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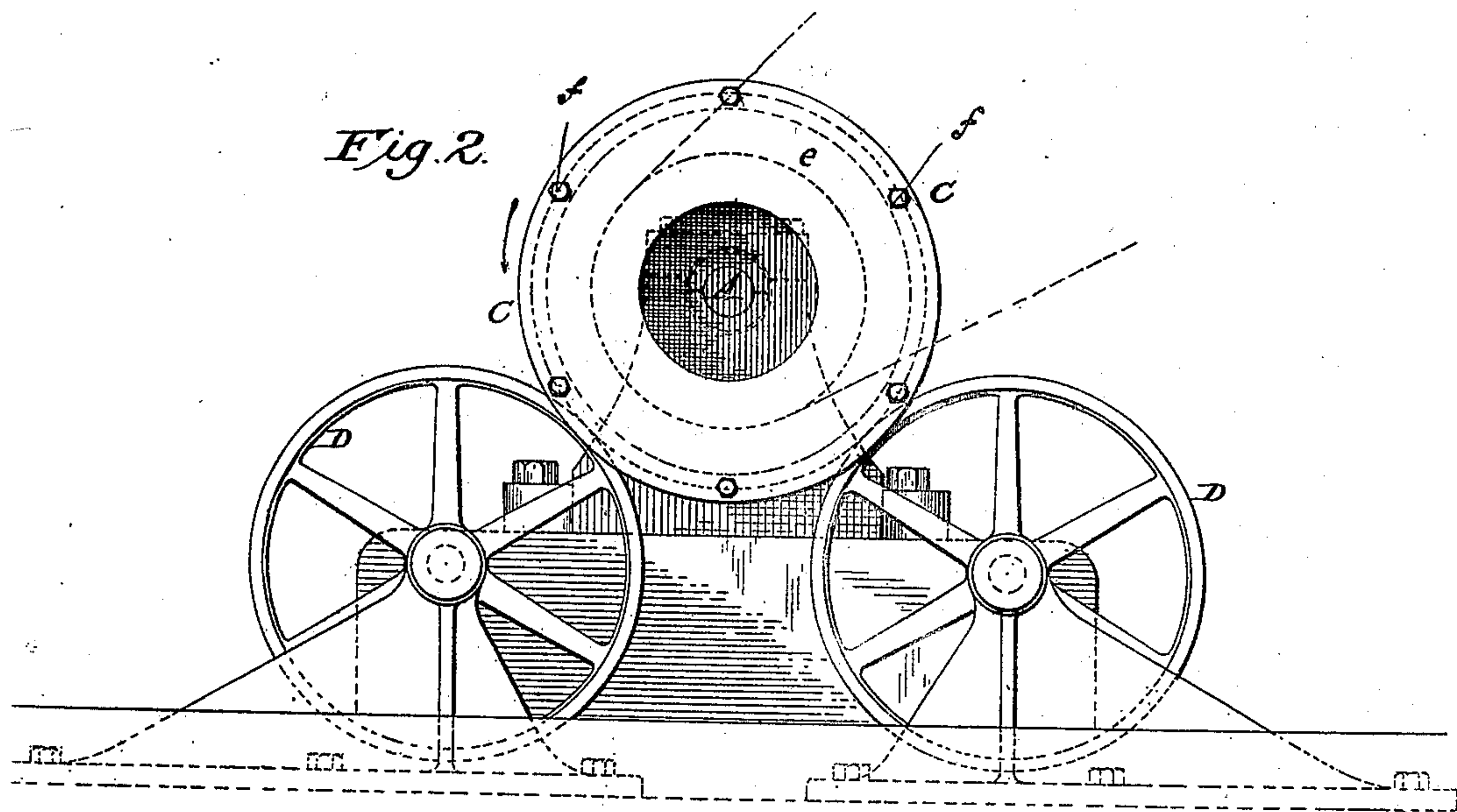
