

THIRD BIENNIAL REPORT

OF THE

STATE MINE INSPECTORS,

TO THE

GOVERNOR OF THE STATE OF IOWA.

FOR THE YEARS 1886 AND 1887.

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PRINTED BY ORDER OF THE GENERAL ASSEMBLY.

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1888.

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## FIRST DISTRICT.

EMBRACING

APPANOOSE, ADAMS, DAVIS, JEFFERSON, LUCAS,  
MARION, MONROE, PAGE, TAYLOR, VAN BUREN,  
WAPELLO, WARREN AND WAYNE COUNTIES.

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THOMAS BINKS, OTTUMWA, INSPECTOR.

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## BIENNIAL REPORT.

*To his Excellency, WILLIAM LARRABEE, Governor of Iowa:*

SIR—In compliance with the requirements of the mining laws of Iowa, I have the honor to submit my report of the department of mines in district number one for the two years ending June 30, 1887. In this report I have endeavored to give a statement of the work done, the out-put of coal and a list of the fatal and non-fatal accidents in and about the mines, and a list of the improvements and the number of mines in the first district.

### COAL OUT-PUT OF THE COUNTIES COMPRISING DISTRICT NO. 1 FOR THE PAST FIVE YEARS.

COUNTY.	1883.	1884.	1885.	1886.	1887.
Appanoose .....	129,896	158,986	245,896	150,000	160,351
Adams .....	3,891	3,981	3,896	9,581	19,851
Davis .....	527	1,207	33,655	1,000	1,800
Jefferson .....	38,887	8,172	1,116	1,083	10,397
Lucas .....	487,821	410,729	439,956	530,759	472,998
Marion .....	90,985	97,085	100,011	141,694	212,695
Monroe .....	93,435	98,427	101,517	117,700	183,505
Page .....	748	1,009	1,819	1,550	1,780
Taylor .....	94	127	617	8,585	12,180
Van Buren .....	1,678	1,778	1,193	8,085	26,331
Wapello .....	237,821	240,720	187,911	237,111	272,073
Warren .....	12,828	13,727	12,825	23,332	24,796
Wayne .....	1,892	4,947	25,812	34,000	28,084
	1,099,503	1,040,895	1,156,224	1,264,433	1,426,841

The foregoing table shows the product of coal in the first district for the past five years. It will be seen by reference to the above table that the past year is largely in excess of any former year. Quite a number of the local mines and some of the larger ones have failed to send in reports of coal mined. It is a very difficult matter to get

the coal product of the State, as there is no way to compel the operators to send in their reports. This department has been delayed in making out their report on account of the operators failing to fill out blanks when sent to them. I would therefore recommend the General Assembly to provide means and make it compulsory on the part of operators to send in reports of their annual production of coal within twenty days after the expiration of the official year.

### LIST OF FATAL ACCIDENTS.

#### OTTO CARLSON—KILLED OCTOBER 15, 1885.

An inquisition held at West Cleveland, in Lucas county, on the 15th day of October, 1885, before H. S. Millan, coroner of said county, upon the dead body of Otto Carlson, there lying dead, by the jurors whose names are hereunto subscribed, the said jurors, upon their oaths, do say that from the evidence given us in this case that it was entirely accidental, and caused by his own carelessness.

Given under our hands this 15th day of October, 1885.

JOHN MASON,  
EDWARD R. EVANS, } Jurors.  
PHILIP PHILIPS,

Attest:

H. S. MILLAN, Coroner, Lucas county.

#### W. B. SANDERS—KILLED DECEMBER 12, 1885.

An inquest held at East Cleveland, in Lucas county, on the 12th day of December, 1885, before W. C. Davis, justice of the peace, acting coroner of the county aforesaid, upon the body of W. B. Sanders, there lying dead, by the jurors whose names are hereunto subscribed, the said jurors, upon their oaths, do say, after hearing the evidence and examining said body, we do find that the deceased came to his death by the falling of a great quantity of slate upon the said deceased, striking his neck and back, from which death was instant.

The jury, on their oaths, do say that the slate fell and the accident occurred from deceased failing to properly prop his room, and they find that props were furnished by the company, and that deceased came to his death solely from his own carelessness and negligence,

and that the White Breast Coal and Mining Company is in no manner negligent.

Given under our hands this 12th day of December, 1885.

J. W. RILEY, }  
R. T. HILL, } Jurors.  
A. F. BAKER, }

Attest:

W. C. DAVIS, Acting Coroner, Lucas county.

#### GEORGE KING—KILLED JANUARY 11, 1886.

We, the jurors, upon our oaths, do say that the deceased came to death by a stone falling upon him while at work in the mine of Kriale & King, in Lincoln township, Lucas county, five miles northeast of Chanton, on the 11th day of January, 1886.

No blame attached to any one.

W. B. FOALKS, }  
J. W. FOSTER, } Jurors.  
J. H. HONEY, }

Attest:

Dr. F. P. STANTON, Coroner, Lucas county.

#### PATRICK BRANNAN—KILLED APRIL 24, 1886.

An inquisition, holden at Patrick Brannan's, in Lucas county, on the 24th day of April, 1886, before F. P. Stanton, coroner of said county, upon the body of Patrick Brannan, who came to his death from injuries produced by a fall of slate in Mine No. 2, East Cleveland, in room 7, first east off main north entry, there lying dead, by the jurors whose names are hereunto subscribed, the said jurors, upon their oaths, do say that he came to his death by a fall of slate in his own room at Mine No. 2, and according to the testimony of witnesses the deceased came to his death by his own neglect.

It testimony whereof, the said jurors have hereunto set their hands the day and year aforesaid.

J. R. EVANS, }  
EDWARD R. EVANS, } Jurors.  
JOHN WATKINS, }

Attest:

F. P. STANTON, Coroner, Lucas county.

## JOHN D. HARRIS—KILLED MAY 29, 1886.

An inquisition holden at Kirkville in Wapello county, Iowa, on the 30th day of May, 1886, before Samuel Guthrie, justice of the peace, acting coroner, upon the body of John D. Harris, there lying dead, by the jurors whose names are hereunto subscribed; the said jurors upon their oaths do say, after having heard the evidence and examined the said body, we do find that the deceased came to his death by falling slate in room No. 15, 11th south in Mine No. 1, Wapello Coal Company, on May 29, 1886; that said death was the result of an unavoidable accident, and that no blame can be attached to any one; dated this 30th day of May, 1886.

JOHN KIRKPATRICK, }  
A. A. JENNISON, } Jurors.  
I. E. PAGE. }

Attest:

SAMUEL GUTHRIE, J. P., Acting Coroner, Wapello County.

## SAMUEL JONES—KILLED JUNE 4, 1886.

An inquisition held at Phillips' Addition to Cleveland, in Lucas county, on the 5th day of June, 1886, before F. P. Stanton, coroner of said county, upon the body of Samuel Jones, there lying dead, by the jurors whose names are hereunto subscribed; the said jurors upon their oaths do say that he came to his death by accident, he being run over by car of coal which ran away accidentally from the main line in Mine No. 2.

In testimony whereof the said jurors have hereunto set their hands the day and year aforesaid.

JOHN MASON, }  
ELI NICHOLS, } Jurors.  
PHILIP J. PHILIPS, }

Attest:

F. P. STANTON, Coroner Lucas County.

## JAMES YOUNG—KILLED JUNE 23, 1886.

An inquisition holden at the house of William Garrington, in Laddsdale, Wapello county, Iowa, on the 24th day of June, 1886, before E. H. Sage, coroner of said county, upon the body of James Young, there lying dead, by the jurors whose names are hereto subscribed; the said jurors upon their oaths do say that the said James

Young came to his death by being crushed by falling slate on the 23d day of June, 1886; purely accidental.

In testimony whereof the said jurors have hereunto set their hands the day and year aforesaid.

W. B. HINKLE, }  
W. E. SICKLES, } Jurors.  
A. A. BROOKS, }

Attest:

E. H. SAGE, Coroner Wapello County.

## ALEXANDER MITCHELL—KILLED JUNE 26, 1886.

An inquisition holden at the residence of Alexander Mitchell, in Lucas county, on the 27th day of June, 1886, before F. P. Stanton, coroner of said county, upon the body of Alexander Mitchell, there lying dead, by the jurors whose names are hereunto subscribed; the said jurors upon their oaths do say that he came to his death by an accident in the Whitebreast Coal Company's mines, No. 2, in Cleveland, Iowa, by being caught with the cage; no blame is attached to any one.

In testimony whereof the said jurors set their hands the day and year aforesaid.

AMOS ROBINSON, }  
ALVIN LOCK, } Jurors.  
C. J. PLYMPTON, }

Attest:

F. P. STANTON, Coroner Lucas County.

## EDWARD CLARKSON—KILLED SEPTEMBER 21, 1886.

An inquisition holden at Cleveland in Lucas county on the 21st day of September, 1886, before J. Grim, justice of the peace, acting coroner, upon the body of Edward Clarkson, there lying dead, by the jurors whose names are hereunto subscribed; the said jurors, upon their oaths do say, after hearing the evidence and examined said body we do find that the deceased came to his death by accident—rock falling upon him while turning an entry off the second south in shaft B, owned and operated by the Whitebreast Coal & Mining Company.

Given under our hands this day and year aforesaid.

THOS. T. JONES, }  
E. R. EVANS, } Jurors.  
JOHN MASON, }

Attest:

J. GRIM, J. P., Acting Coroner Lucas County.

## LEWIS NEIGHBOR—KILLED NOVEMBER 26, 1886.

An inquisition holden at the office of Dr. Densmore, in Kirkville, Wapello county, on the 27th day of November, 1886, before E. H. Sage, coroner of said county, upon the body of Lewis Neighbor, there lying dead, by the jurors whose names are hereunto subscribed, the said jurors upon their oaths do say, that the deceased came to his death by accidentally falling from the coal cars.

In testimony whereof the said jurors have hereunto set their hands this day and year aforesaid.

SAMUEL GUTHRIE, }  
W. H. BRADLY, } Jurors.  
J. W. CARSON, }

Attest:

E. H. SAGE, Coroner Lucas County.

## ABNER C. WILEY—KILLED MARCH 7, 1887.

An inquisition holden at Ottumwa, Iowa, on the 7th and 8th days of March, 1887, before E. H. Sage, coroner of Wapello county, upon the body of Abner C. Wiley, there lying dead, by the jurors whose names are hereunto subscribed; the said jurors upon their oaths do say, that the said Abner C. Wiley came to his death by being crushed by falling slate in mine No. 1, in the Phillips Coal Mine, on the morning of the seventh day of March, 1887. No blame attached to anyone.

In testimony whereof the said jurors have hereunto set their hands this eighth day of March, 1887.

R. B. HAMELE, }  
JOHN H. CARTER, } Jurors.  
E. A. MCGARY, }

Attest:

E. H. SAGE, Coroner Wapello County.

## BARNEY BUDDY—KILLED JUNE 3, 1887.

Mr. Barney Buddy was killed on the above date in the mine of the Pleasant Valley Coal Company, at Coalfield, Monroe county, by fall of slate; his age was 55 years; a widower.

[I have been unable to get the verdict of the jury in the above case, though I have repeatedly written the Coroner requesting him to forward it to this office as the law requires.]

## LIST OF NON-FATAL ACCIDENTS.

FRANK L. WALTON—SEPTEMBER 18, 1885.

A miner; 24 years of age; single man; in the mine of the Whitebreast Coal Company at Swan, in Marion county; back and right arm bruised and small bone in left foot broken by fall of slate in his room.

L. S. BUNCH—NOVEMBER 3, 1885.

A driver in the mine of the Whitebreast Coal Company at Swan, in Marion county; arm bruised and skin scratched off the palm of hand.

ELI BURTON—DECEMBER 1, 1885.

Thirty-six years of age; married man; in the mine of the Whitebreast Coal Company at Swan, in Marion county; bruised across small of back and hips by fall of slate.

ROBERT COLLING—JANUARY 5, 1886.

A miner; 34 years of age; married man; in the mine of the Whitebreast Coal Company at Swan, Marion county; left collar bone broken and bruised about the head and shoulders. Also the left leg bruised by fall of slate in his room.

THOS. BRANNAN—APRIL 24, 1886.

A miner in the mine of the Whitebreast Coal Company at Cleveland, in Lucas county; injured by fall of slate; not serious.

THOS. MALOY—MAY 4, 1886.

Was slightly injured by fall of slate in the mine of the Whitebreast Coal Company at Cleveland, in Lucas county.

JOHN COLLARD—MAY 18, 1886.

A miner in the No. 1 mine of the Whitebreast Coal Company at Cleveland, Lucas county; had a leg broken by premature explosion of shot.

DANIEL TUCKER—MAY 18, 1886.

A colored miner in the No. 1 mine of the Whitebreast Coal & Mining Company at Cleveland, Lucas county; had a leg broken by fall of slate.

ED. WILDS—JULY 5, 1886.

Was injured in the mine of the Wapello Coal Company at Kirkville, Wapello county, by going back to a shot after lighting.

NOAH DAVIS—JULY 10, 1886.

Had a leg broken in the mine of the Wapello Coal Company, Wapello county, by being thrown off of a car of coal against the rib of entry.

GEO. BENNAED—MAY 16, 1887.

A miner in the mine of the Whitebreast Coal Company at Cleveland, Lucas county, was injured by coal falling upon him.

J. R. THOMAS—JUNE 4, 1887.

Had two toes broken in the mine of the Wapello Coal Company at Kirkville, Wapello county, by mule stepping on his foot.

RICHARD PRICE—OCTOBER 11, 1886.

A miner in the mine of the Wapello Coal Company at Kirkville, Wapello county, had one of his toes mashed by fall of slate.

RICHARD WILLIAMS—OCTOBER 12, 1886.

A miner 38 years of age, in the mine of the Whitebreast Coal Company at Swan, Marion county, was bruised across the back by fall of slate.

ED. PERRY—OCTOBER 25, 1887.

Was injured in the mine of the Wapello Coal Company by being caught between the pit cars.

HY. PROUD—OCTOBER 26, 1886.

A miner in the mine of the Wapello Coal Company at Kirkville, in Wapello county, head injured by fall of slate.

H. D. RUSSELL—OCTOBER 22, 1886.

Henry Taylor, A. M. Ballard and Alvin Stanley were injured in the mine of Centerville Coal Company at Centerville, Appanoose county, by the breaking of a cog wheel in the engine, while hoisting the men up the shaft and having no brake on the drom, could not control the cage.

ED. PERRY—NOVEMBER 13, 1886.

In the mine of the Wapello Coal Company at Kirkville, Wapello county, had two fingers taken off by attempting to uncouple a trip of cars while in motion.

MARTIN NICHOLSON—NOVEMBER 16, 1886.

A miner in the mine of the Albia Coal Company near Albia, in Monroe county, had a leg broken by fall of slate.

WILLIAM MC MILLAN—DECEMBER 1, 1886.

Was injured by fall of slate in the mine of the Albia Coal Company near Albia, Monroe county.

JOHN HALL—DECEMBER 24, 1886.

A miner in the mine of the Wapello Coal Company at Kirkville, in Wapello county, was injured by fall of slate.

WILLIAM MC DERMOTT—JANUARY 8, 1887.

William McDermott was injured in the mine of the Whitebreast Coal Company at Swan, Marion county, by being caught between a car and prop.

JAKE BEVANS—JANUARY 6, 1887.

A miner in the mine of the Whitebreast Coal Company at Swan, in Marion county, had his collar bone broken, left side and shoulder cut by fall of slate.

JOSEPH FAIRLESS—JANUARY 25, 1887.

A miner in the mine of the Whitebreast Coal Company at Swan, in Marion county, was injured by fall of slate, not seriously.

EDWARD GIVEN—MARCH 18, 1887.

A colored man in the mine of the Whitebreast Coal Company at Cleveland, Lucas county, was badly bruised by fall of slate.

C. W. PETERSON—MARCH 21, 1886.

A miner in the mine of the Whitebreast Coal Company at Swan, Marion county, had a leg broken by fall of slate.

JOSEPH MARCH—APRIL 4, 1887.

A cager in the mine of the Whitebreast Coal Company at Swan, Marion county, was injured by being caught under the cage at the bottom of shaft.

JOHN DEVORE—APRIL 5, 1887.

A driver in the mines of the Whitebreast Coal Company, at Cleveland, Lucas county, was injured by being caught between a car and a prop.

JOHN HEATHCOTE—APRIL 15, 1887.

A miner in the No. 2 mine of the Whitebreast Coal Company, at Cleveland, Lucas county, was injured by the premature discharge of shot.

JOHN ORR, SR.—APRIL 18, 1887.

Was injured in the mines of the Wapello Coal Company at Kirkville, Wapello county, by fall of slate in his room.

JAKE SMITH—APRIL 18, 1887.

A miner, was injured in the mine of the Wapello Coal Company at Kirkville, Wapello county, by the falling of a lump of coal.

There have been eleven fatal and thirty-four non-fatal accidents in the first district from June 30, 1885, to June 30, 1887. During this period there was mined 2,691,274 tons of coal; there was mined for each fatal accident, 224,272 tons of coal; and for each non-fatal accident, 79,155 tons; for each casualty, 58,505 tons.

IMPROVEMENTS MADE IN THE MINES OF DISTRICT No. 1,  
FROM JUNE 1, 1886, TO JUNE 30, 1887.

## APPANOOSE COUNTY.

NAMES OF MINES.	Air shafts.	Second openings.	Stairway.	Covers on cages.	Safety catches.	Safety gates.	Furnaces.	Fans.	Brakes on drum.
	Bradley & Jones.....	1			1	1	1		
Diamond Mine No. 1.....		1	1	1					
Diamond Mine No. 2.....									1
Centerville Coal Co. ....									1
McLord Mine.....		1							
Fenton & Son.....		1							

## ADAMS COUNTY.

Henry Jones.....		1							
Herbert Perks.....	1								
William Pickard.....	1								
Co-operative Mine.....		1							
Sypert & Jones.....	1								
Hazel Dell Mine.....		1							
Smith Connors.....		1							
Samuel Powell.....		1							
Richard Briscoe.....		1							

## JEFFERSON COUNTY.

Lick Creek Mine.....		1							
Jefferson County Mine.....		1	1						
Black Creek Mine.....		1							
Cedar Mine.....		1							

## LUCAS COUNTY.

White Breast No. 2.....		1							1
Williams & Bros.....		1							
William Griffith.....		1							
John Granville.....		1							



IMPROVEMENTS MADE IN THE MINES—CONTINUED.

MARION COUNTY.

NAMES OF MINES.	Air shafts.	Second opening.	Stairways.	Covers on cages.	Safety catches.	Safety gates.	Furnaces.	Fans.	Brakes on drums.
White Breast No. 7.....	1		1	1	1	1			1
Union Coal Co.....	1		1						
Maddys.....		1							
North Star.....		1							
Ructman.....	1						1		
Black Diamond.....	1	1							
Fern Hill.....		1							
Knoxville City Mine.....	1								
Marshall.....		1							
Evans & Sanders.....	1				1				
Lewis Mine.....		1							

MONROE COUNTY.

Albia Coal Co.....	2		1				1		
Iowa & Wisconsin.....		1	1						
Pleasant Valley.....	1						1		
Chisholm Mine.....		1			1				1

TAYLOR COUNTY.

Anderson Mine.....	1	1					1		
Linsey.....		1							
Bean.....		1							

VAN BUREN COUNTY.

Farmington.....	1	1	1						
Douds.....		1							
Finlin.....	1								

WARREN COUNTY.

Custer.....	1								
Snell & F.....	1								
Webster.....		1							

IMPROVEMENTS MADE IN THE MINES—CONTINUED.

WAPELLO COUNTY.

NAMES OF MINES.	Air shafts.	Second opening.	Stairways.	Covers on cages.	Safety catches.	Safety gates.	Furnaces.	Fans.	Brakes on drums.
Wapello No. 1.....	1						1		
Wapello No. 3.....	1								
Phillips No. 1.....			1						1
Phillips No. 2.....			1	1	1				1
Vanderpool.....	1								
Metzer.....	1								
Kirkpatrick.....		1	1						
Eldon No. 1.....		1							1
Baker.....				1					
Bennett.....	1								
Knight.....	1								
Gooden.....		1							

WAYNE COUNTY.

Occidental.....	1								
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## NAME OF MINES AND LOCATION.

## APPANOOSE COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine	Kind of mine.	POST-OFFICE.
Appanoose Coal Co.	No. 1	Shaft	Cincinnati.
Scandinavian Coal Co.	No. 1	Shaft	Centerville.
Diamond Mine.	No. 1	Shaft	Centerville.
Diamond Mine.	No. 2	Shaft	Centerville.
Walnut Coal Co.	No. 1	Slope	Brazill.
Hawkeye Coal Co.	No. 1	Slope	Brazill.
Standard Coal Co.	No. 1	Shaft	Centerville.
Tipton Coal Co.	No. 1	Slope	Brazill.
B. F. Silknetter	No. 1	Slope	Brazill.
Philby Coal Co.	No. 1	Drift	Brazill.
Centerville Coal Co.	No. 1	Shaft	Centerville.
N. H. Nash.	No. 1	Shaft	Walnut City.
George Glass	No. 1	Shaft	Dennis.
McClards	No. 1	Shaft	Centerville.
Blackburn & Arborgast.	No. 1	Shaft	Numa.
Wm. Crisfield	No. 1	Drift	Cincinnati.
Charles McMarraw	No. 1	Drift	Cincinnati.
Bradley & Jones.	No. 1	Shaft	Numa.
Elden Coal Co.	No. 2	Shaft	Centerville.
Slater & Bros.	No. 1	Shaft	Cincinnati.
Charles Knight	No. 1	Shaft	Plano.
J. J. Young	No. 1	Shaft	Griffinsville.
Fenton & Son	No. 1	Shaft	Milledgeville.
B. B. Parker	No. 1	Shaft	Livingstone.
Clay Thompson	No. 1	Shaft	Plano.
A. J. Morman	No. 1	Drift	Walnut City.
G. W. McCloud	No. 1	Drift	Walnut City.
Jimmerson Huston	No. 1	Drift	Walnut City.
R. L. Dora	No. 1	Drift	Dennis.
Luther Cambell	No. 1	Drift	Centerville.
James Gaston	No. 1	Drift	Moravia.
John Dickinson	No. 1	Shaft	Moulton.
H. C. Barker	No. 1	Shaft	Centerville.

## ADAMS COUNTY.

Herbert Perks	No. 1	Shaft	Carbon.
Wm. Colwell	No. 1	Shaft	Carbon.
Wm. Pickard	No. 1	Shaft	Carbon.
Henry Jones	No. 1	Shaft	Carbon.
Co-operative Mine	No. 1	Shaft	Carbon.
Sypert & Jones	No. 1	Shaft	Carbon.
Hazel Dell	No. 1	Shaft	Carbon.
George Harden	No. 1	Shaft	Carbon.
Levi J. Bailey	No. 1	Shaft	Eureka.
Garrett & Lineman	No. 1	Shaft	Carbon.
Samuel Powell	No. 1	Shaft	Eureka.
Joseph Tippert	No. 1	Shaft	Eureka.
Smith & Connors	No. 1	Shaft	Carbon.
Richard Briscoe	No. 1	Shaft	Briscoe.
Andy Bennett	No. 1	Shaft	Briscoe.

## NAMES OF MINES—CONTINUED.

## DAVIS COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Ely Dye	No. 1	Drift	Eldon.
Tip Dotson	No. 1	Drift	Eldon.
Jerome White	No. 1	Drift	Eldon.
John Cudworth	No. 1	Drift	Eldon.
J. Davis	No. 1	Drift	Eldon.

## JEFFERSON COUNTY.

De Marsh & Hoskinson	No. 1	Shaft	Perlee.
De Marsh & Hoskinson	No. 2	Shaft	Perlee.
Thomas Russell	No. 1	Shaft	Fairfield.
R. A. Eno	No. 1	Shaft	Fairfield.
John Beal	No. 1	Slope	Libertyville.
Andy Black	No. 1	Shaft	County Line.
John Cloke	No. 1	Shaft	County Line.
Amos Taylor	No. 1	Shaft	County Line.
Richard Thompson	No. 1	Drift	Perlee.
William Henry	No. 1	Drift	Perlee.

## LUCAS COUNTY.

Whitebreast Coal Company	No. 1	Shaft	Cleveland.
Whitebreast Coal Company	No. 2	Shaft	Cleveland.
Whitebreast Coal Company	No. 3	Shaft	Cleveland.
Iowa and Nebraska Coal Company	No. 1	Shaft	Zero.
Chariton Coal Company	No. 1	Shaft	Lucas
Williamson & Bros.	No. 1	Shaft	Chariton.
Soudahl & Soudahl	No. 1	Shaft	Chariton.
James McDowell	No. 1	Drift	Chariton.
Phillip Smith	No. 1	Drift	Chariton.
W. M. Griffith	No. 1	Drift	Chariton.
Paul Krile	No. 1	Drift	Chariton.
John Granville	No. 1	Drift	Chariton.
Joseph Love	No. 1	Drift	Columbia.
Joseph Buchanan	No. 1	Drift	Columbia.

## NAME OF MINES—CONTINUED.

## MARION COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Whitebreast Coal Company	No. 7	Shaft	Swan.
Union Coal Company	No. 5	Slope	Flagler.
I. P. Maddy	No. 1	Drift	Knoxville.
William Franklin	No. 1	Slope	Flagler.
Oak Hill	No. 1	Drift	Flagler.
Jacob Bingham	No. 1	Drift	Gosport.
Thomas Griffith	No. 1	Drift	Knoxville.
George McGruder	No. 1	Drift	Attica.
Samuel States	No. 1	Drift	Attica.
Samuel Whitlatch	No. 1	Drift	Attica.
David Price	No. 1	Drift	Attica.
North Star Coal Company	No. 1	Shaft	Hamilton.
Reece & Walters	No. 1	Drift	Maysville.
Davidson & Hoyt	No. 1	Shaft	Lovilla.
George Finstraws	No. 1	Slope	Otley.
S. M. Ructman	No. 1	Slope	Knoxville.
William Thompson	No. 1	Slope	Pella.
S. A. Boudnot	No. 1	Slope	Hamilton.
Black Diamond Coal	No. 1	Slope	Dunreath.
G. W. Hamilton	No. 1	Slope	Hamilton.
Devers & Bros.	No. 1	Slope	Bussey.
John Yanson	No. 1	Slope	Maryville.
Grub & McNaish	No. 1	Drift	Monroe.
Polk Stoup	No. 1	Drift	Monroe.
George Richards	No. 1	Drift	Columbia.
Linn Van Steinberg	No. 1	Drift	Pella.
Martin Vissen	No. 1	Drift	Pella.
William Booth	No. 1	Drift	Columbia.
Lewis Whitlatch	No. 1	Drift	Attica.
Zack Smith	No. 1	Drift	Pella.
Patrick Carey	No. 1	Drift	Pella.
S. S. Collins & Co.	No. 1	Shaft	Knoxville.
John Slackhouse	No. 1	Drift	Pella.
I. N. Davis	No. 1	Drift	Knoxville.
Samuel Harvey	No. 1	Drift	Knoxville.
George Marshall	No. 1	Slope	Otley.
Little & Sulley	No. 1	Drift	Bussey.
Evans & Sanders	No. 1	Shaft	Knoxville.
James Ash	No. 1	Slope	Pleasantville.
William A. Gamble	No. 1	Shaft	Knoxville.
W. M. Lewis	No. 1	Shaft	Knoxville.
John V. Yarrell	No. 1	Slope	Dunreath.
James Moles	No. 1	Drift	Dunreath.
Elijah Stephens	No. 1	Drift	Dunreath.

## NAMES OF MINES—CONTINUED.

## MONROE COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Albia Coal Co.	No. 1	Shaft	Albia.
Ralph Wignal	No. 1	Slope	Avery.
Iowa & Wisconsin	No. 1	Shaft	Albia.
James Seddon	No. 1	Slope	Avery.
Pleasant Valley	No. 1	Slope	Coalfield.
Fredric Mine	No. 1	Shaft	Fredric.
Enterprise Coal Co.	No. 1	Shaft	Albia.
Hickory Mine	No. 1	Shaft	Hickory.
Chisholm Mine	No. 1	Shaft	Chisholm.
Smoky Hollow Mine	No. 1	Slope	Avery.
Granger	No. 1	Drift	Coalfield.
F. Hoslaws	No. 1	Drift	Albia.
J. H. Brewer	No. 1	Drift	Albia.
John Cash	No. 1	Drift	Albia.
Langdon & Griffith	No. 1	Shaft	Albia.
Munley Mine	No. 1	Drift	Albia.
George Richard	No. 1	Drift	Columbia.
Frank Jones	No. 1	Drift	Selection.

## PAGE COUNTY.

Robert Aiken	No. 1	Shaft	Shambaugh.
William McLean	No. 1	Shaft	Shambaugh.
W. J. McLellan	No. 1	Shaft	Shambaugh.

## TAYLOR COUNTY.

Ben Anderson	No. 1	Shaft	New Market.
Roderick Campbell	No. 1	Shaft	New Market.
Brewer & Cade	No. 1	Shaft	New Market.
B. F. Pace, Jr.	No. 1	Shaft	New Market.
William H. Bean	No. 1	Shaft	New Market.
Wm H. Grennan	No. 1	Shaft	New Market.
Y. F. Pace	No. 1	Shaft	New Market.
Gomer Beyrion	No. 1	Shaft	Villisca.
Nathan Wilcox	No. 1	Shaft	Villisca.

## VAN BUREN COUNTY.

Farmington Coal Co.	No. 1	Shaft	Farmington
Carson & Walker	No. 1	Shaft	Douds
Henry Knott	No. 1	Shaft	Farmington.
Emerson Brown	No. 1	Drift	Keosauqua
A. C. Boyer	No. 1	Drift	Bentonsport.
Hugh Finlin	No. 1	Slope	Douds.
Samuel Fitzgerald	No. 1	Drift	Selma.
Perry Davis	No. 1	Drift	Keosauqua.
Thomas Moyer	No. 1	Shaft	Birmingham.
E. S. Green	No. 1	Shaft	Douds
David Cox	No. 1	Drift	Hillsboro.
E. P. Broomfield	No. 1	Drift	Hillsboro.
Ephraim Downard	No. 1	Drift	Utica.
Thomas Teal	No. 1	Drift	Utica.
T. E. Staylor	No. 1	Drift	Wilsonville.

## NAMES OF MINES—CONTINUED.

## WAPELLO COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Wapello Coal Co.	No. 1	Slope	Kirkville.
Wapello Coal Co.	No. 3	Shaft	Kirkville.
Phillips Coal Co.	No. 1	Shaft	Ottumwa.
Phillips Coal Co.	No. 2	Shaft	Ottumwa.
Wapello Coal Co.	No. 4	Slope	Kirkville.
Hawkeye Coal Co.	No. 1	Shaft	Ottumwa.
Jacob Beam	No. 1	Shaft	Ottumwa.
Sheppard Mine.	No. 1	Shaft	Ottumwa.
John Vanderpool	No. 1	Shaft	Ottumwa.
William Metzgar	No. 1	Shaft	Ottumwa.
Miers & Bros	No. 1	Shaft	Ottumwa.
Kirkpatrick Mine.	No. 1	Shaft	Ottumwa.
Eldon Coal Co.	No. 1	Shaft	Ottumwa.
William Baker	No. 1	Shaft	Ottumwa.
William Bowers	No. 1	Shaft	Ottumwa.
S. H. Goodin	No. 1	Shaft	Ottumwa.
William Knight	No. 1	Shaft	Ottumwa.
William Bennet	No. 1	Shaft	Kirkville.
Henry Myers	No. 1	Slope	Kirkville.
M. B. Godley	No. 1	slope	Eldon.

## WARREN COUNTY.

Summerset Coal Company	No. 1	Shaft	Summerset.
Lumsden & Bros	No. 1	Shaft	Summerset.
Warren County Coal Company	No. 1	Shaft	Indianola
D. K. Jones	No. 1	Shaft	Indianola.
George Longstaff	No. 1	Shaft	Summerset.
Lord & Overton	No. 1	Shaft	Summerset.
David Simmons	No. 1	Shaft	Summerset.
Gamble & Bros	No. 1	Slope	Ford.
Harrison Miller	No. 1	Drift	Lacona.
Shupe & Odell	No. 1	Drift	Lacona.
Mumford & Mitchell	No. 1	Slope	Lacona.
Rudolph Miller	No. 1	Slope	Lacona.
Snell & Freeman	No. 1	Drift	Lacona.
Huston Fogle	No. 1	Slope	Lacona.
N. D. Bales	No. 1	Shaft	Milo.
H. H. Webster	No. 1	Drift	Milo.
Boyd Parker	No. 1	Drift	Milo.
S. P. Bryant	No. 1	Shaft	Milo.
Samuel T. Burgess	No. 1	Shaft	Milo.
Eugene Richmond	No. 1	Drift	Milo.
Branch & Long	No. 1	Shaft	Milo.
C. G. Hollingsworth	No. 1	Drift	Milo.
Andy Connors	No. 1	Drift	Milo.
Cass & King	No. 1	Drift	Ford.
Ford Coal Company	No. 1	Drift	Ford.
Dufore & Welling	No. 1	Drift	Ford.
J. P. Cotman	No. 1	Shaft	Norwalk.

## NAMES OF MINES—CONTINUED.

## WAYNE COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Occidental Coal Company	No. 1	Shaft	Seymour.
Cooperative Coal Company	No. 1	Shaft	Seymour.
J. F. Attwell	No. 1	Shaft	Confidence.
Lewis Fry & Company	No. 1	Shaft	Confidence.
B. F. Burns	No. 1	Shaft	Confidence.
Richard Davis	No. 1	Drift	Confidence.
Edward Mosby	No. 1	Drift	Confidence.
Thomas Brock	No. 1	Shaft	Confidence.
Jacob Clark	No. 1	Shaft	Confidence.
Blevins & Dexter	No. 1	Drift	Confidence.

