

**FIRE PROTECTION HISTORY-PART 202: 1903
(SPRINKLER SYSTEM WATER SUPPLIES-GRAVITY TANKS/SPRINKLER
PROTECTION INSTALLERS)**

By Richard Schulte

The seventh Annual Meeting of the National Fire Protection Association (NFPA) was held in Chicago in late May 1903. Among the various topics discussed at this meeting was the sizing of gravity tanks supplying sprinkler systems and also who should be permitted to install sprinkler protection. The discussion of the latter topic was quite contentious. The following is a transcript of the discussions on these two topics:

***“REPORT OF COMMITTEE ON AUTOMATIC SPRINKLER
EQUIPMENTS.***

W. C. Robinson, Chairman.

*W. A. Anderson, F. D. A. Balch, A. Blauvelt, F. E. Cabot,
Everett U. Crosby, H. A. Fiske.*

Mr. Stratton. *May I ask the indulgence of the Chairman of the Committee to make a few remarks in advance of the report?*

Mr. Robinson. *Certainly.*

Mr. Stratton. *I understand since I have arrived in town that there is some feeling upon the part of some of our own people, and also some among the sprinkler manufacturers, in regard to **the propriety of selling automatic sprinklers to be put up by inexperienced and incompetent and small concerns without any responsibility.** Now, it seems that is rather remote from our action here, but, at the same time, it bears directly upon the results which we seek; and as we have spent a great deal of time and money in this organization to create standards and to provide for the betterment of practices and the application of standards to the protection of property, it seems to me that perhaps this will contribute quite as much to the success of all that work as anything that we can ally with it.*

The sale of automatic sprinklers to irresponsible and inexperienced people has undoubtedly caused a great many representatives of inspection departments now in this room trouble and annoyance, and others, who have further responsibilities, a great deal of anxiety. Now, if we could in some way consider this matter, even if we have nothing but a discussion of it here, I think it would be wise, under the circumstances, because it is a matter of considerable importance just now, and if we go on in the future trying to apply these standards, and then farm out parts of the materials, or allow them to be farmed out, to people who do not know these requirements and do not know how to apply them or use them, we will be setting our wheels so they will not turn around very fast toward the end we are after.

The President. *You have heard Capt. Stratton's remarks, gentlemen, and I would like to have a free expression of opinion on the part of the gentlemen connected with the various rating offices.*

Mr. Robinson. *If there is to be no further discussion of the matter, I will move that the President appoint a Committee to take up the subject and to report back to the Association.*

The President. *The Chairman would prefer to have it referred to the Automatic Sprinkler Committee. Does that meet your views, Capt. Stratton?*

Mr. Stratton. *I did not rise with that intention. There has been a good deal of talk about this since I have come here, and I think here is the place and this is the time to discuss the matter.*

The President. *I hope gentlemen will express their opinions.*

Mr. Stewart. *I feel that this is an important matter, but at the same time any definite action upon it by this Association is perhaps uncalled for, or a little beyond our jurisdiction. I feel that it is undoubtedly the sense of most of the members, or at least of a great many of them, that the introduction of sprinklers by those who are entirely inexperienced in the demands in this particular line, is certainly not conducive to the best results. I think experience has shown that. It may be desirable for the Association, if the members feel so, to express as the sense of this meeting that it is unadvisable and not conducive to the best results that automatic sprinklers should be installed by inexperienced persons. Beyond that I do not think it would be advisable for us to take any action in the matter.*

Mr. Cabot. *If I am not mistaken, Mr. President, our rules today say as much as Mr. Stewart has suggested.*

Mr. Blauvelt. *I hope something will result from this further than mere desultory talk. We are never going to know any more about this subject than we know now. We know it is a very burdensome matter for us to be called upon to act as working superintendents for people who undertake to install sprinklers when they don't know how, simply because they have bought some sprinklers somewhere. While it is true that no rule can be laid down, and doubtless no rule could be carried out if it were laid down, yet I believe that Underwriters having jurisdiction would feel that their hands were upheld by this Association if they could get some expression from the Association to the effect that the practice of selling sprinklers and having Tom, Dick and Harry put them in is bad. Speaking for our office, I would say that I should like to have such moral support from this Association. We have to resist attempts made by parties who have gotten hold of an odd lot of sprinklers somewhere and who wish to put them in, and who insist that we make the drawings for them, insist we act as working superintendents, insist that we spend railroad fares to go and teach them, and insist that we overcome the errors that they make. It is a very annoying thing and a very expensive thing. I hope this matter will be very freely discussed and that something will be done today on this floor whereby Underwriters having jurisdiction can get some definite instruction from this body as to what to do in cases of this kind.*