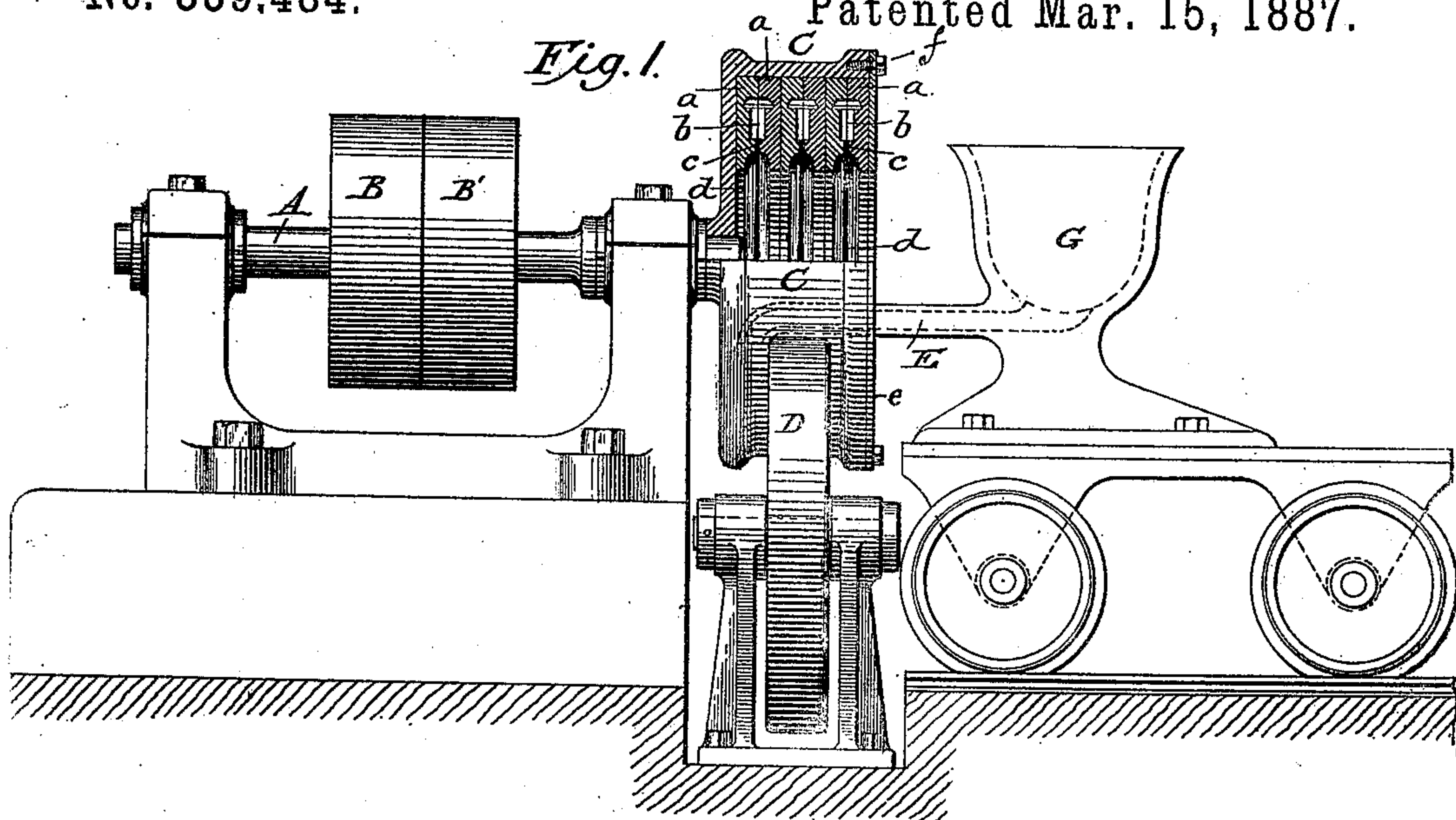
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J. WHITLEY.

