

(No Model.)

S. J. ADAMS.  
MOLD FOR TUBULAR ARTICLES.

No. 433,586.

Patented Aug. 5, 1890.

Fig. 1.

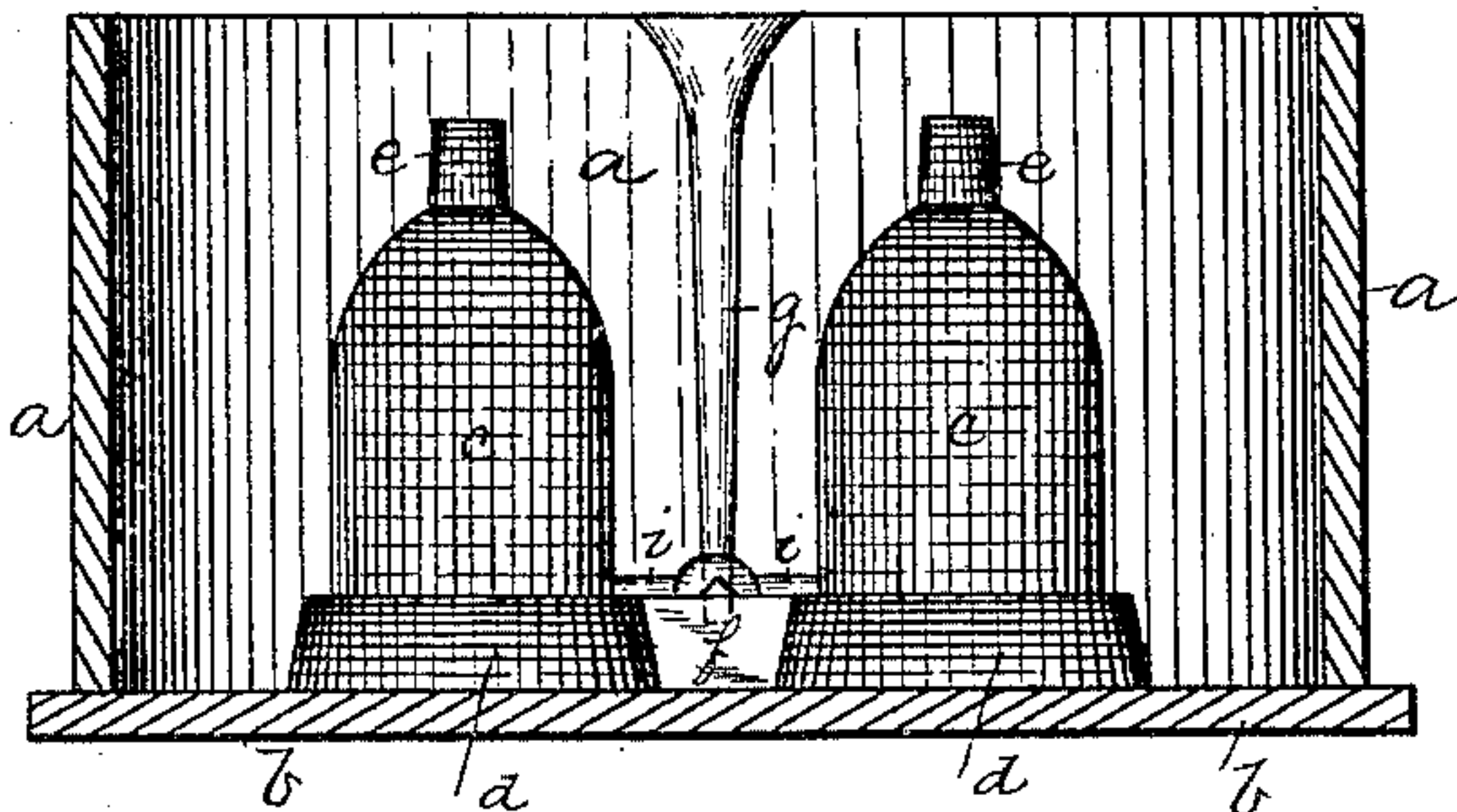


Fig. 2.

