

J. P. BAGLEY.
CORE BARREL FOR INGOT MOLDS.
APPLICATION FILED MAY 8, 1914.

1,155,122.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.

Fig. 1

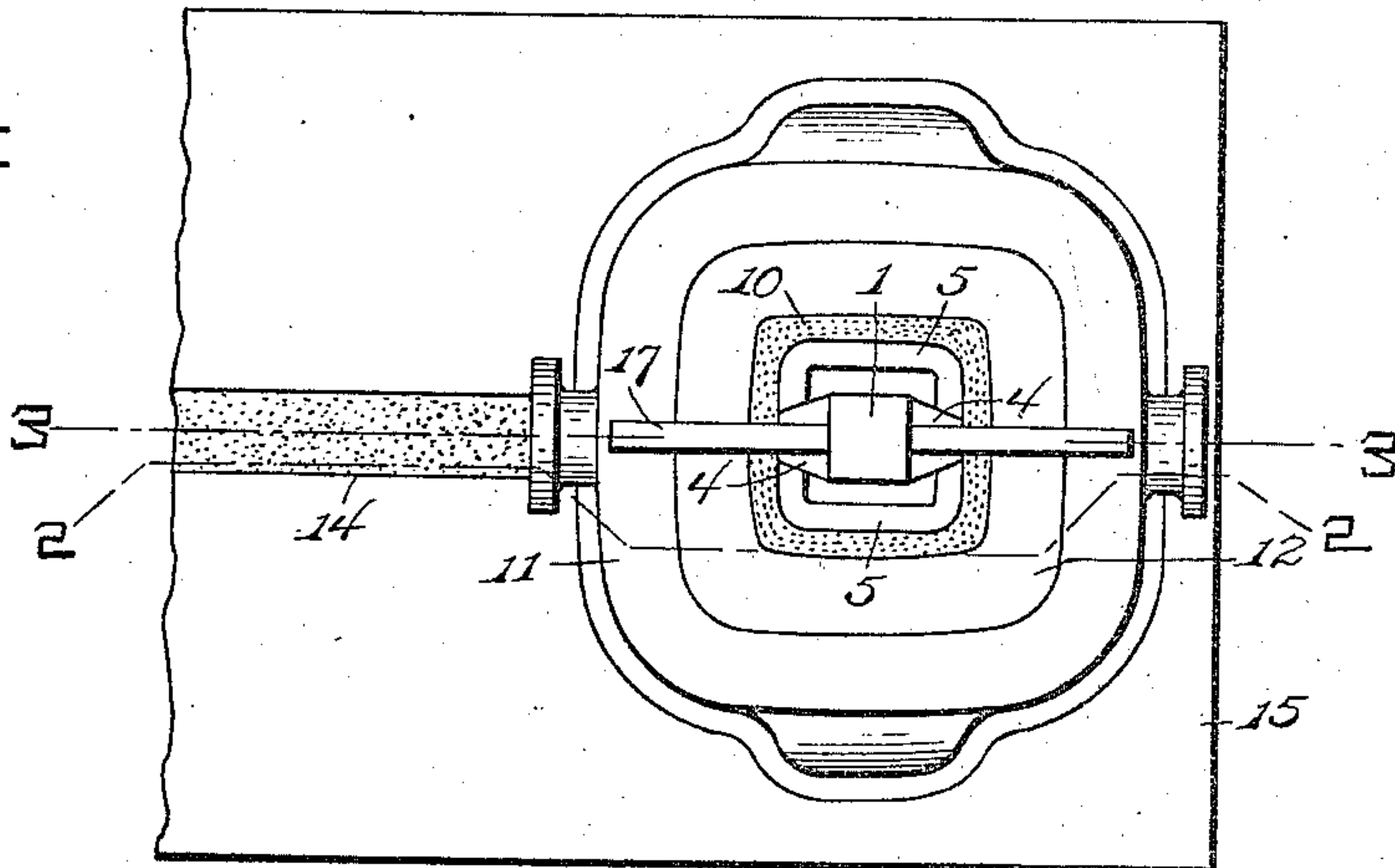