MOLD FOR CASTING RIVETS.

No. 359,484.

Patented Mar. 15, 1887.



WITNESSES

*Sidney P. Hollingsworth*  
*William H. Shipley*

INVENTOR

*Joseph Whitley*  
*By P. T. Dodge*  
Attorney



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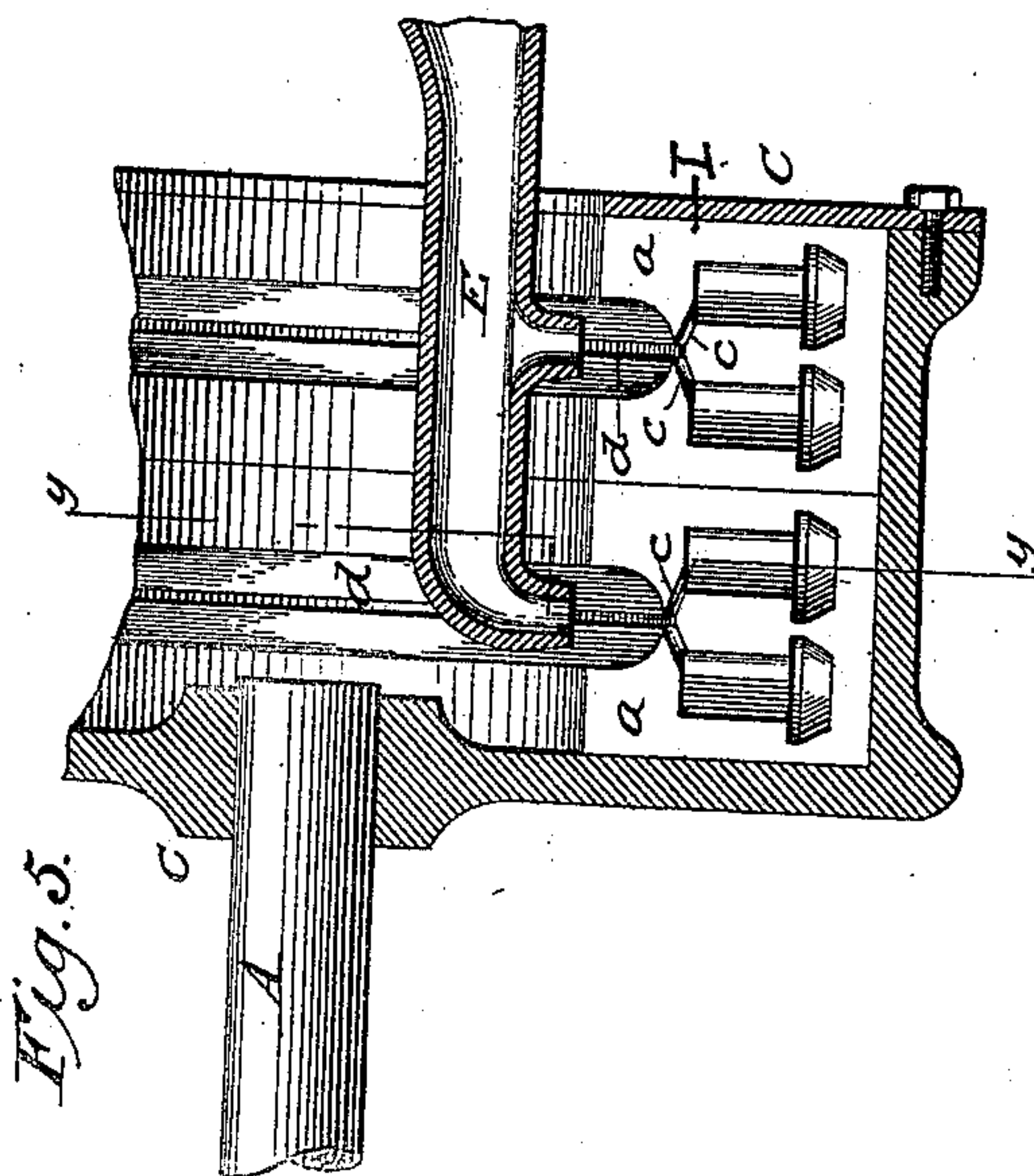
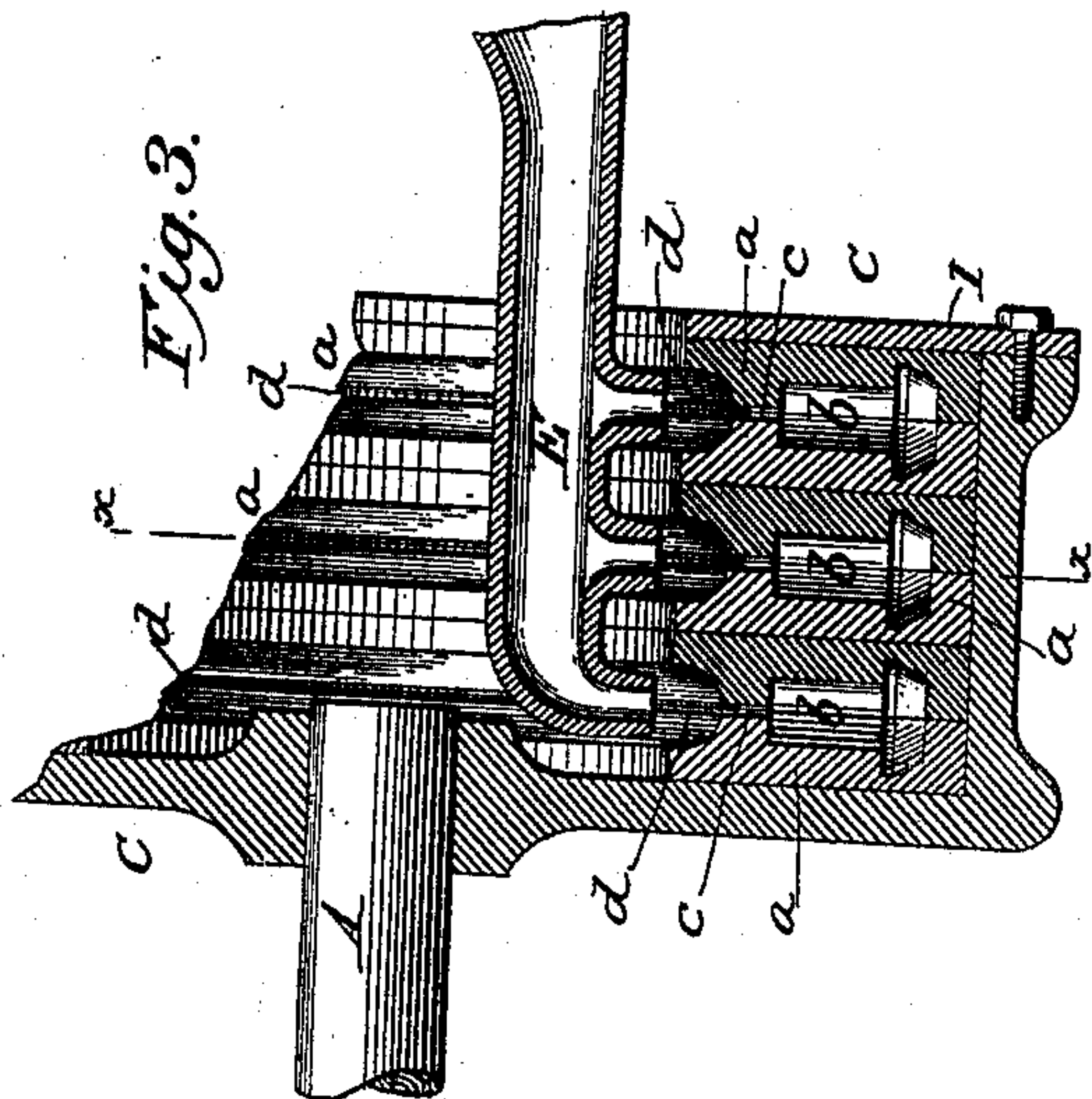
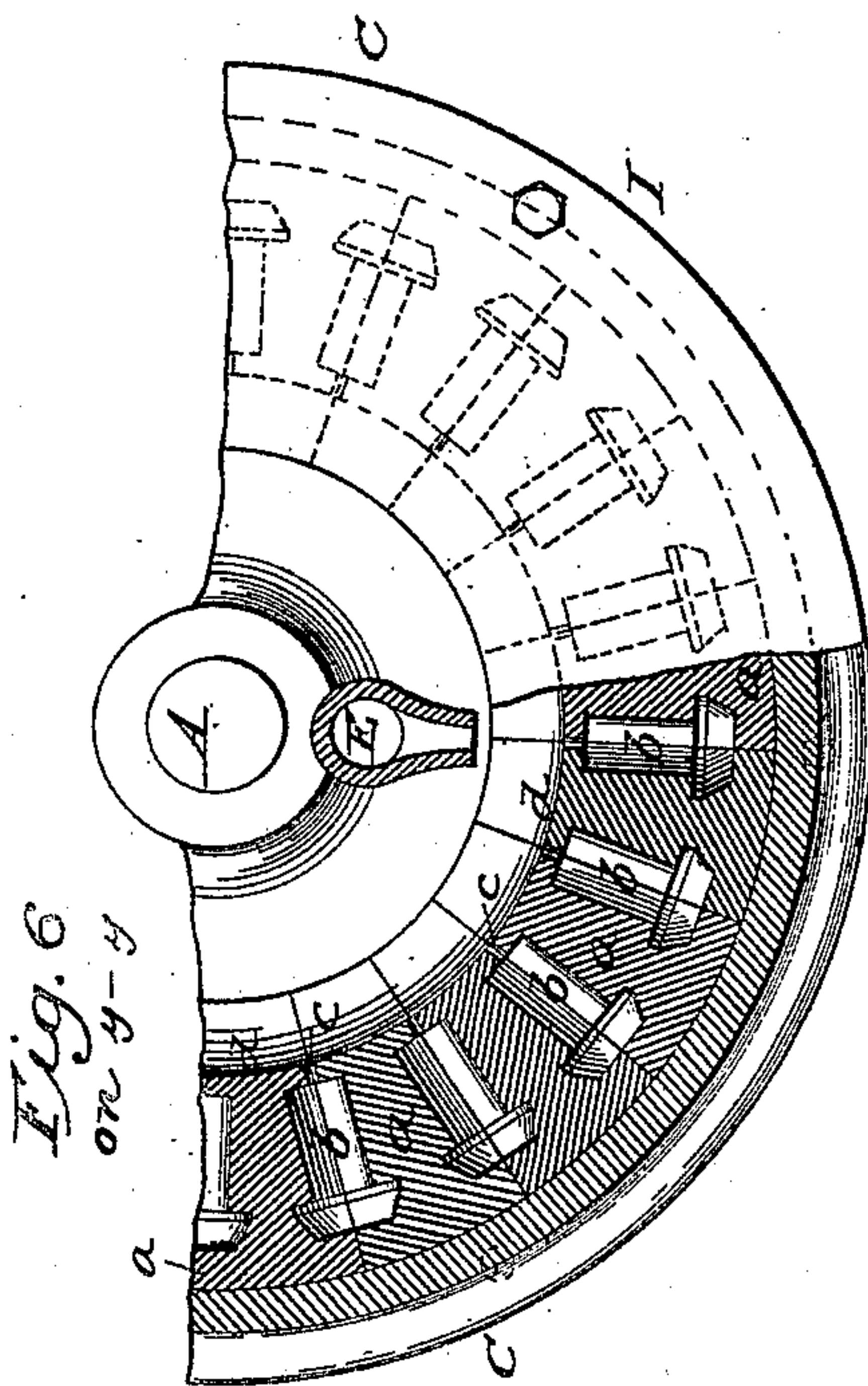