Mr. Sullivan. *Mr. Blauvelt has expressed exactly my views. I think this Association should as a body take some action, or cause some expression to be made, that will be a support to us men out in the field who have all this trouble **occasioned by irresponsible parties installing sprinklers.***

Mr. Anderson. *I hope this Association will take some action. We have been fighting this for ourselves in New York. **We have always had, ever since we recognized sprinklers, a rule that before we would make an examination of a sprinkler equipment we should be furnished with plans and specifications by the sprinkler company installing it.** I see no reason why we should go around and show people how to do the work properly, and I think the Association can help us very much now if it will. We were recently called upon to approve a large sprinkler equipment. We notified the owners of our rule, and after a while they had an authorized sprinkler company look it over, and the company notified them after examination that it could not ask for the approval of the equipment unless important alterations were made.*

Sec. Crosby. *I would move that this subject be referred to a Committee to be appointed by the Chair, to submit at tomorrow's session a resolution which shall express the sense of the Association on this subject. **I want to allude to one other serious difficulty we are apt to encounter in sprinkler systems which are installed by plumbers or pipe fitters, and that is the clogging of the piping with all sorts of foreign material.** It is quite a trick to put the sprinkler piping up properly and know how to leave it during the progress of the work. Inexperienced men are apt to cover up the ends of the pipes with bagging, and they are less careful than a regular sprinkler*

gang about how they put up the pipes. I have known a good many cases where blank flanges, monkey-wrenches, pussy-cats, and all sorts of things which do not belong in a standard installation have gotten into the pipes.

Mr. Goodloe. There seems to be no division of sentiment as to not having Tom, Dick and Harry put in devices such as gasolene vapor lamps and other things, unless they are approved by the Laboratories and manufactured by certain parties. Now wouldn't it be well to provide that we recognize only certain devices in the way of sprinkler equipment when they are manufactured and installed by certain people, and in that way confine the installation to responsible parties. I simply make that as a suggestion for the consideration of the Committee which is to be appointed.

The President. The Committee to be appointed will take note of what is said, and I should like to have an expression of opinion on the whole subject by any gentleman who wishes to express himself.

Mr. Williams. During the last week I inspected a risk in Wisconsin, where the equipment cost \$15,000, and was installed by an outside party. It is a wet system, and all the rules regarding area have been absolutely violated. In some places the sprinklers are twelve feet apart, there are no sprinklers at all in the peak, and yet that equipment has been passed as practically standard, in order to get the money. That is a case I saw in actual experience last week.

Mr. Crosby's motion for the appointment of a Committee was adopted, and the President appointed Messrs. Stratton, Robinson and Anderson as the Committee.

The President. Now, Mr. Robinson, you can proceed with your report.

Mr. Robinson. Mr. President, the Committee has no special report to make at this time, only a verbal one. The sub-committees have been working on their various subjects, but are not yet ready to report, and as the rules would not come up for amendment for the next two years it was not thought advisable to advance any material matter for discussion, as nothing could finally be acted upon at this time.

I do wish to bring before you, however, **the matter of uniform requirements for tank capacities**, in order that the Committee may have the benefit of some discussion upon it. The existing rules, many of them, are mandatory and without reason, so far as I can judge, and I think a start should be made, and I know you will aid your Committee if you will freely discuss the matter in the time that you have remaining this afternoon. The subject is a very broad one. There are several factors entering into the proper determination for water supplies, but there is certainly no good reason why there should be 50 per cent difference in the amount of water required for the same class of risk in one section of the country and another. I trust that the matter will be taken up by the representative men from the different parts of the country,

with the idea of giving the Chairman of your Committee at least some information, so that he can make a start on this subject. The most important factors entering into the question would seem to be:

First, the number of sprinklers liable to be opened,

Second, the time which the sprinklers would have to be supplied;

Third, the conditions tending to the rapid spread of the fire;

Fourth, the susceptibility of the stock or contents of the building to the fire extinguishing effect of water.