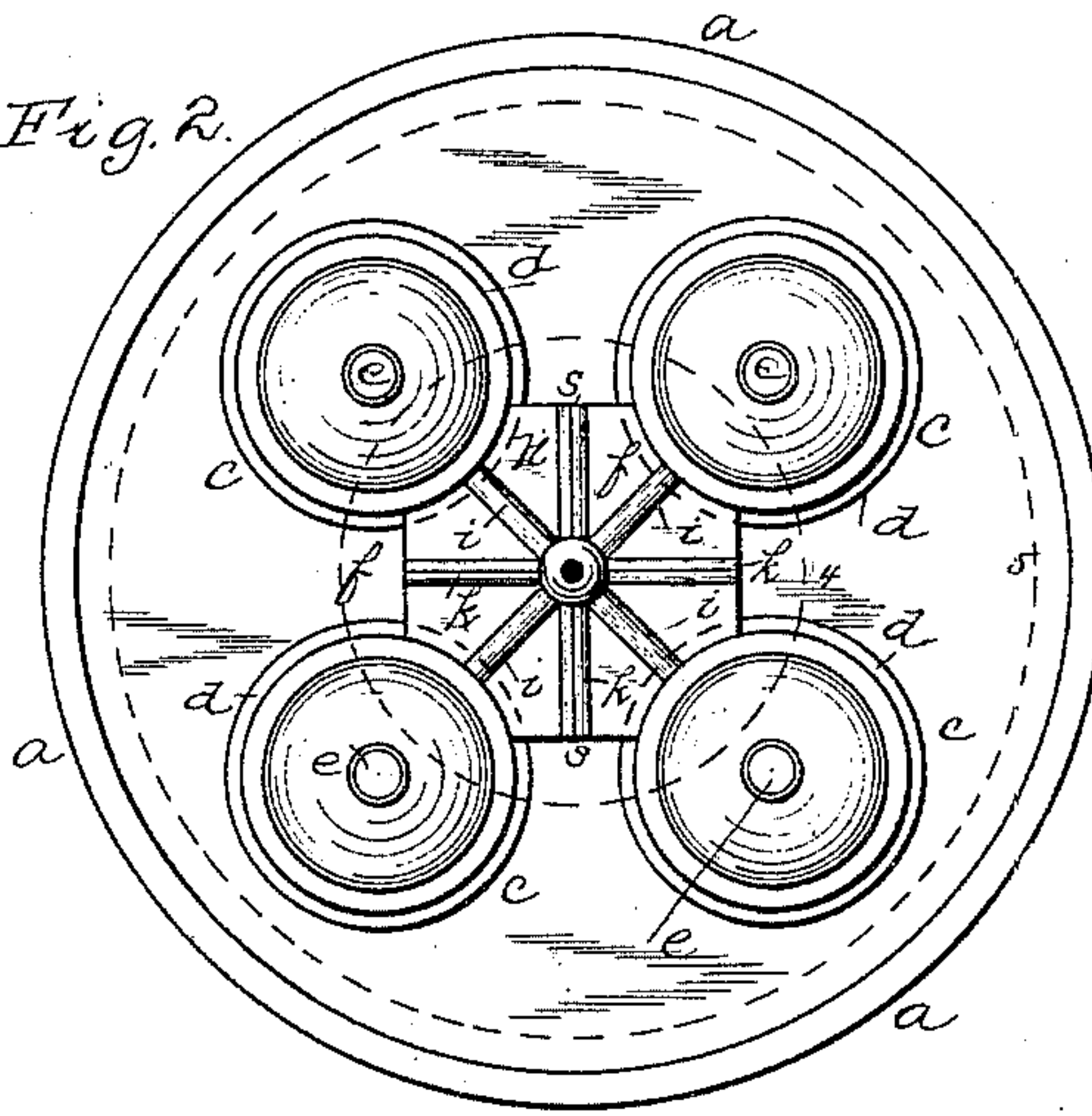


Fig. 5.

