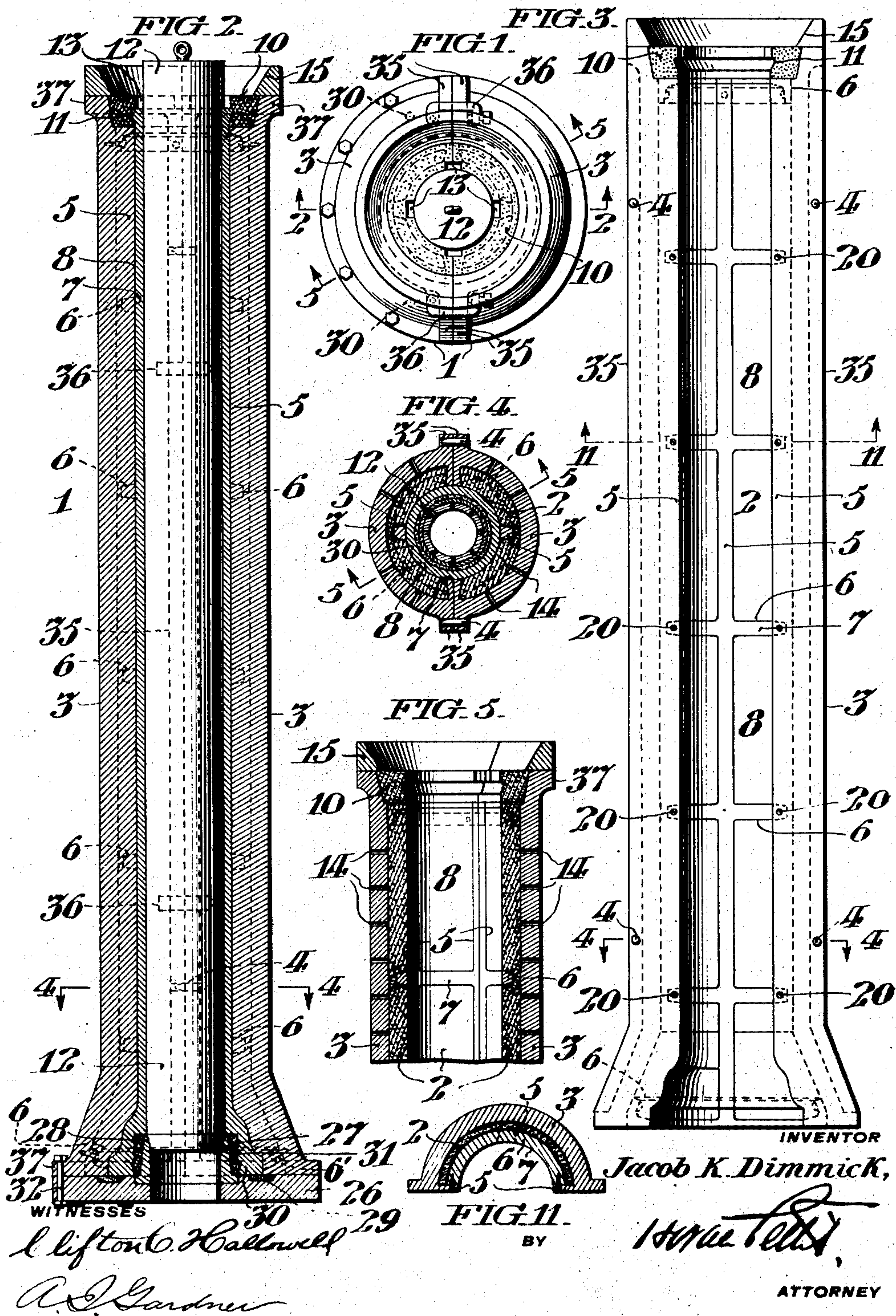


J. K. DIMMICK.
MOLD FOR CASTINGS.
APPLICATION FILED SEPT. 28, 1909.

966,811.

Patented Aug. 9, 1910.

