No. 682,841. Patented Sept. 17, 1901.

W. W. CHAPMAN.

MOLD FOR CASTING BATHS OR OTHER VESSELS.

(Application filed Dec. 27, 1900.)

(No Model.)

3 Sheets—Sheet 1.

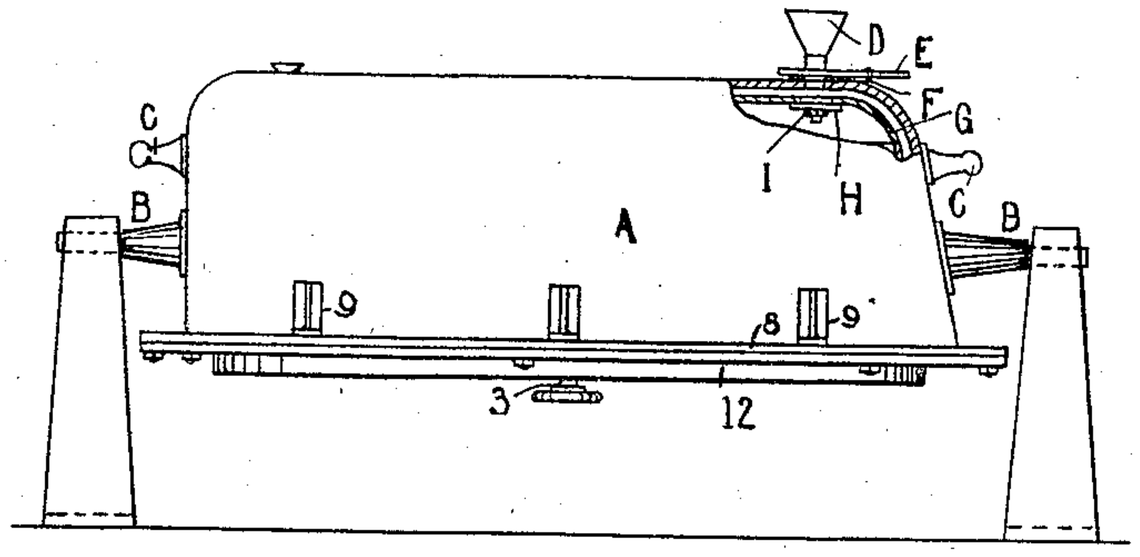

FIG. 1.

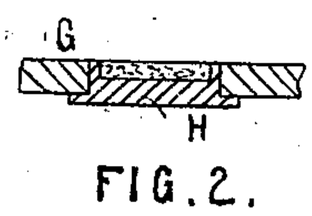

FIG. 2.

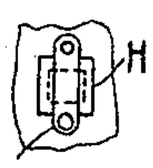

FIG. 3.

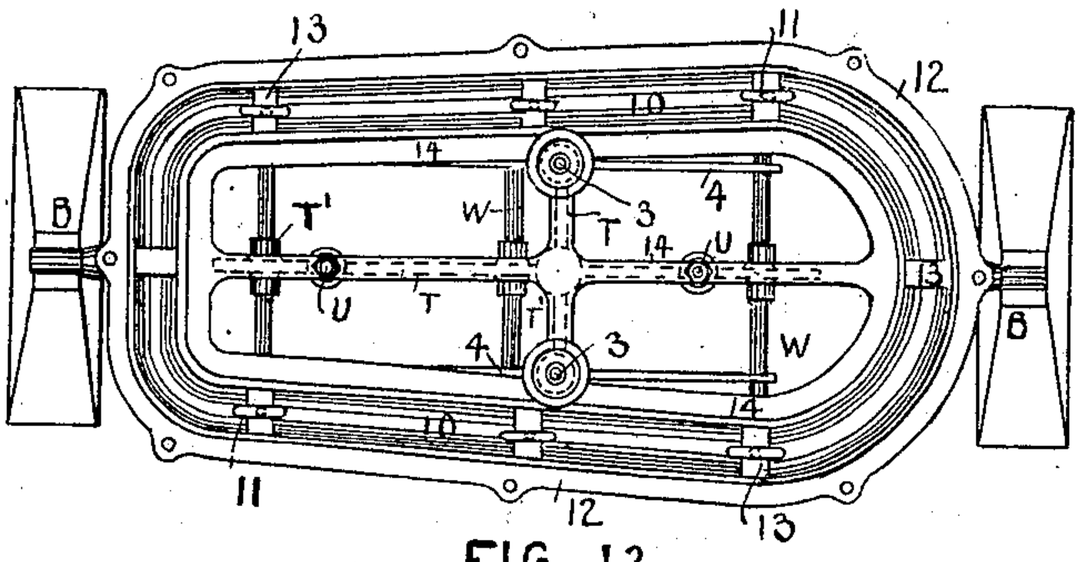

FIG. 12.

