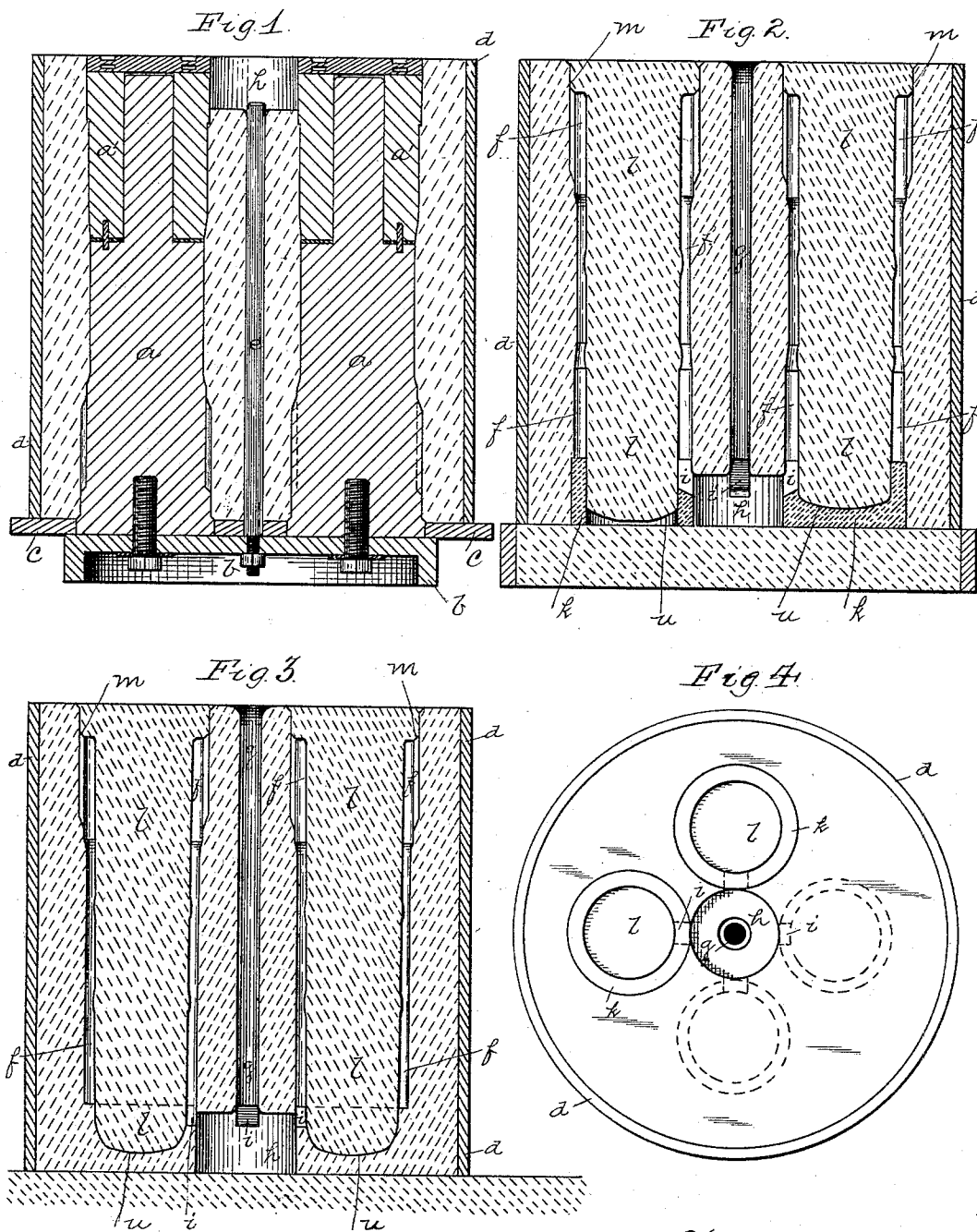


(No Model.)

S. J. ADAMS.
MOLD FOR TUBULAR ARTICLES.

No. 465,771.

Patented Dec. 22, 1891.



Witnesses:

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STEPHEN JARVIS ADAMS, OF PITTSBURG, PENNSYLVANIA.

MOLD FOR TUBULAR ARTICLES.

SPECIFICATION forming part of Letters Patent No. 465,771, dated December 22, 1891.

Application filed September 30, 1889. Serial No. 325,611. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN JARVIS ADAMS, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Molds for Tubular Articles; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to molds for forming axle-boxes and other tubular articles. In these molds as heretofore formed the mold or matrix for the body of the mold was molded vertically in a flask, the upper end of the matrix being open and closed by the core, which fitted into a seat or print at the upper end thereof, and the matrix being either closed at its lower end and the core seated at the base thereof or the matrix extending through the flask and its lower end being closed by a separate core, in which the end of the main core was seated. The gates or sprues through which the molten metal entered the mold-cavity were formed at the upper end of the mold beside the core and the metal flowed downwardly into the mold-cavity in filling it. It is found that in deep molds formed as above described, if the walls of the matrix or core are soft or unevenly packed, the metal will cut into the walls, carrying the sand into the body of the casting and rendering the casting rough and uneven, or in some cases useless, on account of the sand contained in the metal. In case the walls of the mold are packed too hard, however, it will not vent properly and it is found that the metal will not lie against it, and consequently scabs or blow-holes are formed therein. By my invention I am enabled to form molds in which these difficulties are overcome; and I also provide for the forming of the molds without the ordinary bottom boards.