## APPANOOSE COUNTY.

The coal which is operated in this county is of the middle coal measures and is two feet ten inches thick, and extends with more uniformity of thickness than the coal of any other county in the first district and is of excellent quality for domestic purposes. There are 33 mines in this county, twelve of these have railroad facilities for shipping coal. The Appanoose Coal Company located at Cincinnati, on Chicago, Burlington & Kansas City Railroad. There are some coal mines here that do a good business in the winter season, but have to haul their coal to the railroad with teams. There are five mines at Centerville that have railroad facilities for shipping coal. The Scandinavian Coal Company and the Centerville Coal Company are located on Keokuk & Western Railroad. The Watson Coal Company, the Diamond Mine No. 2, and the Standard Coal Company are located on the south-western branch of the Chicago, Rock Island & Pacific Railroad. The Standard mine has facilities for shipping coal on the Chicago, Rock Island & Pacific Railroad, and on the Keokuk & Western Railroad. The mine at Numa, seven miles west of Centerville on the Chicago, Rock Island & Pacific Railroad, has facilities for shipping coal. There are five mines at Brazil: The Walnut Coal Company, The Philby Coal Company, The Tipton Coal Company, The "Hawkeye Coal Company and B. F. Silknetter are slope or drift mines and operated with mule power, and all do a shipping business on the Keokuk & Western Railroad. The vein here is about two feet ten inches in thickness and of the lower coal measures. Two mines here are worked on the long wall system, The Philby Mine and The Walnut Mine. The others are on the room and pillar system. The Elden No. 2 Mine is located west of Centerville, was formerly known as the Co-operative Mine, has no railroad facilities for shipping coal. The Diamond Mine No. 1, and McLard Mine are located at Centerville, and do a large local business. There are quite a number of local mines in the county that do a good local business in the winter season. This county produced in 1886, 150,000 tons, in 1887, it produced 160,351 tons, being an increase of 10,351 tons. The mines in this county are prepared to largely increase their out put, whenever the demand calls for it.

## ADAMS COUNTY.

Has fifteen mines in operation, all are shafts from fifty to one hundred feet deep, and all use horse power, not any of the mines in this county have railroad facilities for shipping. The products is all sold at local sales, Corning being the nearest railroad town. There are ten mines in the vicinity of Carbon, three near Eureka, and two mines are opening up at Brisco. On the north line of the county are working the coal of the upper coal measures, which is about 18 inches thick, and all worked on the long wall system, which is the best method of mining this coal. All the mines in this county were found deficient in escape shafts and general improvements, all have been properly notified to comply with the mining law, quite a number of them are making second openings on sinking new hoisting shafts, nearly all the mines are on the Nodaway river. The production of coal in this county in 1886, was 9,581, in 1887, 19,851 tons, increase 10,274 tons.

## DAVIS COUNTY.

Has only a few small drift mines in operation, located on Salt and Soap Creeks are chiefly operated for local trade in the winter season, the vein of coal is from  $3\frac{1}{2}$  to 4 feet thick. Davis county is bounded on three sides by coal producing counties. And no reason is known why it should not soon rank among the best coal counties in the state. It produced in 1886, 1,000 tons of coal, in 1887, 1,800 tons, increase 800 tons.

## JEFFERSON COUNTY.

Has ten mines in operation. The Jefferson County Coal Company at Perlee are making some valuable improvements, and will largely increase their out-put next year. Perlee is an old mining town, but has not done much since 1883, but the prospect is favorable for a revival of the mining business. The Coal Port Mine, about ten miles east of Fairfield, is one of the principal mines in Jefferson county. There was not much done at the mine in 1885, but since the present manager took charge of the mine the production has steadily increased. In 1887 five thousand tons were mined and shipped. The

principal market was Mt. Pleasant, Iowa. This mine is located on the eastern part of the Iowa coal fields. The vein here is about four feet in thickness, and supposed to be the lower vein of coal. The mines located on Lick Creek, three miles south of Libertyville, are mining considerable coal, and is hauled to the Ft. Madison & Northern Narrow Gauge Railroad. The rest of the mines in the county are operated exclusively for local business. The output of coal for this county in 1886 was 1,083 tons; in 1887 it was 10,397 tons, being an increase of 9,314 tons, and the prospect is good for a still larger increase the coming year.

#### LUCAS COUNTY.

The county has thirteen mines in operation. The principal ones are at Cleveland on the main line of the C., B. & Q. R. R. They have excellent railroad facilities for shipping coal. The product of these mines is shipped to western Iowa and Nebraska. They supply the coal chutes which is located at these mines. Are working the middle vein of the lower coal measures which is of excellent quality for steam and domestic purposes. The Whitebreast Coal Company has five thousand acres of coal lands between Lucas and Chariton on the main line of the C., B. & Q. R. R., and is sinking another large hoisting shaft which will largely increase the output of coal in this county the coming year.

The next largest mine is at Zero, on the main line of the C., B. & Q. R. R. Has railroad facilities for shipping coal. The product of this mine is mostly shipped to Nebraska. There are quite a number of small mines in the vicinity of Chariton, all doing a local business and operating in the upper vein, which is about two feet thick.

The county produced in 1886, 530,759 tons of coal; in 1887 it produced 472,998 tons, showing a decrease of 57,761 tons. The reason for this decrease was the working out of the Chariton mine at Lucas, and the decrease in the output of number one mine at Cleveland, which is being rapidly worked out, and the Zero mine being idle most of last year. The largest field of coal lays in the eastern portion of this county, and is quite extensive. This county will certainly increase her output of coal the coming year.

#### MARION COUNTY.

This county has made considerable progress in the last year, having largely increased the output of coal. There are in this county forty-four mines, the largest one is the No. 7 shaft of the White Breast Coal Co., located at Swan, on the Des Moines branch of the Chicago, Burlington & Quincy Railroad. The products of this mine are shipped to western Iowa and Nebraska. Vein of coal is about four and one-half feet thick, and of the lower coal measures.

The Union Mine, at Flagler, is the next largest mine in the county, and is operated in the lower coal measures. Coal is six feet in thickness, and very uniform. The product of this mine is shipped to western Iowa and Nebraska over the Chicago, Burlington & Quincy Railroad. Are making valuable improvements at this mine, and can largely increase the output the coming year.

The Diamond, at Dunreath, on the Wabash railroad, has railroad facilities for shipping coal. They have coal chutes at this mine to supply the locomotives on the road. They are mining in the lower coal measures; vein five and one-half feet thick; are operating on the lands of the Red Rock Coal Company.

The Collins' Mine is within the city limits of Knoxville, and located on the Chicago, Rock Island & Pacific Railroad; has facilities for shipping coal. A large part of the products of this mine is sold in the city. There are several mines in the vicinity of Knoxville that have a good local trade in the winter season.

The North Star Coal Company Mine is located near Hamilton, and several others in the vicinity haul their coal to the Wabash railroad with teams, and ship it north. There is considerable business done here in the winter season. The greatest difficulty is getting the coal to the railroad.

This county has more mines in operation than any other in the State. The greater part of them is operated for local trade, and are found in nearly every township in the county. The mines in the southern part of the county are all operated for local trade, with the exception of those at Hamilton before mentioned. The lower coal measures extends over a large part of the county, and will some day be one of the largest coal producing counties in the State. The county produced in 1886, 141,694 tons of coal; in 1887, 212,695 tons, showing an increase of 71,001 tons.

## MONROE COUNTY.

Has nineteen mines in operation. Seven of these have railroad facilities for shipping. Three of these are located west of Albia, on the main line of the Chicago, Burlington & Quincy Railroad; two are on the Iowa Central Railroad, northeast of Albia; two others are east of Albia on the Chicago, Burlington & Quincy Railroad, one at Chisholm and one at Avery. There are several small mines in the vicinity of Avery that haul their coal to Avery in wagons and ship it. There are some small mines both north and south of Albia that are working in the upper vein of coal. The product is sold at local sales. The mines that are doing a shipping business are working in the middle seam of the lower coal measures, and nearly all of them increased their out put last year, and all are preparing to increase their business this coming year.

Monroe county is bounded by five large coal producing counties—Marion, Mahaska, Wapello, Appanoose and Lucas—and is in the center of the finest part of the Iowa coal fields. This county produced in 1886, 117,700 tons of coal; in 1887 it produced 183,505 tons, showing an increase of 65,805 tons. Will no doubt increase the out-put of coal this coming year.

## PAGE COUNTY.

Has three mines, situated at Shambaugh, on the Nodaway river; are all working the coal of the upper coal measures. The vein is about eighteen inches thick, and worked on the long wall system; are all shaft mines about fifty feet deep and use horse power. When visited on December 15, 1886, were all found deficient in improvements and escape shafts. Proper notice was given to make second openings and to comply with the mining law.

The product of these mines is all sold at local sales. I was informed that the mines near Clarinda were filled with water and were abandoned. This vein of coal has been traced all along the Nodaway river from Shambaugh to the northern part of Adams county, but there has never been much prospecting done for the lower veins in Taylor, Page and Adams counties. Five to six cents per bushel is paid for mining. The selling price at the mines is nine to ten cents per bushel. The production in this county in 1886 was 1,780 tons, in 1887 it was 2,010; increase 230 tons.

## TAYLOR COUNTY.

Has nine mines in operation in the winter season. Seven of these are located at New Market, on the Humeston & Shenandoah Railroad. Anderson's and Campbell's mines have railroad facilities for shipping coal. The mines of this county, like Page and Adams counties, are working the coal of the upper coal measures. All are operated by shafts from fifty to one hundred and twenty feet deep and all use horse power. Coal here is about eighteen inches thick and worked on the long-wall system. Ventilation is by furnace or natural forces. The mines here were also found deficient in necessary improvements and escape shafts. Proper notice was given to make second openings and to comply with the mining law.

Selling price is \$1.80 per ton on the railroad and \$2.25 to \$2.50 per ton at local trade. Five to six cents per bushel is paid for mining. The mines south of Villisca are operating on the upper vein. The coal is sold at local sales at ten cents per bushel. Seven cents per bushel is paid for mining. The out-put of coal in this county in 1886 was 8,585 tons, in 1887 the production was 12,180 tons; increase 3,695 tons.

## VAN BUREN COUNTY.

Is in the southeastern part of the Iowa coal fields and is one of the oldest coal producing counties in the State. There are fifteen mines in operation, the principal ones being at Farmington, in the southeast corner of the county. There are two mines in operation there, the Farmington Coal Company and Henry Knotts Mine. The former one has a tram road from the mine to the C., R. I. & P. R. R. and do a shipping business. The vein of coal here is about four feet thick, and is of the lower coal measures. The next and most important ones are the two mines at Douds, the Douds Coal Company and Hugh Finlin's Mine. They haul their coal to the C., R. I. & P. R. R., about three-fourths of a mile, with teams and unload in the coal chutes at Douds to supply the locomotives. The vein here is about four feet thick. This county, according to Inspector Wilson's report, has never produced more than 1,778 tons of coal in any one year from 1881 to 1885. In 1886 the out-put of coal was 8,038 tons, being an increase of 6,310 tons over the largest out-put from 1881 to 1885.

The production of coal for the year ending June 30, 1887, was 26,336 tons, being an increase over the year 1886 of 18,296 tons, and there is no reason why the out-put cannot be largely increased next year. This county and Jefferson county should certainly produce enough coal for home consumption, which they have not done in the past years.

#### WAPELLO COUNTY.

There are twenty mines in this county, all working in the lower coal measures. The vein is from four to six feet thick. The largest mines are located at Kirkville, on Ottumwa & Kirkville Railroad, and have good facilities for shipping coal. Are operated by the Wapello Coal Company. Their No. 1 slope is the second largest mine in the first district, and produces the largest amount of coal with one exception. The next largest mines are Phillips mines near Ottumwa, on Chicago & Milwaukee Railroad, and the Eldon mine No. 1 on the southern branch of the C., R. I. & P. R. R. Both have railroad facilities for shipping coal, and are preparing to increase their out-put the coming year. There are several local mines in the vicinity of Ottumwa that do a good local business in the winter.

The Wapello Coal Company is opening a new slope mine on the Ottumwa & Kirkville Railroad. The Hawkeye Coal Company of Ottumwa are opening a new shaft mine one and one half miles north of Ottumwa, on the Chicago, Milwaukee & St. Paul Railroad. Both will have railroad facilities for shipping coal, and when completed will largely increase the production in this county.

The Des Moines river runs diagonally through the county and has cut channels through the stratas in many places. The deepest shafts in the county do not exceed one hundred feet, and in many places can be opened by slopes, the coal lying near the surface.

This county has excellent railroad facilities for shipping coal in any direction. It produced in 1886, 237,111 tons; in 1887 in produced 272,073 tons, showing an increase of 34,962 tons for the past year, and all the mines are preparing to increase the out-put in the future.

#### WARREN COUNTY.

Has twenty-seven mines in operation; the principal ones was Lumsden & Bros. and the Summerset Coal Company. The last named one is worked out and abandoned on March 7, 1887. The vein of coal here is three and one-half feet thick and of the middle coal measures and is of good quality. The shaft at Indianola has been shut down for several months, having no escape shaft. There are four mines on Middle river, three miles south of Summerset, all doing a local business. The mines at Lacona and Milo are operated in the upper vein of coal, which is from fourteen to eighteen inches in thickness; are dependant on local sales for their business and on jack frosts for ventilation, which is generally sufficient, as they only run a few months in the winter season.

This county does not produce much coal for the number of mines it has in operation. The railroads do not run in the right direction. This county is handicapped for the want of an outlet for the coal to western markets. It produced in 1886, 23,332 tons of coal; in 1887 the production was 24,796 tons; increase 1,464 tons.

#### WAYNE COUNTY.

Has ten mines in operation, the principal ones being at Seymour, the Occidental and the Co-operative Coal Company. The last named one was abandoned on January 1, 1887. The vein of coal which is being operated in this county is about two feet six inches in thickness and belongs to the middle coal measures, and is of good quality for domestic purposes.

The Occidental mine at Seymour is the only mine in the county doing a railroad business and using steam power for hoisting purposes. All the rest of the mines are operated for local trade and use horse or hand power. The mine at Seymour is worked on the long wall system; the local mines are mostly rooms and pillars, and are located on the east edge of the county.

There are three lines of railroads penetrates this county—the C., R. I. & P. R. R. and the southern branch of the C., M. & St. P. R. R.; also the Keokuk & Western Railroad. This county produced in 1886, 34,000 tons of coal; in 1887, 28,084 tons; decrease, 4,916 tons.



NAMES AND DESCRIPTION OF MINES IN APPANOOSE  
COUNTY—DISTRICT NO. 1.

APPANOOSE.

This is a shaft mine 160 feet deep, located at Cincinnati on the Chicago, Burlington & Kansas City Railroad, is worked on the double entry system, ventilated by steam jet; this mine was idle the day it was inspected; the ventilation of this mine is good; the volume of air was 3,450 cubic feet per minute, but the steam jet was not working; has a good escape shaft; has safety catches and covers on cages. All of the equipments of this mine are in good order; 60 miners are employed, ten day men; is operated by the Appanoose Coal Company; has railroad facilities for shipping coal.

J. N. MARSH,  
*Superintendent.*

SCANDINAVIAN.

This shaft is located at Centerville, on Keokuk & Western Railroad, is 150 feet deep, worked on the double entry system. Owned and operated by the Scandinavian Coal & Mining Company; has a good escape shaft with horse power in good order for hoisting the men. The equipment of this mine is all in good order; they use a double hoisting engine manufactured by the Ottumwa Iron Works; 65 men are employed, 8 day men; 11,040 cubic feet of air was passing per minute and well conducted to the miners' rooms; was inspected July 6, 1886, and March 15, 1887.

T. J. GREEN,  
*Superintendent.*

DIAMOND NO. 1

Is a shaft mine 80 feet deep, located at Centerville; owned and operated by the Diamond Coal Company; has a good escape shaft with steps in it; the equipment of this mine is all in good order and fully complies with the mining law; ten miners, 1 day man; 2,224 cubic feet of air passing per minute; inspected Nov. 17, 1886.

A. DARGAUDEL,  
*Superintendent.*

DIAMOND NO. 2.

This is a shaft mine 157 feet deep, located at Centerville, on Chicago, Rock Island & Pacific Railroad; is owned and operated by the Diamond Coal Company; they use the Legg mining machinery at the mine, which is run by compressed air. This mine is in good order; was inspected July 13, 1886, and again March 17, 1887; is ventilated by furnace; volume of air was 5,460 cubic feet per minute, well conducted to the working places of the men; has a good escape shaft, and safety catches and hoods on cages; has put a new brake on drum; the equipment of this mine was all in good order; 50 men are employed.

A. DARGAUDEL,  
*Superintendent.*

WALNUT

Is a slope mine situated at Brazil on the Keokuk and Western Railroad; is owned and operated by the Walnut Coal Mining Company; is worked on the long wall system; is ventilated by furnace; was inspected August 10, 1886, and again on March 21, 1887; volume of air was 2,000 cubic feet per minute passing around face of the workings; ventilation was excellent. Orders were given to make second opening for escape way. Mules are used to bring the coal to the surface. Seventeen miners employed, two day men.

J. S. BOYD,  
*Superintendent.*

HAWKEYE

Is a slope mine located at Brazil; is owned and operated by the Hawkeye Coal Company; is ventilated by furnace; was inspected August 11, 1886, and again March 18, 1887; volume of air 2,400 cubic feet per minute, which was well conducted around the mine; is worked with double entries and double rooms; roads are clean and dry; orders were given to change their ladders in their escape shaft and make them comply with the mining law; mules are used at this mine, also; 25 miners employed. They ship their coal on the Keokuk and Western Railroad.

JOHN ARCHIBALD,  
*Superintendent.*

## STANDARD.

This shaft is located at Centerville, on the Chicago, Rock Island & Pacific Railroad and on the Keokuk & Western Railroad, is owned and operated by the Standard Coal Company, is worked on the double entry system, ventilated by furnace. The volume of air found entering the furnace measured 10,920 cubic feet per minute, and well distributed to the miners' rooms; has a good escape shaft, safety catches, and covers on cages. Roads are clean and dry. The machinery and equipment of this mine is all in good order. One hundred miners employed; inspected July 13, 1886, and on March 16, 1887.

G. W. MERRITT,  
*Superintendent.*

## TIPTON.

Is a slope mine, located at Brazil, on the Keokuk & Western Railroad; is owned and operated by the Tipton Coal Company; is worked by double entries and double rooms forty to fifty feet wide, with a track on each side; is ventilated by furnace. Was inspected August 11, 1886, and again on March 22, 1887. Volume air was 2,800 cubic feet per minute. Ventilation was good. Mules are used to bring the coal to the surface. Roads and entries are in good order. Thirty-five miners are employed.

THOMAS PHILLIPS,  
*Superintendent.*

## SILKNETTER.

This is a slope mine, situated at Brazil, on the Keokuk & Western Railroad; is owned and operated by B. F. Silknetter; is ventilated by furnace; is worked by double entry and double rooms; was inspected August 10, 1886, and was visited again March 19, 1887. This mine was deficient in ventilation, the volume was 1,440 cubic feet per minute; had to pass through too many old workings before it got to the miners. I advised them to change the current of air, and send it to the men before coming in contact with the old works; have an escape-way by old slope. Mules are used at this mine to haul the coal to the railroad.

J. D. SHIRCK,  
*Superintendent.*

## PHILBY.

Is a drift mine, owned and operated by the Philby Coal Company; is located at Brazil, on the Keokuk & Western Railroad; has an escape shaft; is worked on the long wall system; is ventilated by furnace; was inspected August 10, 1886, and again March 22, 1887. Volume of air 8,320 cubic feet per minute, which was well conducted around to the mens' rooms. Orders were given to put in some new timbers in their main entry, which they promised to do immediately. Fifty miners are employed in the winter season.

DAVID PHILBY,  
*President.*  
D. D. PHILBY,  
*Superintendent.*

## RELAY MINE.

Is situated a short distance west of Centerville, on the Keokuk & Western Railroad; is one hundred and six feet deep, owned and operated by the Centerville Coal Company; is ventilated by fan; when running gave 9,000 cubic feet of air per minute, and was very well conducted. This mine had been badly managed previous to the Centerville Coal Company taking hold of it; had been worked on ground-hog system. They are getting the mine in good order. They use the Legg mining machinery. Here, eighty miners are employed in the winter season. Is worked with double entries and double rooms; was inspected July 14, 1886, and on March 17, 1887. The mine was greatly improved on my second visit.

F. E. DRAKE,  
*Superintendent.*

N. H. Nash operates a shaft mine near Walnut City for local trade in the winter season. Orders were given to make second opening, and put on necessary improvements.

## JACKSON.

Is situated three miles north of Dennis; is a shaft mine, operated for local trade in the winter season; has escape-way by old slope, which needs some repairs. This mine was idle when visited. Notice has been sent to put in necessary improvements.

GEORGE GLASS,  
*Superintendent.*

## M'CLARD.

Is a shaft mine, sixty feet deep, located at Centerville and operated for local trade. Had escape shaft with perpendicular ladders in it; orders were given to change them, which they promised to do immediately. Vein of coal three feet thick; four miners employed.

J. O. ROBNEY,  
*Superintendent.*

## BLACKBURN.

Is a small shaft mine, located at Numa; is fifty feet deep, operated for railroad and local sales. The four men who run the mine do all the mining; they employ no miners.

BLACKBURN & ARBOGAST,  
*Managers.*

William Crisfield operates a drift mine two and one-half miles southwest of Cincinnati for local trade in the winter season. Vein of coal two and one-half feet thick; two miners employed.

Charles McMarrow operates a drift mine two and one-half miles southwest of Cincinnati for local trade. Vein two and one-half feet thick; two miners employed.

## NUMA.

Is a shaft mine, 144 feet deep, situated at Numa, on the southwestern branch of C., R. I. & P. R. R., and operated by Bradley & Jones. Was inspected July 16, 1886, and found the mine in good order but deficient in improvements and escape way. Notice was given to comply with the mining law; was inspected again November 17, 1886, and found the mine in the same condition in regard to safety catches, cover on cages, brake on drum, not any of these improvements had been applied. The manager told me he had ordered these improvements and would have them on immediately, which has been done. They asked me for an extension of time on their escape shaft, which was granted, as the weather was very cold and the shaft had considerable of water in it. They are sinking their escape shaft now and will have it finished in a short time as I have been informed by letter from the superintendent, dated August 12, 1887.

## ELDON NO. 2.

Is located three miles west of Centerville; depth of shaft 145 feet. It has not been worked for years, but has recently been opened up by the Eldon Coal & Mining Company; have opened considerable of entries which are all double and will be worked on the double-entry system. This mine was employing ten men, has shut down until the mines are put in order for doing a railroad business. Vein of coal is two feet eight inches thick; very regular with a good slate roof over it. This mine only run a few weeks during the winter.

THOMAS GARRINGTON,  
*Superintendent.*

## CINCINNATI.

This is a new shaft, seventy-four feet deep, situated one mile north of Cincinnati. Orders were given to make second opening and put on necessary improvements. Has good horse power and good cable. Coal is hauled to the C., B. & K. C. R. R. with teams. Vein of coal three feet thick; good quality of coal. Six miners were employed when visited on March 11, 1887; is operated by Slater & Bros.

## KNIGHT.

Is a shaft mine, fifty feet deep, located at Plano and operated for local trade. Notice was given to make second opening. This mine is well fitted up for a local mine. Vein of coal three feet thick; ventilated by grate; three miners employed.

CHARLES KNIGHT,  
*Superintendent.*

## YOUNG.

This shaft is forty feet deep; situated near Griffinsville; has no escape shaft; will sink a new hoisting shaft and use the old shaft for air and escape way; vein of coal three feet thick. Operated for local trade in winter season, by J. J. Young.

## FENTON.

Is a shaft twenty-five feet deep; has an escape way by old slope; is located near Milledgeville; is operated for local trade in the winter season; three miners employed; vein of coal three feet thick; ventilated by grate. Operated by Fenton & Son.

## PARKER.

Is a shaft mine, 105 feet deep; situated near Livingstone; has no escape shaft. I notified them to make second opening and have safety catches on covers on cages; six miners are employed in the winter season. This mine was not working when visited. Vein two feet six inches thick; sold at local sales. Operated by B. B. Parker.

Clay Thompson operates a shaft mine three and one-half miles southwest of Plano; is operated for local sales in the winter season; six miners employed; was not running when visited. Notice has been sent to comply with the mining law.

A. J. Mormon operates a drift mine one and one-half miles southwest of Walnut City; is operated for local trade in the winter season. Vein of coal two and one-half feet thick.

G. W. McCloud operates a drift mine one and one-quarter miles southwest of Walnut City, for local trade. Vein of coal two and one-half feet thick.

Jimmerson Huston operates a drift mine three and one-half miles southeast of Walnut City, for local trade in the winter season.

R. L. Dora operates a drift mine three miles southwest of Dennis for local trade.

Luther Cambell operates a drift mine south of Centerville, for local sales.

James Gaston operates a drift mine south of Moravia, for local trade.

John Dickinson operates a small shaft near Moulton, for local trade in the winter season.

## BARKER.

Is a new shaft mine, seventy-four feet deep, located three and one-half miles west of Centerville, on the Keokuk & Western railroad; has no railroad facilities for shipping yet; has been idle for several months; will put in improvements before operating this mine; H. C. Barker, superintendent.

NAME AND DESCRIPTION OF MINES IN ADAMS COUNTY  
—DISTRICT NO. 1.

## PERR'S MINE.

Is a shaft fifty feet, is located at Carbon, eight miles north-west of Corning, has an air shaft, ventilation good, no escape shaft, no covers or safety catches on cages, no brake on drum. Orders were given to make second opening and to put on the improvements. Eleven miners employed; was inspected December 21, 1886.

HERBERT PERKS,  
*Superintendent.*

## ELDEEY'S.

Is a shaft mine fifty feet deep, situated at Carbon, has no second opening, no safety catches or covers on cages, no safety gates on top of shaft, no brake on drum, the ventilation of mine was poor, vein of coal 18 inches thick, worked on the long wall system; notice was given to make second opening and put on necessary improvements, is operated for local trade by William Colwell. Fifteen miners employed; was inspected December 21, 1886.

## PICKARD.

Is a shaft mine operated for local trade, is located at Carbon; was drawing out all the pillars when visited, will be finished soon, have been informed since visited the mine that it is abandoned and are opening a new shaft. Thirteen miners are employed in old shaft.

WILLIAM PICKARD,  
*Superintendent.*

## JONES MINE AT CARBON.

Is a shaft fifty feet deep, employs twelve miners, is operated for local trade, is opening up a new shaft and will put on necessary improvements and use the old shaft for escape way. Operated by Henry Jones; was inspected December 22, 1886.

## CO-OPERATIVE MINE AT CARBON.

Is a shaft fifty feet deep, worked on the long wall system; vein of coal 18 inches thick, will have second opening soon; they are driving their entry to adjoining shaft. Orders were given to put on necessary improvements; is operated by the Carbon Co-operative Coal Company, has natural ventilation at present time. Employs seventeen miners; was inspected December 21, 1886.

THOMAS GABBIE,  
*Superintendent.*  
E. A. CARNES,  
*Secretary.*

Sypert & Jones's shaft at Carbon when visited was not in good condition in regard to general security. No safety catches or covers on cages and the cable in bad order, did not inspect this mine as I did, not consider the cable safe. Orders were given to put on new cable immediately which they promised to do; they have air shaft but no lawful escape way. Ventilation was good; vein of coal eighteen inches thick; worked on the long wall system; is operated for local trade. Twelve miners employed, one day man; visited December 21, 1886.

SYPERT & JONES.  
*Managers.*

## HAZEL DELL MINE.

Is a shaft ninety-five feet deep, situated  $2\frac{1}{2}$  miles north of Carbon, was found in good order, ventilation good, had no second opening, no safety catches or covers on cages, have received information that they are making escape way and will put on necessary improvements and will make the mine comply with the mining law. Vein of coal eighteen inches thick; worked on the long wall system; number of miners employed, nine; is operated for local trade by Joseph Hartshorn; was inspected December 22, 1886.

## HAZEL DELL.

Is operated by George Hardin for local trade, is located  $2\frac{1}{2}$  miles north of Carbon; ventilation was good but was not supplied with the necessary improvements; notice was given to make second opening; vein of coal eighteen inches thick; worked on the long wall system; eight miners employed; shaft eighty nine feet deep; was inspected December 21, 1886.

## NEAL'S MINE.

Is a shaft eighty feet deep, located two miles north of Carbon, is operated by Garrett and Liniman for local trade; had no escape way, no covers or safety catches on cages; orders were given to put on these improvements; ventilation was only moderate; vein of coal eighteen inches thick; worked on the long wall plan: seven miners employed; was inspected December 22, 1886.

## WINDY HILL MINE.

Is operated by Levi J. Bailey, was found in bad order. No ventilation, air way obstructed by falls of roof, no second opening, no safety catches on hoods on cages, no safety gates on top of shaft, no brake on drum. Orders were given to put on necessary improvements and put the mine in better condition. Vein of coal eighteen inches thick; worked on the long-wall plan. Product sold at local sales. Located near Eureka. Was inspected December 23, 1886.

## BRISCOE.

Is a new shaft just opened up, is situated at Briscoe, is making second opening. Vein of coal eighteen inches thick. Will be operated for local trade. Not visited.

BY RICHARD BRISCOE.

Smith & Connor's shaft is eighty feet deep, was operated for local trade, has been abandoned, and they have commenced to sink another shaft, will use old shaft for escape way. Employed thirteen miners. Is located at Carbon. Was visited December 22, 1886.

## WINDY HILL MINE.

Is a shaft forty-five feet deep, operated by Samuel Powell for local trade, is situated near Eureka. This mine was in good order, ventilation good, roads clean and dry, but needed an escape way, safety catches and covers on cages. Notice was given to comply with the mining law. Vein of coal eighteen inches thick; worked on the long wall system. Was inspected December 23, 1886.

Joseph Lippert mine is located two miles north of Eureka; is a shaft seventy feet deep. This mine was very deficient in general improvements. Orders were given to put on a new cable immediately; also, safety catches and hoods on cages and escape shaft. Vein of

coal fourteen inches thick; is on long-wall system. Employs seven miners. Is operated for local trade. This mine was not inspected below, on account of the cable being in bad condition. Was visited December 23, 1886.

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NAME AND DESCRIPTION OF MINES IN CASS COUNTY.

BENNETT.

Is a new shaft just opened up, is situated near Briscoe. Will be operated for local trade. Was not visited. Had been idle for some time. Is the only mine in the county.

ANDY BENNETT.

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NAMES AND DESCRIPTIONS OF MINES IN DAVIS COUNTY—DISTRICT No. 1.

Ely Dye operates a drift mine three miles southwest of Eldon, south of Chicago, Rock Island & Pacific Railroad. Vein of coal three and one-half feet thick. Sold at local sales. Five miners employed.

Tip Dotson operates a drift mine three miles south of Eldon for local trade. Vein of coal three and one half feet thick. Three miners employed.

Jerome White operates a drift mine two and one-half miles southwest of Eldon. Vein of coal three and one half feet thick. Sold at local sales. Three miners employed.

John Cudworth's mine is a drift located two and one-half miles southwest of Eldon; is operated for local trade. Four miners employed.

J. Davis operates a drift mine five miles south of Eldon for local trade. Three miners employed.

NAMES AND DESCRIPTION OF MINES IN JEFFERSON COUNTY—DISTRICT NO. 1.

JEFFERSON NO. 1.

Is situated at Perlee and operated by DeMarsh & Hoskinson; depth of shaft forty-eight feet. Coal is hauled to the C., R. I. & P. R. R. with teams. Orders were given to improve the ventilation of this mine. The air was not conducted properly to the miners rooms. Are driving their entries toward their new shaft. When connected this shaft will be used for air and escape way. Vein of coal three feet four inches thick. Five miners employed. Was inspected March 8, 1887.

JEFFERSON NO. 2.

Is situated at Perlee and operated by DeMarsh & Hoskinson; is a new shaft thirty feet deep. The coal will be taken out at this shaft when connections are made with No. 1 shaft. Orders were given to timber their main entry. Are laying down a tram-road to C., R. I. & P. R. R. Vein of coal three feet thick. Six miners employed. Inspected March 8, 1887.

JOHN DEMARSH,  
*Superintendent.*

WEST COAL BANK.

This is a shaft mine twenty-eight feet deep. Is operated for local trade. Located two miles west of Fairfield. Vein of coal three feet thick.

THOMAS RUSSELL,  
*Superintendent.*

CEDAR.

This is a new shaft mine, situated four miles south of Fairfield on J. F. Crawford's land. Is operated for local trade. Vein of coal three and one-half feet thick. Has been in operation about six months.

R. A. ENO,  
*Superintendent.*

## LICK CREEK.

This is a slope mine, located three miles south of Libertyville on Lick Creek. Is operated for railroad and local trade. Coal is hauled to the Ft. Madison & Northwestern Railroad with teams. This mine was very deficient in ventilation. Orders were given to put a stack on top of air shaft and connect with the adjoining slope for escape way, which has been done since I visited the mine. Vein of coal three feet thick. Ventilated by grate. Four miners employed. Was visited June 7, 1887.

JOHN BEAL,  
*Superintendent.*

## SNOOKS.

Depth of shaft twenty feet. Is located two and one half miles south of county line. Is operated for local trade. Has no escape shaft; had been shut down sometime when visited. Vein of coal four feet thick. Was visited June 7, 1887. Operated by Andy Black.

## BLACK CREEK.

Is a shaft mine, sixteen feet deep. Has an escape shaft with perpendicular ladders in it. Ordered them changed to comply with the mining law. Has an air shaft but no furnace yet. Employs ten miners in the winter season. Vein of coal four feet thick. Located two and one-half miles south of county line. Visited June 7, 1887.

JOHN CLOKE,  
*Superintendent.*

## TAYLOR.

This is a shaft mine, sixty-one feet deep. Located two and one half miles southeast of county line. Is a new work; just down to the coal; no entries opened up yet. Vein of coal two and one-half feet thick. Has not been operated to any extent. Visited June 7, 1887.

AMOS TAYLOR,  
*Superintendent.*

Richard Thompson operates a drift mine one and one-half miles northwest of Perlee for local trade. Two miners employed.

Phillip Henry operates a slope mine one and one-half miles northwest of Perlee for local trade. Two miners employed.

NAMES AND DESCRIPTION OF MINES IN LUCAS  
COUNTY—DISTRICT No. 1.