Fig. 2

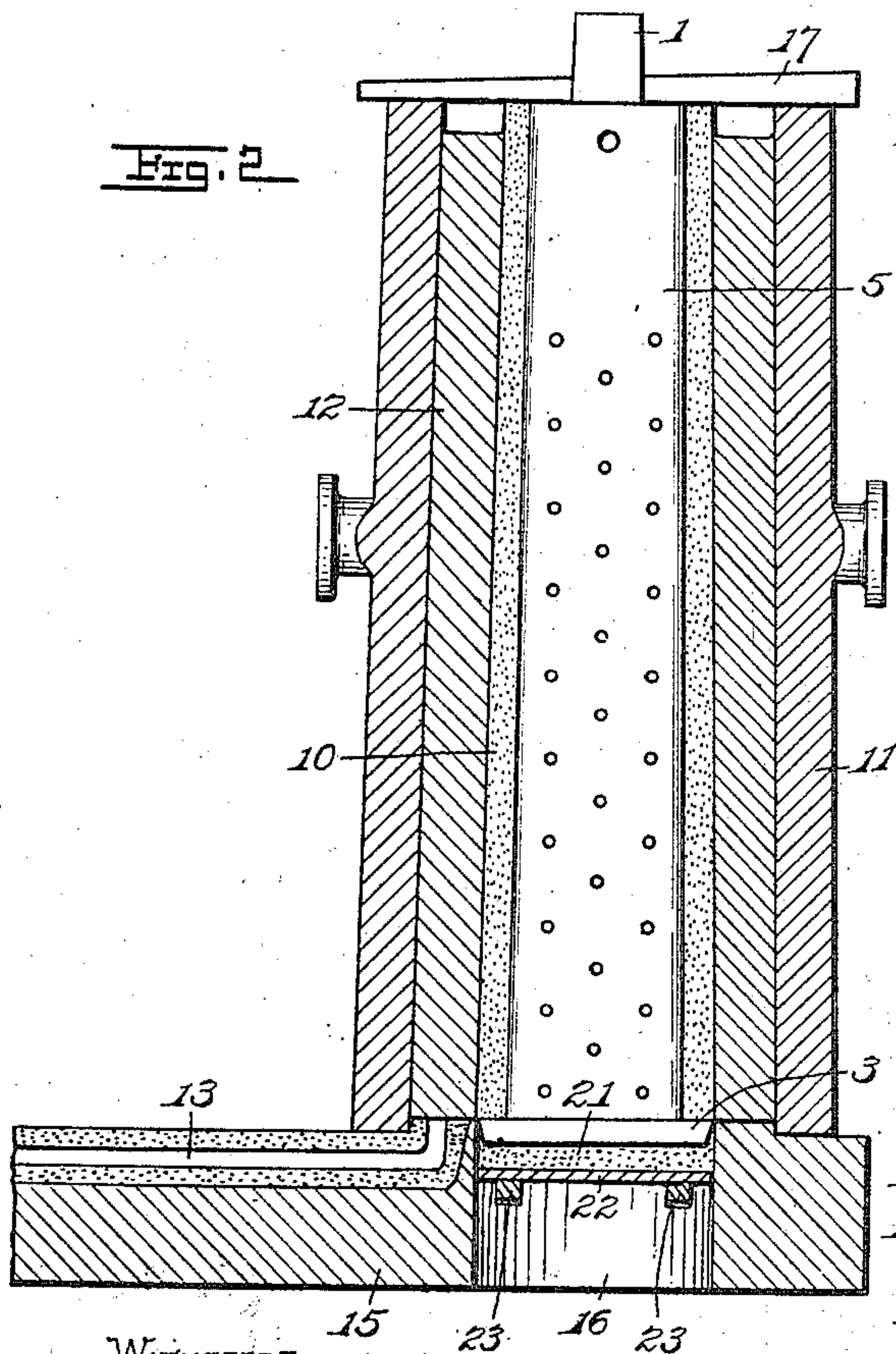
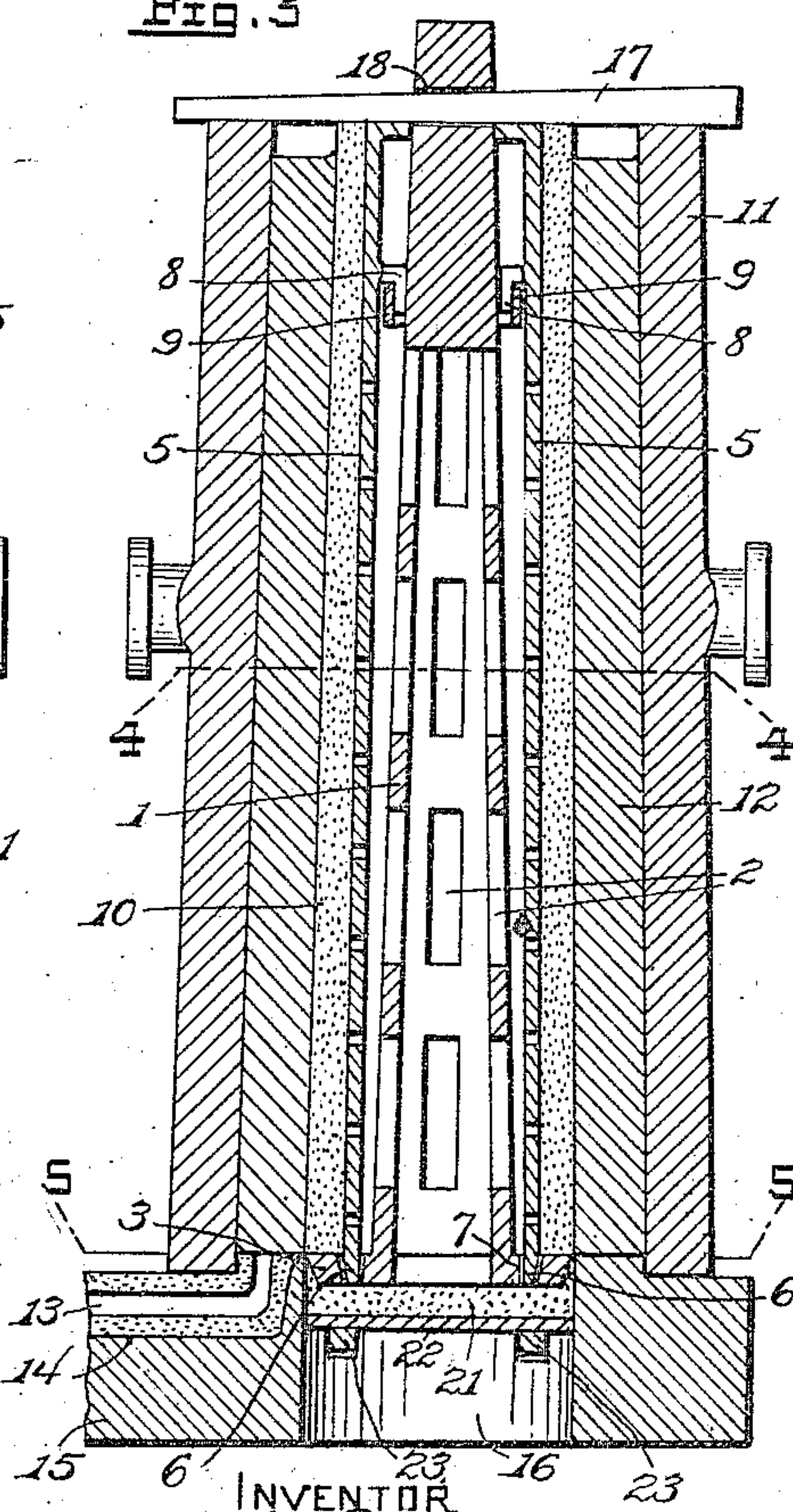