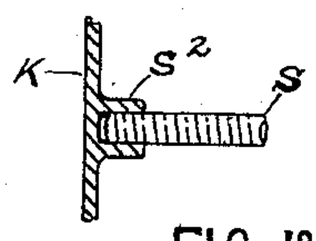

FIG. 13.

Witnesses.
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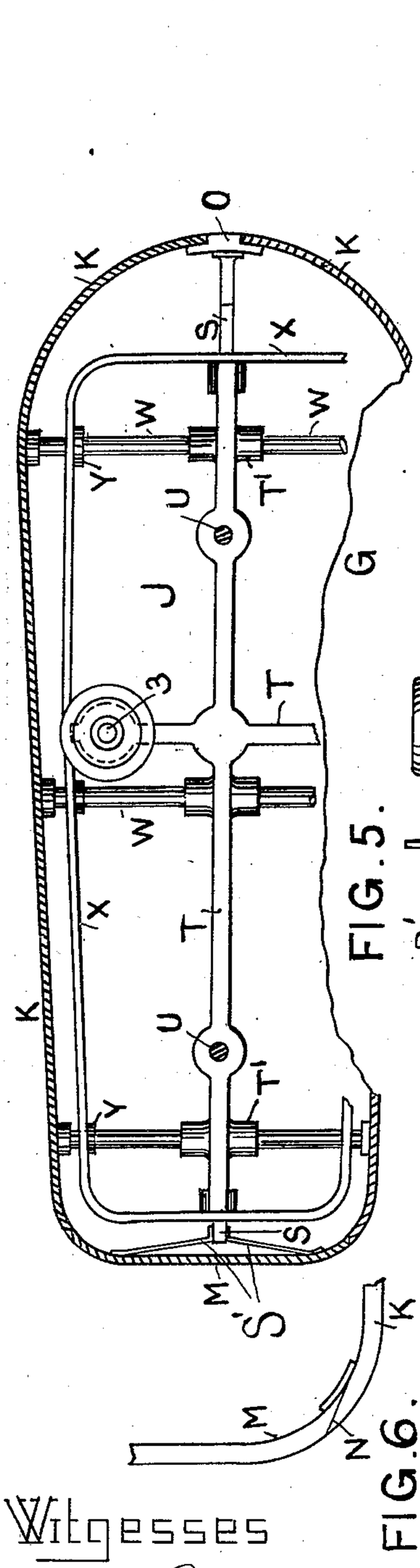

FIG. 5.

FIG. 6.