4 SHEETS—SHEET 1.

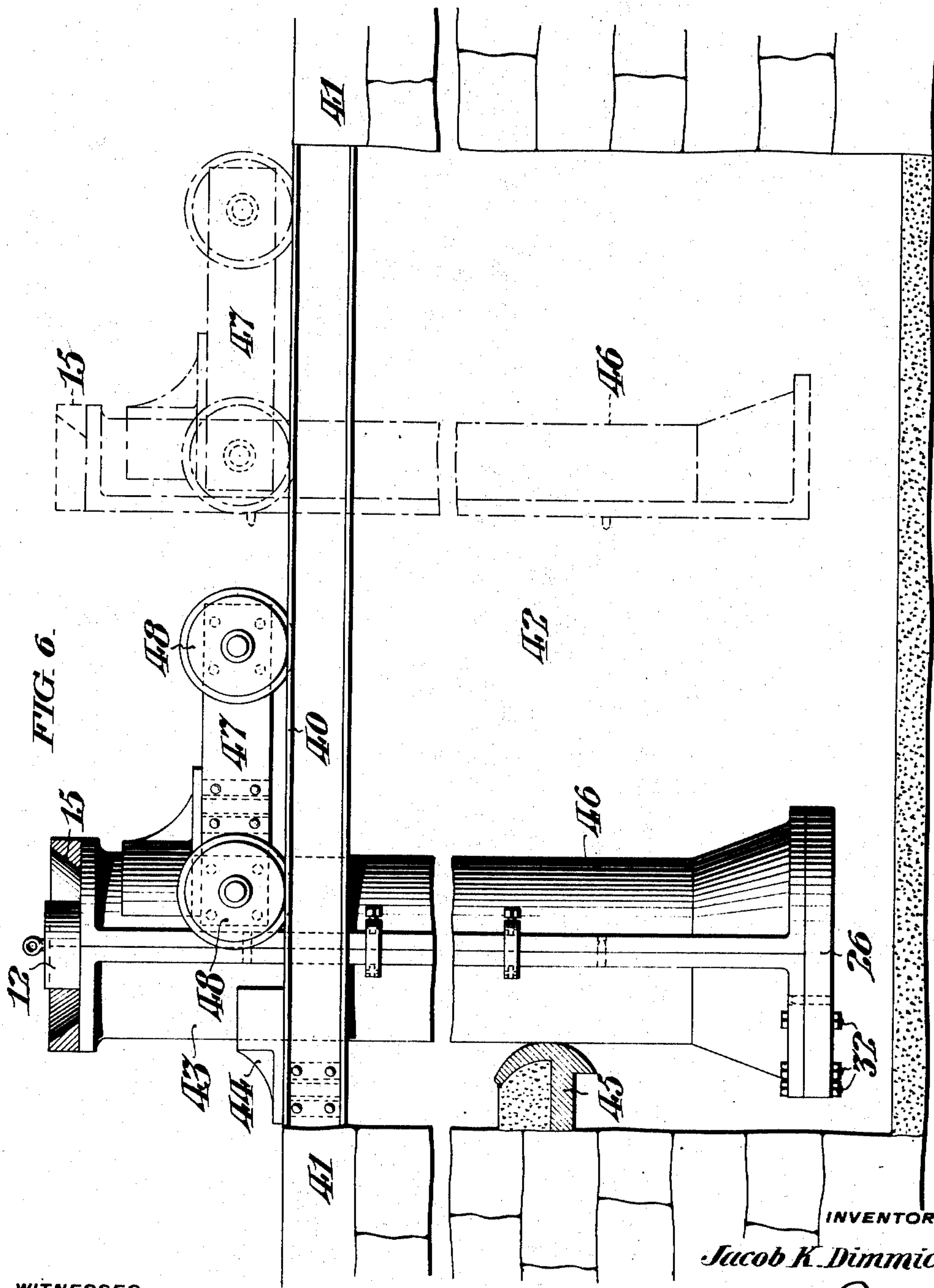


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