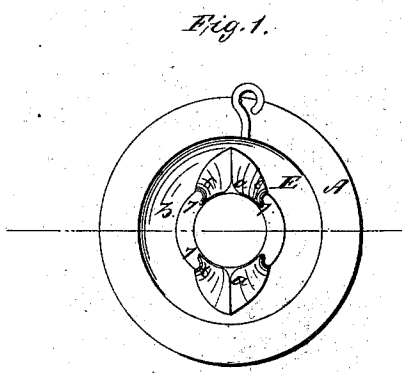
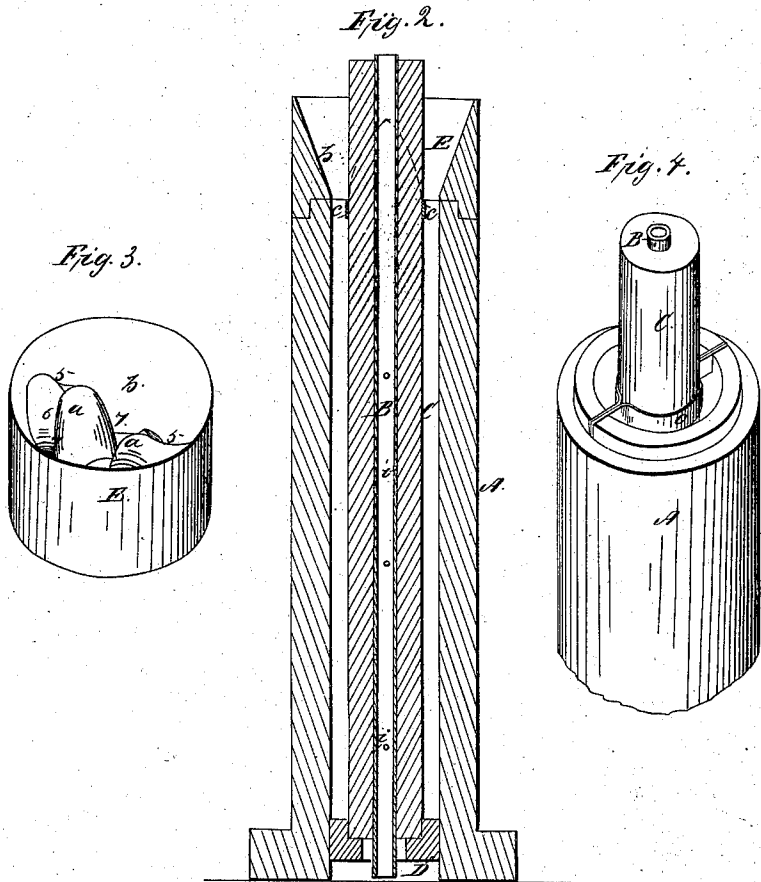


F. ADAMS.
CASTING COPPER CYLINDERS.



Witnesses:
Thos. Howe
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Inventor:
Frederic Adams.

UNITED STATES PATENT OFFICE.

FREEBORN ADAMS, OF SOMERVILLE, MASSACHUSETTS.

IMPROVEMENT IN CASTING COPPER CYLINDERS.

Specification forming part of Letters Patent No. 32,169, dated April 30, 1861.

To all whom it may concern:

Be it known that I, FREEBORN ADAMS, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in the Art of Casting Copper Cylinders and Tubes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of a mold for casting a tube or cylinder; Fig. 2, a vertical section of the same on the line *x x* of Fig. 1; Fig. 3, the funnel or mouth-piece of the mold detached; Fig. 4, a perspective view of the top of the mold A and core C, the mouth-piece E being removed to show the brace *c*.

In casting copper cylinders, tubes, and similar articles in a vertical mold in which a core is used, it is found in practice that from the peculiar nature of the metal and the manner in which it cools it is very difficult to obtain a perfect casting, the finished article being marred by blow-holes and imperfections. This I consider arises from the difficulty with which the fluid metal, as it is poured in at the top of the mold, mixes with that which is partially crystallized in the mold, the metal which is poured in at top on one side of the mold rising or "floating up" and cooling against the opposite side. To remedy this difficulty I devised a plan of rotating the mold, that the metal might be poured uniformly around the core, and for which I obtained Letters Patent of the United States August 2, 1859.

My present invention has for its object the attainment of the same end—namely, the casting of a perfect copper cylinder or tube, and in a more simple and economical manner; and it consists in pouring into a vertical mold around a core two or more streams of fluid metal from opposite sides of the mold; and this method may be adopted when it is not convenient to procure power for the revolution of the mold.

That others skilled in the art may understand and use my invention, I will proceed to describe the manner in which I have carried out the same.

In the said drawings, A is the vertical mold, which stands on a suitable base. B is the core-tube, which is perforated with small holes *i*, and around which is formed the core C of molder's sand. This core is supported on an adjustable block, D, which fits in the mold and may be moved up or down to suit the length of cyl-

inder to be cast. The top end of the core is steadied and kept in place by a thin metal brace, *e*, which encircles it, and rests against opposite sides of the mold. A funnel or mouth-piece, E, fits on top of the mold, and has its inner surface, *b*, beveled for the convenience of pouring in the fluid metal.

In filling this mold according to my improved plan the melted copper is poured in steady streams from two melting-pots—one on each side of the mold—at the same time. The two streams of metal run down on the opposite sides of the mold and mingle together. As the metal rises in the mold, the two sides of the casting rising equally fast and uniformly, the usual imperfections will not occur in it.

In some cases it is more convenient to pour from one melting-pot. In this case I make use of the device shown in the drawings for dividing the stream. Attached to each side of the mouth-piece E is a projection, *a*, which rises to an edge, 5, and slopes off on each side at 6, where its lines again fall into those of the inclined sides of the mouth-piece. The front side of the piece *a* is turned back upon itself at 7 to prevent the fluid metal from flowing over it, and to direct its course against the sides of the mouth-piece. If one only of these pieces *a* were employed, the two parts of the divided stream of metal would again unite on the opposite side of the mouth-piece, and would fall in a single stream down into the mold; but by using two pieces *a* each branch of the divided stream is kept separate, and so falls into the mold on the two opposite sides.

As the melted copper would soon "cut away" the edge 5, I protect it with a piece of plumbago or other heat-resisting substance, which is either made to cover the edge or is let into the iron casting of which the mouth-piece is composed.

In some cases, as with cylinders of a considerable diameter, more than two streams of metal may be poured into the mold from opposite sides.

What I claim as my invention, and desire to secure by Letters Patent, is—

As an improvement in the art of casting copper cylinders and tubes, pouring the fluid metal in two or more streams into the mold on opposite sides, substantially as described.

Witnesses: FREEBORN ADAMS.

THOS. L. GLOVER,
EDMUND MASSON.