Fig. 3



WITNESSES

J. E. Arthur
W. H. Keefe

INVENTOR

By Joseph P. Bagley
H. C. Leland
ATTORNEY.

J. P. BAGLEY.
CORE BARREL FOR INGOT MOLDS.
APPLICATION FILED MAY 8, 1914.

1,155,122.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 2.

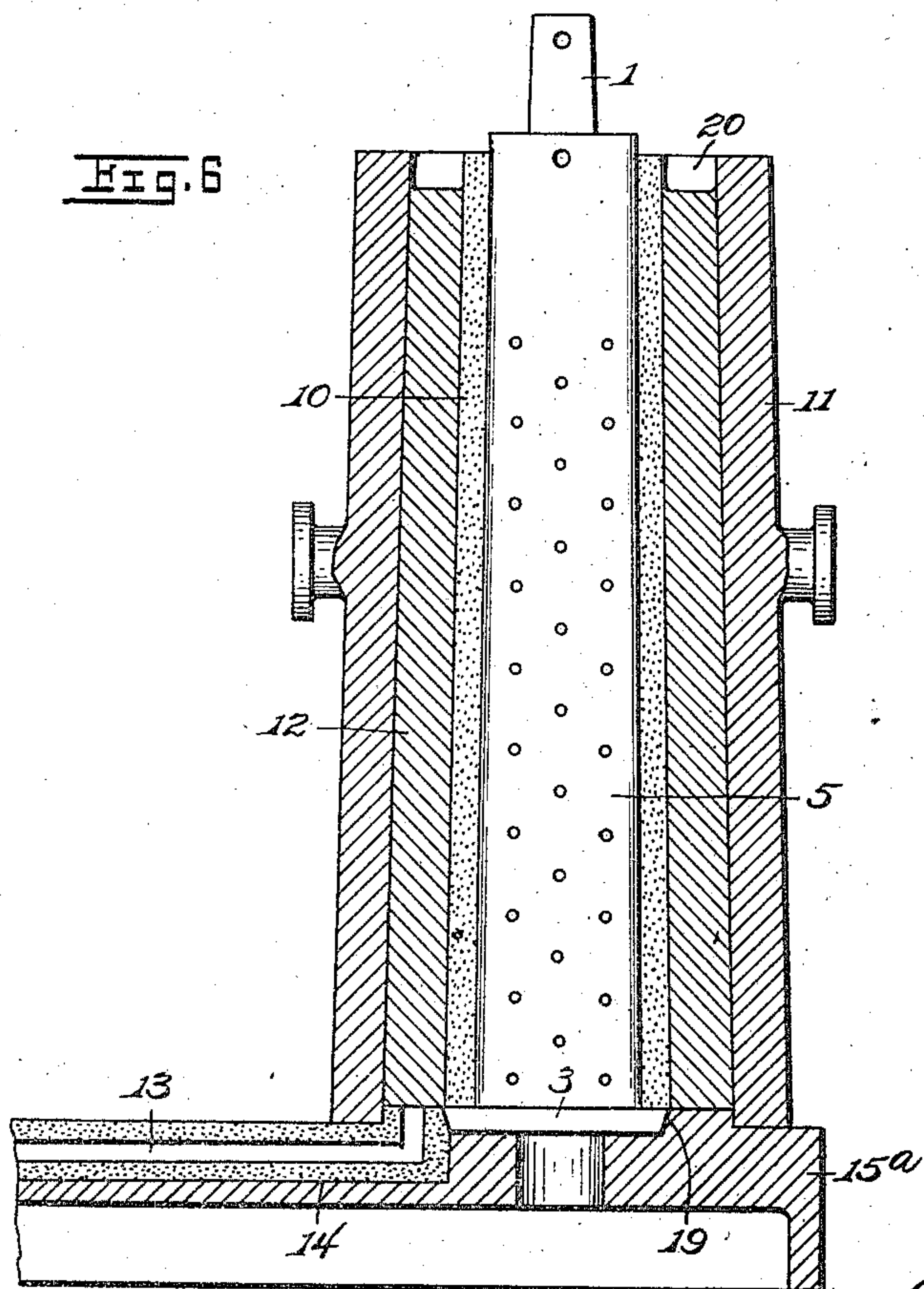