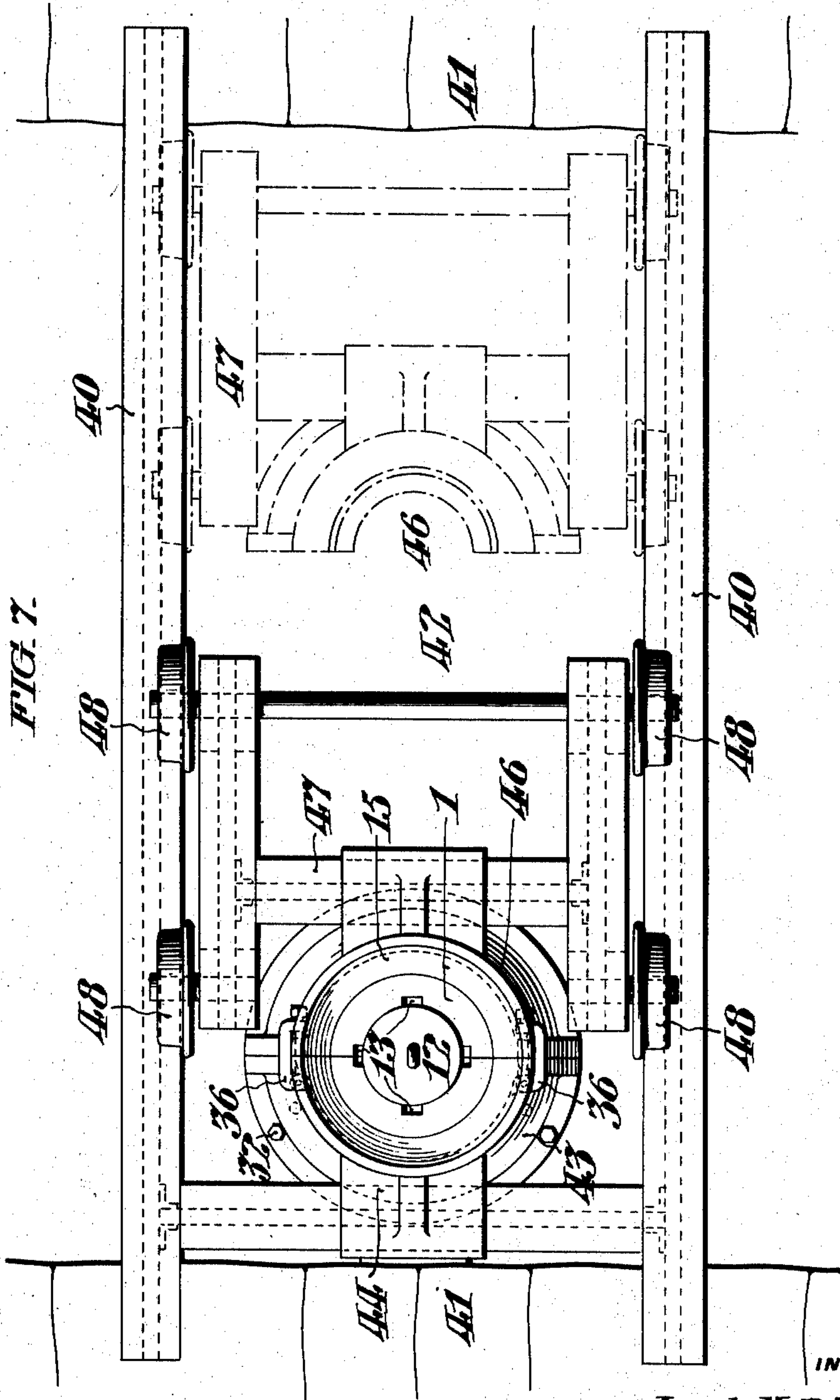
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4 SHEETS—SHEET 4.

FIG. 10.

