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FIRE PREVENTION ACTIVITIES INSPECTORS AND INSPECTIONS

By J. E. Florin

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THE IOWA COLLEGE is annually host to the fire fighters of Iowa, in the Short Course for Fire Fighters held under the auspices of the Engineering Extension Department.

The meeting is really a conference of firemen, municipal officials and others interested in fire fighting and fire prevention; a conference at which they can discuss with experts, both from within the state and from other places the important problems connected with their work. Here, the firemen and representatives from each community can learn new and better ways of meeting their problems through contact with speakers and counselors, many of whom are nationally known in their fields. Practical demonstrations of first aid and fireman training are features of the program.

This publication contains two of the more general papers presented at the 1926 Fire Fighters' Short Course. Several others will be published soon, and can be secured by writing to the Engineering Extension Department of the college.

FIRE PREVENTION ACTIVITIES,

By J. E. Florin

Superintendent of Fire Prevention
Industrial Commission of Wisconsin

"The world moves," said the noted astronomer Galileo more than five hundred years ago, and everything on this Mother Earth is moving; there is no such thing as standing still. Firemanship is moving either forward or it is retrograding. The holding of this short course for firemen and your attendance are most healthful signs of progress. There may be those who question the wisdom of gray-haired veterans attending college. I do not. Education only ends with death. In the words of Carlyle "school hours are all the days and nights of our existence."

The fact that you are here indicates to me another thing, namely, that you do not consider your work a mere pastime or just a temporary "bread-and-butter" job; but a profession, which it really is. Like other professions you must work and study to keep abreast of the time.

Time was, and that within the experience of the present generation, when the work of the fire department was to "throw water," and the boast of the fire department was: "We held 'er; she didn't spread beyond the building."

Then wide-awake chiefs discovered that a gallon of chemicals would do the work of eighty gallons of water, and the chemical fumes would penetrate where water could not be forced. This reduced the water damage by fire and smoke. It also reduced the average loss per fire. Still ultra-conservative chiefs, I may safely call them non-progressing chiefs, accepted the idea of chemical fire protection very slowly, almost unwillingly, and clung to the "drowning-out" method, while their more progressive brethren learned to put out from seventy-five to ninety per cent of all fires with chemicals.

Powerful motor-driven apparatus has in recent years taken the place of hand and horse drawn vehicles; the pumper has replaced the old, faithful steam engine, and in many other ways fire departments have been greatly improved. We may justly boast of the best manned and best equipped fire departments of the world.

In spite of these things, however, fire losses have increased from year to year by leaps and bounds. More water systems, more powerful streams, more firemen and fire departments, more and much better fire fighting apparatus have not checked, reduced, nor even held the fire losses.

During President McKinley's time the fire loss was $150,000,000.00 a year; in 1925 it reached the appaling figure of $570,000,000.00.

The sole remedy of extinguishing fires failed, completely failed. In recent years thinking men have come to the conclusion that partially at least we had applied the wrong remedy. We were fighting fires with might and main, but ignoring the many common, simple causes of fires; we were fighting an effect and losing sight of the cause. The old story of how an attendant at an insane asylum tested the sanity of the inmates illustrates this point. "I turns the faucet and lets the water runs on the floor, and tells 'em to mop it up. Them that isn't idjits will turn the water off; them that is idjits will just mop away." We had been mopping away with powerful streams and forgotten to close the faucet.

Fire prevention is the "closing of the faucet"; it is the discovery and gradual elimination or safe-guarding of conditions, practices and processes which may cause fires.

I am not here to advise you to let up in the least on effective fire fighting, but do state most emphatically that the successful department of today is the one which believes in and carries on thorough fire prevention work. This means close and frequent inspection and follow-up work, it means paying attention to building construction both new and repair, safe-guarding or isolating hazardous processes, securing the enactment of proper building codes, and fire prevention ordinances, spreading the gospel of greater care, and many other things. The time is here now when a chief will not be known beyond the narrow confines of his home city unless he is a leader in fire prevention work. The duty of every fire department is to conserve life, limb and property, and no chief must neglect the most effective means of accomplishing these results.