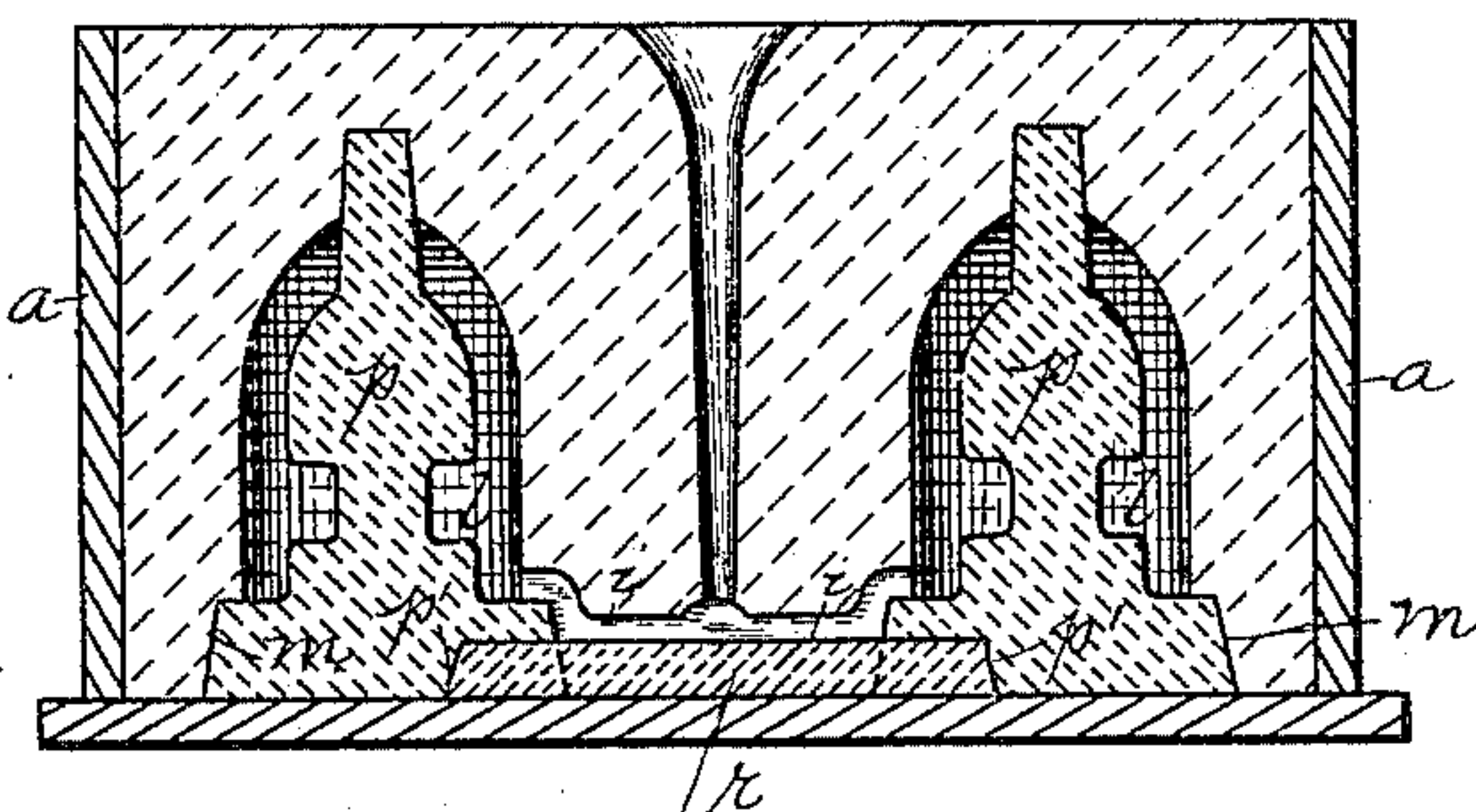


Fig. 7.