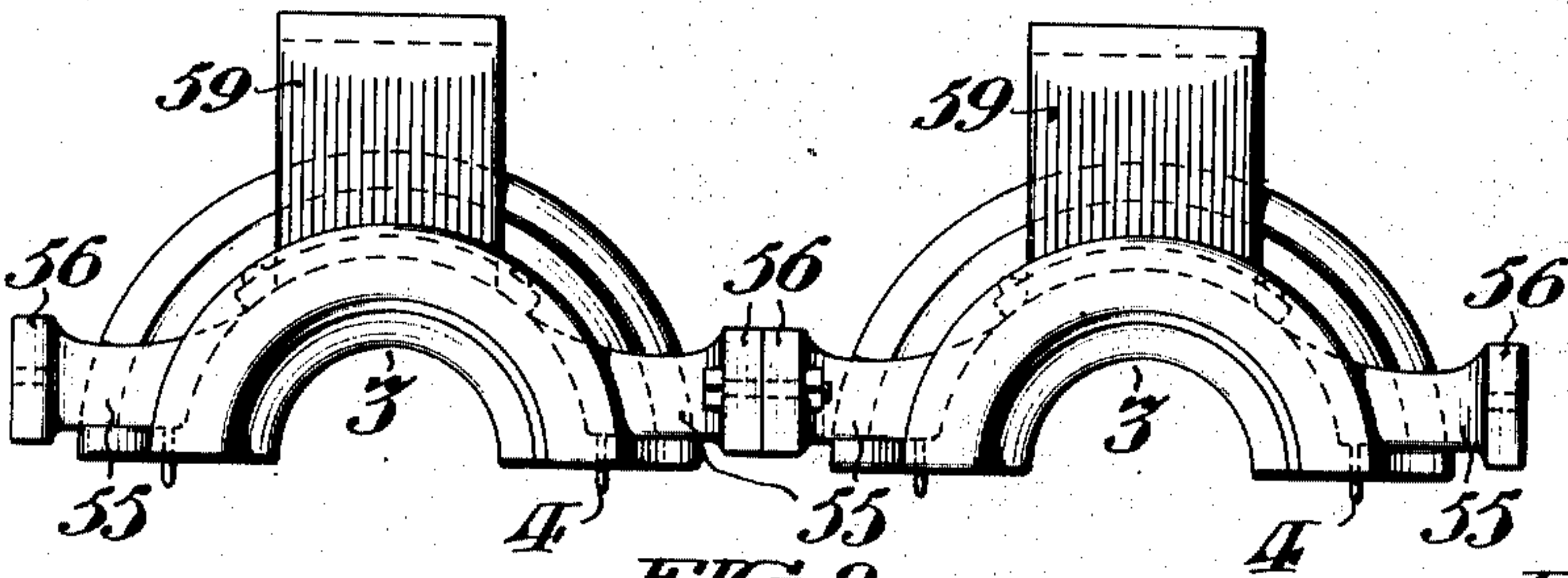
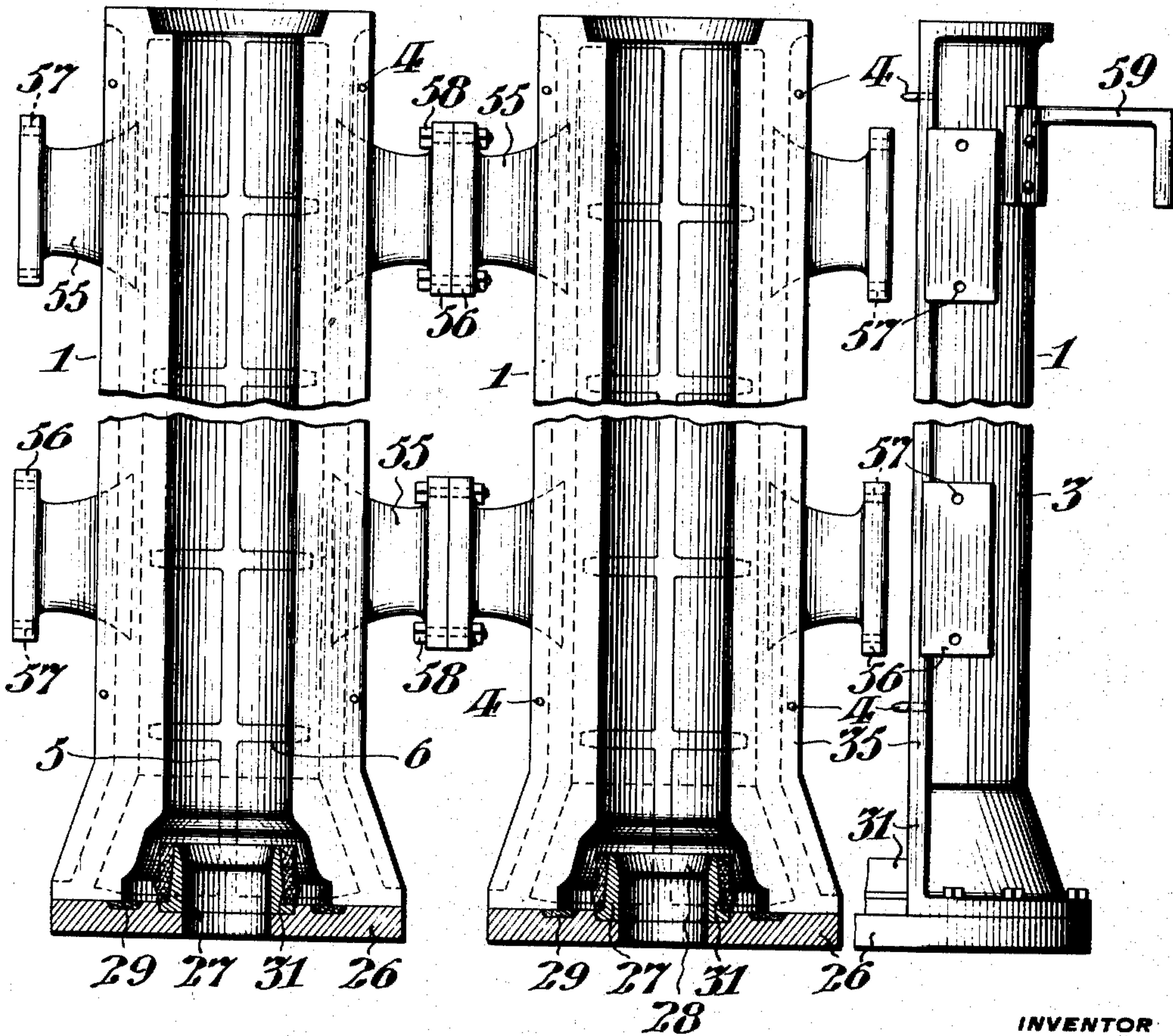