## NO. 1.

Is owned by the Whitebreast Coal & Mining Company, and is a shaft mine and situated at Cleveland, on the C, B. & Q. R. R. This mine formerly had a capacity of 700 tons per day, but owing to a large portion having been worked out materially effects the daily out-put. The solid coal is nearly all taken out and are with drawing the pillars. The equipment of this mine is in good order; has safety catches and covers on cages, and safety gates on top of shaft. Is ventilated with a double Murphy fan passing 20,160 cubic feet per minute; roads are all clean and dry; entries are all well timbered. The tail rope system is in use at this mine for hauling the coal to the bottom of shaft. They blast their coal here at night when they quit, and by doing this they have no powder smoke to work in during the day. The escape way from this mine is by No. 2 shaft, which is about three-quarters of a mile distant. Vein of coal is from four to six feet thick, and is worked on the double entry system. Was inspected June 17, 1886, and on February 21, 1887.

T. J. PHILLIPS,  
*General Superintendent.*  
WILLIAM FOULKES,  
*Mine Superintendent.*

## NO. 2.

Is a shaft mine owned by the Whitebreast Coal & Mining Company, and located at East Cleveland on the C., B. & Q. R. R., worked on the double entry system, and ventilated with a twenty-four foot Ottumwa fan, which was passing when inspected on June 18, 1886, at 66,600 cubic feet per minute; when inspected on February 23,

1887, the volume of air at this date was 48,040 cubic feet per minute, which was not sufficient to ventilate this mine. Has since sunk a new air and escape shaft 6x12 feet in diameter, and a new fan six feet in diameter. Erected thereon, face of fan, six feet with two side inlets. This mine now has the means to give their miners all the fresh air they will need, and if properly conducted to the miners rooms will make it one of the best ventilated mines in the first district. There is employed in this mine 400 miners, 100 day men. The tail rope system is in use on both sides of this shaft. This mine has run nearly steady for the last twelve months, producing 323,000 tons of coal. Entries are driven double. The equipment of this mine is in excellent order and comply with the mining law. Everything above and below shows good management.

T. J. PHILLIPS,  
*General Superintendent.*

WILLIAM FOULKS,  
*Mine Superintendent.*

SUMMIT.

Is a shaft mine 260 feet deep located at Zero on the C. B. & Q. R. R. This mine was operated by the Creston Coal & Mining Company, until December 1886. On January 1st, 1887, the Iowa & Nebraska Coal Company took possession of this mine and is now operating the same. Was inspected on August 13th, 1886, and was found in good order as far as ventilation and general security, but the drainage was poor. The present company has done a large amount of ditching, and has laid considerable pipe, to conduct the water to the shaft; have repaired their air and escape shaft, and is now hoisting seventy-five tons of coal daily and are preparing to hoist a large amount of coal this coming season. Was visited on April 26, 1887, and found the equipment of the mine all in good order, except safety catches. The vein of coal is five feet thick and worked on the double entry system and ventilated with the Ottumwa fan, volume of air was 19,250 cubic feet per minute and well conducted to the miners' rooms.

H. H. VANAUERAN,  
*General Manager.*

SIMON FRAZIER,  
*Mine Superintendent.*

The Chariton shaft at Lucas is worked out and abandoned and a map of the mine has been sent to the office of mine inspectors.

Williamson & Bros' shaft is forty feet deep, located near Chariton. Orders were given to make second opening. Vein of coal two and one-half feet thick. Operated for local trade; nine miners employed.

Sandohl & Sandhol have sunk a shaft twenty-five feet deep, located near Chariton. Vein of coal twenty-eight inches thick. Coal sold at local sales; notice was given to make second opening; two miners employed.

James McDowell operates a drift mine north of Chariton for local trade; four miners employed. Vein twenty inches thick.

Phillip Smith operates a drift mine north of Chariton for local trade; two men employed.

W. M. Griffith operates a slope mine north of Chariton for local trade. Vein of coal two feet thick; five miners employed; ventilation natural.

Paul Kriles' mine is a slope northeast of Chariton; thickness of vein, two feet; operated for local trade; six miners employed in the winter season.

John Granville's mine is a drift, located north of Chariton; operated for local trade. Thickness of vein, twenty-eight inches; six miners employed; has natural ventilation and had a good supply of air.

Joseph Love operates a drift mine, two miles south of Columbia in Lucas county for local trade.

Joseph Buchanan operates a drift mine two miles south of Columbia for local trade.



NAMES AND DESCRIPTION OF MINES IN MARION  
COUNTY—DISTRICT No. 1.

WHITEBREAST NO. 7.

Is a shaft mine located at Swan, on the Albia and Des Moines branch of the Chicago, Burlington & Quincy Railroad. It is owned and operated by the Whitebreast Coal & Mining Company; is worked on the double-entry system and ventilated with a double Murphy fan, which was forcing 23,000 cubic feet of air per minute; have sunk a new air shaft 6x6 feet in diameter and have moved their fan and placed in on the new shaft which will give them all the air they will need. They have a good escape shaft with winding stairway in it which gives the miners an easy and safe way of escape in case of accidents. The equipment of this mine was all in good order when inspected the second time. They have remodeled their dump house and can now dump coal on both sides of the shaft, which will largely increase their facilities for handling coal. This mine makes a large quantity of water but they are prepared to take care of it and keep the mine reasonably dry where the miners work. 225 miners and 30 day men are employed in the mine. Thirty men are employed outside.

R. M. HOSEA,  
*Superintendent.*  
JOHN KINNEY,  
*Mine Boss.*

UNION.

Is a slope mine located at Flagler, on Albia and Des Moines branch of the C. B. & Q. R. R. It is owned and operated by the Union Coal & Mining Company and is worked on the double-entry system and ventilated by double furnace which was passing 18,060 cubic feet

of air per minute; the volume of air was well conducted to the miners' rooms. They have lately finished sinking another air and escape shaft—6x6½ feet in diameter, ninety-three feet deep; it is a good shaft and well curbed and has good ladders in it which gives the men a safe and easy way of escape. They have enlarged their main slope and all their entries. Some places have taken down as much as three feet of the roofing and leveled up the bottom. Important improvements have been made outside: their trestle work from the slope to their dump house has been rebuilt and their dump house has been remodeled so they can dump their coal into the chutes for the locomotives which they supply. They are building a complete set of new mine cars which are calculated to hold one ton of coal. Altogether this is a valuable improvement and will about double the capacity of this mine. Ninety miners and twenty day men are employed.

S. A. FLAGLER,  
*General Manager.*  
HARRY BOOTH,  
*Mine Superintendent.*  
JIM BAILEY,  
*Mine Boss.*

I. P. Maddy operates a drift mine four miles southeast of Knoxville, for local trade; has an escape way by old slope; eight miners employed. Vein of coal four and one-half feet thick.

FRANKLIN.

Is a slope mine, four miles north of Flagler; is ventilated by furnace. Notice was given to make escape way. Vein of coal four and one-half feet thick. Operated for local trade by William Franklin.

OAK HILL.

Is a drift mine; situated at Flagler; has railroad facilities for shipping coal; is ventilated by furnace. Mules are used to bring the coal to the surface. Orders were given to make escape way. This mine has been idle since January 1, 1887. Vein of coal five and one-half feet thick. Thirteen miners employed.

E. F. SOLENBACH,  
*Superintendent.*

Jacob Bingham operates a drift mine two miles west of Gosport, for local trade.

Thomas Griffith is opening up a drift mine at Knoxville, for local trade.

George McGruder operates a drift mine near Attica for local trade.

Samuel States runs a drift mine five miles southeast of Attica for local trade. Vein of coal six feet thick; located on Cedar Creek.

Samuel Whitelatch operates a drift mine one mile south of Attica, for local trade. Vein of coal from three to four feet thick.

David Price runs a drift mine five miles south of Attica, for local trade.

#### NORTH STAR.

Is a new shaft, sixty feet deep, located near Hamilton; have made connections with their slope mine, which is used for escape way; has ventilation at present time; had a good volume of air. Coal is hauled with teams to the Wabash, St. Louis & Pacific railroad. Vein of coal five and one-half feet thick. Six miners employed.

J. A. PRATT,  
*Superintendent.*

Reese & Walters operate a drift mine at Marysville, for local trade; vein of coal seven feet thick; was employing no miners.

#### FERRIS.

Is a shaft fifty feet deep, located two miles from Lovilla; operated for local trade by Davidson & Hoyt. Employ no miners.

George Finstraws operates a slope mine at Otley for local trade; was just opening up a vein of coal six feet thick. Five miners employed.

#### RUCKMAN.

Is a slope mine, located three miles south of Knoxville, Marion county; has no escape way. Order was given to make second opening. Vein of coal three feet thick; sold at local sale. Is ventilated by furnace. Was repairing the mines when visited. Twelve miners are employed in the winter season. Owned and operated by S. M. Ruckman.

#### BLACK DIAMOND.

Is a slope mine, located two and one-half miles northwest of Pella. Was repairing mine when visited. Orders were given to make second opening for escape way. Five miners employed.

WILLIAM THOMPSON,  
*Superintendent.*

#### HAMILTON.

Is a slope mine, situated two miles northeast of Hamilton. The output of this mine is hauled with teams to the Wabash, St. Louis & Pacific railroad and shipped. Vein of coal five and one half feet thick. Seven miners are employed. Has an escape way by drift on opposite side of the hill; is ventilated by grate.

S. A. BOUDINOT,  
*Superintendent.*

#### BLACK DIAMOND.

Is a slope mine, situated at Dunreath, on the Wabash, St. Louis & Pacific railroad; is worked on the double entry system, and ventilated by furnace; ventilation good; 3,240 cubic feet of air was passing when inspected, October 6, 1886; use mule power to bring the coal to the surface. This company has a large tract of coal land under lease, and ought to increase their output in another year. Twenty-one miners are employed; four day men.

J. E. WALTERS,  
*Owner and Operator.*

#### FERN HILL.

Is a slope mine, located two miles northwest of Hamilton. Coal is hauled by teams to the Wabash, St. Louis & Pacific railroad. Ventilated by furnace; 1,040 cubic feet of air per minute. Will not employ more than five miners.

G. W. HAMILTON,  
*Superintendent.*

#### DEVER.

Is a slope mine, operated for local trade; is almost finished, and will be abandoned soon. Vein of coal four feet thick. Located near Bussey. Two miners employed.

DEVER BROS.,  
*Owners and Operators.*

John Yansen operates a slope mine at Marysville for local trade. Has good ventilation. Two miners employed. Vein of coal five feet thick.

Grubb & McNaish is opening up a drift mine on George Marshall's land, three and one-half miles south of Monroe, in Marion county. Will be operated for local trade.

Polk Stoup operates a drift mine four miles south of Monroe, in Marion county, for local trade.

Linn Van Steinburg runs a drift mine two and one half miles southwest of Pella, for local trade.

Martin Vissen operates a drift mine four and one-half miles south of Pella, for home trade.

Wm. Booth operates a drift mine four miles east of Columbia, for local trade.

Lewis Whitlatch operates a drift mine three miles south of Attica, for local trade.

Zack Smith runs a drift mine five miles southwest of Pella, for local trade.

Patrick Carey operates a drift mine six miles southwest of Pella, for local trade.

#### KNOXVILLE CITY MINE.

Is a shaft ninety five feet deep, situated at Knoxville, on the C., R. I. & P. R. R. Has railroad facilities for shipping coal; has a large city trade also. This mine was inspected three times. On my last visit the mine was found in very good order. Several doors had been put up, conducting the air to the miners' rooms. Is ventilated by furnace. Has good safety catches and covers on cages. Has a good escape shaft. Vein of coal three and one-half feet thick. Operated by S. L. Collins & Co.

W. J. STOUTENBURGH,  
*Superintendent.*

John Slackhouse operates a drift mine six miles southwest of Pella, for local trade.

I. N. Davis operates a drift mine five miles southeast of Knoxville, for local trade.

Samuel Harvey operates a drift mine four miles south of Knoxville, for local trade.

#### MARSHALL.

Is a slope mine located at Otley. Has an air and escape shaft. Was not running when visited. Is operated for local trade. Vein of coal six feet thick. Five miners employed.

GEORGE MARSHALL,  
*Superintendent.*

George Richards operates a drift mine near Columbia for local trade.

Little & Sully operates a drift mine two and one-half miles west of Bussey for local trade. Vein of coal four feet thick.

#### EVAN.

Is a shaft mine thirty-three feet deep, situated at Knoxville. Ventilated by furnace. Orders were given to make second opening for escape way. Has good horse power; good cable and cages; has safety catches on but no covers on cages. Is operated for local trade. Vein of coal three and one-half feet thick. Employes 15 miners in the winter season.

EVANS & SANDERS,  
*Managers.*

James Ash operates a slope mine near Pleasantville for local trade.

#### GAMBLE.

Is a new shaft mine. Are just starting their entries from the shaft, which is fifty feet deep and located at Knoxville. Has air and escape shaft sunk to the coal and will make connections as they can do so. Will put in good stairs for escape way. Has good horse power; good cables will be worked on the double entry plan. Coal will be sold chiefly for the city trade. Vein of coal three feet eight inches thick. Operated by Wm. A. Gamble.

#### LEWIS.

Is a shaft thirty five feet deep, situated at Knoxville. The product of this mine will be consumed by the brick and tile works of W. M. Lewis adjoining the shaft. Vein of coal three and one-half feet thick; ventilated by furnace; are clearing up their man-way. Orders were

given to make lawful escape. This mine was not running when visited on July 21, 1887.

W. M. LEWIS,  
*Superintendent.*

John V. Yarrell operates a slope mine in the winter season at Dunreath. The product of this mine was sold to the Black Diamond Coal Company, and shipped on the Wabash, St. Louis & Pacific Railroad. Coal is hauled with teams from this mine to the railroad. Vein of coal is five feet thick; five men employed.

James Moles operates a drift mine near Dunreath for local trade.

Elijah Stephens operates a drift mine near Dunreath for local trade.

NAMES AND DESCRIPTIONS OF MINES IN MONROE  
COUNTY—DISTRICT No. 1.

ALBIA.

Is a shaft mine, situated three miles west of Albia, on the main line of the Chicago, Burlington & Quincy Railroad; is owned and operated by the Albia Coal and Mining Company; is worked on the double entry system, and ventilated by furnace, which was passing 10,960 cubic feet of air per minute. The north side of the shaft was deficient in ventilation. They are sinking a new air shaft on the north side and put in another furnace, which will give them all the air required; has a good escape shaft, six by eight feet in diameter, one hundred and fifty feet from hoisting shaft; has good steps in it; has safety catches and covers on cages. Vein of coal five feet thick.

W. W. GREGG,  
*President.*

JOHN RAMSEY,  
*Superintendent.*

WIGNAL.

Is a slope mine, in fair order; ventilation good when visited. One thousand seven hundred and forty cubic feet of air was passing per minute. Coal is hauled to Avery with teams, and shipped on Chi-

cago, Burlington & Quincy Railroad. Vein of coal four and one-half feet thick.

RALPH WIGNAL,  
*Superintendent.*

IOWA & WISCONSIN.

Is a shaft mine one hundred and sixty-seven feet deep, located two miles west of Albia, on Chicago, Burlington & Quincy Railroad; is owned and operated by the Iowa & Wisconsin Coal Company; is worked on double entry system; is ventilated with a ten-foot Ottumwa fan. Volume of air was 15,120 cubic feet of air per minute, and well conducted to miners' rooms; was inspected July 22, 1886, and on January 15, 1887. On both visits the mine was found in good order; has a good escape shaft, four by six feet, one hundred and twenty-five feet from hoisting shaft; has good steps in it; has safety catches and covers on cages. The machinery is all in good order, and complies with mining law. Number of men employed, eighty-five.

J. D. McMILLAN,  
*Superintendent.*

NATE FLANDERS,  
*Mine Boss.*

SEDDON.

Is a slope mine, located two miles east of Avery; is operated for railroad and local trade. Coal is hauled to Avery with teams, and shipped on the Chicago, Burlington & Quincy Railroad; has good ventilation and escape-way by old slope. Vein of coal three and one-half feet thick; brought to the surface with horse-power; four miners employed.

JAMES SEDDON,  
*Superintendent.*

SMOKEY.

This is a slope mine located two miles southwest of Avery, is operated by the Smokey Hollow Coal Company, is ventilated by furnace, which was giving 9,820 cubic feet per minute and well conducted to the miners' room. Coal is hauled to Avery with a small dummy engine and shipped on the Chicago, Burlington & Quincy Railroad. This mine was opened up on the single entry system; the present

company has changed it into the double entry plan and has greatly improved the mine. Vein of coal is four and one-half feet thick.

JOHN EVANS,  
*Superintendent.*  
SAMUEL WIGNAL,  
*Secretary.*

## CHISHOLM.

Is a shaft mine located at Chisholm, is owned and operated by the Co-operative Coal Company, is ventilated by furnace, volume of air was 12,800 cubic feet per minute, was found deficient in improvements and escape shaft, when inspected, February 16, 1887. The present company had charge of the mine only two weeks when visited; they are putting the mine in order and will make it to comply with mining law.

J. A. FARRELL,  
*Superintendent.*  
CHAS. BLOOMFIELD,  
*Secretary.*

## PLEASANT VALLEY MINE.

This is a slope mine situated at Coalfield, on the Iowa Central Railroad, is worked on the single entry plan, has an air shaft, but their furnace was not completed, ventilation good, 2,960 cubic feet of air per minute, roads clean and dry. Was inspected July 22, 1886, and October 27, 1886. This mine was found in good order on my last visit; have lately put up a new hoisting engine which will largely increase their capacity for taking out coal. Vein of coal three and one-half feet thick. Has railroad facilities for shipping coal. Twenty-five miners employed.

JACOB WALTERS,  
*President.*  
D. WALTERS,  
*Superintendent.*  
ALBERT WALTERS,  
*Secretary.*

## FREDRIC.

This mine is located near Fredric, depth of shaft eighty-two feet, is worked on the long-wall system, ventilated by furnace, volume of

air 8,240 cubic feet per minute; has an escape shaft. Coal is hauled with teams to the Chicago, Burlington & Quincy Railroad and shipped. The ventilation in this mine is excellent; roads clean and dry.

P. T. JACKSON,  
*Superintendent.*

## ENTERPRISE MINE.

Is owned and operated by the Enterprise Coal Company; depth of shaft one hundred and twenty feet; is worked on the double entry system and ventilated by furnace; volume of air was 5,500 cubic feet per minute, when inspected January 14, 1887. This mine has been inspected twice; has a good escape four by six feet, one hundred and fifty feet from main shaft, with good steps in it. This mine is in good order. Vein of coal five and one-half feet thick.

T. J. LEWIS,  
*Superintendent.*

## HICKORY.

Is a shaft mine eighty seven feet deep, situated at Hickory, on the Iowa Central Railroad, is worked on the double entry system and ventilated with a fan; volume of air 6,720 cubic feet per minute, well conducted to the miners' rooms; has a good escape shaft with a winding stairway in it; the miners all come out of the mine by escape shaft. Forty miners and five day men employed. Is owned and operated by Archy Douglas.

## GRANGER

Is a drift mine located near Coalfield; is ventilated by furnace; volume of air, 1,320 cubic feet. Coal is hauled with teams to the Iowa Central railroad and shipped north; have an escape way, but was not in order; they promised to repair it immediately; vein of coal 3½ feet thick; fourteen miners employed; mule power used to bring the coal to the surface.

HIRAM DAVIS,  
*Superintendent.*

Fred Hoslaw's mine is located eight miles northwest of Albia; is a drift and is operated for local trade; vein of coal three feet thick; ventilation by natural forces; inspected January 18, 1887; six miners employed.

J. H. Brewer operates a drift mine two miles north of Albia for local trade; thickness of vein, three feet.

John Cash operates a drift mine one and one-half miles southwest of Albia; is just opening the mine up; coal will be sold at local sales; vein of coal two feet thick; five miners employed.

## LANGDON

Is a shaft mine 50 feet deep, located three miles northeast of Albia; is a new mine just opening up will be operated for local sale by Langdon & Griffith; vein of coal three feet thick.

## MUNLEY

Is a drift mine located three miles south of Albia; vein of coal, two feet thick; has natural ventilation; is operated for local trade by Lemon Steely.

George Richards operates a drift mine four miles southeast of Columbia, in Monroe county, for local trade.

Frank Jones operates a drift mine two miles south of Selection for local trade.

Kridlebaugh & Shooley operates a drift mine two miles east of Avery for local trade.

NAMES AND DESCRIPTION OF MINES IN PAGE COUNTY  
—DISTRICT NO. 1.

## AIKEN.

Is a shaft mine 45 feet deep located at Shambaugh; is operated for local trade; has an escape shaft; orders were given to put it in better order and make it comply with the mining law; has natural ventilation; employs thirteen miners in the winter season; vein of coal two feet thick; worked on the long wall system; was inspected December 15, 1886.

ROBERT AIKEN,  
*Superintendent.*

## MCLEAN.

This shaft is 48 feet deep, located at Shambaugh; was found in bad order; orders were given to repair the shaft, as quite a number of timbers were broken; orders were also given to make escape way; coal is 18 inches thick, worked on the long wall system; was visited December 15, 1886.

WM. MCLEAN,  
*Owner and Manager.*

## MCLELLAN

Is a shaft mine 52 feet deep, situated one mile north of Shambaugh; is a new work vein of coal 18 inches thick; was visited December 15, 1886.

W. J. MCLELLAN,  
*Manager.*

NAME AND DESCRIPTION OF MINES IN TAYLOR COUNTY  
—DISTRICT NO. 1.

ANDERSON MINE.

Is situated on the Humeston & Shenandoah Railroad, about one mile east of New Market. Depth of shaft one hundred and thirty feet. Ventilated by furnace. Has a good fresh current of air passing around the work. Is worked on the long wall system. Vein of coal eighteen inches thick. The equipment of this mine is all in good order. Employs twenty miners. Has facilities for shipping coal. Was inspected December 17, 1886.

BEN ANDERSON,  
*Superintendent.*

LINSEY.

Is a shaft mine one hundred and four feet deep. Is situated at New Market, and is operated by the New Market Coal Company. Is worked on the long wall system. Employs eighteen miners. Natural ventilation, which gives them a supply of air in the winter season. Has facilities for shipping coal on the H. & S. R. R. Was inspected December 15, 1886.

RODERICK CAMPBELL,  
*Superintendent.*

BREWER.

Is a shaft mine fifty feet deep, situated two miles east of New Market. Is operated for local trade. Vein of coal eighteen inches thick. Employs four miners. Operated by Brewer & Cade.

EAGLE.

This is a shaft mine forty-eight feet deep. Is located two miles east of New Market. Vein of coal eighteen inches thick. Worked on the long wall system. Has natural ventilation. Is operated for

local trade. Was inspected December 15, 1886. Has been notified to make second opening.

B. F. PACE, JR.,  
*Superintendent.*

BEAN.

Is a new shaft mine one hundred and twenty feet deep, located at New Market. Is operated for local trade. Has natural ventilation. Vein of coal eighteen inches thick. Worked on the long wall system. Eleven miners are employed. Was visited December 16, 1886. Orders was given to put on new cable and make second opening.

WM. H. BEAN,  
*Superintendent.*

GRENNON.

Is a shaft mine one hundred feet deep, situated at New Market. Vein of coal eighteen inches thick. Worked on the long wall system. Coal sold at local sales. Four men are employed. Notice was given to make second opening and put on the necessary improvements.

W. H. GRENNON,  
*Superintendent.*

PACE MINE.

Is a shaft fifty feet deep, located two miles east of New Market. Vein of coal eighteen inches thick. Sold at local sales. Is worked on the long wall system. Eight miners are employed. Was notified to make second opening and put on improvements.

Y. F. PACE,  
*Superintendent.*

Nathan Wilcox operates a shaft mine south of Villisca for local trade. Vein of coal eighteen inches thick.

Gower Beyrion is opening a new shaft mine south of Villisca for local trade. Vein of coal eighteen inches thick.

NAMES AND DESCRIPTION OF MINES IN VAN BUREN  
COUNTY—DISTRICT No. 1.

FARMINGTON.

This is a new shaft mine, fifty feet deep, situated at Farmington, on the Chicago, Rock Island & Pacific railroad; is operated by the Farmington Coal Company; is worked on the single entry system; has made second opening, which will be used for air and escape way; ventilation good; will put in a good large furnace soon; employs eighteen men at present. Vein of coal four feet thick. Ventilated by furnace. Was not running when visited.

JAMES CARR,  
*Superintendent.*

DOUDS.

This mine is operated by Carson & Walker; is a shaft mine, thirty-five feet deep, situated one mile from Douds. Coal is hauled to Chicago, Rock Island & Pacific railroad, with teams, which supplies the engines. Have opened a new slope, which will be used for taking out the coal; old shaft will be used for air and escape way. Vein of coal three and one half feet thick. Only ten men employed when visited. Is ventilated by furnace, which was passing 3,600 cubic feet per minute.

WILLIAM CARSON, *President.*  
MATTHEW WALKER, *Superintendent.*

KNOTT.

This mine is operated for railroad and local trade; shaft forty feet deep, located one mile from Farmington; is worked on the single entry system. Orders were given to repair the escape way, which needed some timbering. Vein of coal four feet thick. Ventilated with a grate.

HENRY KNOTT,  
*Superintendent.*

BROWN.

Is a drift mine, operated for local trade, situated at Keosauqua. Vein of coal two and one-half feet thick.

EMERSON BROWN,  
*Superintendent.*

BOYER.

Is a new drift mine, located near Bentonsport; is operated for local trade, by A. C. Boyer.

FINLIN.

Is a new slope mine, situated near Douds; is in good order; has an air shaft ventilation by stove; is operated by Hugh Finlin for local trade; also hauls coal to Chicago, Rock Island & Pacific railroad and ships. Vein of coal three feet eight inches thick.

Samuel Fitzgerald operates a drift mine two miles west of Selma for local trade.

Perry Davis operates a drift mine south of Keosauqua, for local trade.

Thomas Moyer operates a shaft mine southwest of Birmingham five miles, for local trade.

E. S. Green operates a shaft mine four miles northwest of Douds, for local trade; is a new mine.

David Cox operates a drift mine near Hillsboro, for local trade.

E. P. Broomfield operates a drift mine near Hillsboro, for local trade.

Ephraim Downard operates a drift mine three miles south of Utica, for local trade.

Thomas Teale operates a drift mine near Utica, for local trade.

T. E. Taylor operates a drift mine near Wilsonville, for local trade.



NAMES AND DESCRIPTIONS OF MINES IN WAPELLO  
COUNTY—DISTRICT NO. 1.

MINE NO. 1.

Is a slope owned and operated by the Wapello Coal and Mining Company, is situated at Kirkville on the Ottumwa & Kirkville Railroad, is worked on the double entry system and ventilated with a fourteen foot Ottumwa fan on the south side of the slope, and a furnace on the north side. The main slope being the inlet for the north side. The furnace was giving 12,450 cubic feet of air per minute. The fan was passing 24,000 cubic feet per minute, total 36,450 cubic feet of air per minute, which will ventilate this mine well if properly conducted to the miners' room. A double drum hoisting engine is used at this mine for the underground haulage; is arranged for the independent operation of both or either drum, separately or together as may be required. The underground works are in good shape for a rapid movement of coal; the roads are clean and dry; entries are well timbered. Have enlarged their down cast shaft where this fan is located and cleaned up their main air course which will increase the volume of air; was inspected June 18, 1886 and January 8, 1887. Three hundred men are employed; vein  $5\frac{1}{2}$  feet thick.

H. L. WATERMAN,  
*General Manager.*

RICHARD ROSSER,  
*Mine Superintendent.*

NO. 3.

Is a shaft sixty feet deep, situated at Kirkville on the Ottumwa & Kirkville Railroad, is owned and operated by the Wapello Coal and Mining Company, is worked on the double entry system, is ventilated by fan, fourteen feet in diameter, was forcing 25,600 cubic feet per minute. This mine was making a large quantity of black damp owing to the pillars being withdrawn from a large portion of the mine. This shaft formerly had a capacity of 600 tons per day, but a large portion of the coal having been worked out, materially affects

the output. The solid coal is about all worked out and will not last more than another year; has a good escape shaft with winding stairway in it. Was inspected June 12, 1886, and on January 5, 1887. One hundred miners are employed, and twenty five day-men in the mine, ten men out side. Vein of coal five feet thick.

H. L. WATERMAN,  
*General Manager.*  
RICHARD ROSSER,  
*Superintendent.*

PHILLIPS COAL COMPANY—SHAFT NO. 1.

This Company is operating two shafts. No. 1 is situated one mile north of Ottumwa on Chicago, Milwaukee & Saint Paul Railroad; is a shaft eighty feet deep; the buildings at this shaft was all burnt down on the 11th of August 1886, also their store buildings and goods. The fire originated from the furnace at the bottom of hoistings shaft. The furnace was located too near the air chamber and not properly secured; all the curbing in the shaft was burnt out, allowing the shaft to cave in; a short time previous to the fire, the company had taken the perpendicular ladders out of their escape shaft and had put in good step ladders. There were about sixty men in the mine when the shaft took fire; all the men got out safely. Four mules were lost. Work was commenced immediately to repair the shaft and build the dump house and store buildings. Was ready to hoist coal the 21st day of September 1886. This mine is now ventilated with a ten foot Ottumwa fan, which will ventilate this mine well, if run at the rate of 80 to 100 revolutions per minute; is worked on the double entry system. Employs eighty miners, ten day-men; was inspected July 10, 1886, and January 4, 1887. Volume of air was 6,500 cubic feet per minute; this amount of air was by natural forces—fan not running.

IRA PHILLIPS,  
*Superintendent.*

MINE NO. 2.

Is a shaft 115 feet deep. Was owned and operated by M. Och-schlager, sold to the Phillips Coal Mining Company July 27, 1886; sold June 7, 1887, to the Phillips Coal Company. Is located one and a half miles north of Ottumwa on the C. M. & St. P. R. R. Is

worked on the double entry system, and ventilated by furnace which was giving 7,500 cubic feet per minute at the up-cast shaft, the escape shaft being used for the down cast. The ventilation of this mine was fair, but needed more doors and boys to keep them closed. Is worked on the double entry system. This mine will probably be made to produce within the next year 50,000 tons of coal annually. Fifty miners employed and eight day men. Has safety catches and covers on cages, and stairs in escape shaft has been inspected twice.

IRA PHILLIPS,  
*Superintendent.*

REAM'S MINE.

Is located two miles north of Ottumwa; is a shaft seventy feet deep; is owned and operated by Jacob Ream. Was given notice to make second opening at this mine and to put cages in the shaft and the necessary improvements. Had natural ventilation but sufficient for the three miners that was employed. Vein of coal was three feet thick. Sold at local sales.

JACOB REAM,  
*Manager.*

SHEPPARD MINE.

Is a shaft sixty-four feet deep; located four miles northwest of Ottumwa. Is operated by Johnson & Burtch for local trade. Had no lawful escape; no covers or safety catches on cages. This shaft is about finished.

VANDERPOOL MINE.

Is a new shaft just opening up; has not been in operation quite one year. Vein of coal three feet thick. Will be operated for local trade by John Vanderpool.

METZGER MINE.

Is located four miles north west of Ottumwa is a new shaft forty feet deep; vein of coal three feet thick. Will be operated for local trade by William Metzger.

Miers Bros. operate a shaft mine ninety feet deep; is located two miles northeast of Ottumwa; is operated for local trade. Vein of coal three and a half feet thick. Notice was given to make second opening and put necessary improvements on cages.

KIRKPATRICK.

Is a shaft mine forty-six feet deep, located two and a half miles south of Ottumwa; is operated for local trade by R. N. Wilcox. Are sinking a new hoisting shaft; will use old shaft for air and escape shaft. Vein of coal three and a half feet thick.

ELDON COAL COMPANY.

Is a shaft seventy-four feet deep, located at Laddsdale on C., R. I. & P. R. R. Is owned and operated by the Eldon Coal & Mining Company, and worked on the double entry system, and ventilated with a fourteen foot Ottumwa fan; has a full volume of air and well conducted to the miners' rooms. Roads are clean and dry; entries are all well timbered; has an escape shaft; has safety catches and covers on cages; has safety gates on top of shaft and brake on drum. The equipment of this mine is all in good order; 65 miners employed. Vein of coal four and a half feet thick.

THOMAS GABINGTON,  
*Superintendent.*

BAKER MINE.

Is a shaft forty-five feet deep; located five miles north of Ottumwa. Is owned and operated by William Baker for local trade; has no escape shaft. Notice was given to put cages in the shaft and make it comply with the law. Is ventilated by furnace; had full volume of air. Vein of coal four feet thick. Six miners employed.

GUMBO MINE.

Is a shaft sixty feet deep; operated by William Bowes for local trade. Vein of coal three and a half feet thick; located five miles northwest of Ottumwa; is a new mine. Two miners employed.

GOODIN'S MINE.

Is a shaft sixty feet deep, located six miles northwest of Ottumwa. This is the only local mine using steam power for hoisting coal in this county; is ventilated by furnace, has no escape way, no safety catches or covers on cages. Notice was given them to put on necessary improvements and make second opening; has good ventilation. Vein of coal four feet thick; owned and operated by S. H. Goodin.

## BENNETT'S MINE.

Is located near Kirkville; shaft is forty-three feet deep; operated for local trade; no miners hoisted at the main shaft, all come out by way of escape shaft. Vein of coal five and one-half feet thick; six miners employed.

WILLIAM BENNET,  
*Superintendent.*

Henry Myers operates a slope mine near Kirkville for local trade in the winter season; four miners employed.

## KNIGHT'S MINE.

Is a shaft thirty feet deep, located two miles northeast of Ottumwa, is a new mine, had 1,560 cubic feet of air but was not well conducted to the miners' rooms. Notice was given to make second opening and put on necessary improvements. Vein three feet thick; five miners employed; coal sold at local trade.

WM. KNIGHT,  
*Superintendent.*

## HAWKEYE.

Is a new shaft mine situated two miles northwest of Ottumwa, on the Chicago, Milwaukee & St. Paul Railroad; shaft is 7x14 feet in the clear; each lifting shaft is 5x7 feet in the clear; will be worked on the double-entry system. Their hoisting engines will be fifty horse power, manufactured by the Ottumwa Iron Works. Their general offices will be in Ottumwa. The following are the names of the officers of the Hawkeye Coal Company:

A. C. CAUGLAN,  
*President, Ottumwa, Iowa.*

WM. GILES,  
*Vice-President, Mt. Olive, Illinois.*

F. S. WORDEN,  
*Treasurer, Bladensburg, Iowa.*

E. KESLER,  
*Superintendent and Secretary, Ottumwa, Iowa.*

W. H. Godley operates a drift mine at Eldon for local sales in the winter season.

Wm. E. Chambers operates a shaft mine one mile north of Ottumwa for local trade. Orders were given to make second opening and put on necessary improvements. Vein of coal three and one-half feet thick.