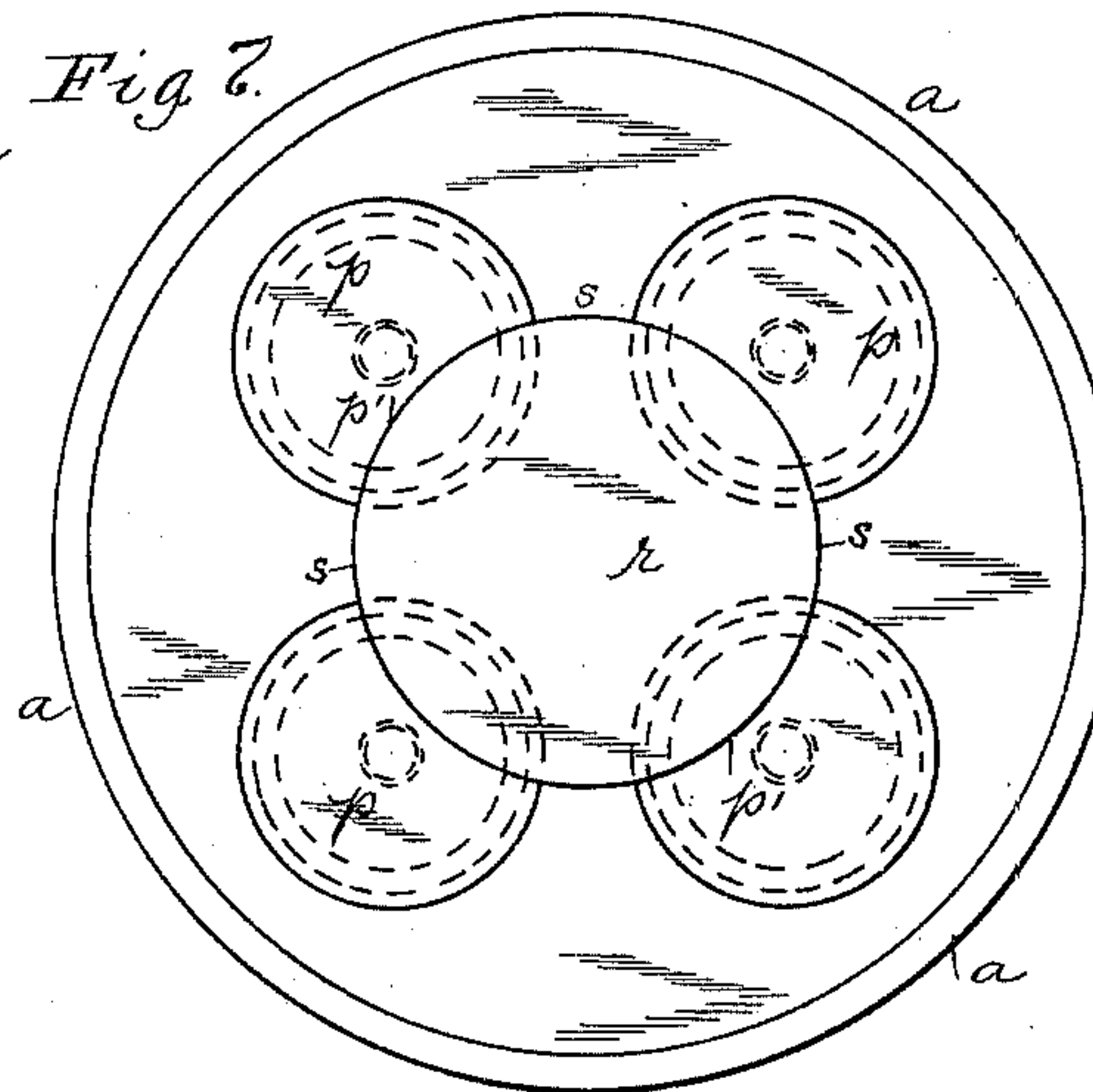


Fig. 6.