FIG. 8.

FIG. 9.



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UNITED STATES PATENT OFFICE.

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MOLD FOR CASTINGS.

966,811.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed September 28, 1909. Serial No. 520,011.

To all whom it may concern:

Be it known that I, JACOB K. DIMMICK, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Molds for Castings, of which the following is a specification.

The main objects of this invention are to provide an improved composition mold whereby several castings may be made consecutively without renewal of the mold; to provide an improved sectional mold; to provide improved means for operating a mold formed of separable parts; and to provide other improvements as will appear hereinafter.

In the accompanying drawings, Figure 1 is a top plan view of a mold constructed in accordance with this invention; Fig. 2 a longitudinal section of the same on line 2—2 of Fig. 1; Fig. 3 a face view of one half of the same; Fig. 4 a transverse section of the same on line 4—4 of Figs. 2 and 3; Fig. 5 a fragmentary longitudinal section on line 5—5 of Figs. 1 and 4 of the upper portion of the same; Fig. 6 a side elevation partly in vertical section of the same mounted in operative position; Fig. 7 a top plan view of Fig. 6; Figs. 8, 9 and 10 are a front elevation, a side elevation, and a top plan view respectively of one portion of a modified form of this invention; and Fig. 11 a section on line 11—11 of Fig. 3.

Referring to the drawings, one embodiment of this invention comprises a substantially cylindrical hollow flask 1 formed of metal or other non-combustible material and lined internally with a coating 2 of molding material such as loam, sand, silicious compound or any other suitable material. This flask 1 is divided preferably upon an axial plane to form separable parts or halves 3 which are separably connected by the usual dowels 4.

For holding the coating 2 of molding material in place in the flask, each half 3 of the flask is provided with inwardly projecting intersecting ribs 5 and 6, the sides of which are preferably undercut or diverge inwardly so that each rib flares inwardly in cross section, and the inner surfaces 7 of which are flush with the inner or face surface 8 of the molding material. By having the inner surfaces of the ribs flush with the surface of the molding material instead of covered by the molding material, all of the molding

material is held firmly in position, and there are no thin layers of molding material that are liable to be broken away from the mold as it is used.

Some of the internal ribs 5 are straight and extend longitudinally of the flask and the remaining ribs 6 are semi-circular or semi-annular in shape and extend transversely of each half of the flask, intersecting the longitudinal ribs and are oppositely arranged to form circular or annular ribs when the flask is closed. One of the longitudinal ribs is arranged along each longitudinal edge or margin of each half of the flask, either integral with the flask as shown or formed in a separate piece and attached to the flask, and the other longitudinal ribs are arranged parallel to and uniformly spaced between the marginal ribs.