With those four suggestions, I would like to hear from the members.

Mr. Palm. *I will say to the Chairman, Mr. President, that I have considered this matter quite seriously, and though I am not prepared at present to give any data, I have gone into several of the questions which he has brought out, as to the amount of water discharged under certain conditions, the number of heads opening, the time required to supply a given amount under certain conditions, etc.; and if those figures will be of any interest to him I shall be pleased to furnish them to him tomorrow. I would also suggest in connection with this, that inasmuch as we have accepted 5000 gallons as a standard, as it were, for about 100 heads—*

Mr. Stewart. *That is the minimum specified.*

Mr. Palm. *It is generally understood, at any rate, that 5000 gallons is the capacity of a minimum sized tank, and I think the rules so state. There are a great many equipments which have 100 heads which have that size tank and a 4-inch riser, so that would probably be a good starting point, with 7500 gallons for 150 heads, 10,000 for 200, and so on. Now, these are all arbitrary figures, of course, but I think if it were carried on along that line with pressure tanks and pumps, it would be a good matter to be developed by the Association. At the present time the inspectors are a good deal at sea, and by applying this rule in several instances I have found it to work to very good advantage.*

Mr. Robinson. *I hope the matter will not be worked out along those lines, for any arbitrary figures you may put down will simply land us where we are at present. We want to know the necessity for our rules. We want to base our water supplies on the real necessity for the water, we want to base them on statistics as far as we can get at them, and I shall look to Mr. Fiske's Committee for some aid in this matter, that is, I shall ask the Committee for some aid. I do not think we can ever establish a rule which we can apply which will cover all individual cases. Each case will have to be judged on its merits to a greater or less extent; but we certainly do not need to be*

so far at sea as we are at present. *I believe if we could take the data we already have and analyze it, and receive suggestions from the members bearing on this analysis, we might arrive at some practical rule based on good engineering.*

The President. *I would state that the crude rule which we have in Philadelphia upon which we base the capacity of the tank is 50 per cent of the heads in the largest room to be supplied at the rate of 15 gallons per head per minute for 15 minutes.*

Mr. Robinson. *The rules vary in different places, and so far as I can discover there seems to be no reason for a great many of them, except they conform to the ideas of the man who makes them.*

Mr. Stratton. *I think there is one general rule which can be applied to cover all cases, and that is this: get as big a tank as you can, put it as far up as you can, get as many sprinklers as you can, and then don't have any fire. I don't believe you can come any nearer to it than that if you figure from now until a dry pipe system freezes up.*

Mr. Blauvelt. *I have very much the same idea that Mr. Stratton has just expressed, except that I am not quite so greedy as he is. I think if we should attempt to arrive at any general rule it would be of very little benefit to those who do not now have rules, and it would somewhat hamper those who do not wish a rule, and **would be an embarrassment to those who have empirical rules that they are accustomed to applying and that the assured are accustomed to.** I believe a rule such as you have in Philadelphia and in New York, although there is **no engineering defence** for it at all, is a convenience in working with the assured and gives you satisfactory general results **without the necessity of any engineering explanation of the rule.** I think, therefore, that the present conditions cannot be tampered with without the danger of making them worse than they now are.*

Mr. Palm. *May I inquire what is the custom in this part of the country with regard to advising as to the size of tanks?*

Mr. Blauvelt. *Mr. Palm looked at me very intently when he asked that question, as if I was the one who was giving all the advice in this part of the country. I will say that that is not true. There is a good deal of advice given in this territory within 500 miles of Chicago, and that advice comes, roughly speaking, from ten different sets of individuals. There are the excepted city inspectors, the inspectors of the Union, the Factory Association, the Junior and Senior Mutuals, and so on. In this territory, roughly speaking, no new tanks are being put up smaller than 10,000 gallons, and not very many of those. I should say that 12,000 or 15,000 gallons was nearer the minimum. There are not many tanks being put up on buildings of over 20,000 or 25,000 gallons' capacity, although in some places where they have a robust building and a robust personage, such as in Milwaukee, the size of the tank is considerably larger.*