NAMES AND DESCRIPTION OF MINES IN WARREN  
COUNTY—DISTRICT No. 1.

## SUMMERSSET.

Is a shaft mine, seventy-six feet deep, is situated at Summersset, on C., R. I. & P. R. R. This mine was inspected three times, was found in fair order but nearly worked out. Work at this shaft was suspended on March 7, 1887; the material all taken out and shaft abandoned; operated by Summersset Coal Company.

WILLIAM E. RUSSELL,  
*Superintendent.*

JOHN BAXENDALE,  
*Mine Boss.*

## LUMESDEN.

Is a shaft mine eighty feet deep, situated at Summersset, on C., R. I. & P. R. R.; has railroad facilities for shipping coal; has been in good order when inspected on September 18th, and on January 27th, with the exception of safety catches and covers. Notice was given to have those improvements put on the cages; has a good escape shaft. Vein of coal three and one-half feet thick; is on double-entry system; ventilated by furnace, has fine current of air, 4,000 cubic feet; twenty-two miners employed; roads clear and dry; operated by Lumesden & Bros.

## WARREN COUNTY COAL, TILE AND BRICK COMPANY.

Operates a shaft at Indianola which is two hundred and twenty feet deep, operated for local trade. This mine was inspected on October 9, 1886, and found in bad condition, both as regards ventilation and general security; their safety catches were out of order, no covers on cages, had no escape shaft, all their brick and tile sheds were

connected with their dump house, which made it very dangerous on account of fire. I notified the company to comply with the law. On my second visit I found nothing done toward making a second opening; I told them that I could not allow them to run any longer without a lawful escape, either to make one or shut the mine down, which has been done, and the mine is now standing idle.

## JONES.

Is a shaft sixty-five feet deep, situated two and one half miles east of Summerset, on Middle River, is operated for local trade, had no escape way, no covers or safety catches on cages. Notice was given to comply with the law. Vein of coal three feet thick, ventilated by grate. Seven miners employed.

D. K. JONES,  
*Superintendent.*

## GEORGE LONGSTAFF SHAFT.

Is thirty feet deep, operated for local trade, had escape shaft just sunk, had not got the ladders in it; orders were given to put them in. Vein of coal three feet thick. Three miners employed. Located three miles east of Summerset, on Middle River.

## LORD &amp; OVERTON'S SHAFT.

Is forty-five feet deep, located two and one half miles east of Summerset, on Middle River, operated for local trade, had no lawful escape, had no safety catches on covers on cages. The ventilation of this mine was moderate. Notice was given to improve the ventilation and put on necessary improvements. Vein of coal three feet thick. Number of men employed, five.

## SIMMONS.

Is a new shaft thirty-five feet deep, well fitted up, had opened about sixty feet of entry. Vein of coal three feet thick. Situated three miles southeast of Summerset. Will be operated for local trade.

DAVID SIMMONS,  
*Manager.*

## CUSTER.

Is a new slope mine, situated at Ford, operated by Gamble & Bro., has air shaft but no escape way, was in fair order, had a good volume of air, has railroad facilities for shipping coal on Chicago, Burlington & Quincy Railroad. Vein of coal three and one half feet thick. This mine has been idle since December, 1886. Employed twenty miners and two day men.

## HARRISON MILLER.

Operates a drift mine near Lacona for local trade. Vein of coal twenty inches thick. Three miners.

## SHUPE &amp; ODELL.

Operate a drift mine southwest of Lacona for local trade. Vein of coal eighteen inches thick. Four miners employed.

## MUNFORD &amp; MITCHELL SLOPE.

Is located southwest of Lacona. Operated for local trade. Vein of coal twenty inches thick. Three miners employed.

## RUDOLPH MILLER.

Has opened a new slope mine south of Lacona, for local trade. Seven miners employed. Vein of coal eighteen inches thick; worked by single entry rooms and pillars. This was the only mine at Lacona that employed enough miners to come under the mining law. Orders were given to make second opening.

## SNELL.

Is a drift mine located southeast of Lacona, has an air shaft, ventilation good, roads clean and dry. Vein of coal twenty-two inches thick. Sold at local sales. Four miners employed. Operated by Snell & Freeman.

## HUSTON FOGLE.

Operates a slope mine southeast of Lacona, thickness of vein twenty inches; is in good condition. Four miners employed.

## BALES MINE.

Is a new shaft thirty feet deep, situated two and a half miles west of Milo, will make connections with their slope in a short time which will give them an escape way. Vein of coal is two feet thick; is worked on single entry; rooms and pillars; three miners employed. Owned and operated by N. D. Bales.

H. H. Webster operates a drift mine four miles south of Milo for local trade. Vein of coal two feet, six inches thick; have made connections with their old drift, which will give them an escape way. Five miners employed and one day man.

## SHAFFER DRIFT.

Is operated by Boyd Parker; are drawing out the pillars and will be finished soon; located five miles south east of Milo. Vein of coal two feet thick. Operated for local trade.

## BRYANT.

Is a shaft mine that has been in operation but a short time. Entries are only opened up a short distance from the shaft; is operated for local trade. Vein of coal eighteen inches thick; four miners employed. Operated by S. P. Bryant; located one mile south of Milo.

Samuel T. Burges is opening up a shaft mine four miles north east of Milo, for local trade.

Eugene Richmond has opened a drift mine for local trade one mile south of Milo. Vein of coal sixteen inches thick; three miners employed.

Branch & Long has opened a shaft one and a half mile west of Milo, for local trade in the winter season. Coal is eighteen inches thick. Three miners employed.

C. G. Hollingsworth operates a drift mine two and a half miles west of Milo, and operated for local trade in the winter season. Vein of coal sixteen inches. Three miners employed.

Andy Connors drift is located three miles west of Milo and operated for local trade. Vein of coal two feet thick. Three miners employed.

Cass & King operates a drift mine near Ford for local trade. Vein of coal three and one half feet thick. Two miners employed.

## FORD COAL COMPANY.

Operates a drift mine one and a half miles west of Ford. Coal is hauled with teams to Ford and shipped on C., B. & Q. R. R. Eleven miners employed. This mine was not running when visited. Orders were given to make second opening. Vein of coal four feet thick.

JOHN GILDOW,

*Superintendent.*

Dufore & Welling operates a drift mine two miles west of Ford for local trade. Three miners employed.

J. P. Cotman operates a shaft mine near Norwalk for local trade.

Ephraim Conicklon operates a shaft mine near Sandyville for local trade.

\_\_\_\_\_  
 NAMES AND DESCRIPTION OF MINES IN WAYNE  
 COUNTY—DISTRICT No. 1.

\_\_\_\_\_  
 OCCIDENTAL.

This is a shaft mine 240 feet deep, is situated at Seymour, is owned and operated by the Occidental Coal Company, was inspected July 15, 1886, and again December 23, 1886, was found in fair order; volume of air 4,160 cubic feet per minute, is worked on the long wall system, the air passing around face of working. This mine is located between the C., R. I. & P. R. R. and C., M. & S. P. R. R.; can dump their coal on both roads. Orders were given to change the ladders in the escape shaft and make them comply with the mining law. The equipment of this mine is all in good order. Steam jet is used for ventilation; forty miners employed; six day men.

E. K. CLARK,

*Superintendent.*

JOSEPH HENNAMAN,

*Mine Boss.*

## CO-OPERATIVE MINE.

Is a shaft mine 240 feet deep, located at Seymour; was inspected July 16, 1886, and again December 28, 1886, was found in very poor condition, not air enough to move the anemometer beyond the air shaft. Notice was given to improve the condition of the mine immediately. The mine closed on January 1, 1887, and has been abandoned.

GEORGE FEETH,  
*Superintendent.*

## ATTWELL.

Is a shaft mine forty feet deep, located three miles northeast of Confidence, is operated for local trade in the winter season. Vein of coal three feet thick; not running when visited.

J. L. ATTWELL,  
*Manager.*

## FRY.

This mine is operated by Fry & Sons for local trade. Depth of shaft fifty feet; no escape shaft; no covers or safety catches on cages. Notice was given to make second opening; eight miners employed in the winter season. Vein of coal three feet thick; worked on the long wall system; operated by Lewis Fry & Co.

## BURNS.

This is a shaft mine fifty feet deep, worked on the long wall system and operated for local trade. Notice was given to make escape way; no safety catches or covers on cages. Vein of coal three feet thick. This mine was not running when visited.

B. F. BURNS,  
*Superintendent.*

Richard Davis operates a drift mine south of Confidence for local trade.

Edward Mosby operates a drift mine south of Confidence for local trade.

Thomas Brock operates a small shaft mine, two miles south of Confidence for local trade.

Jacob Clark operates a shaft mine, two miles south of Confidence for local trade.

Blevins & Dexter operate a drift mine six miles south of Confidence for local trade.

Immediately after my appointment to the office of Mine Inspector, June 1, 1886, covering a period of thirteen months, I have visited all the mines that are located on the railroads in the first inspection district from one to four times each, as the condition of the mines seemed to require, and the local mines once, excepting those that were closed before I could visit them. Some of those were visited but not inspected. Some of the local mines visited did not come under the mining law, but not knowing how many miners they employed I thought it best to visit all of them that I possibly could. The greatest difficulty was to get some of them to understand that they would have to comply with the mining law. I would be asked the question if I intended to have the small operators comply with the laws? I replied that I could make no distinction, that the mining law defined what they had to comply with. Quite a number of them said that it would not pay them to go to so much expense. But I come to the conclusion that by giving them reasonable time that I could accomplish more than by a resort to the courts, and I am happy to say that a very large portion of the operators are making good efforts to comply with the mining law, both in necessary improvements, escapements and air shafts, which are considerably larger than the old ones.

In regard to ventilation, there has been a marked improvement, especially the larger mines. All have fans or furnaces to produce ventilation, and nearly all the larger mines have the required amount one hundred cubic feet for every man per minute. In some mines it is not as well conducted to the miners as it should be, but this is the fault of the mine boss more than the company. Where coal is all mined with powder, as it is in most of the larger mines in Iowa, it is very important that the volume of air be so conducted that it will remove the powder smoke as quick as possible from the working places of the miners. If left to die away in the rooms it makes black damp or carbonic acid gas, then it is impossible for the men to work with either health or comfort.

The mines in this district for the past year have enjoyed a very good trade. Although there has been no advance in prices all things

considered it has been a very prosperous year, and the outlook at present is very encouraging for the future. I think this may be attributed to a certain extent to so many new railroads opening up in the west, which makes a larger market for Iowa coal, and the freight rates being more favorable to the west has a tendency to shut out competition, as it is a well known fact that large quantities of Illinois coal has been shipped into this and to points west of us that really ought to be tributary to our own mines, and which comes into direct competition with our own coal. This certainly could not be done to any great extent without the operators having very low rates on their coal. But be that as it may there is certainly some agency at work that is bettering the condition of the coal market in this State, as the mines in this district are working more steadily and shipping greater quantities of coal to western markets during the past six months than ever before. There has been no strikes or labor troubles in the first district since my appointment to the office of Mine Inspector.

The tail rope system of hauling coal underground is being adopted in some of the mines in this district with unvarying success in every case. It can be applied under almost any conditions. The roads may be straight or curved, bevel or undulating in one continuous line or with side branches. In all cases the system works with equal certainty and economy. One rope, called the main rope, is for drawing the train of full cars outward. The other, called the tail rope, is necessary to take back the empty train, which on a level road cannot return by gravity. The two drums may be located at the opposite ends of the road and driven by separate engines, but more frequently they are on the same shafts at one end of the plane. In the first case each rope would require the length of the plane, but in the second case the tail rope must be twice as long, being led from the drum around a sheave at the other end of the plane, and back again to its starting point, when the main rope draws a train of full cars out, the tail rope drum runs loose on the shaft, and the rope being attached to the rear car unwinds itself steadily. Going in the reverse takes place. Each drum is provided with a brake to check the speed of the train on a down grade, and prevent its over-running the forward rope. The main rope is supported in the middle of the track by wooden rollers of six to eight inches in diameter, and twenty-four inches long, placed at a distance of twenty-five to thirty feet apart. The tail rope runs along side of the entries, over small pulleys or rollers six to eight inches in diameter, supported from the roof or

side of the entries. If a slope or drift mine, the tail rope is sometimes conducted outside on specially erected frames, running over small pulleys or rollers, and down a drill hole or shaft at the end of the main parting, passing under a sheave wheel into a box laid underneath the track to the end of the train of cars. A train rider accompanies the trip, riding on the back end of the train. It is only a question of time, and a very short time, when every large mine in the State will have the tail rope system for conveying the coal from the interior to the bottom of shaft, or to the tippie, if a slope or drift.

When we consider that as recently as seventy five years ago in England and Scotland coal was carried to the surface by women on their heads; that wheelbarrows, or sleds dragged by hand or by dogs, were used for a long time; that hoisting was done by horses in gins or by water balance shaft; that even after the introduction of iron rails, until a recent date, horses and mules were exclusively employed, all of which could transport but limited quantities of coal, we can better appreciate the great advantages of modern progress in the way of machinery, which now brings more coal to the surface of the earth in a day than half a century ago was brought in a year.

There are but three mines in the first district that have the tail rope system, the No. 1 slope at Kirckville, and the No. 1 and No. 2 shafts at Cleveland. The coal is collected at the end of the main road with mules from the cross entries, and brought to the main parting; from there it is brought out with steam power to the bottom of shaft, or to the tippie, if a slope. This system is far more economical, quicker and safer than mule power.

There are quite a number of mines, both shafts and slopes, that could adopt this system of haulage with a little additional cost, as most of them use steam power for hoisting purposes. Counting the cost of mules and feed, and the drivers' wages, there certainly would be a large saving to the operators and an advantage to the miners in getting their coal out of the mine.

The double entry system has been adopted by a large majority of the operators in this district, and this is certainly the best method of working a mine, both as a matter of economy and for the health of the miners where the coal is taken out by room and pillar, but quite a portion of the coal in my district is worked on the long wall system. A part of Appanoose county, and all of Taylor, Page and Adams counties, are worked in this way, which is the best method of working the upper vein of coal. There is no powder used in the long

wall system, consequently the sanitary condition of the mines is generally good.

#### MAPS OF MINES.

This section of the mining law is honored more in the breach than in the observance. A great many of the coal companies have their headquarters or main office located away from the mine, and when we visit a mine and inquire for the map the pit boss or man in charge will probably say that it is at the main office, or that we have no map of our mine, or that it is not finished yet, and will promise to have it ready when we visit them again, and it is not always convenient at the time to go to the main office to see the map, as the mines in this district are scattered over a large area of territory, and it keeps one man busy to get around to them all as often as the safety and health of the mines would require. It is hoped that mine owners, generally, may see the necessity for these maps and that the department may not be compelled to resort to the authority given them in section seven of the mining law.

Below will be found a list of improvements made in this district since I assumed charge of this office, and it affords me great pleasure to state that all of this has been accomplished without a resort to legal proceedings. With very few exceptions a disposition has been shown on the part of the operators of all the larger mines or those doing a railroad business, to comply with the mining law. And when any improvements were ordered or suggestions made by me they were generally carried out promptly as possible, and consequently my dealings with both operators and miners has been of the most pleasant character, for all of which I am truly thankful, as it certainly would have been unpleasant for me to have to applied to the courts to have my orders carried out. It is also detrimental to both operators and miners. To the operators that it makes unnecessary costs, and to the miners that it keeps them out of employment. It is certainly good business economy on the part of the mine owners to keep their mines in good condition, and it is of the first importance in order to do this that a good and competent mine boss should have charge of the inside workings. And here is where I think a great many companies make a mistake. They will hire a man for that position because he will work cheap, even if his qualifications are of the poorest rather than pay a good man good wages, such as a qualified man

should justly be entitled to. Some of the air shafts and second openings have been very costly ones. The one at Cleveland, two hundred and sixty feet deep, with fan and engine complete, cost about ten thousand dollars. Two air shafts at the Albia mine are nearly two hundred feet deep. One at the Iowa & Wisconsin mine one hundred and sixty feet deep; one at Swan ninety feet; one at Flagler ninety feet; one at Kirkville one hundred and twenty feet and their fan shaft enlarged, and there are quite a number more in process of construction at the local mines, which will be finished soon.

Improvements in District No. 1 are as follows:

Air shafts.....	29
Second openings.....	31
Stairways .....	12
Safety catches.....	6
Covers on cages.....	5
Safety gates.....	3
Furnaces.....	5
Fans .....	4
Brakes or drums .....	5

#### ABANDONED MINES.

The Chariton shaft at Lucas, in Lucas county, was abandoned on September 1, 1886, being worked out. A map of this mine has been sent to this office.

The Co-operative shaft at Seymour, Wayne county, was abandoned on January 1, 1887, the shaft being unsafe to operate any longer.

There has been two shafts closed down for failing to comply with the mining law. The Indianola shaft having no second opening. The Watson shaft at Centerville, Appanoose county, not having the necessary improvements.

#### MINES BURNT.

The buildings of the number one shaft of the Phillips Coal Company at Ottumwa, in Wapello county, on the Chicago, Milwaukee & St. Paul railroad, was burnt on August 11, 1886. There was sixty men in the mine when the shaft took fire from the furnace, which was located too near the bottom of the shaft. Orders had been given a short time previous to the fire, to put good and lawful steps in their escape shaft which had been completed a few days before the shaft took fire, which gave the men a safe way of escape from the burning



mine. New buildings was immediately erected and the shaft commenced to hoist coal again on September 21, 1886.

THOMAS BINKS,  
*Inspector District No. 1, Iowa.*

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DISTRICT No. 2.

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J. A. SMITH, INSPECTOR.

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*To his Excellency, WILLIAM LARRABEE, Governor of Iowa:*

In accordance with the provisions of the revised statutes I have the honor to present herewith the biennial report of District No. 2, Department of Mines.

The coal trade during the past year has been more regular than usual, the miners and laborers engaged in the industry having had more constant employment. In consequence of this there has been an almost total absence of strikes or labor difficulties of any kind. But two cases of this kind worthy of notice have occurred during the last two years—the strikes at Draper and What Cheer. More extended notice of these strikes will be found in another part of this report.

The absence of labor troubles in this district is the result of an agreement between some of the miners and operators, which was strictly adhered to by the parties and proved very beneficial.

In view of these facts we are justified in assuming that the reign of "King Coal" is not near its close, and that an era of prosperity for miners and operators is in the near future. It is not the question of price per ton for mining coal that interests the miners of our State so much as the question of constant employment. A maximum price per ton with a few weeks work is not as remunerative as a minimum price with a years nearly constant employment.

With the present amicable relations existing between the employers and employes engaged in mining there is no reason why the condition of all should not be improved in a marked degree.

The mines in district No. 2 are in better condition at present than at any time since the creating of this department. The ventilation, drainage and general security of nearly all the mines have been greatly improved; the double entry system and the split air system are rapidly taking the places of the old methods, and consequently the bad air in mines and other evils are much diminished. It is said that the mining law and mine inspection of Iowa are second only to Pennsylvania.

This is to be attributed to the increase of the inspection force and the support given to it by the executive department to enforce the amended or new law passed in 1885. The increase of the inspection force has enabled the department to extend its labors and thus inspect mines hitherto entirely neglected, and the powers conferred on the inspectors insures them respect and a prompt compliance with their suggestions and directions.

As a further evidence of the benefit to the mines brought about by the reorganization of the department, I append a list of improvements made in and about the mines in district number two from June 3, 1886, the time I commenced inspecting the mines, to June 30, 1887.

Respectfully yours,

J. A. SMITH.

IMPROVEMENTS MADE IN THE MINES OF DISTRICT No. 2,  
FROM JUNE 1, 1886, TO JUNE 30, 1887.

NAMES OF MINES.	Air shafts.	Second openings.	Stairway or ladder.	Furnaces.	Fans.	Safety catches.	Safety gates.	Covers on cages.	Brakes on drum.
Phelix Mactin No. 1.....	1								
Phelix Mactin No. 2.....		1							
James Mine No. 1.....	1								
James Mine No. 2.....		1							
Flair Mine No. 1.....			1						
Rowan Mine No. 1.....	1	1							
Williams Mine No. 1.....			1						
A shaft, What Cheer Coal Co.....								1	
B shaft, What Cheer Coal Co.....	1		1		1		1	1	
C shaft, What Cheer Coal Co.....		1					1	1	
D shaft, What Cheer Coal Co.....		1			1		1	1	
F shaft, What Cheer Coal Co.....							1	1	
H shaft, What Cheer Coal Co.....							1	1	
Crescent Mine No. 1.....		1					1	1	
Crescent Mine No. 2.....			1				1		
Chew Mine No. 1.....			1			1	1	1	1
Blatt Mine No. 1.....						1	1	1	
Fisher Mine No. 1.....						1	1	1	1
Fisher Mine No. 2.....						1	1	1	1
Turnbull Mine No. 1.....		1				1	1	1	
Bennett Mine No. 1.....			1						
Lewman Mine No. 1.....						1	1	1	
Stevenson Mine No. 1.....						1	1	1	
Con. Coal Co. Mine No. 5.....			1		1				
Heightman Mine No. 1.....	1	1	1						
Capel Mine No. 1.....						1	1	1	
Smith Mine No. 1.....	1		1				1	1	1
Burgess Mine No. 1.....		1				1	1	1	1
Guthrie Mine No. 1.....					1	1	1	1	
Reigle Mine No. 1.....						1	1	1	
American Coal Co. No. 2.....		1		1					
Black Heath Mine No. 1.....		1				1			
Valeria Mine No. 2.....		1			1	1	1	1	
Star Mine No. 1.....		1	1			1	1	1	
Snook Mine No. 1.....						1	1	1	1
Lister Mine No. 1.....		1					1		
Carson Bank No. 1.....		1					1	1	
Davidson Mine No. 1.....		1	1				1		
Peters Mine No. 1.....		1					1	1	1
Evans Mine No. 1.....		1							
Edwards Mine No. 1.....	1								
Coward Mine No. 1.....	1								
Total.....	6	20	15	2	5	15	34	23	6

It affords me pleasure to be able to say that these improvements have been brought about without a suit at law or any compulsory measures being resorted to, not one dollar having been expended for legal advice or action since I assumed the duties of mine inspector. In view of these facts I have no recommendations to offer.

#### COAL OUT-PUT OF DISTRICT NO. 2 FOR SEVEN YEARS.

COUNTIES.	1881.	1882.	1883.	1884.	1885.	1886.	1887.
Mahaska.....	917,495	701,397	927,337	932,714	762,785	851,362	895,548
Keokuk.....	463,010	511,849	500,040	430,940	372,816	545,304	599,007
Jasper.....	42,435	40,189	45,883	46,335	90,425	286,084	142,089
Scott.....	3,804	3,711	3,714	3,821	5,937	3,000	8,634
Marshall.....						400	200
Hardin.....						2,000	450
Muscatine.....						100	100
	1,426,744	1,258,146	1,477,024	1,413,811	1,231,963	1,688,200	1,645,978

The foregoing table giving the out-put of coal for the years represented, is only an approximate estimate, as all the mines have not made reports to this office of their total out-put. Allamakee, Clayton, Dubuque and Jackson counties have mines of lead and zinc ore, Dubuque having the largest mines.

As the operators of these mines are under the impression that the mining law of Iowa, does not apply to lead mines, I have in almost every instance failed to get reports of the out-put of lead and zinc; and also to get reports of fatal and non fatal accidents, as required by law. In my opinion the law should be made more explicit, if it is intended to cover the lead and zinc mines. It should, I think, include all mines, as, although lead mines are different from coal mines, the danger to employes is the same, and they should be protected.

The coroner of Dubuque county has persistently refused to report fatal accidents to this office, claiming that the mining law of Iowa does not require him to do so.

I requested the county attorney at Dubuque to bring action against him for non-compliance with the law. The county attorney refused to do as I requested, and sustained the coroner in his refusal, giving as his opinion that the law does not apply to lead and zinc mines.

#### NAMES OF MINES.

##### MAHASKA COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of Mine.	POST OFFICE.
Daniel Reigle.....	No. 1	Shaft..	Oskaloosa.
L. C. Guthrie.....	No. 1	Shaft..	Oskaloosa.
Samuel Smith.....	No. 2	Shaft..	Oskaloosa.
John Burgess.....	No. 1	Shaft..	Oskaloosa.
Robert Beadle.....	No. 2	Slope..	Oskaloosa.
William Wilkinson.....	No. 1	Shaft..	Oskaloosa.
W. N. Hoover.....	No. 1	Shaft..	Oskaloosa.
N. W. Hussey.....	No. 1	Slope..	Oskaloosa.
James Plumb.....	No. 1	Slope..	Oskaloosa.
Samuel Cable.....	No. 1	Shaft..	Oskaloosa.
J. Barrowman.....	No. 1	Slope..	Oskaloosa.
Beacon Coal Company.....	No. 1	Slope..	Beacon.
Beacon Coal Company.....	No. 2	Shaft..	Beacon.
American Coal Company.....	No. 1	Shaft..	Knoxville Junction
Mahaska Coal Company.....	No. 1	Slope..	Fishville.
Roberts Evans.....	No. 1	Slope..	New Sharon.
William Evans.....	No. 2	Slope..	New Sharon.
J. B. Haightman.....	No. 1	Shaft..	New Sharon.
Geo. L. Shoemaker.....	No. 1	Slope..	Leighton.
Leighton Coal Company.....	No. 1	Drift..	Leighton.
O. O. Chapman.....	No. 1	Slope..	Olivet.

##### JASPER COUNTY.

Black Heath Mining Co.....	No. 1	Slope..	Colfax.
Pittsburg Mining Co.....	No. 1	Shaft..	Colfax.
Valeria Coal Co.....	No. 1	Shaft..	Colfax.
Star Coal Mining Co.....	No. 2	Drift..	Colfax.
Yerka Coal Co.....	No. 1	Shaft..	Colfax.
Scott Slaughter.....	No. 1	Drift..	Colfax.
Jasper County Mining & R. R. Co.....	No. 1	Shaft..	Draper.
Jasper County Mining & R. R. Co.....	No. 2	Slope..	Draper.
H. Barnes.....	No. 1	Shaft..	Draper.
E. Woody.....	No. 1	Slope..	Draper.
Robert Marshall.....	No. 1	Drift..	Draper.
Robert Marshall.....	No. 2	Slope..	Draper.
E. E. Edwards.....	No. 1	Slope..	Draper.
Alfred Lister.....	No. 1	Shaft..	Newton.
Newton Coal Co.....	No. 1	Shaft..	Newton.
Wm. Snooks.....	No. 1	Shaft..	Newton.
Wm. Snooks.....	No. 2	Shaft..	Newton.
Davidson Mining Co.....	No. 1	Shaft..	Newton.
Peters & Walker.....	No. 1	Shaft..	Newton.
Robert Carson.....	No. 1	Shaft..	Newton.
C. N. Norris.....	No. 1	Slope..	Prairie City.
Hornlin & Pritchard.....	No. 1	Drift..	Prairie City.

## NAMES OF MINES—CONTINUED.

## SCOTT COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Phelix Mactin .....	No. 1	Shaft ..	Buffalo.
Iowa Bank .....	No. 1	Shaft ..	Buffalo.
Samuel James .....	No. 1	Shaft ..	Buffalo.
Samuel James .....	No. 2	Shaft ..	Buffalo.
John Murray .....	No. 2	Shaft ..	Buffalo.
Robert Williams .....	No. 1	Shaft ..	Buffalo.
Robert Williams .....	No. 2	Shaft ..	Buffalo.
C. G. Rowan .....	No. 2	Shaft ..	Buffalo.

## KEOKUK COUNTY.

What Cheer Coal Co. ....	A ...	Shaft ..	What Cheer.
What Cheer Coal Co. ....	B ...	Shaft ..	What Cheer.
What Cheer Coal Co. ....	C ...	Shaft ..	What Cheer.
What Cheer Coal Co. ....	D ...	Shaft ..	What Cheer.
What Cheer Coal Co. ....	F ...	Shaft ..	What Cheer.
What Cheer Coal Co. ....	H ...	Shaft ..	What Cheer.
Crescent .....	No. 1	Shaft ..	What Cheer.
Crescent .....	No. 2	Shaft ..	What Cheer.
John Blatt .....	No. 1	Shaft ..	What Cheer.
John Blatt .....	No. 2	Shaft ..	What Cheer.
Chew .....	No. 1	Shaft ..	What Cheer.
Cochran & Chew .....	No. 1	Shaft ..	What Cheer.

## KEOKUK COUNTY.

Martin Fisher .....	No. 1	Shaft ..	Delta.
Martin Fisher .....	No. 2	Shaft ..	Delta.
O. W. Olive .....	No. 2	Shaft ..	Delta.
Allan Dunn .....	No. 1	Slope ..	Delta.
Thomas Turnbull .....	No. 1	Shaft ..	Richland.
W. C. Bennett .....	No. 1	Shaft ..	Richland.
J. C. Cardes .....	No. 1	Shaft ..	Richland.
William Lewman .....	No. 1	Shaft ..	Richland.
William Booton .....	No. 2	Slope ..	Sigourney.

## MAHASKA COUNTY.

Consolidation Coal Company .....	No. 2	Slope ..	Muchakinoek.
Consolidation Coal Company .....	No. 5	Shaft ..	Muchakinoek.
James Newell .....	No. 1	Slope ..	Muchakinoek.
John Sladen .....	No. 1	Slope ..	Muchakinoek.
O. H. Vance .....	No. 1	Shaft ..	Muchakinoek.
Excelsior Coal Company .....	No. 1	Shaft ..	Excelsior.
Excelsior Coal Company .....	No. 2	Shaft ..	Excelsior.
Excelsior Coal Company .....	No. 3	Shaft ..	Excelsior.
Acme Coal Company .....	No. 1	Shaft ..	Oskaloosa
Standard Coal Company .....	No. 1	Shaft ..	Oskaloosa

## NAMES OF MINES—CONTINUED.

## HARDIN COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Bennett & Blair .....	No. 1	Slope ..	Eldora.
J. F. Madden .....	No. 1	Drift ..	Eldora.
Erie Ansil .....	No. 1	Drift ..	Eldora.

## MARSHALL COUNTY.

D. M. Moninger .....	No. 1	Shaft ..	Galvin.
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## SUMMARY OF WORK.

June 5, 1886, I visited the Star Coal & Mining Company's shaft, Star A, at What Cheer, Iowa. This mine is at the present writing owned by the What Cheer Coal Company. The volume of air was light, not sufficient to dilute—and thus render harmless—the obnoxious gases generating in the mine. There was a large quantity of these gases, owing to the old works in the mine being left without brattices. One fan was used to ventilate shaft A and shaft B, and as it was the only means of artificial ventilation the volume of air was necessarily light. With that exception the mine was in fair condition. Two hundred and twenty-five miners and one hundred laborers were at work in and about the mine. January 6, 1887, I again visited the mine. It had a full volume of air, which was well distributed, although in some parts it was loaded with impurities. This could not be avoided, as they were drawing the pillars.

June 6, 1886, the Star Coal & Mining Company's shaft, Star B, now known as the What Cheer Coal Company's mine, Shaft B, had two hundred and ninety-seven men and boys and twenty-two mules employed. At this time the full volume of air was 12,888 cubic feet per minute. The means of producing the requisite volume was insufficient, and I notified the company to construct a fan. After the completion of the fan the volume of air was increased to 60,576 cubic feet per minute, and was well distributed throughout the mine. January 5, 1887, I again visited this mine, and found it in good condition, with the exception of the cage on which the men were lowered and hoisted. It was unsafe, and I condemned it.

June 6, 1886, the Star Coal & Mining Company's shaft, Star C, at What Cheer. The volume of air was sufficient but not well distributed. January 1, 1887, this mine passed into the possession of the What Cheer Coal Company, and is now known as Shaft C. January 13 it was in better condition, only one entry being deficient in air. One hundred and ten miners and twenty-seven laborers were at work.

June 6, 1886, the Star Coal & Mining Company's shaft, Star D, at What Cheer, was in bad repair; the volume of air not being suffi-

cient, and the drainage of the mine not good. On my second visit, January 14, 1887, the mine was in fair condition, a new fan having been constructed and the drainage decidedly improved. It is now owned by the What Cheer Coal Company. Fifty miners and twenty-two laborers are employed.

June 8, 1886, I visited the Crescent Coal Company's shaft No. 1, at What Cheer, Iowa, and found it in good condition, regarding ventilation and general security. January 11, 1887, the volume of air was light and not well distributed. I gave the company notice to remedy the defect, and April 4, 1887, the mine was in good working order. One hundred and ninety-seven miners and fifty-six laborers were employed.

June 9, 1886, the Crescent Coal Company's shaft No. 2, at What Cheer, was undergoing repairs, and hence was not in operation. January 12, 1887, the mine was in good condition, the necessary repairs having been completed. One hundred miners and thirty-seven laborers were working in and about the mine.

June 9, 1886, I visited Broomhall H shaft, at What Cheer. Prior to the strike, which occurred in May, 1886, while owned by the Granger Coal Company, it was worked long-wall. At the time of my first visit the mine was in poor repair, and January 12, 1887, I found it but little, if any, better, not yet having recovered from the effects of the strike, which was caused by changing the pitch of the screen—raising it six inches at one end and lowering it six inches at the other. This strike has never been declared off.

August 2, 1886, the Western Union Fuel Company's shaft at Oskaloosa was in good condition, excepting a slight deficiency in the volume of air. One hundred and twelve miners and thirty-six laborers were employed. On a subsequent visit, December 3, 1886, I found it fairly ventilated and 150 miners and forty-four laborers employed.

August 3, 1886, I visited Daniel Reigle's shaft and found the cages without safety catches or hoods. I notified him to put them on at once, as there was no other means of ingress or egress. Two subsequent visits were made to this shaft, and, finding no attention had been paid to my notice, I told him I would enjoin him if he did not make the necessary improvements at once. The improvements were made immediately.

August 3, 1886, the Standard Coal Company's shaft at Oskaloosa was in fair condition, with the exception of one section where the air

course had been lost, and it was necessary to drive a new one some distance before the shaft could be properly ventilated. Some just complaints were entered by the miners in that section, but as the company was doing all in its power to comply with the law, I took no steps to enforce it. Fifty-three miners and sixteen laborers were employed.