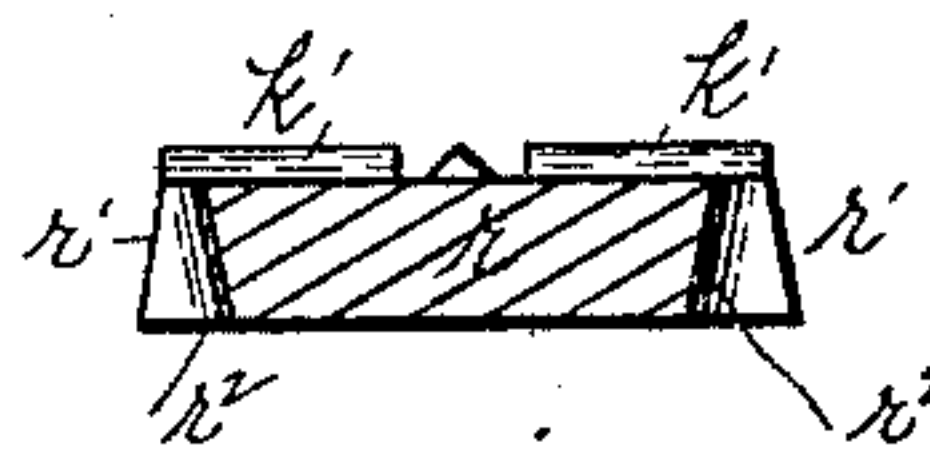
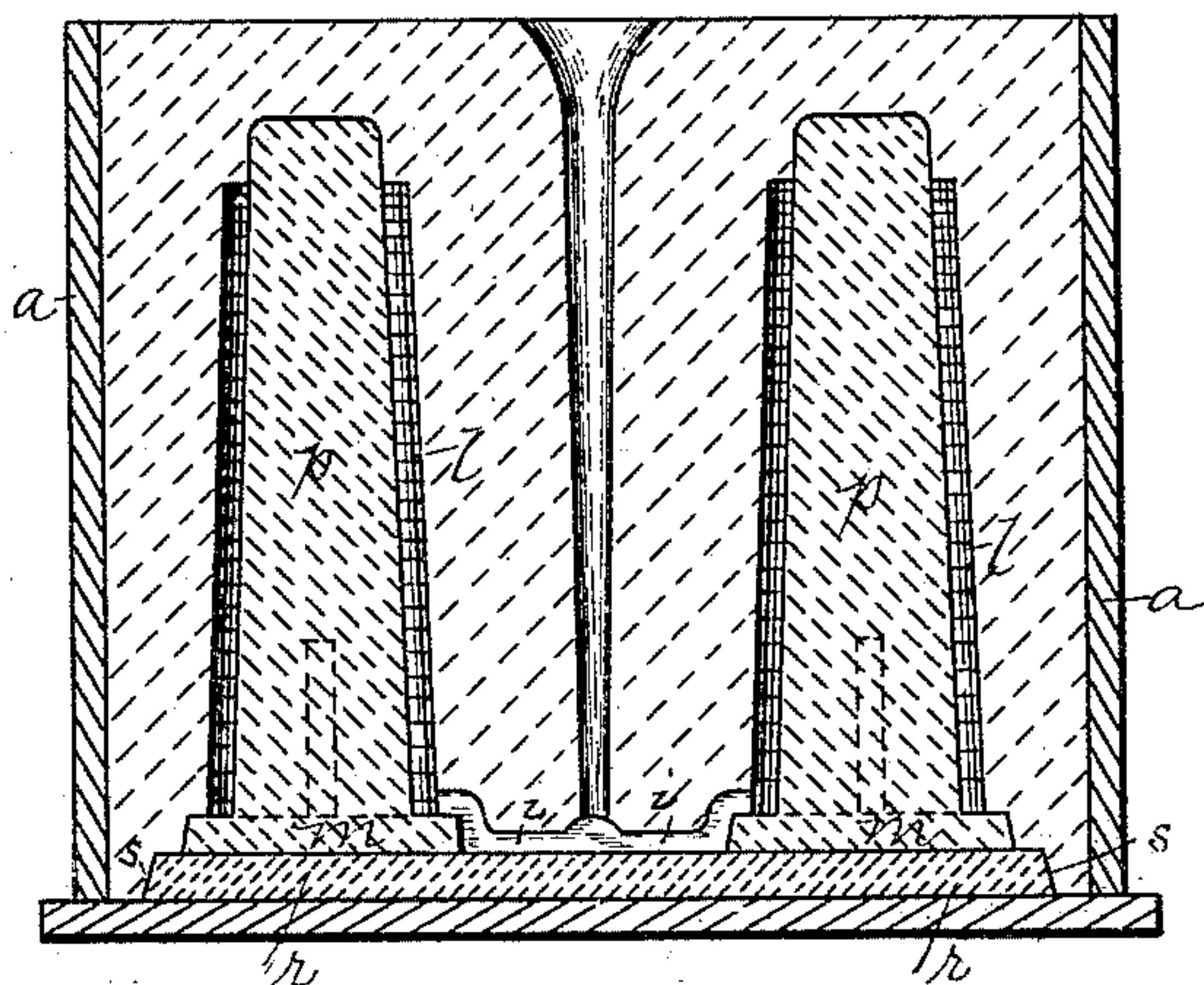


Fig. 4.

