

rapid destruction from the electric spark, all the connections between these segments to the corresponding armature coils should be well examined, and, if necessary, cleaned and well tightened, or made solid with solder. The poor contact between parts of the field wire coils can be very often discovered by holding a piece of iron, for instance a machine wrench, near the pole piece without touching it. If the contacts are good the wrench will be attracted with a uniform force, if poor, these forces will vary and cause a single vibratory motion of the wrench in the hand.

BOILER EXPLOSION AT ST. JOHN, N. B.

ON November 30th two steam boilers in a saw mill at South Bay, near Saint John, N. B., exploded with great violence, causing the death of eight persons and injuring a large number. Considerable damage was done to the property, and about three days after the explosion fire broke out in the portion damaged and the mill was completely destroyed.

There were six steam boilers in one battery in the boiler house. The boilers were of the style commonly used in saw mills in the Maritime Provinces, and sometimes called "Log Boilers." They were cylindrical, egg ended boilers about 33 inches diameter and 35 feet long. There was an equalizing pipe crossing the boilers in such manner that the water was free to flow from one boiler to another, and as all were connected to same steam pipe and were subjected to the same pressure, under ordinary circumstances the water level would be uniform in all the boilers, and if low in one would be low in all. Such at least was the design of the arrangement, and there is no reason to suppose that in actual work the equalizing pipe did not answer its purpose.

A coroner's inquest was held and a large number of witnesses examined. The explosion occurred

about nine o'clock in the morning, at a time when the engineer was at his home for breakfast. The assistant engineer stated that the feed pumps was working at full speed, and had been so for some time; that the engines were running as usual and the safety valves blowing off. The steam gauge showed a pressure of 60 lbs. per sq. inch, and the water gauges showed that the water was high in the boilers. He went to the pump to shut off the water and was in the act of doing so when the explosion occurred.

Other witnesses who had been working in the mill spoke of water having been thrown around them and the mill at the time of the explosion. Parts of two of the boilers were thrown out into the water about 1,000 feet from the boiler room, and the explosion was a violent one. From the evidence, there did not appear to have been two distinct explosions heard or seen by any one. The boilers which exploded were not next to each other, but were said to be Nos. 2 and 5 of the battery. It has frequently happened that where a number of boilers are worked in one battery, the explosion of one has led to the others going off as well. Sometimes witnesses have described these explosions as following one after the other, like shots from a revolver.

No doubt, in this case, one part of one boiler commenced to give way, and led to such disturbances within the other boilers

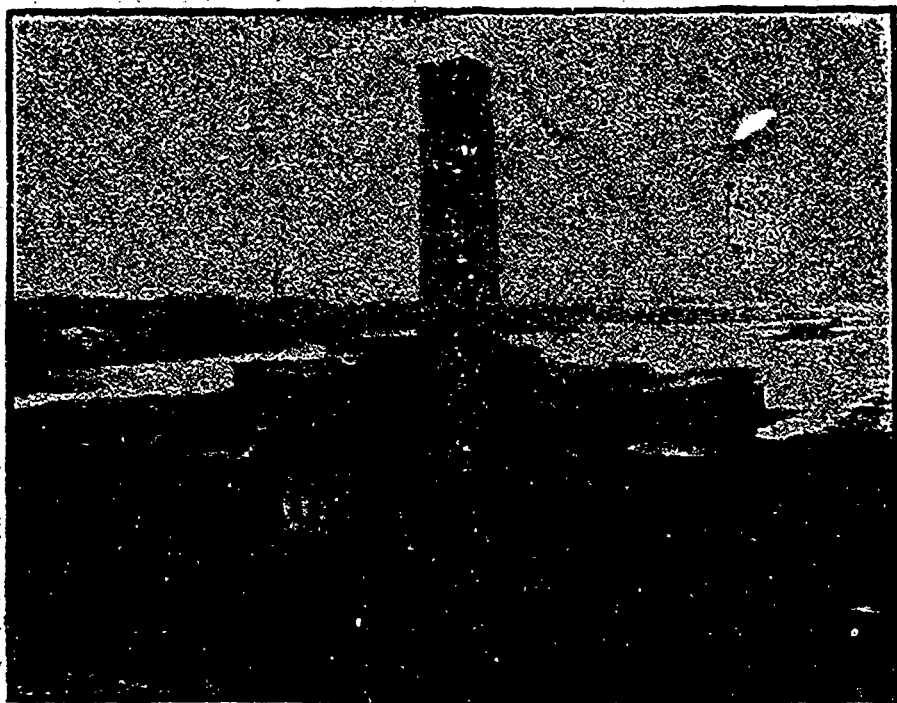
as caused the other to explode. Why did not all the others go up to? The evidence shows that the boilers were not all of the same age. They had been in their present position for about six years, but some of them had done service in other mills before being fitted up at South Bay. They were not all of equal quality, and there seems no reasonable doubt that the weakest exploded. A critical examination and test of the ruptured plates would doubtless show the reason why they ruptured and the others did not.

The jury brought in a peculiar verdict. They found that the boilers were short of water, and that from overheating they exploded. They add a recommendation that the Dominion Government be urged to make boiler inspection compulsory, and that persons running steam boilers in mills be required to hold a certificate of competency. They did not blame any one, yet the verdict intimates that the boilers were not what they should have been and that the men in charge of them could not have passed the necessary examination for certificate of competency.

The evidence of those most likely to know showed that there was plenty of water in the boilers, and some of the dead and injured were severely scalded, yet the water was low! It is the common idea of many that low water is the necessary cause of a boiler explosion.

It seems to be too much to expect from an ordinary jury that

they should be able to understand the various technical points involved in a boiler explosion investigation. In Britain, when any accident of the nature of an explosion occurs to a steam boiler, an enquiry into the matter is made by a competent engineer acting for the Board of Trade. If the accident has been a serious one or produced serious results, after the preliminary investigation the owner of the boiler is liable to be tried before



SCENE OF BOILER EXPLOSION AT ST. JOHN, N. B.

fore a court composed of engineers and a lawyer appointed to try the case for the Government. The object of this trial is to discover the cause of the explosion and to fix the blame on the proper person. Reports are published of these cases and much valuable information is given to the public and warnings issued to boiler owners and attendants. The punishments inflicted are fines or imprisonments. This method is a great improvement on the plan of leaving it to a coroner's jury to say whether or not the explosion was caused by any culpable negligence.

The statement is made that a movement is on foot for compelling periodical inspection of boilers in Canadian saw mills and licensed engineers for saw mills. If such a law were to prevail in this country there would be a great demand for competent engineers, for there are thousands of them now running mill engines who could not obtain the proper certificate of ability. — *Woodworker.*

Before the Street Railway Committee of the Toronto City Council, recently, Mr. Cargill, of the Thomson-Houston Electric Company gave statistics of the relative cost of electric and horse power, saying that in some cases the reduction had been from seventeen to nine cents per mile, or eight cents per mile in favor of electricity in one case, and from seventeen to thirteen in another. In Toronto the difficulties of electricity would probably be increased by the severity of the winters, the high price of coal and other considerations.