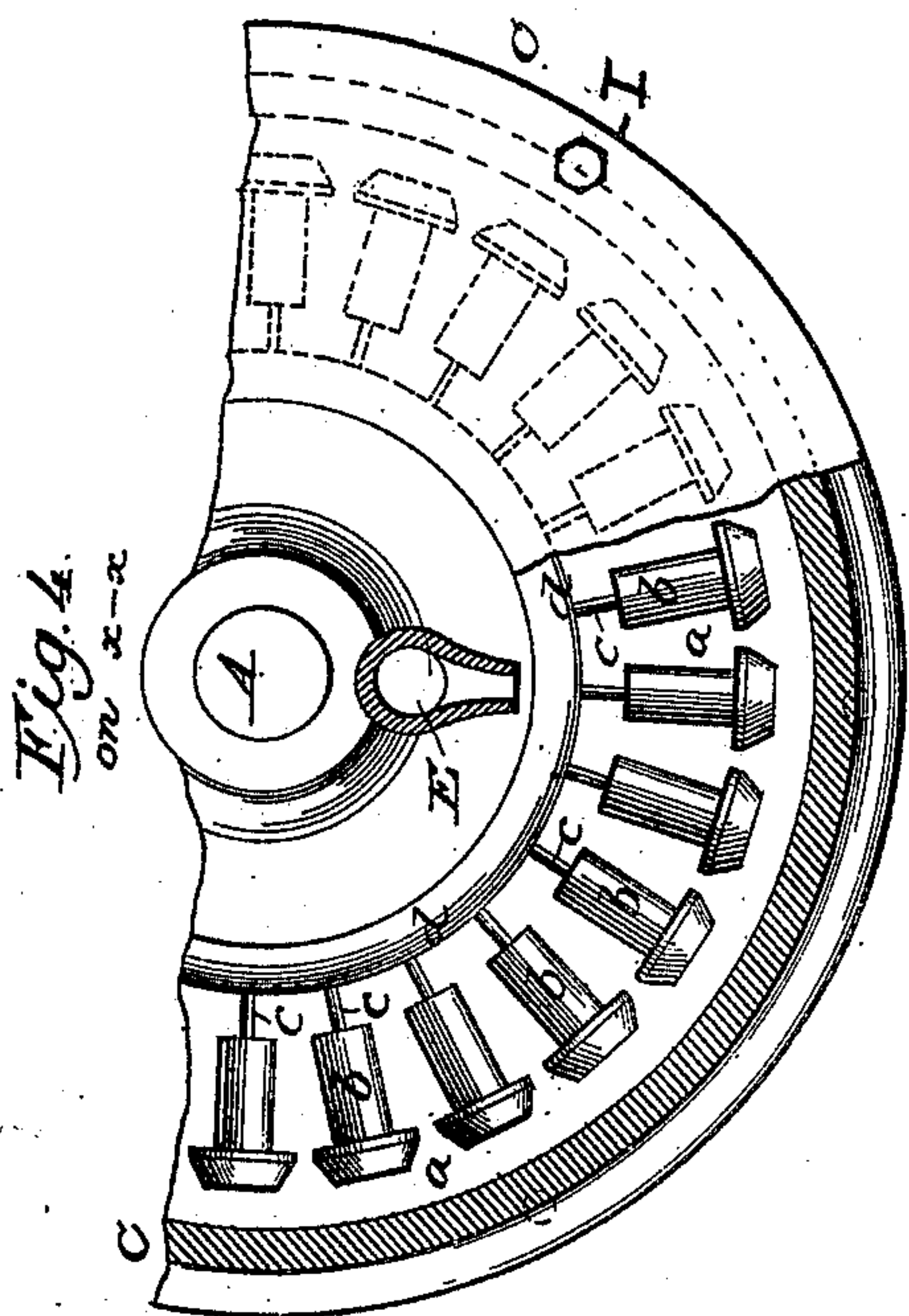
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# UNITED STATES PATENT OFFICE.