Witnesses:

J. A. Cook  
J. J. Ray

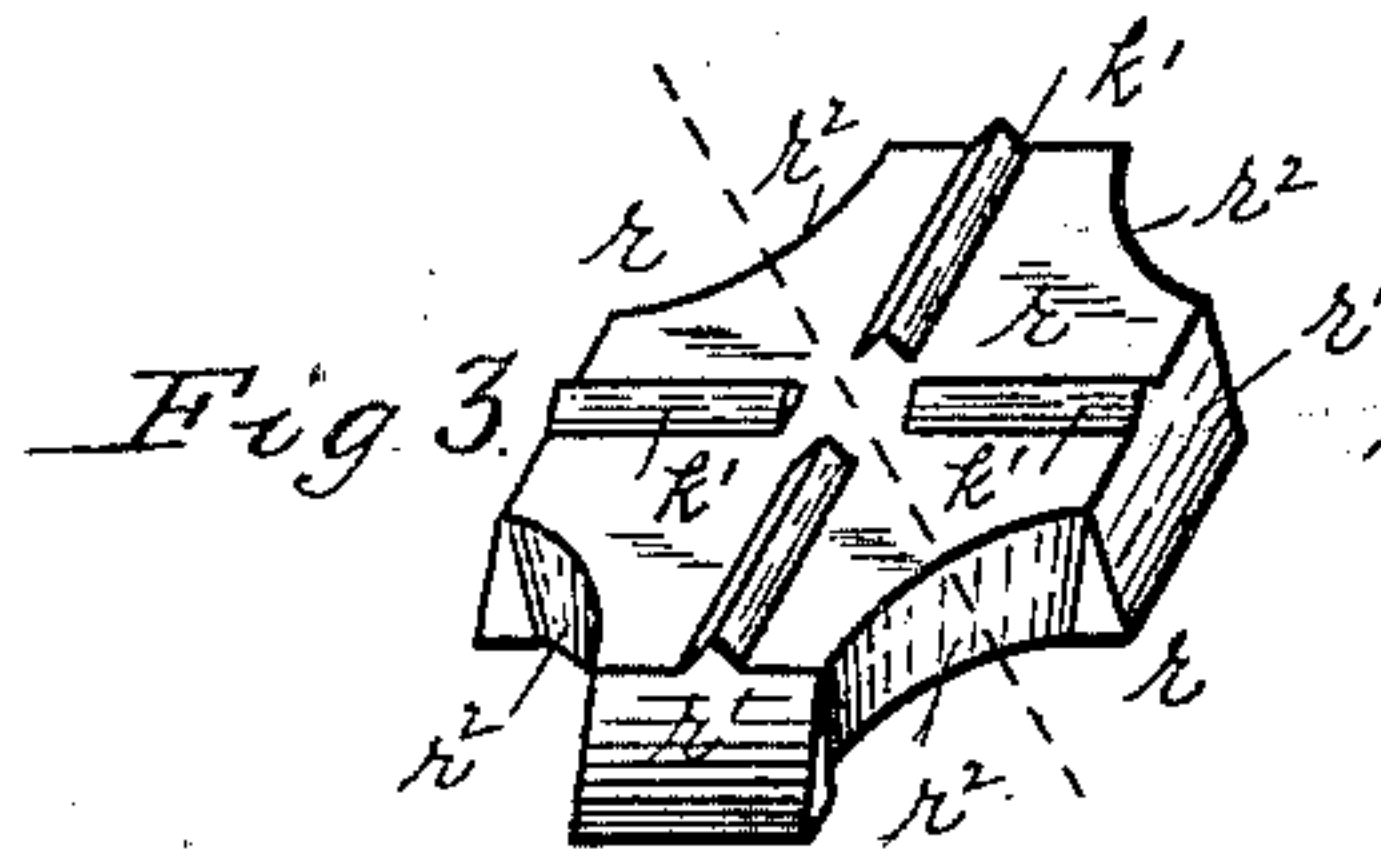


Fig. 3.

Inventor:

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# UNITED STATES PATENT OFFICE.

STEPHEN JARVIS ADAMS, OF PITTSBURG, PENNSYLVANIA.

## MOLD FOR TUBULAR ARTICLES.

SPECIFICATION forming part of Letters Patent No. 433,586, dated August 5, 1890.

Application filed December 4, 1889. Serial No. 332,525. (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 pipe-welding balls, wagon-boxes, and other tubular or like castings, which are cast in a vertical position in a single body of sand, its object being to provide a proper form of mold and cores in which the metal may be fed to the base of the mold-cavity and rise therein, the cutting of the mold by the descent of the molten metal within the mold-cavity being prevented.