Mr. Sullivan. *We try to get them.*

Mr. Blauvelt. *The practice of the Factory Association is to endeavor to increase the height of the tank rather than to increase its capacity. I might speak of this at a little length, because I have regretted to see many men who apparently thought that because there was a large amount of water in storage, there was some occult something which was going to put it on the fire, simply because it was in storage. A large tank at a given elevation on a building will not necessarily by any means control a fire with any more certainty than a small tank will. The fire is not controlled at a given time, so that a certain number of sprinklers open and no more sprinklers open, but it keeps on spreading and opening more sprinklers, and unless you have a water pressure which is sufficient to drive the increased number of sprinklers which are across the line, that is, a line running across the room, to take up the frictional loss in the open line of sprinklers, you will simply find that a part of those sprinklers which have already opened will stop working, cease to spray, for the simple reason that there isn't pressure enough to drive the line of sprinklers across the room. Therefore it is a physical impossibility to get the water on the fire in an increased quantity unless you have increased pressure to do it, and the building will burn up just as readily with a big tank on it as it will with a small tank, in the case of any fire which opens a progressively increasing number of sprinklers. The number of fires where the opening up of your sprinklers is controlled, not by the extinguishing effect of the sprinklers, but by reason of the dimensions of the room is relatively few. A fire in a dry kiln, where there are a small number of sprinklers, can be held by a large tank better than by a small one, for the reason that the large tank is able to keep the sprinklers running for a longer period of time; but generally large tanks are not of particular benefit unless they are put up high. And so the general practice in our territory has been to try to get the tanks higher so as to increase the pressure.*

I see it is about time for us to adjourn now, and I will only say further that I recommend for all ordinary practice to stop absolutely at 30,000 gallons, and to put the tank on the hydrants, and high enough to get hydrant pressure. You can then go right ahead and take hose streams off, and you will find you can run a fair number of hose streams for half an hour, and you will still have a good supply left in your tank for a sprinkler reserve. There are a few exceptional properties where exceptional treatment may be required, but I think in the present state of affairs the general practice may fairly be to keep within the limits of 10,000 and 30,000 gallons per tank.

The President. *Has Mr. Robinson anything further to say?*

Mr. Robinson. *No, I have not.*

Mr. Stratton. *Before we adjourn, I would say that when the time comes I should like to talk the matter of hydrants on tanks over with Mr. Blauvelt. In the meantime he can figure up the fair number of fire streams he is going to maintain, and for how long, and what effect it will have on the sprinklers, for I shall want to get at that.*

Sec. Crosby. *I would like to ask Mr. Robinson if the Sprinkler Committee is to take up the testing for friction loss in long bend fittings, to demonstrate their superiority, if any, over the ordinary fittings.*

Mr. Robinson. *Such was the idea, Mr. President; the only point was to get the time and apparatus. We haven't yet secured all the apparatus we need for such a series of tests.*

(Adjourned to 10 A. M., Wednesday, May 27.)

Chicago, Ill., May 27, 1903.

The President. *The Special Committee appointed yesterday to consider the matter of the installation of sprinklers by other than the sprinkler companies I understand is now ready to report.*

Mr. Stratton. *Mr President, the report of the Special Committee appointed to consider what action this Association should take, if any, with reference to the installation of automatic sprinklers by other than the responsible manufacturers is as follows:*

WHEREAS, It has been the practice of the automatic sprinkler companies to sell sprinklers to be installed by others, and as this practice is growing to the detriment of reliable and satisfactory automatic sprinkler installation; and

WHEREAS, Our members have experienced much difficulty in having equipments properly installed, under such conditions, in accordance with our rules; be it

RESOLVED: That it is the sentiment of the National Fire Protection Association that automatic sprinklers should be installed by the recognized automatic sprinkler companies, and should not be sold to be erected by those not experienced in the installation of an automatic sprinkler equipment, unless such installation be guaranteed to comply with the rules of [of] the National Board of Fire Underwriters by the sprinkler company furnishing the devices installed.

Mr. Cabot. I hope this resolution will not be passed, and in making these remarks I want to say that I am not speaking for my own territory, because we have no difficulty whatever there. Those of you who were at the last meeting of the Association will remember that this same subject came up, and that action similar to what is now proposed was defeated, after a few remarks by Mr. Goddard, who is the secretary of the New England Insurance Exchange. If you pass this resolution you will put the Exchange in the embarrassing situation of either doing counter to the vote of this body—a thing which it has been very loth to do, Mr. President, and has never done, so far as either this Association or the Electric Association is concerned—or else of refusing many risks which today it is bound to accept.