It consists, generally stated, in a mold for such tubular castings having a matrix, a core entering the matrix and closing the upper end thereof, a runner extending entirely through the mold, and a gate connecting the base of the runner and base of the matrix, these parts being contained and supported within a single flask, in combination with a level sand-bed supporting the mold and closing the base of the runner and gate.

To enable others skilled in the art to make

and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a central vertical section showing the patterns within the mold. Figs. 2 and 3 are central vertical sections showing two different forms of molds and showing the cores within the molds, and Fig. 4 is a bottom plan view of the finished mold.

Like letters of reference indicate like parts in each.

In forming a mold in accordance with my invention where the mold is straight or tapering from the upper end it is formed as shown in Fig. 3, the mold-cavities not extending entirely through the body of sand; but where the lower end of the mold-cavity is larger than the central part thereof the pattern is formed in two parts and extends entirely through the flask and body of sand therein, and one part is withdrawn from the lower part and the other part or main body of the pattern is withdrawn from the upper part of the mold, cores being introduced into each end of the mold-cavity, as described in Letters Patent No. 377,009, granted to me January 31, 1888.

I will first describe the mold embodying the latter construction, as shown in Figs. 1 and 2. The patterns *a a'* for the molds and the pattern *e* for the runner are secured to the pattern plate or block *b* and extend upwardly through the stripping-plate *c*. In forming the mold the flask *d* is placed around the patterns, resting on the stripping-plate, and the sand is packed therein in any suitable manner. I thus mold the matrices in the body of sand, which in such case extend through the body of sand and the runner *g*, extending almost to the lower end of the mold, as shown in Figs. 2 and 3. Prior to the removal of the patterns, however, I form by any suitable means the gate-cavity *h*, connecting the runner *g* and matrices *f*, as shown in Figs. 2 and 3. This may be accomplished by a gate-knife, or, as preferred by me, by a cylindrical cutter passing down between the molds and cutting out a circular cavity, and so forming a gate to all the mold-cavities. The patterns are then withdrawn, the pattern *a'* being first withdrawn through the lower end, while the mold is resting on its upper end, and the main patterns

a being subsequently withdrawn through the
 upper end through the stripping-plate *c*. To
 close the lower ends of the matrices *f*, I employ
 the ring or cup cores *k*, (shown in Fig. 2,) these
 5 cores being seated in the seats or prints formed
 for them at the base of the matrices before the
 mold is inverted, and these cores practically
 closing the ends of the matrices. The cores
 may have gates *i* formed in the side thereof
 10 to permit the flow of the metal from the gate-
 cavity *h* into the mold-cavity in case the ring-
 cores extend beyond the gate-cavity *h*. The
 mold is then inverted and a core *l* is inserted
 through the upper end of each matrix, the
 15 core having suitably-shaped seats at its upper
 and lower ends, the seat at the upper end fit-
 ting into the print *m* at the top of the matrix
f and the seat at the lower end fitting into the
 print *n* in the ring or cup core *k*.

20 The finished mold may be placed either
 upon a bottom board or drag having a plain
 sanded surface or upon a suitably-prepared
 surface on the casting-floor, either such sur-
 face forming the base of the gate-cavity *h*, so
 25 that the molten metal will flow down the run-
 ner *g* into the gate-cavity *h* and thence into
 the base of each mold-cavity.

The mold shown in Fig. 3 is practically the
 same as that above described, differing only
 30 in the fact that as the mold-cavities are
 straight or tapering toward the lower end the
 entire patterns can be withdrawn through
 the upper end, and consequently the lower
 ends of the matrices are closed by the sand
 35 of the mold instead of by the auxiliary cores,
 the core-prints *n* being molded at the base of
 the matrices by prints on the patterns. In
 such case the gate-cavity is formed before
 the withdrawal of the patterns, and it com-
 40 municates with the runner *g* and the mold-

cavities, as shown. The cores *l* enter the
 matrices through the upper end of the mold
 and are seated in the prints *m n*, as shown.
 During the pouring of the molds the molten
 metal, entering the upper end of the runner, 45
 will flow down through the same, entering
 the gate-cavity *h* and being confined therein
 by the flat surface of the casting-floor or drag.
 It will then flow into the lower ends of the
 mold-cavities and gradually rise within the 50
 same, filling them without any cutting or like
 action upon the surfaces of the cores or mat-
 rices, and so insuring smooth and solid cast-
 ings. I am also enabled to used green-sand
 cores if it is found desirable. 55

My invention has been described and shown
 as applied to a group of molds; but it is evi-
 dent that it can be employed where a single
 mold is formed in a flask, such as in making
 wagon-skeins and other long tubular cast- 60
 ings, the runner passing through the flask at
 one side of the matrix.

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

A mold for tubular articles, having a matrix, 65
 a core entering the matrix from above and
 closing the upper end thereof, a runner ex-
 tending entirely through the mold, and a gate
 connecting the base of the runner and the
 base of the matrix, these parts being con- 70
 tained and supported within a single flask, in
 combination with a level sand-bed supporting
 the mold and closing the base of the runner.

In testimony whereof I, the said S. JARVIS
 ADAMS, have hereunto set my hand.

STEPHEN JARVIS ADAMS.

Witnesses:

• JAMES I. KAY,
 J. N. COOKE.