DEVOTED TO TEMPERANCE, SCIENCE, EDUCATION, AND LITERATURE.

VOLUME XXVI., No. 23. MONTREAL & NEW YORK, NOVEMBER 13, 1891. 30 Cts. Per An. Post-Paid.

THE NEW ST. CLAIR TUNNEL.

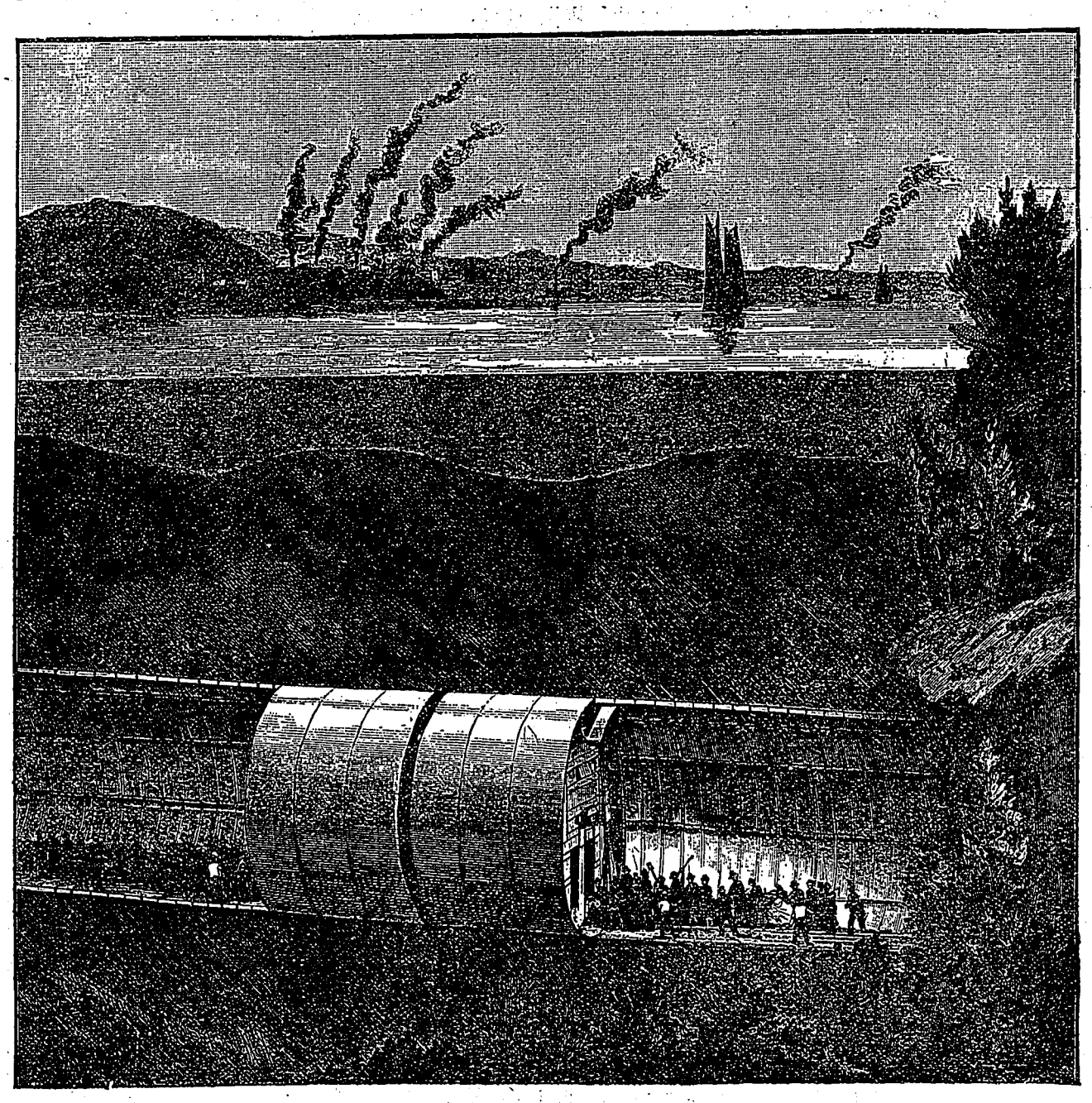
To push a trier through a tub of butter is a comparatively simple piece of work, but when your "trier" is a steel cylinder fifteen feet long and twenty in diameter, and your "butter" a bed of clay and quicksand under a swiftly flowing river, the principle may be very much the same but the carrying out of the principle is quite a different matter.

Yet this is precisely what has just been done in the completion of the Grand Trunk Railway tunnel under the St. Clair river between Sarnia and Port Huron.

The need for this tunnel was very great.

The St. Clair river is claimed by many to be the busiest channel of navigation in the world. Through it all the immense traffic between the upper and lower lakes of the great Canadian chain has to pass, and this, of course, rendered a bridge, with piers obstructing the channel, quite out of the question. But the railway traffic was just as seriously interfered with by the river. In the winter time when the river was blocked by floating ice it would sometimes be five or six hours before the ferry boats could plough their way from one shore to another. This trip can now be made through the tunnel in as many minutes.

The making of the tunnel is of great interest. It was constructed by means of heavy wrought iron shields, with sharp edges, fifteen feet three inches long, and twenty-one feet six inches in diameter. Each shield was pushed forward by 24 hydraulic rams, the barrel of each ram being eight inches in diameter, with a stroke of little more than eighteen inches. Each ram exercised a force of 125 tons. From the date when the shields were first lowered in position at the portals, to the meeting of the shields in the tunnel, the time occupied in constructing the tunnel was twelve months. The cost of the tunnel proper was $1,460,000. The shields weighed eighty tons each and were built by the Tool Manufacturing Company of Hamilton.



THE NEW ST. CLAIR RIVER TUNNEL.

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 being five feet long, eighteen inches wide and two inches thick, with flanges five inches deep, the whole lining weighing together 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 one hundred pounds to the lineal yard. The interior diameter of the tunnel is twenty feet, and ample means have been provided for thorough ventilation, and for lighting it throughout when required by the electric light. The road is practically level under the river, with approaches at each end on gradients of one in fifty. The total length of the tunnel and approaches is 11,553 feet. 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 shunting sidings, to the extent of ten miles, have already been laid on each side of the river.

Mr. Joseph Hobson, the chief engineer and builder of the St. Clair tunnel, who also designed the shields by which the work was done, is a Canadian by birth, having been born near Guelph, Ontario. He served his apprenticeship as a provincial land surveyor in Toronto, and after having passed his examination as such he was engaged for a number of years in private practice as a surveyor and an engineer, and in the location and construction of different lines of railway in Canada and the United States. At the beginning of 1870 he was appointed resident engineer of the international bridge at Buffalo, and was continuously on the ground during the construction of the bridge. On the completion of the work at the end of 1873, he was appointed chief assistant engineer of the late Great Western Railway of Canada, and about two years later he was appointed chief engineer of the line. He still holds that position under the management of the Grand Trunk Railway Company. Mr. Hobson is a member of the Institute of Civil Engineers of England, of the American Society of Civil Engineers, and the Canadian Society of Civil Engineers.

God Has Never had any use for a man who was not willing to do little things.