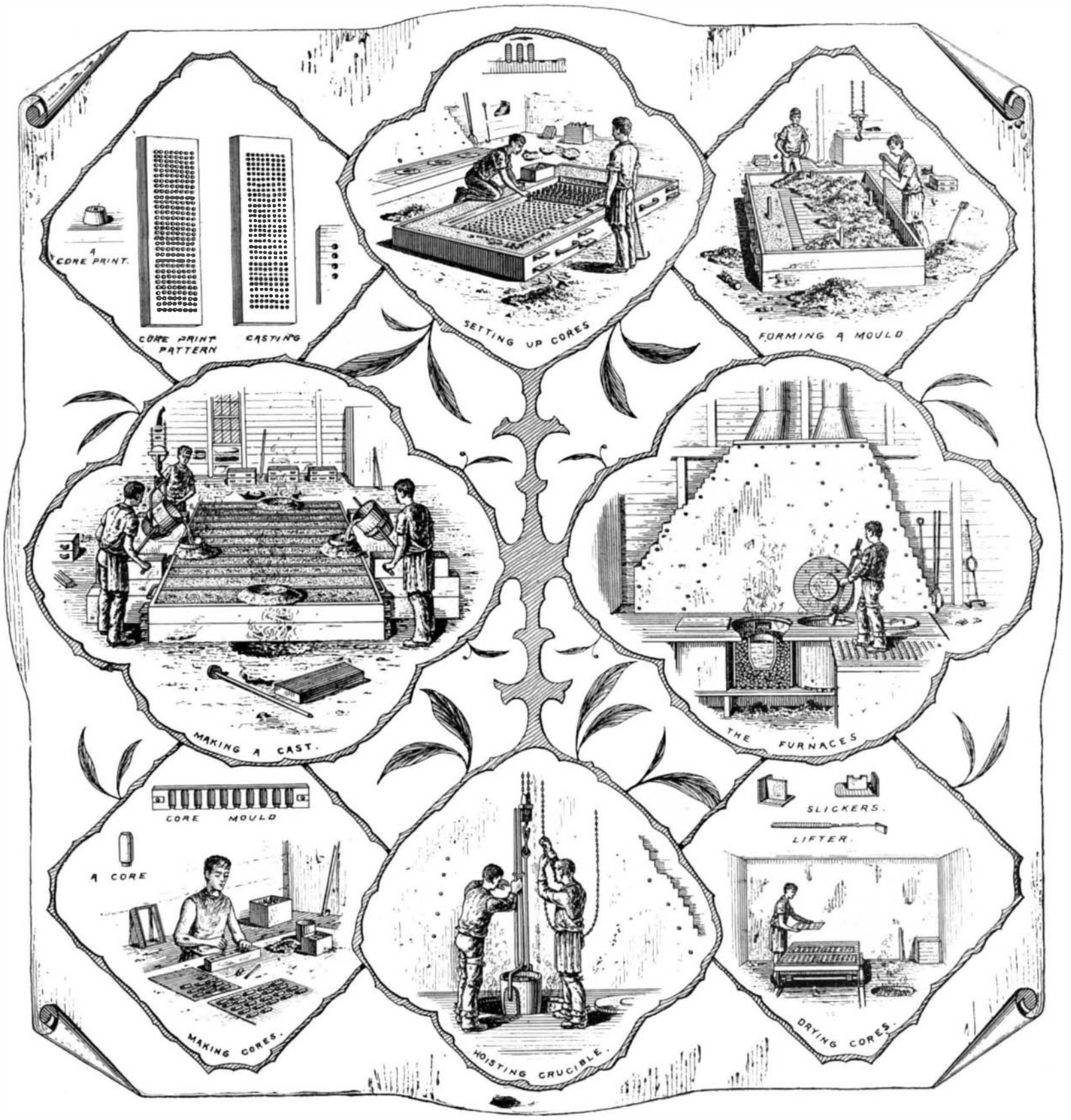
BRASS CASTING.