JOSEPH WHITLEY, OF LEEDS, COUNTY OF YORK, ENGLAND.

## MOLD FOR CASTING RIVETS.

SPECIFICATION forming part of Letters Patent No. 359,484, dated March 15, 1887.

Application filed December 4, 1884. Renewed October 18, 1886. Serial No. 216,588. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH WHITLEY, of Leeds, in the county of York, England, have invented certain Improvements in Molds for Casting Rivets, of which the following is a specification.

The aim of this invention is to provide for the cheap and rapid production of cast steel rivets possessing the characteristics of strength, homogeneity, and malleability.

It relates to an annular rotary mold containing numerous cells, or molds proper, grouped around and communicating with a central space, through which the molten metal is delivered; and the invention consists in the features of construction hereinafter described, and pointed out in the claims.

Figure 1 represents a side elevation of my casting apparatus, the upper portion of the mold proper being shown in cross-section. Fig. 2 represents an end elevation of the same. Fig. 3 is a cross-section, on a larger scale, of the mold and the runner through which the molten metal is delivered. Fig. 4 is a section on the line *xx* of the preceding figure. Fig. 5 is a cross-section of the mold and runner in different form. Fig. 6 is a section on the line *yy* of the preceding figure.

In constructing my apparatus, I mount in bearings or supports of any suitable character a driving-shaft, A, provided with fast and loose driving-pulleys B B', or with other suitable means of communicating motion thereto. It is also provided at one end, which overhangs its support, with a cylindrical shell or body, C, one side of which is closed. For the purpose of steadying and giving additional support to the shell or body when in action I propose to employ two rolls, D, mounted in stationary bearings and acting against the circumference of the body, as shown; but these rolls are not a necessary feature of the apparatus.

Within the rotary shell or body C, I place the mold proper, consisting of two or more sections, *a*, composed of ganister, loam, or other suitable material, having their adjacent faces recessed in such manner that when brought together they will produce cells or molds proper, *b*, each adapted to give form to a single bolt or like device.

It will be observed that the mold contains a large central opening, to which access may be

had from the exterior, and that the series of cells are arranged in a circular series around the central opening and each provided with an inlet-opening, *c*, this construction permitting the entire series of cells to be supplied with molten metal from the center. For the purpose of facilitating the delivery of the metal to the cells, I form the interior of the mold with one or more circumferential grooves or channels, *d*, each communicating with the inlets *c*, so as to guide the molten metal thereto.

For the purpose of introducing the molten metal I employ a gate or runner, E, extending horizontally from a pot or ladle, G, mounted on a wheeled truck, as shown in Fig. 1, so that when the truck is advanced the delivery end of the runner will be introduced into the central opening of the mold. In operating the apparatus the mold receives from any suitable motor a rapid rotary motion, commonly a speed of five hundred revolutions per minute or thereabout. The metal, being introduced at the center, enters the channel *d* and passes thence through the inlets *c* into the cells or molds proper.

In practice it has been demonstrated that the centrifugal force generated by the rotation of the mold will have the effect of eliminating from the metal all gases and vapors and of subjecting the metal before solidification to a pressure such as to render it perfectly homogeneous. The force thus applied has also the additional effect of giving the metal great tensile strength, and of imparting thereto great ductility or malleability.

The internal sections of the mold may be of such form as found desirable in practice. In Figs. 3 and 4 the mold-sections are in the form of flat rings recessed in their side faces and arranged side by side in planes at right angles to the axis of rotation. In Figs. 4 and 5 the mold-sections are in the form of segments of a circle with recesses in their radial faces. These mold-sections, formed in any suitable manner, being thoroughly dried, and, if desired, heated prior to their being used, secure a gradual cooling of the metal, which is thus left in a soft and malleable condition. The mold-sections may be confined in place and held in intimate contact by means of an end plate or ring, I, bolted to the open side of the shell or body, as represented in the various figures, or



they may be secured by any other suitable means.

In order to confine the mold-sections tightly in position I apply to the end of the body or shell C a removable plate, *e*, secured in position by bolts *f* or equivalent fastening devices, which will admit of its ready removal. After the completion of the casting operation the end-plate is detached and the mold sections or rings removed from the interior of the body and separated from each other to discharge the rivets.

It is to be noted that in my apparatus the metal is delivered by the runner in a downward direction directly to the mouths of the cells or molds *b* as the latter pass thereunder. This is advantageous in that the metal is prevented from chilling, and in that the accumulation of surplus metal in the center of the mold is avoided.

Having thus described my invention, what I claim is--

1. The mold arranged to rotate in a vertical plane and provided with the central cavity

and the series of cells or molds proper, *b*, grouped around said cavity and communicating therewith, and a ladle, *G*, having a runner, *E*, arranged, as described, to deliver the metal in a downward direction directly to the mold-cells.

2. A vertically-revolving mold having a central opening and a series of cells or molds proper grouped around said opening and communicating therewith, in combination with a runner or feed-spout arranged to deliver the metal directly into the mouth of each cell as the latter passes thereunder.

3. The rotary annular mold provided with a series of cells or molds proper, the internal grooves, *d*, and the inlets extending from said grooves to the cells.

JOSEPH WHITLEY.

Witnesses:

THOMAS TURNER,  
*Notary Public, Leeds.*

JOHN LOWE,  
*Clerk to Thomas Turner.*