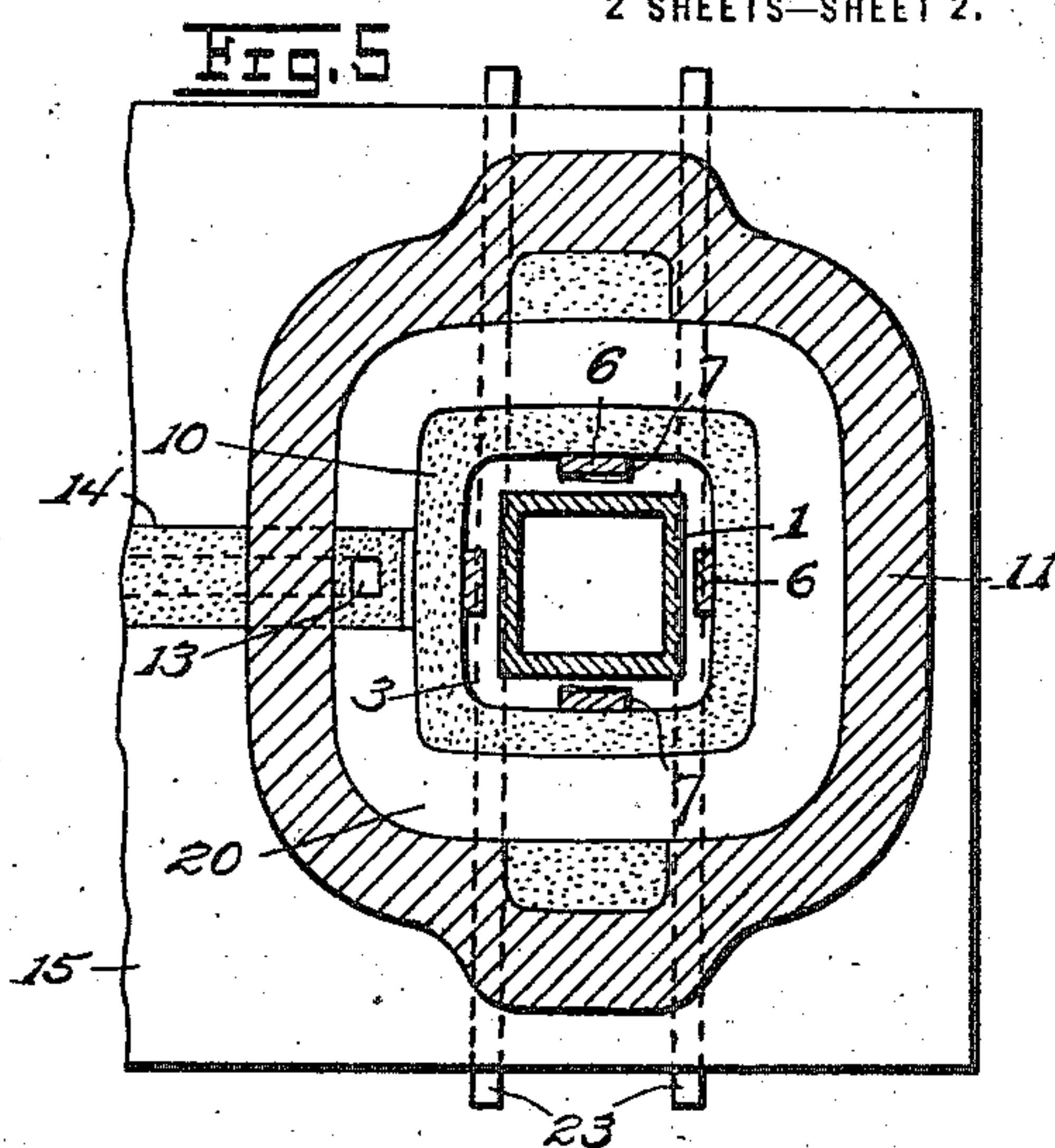
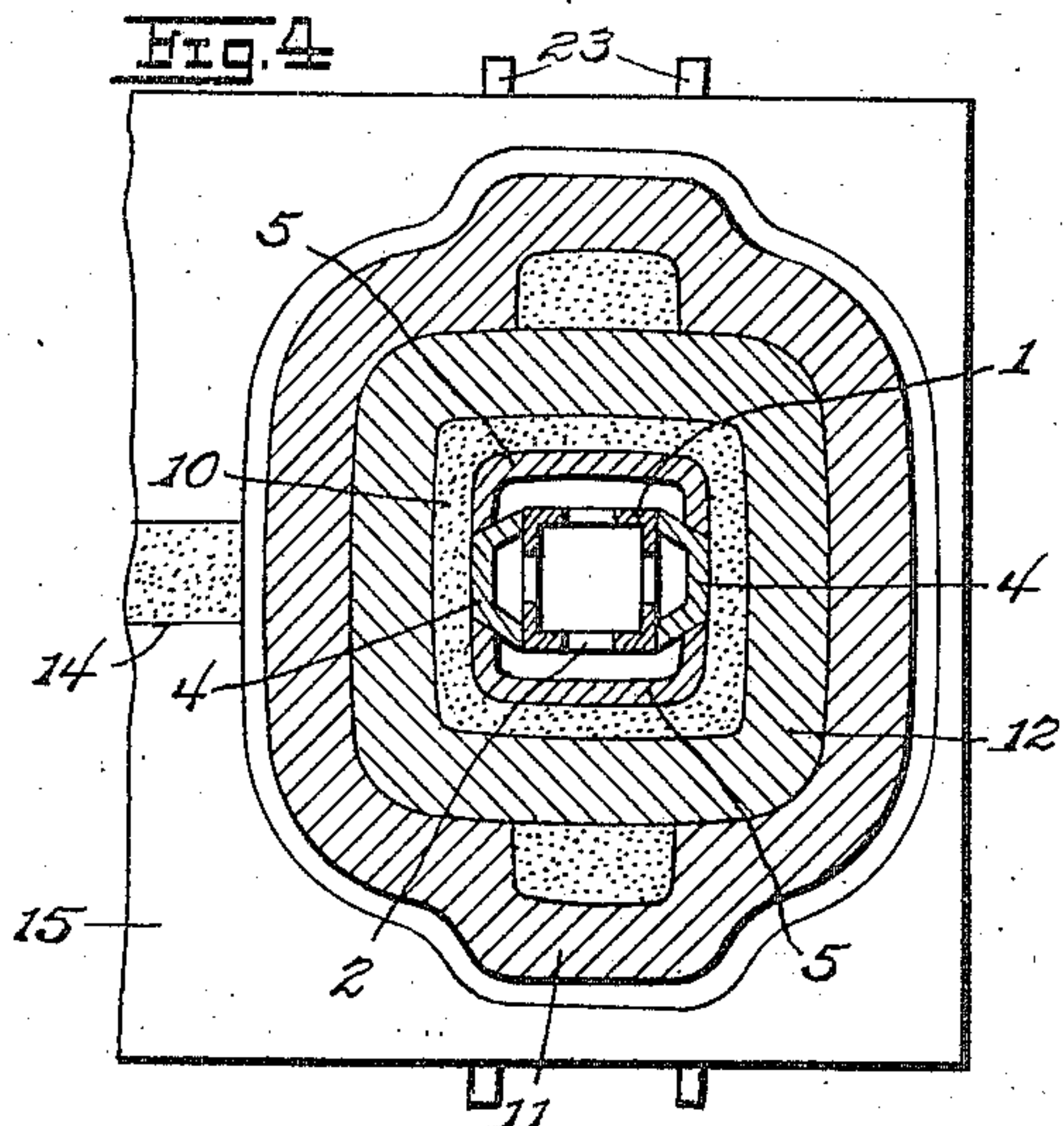
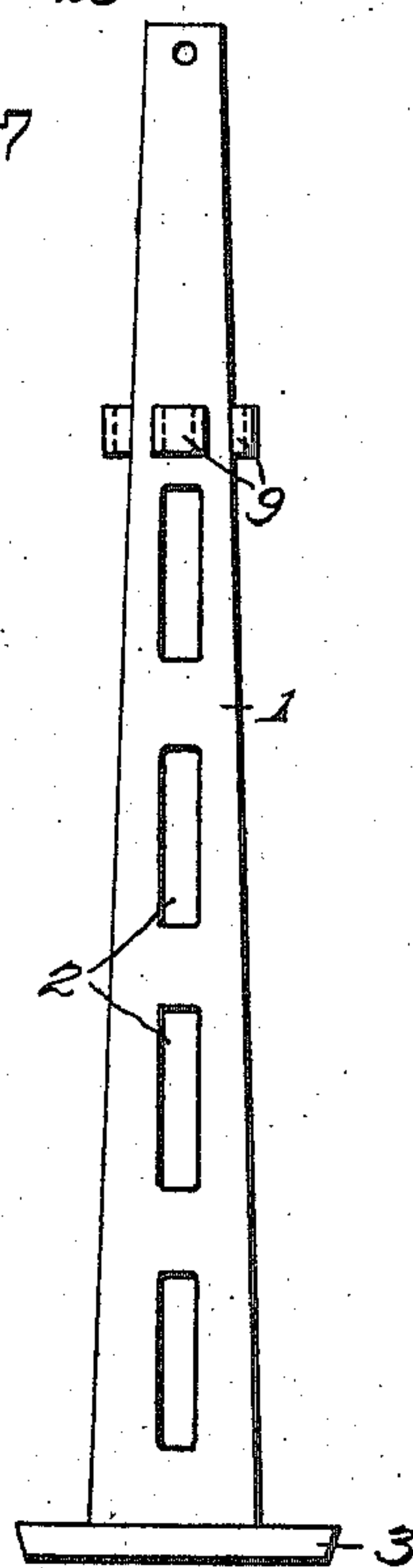


