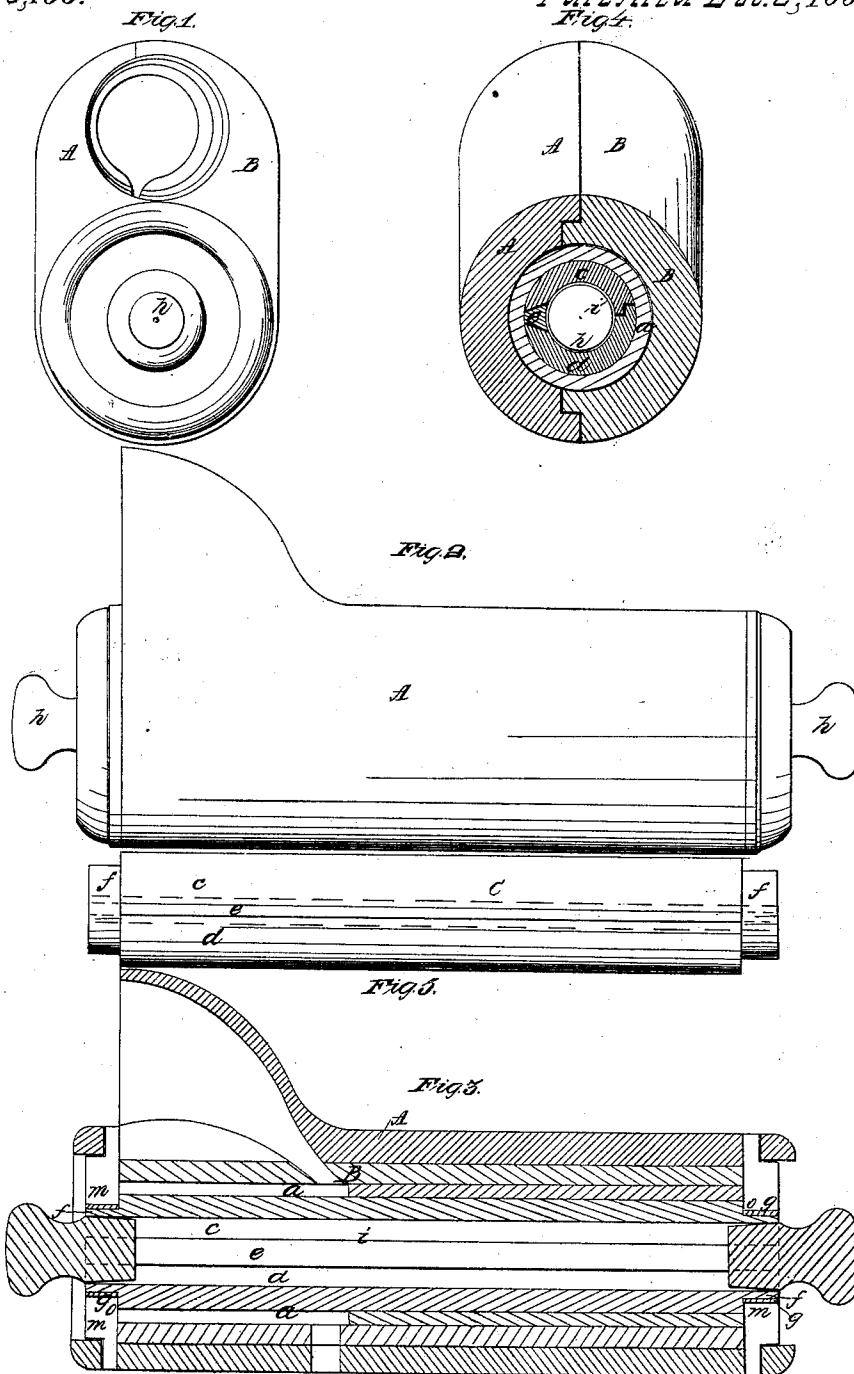


J. Smith, Jr.,
Casting Metal Pipe.

N^o 16,166.

Patented Dec. 2, 1856.



UNITED STATES PATENT OFFICE.

JAMES SMITH, JR., OF NORTON, MASSACHUSETTS.

IMPROVEMENT IN CASTING METALLIC TUBES.

Specification forming part of Letters Patent No. 16,166, dated December 2, 1856.

To all whom it may concern:

Be it known that I, JAMES SMITH, JR., of Norton, in the county of Bristol and State of Massachusetts, have invented an Improvement in Molds for Casting Metallic Tubes; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1 denotes a top view of one of my improved molds; Fig. 2, a side elevation of it; Fig. 3, a longitudinal section of it; Fig. 4, a transverse section; Fig. 5, an external view of its metallic core.

My invention is to be found in the manner in which I construct the said core, whereby it is not only rendered capable of contraction in a transverse direction while in the mold and surrounded by hot metal in the act of cooling, but of being easily taken apart, so as to separate it from a tube that may be cast upon it.

In the drawings, A and B exhibit the two halves of the mold-shell, which are formed with not only a cylindrical matrix, *a*, for the reception of a core, C, but with a sprue-passage, *b*. The body of the core C of the mold, as shown in the drawings, is cylindrical in external form, and is composed of two stave sections or parts, *c d*, and a third or very narrow opening or stave, *e*, having a trapezoidal or wedge-shape form transversely. These staves are made at their opposite ends with shoulders *o o* and projections *f f*, so as to receive hoops or rings *g g*, which, after being made to encompass the staves, are with the staves held in place by two tapering plugs, *h h*. These plugs are driven into the heads of the core, respectively, and so as to spread the staves closely against their rings. The core thus constructed has a chamber or cylindrical space, *i*, within it. In the formation of those edges of the two major staves *c d* which rest against the opposite beveled edges of the minor or spring stave *e* they may be beveled or chamfered to conform to such edges of the stave *e*. The core, being thus made, is to be placed in the mold, as shown in the drawings, the two heads or ends *m m* of the mold being formed so as to closely embrace and fit to the rings *g g*.

In casting metallic tubular ingots which are intended to be drawn out by rollers and converted into seamless metal tubes, it is desirable, for various reasons, to employ a metallic core in the mold. The difficulty attending the use of such a core has been that metal, when cast around it, would so shrink or contract on it as to render it extremely difficult, if not impossible, subsequently to detach it from the core. The peculiar manner in which I construct the core, as hereinbefore specified, enables it to contract more or less transversely between its ends while metal cast around it and in the matrix may be in the process of contraction. Thus the cast metal has the opportunity of contracting without undue strain of its particles, the core giving away to the force of contraction. After the metal has become set or sufficiently cool, the mold may be opened, and the core, with the tubular ingot, may be removed from the matrix. This having been accomplished, I can easily separate the core from the casting, as in order to do so all that will be necessary will be to withdraw the plugs and rings from the ends of the staves and press the minor or contractile stave toward the axis of the core, so as to detach it from the others, which by the process will be loosened from the ingot, and with the other stave may be drawn out of the same.

I claim—

The method of making the metallic mold-core—viz., of removable separate sections or staves *c d* and a narrow trapezoidal or wedge-shaped spring or stave, *e*—the whole being arranged and held together by rings *g g* and plugs, (or their mechanical equivalents,) and made to operate in manner substantially as above specified.

In testimony whereof I have hereunto set my signature this 22d day of October, A. D. 1856.

JAMES SMITH, JR.

Witnesses:

JOSEPH WILBAR,
W. HENRY CARR.