Now, Mr. President, I do not believe any man in this room is prepared to say that he will not accept a risk under the conditions which are objected to; and if we are not prepared to say that we will not accept such a risk, then let us not resolute about it. Let us not use mere words. We have got words to-day in our sprinkler rules which say that this ought not to be done, and let us not merely say that over again. If we are prepared to go out and say that we won't accept a risk unless this recommendation is complied with, I am with you; but I don't believe in merely saying that we don't think the practice is a good thing and resolving about it.

Mr. Stratton. *May I ask, Mr. President, what the nature of the embarrassing situation of the New England Exchange will be?*

Mr. Cabot. *I thought, Mr. President, that I made it plain that they would either have to abide by this resolution and refuse to accept such installation, or else they would have to pass over the resolution which it is proposed to adopt.*

Mr. Stratton. *Mr. President, the New England Insurance Exchange was foremost in the work of advocating and trying to get the installation of sprinklers throughout their district, and I cannot for a moment think that that body would prefer to stay and operate under the conditions which were first provided by them so long ago, rather than to progress with every opportunity and in conjunction with this Association. If this resolution will do anything to advance the work in harmony with the work of this Association, which has been altogether for the purpose of creating and defining rules already made to improve and benefit the character of fire protection installation of all kinds, not only sprinklers, but everything, we should adopt it. We have been in operation seven years and it is quite natural that we should have learned something, and this is the place where we come to discuss what we have learned, and to see whether we will profit by experience; and I don't believe that there is any rule of the New England Exchange now in existence which will force them to lose business if this resolution is adopted. If there is such business, it is beyond the reach of this, because this will not be retroactive upon the business, and I do not see why in the future we should not guard ourselves.*

Mr. Stewart. *I would like to inquire what is the necessity for this, in view of the statements already existing in the rules, and in what way a resolution passed as the sentiment of the members would help any of those in the field more than the fact that they are now able to show a man what is stated in the printed requirements or rules.*

Mr. Blauvelt. *Mr. President, I rise to reply to Mr. Stewart's inquiry, and to say that it is eminently fitting, after the lapse of a number of years, that we should reiterate and make more plain that which we have already said. That is what I consider this resolution to do. I think it does not do more than that. And I think this is a very good time, after a lapse of years, and after our experience, to make record of our matured view.*

Mr. Stratton. *I would like to call attention, Mr. President, to the fact that the rule is not a mandatory one.*

The President. *No; it is an expression of opinion.*

Mr. Shetland. *I would like to ask Mr. Stratton what he would do provided the assured wants to put in one, two or three sprinklers. If I understand this resolution correctly it means that if the assured wants to make a slight addition to his equipment he should get a sprinkler company to guarantee that the work will be done correctly. Now, I do not think, as Mr. Cabot says, that you want to pass a resolution here which is not going to be enforced. We cannot enforce it, and not only the New England Insurance Exchange cannot enforce it, but there are other organizations which cannot enforce it. They are not going to reject business simply because a party picks up a few sprinklers and puts them in himself. What are the inspectors for if they are not to find out whether the work is done correctly? If it is not done*

correctly, and the equipment is not up to the standard laid down, the risk will be taken at some other rate, and that is the end of it. We all know it, we know that we do it to-day and that we are going to do it tomorrow; and this matter is covered in the rules now so that there is no need of saying anything else about it.

Mr. Halliard. *I hope that this resolution will not prevail. We have a great many manufacturers in New England who install these equipments in a manner satisfactory to us, although it would be hard to obtain a guarantee for them.*

Mr. Palm. *I do not think that the resolution—if I am mistaken I want to be corrected—is intended at all to apply to slight alterations or additions.*

Mr. Shetland. *It says so.*

Mr. Stratton. *Where does it say so?*

Mr. Sweetland. *It says any sprinkler installed, practically, or words to that effect.*

Mr. Stratton. *It refers to sprinkler installation.*

Mr. Shetland. *Isn't that a sprinkler installation?*

Mr. Stratton. *No.*

Mr. Shetland. *Certainly, it is.*

Mr. Stratton. *A sprinkler installation is the installation of a sprinkler equipment.*