My invention consists, generally stated, in a mold for tubular or like articles, having formed in the same body of sand a matrix and a runner extending vertically through the body of sand and communicating at its lower end with the matrix, and a core-seat below said runner, in combination with a core fitting in the matrix, and a separate core fitting in the core-seat below the runner and closing the end thereof, the mold as so constructed providing for the proper and easy forming of the pouring-gate and runners by connecting with the base of the patterns, while the cores can be easily inserted within the mold formed, and the mold employed with the ordinary bottom board without fear of the molten metal cutting into the same, and the molten metal can flow downwardly through the runner until it strikes the runner or filling core, and thence into the mold-cavities, rising gradually therein, this being the most advantageous way to feed the metal to the mold.

My invention also consists in certain other improvements, hereinafter more fully set forth and claimed.

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 vertical section of the flask, showing the patterns in full lines therein. Fig. 2 is a top view of the flask, showing the

patterns extending up into the same, and the pattern for forming the sets or prints for the runner or filling-in core. Fig. 3 is a perspective view, and Fig. 4 a section, of the core employed in Figs. 1 and 2 for closing the base of the runner. Figs. 5 and 6 are vertical sections showing other forms of molds embodying my invention; and Fig. 7 is a bottom view of the mold shown in Fig. 5, the mold having therein the core closing the base of the runner.

Like letters of reference indicate like parts in each.

I have illustrated my invention in connection with the casting of what are known as "pipe-balls" and "wagon-boxes," though it is evident that it may be employed in forming other like long cylindrical castings. The flask *a* is of the ordinary construction, a metal flask being generally employed, and to form the molds in said flask a suitable pattern-plate *b*, carrying a pattern or set of patterns *c*, is employed, the flask resting on the pattern-plate, and the patterns extending up within the flask. These patterns have the suitable print-patterns *d e* thereon for forming the seats of the cores, where such cores are employed.

If desired, the patterns may extend entirely through the flask and both ends of the molds be closed by cores, such form of pattern and mold being employed in forming castings having enlargements thereon, as is well known in the art.

Where a cluster of patterns is secured to the pattern-plate, I locate the pattern for forming the seat for the runner or filling-up core *r* between the several patterns, as shown at *f*, Fig. 2, the form of such pattern employed with my invention, as shown in Fig. 1, being shown in full lines in Fig. 2, and the form of such pattern employed with my invention, as illustrated in Figs. 5 and 6, being shown in dotted lines in Fig. 2, said dotted lines being marked, respectively, 4 and 5 in said figure. Extending up from this runner core-pattern *f* is the runner-pattern *g*, which extends to the top of the flask, as shown, and forms the runner or pouring-gate for pouring the molten metal to the mold, this runner-pattern being either withdrawn from the top



of the mold or being withdrawn with the patterns through the base of the mold after the formation thereof. I form ribs  $i$ , extending from the runner-pattern  $g$ , over the surface of the pattern  $f$ , to the several mold-cavities, so forming side runners for the feeding of the molten metal to the mold-cavities.

Where the form of runner-core shown in Figs. 1 to 4 is employed, in order to center said runner-core before the cores for the several molds are inserted, I also provide guiding-ribs and seats on the core and mold, so as to insure the core being placed in the proper position therein. It is preferred to form the guiding seats or depressions in the mold or body of sand, and these are formed by the ribs  $k$  on the pattern, the guide-ribs  $k'$  on the core, as shown in Fig. 3, seating themselves in the depressions formed by said ribs  $k$ . The molds formed by the patterns above described have the ordinary mold-cavities  $l$ , with the core seats or prints at the ends thereof and in which the cores  $p$  are seated. Where the form of runner-core  $r$  shown in Fig. 3 is employed, it will be noticed that it bears upon the body of sand within the flask at the points  $r'$ , and at those points its face edges are inwardly inclined from its bottom surface upwardly, so that it may engage with like seats  $s$ , formed in the body of sand. As, however, it fits between the several cores  $p$ , inserted within the mold-cavities, and it is intended to insert this runner-core prior to the placing of the other cores within the mold, in order to form a proper joint with the other cores, the faces bearing upon the other cores, as at  $r^2$ , are formed inwardly inclined from the top surface of the core downwardly, and when the core is inserted within the mold these faces  $r^2$  correspond to the other faces of the core-seats  $m$ , completing the same, and so preparing said seats for the reception of the cores  $p$ . Different forms of runner-core may, however, be employed—such as those shown in Figs. 5 and 6—the runner-core shown in Fig. 5 being simply a circular core, which is inserted in the flask after the ordinary cores  $p$  have been placed therein, said cores  $p$  having depressions  $p'$  formed in their core-seats  $m$  for the reception of the core  $r$ , which core fits into said depressions and also fits into the seats  $s$  in the body of sand, as shown by the dotted line 4 in Fig. 2. The depressions  $p$  in the cores and the seats  $s$  in the body of sand thus form the seats for the circular core, which is seated or rests in these seats and so closes the base of the mold. The core employed in Fig. 6 extends entirely around the ordinary cores  $p$ , inserted within the mold, said core being what might be termed a "plate-core," and bearing around its entire edge in the seat  $s$  of the mold instead of bearing part upon the mold and part upon the cores. In such construction the runner-core pattern extends out to the line indicated at 5, Fig. 2, and the cores  $p$  are first inserted in the mold formed and

