

would be able to meet its payments dollar for dollar, would remain undisturbed.

Public confidence is an essential element for the success of the business as a whole. That confidence is best retained by holding the companies to a rigid accountability for their acts. We do not believe in faith unless it be backed by sound reason, nor should duty be evaded through the fear that the criticism of one company will injure all the others. Life insurance as a whole is as solid a business as that of banking. To relinquish a policy or to refuse to insure because of occasional scandals, is a most ill advised policy.—*New York Commercial Bulletin.*

A GREAT ENGINEERING FEAT.

On Saturday last the formal opening of what is known as the St. Clair Tunnel took place in the presence of a large number of distinguished guests. The nature of this remarkable work has already been explained in these columns, but the following brief description may well be given at this time:

The tunnel has been built under the St. Clair river at Sarnia to supersede the ferry system of transporting the traffic of the Grand Trunk route from the American to the Canadian banks. Long ago the clumsiness of the ferries, and particularly the exasperating delays in winter on account of ice floes, made apparent the necessity for some sure and more expeditious means of transit. A tunnel was considered least objectionable because the immense vessel interests were stoutly opposed to a bridge, on the ground that it would prove a hindrance and often a danger to navigation. But the nature of the sub-aqueous soil, clay and sand made the feasibility of digging a tunnel a perplexing question. However, it was decided to make an attempt at constructing one. Two huge shields were started toward each other, one from the American, the other from the Canadian side. They bored their way down under the river bed until they met about under the middle of the river. It took twelve months to eat out the passage.

These shields were made of heavy wrought iron, with sharp edges, 15 feet 3 inches long and 21 feet 6 inches in diameter. Each shield was pushed forward by 24 hydraulic rams, the barrel of each ram being 8 inches in diameter, with a stroke of a little more than 18 inches. Each ram exercised a force of 125 tons.

The actual tunnel itself under the river is 6,026 feet long. It is lined throughout with solid cast-iron plates bolted together in segments. Each segment is 5 feet long, 18 inches wide, and 2 inches thick, with flanges 5 inches deep. The whole lining weighs 28,000 tons. The bolts and nuts for connecting the segments together weigh 2,000,000 pounds. The permanent way through the tunnel is laid with steel rails, weighing 100 pounds to the lineal yard. The interior diameter of the tunnel is 20 feet, and ample means have been provided for thorough ventilation and for lighting it throughout, when required, with electricity. The road is practically level, under the river, with approaches at each end on gradients one foot in fifty. The total length of the tunnel and approaches is 11,553 feet—over two miles. At the ends of the approaches are junctions with the Grand Trunk Railway on the Canadian side and the Chicago and Grand Trunk Railway on the American side of the river. In connection with these junctions, ample ground has been levelled and prepared, and ten miles of shunting sidings have already been laid on each side of the river.

The cost of the tunnel proper was \$1,460,000. The Grand Trunk people believe that when the tunnel is in actual use it will offer facilities for through communication between Chicago and all points east, which will be greatly appreciated by passengers. It shortens the distance to the seaboard about six miles and saves two hours in time.

In responding to the toast of "Trade and Commerce" at the dinner following the opening, the chairman said he had been told that the commerce of the St. Clair river was equal to five times that of the Suez canal, and that during certain months of the year there was a vessel passing every two and a half minutes, while as an average of seven months a vessel passed every five and a third minutes.

An American exchange, in referring to the event, says: Although the construction of the tunnel may not have called for as high a standard of engineering skill and science as that of the Forth bridge in Scotland, it will, nevertheless, stand as a lasting monument to the enterprise of the Grand Trunk Railway Company and to the ability of engineer Joseph Hobson and his assistants. From a commercial and railway standpoint, however, its importance is undoubtedly equal to, if not greater, than that of the Forth bridge. The tunnel now gives a continuous line of rail from Montreal to Chicago under the one management, and makes a considerable saving both in time and distance, advantages of great moment in the way of transportation. Although practically a portion of the railway system of the Grand Trunk, no other railway will be debarred from using it.

MANUFACTURERS' NOTES.