August 3, 1886. The L. C. Guthrie shaft at Oskaloosa is eighty-three feet deep; the coal five feet thick. It was well ventilated, a fan having recently been constructed in the air-way. There were no hoods or safety catches on the cages, no brake on the drum or safety gates at the top of the landing. The man-way was, also, partially obstructed by a fall of slate. I notified him to make the necessary repairs. This he was somewhat dilatory in doing, as I made two subsequent visits before the improvements were completed. This was finally accomplished, with the exception of the brake on the drum.

August 4, 1886. Samuel Smith's shaft at Oskaloosa is seventy four feet deep; the coal four feet thick. He was working five miners and one laborer. There were no hoods or safety catches on the cages, no brake on the drum; no escape shaft or safety gates. It was some time before all these improvements were made, but it was finally accomplished and on my last visit to this shaft I found it in good condition.

August 4, 1886. Samuel Cable's shaft at Oskaloosa is forty-five feet deep; the coal four feet thick. Four miners and one laborer were employed. The condition of this mine in regard to general security was not good, there being no means of escape, except a shaft that was used as a furnace shaft. There were no hoods or safety catches on the cages, and no brake on the drum. I notified him to put them on. After considerable delay he complied.

August 5, 1886, I visited Excelsior Coal Company's shaft No. 1 at Excelsior, Ia. This shaft was working 35 miners and 12 laborers. It was nearly finished and at present writing is abandoned.

August 5. Excelsior Coal Company's shaft No. 2 at Excelsior, Ia., is the largest and best equipped mine in the State, and has produced the most coal in one day; 500 miners and 100 laborers were employed. I found a slight deficiency in the volume of air, which was perceptible throughout the mine. I notified the company to remedy the defect. The superintendent promised it should be attended to at once. February 1, 1887, there was still a slight defect in the distribution of

the air, particularly in 9 and 10 left north entry, and 10 left south entry; also, in south 12 foot entry, and the Ed. Worthy entry.

On the 11th and 12th of March, 1887, I again visited the mine and found it somewhat improved. March 17, 1887, all deficiencies had been supplied and the mine was in good working order.

The tower of this shaft and the machinery, which was very expensive, was burned April 5, 1887. It caught fire about 12:30 o'clock p. m., near the top of the tower and was totally destroyed, involving a loss to the company of about \$10,000.

This was a loss to the miners as well as the company as many were thrown out of employment. The tower is being rebuilt as rapidly as possible.

August 9. The Consolidation Coal Company's shaft No. 5, at Muchakinoek employs 195 miners and 20 laborers. I visited this shaft on two occasions and found it in good condition.

August 10. The Beacon Coal Company's slope No. 1 was in good condition, except the traveling way to the escape shaft, which was obstructed by a fall of slate. I notified the company to remove it. Promise was made to do it at once. Twenty-one miners and four laborers were employed at this slope.

August 11, 1886, the Mahaska Coal Company's slope No. 2 had nineteen miners and two laborers employed. This slope was in as good condition as possible, considering the system under which it was worked, the single entry. The superintendent stated that he intended to adopt the double entry system. It would doubtless be an improvement.

August 11. The American Coal Company's slope at Knoxville Junction was poorly ventilated. It was impossible to get the requisite volume of air with the means of artificial ventilation employed. Only a small furnace and an air-shaft, and these were not sufficient. A larger shaft was sunk and a larger furnace constructed; these gave ample means to properly ventilate the mine.

September 13, 1886. The Black Heath Mining Company's slope at Colfax was in fair condition, excepting that the air was not well distributed, and there was no ladder in the escape shaft. I visited this slope twice while the company was making the necessary improvements, and I found it advisable to have an air-shaft sunk, as the number of men had been increased, and the means of artificial ventilation was not sufficient to secure the requisite volume of air. Fifty five miners and nine laborers were employed.

September 14, 1886, I visited the Valeria Coal & Mining Co's shaft at Valeria. The recent breakage of the steam pumps, made it impossible for the company to prevent a large body of water accumulating in the mine, hence the sanitary condition was not good. The company at this time was working sixty-four miners and twenty-four laborers. April 14, 1887, I again visited the shaft. The company had put in a pump of sufficient capacity to overcome all accumulations of water, and in consequence the sanitary condition of the shaft was good. The volume of air at this time was fully up to the standard and well distributed.

September 14, 1886, the Star Coal and Mining Company's shaft, No. 1, at Colfax, was not in good condition in regard to general security, there being no second opening or lawful escape shaft; no safety-catches or hoods on the cages or safety gates at the upper landing. I notified the company to supply them at once. The sanitary condition of the mine was good, having the requisite amount of air which was well distributed throughout the mine. Visiting this mine at a later date I found the company had made a second opening by sinking an air shaft. Safety-gates had, likewise, been supplied. At this time two boys, who were under age, were at work, trapping, in the mine. I told the superintendent to send them out at once. The son of the engineer, a boy apparently not more than twelve years old, was in the habit of hoisting and lowering men. I did not deem it safe to allow him to handle an engine when men were going down or coming up; therefore I notified the engineer—the boy's father—the pit boss and the superintendent not to allow it to occur again. They promised to comply with my wishes. Seventy miners and twenty-five laborers were employed.

On October 4, 1886, I visited the Star Coal and Mining Company's shaft, Star F, at What Cheer, Iowa. This shaft did not run but twenty-three days in 1885, and none in 1886 until September 16th. It had a large volume of air, but it was not properly distributed. On the east side of the mine there were fifty men employed, but there was no current of air near the working place, as the intake was so obstructed with falls of roof that it was impossible to force sufficient air through it to ventilate that section of the mine. The air that was forced through the obstructed part of the entry returned immediately through the door that opened on the return air-course. I notified the company to clear up the old intake or drive a new one. They did the

latter; and on visiting it at a later date I found the new air-course completed, and, in consequence, the sanitary condition much improved. I suggested to the pit boss some minor improvements which he said he would attend to. This shaft was formerly owned by the What Cheer Land and Coal Company; January 1, 1887, passed into the hands of the What Cheer Coal Company; 270 miners and 25 laborers are employed.

October 5, 1887, John Blatt's shaft No. 1, at What Cheer, Iowa, had no safety-catches or hoods on the cages and no safety gates at the top of the shaft; the sanitary condition was likewise poor; the anemometer would not register. I notified the owner to increase the volume of air and construct the necessary securities at pit-top. I visited the shaft again January 14, 1887, and found it in good working order. The ladder in the escape shaft was straight. I advised a lawful one, and promise was made to have one put in. A force of seven miners and one laborer was at work.

October 5, 1886. J. S. Chew, the owner and operator of the Mofet bank at What Cheer, Iowa, had seven miners and one laborer employed. He had no hoods or safety catches on the cages, no brake on the drum, no safety gates, or ladder in the escape shaft. I notified him to make all necessary improvements as soon as possible. January 17, 1887, I again visited this mine and found it much improved, the air being of sufficient volume and well distributed, and safety catches and gates, hoods, drums, etc., being supplied.

October 11, 1887, I visited C. G. Rowan's shaft No. 2, at Buffalo, Scott county, Iowa. He had ten miners and two laborers employed. The shaft is ninety-eight feet deep and the vein of coal two feet and six inches. The sanitary condition as well as the general security of this shaft was poor. There was no air circulating, and no means of lowering or hoisting men except a swinging box. I notified him to sink an air shaft, and to construct a man-way. This he did and the shaft is now in good order.

October 11, 1886. The Murray bank, operated by William Hutchinson, had three miners and one laborer at work in it. The shaft was unsafe and there was no escape shaft. I notified him not to permit men to go down into the shaft until he had secured it. This he did, and commenced sinking an escape shaft. He subsequently gave up the mine and the shaft was not completed.

October 11, 1886. The Phelix Mactin shaft No. 1, at Buffalo, was



about wrought out, and is now abandoned. Three miners and one laborer were employed.

October 11, 1886. The Phelix Maetin shaft No. 2, at Buffalo, had no safety gates at the top of the shaft. The coal was hoisted by means of a swinging box, and the only mode of ingress and egress was up the quarter shaft, which was supplied with a lawful ladder. This shaft had not been in operation one year, hence the law did not require a second opening.

October 11, 1886. Samuel James' shaft, at Buffalo, had no hoods or safety catches on the cages, and no safety gate at the top of the landing. The traveling way to the escape shaft was closed by a fall of roof. I notified him to make connection with the escape shaft, and to put a lawful ladder therein. February 4, 1887, connection with the escape shaft had been made, the ladder placed in it and the men were not permitted to enter or leave the mine by any other way. Mr. James has also another shaft called poorman's shaft, which he works during the winter season. Thirty-eight miners and four laborers are employed in both mines.

October 29, 1886. W. C. Bennett's shaft at Packwood, employs four miners and one laborer. There are no safety gates at the top of the landing, no cages, and the escape shaft had a straight ladder. I hold him to construct safety gates and put a lawful ladder in the escape shaft. February 3d I again visited this mine and found the necessary improvements had been made. The shaft at this time was closed, there being a sufficient amount of coal to supply the trade, which is entirely local.

October 29, 1886. Hoadly's bank, operated by J. C. Cardes, has three miners employed. This bank had neither safety gates or cages. The escape shaft—which is not the proper distance from the main shaft—has a straight ladder in it. I told him to put in cages with safety-catches and hoods of approved pattern. February 7th I visited this bank and found the necessary improvements had been made.

October 29, 1886. William Lewinan's shaft at Richland had no ladder in escape shaft, no safety gates, no cages. Notice was at once given to supply these; and when I visited the mine again, February 7, 1887, the notice had been complied with and the shaft was in good working order. Five miners and one laborer were employed.

November 15, 1886, I visited the Davidson Mining Company's shaft No. 1, at Newton. There was no air traveling, although there was a

furnace large enough to produce a sufficient amount of air. It was not in operation at the time I was there, and I told the superintendent to have a fire kept in it at all times, especially when the miners were working. There was no lawful way of ingress or egress, and I told him to sink an escape shaft, to put safety gates at the top of the shaft and hoods and safety catches on the cages, if men were hoisted or lowered on them. At a later visit I found all these improvements had been made. The company was working fourteen miners and one laborer.

November 15, 1886, William Snook's shaft, at Newton, had just been opened; the men were driving the entries; there were no hoods or safety catches on the cages, or brake on the drum. I told him that these were necessary, and on second inspection I found that they had been supplied. Four miners and one laborer were employed.

November 15, 1886, Peters & Walker were working a force of four miners and one laborer at their shaft at Newton. I noticed the absence of safety gates at the pit top and hoods and safety gates on cages. They promised to supply these, and on second inspection I found they had partially done so.

November 16, 1886, Robert Carson's shaft at Newton employed four miners and one laborer. The owner of this mine did not conform to the law in means of general security, there being no safety gates, safety catches, hoods or brake. I called his attention to these deficiencies and they were supplied.

November 16, 1886, Alfred Lister's shaft in regard to general security was in poor condition. He had no safety gates at the pit-top and no lawful means of escape. I told him it was necessary to make a second opening. On a subsequent visit I found the improvements had been made.

November 17, 1886, William Evans' slope at New Sharon was in fair condition. The escape shaft had no ladder in it; but that has since been supplied. Fourteen miners and six laborers were at work.

November 17, 1886, J. B. Haightman's shaft at New Sharon was not in good condition in regard to general security, there being no safety gates, hoods, safety catches, brake on drums or escape shaft. I gave him notice to supply them at once, and I have since learned that he has put in an escape shaft. Eight miners and one laborer were employed.

November 17, 1886, Robert Evans' slope at New Sharon was in fair

condition. I noticed the absence of a ladder in the escape shaft and called the owner's attention to it. He promised to have one put in immediately. He was working six miners and one laborer.

December 4, 1886, John Burgess' shaft at Oskaloosa had fourteen miners and five laborers employed. The general security of this mine was not all that could be desired, and in consequence some repairs were ordered. Two visits were made to the mine before they were completed.

December 6, 1886, the Marshall slope at Draper, leased by Hopkins & Sons, had a full volume of air, but it was not well distributed. I made some suggestions and the lessees promised to adopt them. They were working seven miners and three laborers.

December 6, 1886, E. E. Edwards' slope at Draper was in fair condition. Five miners and one laborer were at work.

December 14, 1886, I visited the Pritchard slope at Prairie City and found it in good condition. Nine miners and four laborers were at work in this mine.

December 14, 1886, the Norris slope at Prairie City had eight miners and five laborers employed. There was a slight defect in the distribution of air, which I notified him to remedy.

January 15, 1887, I visited the Delta shaft No. 1, owned by Martin Fisher, at Delta, Iowa, and found he had not complied with the notice I gave him at my former visit. I told him that as he had shown no disposition to comply with the law, a persistence in that course would compel me to enjoin him. He promised to make the desired improvements immediately, and on January 26th I found it in good condition.

January 15, 1887, the Olive shaft, at Delta, was in poor condition. I told the owner that if he would persist in ignoring the law it would be necessary for me to enjoin him. He said he would endeavor to comply with the law. January 26th I again visited this mine, and found that he and the miners who were working in the mine had entered into a joint stock company to evade the law. I told them it would be necessary to furnish me with a copy of their agreement with each member of the company's name signed thereto, which they did.

January 26, 1887, the Allan Dunn slope had two miners and one laborer employed.

January 27, 1887. The Benton slope at Sigourney, operated by

Ben. Rowley, is worked for local purposes only. Four miners and one laborer are employed. The coal is five feet thick.

February 5, 1887, William Wilkinson's shaft, at Oskaloosa, had three miners and one laborer employed. He was not complying with the law, and I gave him the required notice.

February 5, 1887, W. N. Hoover's shaft, at Oskaloosa, was not complying with the necessary fixtures. I told him it would be necessary to supply the same if he allowed any one to work in the mine. At this time he had no one employed.

February 5, 1887, I visited Charles Tappe's drift at Muscatine. The coal is twenty-two inches thick. Number of men employed was not sufficient to have the mine considered as being subject to mining law.

February 5, 1887. A. M. Hair's drift, at the same place, has been in operation twenty years. Heretofore Muscatine has not received the credit due for coal.

February 5, 1887, N. W. Hussey's slope, operated by William Minnick & Co., had three miners and one laborer employed.

March 15, 1887. Bennett & Blair's slope, at Eldora, had, during the winter months, fifteen miners employed, but at this date the slope was not worked.

March 15, 1887, Eric Ansil's drift, at Eldora, had no one employed; but during the winter four miners worked the drift.

April 13, 1887, I visited the Eureka slope, at Colfax. Having but two miners and one laborer employed, this mine does not come under the law. The coal is five feet thick.

April 13, 1887, Scott Slaughter had two miners and one laborer employed.

April 20, 1887, I visited Southwell & Co's lead and dry-bone shaft, at Dubuque. I found it necessary to have an escape shaft sunk, and I notified them to sink one. They mine about six tons of zinc ore per day. The ore is worth \$9 per ton. Fifteen miners and one laborer, who receive from \$1.25 to \$1.50 per day, are employed.

May 10, 1887, H. Barns' slope, at Draper, was not in operation. At no time within the last year has he employed more than two miners and one laborer.

May 10, 1887. E. Woody's slope, at Draper, was closed since March 1, 1887. Up to that time he had four miners and one laborer at work.

## ACCIDENTS.

Since the 28th of May, 1886, six fatal accidents have occurred in this district. Prior to that time, and subsequent to June 30, 1885, there were eleven, making a total of seventeen since the last biennial report. Of these ten were caused by falls of slate, four by explosion of powder, one by a fall of coal, one by a cage and one was frozen to death. The number of non-fatal accidents reported to this office since the last biennial report is thirty-nine. Of these sixteen were injured by falls of slate, seven by pit cars, three were kicked by mules, two were injured by railroad cars, four by falls of coal, three by blasts, two by cages, one by a pump and one by a fall from a wagon.

## LIST OF FATAL ACCIDENTS.

CHARLES GORMAN—KILLED JULY 2, 1885.

The jurors upon their oaths do say that the deceased, Charles Gorman, lost his life by the accidental running away of the engine in the hands of David Myerly at shaft known as Crescent Coal Company, thereby throwing him under the cage and killing him; and we hereby censure the Crescent Coal Company for employing inexperienced engineers to run their engines.

HOMER SHERBONDY, }  
W. H. HARRISON, } Jurors.  
ALBERT GREENWAY, }

JAMES McCONNELL, Coroner, Keokuk County, Iowa.

WILLIAM HAIGH—KILLED SEPTEMBER 16, 1885.

We, the jurors, hereby find that the deceased came to his death by slate falling upon him while he was working in the Pittsburg mine; that the cause of his death is not blameable to carelessness on his part nor negligence on the part of the miners, owners or employer.

L. C. WESTFALL, }  
JAMES BARRY, } Jurors.  
H. W. ROBINSON, }

HUGH NEWELL, Coroner, Jasper County, Iowa.

DENNIS BURNS—KILLED NOVEMBER 9, 1885.

The jurors on their oath do say that the said Dennis Burns came to his death by purely accidental means—by the fall of slate—and that there is no blame attached to any one whatsoever.

JOHN A. GRIFFITH, }  
WARREN ABDILL, } Jurors.  
J. M. DODD, }

JAMES McCORMACK, Coroner, Keokuk County, Iowa.

HENRY WOLVERTON—KILLED NOVEMBER 23, 1885.

The said jurors, on their oaths, do say that said Henry Wolverton came to his death by an accidental and unavoidable fall of slate, at the Leighton Coal and Mining Company's mine, about 12 o'clock, noon, on November 23, 1885. We further find that no one is to blame for the accident.

C. LEIGHTON, }  
W. E. RICHIE, } Jurors.  
DAVID B. DAVIS, }

J. C. BARRINGER, Coroner, Mahaska county, Iowa.

MALCOLM PETERSON—KILLED DECEMBER 19, 1885.

The said jurors, upon their oaths, do say said Malcolm Peterson came to his death by a premature discharge of a shot while tamping a hole in room No. 12, mine No. 5, Consolidation Coal Company's mine at Muchakinock, about 11 o'clock A. M. on Saturday, December 19, 1885, and we further find that no one is to blame for the accident.

WILL W. STEWARD, }  
J. N. CAMPBELL, } Jurors.  
WILLIAM LOOFT, }

J. C. BARRINGER, Coroner, Mahaska county, Iowa.

LEWIS EVANS, J. C. WHITE, PETER ANGSTROM—KILLED JANUARY 7, 1886.

The said jurors, on their oaths, do say that said Evans, White and Angstrom came to their deaths by reason of the explosion of a can of blasting powder, accidentally exploded by the blow of a pick in the hands of White, in a room at the mines of the Valeria Coal and Mining Company; that the explosion was the result of a reprehensible custom among miners, and that no blame can be attached to the company or its management.

J. R. RODGERS, }  
JESSE SLAVEN, } Jurors.  
H. W. ROBINSON, }

E. A. WILLIAMS—KILLED JANUARY 26, 1886.

The said jurors, upon their oaths, do say that said Williams came to his death by being crushed in the mine of J. D. Guthrie, Oska-loosa township, by a fall of slate. No one is to blame for the said injury. Said injury occurred about 6 o'clock January 26, 1886.

N. R. LACY, }  
C. H. PHELPS, } Jurors.  
E. K. HINES, }

J. C. BARRINGER, Coroner, Mahaska county.

LEE SMITH—KILLED APRIL 30, 1886.

The said jurors upon their oaths do say, said Lee Smith came to his death while visiting in room No. 7, American Coal Co's Mine No. 2, by an accidental fall of slate, about 8 o'clock A. M., on Friday, April 30, 1886. We further find that no one is to blame for the accident.

DAVID DAVIS, }  
H. D. HATCHET, } Jurors.  
W. F. MARKS, }

J. C. BARRINGER, Coroner, Mahaska county, Iowa.

WILLIAM RAMSAY—KILLED MAY 7, 1886.

The said jurors upon their oaths do say that said William Ramsay came to his death by an accidental and unavoidable fall of a portion of the roof in mine No. 2, eleventh left entry, south side of shaft, near the face of said entry, Excelsior Coal Company's mine at Excelsior, about 10 o'clock A. M., on Friday, May 7, 1886. The jury fur-

ther find that said accident was without the fault or negligence of any one.

JAMES S. RICE, }  
W. L. HOWE, } Jurors.  
W. F. MARK, }

J. C. BARRINGER, Coroner, Mahaska county, Iowa.

CHARLES SJEQUIST—KILLED OCTOBER 25, 1886.

The said jurors, upon their oaths, do say said Charles Sjequist came to his death by an unavoidable and accidental fall of slate in room 31, K entry, mine No. 5, Consolidation Coal Company's mine, at Muchaknock, Mahaska county, Iowa, about 11:30 o'clock, on October 25, 1886. We further find said accident was without fault or negligence of any one. In testimony whereof the said jurors have hereunto set their hands the day and year aforesaid.

JAMES A. RICE, }  
THOS. M. SHOCKLEY, } Jurors.  
C. W. JORDON, }

J. C. BARRINGER, Coroner Mahaska county.

JOHN ORMSHER—KILLED OCTOBER 28, 1886.

We being called on a jury to here examine the dead body of John Ormsher, after making an examination of said deceased and hearing the evidence in the case are united in believing that he came to his death by running a very dangerous risk of mining a loose shot of coal, which fell and caught him whilst at work under it.

ALBERT EMONY, }  
D. WARREN, } Jurors.  
WILLIAM JOHNSON, }

M. B. BROWN, Coroner of Keokuk county, Iowa.

TEMPER CROSBY—KILLED JANUARY 6, 1887.

The said jurors, upon their oaths, do say said Temper Crosby came to his death by fainting, or in a fit, and falling on the ground, on Thursday evening, January 6, 1887, and that before he recovered consciousness he became chilled from the intense cold, and was frozen to death, on the night of January 6, or on the morning of January 7, 1887.

We further find that his death was purely accidental, and that no one was to blame.

In testimony whereof, the said jurors have hereunto set their hands, the day and year aforesaid.

A. CHUBB,  
F. C. LOFLAND, } JURORS.  
A. A. PAIN,

J. C. BARRINGER, Coroner.

THOMAS BRIGHT—KILLED JANUARY 22, 1887.

The said jurors, on their oaths, do say that the said Thomas Bright came to his death by slate or rock falling upon him from the roof of the room in the coal mine of the Black Heath, which might have been prevented if the occupants had put in more props.

In testimony whereof, the said jurors have hereunto set their hands, the day and year aforesaid.

C. E. CRAGAN,  
W. W. SMALL, } JURORS.  
R. C. TOPPER,

J. B. NILES—KILLED APRIL 16, 1887.

The said jurors, on their oaths, do say that said J. B. Niles came to his death by a fall of slate in room No. 19, east entry, eighth right, mine No. 3, Excelsior Coal Company's, on the 16th day of April, 1887, about noon; that his death was purely accidental, and without the fault of any one.

In testimony whereof, the said jurors have hereunto set their hands, the day and year aforesaid.

CHARLES A. CONEY, } JURORS.  
JAMES RICE,  
L. J. ALLEN,

Attest:

J. C. BARRINGER, Coroner.

AUGUST TRAGNER—KILLED MAY 13, 1887.

POWESHIEK TOWNSHIP, JASPER COUNTY, IOWA.

The said jurors upon their oaths do say that on the 13th day of May, 1887, near the hour of twelve o'clock—mid-day or noon—by reason of slate falling from the roof of room in Star Coal mine in said township and county, on to him, the said August Tragner, crushing his head and skull.

J. M. KENNEDY, } JURORS.  
A. S. KIZER,  
W. N. ROWLES,

### LIST OF NON FATAL ACCIDENTS.

BRION DALE—FEBRUARY 19, 1886.

Injured by a fall of slate at Excelsior Coal Company's mine, Excelsior, Iowa. Injuries not serious.

THOMAS SCOTT—MARCH 5, 1886.

Foot injured by car jumping the track at Excelsior Coal Company's mine, Excelsior.

THOMAS CARR—MARCH 23, 1886.

Injured by a fall of slate in No. 2, Excelsior Coal Company's mine, Excelsior. Injuries not serious.

JAMES BOWDEN—JULY 8, 1886.

Kicked in the mouth by a mule at Excelsior Coal Company's mine, Excelsior. Lower jawbone broken.

THOMAS AIRIE—JULY 11, 1886.

Injured by a fall of slate in shaft A, at Star Coal Mining Company's mine, What Cheer. One rib broken.

JOHN SACKFIELD, SEN.—JULY 13, 1886.

Injured internally and both legs broken by a fall of slate in shaft B, Star Coal Mining Company's mine at What Cheer. Injuries probably fatal.

THOMAS GIBSON—OCTOBER 5, 1886.

Injured by a fall of slate in Crescent Coal Company's mine, What Cheer, Iowa. Not seriously.

ROBERT WALKER—NOVEMBER 6, 1886.

Injured in the back by a fall of slate at Excelsior Coal Company's mine No. 2, Excelsior, Iowa.

J. M'FADDEN—NOVEMBER 30, 1886.

Right arm injured while coupling to railroad cars at Excelsior Coal Company's mine, Excelsior, Iowa. Arm amputated.

D. ROBERTS—DECEMBER 8, 1886.

Hand injured by a fall of coal in shaft C, Star Coal Mining Company's mine, What Cheer.

M. O'BRIEN—DECEMBER 11, 1886.

Injured by a fall of slate in shaft A, Star Coal Mining Company's mine, What Cheer.

JOHN SHARP—DECEMBER 11, 1886.

Hand injured by a shot blowing through from shaft B in shaft A, Star Coal Mining Company's mine, What Cheer.

JAMES POWERS—DECEMBER 15, 1886.

Caught by the cage which was coming down while he was crossing shaft F in Star Coal Mining Company's mine, What Cheer. Back injured and one leg broken.

SAMUEL M'FARLAND—DECEMBER 15, 1886.

Finger crushed by being caught in the pump at shaft F, Star Coal Mining Company's mine at What Cheer. Finger amputated.

JOHN RAIT—JANUARY 7, 1887.

Foot slightly injured by top coal falling on it at shaft A, What Cheer Coal Company's mine, What Cheer.

WM. SAMUELS—JANUARY 12, 1887.

Finger broken at Shaft A, What Cheer Coal Company's mine, What Cheer.

JOHN GILLEN—JANUARY 12, 1887.

Slightly injured at the same time and place.

WM. JEFFRIES—JANUARY 12, 1887.

Slightly injured at the same time and place.

GEORGE SMART—JANUARY 15, 1887.

Injured by a fall of slate in Excelsior Coal Company's mine No. 2, Excelsior.

WM. M'GUAN—JANUARY 16, 1887.

Kicked by a mule at What Cheer Coal Company's mine, What Cheer. Slightly injured.

C. G. LARSON—FEBRUARY 1, 1887.

Injured by premature explosion of a blast at Western Union Fuel Company's mine, Oskaloosa. Injuries severe but not dangerous.

J. CAIN.

Ankle bone fractured by a fall of slate in entry of Valeria Coal & Mining Company's mine at Colfax.

J. COLE.

Slightly injured internally by falling from a slate trestle at Valeria Coal & Mining Company's mine, Colfax.

DAVID HOPKINS—MARCH 5, 1887.

Kicked in the mouth by a mule at No. 2 mine, Oskaloosa, Iowa.

ROBERT DALE—FEBRUARY 26, 1887.

Injured by a piece of slate falling on him at the face of his room in Excelsior Coal Company's mine No. 2, Excelsior, Iowa.

GEORGE HUNT—FEBRUARY 28, 1887.

Slightly injured by a piece of slate falling on his head at face of his room in Excelsior Coal Company's mine No. 2, Excelsior, Iowa.

EDWARD EVANS—MARCH 16, 1887.

Leg broken by being caught by a loaded car in the entry, shaft B, What Cheer Coal Company's mine, What Cheer, Iowa.

JOHN HARVEY—MARCH 16, 1887.

Head injured by falling slate in shaft A, What Cheer Coal Company's mine, What Cheer, Iowa.

ELLIOT CASEY—MARCH 28, 1887.

Injured by the explosion of a blast in Excelsior Coal Company's mine No. 2, Excelsior.

SHERMAN POWERS—MARCH 29, 1887.

Slightly injured by falling from a wagon at Crescent Coal Company's mine, What Cheer.

GEORGE WHITE—APRIL 7, 1887.

Injured by a fall of slate from shaft F, What Cheer Coal Company's mine, What Cheer, Iowa.

J. STOKES—APRIL 8, 1887.

Injured by falling from a box car at shaft C, What Cheer Coal Company's mine, What Cheer, Iowa.

ALPHONSE DILLBAR—APRIL 8, 1887.

Injured by a large piece of coal falling on his head and shoulders at shaft B, What Cheer Coal Company's mine, What Cheer, Iowa. Injuries not very serious.

SAMUEL MOPING—APRIL 8, 1887.

Injured by a piece of coal hitting him on the back at Excelsior Coal Company's mine No. 3, Excelsior, Iowa.

GEORGE JACKSON—APRIL 14, 1887.

Driver in Excelsior Coal Company's mine No. 3, Excelsior. Injured in the head by collision with another driver.

D. PUGH—APRIL 16, 1887.

Arm slightly injured by a fall of slate in shaft C, What Cheer Coal Company's mine, What Cheer, Iowa.

ARTHUR OVERTON—MAY 4, 1887.

Leg broken by car crushing him against the side of the entry in No. 3 mine, Excelsior Coal Company, Excelsior, Iowa.

SAMUEL WALKER—JUNE 13, 1887.

Injured by a fall of slate in No. 2, Excelsior Coal Company's mine, Excelsior, Iowa.

Injuries not serious.

DAVID WHITEHEAD—JUNE 17, 1887.

Ankle broken in two places by a descending cage, in shaft A, What Cheer Coal Company's mine, What Cheer, Iowa.

Injuries very serious.

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### STRIKES.

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During my term of office, which began May 28, 1886, there has been but one strike in district No. 2. This was at Draper, and occurred November 15, 1886. The miners at Draper, in the employment of the Jasper County Mining and Railway Company, struck about the 15th of November, on account of difficulties concerning the check weighman. A check weighman, who had been appointed by the miners, and who seemed to be satisfactory to both miners and operators, resigned after a week's work, and in his place the miners appointed another man from among their number. The day on which he began work he came to the top a little after 7 o'clock. The company weighman had dumped two pit cars of coal on the flat before the check weighman arrived. The check weighman protested against the coal being dumped before he got there, and the company weighman told him he was working for the company, and if the check weighman wanted to see the coal dumped it was his place to be there. He also asked the company weighman what beam he had balanced the flat on, and was informed that it was not that gentleman's business to teach the check weighman his. The superintendent soon came, and ordered the check weighman down from the dump-room. The miners consulted, and sent a committee to the superintendent, but upon failure to secure the re-instatement of their check weighman they went out on a strike. They then wrote to me asking me to come down and re-instate their man. I went at once, and examined thor-

oughly the facts of the case, and advised them that I could do nothing, as they had taken the matter into their own hands by striking.

The miners were not satisfied with my decision, and I agreed to get and send to them the opinion of the Attorney-General. The Attorney-General stated, in substance, that "it was the right of the miners, working in any mine, to select a competent person of their number to act for them, and to examine the scales, machinery, etc., used by them in the weighing of coal mined by them, and that he must be a competent man as specifically stated in the law. It is the duty of the operator or owners of the mine, mine manager, or agent, to give said person so appointed free access, at all times, to all such scales, machinery, etc. He further stated that the mine inspector has no power to appoint such a person, or to reinstate one who had been appointed and discharged. If, however, the operator or the superintendent or whoever has charge for the owner, refuses to allow the person so appointed to inspect the machinery, scales, etc., and to perform his other duties, as contemplated in the new mining law, then I may order the superintendent to comply with the provisions of the law defining the duties of a check weighman, and a refusal thereafter to do so, will subject such person to the fine provided in section nineteen of the law." If, however, the miners strike and do not send up any coal to be weighed, I cannot, "during the continuance of such strike, do anything." I cannot order the superintendent, or owner, or agent to allow a man to inspect the weights when there is no coal to be weighed and no check weighman.

I send a certified copy of the opinion to the miners, and accompanying it a letter from which the following is an extract: "You will see by this that I have no power to reinstate any one at any time, and also that I can do nothing in the matter until you resume work. I would advise you to return to work, and select one of your number as check weighman, and then, if the operator refuse to let him act in that capacity, do not strike, as a strike takes from me all power to act, but notify me immediately and I will attend to the matter at once." I also sent a copy to the operators, and referred them to its provisions, that they might be governed accordingly. At the expiration of two weeks, the men returned to their work, and there has been no further trouble.

Prior to this time about May 9, 1886, a strike occurred at What Cheer, in Broomhal H. mine, owned by the Granger Coal Company,

and operated by the Star Coal & Mining Company. The Company caused the pitch of a screen to be changed—raising it six inches at one end, and lowering it six inches at the other—claiming that the coal was injured by rolling down so steep an incline; that it was not properly cleaned; and that the railroad flats were broken by the force of the fall. The miners considered it unjust as it enabled a great amount of small coal to fall through; they also claimed that the bars had been widened. This was not the case as was afterwards proven.

The miners sent a committee to the operators, notifying them that they would send up no more coal until the screen was placed in its former position. The operators would not yield, and the men went out on a strike, July 22. The miners and general superintendent met at the mine, and some trouble occurred, during which two shots were fired, one striking the superintendent in the face inflicting a slight wound, and the other wounding a miner in the arm.

This strike has never been declared off; but the mine has been running as usual since that time.

Peace and harmony exist between miners and operators, and many of those engaged in the strike are now in the employ of the company.

#### LABOR AND CAPITAL.

The wonderful advances made in the arts and sciences, manufacturing and development of our resources are familiar to all. As to the future of this great nation who can tell?

Its resources are inexhaustible, its possibilities unlimited and beyond my powers to portray.

Several questions are forcing themselves upon us as a nation, among which are two that seem to eclipse all others in importance—the temperance question and the question of labor and capital.

Of these two it is only my province at this time to discuss the latter, and it will require the greatest forecast and wisdom of our wisest and best statesmen to properly adjust it.

The interests of labor and capital are so intimately connected, so closely interwoven that the neutral path between them is narrow and not very clearly defined; still all signs point to a peaceful solution of this great question.

Instead of frequent strikes, which must always entail loss upon employer and employed, differences are now adjusted through com-



mittees from amalgamated associations, knights of labor and other kindred organizations, who meet similar committees from the other side in friendly conference, and I have no doubt but that this idea will continue until through a gradual process of development a system will be devised through which all differences can be adjusted without any perceptible jar.