Fig. 7



WITNESSES:

J. E. Arthur,
W. F. Keefe.

INVENTOR

Joseph P. Bagley.
By *H. E. Dunsen.*
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOSEPH P. BAGLEY, OF WARWOOD, WEST VIRGINIA, ASSIGNOR TO WHEELING STEEL CASTING COMPANY, OF WHEELING, WEST VIRGINIA, A CORPORATION OF WEST VIRGINIA.

CORE-BARREL FOR INGOT-MOLDS.

1,155,122.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed May 8, 1914. Serial No. 837,180.

To all whom it may concern:

Be it known that I, JOSEPH P. BAGLEY, a citizen of the United States of America, and resident of Warwood, County of Ohio, and State of West Virginia, have invented certain new and useful Improvements in Core-Barrels for Ingot-Molds, of which the following is a specification.

This invention relates to apparatus for casting ingot molds, and it has for its primary object to provide a practical apparatus or mold wherein the casting of ingot molds of steel may be readily accomplished.

A further object of the invention is to provide a mold for steel ingot molds, having a collapsible core barrel the removal of one portion of which may be conveniently effected by a simple operation before appreciable shrinkage of the casting occurs, permitting the automatic collapse of the remaining portions of said barrel.

A still further object is to provide, in an apparatus of the character mentioned, a core barrel the collapse of which is automatically induced by the natural shrinkage of the casting.

Another object within the contemplation of the invention is to provide a mold for ingot molds comprising a supporting seat through which the core arbor may be ejected, permitting the core barrel to collapse, without removing the casting from molding position.

With these and other important objects in view, the invention resides in certain features of construction, arrangements of parts and combinations of elements which will hereinafter be fully described, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a top plan view of the invention; Fig. 2 is a vertical section taken on the line 2—2, Fig. 1; Fig. 3 is a similar section taken on the line 3—3, Fig. 1; Fig. 4 is a horizontal section taken on the line 4—4, Fig. 3; Fig. 5 is a similar section taken on the line 5—5, Fig. 3; Fig. 6 is a view similar to Fig. 2, showing a modified form of mold seat; and Fig. 7 is a side elevation of the core arbor detached.

Referring to said drawings, in which like designating characters distinguish like parts throughout the several views.

1 indicates a hollow upwardly tapered core arbor having side openings 2 formed therein and having an integral horizontally disposed base-flange 3. Disposed about said arbor 1 is a plurality of metal staves, each of which is of substantially U-shape in cross section, said staves being arranged in oppositely disposed pairs and constituting a substantially rectangular inclosure. The staves 4 constituting one of said pairs have their inturned lateral edges resting against the arbor, as is shown in Fig. 4, while the inturned edges of the staves 5 constituting complementary inclosure-forming members rest against said staves 4, as shown in Figs. 1 and 4. For a purpose which will hereinafter be explained, the opposite lateral faces of said staves 4 are inclined or beveled in an outward direction, and the interengaging edges of the staves 5 are beveled to correspond therewith, as shown in the last-mentioned figures.

The lower ends of the staves 4 and 5 are seated upon the base-flange 3 of the central member or arbor 1, tenons 6 being preferably formed on said ends for seating in sockets or mortises 7 provided therefor in said flange. As a means for supporting the bodies of said staves against lateral movement with respect to said arbor and which, at the same time, offers no resistance to endwise movement of said arbor in the direction of its greatest diameter, downturned hooks 8 are provided on the inner faces of said staves, and eye-pieces 9 are formed on the outer faces of said arbor, said hooks being adapted to assume interlocking engagement with said eye-pieces, as shown in Fig. 3, when said parts occupy assembled relation.

Closely embracing the staves of the core-barrel, above described, and resting upon said base-flange 3, is a sand-core 10, said flange being of such area that it will just accommodate thereon such sand-core when of properly proportioned thickness.

Disposed in encircling relation to the core constituted by the core-barrel and sand-core is an outer mold 11 of steel the interior di-

mensions of which are such that there is left between it and said core a casting space 20 of the size and form desired for the ingot mold 12 to be cast therein.

