

The whole works (remarks *Engineering*) are at present in the state of rapid growth. Understood as a beginning, merely, we have no hesitation in saying that the establishment we have outlined will "do" for the present.

What makes Iron Fibrous.

When Mr. Bessemer began to manufacture wrought iron from cast, by blowing air into the molten metal, it was objected to the product that it had no fibre, as common puddled iron had, and that iron without fibre must necessarily be weak. In this inference—which was wholly theoretical—we did not concur, and the question then arose, what does fibrous iron really mean? When the particles of wrought iron are brought to a high temperature, without the presence of any intervening material, they cohere in every direction, and the iron is not fibrous. But when slag is intermingled, as in common iron is the case, there are intervening layers of cinder, which, when the iron is passed through the rolls, are not wholly expelled, but are only greatly attenuated; and as these planes are then very numerous, and pass in every longitudinal direction, they prevent to some extent the lateral adhesion of the particles, which, however, adhere end to end, and a fibrous iron is thus produced. It is now well known that homogeneous iron is much stronger than fibrous iron. But at the beginning of the manufacture, fibre was accounted as necessary in iron as in ropes or thread—a theory resulting merely from the accident of the production of fibre by the modes of manufacture then exclusively employed. In the case of iron produced by the common process, any bubble or vacuity in the metal becomes filled with slag, which hinders the sides from being effectually welded under the hammer. But in the Bessemer iron, as the slag is absent, the sides of the bubble cohere when the ingot is subjected to pressure while still hot. It is better to hammer the ingots while still hot, after having been poured, than to allow them to cool and to beat them afterwards. For in the one case the heart of the ingot is the hottest part, and in the other the coldest.—*Engineering*.

Dion's Patent Fire-alarm.

A few days ago we witnessed at the office of Bunting & Co., of this city some experiments with Dion's patent fire-alarm—the invention of Mr. Charles Dion of Montreal, C. E. It consists of an arrangement of wires connected with a bell which is sounded by means of certain clock-work mechanism. Upon the appearance of a fire in the room or apartment where this apparatus is placed, the heat acts upon the metallic wires and the alarm is immediately sounded. We saw a few fragments of newspaper lighted in a pan some distance from the connecting wires, and in about fourteen seconds the bell was ringing, and so continued until the weight which operated the hammer of the mechanism had run down.

The object of the apparatus is to give timely notice of a fire that may occur in any part of a public building or private dwelling. The wires may be conducted to every room and the alarm

apparatus placed where it can be observed, or where it will arouse those that can proceed to the place where the faithful instrument tells that the fire is burning. The arrangement of this alarm is almost without limit. The wires may be conducted to a certain point, similar to a fire alarm telegraph, and they may be placed in each room, or centered into the room which the guardian or janitor of the building occupies. They may be placed in the state-rooms or holds of a vessel, and there be as effective as in a dwelling house. If the wires be extended through heaps of grain, any undue heat occasioned by an increase of temperature of the pile may be made known in the same manner as if a fire had commenced in the apartment.

The invention has been put to use in the bishop's palace and chapel at Montreal, and numerous other places. The Board of Fire Underwriters of New York City have certified to the merits of the invention, and recommend its general employment.—*American Artizan*.

Beet Sugar.

We think we have important news regarding beet sugar. Last year a number of enterprising capitalists of Springfield, Ill., organized a company for the purpose of making beet sugar. The place selected was at Chatsworth, Ill., and the works were under the direction of the Messrs. Gennert, the original projectors. They planted 400 acres, mostly fresh prairie, and raised a crop of 4,000 tons of fine beets at the cost of \$4 a ton in the pits. The varieties were the White Silesian and Imperial, and upon a test of various parts of the crop the average yield of fair refining sugar is 7½ per cent. This is confirmed by analysis made at Belcher's sugar refinery, St. Louis. When refined the yield is 5½ per cent. of sugar equal to New York "refined B." Quite a number of barrels have been made, and the works are in operation this winter. When all the beets are worked up the yield must reach nearly 400,000 pounds of refined sugar. The starting of new works and expensive machinery is always difficult, and this company has had its share, and there has been delay. But this delay has been of use in settling the question whether beets can be kept in large quantities during the fall and winter months. They find that the loss during four months is only one per cent. The conclusion of this vast experiment, worthy of the Prairie State, is that beets can be grown on the raw but rich soil of the West as well as the highly fertilized soils of Belgium and France, that yield of sugar is almost precisely the same, and that the beets can be kept until they can be used. The importance of these facts scarcely can be over-estimated. That prairie region is equal in extent to England, France, Spain, and Portugal combined, and on almost every acre the beet can be cultivated. Underlying are inexhaustible beds of coal, and a people fully competent to enter upon this new enterprise are ready. Sugar is next in importance to wheat. A beet sugar crop on these prairies will be of greater value than the corn crop. Granting these to be facts, the time cannot be distant when sugar will be sent from the West to New York and exported to foreign countries.—*New York Tribune*.