Much valuable information may be gleaned from the experience of European countries in matters of fire prevention. You have been told that the per capita fire loss of these countries is about one-tenth that of the United States, and that their insurance rates are correspondingly low. Why this difference?

First. For centuries European countries had stricter building laws and regulations, requiring a more general use of fire-resisting building materials, as for instance tile instead of conflagration spreading shingles on roofs, and requiring the construction of buildings so that fire could not start readily nor spread rapidly.

Second. Through strict laws and ordinances these countries regulated the handling, storage, use and disposition of combustibles, explosives, inflammables, and other things and conditions which might cause fires, and provided an ample and efficient inspection force to make sure that these laws were strictly obeyed.

Third. No sympathy is wasted in Europe on the man who has careless fires. It is up him to explain the cause of the fire and to prove

that the fire was not due to his acts of commission or omission. If it is shown that his own carelessness caused the fire, or that the fire was due to a violation of any legal requirement, he must pay the damage to his neighbor's property, if any, and to his landlord, if he is a renter. It is up to him to prove that he could not possibly have prevented the fire. Similarly contractors are held responsible for their careless work and any violation of building regulations.

Fourth. Through education, instruction and training, and from dire necessity, Europe has learned the lesson of saving and thrift; we have not, we are wasters.

We, in Wisconsin, have endeavored to put into practice the lessons thus gleaned from European experience.

In 1911 the state legislature enacted the compensation law, and created the state industrial commission to administer this law, and gave it jurisdiction over safety in places of employment and in public buildings.

Section 101.06 provides that "every employer and every owner of a place of employment and of a public building now or hereafter constructed shall so construct, repair and maintain such place of employment or public building and every architect shall so prepare the plans for the construction of such place of employment or public building as to render the same safe." Public buildings are defined to (101.01) "mean and include any structure used in whole or in part as a place of resort, assemblage, lodging, trade, occupancy, or use by the public, or by three or more tenants."

Thus, in broad terms the legislature set up the standard of "safety" in all of the more important buildings.

This act further provides that " it shall be the duty of the industrial commission, and it shall have power, jurisdiction and authority to ascertain, fix and order such reasonable standards, rules and regulations for the construction, repair and maintenance of places of employment and public buildings, as shall render them safe."

A later ammendment (101.10-5a) conferred upon the commission like authority to regulate fire hazards generally and to order the removal or repair of dilapidated buildings. The language of this statute follows the wording and provisions of the various state fire marshal laws.

Acting under this authority the industrial commission prepared, or rather caused to be prepared, and promulgated the state building code regulating the construction of the larger buildings throughout the state, exempting the smaller buildings, private residences and outbuildings appurtenant thereto, farm buildings and temporary structures.

This code applies to new buildings and requires more extensive use of fire resisting building materials in all such buildings.

The installation of heating and power boilers, furnaces, smoke pipes,

hot-air pipes and registers, steam pipes, and the construction of chimneys are regulated. The heating and ventilating flues must not be installed to serve as ready passageways for flame and fire.

This code also provides that the larger buildings must be subdivided by fire walls, equipped with standard fire doors, so that a total loss by fire is almost impossible. Floor openings of every kind must be protected, trapped or inclosed to prevent the vertical spread of fire.

The electric light and power equipment must be installed according to the rules and requirements of the Wisconsin state electrical code. This code is a combination of the National Electrical (fire) Code, and the United States Bureau of Standard's Safety Code, and was prepared and promulgated by the commission under the same broad authority as the building code.

Dangerous manufacturing processes must be isolated or cut off by fire walls, ceilings, floors and doors.