The transverse semi-annular internal ribs 6 are spaced substantially uniformly longitudinally of the flask or in vertical series, and are oppositely arranged in the two halves of the flask to form annular or circular ribs. The bottom annular rib is preferably flush with the lower end of the flask, and either integral therewith or formed separately, as shown, and secured to the flask 1 by screws 6'. The top annular internal rib 6 of the flask is spaced slightly below the upper end of the flask and is either integral therewith or secured thereto, and forms a circular seat for an inwardly tapering ring or bead cake 10, of molding material, which fits removably into the upper end of the flask, and the inner lower surface of which is preferably provided with an annular recess 11, to form a bead upon the upper end of the casing.

The ring or bead cake 10 acts to hold the upper end of a core 12 in position, and is formed in two halves, one of which is placed in each half of the flask, and the ring is provided with suitable apertures or gates 13 to permit the molten iron or other material to be poured into the mold during the casting operation. Vents 14 are provided leading from the lining 2 of the flask in each space between the ribs and through the flask to permit of the escape of gases and vapors during the casting operation. The bead cake 10 is preferably made of core composition that will disintegrate as the casting cools and allows the casting to shrink, downward, thus avoiding breaking or injuring the casting or the rest of the mold. The up-

per end of each half of the flask preferably projects inwardly over the corresponding half of the bead cake 10, to hold the cake in position, and is flared upwardly as at 15 to form one side of a runner box to receive the metal as it is poured into the mold and to act as a head or basin or a separate split runner box may be suitably attached to the flask.

10 To avoid heating of the flask, and consequent expansion and separation of the flask from its lining of molding material, and the resulting disintegration of the molding material, the semi-circular ribs in each half of the flask between the top and bottom semi-circular ribs are preferably not integral with the flask but formed separately, and the ends of these ribs are secured to the marginal longitudinal ribs of each half of the flask respectively by means of screws 20 or other suitable fastening devices, and these semi-circular ribs are spaced from the inner surface of the flask and separated from the flask laterally by the lining 2 of molding material. The longitudinal rib or ribs between the marginal longitudinal ribs in each half of the flask are also preferably separated from the inner surface of the flask by the lining 2 of molding material, and are either integral with or suitably secured to the semi-circular ribs by which they are supported. These longitudinal and semi-circular ribs therefore perform the function of holding the molding material in place and also at the same time are so constructed and supported as to avoid heating the body of the flask, and consequent injury to the mold.

40 The lower end of the flask is closed by a chill plate 26, of metal or other suitable material having a central aperture and provided centrally upon its upper side with an upwardly projecting removable ring or socket iron 27, fitting in a corresponding recess in the chill plate and having a downwardly tapering centrally arranged aperture 28 forming a socket to receive the lower end of the core 12 and to hold the same in position. An annular layer 29, of molding material is arranged in a recess provided therefor in the upper side of the chill plate to form a contact for the casting 30 and the socket iron 27 is surrounded by an annular layer 31, of molding material for the same purpose. Bolts 32 are provided between the lower end of one half of the flask and the socket plate 26 for holding these parts separably in proper relation.

60 The flask may be made of various shapes to suit various purposes and each half of the flask is preferably provided with external longitudinal marginal ribs 35 integral therewith and adapted to receive clasps 36, for holding the two halves of the flask together, and with external circular end ribs 37 for

strengthening the flask. For the convenient operation of this improved flask or similar flasks, in making large castings, the flask is preferably suspended between two parallel tracks 40, which may be constructed of I beams and conveniently fixed between the side walls 41 of a pit 42, one half 43 of the flask being rigidly secured between the tracks and adjacent one of the walls of the pit and facing inwardly. For this purpose, a bracket 44 extending between the tracks outside of the flask, may be used, and the lower portion of this half of the flask is preferably braced by a lug 45 extending inwardly from the adjacent wall 41 of the pit.

80 The inner half 46 of the flask is rigidly mounted upon a carriage 47 supported by wheels 48 upon the tracks 40, and by moving the carriage upon the tracks the inner half 46 of the flask may be moved toward or away from the outer half of the flask. When the flask is thus mounted, the socket plate 26 is removably secured by means of bolts 32 to the outer half 43 of the flask, so that the inner half of the flask may be drawn away from its outer half without disturbing the socket plate.