5 In casting, the molten metal rises into the casting space through a suitable passage, as 13, provided in a core of sand or other refractory material which is seated in a channel 14 provided in a supporting base 15, 10 leading from the pouring column (not shown). Said base 15 constitutes a seat upon which rests the steel mold 11, as also the ingot mold when formed. Said base, which is formed of steel and corresponds 15 substantially to the drag commonly employed in foundry practice, preferably has formed therein an opening 16 of a size and form which will just permit the passage therethrough, without binding, of the base- 20 flange 3 of the core arbor, as is clearly shown in Figs. 2 and 3. With the base so constructed, the core is supported with the base-flange of the arbor in said opening 16 and with its upper face flush with the top sur- 25 face of that portion of the surrounding base 15 which is immediately adjacent to said opening. The supporting means may be of any appropriate character, but preferably consists of a sand layer 21 which rests upon 30 a plate 22 mounted in said opening 16 upon the top of one or more wedge-like bars 23 which are directed horizontally through openings provided therefor in the base 15, said plate 22 and said sand layer 21 being 35 adapted to drop out of said opening 16 when said bars 23 are withdrawn from supporting relation thereto. Supplementary to said supporting means a wedge 17 may be directed through a suitably located opening 40 18, provided in the upper end of the arbor, so that its opposite ends may rest upon the upper end of the firmly seated outer mold 11, as shown in Figs. 1, 2 and 3.

45 When the casting 12 has solidified sufficiently and before appreciable shrinkage thereof has taken place, the supporting means is removed, whereupon the arbor 1 will either drop downward of its own weight through said opening, or may be 50 caused by a blow applied to its upper end to drop therethrough, thus releasing the staves 4 and 5 and rendering them free to collapse or move inward from the sand core 10. In practice, said staves, or some of 55 them, may release themselves from said sand-core and drop through the opening 16 with the arbor; or, if not so released, their presence within the casting will in no way interfere with the shrinkage of, or otherwise tend 60 to damage, the casting, due to the fact that the pressure resulting from such shrinkage, acting upon said staves, readily collapses the latter, such collapse being readily provided for by the beveled forms of the interengag- 65 ing surfaces of said staves.

In Fig. 6, wherein is illustrated a base 15^a of modified form, a solid circumferentially beveled seat 19 is provided in said base for the base-flange 3, the opening 16 of the preferred embodiment being omitted. When 70 the base has this form, the entire molding apparatus, including the casting 12, is bodily elevated from said base, and the core arbor is then either ejected while the apparatus remains suspended or after depositing the 75 apparatus on its side on the foundry floor.

Irrespective of the manner of handling, however, when the core arbor has been ejected, the staves yield readily to external pressure, as the pressure due to the shrink- 80 age of the casting, the staves 4 unobstructedly falling inward at their upper ends, thus removing all bracing support from the upper ends of the staves 5 and permitting the latter to also fall inward into 85 substantial encircling relation to said staves 4. As hereinbefore indicated, this collapse of the staves is facilitated by the provision of the beveled surfaces thereon. So little resistance is offered by the staves that it fre- 90 quently happens in actual practice that one or more thereof drop out with the arbor when the latter is ejected, much of the sand constituting the core 10 being also carried outward therewith. While all of the staves 95 may be removed promptly after the ejection of the arbor, it is not necessary to remove them until the casting has cooled and is ready to be cleaned for shipment.

What is claimed is—

1. A core barrel comprising a central member, and a plurality of staves surrounding and in interlocking relation with said member, all said staves having beveled edges and being freely movable in an inward direc- 100 tion when said central member has been ejected. 105

2. A core barrel comprising a central member, and two pairs of oppositely disposed staves embracing and interlocking 110 with said member, one pair of said staves being seated against said member and the other pair thereof being seated against the one pair, the interengaging portions of said staves being beveled. 115

3. A core barrel comprising a central member, and a plurality of staves embracing said member, said staves being interlocked with and permitting the ejection of said member in one direction only, said staves 120 having interengaging beveled surfaces and being automatically collapsible under pressure exerted by the shrinkage of an encircling casting.

4. A core barrel comprising a central 125 member, and a plurality of staves separately interlocked with and disposed in embracing relation to said member, said staves having interengaging beveled surfaces which, when said member is ejected, facilitate collapsing 130

movement thereof under external pressure exerted by shrinkage of an encircling casting.

5 A core barrel comprising a central member, and a plurality of staves disposed in inclosure-forming relation to said member and separately attached to said member whereby the latter is locked except against movement in one direction only, said staves

having interengaging beveled surfaces which 10 serve to facilitate the collapse thereof when said member is ejected.

In testimony whereof, I affix my signature in presence of two subscribing witnesses.

JOSEPH P. BAGLEY.

Witnesses:

W. F. KEEFER,

H. E. DUNLAP.