Mr. Shetland. *Well, it says installation of sprinklers.*

Mr. Stratton. *If you want to split hairs on this I think I can go into it a little further. In the first place Mr. Halliard says we can't get a guarantee. I say we can get a guarantee of his goods from any sprinkler man who wants to stay in business. And so far as adding sprinklers and the duty of the inspectors is concerned, the suggestion of Mr. Shetland is, isn't it just as good as a guarantee from the man who makes the sprinklers, if you have any confidence in the inspectors, to have them say that they are installed to cover the points where additional sprinklers are needed? But that would not cover the installation of a 1000 or 1500 or 2500 sprinkler equipment with all the conditions surrounding it. We have gone ahead and made rules—for what? We have been legislating upon the minutest parts of fire apparatus all the time, and now we would leave this open at the end to have it spoiled in the installation. That is more a matter of sentiment than of business. **We don't care anything about the sprinkler men in this matter; we want to get protection for the companies we represent, and that is one way of improving that protection.***

Mr. Palm. I am afraid this resolution will be looked upon as a hardship to the assured, but really it is quite the contrary. This provides for a guarantee that the work is properly done, and that is worth a great deal to the assured. Quite a number of instances have come to my notice quite recently where errors have been discovered after the building has been equipped, and I have told the parties that the companies doing the work could have the privilege of making it right, and I trust that they will. Now, this resolution points out to the assured our desire that they should get the best work. It guarantees to the assured that they will get proper work and to the insurance companies proper and well installed sprinkler equipments. I may state that I am speaking for the Underwriters of New York State, and have been requested to make these remarks on the floor.

Mr. Shetland. Mr. President, at the time we had an alarm valve, I think it was, or a dry valve, up for consideration and approval by the Exchange some years ago, before such approval was given we obliged the company to name the price that it would sell it for to outside parties, simply on this point, and this point only, to provide that others could install it besides the sprinkler company. In many of our risks we absolutely require them to furnish plans before any sprinklers are installed. It is a simple problem to check up that plan, we have got to check the work up any way, and if we check the plan up we save ourselves. And while I know they may have some trouble in the West and in other places, and we have trouble in New England also, I don't believe we have half the trouble now that we will have if this resolution is passed.

Mr. Stratton. *I should like to ask Mr. Shetland if the checking up of a plan for a sprinkler equipment before the pipe is cut is any guarantee that you are going to get it the way you want it?*

Mr. Shetland. *No guarantee at all.*

Mr. Stratton. *Then I don't think that applies to this question.*

Mr. Shetland. *If a man is capable of making a plan which is satisfactory, he certainly ought to be capable of installing the equipment according to that plan.*

Mr. Stratton. *The same man who makes the plan doesn't put the sprinklers in.*

Mr. Wensley. *That brings up the point I had in mind as to what would be the practical result of this resolution. When it comes to the installation of a few sprinkler heads here, there or anywhere, the sprinkler companies haven't enough men so that they can send their own men to all different points at the same time. They will be obliged to follow out some such plan as this, in all probability—and if I am not mistaken one of them has said so in my hearing since I have been in Chicago; they will correspond with the assured, find out the dimensions of his building, how many heads are going to be required, and then they will have a sketch drawn and the heads will be put in. This recommendation that we have a guarantee will provide for the perfecting of a little addition to the equipment afterwards, if necessary. I think the resolution is well drawn and covers the several points which Mr. Palm has pointed out in the interest of the insurance companies, in the interest of the assured, and in the interest of the sprinkler companies, although we are not legislating for them. I think the proposition from all three standpoints is fair, and I hope the resolution will prevail.*

Mr. White. *I want to say a word in favor of the resolution, which I certainly hope will prevail. It may be of interest to know that in the territory which I represented for twelve years there was not a single equipment installed by other than a reputable sprinkler contractor, and we didn't lose a single sprinklered risk. I don't think there is any hardship in the application of this rule, and I think most of the members who have spoken have lost sight of the fact that it is not mandatory, but that it is a rule to be used at discretion by the people in the field.*

Mr. Palm. *I would like to make one suggestion with regard to the accuracy of the work. The man who has the work done will have a guarantee, and it will be a question of honor with all parties concerned that if the work is not right it will be made right.*

Mr. Wensley. *In other words, it helps us as well as it helps the assured and the sprinkler company.*

Mr. Shetland. *I would like to ask Mr. Stratton to answer the question what he is going to do provided a man wants to install three or four or a dozen sprinklers in his risk.*