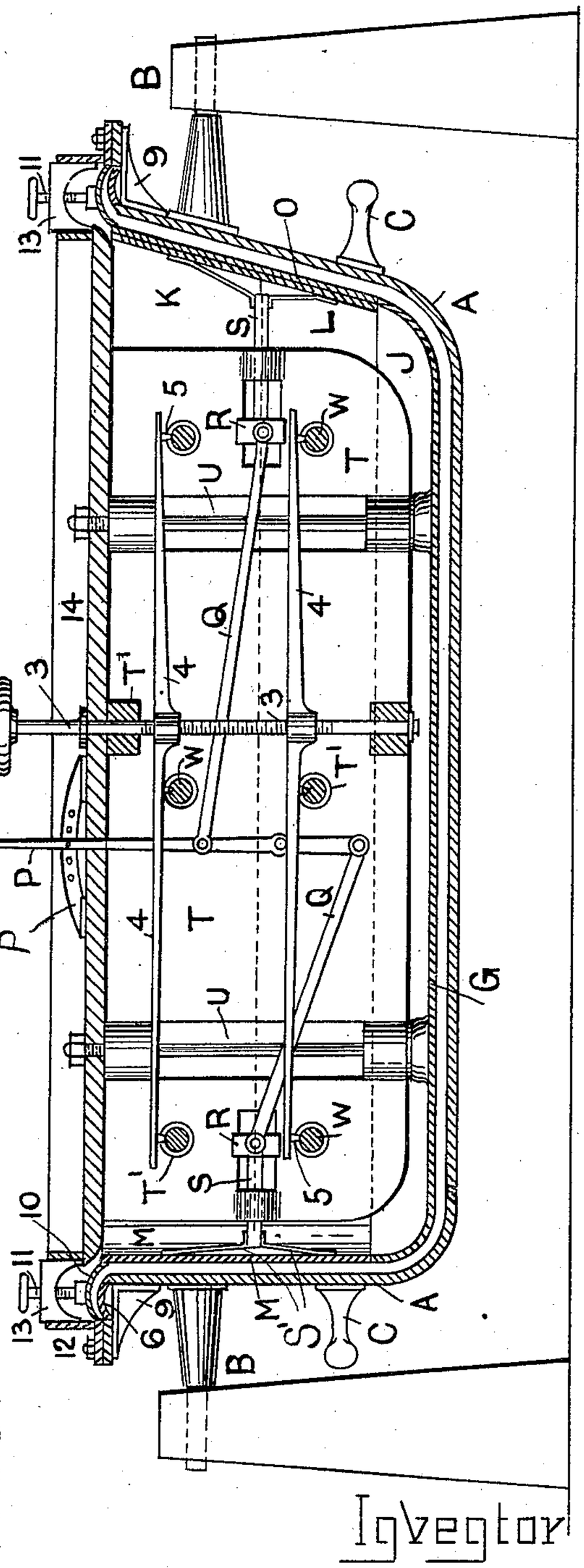

FIG. 4.

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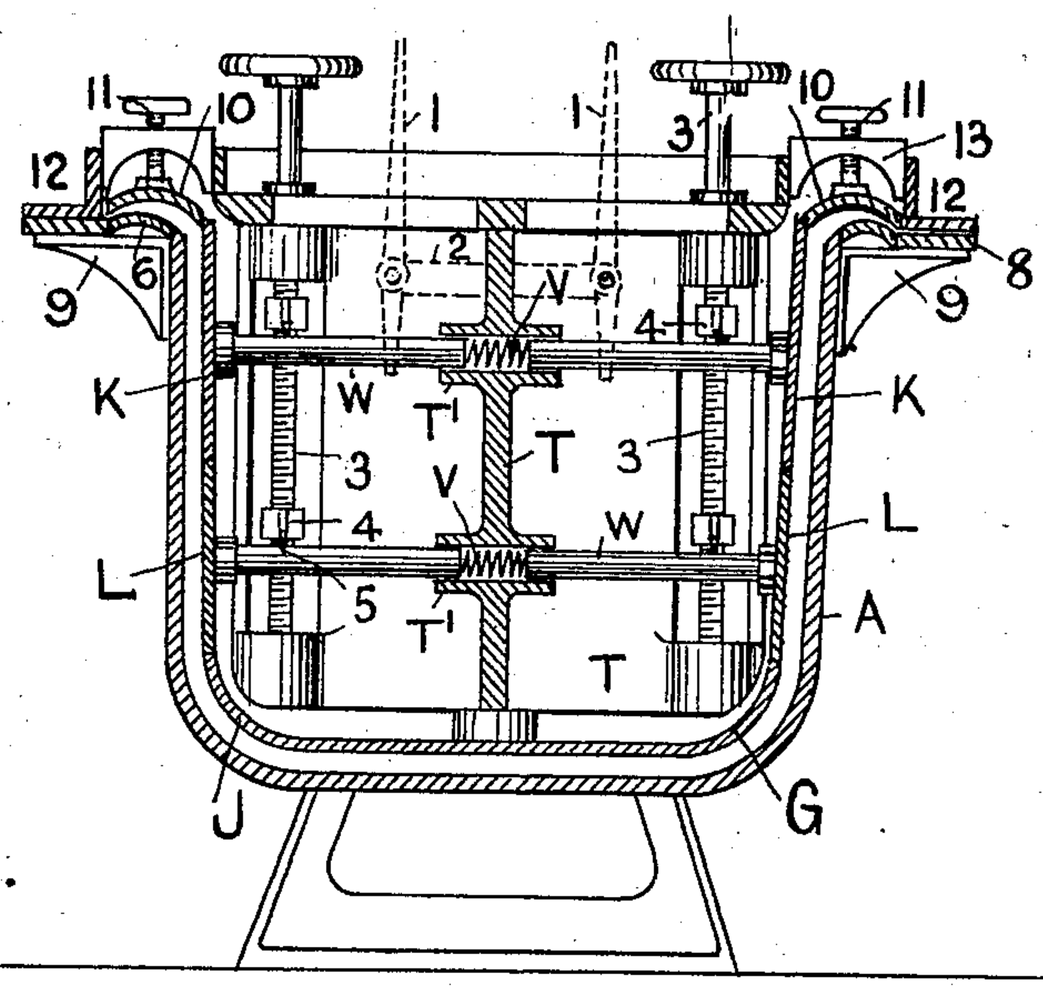
FIG. 7.



