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Per A. W. LAW, Sec.-Treas.

Toronto, October 1, 1893.

OWING to the large amount of space taken up in our last two issues by the reports of the conventions of Canadian Stationary Engineers and the Canadian Electrical Association, a considerable amount of news and correspondence has been crowded out, but will appear in next issue. Our notices of the Montreal and Toronto Exhibitions are also held over.

PROF. THURSTON, an American consulting engineer, who was officially connected with the Philadelphia Exposition in 1876, says that the Canadian exhibit at the World's Fair shows that the Dominion has made greater progress in manufactures during the time which has elapsed since the former exhibition than any other nation.

STEEL FOR FIRE-BOXES.

An English manufacturer, speaking at a meeting of the Mechanics' Association, at Lakewood, N.J., recommended that plates for fire-box and other purposes should have about .11 of carbon. You may put, said he, from .50 to 55 of ferro-manganese into it, but you should get your sulphur and phosphorus down to as low as .04 to .05. If you do that you will have a material which if properly manipulated from the ingot down to the shorn plate, will do almost anything as regards standing fire and every other manipulation involved in turning it into first-class boilers. In some factories in this country it is thought not necessary to put any work on the ingot. We hold a different opinion. We prefer for the best class of work to hammer the ingot, reducing it from about 15 in. thick to about 5 in. That ingot is hammered on the flat and on the edge and the ends are cut off. It is necessary to exercise care in reheating such a slab, because we all know that we are troubled at times with lamination in the plate. That has been clearly proved over and over again to be caused by the overlapping of one side of the plate on the other. Men who are rushing their work will bring out their slabs not so well heated on one side as on the other, and when such a slab enters the rolls the soft side will run ahead and draw farther than the hard side, and the hard side is, as it were, rolled partially into the soft slate. This may not show itself, even when the plate is short, even when it has been annealed, but still it will show itself in working some day. It will show itself when it comes to deal with the expansion and contraction due to its work in the boiler. We have found by experience that there should be a little difference in the amount of carbon according to the thickness of the plate that you are making. If you are starting with .11 carbon for a quarter-inch plate, and you are going to make half-inch plates which shall bear the 25 tons and not less than 24 tons tensile test, and with the same elongation of 25 or 20 per cent., you must put a little more carbon into the half-inch plate than you put into a quarter-inch plate, and so on. Otherwise you will not get the same tensile strength, because your material is made more dense in rolling down to a quarter-inch plate, than to a half-inch or three-quarter inch plate. These features have led to pretty fair success on our side. If the users of plate in this country were to lay down a standard of purity, and strength, and elongation of plate, this would be the very first thing to do in order to get that uniformity in the fire-box plates which is so much required. Of course, a great many plates would have to be thrown out, but there is nothing like having a lot of material thrown out that will make a manufacturer find out what is the right thing for him to do. We employ a method of determining the amount of carbon which is known as the color test. We take a known weight of a chemically pure iron, or a known weight of steel with a known quantity of carbon. That known weight of pure iron is dissolved in acid and a known weight of water mixed with it, which produces a rather crimson colored liquid. We take our supposed pure iron from the furnace, and weigh the same quantity and dissolve it with the same quantity of acid as the other, and then fill up two test tubes that are graduated with such a quantity of water as will bring both the liquids to the same shade of color, looking at them on a sheet of white paper. The result is, that when you read off the difference in the water on the scale of the two tubes, you know the difference in carbon between one and the other. One is considered to be without carbon entirely, and the other may have a little in it. That process can be carried through in ten minutes. If you want to know what carbon you have in a piece of finished material you treat it in the same way.