Mr. Stratton. *I will have to answer that when I get the inquiry from the man. I don't know what the conditions would be under which he would want to do it.*

Mr. Shetland. *The resolution would not allow him to do it.*

Mr. Williams. *When a sprinkler equipment is installed, we want to know that the best workmanship that can be had is used in installing the equipment. Now, if we have an ordinary plumber put in an equipment according to plans, the plans may not fit the conditions in the factory exactly, and he has got to make changes, and those changes nine times out of ten will not conform to the plans. When an equipment is installed by an untrained or an unskilled mechanic, he is liable to leave in blank flanges, to use white lead or red lead too liberally, and the grossest carelessness is often displayed. When an equipment is put in by a reputable sprinkler company, all those features are eliminated, and I hope this resolution will prevail.*

Mr. Cabot. *Mr. President, I want to say just one word. Mr. Wensley made a very good and very telling speech in favor of this resolution, but he forgot one man; he forgot the assured. Today the assured is the man who is going to the Legislature and passing anti-compact laws. Some of the Western States know what that means, and one of the New England States knows what it means. Now, when you tell the assured that he can only buy his sprinklers where he buys his pipe and all the fittings and everything else from the man who makes them, he feels right off that if he could have bought them where he pleased and put them in, he could have saved something, and you at once put him in antagonism to the insurance interests; and then he goes to the Legislature and shoves in some bill which is against them.*

Mr. Stratton. *I would like to have Mr. Cabot point out wherein this resolution would restrict the purchase of sprinklers, in the way he suggests.*

Mr. Cabot. *If I understand the English language that is the whole effect of the resolution; there is nothing else in it.*

Mr. Stratton. *I am sorry to say that I have suspicions, then, of your knowledge of English. Please read it.*

Mr. Cabot. *"We therefore strongly recommend to the automatic sprinkler companies that they do not sell their sprinklers to be erected by others."*

Mr. Stratton. *That has been stricken out by the Committee. Go on and read a little further.*

Mr. Cabot. *No, that is all I want to read. I am talking about the assured. I am not afraid of him, but some gentlemen in the West have found out that there is reason to be afraid of him.*

Mr. Stratton. *I would like to read a little more of this English—"unless such installations be guaranteed by the sprinkler company to comply with the rules of the National Board of Fire Underwriters.["]*

Mr. Wensley. *That is just the point. At the end of the resolution it says "unless guaranteed by the sprinkler company." We are in this position: the assured cannot say, as one of them did to us in a letter only last week, that this recommendation for new sprinklers is in the interest of such and such sprinkler people; but we are in the position to say to them now, here you have got a protection for yourselves as well as for the insurance companies and for the sprinkler companies; you have got a guarantee that this equipment is going to be put in so that it will give you the best protection, and so it shall not cost you anything for changes on account of defects.*

Mr. Blauvelt. *Mr. President, I think this resolution gives the Western inspectors all the latitude they need in dealing with the assured. If there is any Western inspector present who does not think so, I should like to hear from him.*

Mr. Stewart. *I am still unable to see any reason for any further action than what has already been taken in the rules as established. To add a recommendation that a guarantee should be had would seem to me to be superfluous, for any business man would naturally require a guarantee.*

Mr. Shetland. *I want to ask one question more, and that is this: provided the sprinkler company is obliged to guarantee the work, in other words, is obliged to do the engineering and, perhaps, to make the alterations, or see that they are made, how is it going to get its pay for that? Is it going to get it by increasing the price of the sprinklers to the insured or who will pay it?*

Mr. Stratton. *My experience, covering a period of over twenty years in direct contact with the sprinkler business, indicates to me that that will not come into the question at all. The rules of underwriting associations throughout the country require that detailed drawings, showing the arrangement of the sprinkler equipment, shall be filed with the board; now, who pays for that?*

Mr. Shetland. *The assured pays for it.*

Mr. Stratton. *No, he doesn't.*

Mr. Shetland. *Yes, he does; it is added into the cost of the equipment.*

Mr. Stratton. *I don't believe you can find that item on the books of a sprinkler concern anywhere.*

Mr. Palm. *If the assured has to pay for it anyway, he had better pay for it in the beginning.*

Mr. Stratton. *Who pays the five or six sprinkler concerns who make plans and do not get the job?*

