

ments with such an arrangement as you have here. I have been looking into the matter, and I hardly know even yet whether I have got it correctly; but I see your town is divided into six districts, and the arrangements can only be made effective in one of these, at any one time. To make it effective in any other, you must turn off the water from the district in which it previously was, and so on throughout the city. Now, this is a great defect, and it is one which it is impossible for you to get over satisfactorily, but then on the other hand it can be provided against to a certain extent by intelligent engineers, such as I presume exist among you, and the constant study and practise of the means of making large supplies of water available in case of fire. I find you have got a certain number of cisterns, with an aggregate quantity of about six hundred thousand gallons of water, but these are distributed throughout the town, and therefore are not available for any one fire. With regard to your means of getting access to the water you have a number of hydrants throughout the town, but I can hardly ascertain the principle on which they have been fixed. The proper arrangement here, in a town subject to severe frosts, would be to have the cock at such a distance from the ground level that frost could not reach it, and the elbow should always be kept empty. Now many of you have seen what are called frost-proof firecocks. When shut off the water opens a slot which allows the elbow to drain itself independently, and as you all know an empty pipe will not freeze. But you have to deal with the state of things which actually exists, and you might I think overcome the difficulty I saw yesterday, by carrying on each engine and hose-reel a piece of copper pipe of the necessary length with a proper screw, and this could be dropped down from the surface and screwed on from above without a man having to enter the hole, which must be difficult at any time, but especially in winter, or whenever snow is on the ground. Another plan which I should recommend would be the establishment of large dams. In working at fires you all know what a very great difficulty there is with eight or ten men inside a building and all the engines working around at various distances far beyond what a human voice will reach to pass an order from the man at the branch to the man at the engine, in some cases, understand, as much as 1,200 feet. In those cases I think you will find the large dams very serviceable. We have in London a set of these dams, which we use for large fires, holding a quantity of six hundred gallons. They are all in pieces, and so arranged that one man can erect them alone in less than one minute, two in half a minute and six men in a very short time. A dam can be placed at whatever spot is most convenient, beyond the range of any walls that may be likely to fall. Hose is laid from all adjacent hydrants and turned into the dam, with open deliveries, and the dam continues filling as long as the water is turned on. The result is that the line of delivery under pressure—that is to say between the engine and the branch—is a very short line in every case, and the message to be sent to the engine has not more than one hundred or one hundred and fifty feet to travel. You can all see what a convenience that is in case of large fires. Any fire not likely to be subdued within half an hour is invariably combatted in this way. There are several useful results from this; one is that instead of having a hose of that enormous length 1,200 feet, or half or one-third that length with heavy pressure from the steam engine, you have no pressure on the long distance between the hydrants and the dam, and the whole of your pressure comes on the short length between the steamer and the fire. Now I would commend to your use some means of applying water such as this. You will find that with the great river near you, and with the engine you have here, which can easily travel down hill, you could get a very favorable result. I have observed on this visit, and on all previous visits and from all correspondence I have had, an extraordinary want of originality among the members of the fire departments at this side of the Atlantic. It appears to me that a set of builders, sellers, traders and others have got hold of every department everywhere throughout America, and that they make the things and come in and sell them without any regard to or knowledge of the requirements of special cases. Now what I want to point out to you is that you have among you a certain amount of talent, and I do not at all see why you should be led away by traders or builders. You know for yourselves better than they do what you want. You ought to judge for yourselves. You cannot gallop this engine up to the Citadel and down again with a

pair of horses. Your hose, too, is of such weight that I do not understand how you can get on in case of enormous fires. I should not attempt it. If you have 46 fires in the year and 34 men to work them I have nearly 2,000 fires and some 500 men. Every steam engine of mine has got on it in a box every article required. We carry on each engine 400 feet of hose—rather a low limit—and every article required on that engine is carried on that engine, and also the whole crew. I have engines which carry all the gear, 400 feet of hose, every possible article they can require, coal for one hour, and all the men, so that when one of my engines arrives at a fire it is a complete fire brigade, and as engine after engine comes up it adds to the hose. I think myself that as soon as you over here get out of the way of being led by these traders and deal only with those who will take your orders and supply what you know you want you will begin to get very much stronger than you are now. I can assure you it would be impossible for me to protect the great city I have under my charge with the heavy gear you have here. All over America I find they use none but large nozzles. An inch-and-a-half nozzle is small for them. I think I may say that I have never on one single occasion during this current year used a jet larger than one inch. I have large engines—one of two hundred and forty horse-power—working on the river, which is 22 miles long on each side, making 44 miles to protect, and I have four vessels there, and yet one engine of two hundred and forty horse-power very rarely works with a larger jet than one inch. That engine can throw sixty-four jets. For my purposes I find it more convenient to do this than to concentrate them. I feel quite sure you will find small jets much more handy for general use. If your engine is in good working order, you get more about the building with small jets; you get the same quantity of water, whether you divide it into one hundred streams or take it all in one. It has struck me before I left you that some of you might like to ask questions of me, and I should be very glad if you will do so. It would be a great pleasure to me to answer you. When in New York, we talked a good deal on the subject of jets, and they expressed their surprise that I used one-inch jets. You will be perhaps more surprised when I tell you that I use the largest nozzles in Europe, and that all over France, Germany, Hamburg, there is no such thing known in ordinary use as a one and a-half inch jet. They possess them, as we all do because we have bought them, but they never use them. I should recommend you in this city to strike out new lines for yourselves with your own knowledge, or else to go to some English manufacturer and break away for a time from the American. I am sure you will get advantage, but the point is to do it for ourselves, and not go blindly into the hands of an English maker any more than an American.

The Chief of the Brigade enquired Captain Shaw's opinion of ladders.

Capt. Shaw—I do not think there could possibly be a more interesting enquiry. The difficulties of getting a high ladder have proved enormous. There is no such thing as a good high ladder to be found. I have seen a ladder ninety feet long, which I would have ascended if manned by my own men, but I should under no circumstances recommend it to anybody else. It was positively unsafe.

Q.—Do you believe we are better working a fire inside a house—from the ladders or the stairs?

A.—Wherever possible to use the stairs, that is the right thing to do. It is the greatest mistake that can be made to use ladders when you can get inside. Here comes in the question of the subject of clothing, which I really consider very important. Our clothing consists of the plainest things:—Tunic, trousers, boots and brass helmets. I have been explaining to the Chief to-day that in many cases where there are iron bars behind the door and much time would be occupied in forcing them, we remove a panel and creep in through this, and very often do the whole of the work without getting the door open. But as a rule some of the young men are sent inside afterwards and break open the bars. Your helmets would not pass through a panel. I know you are in the habit of getting into houses as far as you can, but I do not think you can carry your helmets because if you went through as narrow places as we do, there would not be room. We are exceedingly particular in the matter of clothing. A man must have his uniform clothing on at a fire and no other. Of course, therefore, everybody is known by the police and public.