Automatic sprinklers are required in the basements of certain specified buildings and throughout other designated buildings. In others either standpipe water protection or approved chemical fire extinguishers are required. In most public buildings and in factories where more than ten people work above the second floor a private fire alarm system is required.

Realizing that even a fire resisting building is never panic proof the code requires ample, safe exit facilities.

Feeling that the requirements of the building code might be rather strict when applied to old, existing buildings the commission prepared and promulgated a "Code on Existing Buildings," that is, buildings existing prior to October 1914 when the state building code became effective. The provisions of this code follow the general lines of the building code, but are less strict. Replacing poor shingles with fire resisting roof coverings, putting fire stops in floors, walls and partitions, installing fire windows and fire doors, protecting all woodwork exposed by any part of the heating apparatus, repairing or rebuilding chimneys, overhauling defective electric wiring and other changes often make old buildings much safer, less liable to fire, and in some measure check the spread of fire. In many of these old buildings also fire protection and fire alarms are required, also proper exits.

A wholesome provision of this code is that whenever the occupancy of one of these old buildings is changed to one more hazardous then the stricter regulations of the state building code apply, as for instance, turning a mercantile building into a garage.

Then we have a set of regulations collectively known as "General Orders on Fire Prevention." This is to a large extent a housekeeping code. It regulates the storage, care and disposal of waste materials of all kinds, oils, oily substances, explosives, volatile liquids, their use, and the use of soldering furnaces, torches, fire pots, vulcanizers and the like. The construction of smokehouses, dry cleaning plants,

laundry drying rooms, and other buildings or parts of buildings where hazardous work is done, is regulated. Provision also is made in this code for the condemnation of dilapidated buildings which have become a menace to other buildings and property.

It will be noted that these codes aim to eliminate fire producing and fire spreading conditions, whether they be matters of construction, use, equipment or housekeeping, and all to the end of better protecting life, limb and property, and to reduce the deplorable fire waste.

These codes have the effect of law and a penalty of from $10.00 to $100.00 for each day's violation is provided by statute. The codes are enforced by the industrial commission and local officials such as fire chiefs and building inspectors. The code rules are minimum requirements, but there is nothing in the statutes which prevents municipalities from making requirements more strict, in fact, we encourage and aid in the enactment of local building and fire prevention ordinances.

The original fire marshal acts provided that when "on inspection" hazardous conditions were found the fire marshal might make a reasonable order for the correction of such conditions. The Wisconsin codes set up a standard of safety, in advance of inspections, and provide for the enforcement of such standard. Through the enforcement of these codes we hope, in time, to have a safer class of buildings in Wisconsin, less liable to fire and free from life dangers. I am convinced that permanent improvement in fire conditions can only come with permanent improvements in building conditions. The fire dangers arising from poor housekeeping always will mean a constant fight.

Our building division force of five men examines building plans sent in and inspects buildings in process of construction, the two fire prevention men inspect existing buildings, the ten factory inspectors inspect factories, three boiler inspectors inspect boilers and boiler rooms, reaching out into country creameries and cheese factories.

A Wisconsin statute requires co-operation among various state departments. Under this law the state educational department inspects school buildings and the hotel inspectors inspect hotels and restaurants. These other departments are clothed with full power to enforce the requirements of the building and fire prevention codes of the industrial commission.

Violations of code requirements are personally called to the attention of owners or occupants, written notices requiring corrections sent, and followed up until the hazardous conditions have been corrected.

Fire departments throughout the state are required by law to inspect all buildings and premises, except the interior of private residences, to make and keep on file full, written records of each such inspection in form as required by the industrial commission, which, through its fire prevention division, supervises such work and receives quarterly and yearly reports of the same. We deem this work highly important, first, to prevent fires; second, because acquaintance with

buildings enables the department to fight fires more intelligently and effectively; and third, to better protect the lives of occupants of buildings and firemen themselves.

Much of the fire loss due to hazardous conditions can be eliminated through continuous inspection work but there will still remain the large loss due to thoughtless, careless human acts. These cannot be corrected through code regulations, but only through the slow process of education; meanwhile we must pay the price of carelessness.

