and bottom with almost equal force, effecting quick results. The metal used is simply ingot copper and tin, in the proportion of four parts of the former to one of the latter. The copper is first melted, and then the tin is put into the molten mass, soon becoming a port of it. The kettle has a capacity of about a ton. For a bell weighing three hundred pounds, the mould is completely filled in seven or eight minutes. For bells weighing six hundred pounds, it requires about fifteen minutes, and so on.

The bell having cooled sufficiently, the moulds are broken, and it is taken out and turned over to the polisher. The insude, having been moulded against the smooth surface of black lead, needs no polishing, but the outside requires attention in that respect. The operation is very simple. The bell is hoisted to the centre of a double revolving table. The part the bell rests upon revolves one way, the surrounding part in an opposite direction. This latter part is so constructed that it will hold a large quantity of coke. Thus, in revolving, the coke scours the outside of the bell, the result being a smooth, bright surface.

Before polishing, however, the tone of the bell is tested, and it is again tested after polishing, as carefully as the string of a piano, or the reed of an organ. If satisfactory, nothing remains to do but the mounting.

An idea of the great accuracy that must be displayed in the plans and preparation of the moulds can be seen in that from ten to twenty-five pounds of metal, either too much or too little, in bells weighing from six hundred to two thousand pounds, or a variation of from one-twentieth to one-twelfth of an inch in thickness, will affect the tone. The successful manufacture of chimes and peals, therefore, can only be done by those whose knowledge of the business is as accurate as instinct, and this is possessed only by those who have followed the business for a lifetime.

THE INVENTOR OF THE SEWING MACHINE.

We glean the following curious scrap of history from the Sewing Machine World :--

If you should inquire from some one of the numerous persons now using the sewing machine-Who is the inventor of the sewing machine ? every one, accustomed as he is to see everywhere the pictures of Elias Howe and the gigantic S of the Sirger Sewing Machine Co., would undoubted'y answer you that the sewing machine was devised by American inventors. Well, this is not true. American inventors have unquestionably contributed largely to endow the sewing machine with the numerous improvements which it has received for some thirty years, but they did not originate it. As early as 1830, a man-a modest tailor-had appeared who had succeeded in building, and running in an industrial way, a sewing machine supplied with a continuous thread, and the needle of which was not passed entirely through the cloth, and that man was neither an American nor an Englishman ; he was a Frenchman, by name Barthélemy Thimonnier.

The English and Americans have so many industrial devices of their own invention, that we do not hesitate to take away from them, in behalf of a modest French inventor, who struggled hard during his whole life, the glory of having devised a machine by means of which many manufacturers—Elias Howe, Singer, Wheeler, Wilson, among others — secured large fortunes.

Barthélemy Thimonnier, whose picture the reader will find on page 60, was the son of a dyer of Lyons, and was born at the Arbresle (Rhone), in the year 1793. He studied a little while at the seminary of Saint Jean, and was put to the tailor trade which he practiced at Amplepuis (Rhone), where he had been brought up. Thimonnier, who had many opportunities of seeing the female sock embroiderers working for the manufacturers of Tarare, took it into his head to build a machine to perform with it the work of the en.broiderers and the tailor.

In 1828 he removed to Saint Etienne, and during several years neglected his own business, his only means of earning a livelihood for himself and his family, and devoted himself in a lonely room to many pursuits and studies, which his friends, as they were unable to understand them, considered at once as foolish. At last, in 1829, after four years' hard work, which, ignorant as he was of mechanics, was the more painful, he mastered his idea, and, in 1830, he applied for a patent for a chain stitch sewing machine.

Taken to Paris by Mr. Beaunier, a supervisor of mines, who guessed at first the real value of the invention, and became morally and pecuniarily interested in its success, Thimonnier was, in 1831, made a partner and appointed manager of the firm Germain Petit & Co., and set up on Sèvres Street, in Paris, a workshop, where he used eighty machines, making army clothing.

At this time, the workingmen were adverse to every kind of new machinery, and used sometimes to destroy it, as the boatmen on the Soan river broke Marquis de Jouffroy's steamboat about twenty-five years before Fulton launched his boat on the Hudson river. Thimonnier's machine shared the fate of the other machines; the inventor was obliged to take flight, and, a few months later, on account of the death of Mr. B aunier, the partnership with Germain Petit & Co., was dis olved, and Thimonnier returned to Amplepuis, in 1832. In 1834 he went back to Paris, and, as a journeyman, ran his machine, which he was always studying to improve.

In 1836 he was penniless, and obliged to go once more to Amplepuis; he went on foot, carrying his machine on his back, and to earn his living during his journey he made a show of it as a curious piece of mechanism. He manufactured at Amplepuis a few machines, which he sold with a great deal of trouble in his neighborhood; in 1845, his machine would run at a rate of 200 stitches a minute. He made then a partnership with Mr. Magnin, and built in Villefranche some machines which he used to sell at fifty frances apiece; and on August 5th, 1848, jointly with Mr. Magnin, he applied for an improvement patent for his machine, which he called "Cousobrodeur" (the English patent was applied for on February 9th, 1843), and which he no longer made of wood, but of metal, and with accuracy.

The revolution of 1848 having stopped Thimonnier's business, he started for England, where he stayed a few months, and sold his patent to a Munchester firm.

At the exhibition at London in 1851, on account of inexplicable bid luck, Thimonnier's machine was not ready for the examination of the commissioners ; whereas, the Americans exhibited their first improvements to Thimonnier's machine, and the shuttle and two-thread machine of Elias Howe ; as early as 1832 Thimonnier bad studied this kind of machine, and was yet studying it in 1856. But, exhausted by thirty years' struggling and suffering, he died penniless at Amplepuis on Aug. 5th, 1856, leaving a widow and several children. Later, in 1866 and 1872, the French Government, at the request of the Industrial Science Society of Lyons, relieved by its subsidies the last days of that poor widow, who died on August 9th, 1872.