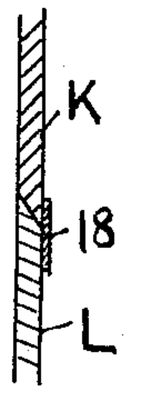


FIG. 8.

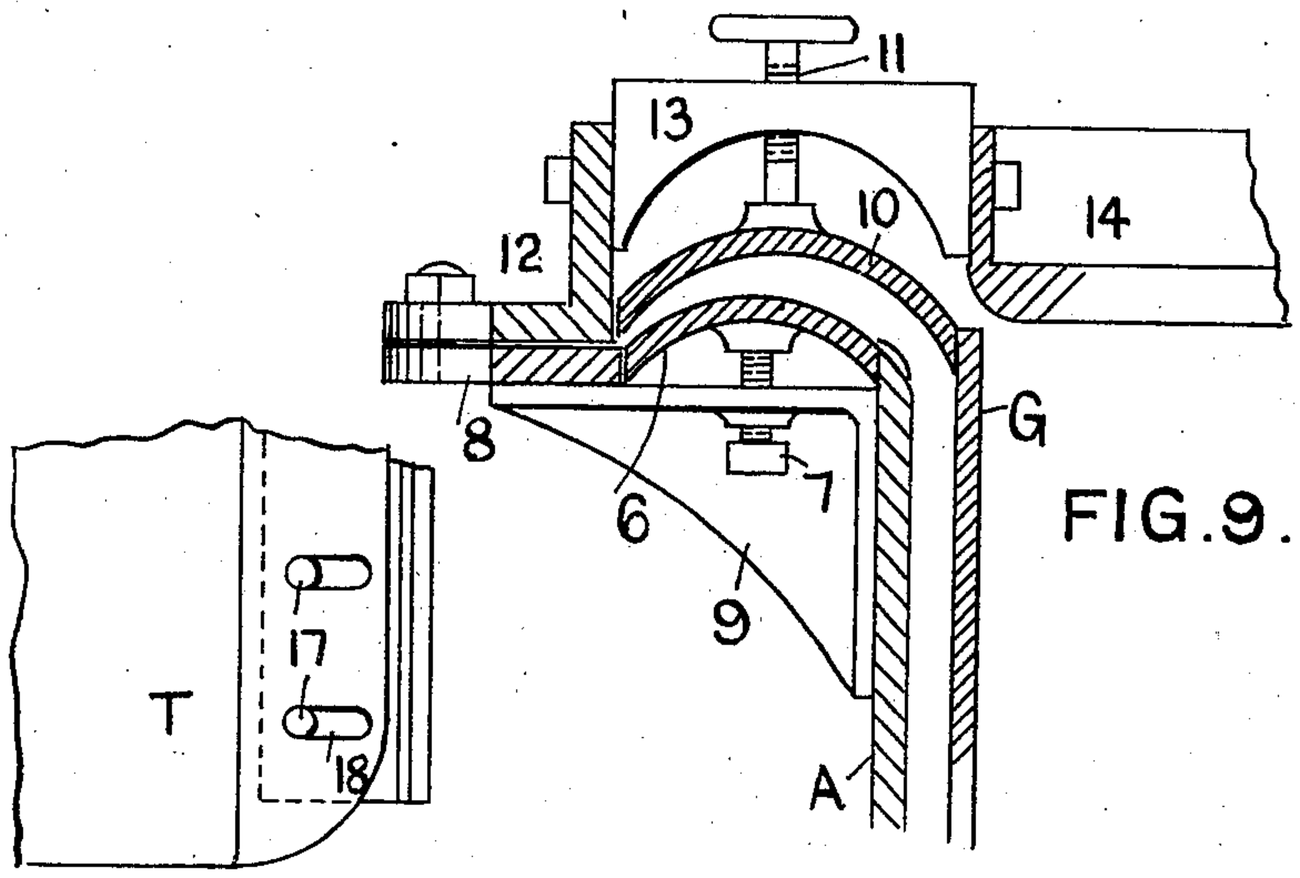


FIG. 9.