In the operation of this improved mold, the interior surface of the mold is covered with a coat of blacking in the usual manner and the parts of the mold are adjusted to receive the molten metal. After the mold has been filled with molten metal and allowed to stand a sufficient time to permit the metal to set, the two halves of the flask are separated, which may be conveniently done by moving the carriage 47 when the flask is thus mounted, the casting may then be withdrawn from the flask without injury to the mold within the flask. A fresh core and a fresh socket ring may then be placed in position in the fixed half of the flask and the movable half of the flask replaced by simply moving the carriage upon which it is mounted, whereupon a second casting may be made, and this operation may be repeated a great number of times without repairing or remaking the mold in the flask. After each casting is made, it may be considered desirable to re-black the surface of the mold, although this may be omitted except with every third or fourth casting. The intersecting arrangement of the internal ribs in this improved mold is such that the surface of the molding material is divided into substantially uniform sections and any one or more of these sections may be renewed at any time without disturbing the rest of the mold.

120 It is obvious that this improved mold and the apparatus for operating it each effect a large saving in the cost of making a number of castings, as a single mold serves for a large number of castings and the labor, skill and time required in making each casting is reduced to a minimum.

This invention might be applied in forming a sectional mold for casting several objects simultaneously by joining as shown in Figs. 8 to 10, a series of flasks 1, each similar in construction to the flask heretofore described, each part of each flask being provided with oppositely disposed brackets 55 having flat flanged ends 56 provided with apertures 57 adapted to register with each other and to receive bolts 58, whereby the parts of the flask are rigidly secured together. One portion of each of these flasks may be provided with a rearwardly extending bracket 59, whereby these portions which are bolted together, to form a unitary element of the mold, may be rigidly secured in a fixed position between suitable tracks in a manner similar to that shown in Fig. 6. The chill plates 26 and socket iron 27 are secured to these portions of the flasks as heretofore described. The portions of the flasks corresponding to the portions just described and shown in Figs. 8 to 10 are bolted together in a similar manner, constituting a movable unitary element, adapted to cooperate with the fixed part of the mold, and this movable element may be mounted upon a carriage as heretofore explained, for convenience of operation. By this modified construction, a series of pipes or other articles may be cast simultaneously or consecutively by a single adjustment of the mold.

In applying this invention, it is obvious that many changes might be made in the construction illustrated, without departing from the spirit of this invention; for instance, the ribs in the flask might be arranged in various ways other than that shown, and some of the ribs might be omitted, or the ribs might all be made integral with the flask, or the ribs might be of a different form in cross section, provided they were shaped and arranged to serve the function of retaining the molding material in place. Each rib might have parallel sides or sides slightly converging inwardly and still perform its function with some efficiency. The internal marginal longitudinal ribs 5 and the top and bottom or marginal transverse annular ribs 6, which are either integral with the flask or in contact therewith throughout their full lengths, may taper inwardly in thickness so as to have only a narrow face edge exposed to the casting to minimize the heating of the flask, while the other internal ribs, which are separated from the flask by the molding material, may in the same construction increase inwardly in thickness as heretofore described, or all of the internal ribs may increase inwardly in thickness. In the drawings, the top and bottom annular ribs are shown as tapering inwardly in thickness, while the other internal ribs are shown as

increasing in thickness for reasons stated. The ribs are preferably rigid and made of the same metallic material as the flask, but might be made of any suitable non-combustible material. This invention is therefore not limited to any particular construction set forth, but includes all forms of the invention which come within the scope of the appended claims.

Having thus fully described my invention, I claim and desire to protect by Letters Patent of the United States:

1. A mold comprising a support, molding material carried by said support, and means flaring away from said support and engaging said molding material and terminating in a surface substantially flush with the face surface of said molding material for holding the same in place.

2. A mold comprising a hollow flask, a lining of molding material in said flask, and undercut means projecting inwardly from said flask and engaging said molding material and terminating in a surface substantially flush with the face surface of said molding material for holding the same in place.

3. A mold comprising a hollow flask, a lining of molding material carried by said flask and a rib projecting inwardly from said flask and having an inner surface flush with the inner surface of said molding material and an undercut side for holding said molding material in place.

4. A mold comprising a flask, a lining of molding material within said flask, and undercut means having an inner surface flush with the inner surface of said molding material for holding said molding material in place.