The illustrations accompanying this subject represent a casting in brass of a condenser tube head weighing about 500 pounds, the casting being 6 feet 3 inches in length, about 22 inches in width and about 2 inches in height or thickness. Moulded into this head are about 1,000 circular holes ¾ of an inch in diameter, in which the ends of the steam tubes or pipes are fastened. In forming a mould for a brass casting, a stronger sand than is used for iron is required, the molten metal traveling more, and, unless the proper sand is used, will eat itself into the mould. The best sand used for this purpose is called by moulders Jersey yellow sand No. 3. The tube holes are formed by means of bottle-neck cores 2 inches in length and ¾ of an inch in diameter, made of a composition of sand, wheat flour and stale beer, the outside being rubbed being about ½ inch in height, $\frac{9}{16}$ of an inch in diameter at the top and about $\frac{15}{16}$ of an inch at the bottom. The core print pattern when finished is then pressed down bottom up into the sand in the bottom flask or mould box, the material being rammed down solidly around the pattern until the flask is evenly filled. A straightedge is then passed over the top to scrape off the surplus sand and the loose material blown off the back of the pattern by the operator by means of a hand bellows. A sprinkling of parting sand or wheat flour is then put over the surface to prevent the sand in the top mould from sticking to the other. The second or top flask is then placed in position and a clay wash put on the sides to make the sand stick. Long wooden gate pins are then placed in position, sticking upright in the sand at the sides and ends of the bottom mould. The top flask is then filled with the moulding sand and carefully rammed down around the pins, which project above the mould.

When the moulding process is completed, the gate pins are withdrawn and a fine vent wire run down through the sand over the surface to the pattern below, to let out the gas and prevent explosion during the casting process. The top mould is then taken off and turned over carefully, with the impression in the sand of the upper side of the pattern. The core print pattern is then taken carefully out of the bottom mould, leaving the impression of the projecting core prints into the sand, into which the operator or moulder places the ends of the bottle-neck cores. These cores are placed in an upright position one at a time until the holes, which number about 1,000, are filled. The cores must be fixed securely and stand up straight and plumb with each other in the holes. This is done by going over each one again and again, the whole operation, including the building up of the mould, taking the operator about two days. A gutter where the gate pin impressions are is cut into the sand, with a number of outlets leading into the mould. The upper flask is then placed carefully in position over the other by means of a derrick and securely bolted, the back of the tube head touching and holding the cores beneath in position. The molten brass is then poured into circular iron head boxes placed around the gate pin holes, the metal running down into the gutters below and into the mould. The metal is poured into the gate holes from the two sides, the molten brass passing between the cores forming, when the mould is filled, the tube holes. The casting, when completed, is allowed to cool for four hours, after which the casting is trimmed of its roughness and filed and sent to a machine shop to be finished for the fitting of the tubes. It requires



THE BRASS CASTING INDUSTRY.

with plumbago to prevent the metal from sticking. Brass founders' furnaces are mostly sunk under the floor level, the pit for removing the ash being covered over with hinged iron gratings. The covers for the furnace tops are circular in shape and are constructed of cast iron. The internal building of the furnace is fire brick grouted with fire clay. The outside shell is circular and made of iron 4 feet in height and about 2 feet in diameter.

The crucibles in which the ingots of brass are melted are composed of fire clay and black lead and are known as blue pots. The crucibles principally used for medium large castings are about 20 inches in height, 12 inches in diameter and about 1 inch in thickness. The core print pattern for the condenser tube head is made of wood. The design is first laid out and the prints securely fastened in place to the block by means of nails running down through the center. The prints are made of maple and are conical shaped, about 1,800° Fah. to melt the material, which is composed of 1 part spelter, 2 parts tin and 3 parts copper, it taking about 7 hours to melt about 500 pounds with a hard coal fire. The flasks are about 8 feet 4 inches in length, about 4 feet in width, about 7 inches in height and about 1 inch in thickness. The moulds are trimmed up with steel slickers and small particles of loose sand taken out by means of lifters. The sketches were taken from the plant of W. & A. Fletcher Company, Hoboken, N. J.

PROF. RICHET publishes some figures of mortality from diphtheria in the Revue Scientifique, which seems to show that either the disease has this year taken a milder form or else Dr. Roux's serum treatment is effective. The deaths in 1884 in Paris hospitals were 1,400; from 1887 to 1891 they were from 900 to 960 a year; from 1892 to 1894 they averaged 733; in 1895 they were 239.

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