the plate-core extends past them and fits in the seats  $s$ , Fig. 5.

In forming the molds in accordance with my invention the patterns extend up within the body of the flask and the sand is fed into the flask and compacted therein by any suitable means. After the formation of the mold the pattern is withdrawn. In the mold shown in Fig. 1 the runner or filling-up core  $r$  is then placed within the mold, its seats  $r'$  bearing upon the mold, while its ribs  $k'$  fit in the seats corresponding to them in the mold, and the cores  $p$  are then inserted in the mold, the prints  $m$  of the cores fitting part within the corresponding seats in the body of the sand and part against the faces  $r^2$  of the core  $r$ . The bottom board is then placed upon the flask and the flask inverted, when the mold is ready for casting. In the mold shown in Fig. 5, after the formation thereof, the cores  $p$  are inserted within the mold-cavities and the core  $r$  is then inserted in place, said core resting on the cores  $p$  and bearing around its edge in the body of said cores and in the body of the mold between said cores, as indicated by the dotted line 4 in Fig. 2. The bottom board is then placed in this mold, when it is ready for casting. In the mold shown in Fig. 6, after the molding thereof, the cores  $p$  are inserted in the mold-cavities and the plate-core  $r$  placed over the same, it being seated on the body of sand forming the mold. The bottom board is then placed above the plate-cores  $r$  and the mold inserted, when it is ready for casting.

During the casting operation in any of the molds shown the metal will flow down through the runner until it comes in contact with the runner-core  $r$ , which prevents its striking the bottom board and wearing into the same. The metal then flows through the side runners into the several mold-cavities, and as, especially in molds formed by what are known as the "jarring" process, the sand is more firmly compacted around the base of the mold than in the upper part thereof, it is evident that I obtain the necessary compactness of the mold at the base and feed the molten metal to such part, while the upper part, which may be less compact, will permit the escape of the gases—a point of great importance in forming a perfect casting.

The invention is simple in construction, overcomes the necessity of either employing separate drags for the base of the mold or the use of the casting-floor, which it is hard to keep level, and the molds can be as rapidly formed as those heretofore in use.

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

1. A mold for tubular and like articles, having formed in the same body of sand a matrix and runner extending vertically through the body of sand and communicating at its lower end with the matrix, and a core-seat below said runner, in combination



with a core fitting in said matrix, and a separate core fitting in the core-seat below the runner and closing the lower end thereof, substantially as and for the purposes set forth.

2. A mold for tubular articles, having formed in the same body of sand a matrix open at the base of the mold, a runner extending vertically through the body of sand and communicating at its lower end with the matrix, and a core-seat below said runner, in combination with a core fitting in said matrix, and a separate core fitting in the core-seat below the runner and closing the lower end thereof, substantially as and for the purposes set forth.

3. A mold for tubular articles, having formed in the same body of sand a matrix open at the base of the mold, a runner extending vertically through the body of sand and communicating at its lower end with the matrix, and a core-seat below said runner, in combination with a core fitting in said mat-

rix and closing the lower end thereof, and a separate core fitting in the core-seat below the runner and bearing part upon the main core, substantially as and for the purposes set forth.

4. A mold for tubular articles, having formed in the same body of sand a matrix open at the base of the mold, a runner extending vertically through the body of sand and communicating at its lower end with the matrix, and a core-seat below said runner, in combination with a core fitting in said matrix and having a depression therein to receive another core, and a separate core fitting in the core-seat below the runner and entering the depression in the main core, substantially as and for the purposes set forth.

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

STEPHEN JARVIS ADAMS.

Witnesses:

JAMES I. KAY,  
J. N. COOKE.