We learn from a local paper that Messrs. W. Kennedy & Sons, the enterprising founders of Owen Sound, shipped recently to East Angus, Que., four of their now famous American turbine water wheels. They are for the Royal Pulp Co., which is fitting up new mills at that place. The shipment weighed 28 tons, and was valued at \$5,000. Fifteen tons of steel shafting is to follow, besides gearing and pulleys.

It is claimed that the steamer "Majestic" is the most economical coal burner of any of the Atlantic "high flyers." She burns 220 tons of coal a day, shows 19,500 horse power, and makes an average of over 20 knots, or 23 miles, per hour throughout the Atlantic passage. There are only two other ships that have reached this speed, namely, the duplicate ship the "Teutonic" and the "City of Paris." But there are, says the *Scientific American*, a few other vessels that come near this speed.

Armour & Co., of Chicago, received at the Custom House, on the 16th, an invoice of 2,723 boxes of tin plate. It weighed 300,000 pounds, and it took a small freight train to transport it from the seaboard. The McKinley tax on the tin plate made the total duties \$6,000.

Canadian knitting mills using worsted yarns have this year, says the correspondent of the *Textile Record*, found great difficulty in procuring regular supplies of yarn. At the beginning of the year there were but four concerns making worsted yarns in this country: the R. Forbes Co., Hespeler; Quebec Worsted Co., Quebec; McCrae & Co., Guelph; and Dixon Bros., Dundas. A boiler explosion in the Quebec Worsted Works entirely wrecked the plant, so that the manufacture at that point was given up, and the trade of the country depended for its supply upon the other three mills. The Paton Manufacturing Company, owning

the plant of the Quebec Worsted Company, has moved it to Sherbrooke, P.Q., and will resume making worsted yarns there next season.

A factory for the making of cardigan jackets has been started at Streetsville, Ont., by George Wortman.

At St. John's, Que., a hosiery mill, to employ about twenty-five machines on hosiery, mitts, etc., will shortly be put in operation by Mr. Buck, of Farnham.

Very satisfactory results, says the *American Bookbinder*, are now being obtained by some of the English paper manufacturers in bleaching paper by electricity, the process rendering the paper perfectly white without in the least injuring its strength. This process in question depends on the use of a solution of magnesium chloride, which is decomposed by the action of a strong electric current into chlorine and oxygen on the one hand, and into magnesium and hydrogen on the other. Plates of platinum are used as electrodes.

The *Boston Journal of Commerce* values a handful of crude pig iron weighing about five pounds at five cents. It would make about sixty table-knife blades worth \$1.50; converted into steel watch springs, there would be about 110,200 of these little coils, which at the rate of \$1.75 a dozen, would be valued at \$16,070.83.

FOR DRY GOODS READERS.

A prize was recently offered by an American firm for the best and most novel advertisement. A clever competitor won the prize with the following simple formula:

THIS ARTICLE IS WORTH \$2.

OUR PRICE FOR IT IS \$2.

The novelty of charging for an article just what it is worth—no more and no less—will be most refreshing to those shoppers who have been pestered with importunities to purchase a \$20 suit of clothes for \$5; a \$6 pair of shoes for \$2; a \$4 a yard silk for \$1.50, and so on.

We learn from the *N. Y. Bulletin* that manufacturers of many lines of prints have been enjoying a season of prosperity for several weeks, and the demand for certain styles, such as "polka dots" and imitations of China silk, have, in many cases, had an almost phenomenal sale, with the products of several mills sold far ahead. In some instances, orders have been actually refused. This decided improvement in the trade will be almost a godsend to certain concerns, which, during the first half of the year, failed to do anything like a prosperous business. It has already proven a great stimulus to the print cloths industry, the prices of cloths having materially advanced in the past few weeks, and the market for the latter will strengthen still further if the demand for prints continues.

Black hosiery, it is said, is quite as safe a choice as in any former season, notwithstanding the repeated warning of its retirement. A large number of ladies refuse to wear the black hosiery because of its certainty to stain the skin. There is no absolute dependence to be placed upon even the highest priced black hose. A warm day will leave the skin more or less discolored by them. The grays, garnets and browns hold their color better than the black. White silk hose for those who can afford them in large quantities are desirable, but none of the many receipts