The schools of Wisconsin are now required to give one instruction period each month to the study of fire causes and correction of fire hazards. Let us hope that the next generation will not be the careless mortals we have been in the matter of fire.

As a part of our educational campaign, we prepare monthly bulletins on common fire hazards. These bulletins are sent to all fire chiefs, also to all newspapers and receive wide publication. For Fire Prevention Week a special pamphlet is prepared and sent to all schools. Whenever possible the deputy in charge of fire prevention work responds to the numerous requests for fire prevention talks. Bread, thus "cast upon the waters" may, we hope, return an hundred fold.

Constantly we are called upon to deal with special problems involving fire hazards. Owing to deaths, explosions and fires due to acetylene gas plants in basements of private residences, we fought against basement installations of generators and finally forced the cooperation of manufacturers.

When visible gasoline pumps, electrically driven, appeared we began to have fires. After full investigatiion and public hearing, the commission required motors and switches in such pumps to have vapor proof enclosures, that the glass cylinder be substantially guarded, and that it be empty except during the process of serving a customer. Those desiring to install gasoline bulk stations must submit plans and full information and receive specific approval.

With the coming of the radio craze we warned against fire hazards connected therewith and a chapter in our state electrical code now regulates radio installation.

Prior to July 4th our time is given to the suppression of the more dangerous kinds of fireworks, and to regulation of the storage and use of the milder kinds. Accidents and fires along these lines have decreased, but have not been entirely elimiated.

To me the work has been full of interest because of its endless varity, its special problems and the conviction that it was in the interests of humanity and the protection of property.

INSPECTIONS AND INSPECTORS

By J. E. Florin

Superintendent of Fire Prevention
Industrial Commission of Wisconsin

The essence of the conservation movement, of which fire prevention is an important part, during the past quarter century has been to discover and study the causes of waste, whether human or property, and to eliminate these gradually so far as humanly possible. Small pox, yellow fever, malaria and other contagious diseases are not dreaded as they were years ago because scientists and scientific medical men, as distinguished from mere practitioners, discovered the causes of these diseases and eliminated them to a great extent. Through such movements pestilential cities like Havana and Manila have become reasonably healthful. Doctors deserve equal credit with engineers for the building of the Panama Canal, because they made it possible to live and work in the Canal Zone by conquering diseases. By studying and eliminating causes, human sacrifices through contagious diseases have been checked. Fire waste must be checked in the same way.

The wide-awake fire departments of to-day, the country over, are organized as fire prevention forces as well as fire fighting organizations, and to-day no department lives up to its full measure of usefulness unless it does some real and effective fire prevention work. No doubt you have noticed also that no program of a firemen's course or convention, state or national, is complete without allotting a due share of time to fire prevention topics and discussions.

It devolves upon the chief to plan the fire prevention campaign in his city, with such counsel and advice as he may get locally or from state departments.

INSPECTORS

Much of the success and value of the work will depend on the character, ability, intelligence, tact, and judgment of the inspectors, and the manner and thoroughness of their work.

The inspector should know the local building code and ordinances affecting the fire hazard and also the state laws and regulations affecting the same hazards. He should have a good knowledge of the many common fire hazards and the ever increasing special hazards of building construction which tends to greater safety in preventing and confining the fire, of all conditions that are implied in the broad term of "poor housekeeping," of private fire appliances, their use, care and limitations. He must have an observant eye, an inquisitive mind, and

be determined to get at the bottom of all problems before him. He must be a teacher to the extent of being able to explain fire hazards to those with whom he deals. If he is to succeed, he must have their good will, confidence and co-operation. This depends largely on his preparation and still more on the manner in which he does his work and his method of approaching people. The officious, bull-dozing inspector will never be a success. The crook may, but the honest American business man does not tremble at the approach of a "blue-coat," as is the case in police-ridden countries and cities. The American business man must be shown even though he does not live in the "show-me" state.