The progress of arts and sciences is rapidly tending, where it is unchecked, to make less labor necessary for man's subsistence, and nothing could be so certain to destroy this tendency as an organized effort by labor to gain a forced, artificial and unfair advantage over its employer. Labor organizations can do very much by striving to sweep away passion and prejudice; by upholding peace, order and security—the conditioning of efficient production—and by inculcating an intelligent consideration of facts by their members.

In the meantime it behooves each and every one to use his best endeavors to preserve peace and harmony in every crisis and place his love of country above selfish and mercenary ends and thus preserve this great government “of the people, by the people, and for the people.”

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DISTRICT No. 3.

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JAS E STOUT, INSPECTOR.

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DES MOINES, IOWA, August 15, 1887.

*To His Excellency, WILLIAM LARRABEE, Governor of Iowa:*

SIR—In accordance with the law I have the honor to present herewith the report of district No. 3 of this department for the two years ending June 30, 1887, in this report I will endeavor to give a summary of the work done, the out-put of coal together with a list of all accidents occurring in or about the mines and any other matter that I may deem of importance.

JAS. E. STOUT,  
*Inspector District No. 3.*

COAL OUTPUT OF THE COUNTIES COMPRISING DISTRICT No.  
3, FOR THE PAST FIVE YEARS.

COUNTY.	1883.	1884.	1885.	1886.	1887.
Boone.....	466,981	473,073	458,191	294,970	167,068
Dallas.....	38,208	37,185	32,986	21,986	40,420
Greene.....	88,851	96,327	89,687	117,538	105,894
Guthrie.....	.....	5,187	4,596	17,194	18,305
Hamilton.....	1,998	1,878	918	3,312	6,689
Polk.....	558,821	619,921	462,895	337,964	305,094
Webster.....	248,560	214,014	145,296	107,777	146,221
Story.....	.....	.....	.....	.....	2,000
Total.....	1,413,419	1,447,585	1,194,469	900,741	791,671

The foregoing table giving the out-put of coal in the counties comprising the third inspection district for the past five years is as near correct as it is possible for me to give it, as it is impossible to get some of the operators to report their out-put to this office and as there is no law to compel them to make such report we have to be satisfied with what we can get. The larger mines or those doing a railroad business, have about all reported, but the smaller ones are very slow and of quite a number of them we have to make merely an approximate estimate, which, knowing the number of miners they employ and the condition of their market, we can probably get very nearly correct. As will be seen by reference to the table the out-put shows a large decrease during the last three years. This is due to the exhaustion of mines in different parts of the district, chief among which are Angus and Moingona in Boone county, Coalville in Webster county and on the east side of the city of Des Moines, in Polk county, where several mines have been drowned out with water within that time.

## LIST OF FATAL ACCIDENTS.

WILLIAM R. HALL—KILLED NOVEMBER 2, 1885.

An inquisition holden at the mayor's office, Boonesboro, Boone county, on the 3d day of November 1885, before George Doran, coroner of said county, upon the dead body of William R. Hall, the jurors whose name are hereunto subscribed, the said jurors upon their oaths do say that the said William R. Hall came to his death on the 2d day of November 1885, by being accidentally struck by one of the cages in the shaft mine of W. D. Johnson & Company, in Des Moines township, Boone county, Iowa.

W. D. TEMPLIN, }  
WILLIAM LOGAN, } JURORS.  
S. C. BLONCK, }

GEORGE DORAN, Coroner Boone County.

DAVID M. WILLIAMS—KILLED DECEMBER 8, 1885.

An inquisition holden at Angus, Boone county, Iowa, on the 9th day of December, 1885, upon the body of David M. Williams, before Thos. Pratt, justice of the peace, in and for said county by the jurors whose names are hereunto subscribed, the said jurors upon their oaths do say that the deceased came to his death from the result of injuries to the brain, caused by a fall of the roof in his working place in the Enterprise shaft in Boone county, Iowa, on the 8th of December 1885, and that is was purely accidental as we verily believe from the evidence produced.

C. P. LUDDEN, }  
THOS. RAY, } JURORS.  
D. J. MORRIS, }

THOS. PRATT, J. P., and acting Coroner, Boone County, Iowa.

GUS. NELSON—KILLED SEPTEMBER 21, 1886.

An inquisition holden at the city hall in Des Moines, Polk county, Iowa, on the 21th day of September, 1886, before J. W. Griffith, coroner of said county, upon the body of Gus Nelson, there lying dead, by the jurors whose names are hereto subscribed, the said jurors upon

their oaths do say that the said Gus Nelson came to his death on or about 8:30 o'clock A. M. September 21, 1886, in the mine of the Des Moines Coal & Mining Company, situated in Bloomfield township, Polk county, Iowa, by means of a large piece of slate or stone falling upon him from the roof of said mine, while he was in the employ of said Company, and we further find that the said Gus Nelson came to his death wholly on account of his own negligence by working his room too wide; in testimony whereof the said jurors have hereunto set their names the day and year aforesaid.

OSCAR FIELDS, }  
W. H. BUCKLEY, } JURORS.  
J. W. NOBLE, }

I. W. GRIFFITH, Coroner Polk County.

OCTOBER 28, 1886.

Richard Hughes and Thomas Hughes, father and son were injured by the explosion of a keg of powder, in the Polk County Mine, from the effects of which they died on November 6, 1886.

No inquest was held.

POLK COUNTY COAL COMPANY.

SOLOMON PIPER, JOHN S. BLYTHE, CHAS. COULSON—DECEMBER 28, 1886.

An inquisition holden at Surry, Greene county, Iowa, on the 28th day of December, 1886, before D. J. Bowman, coroner of said county, upon the bodies of Solomon Piper, John S. Blythe and Chas. Coulson, there lying dead, by the jurors whose names are hereto subscribed; the said jurors on their oaths do say that the said Solomon Piper, John S. Blythe and Chas. Coulson came to their death by the explosion of a boiler at the Armstrong Coal Mine, said boiler was in the hands of Oliver Armstrong, engineer, and Solomon Piper, fireman; the cause of said boiler explosion to the jurors unknown.

DON C. LYON, }  
JEROME LYSINGER, } JURORS.  
ALEXANDER MUIR, }

D. J. BOWMAN, Coroner, Greene county.

SAMUEL ARROWOOD—KILLED MARCH 19, 1887.

An inquisition holden at Altoona, Clay township, Polk county, Iowa, on the 20th day of March, 1887, before I. W. Griffith, coroner of said county, upon the body of Samuel Arrowood, there lying dead,

by the jurors whose names are hereunto subscribed; the said jurors upon their oaths do say the said Samuel Arrowood came to his death in the mine of the Altoona Coal & Mining Company, on or about 9:15 P. M., March 19, 1887, by being struck by some substance from a shot fired in said mine; deceased failing to get out of the way of danger from said shot.

In testimony whereof the said jurors have hereunto set their hands the day and year aforesaid.

JAMES PORTER,  
T. E. HAINES,  
W. H. ROBBINS, } Jurors.

Attest:

I. W. GRIFFITH, Coroner, Polk county.

E. W. GAYLORD—KILLED JUNE 17, 1887.

An inquisition holden at Surry, in Washington township, Greene county, Iowa, on the 17th day of June, 1887, before S. Q. Free, justice of the peace in and for said county and acting coroner, upon the body of E. W. Gaylord, there lying dead, by the jurors whose names are hereunto subscribed; the said jurors upon their oaths do say that the said E. W. Gaylord came to his death by being caught between cage and shaft and the iron rail projecting over the shaft, at Keystone Mine No. 3, and no negligence can be attached to any one, as it was an unavoidable accident.

WM. BRAMBAUGH,  
DAVID McCARL,  
A. J. BURKETT, } Jurors.

Attest:

S. Q. FREE, J. P., acting Coroner, Greene county.

### NON FATAL ACCIDENTS.

On the 18th day of December, 1886, in the mine of the Polk County Coal Company, Daniel Bunce got his hand caught between the beam and safety catch of the cage, and had three fingers taken off.

On the 5th day of February, 1887, in the mine of the Standard Coal Company, at Angus, in Greene county, a miner by the name of Gust. Johnson had a leg broken by a fall of slate.

On the morning of February 8, 1887, a miner, Henry McIntosh, was injured by a fall of roof in the mine of the Standard Coal Company, at Angus, in Greene county. Injuries very serious.

On the 20th day of February, 1887, Ed. Bechtol fell down the shaft of the Polk City Coal Company, at Polk City, a distance of 238 feet; had one leg broken, otherwise not seriously injured.

On the — day of December, 1886, Hugh McCahil had an arm broken by fall of roof in the mine of the Armstrong Coal Company, in Greene county.

On the — day of December, 1886, Charles Nugent was injured by fall of roof in the mine of the Standard Coal Company, in Greene county. Injuries not serious.

December 28, 1886, Oliver Armstrong was injured by the explosion of a boiler at the mine of the Armstrong Coal Company, in Greene county. Not serious.

December 28, 1887, Ted. Richards was injured at the mine of the Armstrong Coal Company, in Greene county, by explosion of a boiler. Injuries very serious.

June 4, 1887, in the mine of the Polk County Coal Company in Polk county, Richard Taylor had the muscles of his leg injured by a fall of roof; not serious.

There were ten fatal accidents reported to this office during the two years ending June 30, 1887, and the record shows nine non-fatal, although some of them were not reported officially as they should have been, but were learned some by newspaper reports and others by hearing it talked of while on my tours of inspection, and I am

satisfied that some have occurred of which I have no knowledge. Of the fatal accidents, four of them were in Greene county; three of which were caused by the explosion of a boiler at the mine of the Armstrong Coal Company on the 28th day of December, 1886, the particulars of which are these: There were two boilers in use at this mine, in charge of Mr. Oliver Armstrong as engineer, and Solomon Piper as fireman. During the most of the forenoon of that day, Piper, the fireman, was down in the mine making some repairs on the pump, during which time the engineer done his own firing, at about half past twelve o'clock the fireman came up out of the shaft and told the engineer to go and get his dinner and hurry back so he (the fireman) could eat his. In the meantime he asked the engineer if all was right in the boiler house, to which the engineer answered yes, and immediately went to his dinner. The fireman then proceeded to clean out the fires under the boilers, and while so engaged, the engineer returned from his dinner and blew the whistle for a quarter to one o'clock, which was the signal for the men to go down the shaft preparatory to the afternoon work, which they proceeded to do, and while the engineer was engaged in letting them down, a terrible explosion took place which entirely demolished the engine and boiler house, and as soon as the men could collect their scattered senses, they found that the fireman, Piper, John S. Blythe, pit boss, and Chas. Coalson, a miner, had been killed outright, while the engineer, Armstrong, and Ted Richards, one of the day men, had been badly injured. The boiler that exploded had been in use about three years and was supposed to be entirely safe, and the engineer claims there was plenty of water in at the time, and although there are a number of theories as to the explosion, it will probably never be known to a certainty. If it had occurred five minutes sooner, the loss of life would have been very great, as not less than forty miners had been seated around the boiler and in the engine house at that time.

The other death that occurred in that county was that of Mr. E. W. Gaylord, manager of the Keystone and Standard mines. On the 17th day of June, 1887, he was examining something around the top of the Keystone shaft No. 3, which being a new mine they were just fitting up; they had not yet got the gates put up at the ground landing and Mr. Gaylord undertook to step across the corner of the shaft, and being hard of hearing, he did not hear the signal for the cage to be hoisted, which struck him on the head and killed him instantly. Two of the fatal accidents occurred in Boone county, one of which was

caused by being caught by the cage at the bottom of the shaft in the mine of W. D. Johnson & Company, near Boonesboro; the other by falling of roof in the Enterprise shaft at Angus. Polk county is credited with four; two of these were caused by the explosion of powder while charging a shot in the mine of the Polk County Coal Company; one by fall of roof in the mine of the Des Moines Coal & Mining Company, and the other by being struck with flying coal from a shot in the mine of the Altoona Coal Company, at Altoona, he not getting out of danger when the shot was being fired.

In comparing the accidents with the output of coal in this district for the past two years, we find there was 1,692,412 tons of coal mined, and one life lost for each 169,241 tons mined. One non-fatal accident occurred for each 188,045 tons, one casualty including fatal and non-fatal for each 89,074 tons. In comparison with other states we find the average in Illinois for the years 1883, 1884 and 1885 to be one life for each 138,821 tons, but this includes the Braidwood disaster of 1883. Ohio for 1886 shows 196,167 tons mined for each fatal accident. Pennsylvania in the anthracite region averages one life for each 102,607 tons.

## NAME OF MINES AND LOCATION.

## BOONE COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Eagle Coal Company	No. 1	Shaft	Angus.
Climax Coal Company	No. 2	Shaft	Angus.
Climax Coal Company	No. 3	Shaft	Angus.
Dalby Bros	No. 1	Shaft	Angus.
Panic Coal Company	No. 1	Shaft	Angus.
Clark, Nelson & Flockhart	No. 1	Shaft	Boonsboro.
Heeps & Marshall	No. 1	Shaft	Boonsboro.
Millford Coal Company	No. 1	Shaft	Boonsboro.
Sandstrom & Farsland	No. 1	Shaft	Boonsboro.
W. D. Johnson & Company	No. 1	Shaft	Boonsboro.
McBirnie & Waddell	No. 1	Shaft	Boonsboro.
Rogers & Crow	No. 1	Slope	Boonsboro.
Samuel McBirnie	No. 1	Shaft	Boonsboro.
Chas. A. Sherman	No. 1	Shaft	Boonsboro.
James Bulkley	No. 1	Shaft	Boonsboro.
William McBirnie	No. 1	Shaft	Boonsboro.
Clyde Coal Company	No. 1	Shaft	Moingona.
Northwestern Coal Company	No. 3	Shaft	Moingona.
Hutchinson Bros	No. 1	Slope	Zenorsville.
John Clemens	No. 1	Slope	Zenorsville.
John Clemens	No. 1	Shaft	Zenorsville.
Joseph York	No. 1	Slope	Zenorsville.
Joseph York	No. 1	Shaft	Zenorsville.
James Wilson	No. 1	Shaft	Pilot Mound.
William Zunkle	No. 1	Shaft	Pilot Mound.
Madrid Coal & Mining Company	No. 1	Shaft	Madrid.

## NAME OF MINES AND LOCATION—CONTINUED.

## WEBSTER COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST OFFICE.
Fort Dodge Coal Co	No. 4	Slope	Fort Dodge.
Fort Dodge Coal Co	No. 16	Slope	Fort Dodge.
Spoo Bros. & O'Neil	No. 1	Shaft	Fort Dodge.
Collins & Myers	No. 1	Shaft	Fort Dodge.
Thos. Bain	No. 1	Shaft	Fort Dodge.
Collins Bros.	No. 1	Slope	Coalville.
Thos. Collins	No. 1	Drift	Coalville.
Keefe & Smith	No. 1	Drift	Coalville.
L. Dupleas	No. 1	Shaft	Coalville.
Alf. Davis	No. 1	Shaft	Coalville.
Craig Coal Co.	No. 1	Drift	Kalo.
Craig Coal Co.	No. 2	Drift	Kalo.
Irvine, Anderson & Farline	No. 1	Slope	Kalo.
Carlson Coal Co.	No. 1	Drift	Kalo.
James Porter	No. 1	Drift	Kalo.
James Brown	No. 1	Drift	Kalo.
James Brown	No. 2	Drift	Kalo.
Walter Irvine	No. 1	Drift	Kalo.
Peterson, Anderson & Tappan	No. 1	Drift	Kalo.
Owen McGovern	No. 1	Drift	Kalo.
Bronck & Harbach	No. 1	Drift	Kalo.
Mills & Everett	No. 1	Drift	Kalo.
Baker Webster	No. 1	Drift	Kalo.
Erick Johnson	No. 1	Drift	Kalo.
D. C. Hart	No. 1	Drift	Kalo.
Crooked Creek Coal Co.	No. 1	Drift	Lehigh.
Crooked Creek Coal Co.	No. 2	Slope	Lehigh.
George Corey	No. 1	Drift	Lehigh.
Parks & Cox	No. 1	Drift	Lehigh.
S. W. Corey	No. 1	Drift	Lehigh.
C. S. & F. Corey	No. 1	Drift	Lehigh.
Higby Bros	No. 1	Drift	Lehigh.
W. C. Beem	No. 1	Drift	Lehigh.
W. C. Beem	No. 2	Drift	Lehigh.
James Harper	No. 1	Drift	Lehigh.
Heman Williams	No. 1	Drift	Lehigh.
John Martin	No. 1	Drift	Kalo.
All Stine	No. 1	Drift	Kalo.

## NAME OF MINES AND LOCATION—CONTINUED.

## GUTHRIE COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Marchant & Winters	No. 1 Shaft	Fanslers.	Fanslers.
J. Marshmans	No. 1 Shaft	Fanslers.	Fanslers.
Olie Oleson	No. 1 Shaft	Fanslers.	Fanslers.
J. W. David	No. 1 Shaft	Fanslers.	Fanslers.
P. Renslow	No. 1 Shaft	Fanslers.	Fanslers.
James Thomas	No. 1 Shaft	Fanslers.	Fanslers.
D. D. Rees	No. 1 Shaft	Panora.	Panora.
Burgess Bros.	No. 1 Shaft	Panora.	Panora.
John Courtney	No. 1 Shaft	Panora.	Panora.
George Cooper	No. 1 Slope	Stuart.	Stuart.
W. L. Fleming	No. 1 Shaft	Stuart.	Stuart.
Murphy & McKeag	No. 1 Shaft	Stuart.	Stuart.
Wales & Son	No. 1 Drift	Bayard.	Bayard.
Samuel Sisk	No. 1 Drift	Bayard.	Bayard.
Allan McPherson	No. 1 Shaft	Bayard.	Bayard.
Morgan & Love	No. 1 Shaft	Bayard.	Bayard.
Daniel McNally	No. 1 Drift	Stuart.	Stuart.
Andrew Cove	No. 1 Drift	Stuart.	Stuart.
James Burnham	No. 1 Drift	Dale City.	Dale City.
Isaac Ford	No. 1 Drift	Dale City.	Dale City.
Alexander Lamb	No. 1 Drift	Stuart.	Stuart.

## POLK COUNTY.

Garver Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Atlas Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Giant Coal C.	No. 2 Shaft	Des Moines.	Des Moines.
Eureka Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Des Moines Coal and Mining Co.	No. 1 Shaft	Des Moines.	Des Moines.
Pioneer Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Coon Valley Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Polk County Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Walnut Creek Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Union Coal and Mining Co.	No. 1 Shaft	Des Moines.	Des Moines.
Van Ginkle Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Pleasant Hill Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Runnells Coal Co.	No. 1 Slope	Des Moines.	Des Moines.
Camp Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Wabash Coal Co.	No. 2 Shaft	Des Moines.	Des Moines.
Carlson & Lund	No. 1 Shaft	Des Moines.	Des Moines.
Co-operative Coal Co.	No. 1 Shaft	Des Moines.	Des Moines.
Coon Valley Coal Co.	No. 2 Shaft	Des Moines.	Des Moines.
Polk City Coal Co.	No. 1 Shaft	Polk City.	Polk City.

## NAME OF MINES AND LOCATION—CONTINUED.

## DALLAS COUNTY.

NAME OF COMPANY OR FIRM.	Name of mine.	Kind of mine.	POST-OFFICE.
Dawson Coal Co.	No. 1 Shaft	Perry.	Perry.
George Sarginson	No. 1 Drift	Perry.	Perry.
Chicago & Van Meter Coal Co.	No. 1 Shaft	Van Meter.	Van Meter.
Thos Botts & Son	No. 1 Slope	Redfield.	Redfield.
Oliver Caves	No. 1 Slope	Redfield.	Redfield.
Lewis Hubbard	No. 1 Shaft	Redfield.	Redfield.
Eli Cotton	No. 1 Slope	Linden.	Linden.
Joseph Staples	No. 1 Slope	Linden.	Linden.
J. R. Strange & Son	No. 1 Shaft	Woodward.	Woodward.

## STORY COUNTY.

Collins Fuel Co.	No. 1 Shaft	Collins.	Collins.
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## GREENE COUNTY.

Armstrong Coal Co.	No. 1 Shaft	Surry.	Surry.
Keystone Coal Co.	No. 1 Shaft	Angus.	Angus.
Keystone Coal Co.	No. 2 Shaft	Angus.	Angus.
Keystone Coal Co.	No. 3 Shaft	Angus.	Angus.
Standard Coal Co.	No. 1 Shaft	Angus.	Angus.
Moingona Coal Co.	No. 1 Shaft	Angus.	Angus.
Dale, Goodwin & Co.	No. 1 Shaft	Grand Junct'n.	Grand Junct'n.
Buckeye Coal Co.	No. 1 Shaft	Surry.	Surry.
Buckeye Coal Co.	No. 2 Shaft	Surry.	Surry.
Ohio Coal Co.	No. 1 Shaft	Surry.	Surry.
Vulcan Coal Co.	No. 1 Shaft	Rippey.	Rippey.
Robert Dichborne	No. 1 Shaft	Angus.	Angus.
Isaac Busey	No. 1 Shaft	Surry.	Surry.

## HAMILTON COUNTY.

David Wade	No. 1 Drift	Webster City.	Webster City.
S. C. Lester	No. 1 Drift	Webster City.	Webster City.
Wm. Silvers	No. 1 Drift	Webster City.	Webster City.
John Walker	No. 1 Drift	Webster City.	Webster City.
Thos. House	No. 1 Drift	Webster City.	Webster City.
Isaac Morrow	No. 1 Drift	Webster City.	Webster City.
Benjamin Burton	No. 1 Drift	Webster City.	Webster City.
Robert Martin	No. 1 Drift	Webster City.	Webster City.
Nathan Clafin	No. 1 Drift	Webster City.	Webster City.
Arnold Clafin	No. 1 Drift	Webster City.	Webster City.
Joseph Cregg	No. 1 Drift	Webster City.	Webster City.
Mike Ward	No. 1 Drift	Webster City.	Webster City.
Richard Lane	No. 1 Drift	Webster City.	Webster City.
Jerry Robbins	No. 1 Drift	Webster City.	Webster City.
Al. Cregg	No. 1 Drift	Webster City.	Webster City.
Crouse Bros	No. 1 Drift	Kamrar.	Kamrar.
James Shea	No. 1 Drift	Kamrar.	Kamrar.
Joseph Bell	No. 1 Drift	Homer.	Homer.



IMPROVEMENTS MADE IN THE MINES OF DISTRICT NO. 3  
FROM JUNE 1, 1886, TO JUNE 30, 1887.

BOONE COUNTY.

NAMES OF MINES.	Air shafts.	Second opening.	Stairways.	Covers on cages.	Safety catches.	Safety gates.	Furnaces.	Fans.
Clark, Nelson & Flockhart.....	1			1				
Millford Coal Co.....		1		1	1	1		1
A. Heeps & Co.....		1						
W. D. Johnson & Co.....				1				1
McBirnle & Waddell.....		1			1			
Clyde Coal Co.....				1	1	1		
Samuel McBirnle.....				1		1		
Dalby Bros.....		1	1	1	1	1		1
Joseph York.....		1						
Chas. A. Sherman.....		1		1	1	1		

GREENE COUNTY.

Armstrong Coal Co.....				1	1	1		
Dale, Goodwin & Co.....		1		1	1	1		
Buckeye Coal Co.....				1	1	1		
Keystone Coal Co.....	1	1	1	1	1	1		1
Vulcan Coal Co.....	1	1	1	1	1	1		1

GUTHRIE COUNTY.

Merchant & Winters.....		1		1	1	1		
P. Renslow.....		1		1	1	1		
J. Marshman.....				1	1	1		
Olie Oleson.....		1		1	1	1		
J. W. David.....		1		1	1	1		
D. D. Rees.....	1	1		1	1	1		

POLK COUNTY.

Pioneer Coal Co.....	1							
Union Coal Co.....		1	1					
Van Ginkle Coal Co.....	1		1	1				
Wabash Coal Co.....	1	1	1	1	1	1		1
Camp Coal Co.....	1	1	1	1	1	1		
Polk City Coal Co.....				1	1	1		
Coon Valley No 2.....	1			1	1	1		

IMPROVEMENTS—CONTINUED.

WEBSTER COUNTY.

NAMES OF MINES.	Air shafts.	Second opening.	Stairways.	Covers on cages.	Safety catches.	Safety gates.	Furnaces.	Fans.
Collins Bros.....	1	1						
Spoo Bros. & O'Neil.....				1	1	1		
Collins & Myers.....				1	1	1		
Crooked Creek Coal Co. No. 2.....	1	1						1
W. C. Beem No. 2.....	1	1		1				1
C. S. & F. Corey.....				1				
Keefe & Smith.....		1						
Geo. Corey.....		1						
Silas W. Corey.....		1						
Parks & Cox.....	1							1

STORY COUNTY.

Collins Fuel Co.....				1	1	1		
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NAMES AND DESCRIPTION OF MINES IN BOONE COUNTY  
—DISTRICT No. 3.

EAGLE MINE.

This is a shaft mine situated at Angus; depth 100 feet; is owned and operated by the C. M. & S. P. R. R. Company; Joseph Ramsey superintendent; number of men employed, seventy-five; thickness of vein, three to four feet. All the coal produced is used by the company on their own railroads. The mine is nearly wrought out and will soon be abandoned.

CLARK, NELSON & FLOCKHART

are operating a shaft mine located near Boonsboro; depth, eighty feet; number of men employed, twenty-two; thickness of vein, two and one-half feet and is what is called the Black Jack vein; is worked on the long wall system. About half the output sold to the local trade, the balance hauled in wagons and loaded on the cars of the C. & N. W. Railroad.

HEEPS & MARSHALL

are operating a shaft mine two miles west of Boonsboro, on the Des Moines river; depth, forty feet; number of men employed, thirty-one; ventilated by furnace; thickness of vein, four feet. Coal is ferried over the river in wagons and loaded on the cars; very little work done in the summer time.

MILLFORD COAL COMPANY.

Birmingham & Keaton owners and operators, mine situated two miles west of Boonsboro; depth of shaft, 100 feet; number of men employed, fifty-nine; ventilated by fan. They have one of the finest veins of coal in the county at this mine with a good roof over it;

they have to haul the coal in wagons over a mile and when the water is high in the Des Moines river they have to take it over in a ferry boat, but notwithstanding all this they handle considerable coal in the winter season.

SHEPPARD MINE.

Operated by Sandstrom & Farsland; shaft depth, ninety feet; number of men employed, twelve; thickness of vein, two and one-half feet; is located one and one-half miles west of Boonsboro; is almost wrought out and will soon be abandoned.

W. D. JOHNSON & CO.

This is a shaft mine, one mile west of Boonsboro, on a branch of the C. & N. W. Railroad; depth, 242 feet, is the deepest mine in Boone county; number of men employed, eighty-six; ventilated by fan; thickness of vein, four feet; this mine has been in operation for a number of years and have worked over a large territory. they are troubled considerably with fire in the old works, as the fine coal and fireclay mixing together cause it to heat and sometimes take fire. They are working two veins, the Boone lower vein and the upper or Black Jack vein. Mr. E. D. Roberts has charge of the underground work.

MC BIRNIE & WADDELL.

Are the owners and operators of a shaft mine, located near Boonsboro; depth eighty feet; number of men employed thirty; thickness of vein  $2\frac{1}{2}$  feet; is what is called the Blackjack vein; about one-half the output sold to the local trade; the balance shipped to points west on Chicago & North Western Railway.

CLYDE COAL COMPANY.

Are located one mile from Moingona shaft mine; depth eighty feet; number of men employed sixty-five; are working the Blackjack vein; this mine is fitted up in splendid shape on top; have not been in operation a great while; the water broke in at one time and gave them considerable trouble to overcome it.

O. M. CARPENTER,  
Superintendent.

## ROGERS &amp; CROW.

Are operating a slope mine one mile west of Boonsboro; number of men employed forty-three; is worked on the long wall system; thickness of vein two to three feet; they bring the coal up an incline about three hundred yards long which runs down to the bottom of the slope, there the coal is weighed in the small cars and then dumped into a large car in which it is taken up the incline and there dumped into the railroad cars.

WILLIAM CROW,  
*Superintendent.*

## HUTCHISON BROS.

Are the owners and operators of a slope mine at Zenorsville; number of men employed twenty-six; ventilated by a furnace; thickness of vein four feet; this mine has been in operation for a number of years; coal of a very good quality; operated only in the winter season for the local trade of which they have a very large one; the mine is nearly exhausted and will soon be abandoned.

JOHN CLEMENS.

Is operating two mines, located at Zenorsville; one a shaft forty-four feet in depth; the other a slope; number of mine employed in both, twenty-seven; coal all sold to the local trade, and mines nearly finished; have been in operation fifteen years.

JOSEPH YORK.

Is operating a slope mine located at Zenorsville; number of men employed twelve; ventilated by small furnace; coal all sold to the local trade; he also has sunk a shaft and intends to put in steam hoisting machinery, and be ready to take coal out of it the coming winter; thickness of vein four feet.

## CLIMAX COAL COMPANY.

This company have two shaft mines at Angus, but for some reason they have been standing idle since the spring of 1886.

## NORTHWESTERN COAL COMPANY.

The mine of this company is located near Moingona on the Chicago & North Western Railroad; is a shaft mine; depth seventy feet;

number of men employed ninety-three; ventilated by fan. W. D. Morgan, Superintendent; coal vein is rather thin, from two to three feet, and worked on the long wall system.

SAMUEL MCBIRNIE.

This is a shaft mine located near Boonsboro; depth 110 feet; number of men employed, twenty-six; ventilated by furnace; thickness of vein, two and a half feet, and is what is known as the black jack vein. About one half the output sold to the local trade; the balance hauled in wagons to the railroad. Coal is worked long-wall.

JAMES BULKLEY.

Is operating a small shaft mine, located two miles up the river above Boonsboro is operated for the local trade entirely. Number of men employed, five.

WILLIAM MCBIRNIE.

Operates a shaft mine southwest of Boonsboro about two miles. All coal sold to the local trade.

CHARLES A. SHEERMAN.

Is operating a shaft mine; depth seventy feet; located near Boonsboro; number of men employed, twenty-one; operated by horse power. They depend on natural ventilation, which does not give very good satisfaction. Coal vein two to three feet and worked long wall; the shaft is sunk in a ravine, and the coal is hauled up an incline 560 feet long, and there loaded on wagons and hauled to the railroad.

DALBY BROS.

This mine is located at Angus; depth of shaft 112 feet; number of men employed twenty-five; ventilated by a fan; is operated almost exclusively for the local trade, of which they have a very large one in the winter season, which will increase in the future as the other mines in that vicinity are nearly finished; thickness of vein four to five feet, and of a very good quality; with a good roof over it.

JAMES WILSON.

Is operating a shaft mine three miles from Pilot Mound, near the Des Moines river; number of men employed, fifteen; thickness of vein four feet. Coal all sold to the local trade and operated only in the winter season.

WILLIAM ZUNKLE.

Is the owner of a shaft mine about three miles from Pilot Mound; Number of men employed, ten; operated for the local trade only.

PANIC COAL COMPANY.

This company owns a shaft mine in Angus which has been standing idle for the past year or more.

#### DALLAS COUNTY.

VAN METER MINE.

This is a shaft mine, depth two hundred and seventy-five feet, and is situated at Van Meter, on the Chicago, Rock Island & Pacific Railroad; is owned and operated by the Chicago & Van Meter Coal and Mining Company. It has been in operation for several years, and consequently they have worked over considerable territory. It is worked on the long wall system; thickness of vein, two to three feet; is ventilated by a fan; number of men employed, fifty-six. A part of the out-put is sold to the local trade, some used by the railroad company for coaling engines at that place, and the balance is shipped to points west.

E. T. HILL,  
*Superintendent.*

LEWIS HUBBARD

is operating a small shaft mine; depth twenty feet; located near Redfield; number of men employed, six; thickness of vein, two feet; coal all sold to the local trade.

DAWSON COAL AND MINING COMPANY

is operating a shaft mine, situated at Dawson, five miles west of Perry, on the Chicago, Milwaukee & St. Paul Railroad; number of men employed, sixteen; depth of shaft, seventy-six feet. The mine

at present being operated, is only a small shaft, coal hoisted by horse power, and is located about four or five hundred yards from the railroad. The company is engaged in the work of sinking a new and larger shaft on the railroad, which will be fitted up for a larger output of coal. Then the shaft now in use will be used as an air and escape shaft. This is a new field of coal, recently discovered, and promises to be very extensive; thickness of vein, four feet, and of a very good quality, covered with a splendid roof. The depth of the new shaft will be one hundred and sixty feet.

JOSEPH RAMSEY,  
*Superintendent.*

GEORGE SARGINSON

is operating a small drift mine near Dawson. The opening is made right on the bank of the north branch of the 'Coon river, and can only be operated when the water is low or the river frozen over. His intention is to abandon this opening, and sink a shaft farther from the river; number of men employed, six; thickness of vein, three feet; coal all sold to the local trade.

KAIN BROS.

are operating a slope mine, located near Redfield; number of men employed, two; thickness of vein, twenty-three inches; operated only in the winter season for local trade.

OLIVER CAVES.

This mine is situated five miles southeast of Redfield, and is operated for the local trade only; number of men employed, five; thickness of vein, two feet.

ELI COTTON

Is operating a small slope mine two miles east of Linden; number of men employed, four; thickness of vein one and one half to two feet; coal sold to local trade only.

JOSEPH STAPES

Is the owner and operator of a drift opening two miles east of Linden, working three miners; vein one and one half feet; local trade.

## THOS. BOTTS

Is operating a slope mine located one mile south of Redfield; number of men employed, nine; coal all sold to the local trade; thickness of vein, three feet.

## GREENE COUNTY.

## ARMSTRONG COAL COMPANY.

This mine is situated two miles west of Angus; is a shaft; depth, 50 feet; number of men employed, one hundred; ventilated by a fan; William Blair, superintendent; on the 28th day of December, 1886, the boiler exploded at this mine, killing three men and completely destroying the engine house which has not been rebuilt and the mine is still idle.

## KEYSTONE NO. 1

Is a shaft mine one mile west of Angus; depth, sixty-one feet; number of men employed, thirty; ventilated by furnace; thickness of vein, four feet; considerable of the output sold to local trade, the balance hauled in wagons to the cars. This mine was opened in 1878, and is now wrought out and abandoned, the last coal being taken out in February, 1887.