5. A mold comprising a flask, a lining of molding material carried by said flask, and intersecting ribs having inner surfaces flush with the inner surface of said molding material for holding said molding material in place.

6. A mold comprising a flask, a lining of molding material carried by said flask, and intersecting undercut ribs having inner surfaces flush with the inner surface of said molding material for holding said molding material in place.

7. A mold comprising a hollow flask formed of separable parts, each part being lined with molding material and being provided with inwardly projecting intersecting ribs having inner surfaces flush with the inner surface of said molding material for holding said molding material in place.

8. A mold comprising a substantially cylindrical hollow flask divided substantially on an axial plane to form separable parts, an internal lining of molding material for each of said parts, a plurality of inwardly projecting ribs extending longitudinally of

each of said parts, one of said ribs being arranged adjacent each longitudinal margin of each of said parts and one of said ribs being arranged in each part between said margins, and a series of inwardly projecting transverse ribs intersecting said longitudinal ribs to hold said molding material in place.

9. A mold comprising a substantially cylindrical hollow flask divided substantially on an axial plane to form separable parts, an internal lining of molding material for each of said parts, a plurality of inwardly projecting ribs extending longitudinally of each of said parts, one of said ribs being arranged adjacent each longitudinal margin of each of said parts and one of said ribs being arranged in each part between said margins, and a series of inwardly projecting transverse ribs intersecting said longitudinal ribs, said ribs diverging inwardly in cross section to hold said molding material in place.

10. A mold comprising a hollow flask, intersecting ribs extending inwardly from said flask, and a lining of molding material in the spaces between said ribs and having a face surface flush with the inner contour of said ribs, said flask being provided with vents therethrough leading from the spaces between said ribs to permit of the escape of gases and vapors.

11. A mold comprising a flask having a fixed part, and a movable part, a socket member adapted to receive a core and supported entirely by said fixed part, a carriage upon which said movable part is mounted, and means supporting said carriage.

12. A mold comprising a flask having a fixed part and a movable part, and a socket member adapted to receive a core and supported entirely by said fixed part.

13. A mold comprising a support, a lining of molding material carried by said support and a rib connected to but spaced from said support and engaging said molding material to retain said material in place.

14. A mold comprising a support, a lining of molding material carried by said support, and a rigid rib connected to but spaced from said support, and engaging said molding material to retain said material in place.

15. A mold comprising a flask, a lining of molding material carried by said flask, and a rib connected only at intervals to said flask and engaging said molding material to hold said material in place.

16. A mold comprising a flask, a lining of molding material carried by said flask, and a rib connected only at intervals to

said flask and engaging said molding material to hold said material in place, said rib being separated from said flask by a portion of said molding material.

17. A mold comprising molding material and intersecting ribs dividing the face of said molding material into separate sections, whereby any one of said sections may be replaced without disturbing the other sections.

18. A mold comprising a support, molding material carried by said support, a rib projecting directly from said support, and a rib secured to said first mentioned rib, and spaced from said support by said molding material, both of said ribs engaging said molding material, to hold the same in place.

19. A mold comprising a support, molding material carried by said support, a rib projecting directly from said support, and a rib secured to said first mentioned rib, and spaced from said support by said molding material, both of said ribs engaging said molding material, to hold the same in place, said first mentioned rib tapering in thickness and said second mentioned rib increasing in thickness toward the face of said molding material.

20. A mold comprising a hollow vertical flask having an annular rib projecting inwardly adjacent the upper end of the flask, but spaced therefrom, forming a recess above said rib to receive a bead cake, the inner contour of said rib being flush with the inner surface of said mold.

21. A mold comprising a hollow vertical flask having an annular rib projecting inwardly adjacent the upper end of the flask, but spaced therefrom, forming a recess above said rib to receive a bead cake, the inner contour of said rib being flush with the inner surface of said mold, and a runner box at the upper end of said flask, and overlapping said recess.

22. A mold comprising a fixed part and a movable part, a movable carriage upon which said movable part is mounted and a socket member held in fixed relationship to said fixed part and adapted to receive a core, said movable part being movable independently of said socket member to open and close said mold.

In witness whereof I have hereunto set my hand this 16th day of September, 1909.

JACOB K. DIMMICK.

Witnesses:

A. I. GARDNER,
ALEXANDER PARK.