It would be well if all inspectors were technically trained; but that is out of the question, as we can not get engineers to work for the ordinary fireman's salary. Lack of technical training, however, need not discourage the firemen. Good judgment, commonly called "horse sense" is his best qualification and will help him in most cases. The greatest number of fires and the bulk of the fire loss are due to very common causes, which the fireman has come to understand. When the inspector finds conditions which appear to be hazardous or manufacturing processes involving fire hazards, and he does not fully understand these conditions and processes and is in doubt as to the proper remedy, he can always get information from his chief, insurance men and specialists along different lines. When you strikes problems you do not understand fully, it will do no harm to acknowledge frankly that you are in doubt as to the proper remedy, court suggestions from the owner, or tell him that you will return later. It is not the easy problems, but the more perplexing ones that make inspection work interesting and make the inspector study and grow in his work. Whatever hazards the inspector finds he must find a proper remedy as soon as possible. The ability to recognize defects and hazards is important, but the ability to suggest a practical and effective remedy is fully as vital. Two weeks ago the volunteer chief of one of our cities called me to his garage to inspect a fire door. The garage was built in two units. The first was brick veneer, the second solid brick construction. His local insurance agent told him he could save on insurance if he installed a fire door at the one communicating opening. He bought a labeled, automatic fire door and procured a mechanic to install it. I found it installed on the side of the first, or brick veneer unit, and surrounded by the lath and plaster walls. I was obliged to tell him that he was entitled to no insurance credit simply because the door as installed would not prevent the passage of fire in either direction, and advised him to install the door on the other side attached to the solid brick wall. Just a little lack of reasoning made the remedy ineffective.

It is always best not to suggest an expensive remedy when a relatively simple and inexpensive one will answer. Often the pocket book

is the most sensitive part of the building owner's anatomy. When the inspector is sure of the hazardous condition and of the proper remedy, he is then justified to show a gentlemanly firmness and persistence in having the needed corrections made.

INSPECTIONS

Assuming that the inspector has prepared himself for his work, it is well to have him map out a definite plan of action. The inspector is working in his home town and knows the people with whom he is to deal. Before entering a building he may well consider the best way of approaching each particular owner or occupant. If possible he must make a favorable impression from the beginning. Again let me remind you that pompousness, undue officiousness or stubborn "standing upon the law" usually have the contrary effect.

As he approaches a building let him carefully note the outside conditions—walls, roofs, chimney—the exposure from other properties, the accessibility with fire department apparatus and the location of the nearest hydrants and fire alarm box. Being in his home town the inspector has a general knowledge of the use and occupancy of each building and can picture to himself hazards he is likely to find. After entering, of course, he must be ready to discover fire hazards not thought of in advance.

On entering he should go to the office and inquire for the proprietor or manager. If not personally acquainted he should introduce himself and briefly state his mission. He should always wear his uniform or badge for the purpose of identification. Either state law or local ordinance should give him full authority to inspect specified buildings at any reasonable hour of the day; but it is best not to stand on this authority, save in exceptional cases, but to ask the owner for permission to inspect, and moreover request the owner to accompany him or designate some employee to do so. In this way both fire hazards and corrections can be fully discussed personally, and the later, confirmatory, written notice need then not be so extensive. Some of the larger factories have their own inspector or safety man. Such would be the proper person to accompany the fireman on his inspection trip.

The inspector must avoid carping criticism and petty fault-finding and must not allow himself to be drawn into useless arguments. His business is to find hazards and defects, but he must always be ready to commend that which is good and safe.

He must not trust too much to memory, but should make full notes of defects he finds, point out and explain these defects and needed remedy to the owner, and further, either leave a copy of his recommendations with the owner or mail the same to him soon after the inspection.