Mr. Shetland. *That is a part of their office expense.*

Mr. Stratton. *Then why single out this thing and ask who is going to pay the money for this, which is a legitimate business transaction. Such things enter into the expense of all such companies and is not a factor in making a price.*

Mr. Sullivan. *The people who pay for this equipment are the people who pay our salaries, and they pay it by making a reduction in the premiums. That being the case, we are entitled to the best. It is not a question of engineering or who will make the plans; it is a question of who will install the work and of how it will be installed and of guaranteeing the integrity of the work.*

Mr. Blauvelt. *Mr. President, I think this discussion as to who pays for one thing and who pays for another is not exactly in order. I would like to close that part of the discussion, if possible, and to point out this: that in order to get a sprinkler equipment in place and in service, money must be spent. That money is going to come from out of the United States somewhere. Now, if you adopt the method by which the least amount of money will have to be spent, you do the best thing for the sprinkler companies, for the assured, and for the insurance people. There is no way to put in a sprinkler equipment which is so expensive as to put it in by piecemeal, gathering up the ends and fastening them together, and spending a lot of insurance money for travel and inspection, and charging it in the rate.*

Mr. Stratton. *And then having to do the work all over again.*

Mr. Merrill. *I understand, Capt. Stratton, that this resolution is not intended to apply to one or two additional heads which are put on pipes by the assured, but that it is intended to cover the larger equipments. Am I correct in that understanding?*

Mr. Stratton. *Well, I singled that out as a dividing line, but I think the resolution ought to cover everything.*

Mr. Merrill. *Do you think it would be necessary to require the assured to get a guarantee from somebody if he wished to add one head to his piping?*

Mr. Stratton. No.

Mr. Merrill. Then cannot this resolution be so amended as to make that plain, and perhaps that will solve the difficulty for the members from New England? I would suggest that the Committee be requested to insert a statement as to just what size of equipment this resolution is intended to cover.

The President. Do you move an amendment?

Mr. Merrill. Yes, sir; for the purpose of bringing it before the meeting, I will move to amend this so that it shall apply only to complete equipments.

Mr. Fredrick. It does not seem to me that this presents any very great difficulty. If we have from the sprinkler contracting companies a guarantee that they will not sell their sprinklers without our permission, for example, and the assured applies to a contracting company for half a dozen or a dozen heads, the contracting company will come to us and say that they have been asked to supply them, we in turn will look into the matter and see under what conditions these sprinklers are to be installed, and then if we see fit we can make an exception to the rule and give our consent that the sprinklers can be put in, having satisfied ourselves in the individual case that the equipment contemplated, or the extension, will be installed in accordance with our rules and requirements.

The President. I understand that Mr. Merrill's motion is to amend the resolution so that it will read: "Be it resolved that it is the sentiment of the National Fire Protection Association that complete automatic sprinkler equipments should be installed by the recognized automatic sprinkler companies," etc.

Mr. White. That would allow the independent installation of perhaps two or three hundred heads as an addition to an old equipment.

Mr. Stratton. I had rather no action would be taken than that we should modify in that way the original proposition. Those who were on the Committee on sprinkler rules for the United States some seven years ago may recall how desirable it was found to be that the records of the sales of sprinklers should be available in some quarter where we could trace the Class C sprinklers; the suspicious sprinklers, and the effect of water and corrosion in various departments.

Now, we are doing a double job by the passage of this resolution. If the maker guarantees these sprinklers and keeps the record of them, if ten years from now you want to revise your sprinkler rules, and want to guard against any features in the construction of the sprinkler heads or the valves, you first find the type of sprinkler or valve and then you can go to the concern which made them and see the record. That is of great incidental value in connection with this matter. The proposed amendment is only a means to get this thing into a position where it will be useless, in my estimation, and I think the original proposition should go through or none.

Mr. Merrill's proposed amendment was rejected and the resolution as reported by the Committee was adopted."

While the discussion regarding the expertise of companies installing sprinkler protection was quite contentious, and hence, interesting, the discussion regarding the minimum size of gravity tanks is of much more interest from an engineering standpoint. Clearly, it was recognized that not only is the capacity of a gravity tank of importance, but also the height of the tank. In other words, it was recognized that flow and pressure are related and that the quantity of water flowing from operating sprinklers is directly related to the elevation pressure available from the gravity tank.

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