## KEYSTONE NO. 2

Is located two miles west of Angus; is a shaft mine; depth 90 feet; coal loaded on a branch of the Des Moines & Fort Dodge Railroad; thickness of vein, four to five feet. In the spring of 1886 the creek broke into this mine drowning them out, and although they pumped the water out it had damaged the mine to such an extent that very little coal was taken out afterward, and it was soon abandoned and all the machinery removed.

## KEYSTONE NO. 3.

This is a new shaft mine recently opened; depth, 100 feet; number of men employed, seventy; thickness of coal vein, four to five feet; John McKay, superintendent; they are working two veins at this mine; the first or upper vein and the second or middle vein of the coal measure, working the upper one by a drift or slope driven from the lower one up, there being but a few feet between them on one

side of the shaft; the coal in both is of a splendid quality, with a hard rock roof over the lower one. The company are sparing no expense in fitting up both inside and out for a large output of coal. They have three of the Legg mining machines in operation, also a drilling machine supplied with power by a 100 horse power air compressor placed in the engine house; mine is ventilated by fan.

## STANDARD COAL COMPANY.

This is a shaft mine; depth one hundred feet; located near Angus; number of men employed one hundred and forty-one; ventilated by a fan; John McKay, superintendent. This mine has been in operation over five years, with a large annual out-put of coal, but is now wrought out and abandoned, the last coal being taken out in May, 1887, and the machinery has all been taken away.

## MOINGONA COAL COMPANY.

The mine of this company is located at Angus, but has been idle for the past year.

## DALE, GOODWIN &amp; COMPANY.

Is a shaft mine, located at Grand Junction; depth one hundred and forty feet; number of men employed seventeen; ventilated by fan; Robert Goodwin, superintendent. The company are running a brick and tile works in connection with the mine, using the principal part of the coal taken out for burning the same. The clay for making the brick and tile is taken out from underneath the coal.

## BUCKEYE COAL COMPANY.

This company own two mines, two miles northwest of Angus; they are about three hundred yards apart; No. 1 is operated by horse power, No. 2 by steam power. Levi Hamiltor, of Oskaloosa, is the owner, but they are at present operated by David Crawford and John Hall. Number of men employed thirty-six. Considerable of the out-put is sold to the local trade, the balance loaded on the Des Moines & Fort Dodge Railroad and shipped to points north. Thickness of vein four to five feet, and of very good quality.

## VULCAN COAL COMPANY.

This is a shaft mine, located at Rippey; depth one hundred and twenty feet; owned and operated by the Vulcan Coal Company; Isaac Simpson, superintendent; number of men employed forty-four; ventilated by fan; thickness of vein three to four feet. This mine has not been in operation a great while. Considerable of the output sold to the local trade, the balance shipped on the Des Moines & Fort Dodge Railroad.

## OHIO SHAFT.

William Simonds owner and operator. Is a shaft mine; depth thirty-five feet; located two miles west of Angus, on Snake Creek; number of men employed thirteen; thickness of vein four feet. Coal mostly sold to the local trade. Operated only in the winter season.

## ROBERT DICHBORNE

is operating a small shaft mine on the Coon River, five miles west of Angus. Coal all sold to local trade; number of men employed five.

## BUSEY MINE.

This mine is located five miles west of Angus; is a shaft mine; was opened in 1875, and operated by Isaac Busey for the local trade only; was not operated last winter, but is now leased by Isaac and Thomas Jones, who are sinking a new shaft, and will be ready for work the coming winter.

## GUTHRIE COUNTY.

## MARCHANT &amp; WINTERS

are the owners and operators of a shaft mine, depth one hundred and twenty-six feet; located on the Middle 'Coon river, near Fansler's mill; number of men employed, ten; vein two feet thick and of a very good quality, and worked on the long wall system, for which owing to the nature of the roof and the thickness of the vein it is very well adapted. The roof settles in a body and does not make a break with every fall of coal. The output is all sold to the local trade, which they are well prepared to supply, having large sheds built which they fill early in the fall, thereby giving the miners steady employment from September 1st to April 1st.

## P. RENSLOW

is operating a shaft mine, depth eighty-one feet; located near Fansler's mill; number of men employed, ten; thickness of vein two feet. Coal all sold to the local trade; worked on the long wall system.

## J. MARSHMAN

is operating a small shaft mine, depth eighty-six feet; located near Fansler's mill; number of men employed, six; coal hoisted by horse power; thickness of vein two feet, and worked on the long wall system. Coal all sold to local trade.

## OLE OLESON

is operating a shaft mine, depth sixty-three feet; located near Fansler's mill; number of men employed, seven; coal hoisted by horse power and all sold to the local trade.

## J. W. DAVID.

This mine is located near Fansler's mill; depth of shaft eighty feet; thickness of vein two feet; number of men employed, six.

## DANIEL M'NALLY

operates a small mine for the local trade only, near Stuart.

## ANDREW COVE

operates a small mine on the South 'Coon river, north of Stuart, for local trade only.

## JAMES BURNHAM.

This mine is located near Dale City and is only operated for the local trade. Very little coal taken out.

## ISAAC FORD

operates a small mine for the local trade only, near Dale City.

## RICHARD WALES &amp; SON

are operating a small drift mine five miles southwest of Bayard; number of men employed, eight; thickness of vein eighteen inches. Coal all sold to the local trade.

## SAMUEL SISK

operates a small drift mine five miles west of Bayard, for the local trade.

## ALLEN M'PHERSON.

This is a shaft mine located five miles southwest of Bayard, but is at the present standing idle.

## MORGAN &amp; LOVE

are operating a small shaft mine five miles southwest of Bayard. Number of men employed, six; coal all sold to the local trade; thickness of vein, eighteen inches.

## D. D. REES

is the owner and operator of a shaft mine, located at Panora; depth of shaft, 100 feet; thickness of vein, eighteen inches; number of men employed, fourteen; coal hoisted by horse power and worked long wall. Although this vein is very thin they take out considerable coal in the winter season as the demand is good and it can be produced cheaper than it can be shipped in from other places.

## BURGESS BROS.

are operating a shaft mine, three and one-half miles east of Panora. Depth, thirty-four feet; number men employed, ten; only operated in the winter season for the local trade.

## JOHN COURTNEY

operates a small shaft in the winter season for the local trade near Panora. Coal vein, sixteen inches; number of men employed, three.

## GEORGE COOPER

operates a small slope mine two and one-half miles north of Stuart; number of men employed, six; only worked in the winter season and very little coal taken out; thickness of vein, fourteen inches.

## W. L. FLEMING.

This is a shaft mine, located three and one-half miles north of Stuart; coal hoisted by horse power and all sold to the local trade;

thickness of vein, twenty-two inches; number of men employed, three.

## MURPHY &amp; M'KEAG

are operating a small shaft mine five miles north of Stuart. Number of men employed, four; coal all sold to the local trade.

## ALEXANDER LAMB

operates a small mine for the local trade north of Stuart, on South Coon river.

## HAMILTON COUNTY.

There were in this county, according to the former Inspector's report, eighteen mines, all located along the Boone river, but they are all very small; most of them will make a small opening in the hillside, work it one winter and abandon it in the spring; again making a new one when they want more coal. Under these circumstances I did not deem it advisable to spend time and money in making a personal inspection of them, as they were all drift openings and employed so few men that they did not come under the control of the mining law.

## POLK COUNTY.

## GARVER COAL COMPANY.

This company is operating a shaft mine situated in East Des Moines; depth of shaft 118 feet; number of men employed, ninety-five; ventilated by a fan; thickness of vein, four to six feet. Edward Turby, Superintendent; the output from this mine during the past winter was the largest since the mine was opened, the principal part of which is sold to the railroad companies. There is a heavy vein of water overlying the coal in some parts of this coal field, and the company are expecting to get it at any time and are making preparations to be able to handle it.

## ATLAS COAL &amp; MINING COMPANY.

Located in East Des Moines; depth of shaft 100 feet; number of men employed, fifty two; ventilated by a fan; J. J. Hollister, superintendent. This mine was formerly known as the Standard, but was reorganized under the name of the Atlas. The shaft was sunk on a

hill which made it expensive to get the coal to the bottom of the shaft; they were working two veins, the upper by means of a slope from the lower one up, but the territory in the upper vein being small, and the coal going east in the lower one not proving good the mine is now abandoned.

GIANT COAL COMPANY.

The shaft of this company is 145 feet in depth; located in East Des Moines; were employing last winter thirty-eight miners, but is now wrought out and abandoned.

DES MOINES COAL & MINING COMPANY.

This company is operating a shaft mine; depth seventy-five feet; located in Sevastopol; number of men employed, thirty. They are working the second vein at this mine which is of very good quality. The out-put is mostly sold to the city trade.

EUREKA COAL COMPANY.

Are operating a shaft mine; depth 160 feet; located in Sevastopol; number of men employed ninety-two; ventilated by fan; coal is shipped on the Chicago, Rock Island & Pacific Railroad; this mine was purchased by the present company, July 24, 1886; they at once proceeded to make extensive repairs both above and below, and are now prepared to take out large quantities of coal.

C. J. CARLSON,  
*Superintendent.*

CARLSON & LUND COAL COMPANY.

This is a shaft mine located a short distance south of the city of Des Moines; dept of shaft sixty five feet; ventilated by furnace; number of men employed fifteen; the coal is hoisted with a gin; they are working the first vein, which is badly troubled with clay veins and very expensive to mine; it is the intention of the company to sink to the lower vein in the near future.

WABASH COAL & MINING COMPANY.

This mine of this company is situated at Hastie on the Wabash Railroad, six miles east of Des Moines; is a shaft mine; depth one hundred feet; number of men employed thirty-six; ventilated by fan;

this mine is now owned by J. M. Christy of Des Moines; the former owners were operating a shaft about three hundred yards west of one now in operation but getting out under the bottom toward the river, a heavy vein of water broke in and drowned them out; they put in heavy pumps and spent considerable money in trying to overcome it, but were at last forced to abandon it and the present shaft was put down in 1886; thickness of vein four feet.

A. B. CALDWELL,  
*Superintendent.*

CO-OPERATIVE COAL COMPANY.

This is a shaft mine located a short distance south of the city of Des Moines; depth 124 feet; number of men employed ten; coal hoisted by horse power; they are at present working the first vein, but intend to sink to a lower vein soon.

PIONEER COAL COMPANY.

This company are operating a shaft mine located in south Des Moines; number of men employed fifty; ventilated by fan; depth of shaft 150 feet; this mine has been in operation for about fifteen years and have worked over a large territory; most of the out-put is sold to the city trade; they are working in better coal at present than they have had for several years, but they have a long way to haul the coal, which makes it expensive at this time; I inspected this mine December 23, 1886; I think I can truthfully say it was the best ventilated mine in my district; break throughs were made at short intervals, between the rooms. And the mine boss John Gibson is very careful and will allow no rubbish to be thrown in them to impede the free circulation of the air, and he has an anemometer of his own, which he uses frequently so that he can tell just the volume of air he has in circulation at any time.

COON VALLEY NO. 2

is a shaft mine located at Avon, five miles southeast of Des Moines, on the Chicago, Rock Island & Pacific Railroad; number of men employed, seven; thickness of vein, two to three feet; depth of shaft, forty-five feet. This mine was opened several years ago, but very little coal taken out. The present owners have put in steam hoisting machinery, and are expecting to develop it largely in the near future.



The coal is not proving up very good near the shaft, but they have drilled quite a distance away, and claim that proves all right there.

THOS. BECK,  
*Superintendent.*

## COON VALLEY NO. 1

is located in South Des Moines; depth of shaft, one hundred and eighteen feet; number of men employed, one hundred and four; ventilated by fan. The coal is loaded on the narrow gauge railroad, and any coal they may want to ship to points on other roads has to be transferred to the standard gauge cars by hand, which makes it very expensive. A large part of the out-put is sold to the local trade.

## ALTOONA COAL AND MINING CO.

This company is operating a shaft mine; depth, two hundred and eleven feet; located on the Chicago, Rock Island & Pacific Railroad, eleven miles east of the city of Des Moines; number of men employed, sixty-three; W. H. Baker, superintendent; ventilated by fan. This mine, in the winter of 1885, had a heavy squeeze on the main entry pillars, and after trying for a long time, at a heavy expense, to keep it open, they had to abandon it and work around it in the solid coal, and leave larger pillars. The coal is of a rather hard nature, and will stand shipping very well; thickness of vein three to four feet.

## POLK COUNTY COAL CO.

is operating a shaft mine, located in Sevastopol; depth one hundred and five feet; number of men employed, sixty-five; ventilated by a furnace; thickness of vein, four to five feet; William Robinson, mine boss. This mine has been in operation for about fifteen years, and during most of that time have been working the second vein, but that is now exhausted, and they are now working the third or lower vein, which varies considerably in thickness. A large part of the out-put is sold to the city trade in the winter season.

## WALNUT CREEK COAL CO.

The mine of this company is situated four miles west of the city of Des Moines; depth of shaft, one hundred and thirty-seven feet; number of men employed, sixty-three; ventilated by fan; thickness of vein, two to four feet. This mine is so located that they can load

coal on three railroads, namely: the Des Moines & Ft. Dodge, the Chicago, Rock Island & Pacific, and the Wabash narrow gauge. On the north side of the mine, in the thin coal, they work the long wall; on the south side it is worked room and pillar.

## UNION COAL AND MINING CO.

This company is operating a shaft mine, situated in Sevastopol; depth, one hundred and fifty feet; number of men employed thirty; ventilated by fan. They are working the third or lower vein, having exhausted the second vein. They are working with single entry, which does not give good satisfaction, for the reason that it is difficult to air the mine properly with that system. A considerable part of the out put is sold to the city trade.

## VAN GINKLE COAL CO.

are operating a shaft mine, depth seventy five feet; located a short distance south of Sevastopol; number of men employed, fifty-five; thickness of vein four feet. They are working the second vein, which is of a very good quality with a good rock roof. Some of the rooms are driven up fifty yards, thirty feet wide without a stick of timber. A large part of the output is sold to the city trade.

## PLEASANT HILL COAL CO.

This is a shaft mine; depth sixty-eight feet, and is located a short distance south of Sevastopol; number of men employed, fifteen; coal all sold to the local trade. This mine is nearly wrought out, and will soon be abandoned; thickness of vein, four feet.

## RUNNELL'S COAL CO.

The mine of this company is located at Runnells, sixteen miles southeast of Des Moines, on the Wabash railroad. Is opened by a slope; number of men employed, thirty-five; thickness of vein four feet; ventilated by a furnace.

## CAMP COAL CO.

are operating a shaft mine, located at Runnells, sixteen miles southeast of the city of Des Moines, on the Wabash railroad; number of men employed, twenty-five; depth of shaft forty feet; thickness of vein four feet; coal hoisted by horse power.

## POLK CITY COAL CO.

This mine is situated at Polk City; depth of shaft two hundred and thirty-eight feet; number of men employed, ten; thickness of vein four feet. This shaft is very small, being put down more for a prospect shaft than for the purpose of hoisting much coal, it being the intention of the company to sink a larger one. They expect to sell most of the output to the local trade.

## STOREY COUNTY.

## COLLINS FUEL CO.

This company are operating a shaft mine, located three miles southeast of Collins; depth of shaft one hundred and fifty feet; number of men employed, twenty; thickness of vein three feet. This is a new shaft opened in the summer of 1885. Being situated a long distance from the railroad the output is all sold to the local trade. The roof over the coal is of rather a soft nature, and requires a great deal of timber on the entry.

## WEBSTER COUNTY.

## FT. DODGE COAL CO. NO. 4 AND 16.

This company are operating two mines, located six miles southeast of Ft. Dodge, at Coalville. Number 4 is a slope mine and has been in operation several years, but is nearly wrought out and will soon be abandoned; number of men employed during the past winter, one hundred and twenty-five; ventilated by a fan. Number 16 is also a slope mine, about one mile south of No. 4. Has but recently been opened, but is not proving up very good, as the coal is badly mixed with stone; number of men employed, fifteen. This company have been operating here for the last fifteen years, and during that time have opened and wrought out several mines, and have taken out large quantities of coal, which has been shipped principally on the Illinois Central west. F. A. White, superintendent.

## COLLINS BROS.

are the owners and operators of a slope mine, located near Coalville. Number of men employed, fifty-four; natural ventilation; thickness of vein, six to eight feet. This mine up until the fall of 1886 was hauling coal in wagons to the railroad, but at that time the Mason

City & Fort Dodge Road put a track to the mine, when they put in steam power and were enabled to increase their out-put. Their coal is of a soft nature and shipped both on the Illinois Central west and on the Mason City & Fort Dodge north.

## CRAIG COAL &amp; MINING COMPANY

are operating two mines at Kalo, on the M. & St. L. Railroad. Number of men employed at both, ninety-two; they are drift openings; No. 1 is worked on the long wall system, No. 2, room and pillar; thickness of vein, four feet and is ventilated by furnace.

JERRY DAWSON,  
*Superintendent.*

## CROOKED CREEK COAL COMPANY NO. 1

is a drift opening located at Lehigh, has been in operation for several years. Number of men employed, eighty-five; ventilated by furnace; thickness of vein, four feet and coal of a very good quality. This company have built a branch road of their own from Judd, a station on the Illinois Central, a distance of eight miles and also one from Webster City, which gives them connection with the Northwestern at that point and gives them a good outlet for the coal; is worked on the long wall system.

REES STEVENS,  
*Pit Boss.*

## CROOKED CREEK NO. 2

is situated a half mile from No. 1, operated by the same company, is a new mine recently opened, is a slope. Number men employed, forty-nine; ventilated by furnace; vein two and one-half, four feet; worked long wall and is opening up a very fine field of coal.

## GEO. COREY

is operating a drift mine near Lehigh, has been in operation for several years; coal is of a very good quality, is worked both long wall and room and pillar; number of men employed, twenty; thickness of vein, three and one-half to four feet; ventilated by furnace. Part of the output sold to the local trade and balance shipped west on Illinois Central and to points on Chicago & Northwestern, by way of Webster City.

## SPOO BROS. &amp; O'NEIL

are operating a small shaft mine, located on South Lizard creek, five miles west of Fort Dodge. Depth of shaft, ninety feet; number of men employed, fifteen; coal hoisted by horse power. This is a new shaft recently opened; coal all sold to the local trade; thickness of vein, four feet.

## BLACK DIAMOND NO. 1,

W. C. Beem, owner and operator, is a drift opening and has been in operation several years; have worked over quite a large territory. Number of men employed, fourteen; ventilated by furnace; is located on Crooked Creek near Lehigh; coal sold to local trade and shipped on the Mason City & Fort Dodge Railroad; it is the intention of Mr. Beem to abandon this opening and make a new one farther up the creek; vein, three and one-half to four feet.

## BLACK DIAMOND NO. 2,

Owned and operated by W. C. Beem, located on Crooked Creek, near Lehigh. Number of men employed, twenty-four; ventilated by furnace; is a drift opening and is worked on the long wall system; thickness of vein, three and one-half to four feet; has not been in operation but a short time and is in very good condition for taking out coal.

## COLLINS &amp; MYERS

are the owners and operators of a shaft; depth, sixty feet; located five miles west of Fort Dodge. Number of men employed, twelve; thickness of vein, four feet; operated for the local trade only.

## THOS. BAIN

is operating a small shaft mine; depth, forty-two feet; located five miles west of Fort Dodge. Number of men employed, six; coal all sold to local trade.

## PARKS &amp; COX

are the owners and operators of a small drift mine located on Crooked Creek, one mile south of Lehigh. Number of men employed, thirteen; ventilated by furnace; thickness of vein, three and

one-half feet; coal shipped on Mason City & Fort Dodge Railroad. This is a new mine opened in the fall of 1886, the mine previously operated by this company being wrought out and abandoned.

## S. W. COREY.

This a drift opening located on Crooked Creek, one mile from Lehigh; number of men employed eighteen; ventilated by furnace; thickness of vein four feet; a part of the out-put sold to local trade; the balance shipped on Mason City and Fort Dodge Railroad; is worked very little in the summer time.

## HIGBY BROS.

This is an old drift opening located on Crooked Creek, near Lehigh; owned and formerly operated by the Crooked Creek Coal Company, but now being operated by Higby Bros. taking out a little crop coal; number of men employed, six; thickness of vein, three feet and a half.

## IRVINE, ANDERSON &amp; FORLINE.

Are operating a small slope near Kalo; number of men employed, twelve; thickness of vein, four feet; coal all sold to the local trade.

## CARLSON COAL COMPANY.

Are located at Kalo; is a drift mine; number of men employed, fourteen; this mine has been operated quite extensively in the past, but is nearly exhausted now; the principal part of the work at the present time is on pillars; they are troubled considerably with fire in the old works; coal shipped on the Minneapolis & St. Louis Railway.

## THOS. COLLINS

Is the owner and operator of a drift mine near Coalville; number of men employed, ten; thickness of vein, four to six feet; this is an old mine; has been in operation several years; it is a good quality of coal operated only in the winter season for the local trade; is nearly finished.

## JAMES PORTER

is operating a small drift opening at Kalo; number of men employed, four; thickness of vein, three feet and a half; coal all sold to the local trade.

## WALTER IRVINE

Is operating a small drift mine located in Craigs Hollow near Kalo; is only worked in the winter season for local trade; number of men employed, five; thickness of vein, three feet and one-fourth feet; is nearly wrought out and will soon be abandoned.

## PETERSON, ANDERSON &amp; TAPPAN

Are operating a small drift mine at Kalo; number of men employed, three; thickness of vein, three feet; coal all loaded on cars and shipped on the Minneapolis & St. Louis Railroad.

## OWEN MC GOVERN.

Operates a drift mine near Kalo; number of men employed, three; vein, three feet; coal all sold to local trade.

## JAMES BROWN.

Is operating two small drift mines near Kalo; number of men employed, eight; thickness of vein, two and one half to three feet; coal all sold to the trade and mines nearly finished; only worked in the winter season.

## C. S. &amp; L. COREY

own and operate a drift mine located on Crooked Creek, one mile from Lehigh; number of men employed, twenty-three; thickness of vein, three to four and one half feet; ventilated by furnace. This is one of the best mines in that vicinity, the vein being thicker and the roof better than most of the other mines. Considerable of the output is sold to the local trade in the winter season, the balance is shipped to points on the Mason City & Ft. Dodge Railroad. John Hodgeson is the pit boss.

## KEEFE &amp; SMITH

are operating a drift mine near Coalville; number of men employed, twenty-five; thickness of vein, three feet. Considerable of the output sold to local trade. They also take out an inferior quality of cannel coal that lays beneath the other vein and on a level with the water in the river, but the demand for it is light, and is only bought for the reason that it sells cheaper than the other coal.

## BLONCK &amp; HARBACH

are operating a small drift mine located near Kalo; number of men employed, five; thickness of vein, three and one half to four and one-half feet. Coal all sold to the local trade.

## MILLIS &amp; EVERETT

are the owners and operators of a drift mine near Kalo; number of men employed, five. Coal all sold to the local trade. Mine nearly finished.

## ERICK JOHNSON

is operating a small mine two miles south of Kalo; number of men employed, two; local trade.

## BAKER WEBSTER

is working a small drift mine one mile south of Kalo; number of men employed, five; thickness of vein, three to six feet. Coal mostly sold to the local trade; some little loaded on the cars and shipped on the M. & St. L. R. R.

## D. C. HART

is operating a small drift mine near Kalo; number of men employed, five; thickness of vein, four feet; operated only for the local trade.

## L. DUPLEAS

is operating a small shaft mine located near Coalville; number of men employed, two. Coal rather soft and only operated for the local trade.

## ALF. DAVIS

is operating a shaft mine near Coalville; number of men employed, two; thickness of vein, four feet, and rather soft. All sold to the local trade.

## JAMES HARPER

is operating a small slope mine near Lehigh; number of men employed, six. Coal all sold to local trade.

## HENAN WILLIAMS

operates a drift opening at Lehigh for the local trade only; number of men employed, six; thickness of vein, three feet.

## JOHN MARTIN

is operating a small drift opening on Holiday Creek, about seven miles southeast of Ft. Dodge; number of men employed, five. Coal all sold to the local trade and operated only in the winter season.

## ALL STINE

operates a small drift mine on Holiday Creek; number of men employed, six. Coal all sold to the local trade.

## BOONE COUNTY.

The output of coal from this county shows a large decrease since 1884, that year showing the largest output since a record has been kept at this office, amounting to 473,073 tons; in 1886 the output was 294,970, showing a decrease of 178,103. This is owing to the exhaustion of the coal field at Angus and Moingona. The Climax Coal Company at Angus, in the southwest part of the county, in 1884 were operating two mines with a capacity of not less than 600 tons per day; in 1886 they done practically nothing, and so far this year they have been entirely idle. The Moingona Coal Company at Moingona, were in 1884 operating a mine with a large capacity, it also is now abandoned. June 30, 1885, there were in operation in this county thirty-six mines; at the present time there are but twenty-seven, showing a decrease of nine during the two years. The Des Moines river runs almost through the center of this county from north to south, and coal is found at intervals the entire distance, but the only points at which they have railroad facilities along the river is at Moingona, where the main line of the Chicago & Northwestern railroad crosses the river, and at Boonsboro where a branch is run to the mines, a distance of about two miles. The largest coal producing district in the county at the present time is at Boonsboro, while there are none of the mines there which have a large capacity individually, but there are quite a number of them. There are two veins of coal being worked at this place, the upper, or what is known as the blackjack vein varies in thickness from two to three feet, and is

not of a very good quality; it has to be sold in market at from ten to twenty-five cents below the lower vein coal, and is all worked on the long wall system. This vein seems to be more regular and to underlie a larger territory than the lower vein; where they both underlie the same territory they are separated in most places by about eight feet, consisting of from two to four feet of slate and boulder rock, the balance soapstone, and where the two veins are being worked in the same mine, they sometimes cause considerable trouble by the fine coal getting mixed with the fireclay, thereby causing it to heat and take fire, which can only be extinguished by closing up that part of the work from all contact with the air, which is sometimes very expensive and difficult to do. The lower vein in this field averages scant four feet in thickness, although in the Millford Coal Company's mine on the west side of the river it runs up to five feet in some places. This vein is of a very superior quality and will I think compare favorably with any coal in the State for domestic use. The coal companies doing business here have always been handicapped to a certain extent by the railroad company charging them twenty-five cents per ton for switching the coal to the main line, until the spring of 1886, when they reduced it to the same rate per mile as charged on any other part of the road. The deposit of the lower vein appears to be very extensive on the west side of the river. There are two mines in operation there at present, and the Clyde Coal Company own quite a large tract there which has been thoroughly prospected, and which it is generally supposed will be opened in the near future.

The great drawback, however, to the proper development of this coal is the absence of railroad facilities on that side of the river. What coal is mined at the present time is hauled in wagons. During the winter season and at low stages of water they build a temporary bridge, at other times a ferry-boat is used. Moingona is one of the oldest mining camps in the county, and several years ago produced large quantities of coal, but at the present time there are but two mines in operation there, and but one that is doing very much business. The vein being worked here is the black-jack vein; the lower vein being entirely absent or too thin to be worked with profit. There is very little doubt but what there is considerable workable coal undeveloped between Boonsboro and Pilot Mound, in the northern part of the county. At the latter place there are two mines in operation in the lower vein coal, which is equally as good in quality

as at Boonsboro, but owing to lack of railroad facilities they are not developed very largely, the out-put being sold entirely to the local trade.

At Angus there are three distinct veins of coal, but only the two lower ones have been found workable, and they seem to lay in small basins or pockets. The first of these mines were opened in 1878, and for a few years the out-put from this field was large, but at the present time there are not to exceed one hundred miners employed there. There is quite a large territory of coal there yet, from four to five feet thick, but owing to the fact that there are heavy veins of water and sand immediately overlying the slate which covers the coal, it is an open question whether it will ever be recovered or not. There was one shaft put down in it in 1882, but it was abandoned after driving the entry a few feet from the shaft.

#### DALLAS COUNTY.

This county has at the present time nine mines. They are all small mines operated for the local trade only, with the exception of two; one of these is located at Van Meter, on the Chicago, Rock Island & Pacific Railroad, the other at Dawson, on the Chicago, Milwaukee & St. Paul Railroad. The mine at Van Meter is owned and operated by the Chicago & Van Meter Coal Company, and is the deepest shaft in my district, being 275 feet in depth. The coal at this mine is not very thick, running from two to three feet and the vein does not appear to extend over a very large area, as there has been considerable prospecting done in that section without finding the coal thick enough to mine; this vein belongs to the lower coal measure. At Dawson, five miles west of Perry there are two mines in operation; this is a new field of coal recently discovered; is a very good quality, and judging from the work being done in the way of building houses and the fitting up of a new shaft being sunk, the field is an extensive one; there are two companies at work here who have several hundred acres bought and under option and are prospecting it thoroughly. This will be a good point for mines as they will have a good outlet by way of the Chicago, Milwaukee and St. Paul Railroad into Nebraska and Dakota. This same territory was prospected a few years ago, but the parties having it done after finding the first vein thin at a depth of about 125 feet concluded that was all the coal there was there and abandoned it and gave up the leases. The balance of the mines in

this county are located at and near Redfield and Linden on the Wabash narrow guage railroad and near Woodward on the Chicago, Milwaukee & St. Paul. The vein at the two former places varies in thickness from sixteen to twenty-four inches and belongs to the middle coal measure, the upper coal being entirely absent here and the lower vein has not been found as yet thick enough to mine. The output of coal from this county has been steadily decreasing since 1883, the output that year being 38,208 tons; in 1886 the amount was 21,986 tons, showing a decrease of 16,222 tons.

#### GREENE COUNTY.

A very small portion of this county is underlaid with workable coal, at least that would seem to be the conclusion to be drawn from the prospecting that has been done at various places in the county, which has been barren of good results. There are at present eight mines in the county. Although the table accompanying this report shows thirteen that were at work during the past winter, five of them are wrought out and abandoned. Of these eight, six of them are located near the southeast corner of the county, where there are three distinct seams of coal, but as a general thing only one of them is workable on the same territory; that is, where one comes in good the other runs out, either by decreasing in thickness or getting soft so that it is worthless. The coal in this field mostly lays along small creeks that are tributaries of the north branch of the Raccoon river, at a distance of about two miles from the river, although there is one mine being operated right on the river, three miles west of Surry, but having no railroad facilities it is not very largely developed, coal all being sold to the local trade. This seems to be the farthest point northwest on the river that coal has been found at a workable thickness, although it has been prospected at short intervals for forty miles farther up, and while some of the prospectors claim to have found the coal four feet in thickness, it is rather doubtful if that is the case, as most of it has been done by men of little or no experience at the business, and a great many such reports have been proven without foundation.

The only place in the county at which coal has been found of a workable thickness, west of the river, is just above what is known as the State ford, on the farm of James Crabb. A shaft was put down there several years ago, and entries were driven to quite a distance,

but the coal proved so inferior in quality that it could not be sold, and the shaft was abandoned. At Rippey, a small town on the Fort Dodge Railroad, a shaft was put down about three years ago, but it has not been very largely developed as yet.

At Grand Junction, seven miles north of Rippey, at the crossing of the Des Moines & Fort Dodge and the Chicago & Northwestern, there is a shaft that has been in operation for about twelve years, but they do not take out a great deal of coal, as the vein is only one and one-half feet thick. A brick and tile work is run in connection with the mine, the clay being taken out from underneath the coal.

The out-put of coal from this county was larger for the year ending June 30, 1886, than for any preceding year, being 117,538 tons. Of this amount the Standard Coal Company alone produced 63,243 tons, or over one-half the production of the entire county.

#### GUTHRIE COUNTY.

This county has twenty-one mines in operation, located at intervals from Stuart in the southeast part of the county to Coon Rapids up in the northwest corner. They are all small mines, employing from two to ten miners each in the winter season, except one at Panora which is employing fourteen. There is not a mine in the county that ships any coal by railroads, it being all sold to the local trade. The mines are all located on the Middle and South Raccoon rivers or their tributaries and the coal varies in thickness from fourteen to twenty-six inches, the latter thickness being found near Fansler's Mill on the middle branch of the river. At this place there are six mines and considerable coal is taken out for local mines, as the country round about is well settled and there is quite a demand for coal in the winter season, but they are almost entirely idle in the summer time. The coal at this place seems to run very regular and be of almost a uniform thickness in all the mines, although some of them are quite a distance apart. The mines are all worked on the long wall system, for which, owing to the nature of the roof and bottom, they are very well adapted and I have no doubt that if they had railroad facilities they could produce coal as cheaply as some places in the State that have considerably thicker seams, and it comes out of the mines in fine condition for shipping, as it makes nearly all lumps and is of a very good quality. The output of coal for this county was

larger for the year ending June 30, 1886, than for any preceding year, and I think will still show an increase for the year ending June 30, 1887, the amount being 17,194 tons as against 4,596 tons in 1885.

#### POLK COUNTY.

This county is the largest coal producing county in my district, although the out-put has decreased considerable during the last few years, 1884 showing the greatest out-put of any one year, 610,921 tons, against 337,964 tons in 1886, a decrease of 281,077 tons. This must not be attributed to a failure of the coal fields of this county, as such is certainly not the case, as Polk county mines have not been operated at more than one-half their capacity during that time, but to an entirely different cause, chief among which is the opening of new mines in adjoining counties, which are compelled to ship a large part of their product to the city of Des Moines and to other markets that Polk county mines formerly supplied, thereby dividing the trade with them, and to the opening of larger mines in the southeastern part of the State, which, owing to their large capacity, thickness of vein and other advantages, are enabled to put coal into the market very cheaply. There are at the present time twenty mines in the county, the majority of which are located in and near the city of Des Moines. There are three separate seams of coal being mined; the upper one is greatly troubled with clay seams and is not worked very extensively, it varies in thickness from three to four feet; the second or middle vein averages about four feet and is of a fine quality, with a good rock roof over it; in some of the mines very little if any timber is used in this vein; the lower vein, and the one that is being worked the most extensively at present, seems to run more regular and to underlie a larger territory than either of the other two; it varies in thickness from three to six feet, and is of rather a harder nature than the other veins, and, contrary to the general rule in this State, the roof is not so good as the second vein roof, which, while it looks all right when the coal is first taken out, and a person would think it was first class, it soon begins to cut on one side and fall out in slabs, and if not timbered will soon fall to a great height. There is a large territory underlaid with this vein of coal on the east side of the city of Des Moines that it is very difficult if not impossible to work, for the reason that it is overlaid with a vein of sand and water which has already drowned out four mines, who, although

they spent considerable time and money in trying to pump it out, had to abandon them at a great loss to the companies engaged.