Being sure of his ground, the inspector must be firm, but courteous in insisting on the proper correction of defects. In no case must he

lose his temper or he is a beaten man and subject to being "bluffed" by any "bully." In the first instance the recommendations should be in the form of suggestions, rather than official demands. If an early reinspection reveals that the recommendations have been ignored and persuasion of law is needed, it is best to call the attention of the chief to the matter, and he can then serve the proper legal notice or take such other course as to him may seem best.

To facilitate his work the inspector should follow out a regular plan. In the larger buildings, equipped with elevators, it is best to begin the inspection at the top and then work down to the basement, and from the main building to the outbuildings belonging to the same owner. The attic and the basement offer the best opportunity to inspect old jobs of electric wiring. Open switches and fuse blocks, insufficient porcelain knob fasteners, wires in contact with woodwork and other defects may there be found. The attic offers the best opportunity to inspect chimneys and make sure that woodwork is not in physical contact with thin chimney walls. Here, too, the inspector often finds a conglomeration of things stored all the way from the first copy of the Saturday Evening Post to pieces of useless, antiquated furniture. Similarly each of the lower floors must be thoroughly inspected. In the basement or an addition the inspector will find the heating plant, sometimes a power plant. This entire installation must be thoroughly inspected, the clearance to exposed woodwork, the condition of furnace, boiler, smokepipes and chimney noted, also the storage of fuel and ashes. Defects along these lines are usually the leading causes of fires. The basements and closets also offer opportunity for the storage of all sorts of combustible materials of questionable value.

Special attention must be given to the storage of oils, paints, explosives, matches, oily waste and paint rags, carbide, chemicals, etc.

In addition to noting defects and fire hazards, the inspector should ascertain the condition of private fire appliances, such as water barrels and pails, chemical extinguishers, hose, hose connections, valves, private fire alarms and water supply. With permission of the owner it is well to make tests of some of these appliances and follow up with the necessary recommendations for corrections and improvements. The inspector should always stress the importance of first aid fire appliances to extinguish incipient fires.

Buildings in process of construction should be inspected to make sure that they comply with the building code and ordinances. Rebuilding and repairs must be under close scrutiny of the inspector. Often he can suggest inexpensive improvements in old buildings which will make them less liable to fire and will materially retard the spread of fire. Any improvements in the building line are of a permanent nature, while hazards arising from use, occupancy and housekeeping are with us always and mean a constant fight.

The condition of the yards, alleys and sidewalk areas must also be noted, and vacant, useless shacks and fire-traps listed for condemnation by the fire chief or building inspector. This is a harsh remedy, as no compensation is given in such condemnation cases, and the inspector must be sure that he is within his powers and rights. This is a particular work, but the removal of such fire starters and fire spreaders often greatly increases safety from fire and conflagration.

Where neither state laws nor city ordinances confer sufficient power upon the department or its chief, let him take up the matter with the mayor and council, demonstrating to them that a comprehensive building and fire prevention ordinance is for the best interests of the city. In time, the results obtained will speak for him.

From long experience I am thoroughly convinced that nothing is more effective in reducing the deplorable fire waste than continuous intelligent inspection work, and in time your success will be measured in dollars and cents by the per capita fire loss during a period of years.

While inspection work is not as dramatic as saving a child from a burning building, I am convinced that not only more property but more precious lives are saved through intelligent inspection work than by all the streams of water and all extinguishing work. Why expose either to the danger of fire?

You have heard the story of the darky who was trying to saddle a mule. A by-stander asked him, "Does the mule ever kick you?" The darky said, "No sah, but he sometimes kick whar I'se jes bin." The darky knew where the mule was likely to kick. We never know where fire will strike next, and the only way is to remove all causes of fire as far as humanly possible.

Your service must be such that you will be as welcome on your fire prevention mission as you are when responding to a fire call.

Service must be the watchword of fire departments and by doing intelligent inspection work in addition to the fire fighting activities the department will live up to its full measure of usefulness and public service.

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