At Polk City, sixteen miles north of the city of Des Moines, a vein of coal has been discovered and a shaft put down to it during the past year. The seam is four feet thick, and judging from the appearance of the coal it belongs to the middle coal measures, although the roof is of a different nature from that which generally covers that vein.

#### WEBSTER COUNTY.

There is a large area of this county underlaid with coal but it is apparently confined to the territory contiguous to the Des Moines River and its tributaries, for, while in some places the coal has been found a workable thickness at some distance back from the river the roof has invariably been so bad that it could not be mined profitably. The coal production in this county seems to have reached its maximum in 1883 and to have been steadily decreasing ever since. In that year the output was 248,560 tons; in 1886 the amount was 107,777 tons, showing a decrease of 140,783 tons. The number of mines as reported in 1885 was 39; at the present time there are 35; it may seem strange that the output of coal is so much less while the number of mines nearly hold their own, but the reason for this is there are so many more small mines now employing from two to four men, and less of the larger or railroad mines. Lehigh is at the present time the largest coal producing point in the county. There are quite a number of mines here, the largest employing about eighty men, down to small ones employing five. The coal varies in thickness from two to four feet and is of a very good quality covered with a uniformly good roof; it is worked both room and pillar and long wall. They have not had until the past season very good shipping facilities at this place, the Crooked Creek Coal & Railroad Company owning the only railroad, and having mines of their own the other operators claim they charged such high rates of freight that it practically kept them out of the market; but in the fall of 1886 the Mason City & Fort Dodge Railroad Company built a road from Fort Dodge down and that now gives them a good outlet north and northwest. The Mason City & Fort Dodge Company owns 2,800 acres of land near Lehigh which has been thoroughly prospected a few years ago, and the general supposition is that they will open up large mines there at no distant

date. The small mines that supply the local trade here do not do as large a business as they did a few years ago owing to the fact that there are so many more railroads through the section of country that was formerly tributary to them which are shipping in coal cheaply from large mines in other parts of the State. The vein being mined here at the present is the upper vein, and it is claimed that there are still two more veins below that are workable in places; that being the case Lehigh will certainly be an important mining point in the future. Kalo, seven miles southeast of Fort Dodge was a few years ago a very large shipping point, but the coal seems to have been in small basins cropping out in the bluffs of the river, and when they were worked back any great distance the coal either runs out entirely or the roof gets so poor that it is impossible to recover. There are at the present time fifteen mines in operation at and near Kalo, but there is only one of them that do very much of a shipping business, the balance being mostly operated for the local trade only, a great many of them only employing from two to five miners, and that for only a few months during the winter season. Coalville on the opposite side of the river from Kalo has the past year been doing very little. The mines of the Fort Dodge Coal Company are nearly exhausted, they having at the present time only one opening in operation and not employing very many miners in that one. This company have been in operation in this field for several years and have mined large quantities of coal the vein varying in thickness from three to eight feet and of rather a soft nature making very good steam coal. There are six mines in operation here at present, but only two of them have railroads to the mine; the others that ship only haul it in wagons to the track. There is at this place a vein of cannel coal which crops out about on a level with the water in the river; the seam is six feet in thickness in all, but only about two feet of the lower part of it is mined, the upper part being little better than slate, and what they do mine is apparently of a very inferior quality and finds but very little sale; it will burn in open grates and is bought by some for the reason that it is sold cheaper than other coal; it lays about sixty or seventy feet below the other coal. The only place in the county that coal is being mined at any distance from the Des Moines river is on the south branch of the Lizard creek five miles west of Fort Dodge; there are three small shafts in operation there, the output of which is sold to the local trade; the vein is about four feet thick and is a very hard



coal to mine. There seems to be quite a large territory of this coal here, but the roof is so poor that it is very expensive to mine.

Immediately upon my appointment to the office of Mine Inspector June 1, 1886, I entered upon the duties of the office, and since that time up to June 30, 1887, a period of thirteen months, I have visited all the mines in my district except a few of the smaller ones, all the way from one to five times each as the condition I found them in seemed to require. My reasons for not visiting some of the smaller mines are that they were drift openings that do not come under the mining law, and therefore it was not necessary for me to spend money in visiting them. Notably among these is the mines in Hamilton county, of which there were according to the last report eighteen. They are all located along the Boone river. Most of them are employing from two to four men each, and the former inspector, Mr. P. C. Wilson, advised me that it would only be an unnecessary expenditure of time and money for me to visit them, and there were other places that were needing my attention. The first great difficulty I had to overcome was to get the operators to understand that they must obey my orders in complying with the law. The former inspector having the work of the whole State to attend to himself was not able at all times to see that his orders were obeyed, and some of the operators had fallen into the habit of paying no attention to him, as his visits were necessarily so far apart, and it was hard to get them to understand that the order of things had been changed by the increase in the inspection force. Of course it is within the power of the inspector to enforce his orders promptly by a resort to legal proceedings, but it was my desire to avoid this if possible, as I considered it detrimental to both miners and operators to have a mine closed by injunction, as it kept the men out of employment and made heavy expense for the operator, and I am happy to state that I have been successful in most cases in getting the improvements made without resorting to harsh measures; the exception being that of the two Buckeye shafts, Nos. 1 and 2, located near Surry, in Greene county, and owned by Mr. Levi Hamilton. I visited the mines three different times, and no attention being paid to my requests that certain improvements should be made, I applied to the Judge of the Greene County District Court for an injunction, which was granted, and the mines closed up on the 20th day of February, 1887, and on the 2d day of March, 1887, the company notified me that they had made the re-

pairs needed on No. 2 shaft, and requested that the injunction be dissolved. On March 5th I visited the mine and found that they had put in new cages, a new rope, safety catches, safety gates, and that the air in the mine was very good. I therefore told them that if they would pay the costs I would have the injunction dissolved, which they done and went to work. Their No. 1 shaft is still idle.

On the 1st day of March, 1887, I received a telegram from Van Meter, Dallas county, saying that I was wanted at that place, and on the next day I went there in response to the call and found the miners all out awaiting my coming. The trouble was no air in the mine. I went down the shaft and made an examination, and found they had allowed the air courses to become filled up so that a sufficient amount of air could not pass through the mine. The mine is worked on the long wall system, and at the face of the first working place where there should have been over five thousand feet of air passing per minute there was only eight hundred and sixteen feet. I then told the superintendent that the mine would have to be stopped until the air courses were opened up, and if they would do so without legal proceedings all right, if not I would be compelled to apply for an injunction; but he concluded that he would stop and make the repairs without putting the company to unnecessary costs. The mine was idle a month, at which time they had opened the air ways and had a good current of air passing through the mine; I therefore allowed them to resume work.

Another case where I was compelled to have a mine closed up was at Lehigh in Webster county, the Black Diamond No. 1, owned and operated by W. C. Beem. On my inspection of the mine March 10, 1887, I found they had allowed the traveling way to the escape way to become closed so that it was impossible to pass through it, and the timber on the entries were broken and in a dangerous condition, I therefore requested that the mine be closed until repaired. The miners loaded out their loose coal the next day and the mine is still idle. The wisdom of increasing the inspection force has, I think, been fully demonstrated by the work of the past year, as there are a great many mines that require frequent visits from the inspector to keep them in good condition. For instance we may visit a mine to-day and find a good volume of air traveling through the air-ways well conducted to the working places and everything in good condition generally, then in a month from now visit the same mine again and

find falls in the air-ways so that very little air can pass through, doors broken, brattices in bad repair, break throughs not made where they should be, thereby compelling many of the miners to work in very foul air. This condition of things is due to different causes, sometimes it is due to the ignorance or carelessness of the pit boss in charge of the underground work and oftentimes to the company restricting the pit boss in not allowing him help enough to keep the dead work up with the out-put of coal and the development of the mine. Of course this is not the case at all the mines by any means, as some of the pit bosses are careful, competent men who take pride in keeping their mines up to all the requirements of the law in every particular. The past winter has been very free from snow blockades as compared with the winters generally, thereby enabling the railroad companies to have their cars moved promptly, so that the mines were kept running very steadily. Yet, notwithstanding this fact, the coal business for the past year has not been very satisfactory to many of those engaged, owing to the low prices prevailing for coal. Mines that were getting from \$2.25 to \$3.00 per ton a few years ago are now selling at from \$1.35 to \$2.17, the latter figure being the highest reported to this office and that at only one mine for a few of the best winter months. The majority of those reported range from \$1.50 to \$1.75 per ton. The past year has also been free from any general strike, although a few local strikes have taken place. There seems to be a growing tendency to make yearly contracts between the operators and miners in quite a number of places where this system has been tried and both parties have lived up to their agreement it has given very general satisfaction. Below I will give a letter from T. N. Canfield, manager of the W. D. Johnson & Company mine at Boonsboro, Boone county, received in answer to a letter of inquiry sent him:

BOONSBORO, IOWA, July 19, 1887.

*Jas. E. Stout, Mine Inspector, Des Moines:*

DEAR SIR—Yours of recent date at hand, and will say in reply that I will answer your question with pleasure. Our strike of last year commenced March 1, and ended June 30, 1887. The cause of the strike was a notice from us to the men that March 1st the price of mining would be reduced to four cents per bushel, and that we wanted to make a contract at that price for a year from April 1, 1886. They refused to accept of either and remained out until the last of June, when they agreed to go to work, July 1, for four cents, until April 1, 1887, and they have lived up to their agreement and it

has worked a benefit to them as well as to us, and when the first of April, 1887, came, they willingly renewed the agreement for another year. The coal trade is light, and we have but few men in. Our new fan works well, and we are in good condition for the fall trade.

Yours respectfully,

T. N. CANFIELD,

*Manager.*

On the tenth of April, 1887, a strike took place at Lehigh, in Webster county. The price being paid for mining prior to that time being one dollar per ton, and on the first of that month the Crooked Creek Coal Company, who were doing the largest business of any mine in that field, notified their miners that after the tenth, a reduction would be made to eighty-five cents per ton. This the miners refused to accept and work was stopped, and by the first of May all the other mines in that vicinity were closed, except the mine of S. W. Corey, and he kept his men at work by paying his miners by the day for mining. The strike lasted until the eighteenth of May, when it was settled by Mr. Wheat, Master Workman of the Knights of Labor, going there and effecting a compromise, setting the price at eighty-seven and one-half cents in the summer months, and one dollar for the winter. At Kalo, in Webster county, there was a strike of seventeen days duration in October, 1886, at the mines of the Craig Coal Company, the miners demanding five cents per ton extra for brushing the roof, it being long-wall work. This the company refused to give, but after the mine had been idle seventeen days, they acceded to the demand of the men, and work was resumed. At the mines of the Fort Dodge Coal Company and Collins Bros., located at Coalville, in Webster county, the miners came out on strike about the first of April, 1887, to resist a reduction, and are still out at the present writing. On the first of May, 1887, there was a strike of a few days duration at some of the mines in South Des Moines against a reduction and a contract to work for a year at a certain price, but the miners not being united among themselves they finally signed the agreement and went to work. These are about all the strikes that have taken place in my district during the past year.

The reports of accidents occurring in this district for the two years ending June 30, 1887, show that out of ten fatal accidents, there were only two occasioned by falls of roof in the mines, as against six in the preceding two years, but of the non-fatal accidents which are quite numerous, and some of which are very serious, the majority are

caused in that way, and when they are reported to this office, the report generally winds up in about this style: ("This accident could have been avoided by a free use of props, and we trust that this will be a sufficient warning to all our men hereafter so that they will use timber enough to prevent any such accidents in the future.")

All the blame is thrown upon the miner himself, but it seems to me that if the pit boss would exercise a little more authority, and when he is making his rounds through the mine, would compel some of the more careless miners to put timber in dangerous places, it would be the means of preventing a great many of the accidents that now occur, but the majority of the pit bosses seem to think they have performed their whole duty when they furnish the miner with sufficient timber, but it is a well known fact to all men who are familiar with mining, that even the best and most experienced miners owing to familiarity with danger are liable to get careless sometimes, and even knowing that a certain part of the roof is in a dangerous condition will work under it, perhaps having a car to load or a piece of mining to do after which they intend to put up timber and secure it, not really thinking of the danger they are in, where if their attention was called to the matter by one having authority in the premises, they would immediately stop the work they were doing and put up props and thus avert the danger. The gases met within the mines of this district are only two, namely, carbonic acid gas, or as it is more commonly known among the miners, black damp and carbonic oxide, or white damp (carborated hydrogen or fire damp being as yet unknown in the mines here). Of these two black damp is the most frequently met with as there are very few mines but what generate it in greater or less quantities; it is produced by the breathing of men and animals, and by the combustion of lamps and powder; it is also generated in old and abandoned workings, and as it is heavier than common air, those mines that have worked over a large territory, the openings to which are left open, are compelled to have a large volume of air traveling to dilute and render it harmless; even then I frequently find mines in which there is double the amount of air passing through that the law requires, and still the miners are troubled with headaches and languid feeling caused by the air, being heavily loaded with this foul mixture; the better plan to pursue in such mines is to close up the openings to each room, or old work as soon as finished, either by building a stopping with slate, or refuse matter from the mine, or by

board brattice; if this is done at the time as the work goes along the cost would not seem heavy; but if left until there are all the way from fifty to one hundred such places open, then the owners of the mines sometimes object, on the ground that it is too expensive, and they are still left open, and the men are compelled to keep on working in air that is really not fit for a human being to breathe.

#### VENTILATION OF MINES.

There are two methods of ventilation; that is, natural and artificial. The mining law of this State provides that all mines governed by the provisions thereof shall be provided with some artificial means of ventilation, and this is in nearly every instance complied with, the exceptions being a few of the smaller mines that employ from five to ten miners only during a few of the coldest winter months, at which time natural ventilation gives them all the air required, but in mines that work any in the summer time, or employ more than eight or ten men in the winter, this system should never be relied upon, for when the air outside is hot and sultry, in the mine it will either be on a stand-still or merely baffle backward and forward, thereby doing no good. There are two methods of artificial ventilation in use in this district; namely, the fan and the furnace. Of these two, the former gives the best results, and at most all mines where they have steam power the fan is used in preference to the furnace, but there are some drift openings that think it cheaper to build a furnace than it would be to put up a fan, which, of course, would necessitate a boiler and engine also to furnish the motive power. But the fan, besides giving the best results, is cheaper to keep in operation than the furnace, as they are usually supplied with steam from the boilers that supply the hoisting engine, and all the care they generally require is oiling occasionally, which is done by the engineer or some of his assistants, and which takes but a few minutes daily, while in case a furnace is used it requires the constant attendance of one man to keep up the fire in order to have the necessary current of air passing through the mine. Then, sometimes when work is a little slack, in order to economize, the attendant is taken away and put at some other work, and the care of the furnace is left to some of the day men, the consequence is that it is not well attended to at all times, and the miners suffer for the want of air. There is one great difficulty I find in the construction of a great many of the furnaces, and that is they are

made too small. The air-ways all through the mine will have from twenty-four to thirty-six feet sectional area, but when it comes to the furnace the area is probably only six or seven feet, when of course the resistance the air encounters here checks the volume.

I remember going through one mine where there were eighty men employed; it was a drift mine ventilated by furnace, and I found the air ways were all large and in good condition, but the volume of air was very small. The pit boss said he could not understand it, but as the furnace was reached the trouble was explained. While the air ways had an average area of about thirty feet, the furnace was three and one-half feet in width and two feet two inches high from the grate bars to the highest point of the arch, which was entirely inadequate. The shaft was also shallow, which made it still worse, and I requested the pit boss to have the furnace torn out and enlarged, which he agreed to do. In my humble opinion the size of furnace that gives the best results in a mine having air ways, the size of the one described would be six feet wide, three feet high and length of bars eight feet, and if the fire is properly kept in such a furnace I think it will give entire satisfaction.

Of the fans in use there are several different kinds, the relative merits of which I shall not discuss, as any of them are capable of giving sufficient volume of air if properly set and the air ways are large enough, but the great trouble with some of them are that while they have a fan with a capacity of thirty thousand cubic feet per minute some part of the air courses are partly closed so that not more than half that amount can pass through with the pressure exerted by the fan. In another part of this work will be found a cut of a fan that is in use at the No. 3 shaft of the Keystone Coal Company, at Surry, Greene county. This fan is put up by N. S. McDonald & Co., of Des Moines, but it is the way the fan is set that I want to call attention, as it gives a larger volume of air than any fan of the same size in my district, and owing to the construction of the covering the air can be reversed, making either a suction or forcing fan, at will, without changing the course of the fan, simply by opening and closing certain doors, which can be done in two minutes time. A great many air shafts are troubled considerable with water dripping down them, and where the air is always forced down them and up the hoisting shaft, they are liable to become closed up with ice in the winter, thereby shutting off the air. And, on the

other hand, where the air shaft is used all the time as the upcast, the hoisting shaft will be frozen up, but with a fan set in this way the air shaft can be used as the downcast during the day time and at night, say at 8 P. M., reverse it, let it run that way until say 3 o'clock A. M.; by working it in this way both shafts can generally be kept free from ice. This method of setting a fan costs very little more than the ordinary method in general use for setting the same kind of fan, and I would advise all companies who contemplate putting up fans to give this system careful consideration, and I am satisfied they will be amply repaid for any extra cost by the result gained.

#### MINING MACHINES.

The use of mining machines, or iron men, is not as general in this State as in some of the eastern States. One reason for this is probably that our coal, to a certain extent, lays in too small pockets, and would not justify companies to go to the expense of putting them in for the short time that some of the mines last, as the cost is considerable, in the first place, in the machine itself, then the air-compressor, which is set in the engine-room along side the hoisting engine, which is a very costly piece of machinery, then it takes extra boilers to furnish steam for the compressor, and pipe to conduct the air to the machines. Said pipe is first taken down the shaft, then along each entry in which the machines are used, a T joint and valve at the opening to each room, then the air is conducted to the machine by a rubber hose.

It will be seen, from all this, that these machines are almost beyond the reach of companies with ordinary capital. Then, again, they require more room to work in than the roof in some mines will allow; that is, the props must not be any nearer the face of the coal than about nine feet, and in some of the mines if the props were left that distance back the rooms would certainly close, and it is yet an open question, taking everything into consideration, whether they are a financial success or not in this State. The only place in this district where mining machines are used is at the mines of the Keystone Coal Company, in Greene county. This company has three of the Legg machines in use, manufactured by the Lechner Manufacturing Company, at Columbus, Ohio. These machines mine in the slate below the coal, thereby making less waste than by hand mining, and when everything is working just right they certainly do very fine work.

There is another good feature in connection with these machines, and that is, they both cool and purify the air, and increase the volume slightly while running. At the time I inspected that mine, June 27, 1887, I measured the volume of air with the machines standing, and found 10,438 cubic feet per minute passing; then I had two machines started, and, after they had run a short time, measured again, and found 10,880 feet, an increase of 450 feet.

#### NATURAL GAS.

In view of the fact that natural gas has been found in this State, it seems to me that a slight mention of it here will not be out of place, as it is a well known fact that where it has been found in large quantities it has seriously affected the coal trade, and some of our best posted coal men of this State attribute, to a certain extent, the low prices prevailing for coal for the past year or so to the displacement, by natural gas, of millions of tons of coal in Ohio, Pennsylvania and Indiana, thereby compelling it to seek a market in the west. It seems that the large supply of gas now being taken from the bowels of the earth in the eastern States comes principally from what is known as the Trenton limestone.

Prof. Edward Orton in a paper read before the Ohio Mining Institute, gives the following in regard to that rock: Trenton rock or more properly, Trenton limestone, is the name of a geological formation that was first noted in Oneida county, New York, some fifty years ago where in the deep gorge of a water course limestone walls containing well preserved fossils characteristic of the division of geological time known as the lower silurian age were found. The rocks of this period had received no local name in North America, so they were christened Trenton limestone. Trenton limestone which has acquired such fresh and mighty importance of late, is a dark blue rock almost black, lying in massive beds which are sometimes separated by layers of thick shale; the limestone has a thickness of about 150 feet; it is covered by a stratum of 300 feet of thin bedded dark shale which is sometimes mistaken for coal. The shale is called the Utica slate or shale. Trenton limestone was the first great limestone formation on the continent and was much wider than any that succeed it.

Mr. James Hall, in his geological survey of the State of Iowa in 1858 has this to say in regard to the Trenton limestone in this State:

"The area occupied by the Trenton limestone in the Mississippi Valley is very considerable. It may be found cropping out in the bluffs of almost all the streams in Wisconsin south of the river of that name and in the northern portion of the mineral region it covers most of the elevated region between the streams. It is spread out in Iowa over the larger portion of the regions to the northeast of a line drawn from McGregor in a northwesterly direction."

As to the permanency of the gas supply scientists differ in opinion; while some claim that it is practically inexhaustible, others, and by far the greater number, claim that it is only a matter of time and that the young people of to day will live to see the supply exhausted. Some of the heaviest gas producing districts of Pennsylvania are already showing signs of failure. Gas has been found in several places in this State in small quantities by parties prospecting for coal within the past few years, but as a general thing very little attention was paid to it at the time. In the month of October, 1886, at the town of Herndon, in Guthrie county, the crossing of the Wabash narrow gauge and the Chicago, Milwaukee & St. Paul railroads, Mr. F. Gardner was boring a hole for water and had got down to the depth of about 120 feet and had stopped and gone to the house for supper in the evening when they were startled by a loud noise like that made by steam escaping from a boiler and on going out to the well found it discharging large quantities of gas, sand and gravel, but having had no experience in such matters, did not know what to make of it at first, but other parties seeing it pronounced it gas; but this well was not utilized as they could not get it tubed so as to shut off the sand.

The next hole was put down by Mr. H. C. Booth, this also was abandoned for the same reason, and another one put down which was more successful. This well was put down in November, 1886, and Mr. Booth had the gas conducted to his house, since which time they have used no other fuel either for cooking or heating purposes. The gas is conducted into the house by a  $\frac{3}{4}$  inch pipe, and is used in ordinary cooking and heating stoves. There are seemingly no diminution in the pressure of gas at this well since first put down. There have been six wells bored here, and a good strong flow of gas in all of them, but only two are being utilized at present, owing to improper tubing not being able to shut out the sand. They are all about the same depth, 120 feet, with the exception of one, which reached a depth of 219 feet, and which is now standing with the tubing plugged

up. This gas is found in a vein of sand, and the strata above that is composed of first black loam, six feet yellow clay, six feet blue clay, 108 feet. There does not appear to be much variation from this in all the holes bored. It certainly seems as if this fine supply of natural fuel could be utilized if not there where it is found, then by piping to other places where there is demand for it for manufacturing purposes. Judging from the different places in which it has been found and the uniformity in depth of all the wells, it certainly appears to be extensive, and if one hole does not furnish pressure enough for piping long distance, then put down more the cost of which owing to the shallowness would not be great. These wells are only about forty-two miles from the city of Des Moines, and the city of Youngstown, Ohio, is supplied with gas brought from a distance of sixty-three miles; of course, intermediate towns are supplied from the same pipe.

#### RECOMMENDATIONS.

I have a few suggestions to offer in the way of amendments to the mining law, which I think will be a benefit, while they will make no material change in the general tenor of the law they would merely make the existing sections a little more explicit and not conflicting one with the other, which I think they do as they now stand. Section 8, in the first clause of the section says, "it shall be unlawful for the owner or agent of any coal mine worked by a shaft to employ or permit any person to work therein unless there are to every seam of coal mined at least two separate outlets separated by natural strata of not less than one hundred feet in breadth, by which shafts or outlets distinct means of ingress and egress are always available to the persons employed in the mine, but in no case shall a furnace shaft be used as an escape shaft and if the mine is a slope or drift opening, the escape shall be separated from the other openings by not less than fifty feet of natural strata." The closing part of the same section says, "and, *provided further*, that this act shall not apply to mines operated by slope or drift openings, where not more than five persons are employed therein."

Section 9 reads, "in all mines there shall be allowed one year to make outlets as provided in section 8, when such mine is under two hundred feet in depth, and two years when such mine is over two hundred feet in depth, but not more than twenty men shall be employed in such mine at any one time until the provisions of section 8

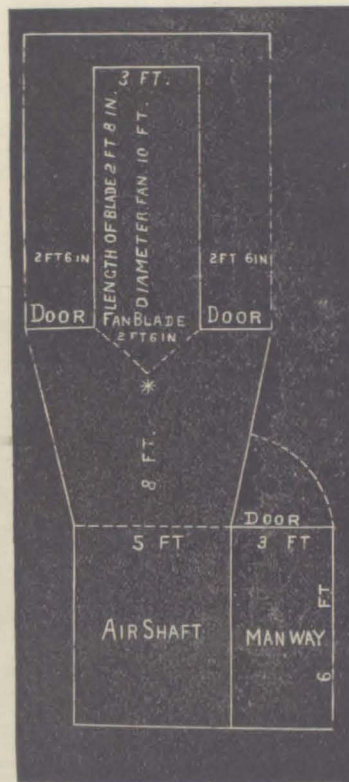
are complied with and after the expiration of the period above mentioned should said mine not have the outlets aforesaid they shall not be operated until made to conform to the provisions of section 8." Now from the reading of the foregoing it would appear that the inspector had jurisdiction over *all* shaft mines and over all slope or drift openings where more than five persons are employed at once, but now we will see what section 14 says, "in case any coal mine does not in its appliances for the safety of the persons working therein conform to the provisions of this act or the owner or agent disregards the requirements of this act for twenty days after being notified by the inspector any court of competent jurisdiction while in session or the judges in vacation may, on application of the inspector, by civil action in the name of the State enjoin or restrain by writ of injunction the said agent or owner from working or operating such mine *with more than ten persons at once*, except as provided in sections 8 and 9."

Now it seems to me that these sections are contradictory, but if such is not the case and the real meaning of the law is that mines may work ten or less persons at once without complying with requirements of the mining law I think it will work an injustice to a large number of mines in this State. At least one-fourth of the miners in my district will be without the protection of the law, and as a general thing it is the miners employed in those small mines that stand in the greatest need of that protection; for while the larger mines are mostly owned by parties who are able to have the best of machinery and everything that is required for the safety and health of the men in their employ. A great many of the mines that employ as many as ten men in the winter season are operated by men of limited capital, and as limited experience and knowledge, and who if not compelled by law to do otherwise would allow their mines to get in a very unsafe and unhealthy condition, and I see no reason why men who are working where only ten men are employed should not be entitled to the same protection that is accorded where twenty or more are employed. Therefore I would suggest that the words "with more than ten persons at once" where they occur in section 14, chapter 21, laws of 1884, be stricken out.

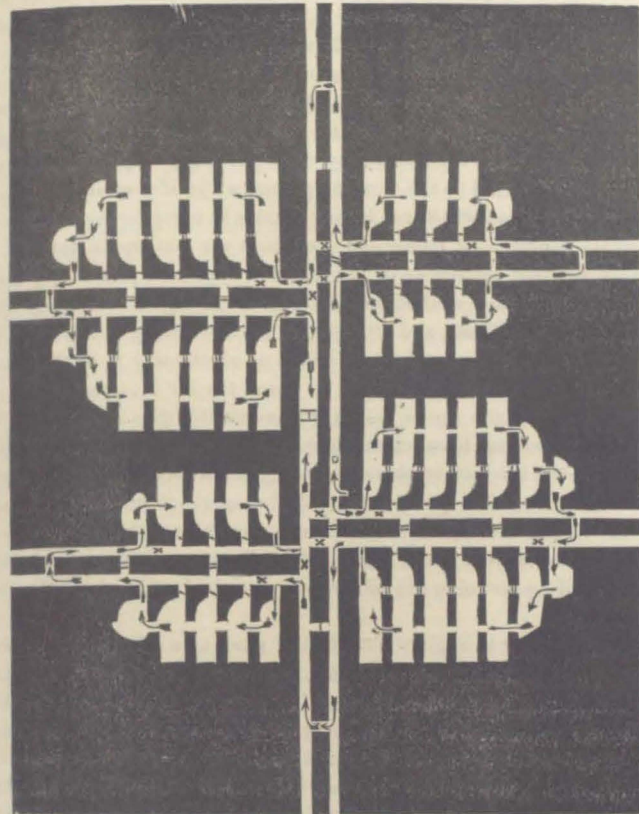
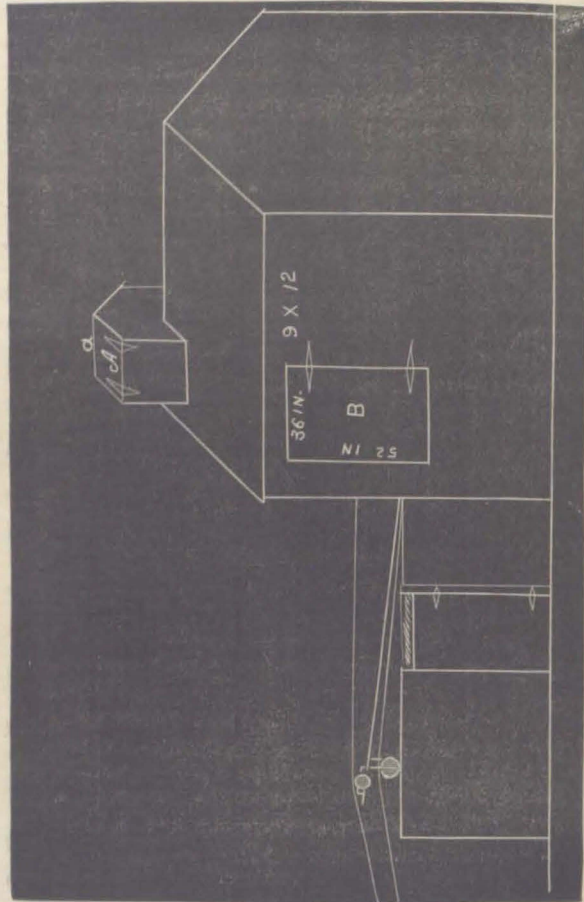
I would also suggest that the following words be inserted in section 8: This section shall not apply to any mine or part of a mine in which the second outlet or escape shaft has been rendered unavaila-

ble by reason of the final robbing of pillars previous to abandonment so long as not more than twenty persons are employed therein at any one time, and the cages or other means of egress shall at all times be available to the persons therein employed.

My reason for asking this is that the second opening or escape way is in some mines situated a long distance from the hoisting shaft, in which case there is a large amount of coal in the pillars between the two shafts which if left in would entail considerable loss, both to the operator and the owner of the land if leased, and of course the mine being so near finished it would not pay them to sink a new shaft, but under the present law the inspector has no authority to allow such mine to be operated, and certainly could not do so and take the chances, for if any accident should happen in such mine the responsibility would rest with him. Then again, if we compelled a mine to close up, leaving say eight or ten thousand tons of coal in the pillars, all of which is very valuable to the operator by reason of the cheapness with which pillar coal can generally be taken out, it would certainly be a great loss to them.



When the doors are open from the star (\*) the spaces on sides are closed, doors on top marked A are closed, and doors marked B are open, the fan is then a down-cast or forcing fan. Desiring to make it a suction or upcast, close the doors to the star, thus opening the side spaces, close doors marked B, open doors marked A and the current is changed.



REFERENCE.

- ▣ Main shaft.
- + Doors.
- | Stoppings.
- | Curtains.
- ▢ Air shaft.
- < Air current.
- Regulator.



The foregoing plan of a mine is designed for the information of those who are about to open new mines and who probably have had no experience in such matters. It will be seen that it is all double entry work, as in my opinion single entry is not a good system, even in small mines that are worked for the local trade only; of course, the single entry system will save some outlay at first in entry driving, but that advantage is soon lost by the trouble and expense in carrying the air forward to the working places, while if a mine is worked by this plan there will never be any trouble in carrying the air to any distance required, if doors and stoppings are put up in the right places, but that putting up of doors is the important point. We frequently find mines worked on this plan with a good volume of air going down this shaft, and still the air at the working face is in very bad condition, the rooms will be driven up all the way from thirty to fifty yards and no means taken to force the air into them, and if powder is used, the smoke just lays there until it dies away, when, if a door was put up between the first and second rooms in the entry, up which the air travels, thereby sending the whole volume of air up the first room, then put curtains at the openings of all the other rooms in that entry, make good-sized break-throughs between the rooms; then after it passes through into the return entry repeat the above, and by so doing the miner will get the benefit of all the air traveling.

I will now try to explain a method of working a mine on the above plan without the aid of a compass. I do not mean by this to do away with the compass entirely, as it will be necessary to use it to make a plat of the mine, but simply to keep the entries and rooms straight and on the proper course; it is necessary in order to leave all the pillars of a uniform thickness, that the main entries should be driven straight from the shaft and the cross entries should be driven at a direct angle from the main entries, the rooms at a direct angle from the cross entries. To do this, first, after the entries are away from the bottom of the shaft, say twenty yards, drop two plumb lines down the shaft, one on each side, so that they will hang in the bottom about on a line with one rail in the entry; be particular to have them both the same distance from one end of the shaft; then go back, say forty feet from the shaft, and put up two sights about twenty inches apart, hang them to correspond with the lines in the shaft; be sure and put them up solid, so that they will be perma-

nent; then drive the main entries by those sights, renewing them as the entry is driven forward; when you are ready to turn off a cross-entry mark it off where you want it; drive it in, say thirty feet, then get a wooden square made; let each arm of the square be four feet in length; then put down the sights that are nearest that point in the main entry; lay the square with one arm on the main entry, the other in the cross entry; set two lights on the arm of the square that lays in the main entry, one on each end, so that the blaze will be on a line with the edge of the square; then set it in so the lights will correspond with the lights in the main entry; then put the lights on the other arm of the square, put up a pair of lights in the cross-entry to correspond with the lights, and you will have a direct angle from the main entry; in turning rooms of the cross-entries repeat the above.

By this method the pillars will be of a uniform thickness, so that in drawing them back in the rooms there will be no weak places in them for the weight to run ahead and be the means of losing a part of the coal that should be recovered, which all old miners know is often the case in pillar drawing. The size of the pillars to be left in mines should be governed by the nature and thickness of the overlying stratas, and in opening up a mine the man in charge will have to be guided by his own judgment in that matter, but it is always best to leave them large enough, and if an error is made, let it be on the safe side.

JAMES E. STOUT,  
*Inspector District No 3.*