FIG. 10.

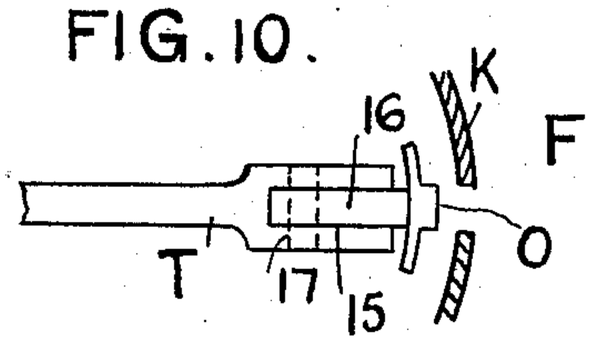


FIG. 11.

Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM WARD CHAPMAN, OF PRESCOT, ENGLAND.

MOLD FOR CASTING BATHS OR OTHER VESSELS.

SPECIFICATION forming part of Letters Patent No. 682,841, dated September 17, 1901.

Application filed December 27, 1900. Serial No. 41,210. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WARD CHAPMAN, iron-molder, a subject of the Queen of Great Britain, residing at Prescot, in the county of Lancaster, in the Kingdom of England, (whose full postal address is 26 Warrington road, Prescot, aforesaid,) have invented certain new and useful Improvements in Molds for Casting Baths or other Vessels, of which the following is a specification.

In the manufacture of baths the usual plan has been to cast them in sand molds, which, however, is a somewhat slow process, as a mold has to be made for each casting, and a workman at the quickest rate could hardly make more than two molds a day. Now by my present invention I make the baths or other vessels of iron, zinc, spelter, aluminium, or other suitable material. Furthermore, I dispense altogether with the use of sand and make the molds for casting of iron, steel, or other metal suitable for the purpose. The great rapidity with which zinc and spelter chill and become set caused difficulties hitherto in the use of metal molds. This rapid setting and consequent contraction of the spelter in a rigid metallic mold would cause the cast metal to crack, because the metallic mold would not give, as a sand mold would, to the contraction of the cast spelter. To remedy this, I form the core of the mold in sections, which are capable of being drawn in or contracted, thereby allowing the casting to contract without being injured at all.

Referring to the accompanying drawings, Figure 1 is an elevation, partly in section, of a bath-mold in position for pouring in the metal; Figs. 2 and 3, details of Fig. 1, to be hereinafter described; Fig. 4, a longitudinal section of Fig. 1, showing the mold in an inverted position; Fig. 5, a plan view, partly in section, of a portion of Fig. 4; Fig. 6, a detail of Fig. 5; Fig. 7, a cross-section through Fig. 4; Fig. 8, a detail of a portion of Fig. 4; Fig. 9, an enlarged detail view of a portion of Fig. 7; Figs. 10 and 11, an elevation and a plan of a slight modification of part of Fig. 4; Fig. 12, a plan of the mold. Fig. 13 is a detail showing one method of mounting the end pieces upon the standard, hereinafter described.

In the drawings, A is the outer metal casing of the mold, which is supported on trunnions B and is provided with arms or lugs C to receive the sling of the crane for the purpose of turning the mold from the position shown in Fig. 4 to that shown in Fig. 1.

D is the funnel into which the molten metal is poured, and E a handle for holding the funnel in position while filling the mold and for removing it when sufficient metal has been poured in.

F is a sliding valve for closing the aperture when the funnel is removed.

It has been found that the constant impinging of the molten metal on one portion of the inner casing or core G wears it away at this particular place. Now to remedy this I insert a plug H, of metal, which is kept in position by means of a bar or strap I. (Seen more clearly in Fig. 3, which is an underneath plan view.) When certain metals—for instance, iron—are being cast, I prefer to form a recess in the plug H and to fill such recess with charcoal, as shown in Fig. 2, which is a section through the plug and a portion of the core G.

Referring now to the core, it will be seen from the drawings that the bottom part J is one piece, but the sides and ends are made up of several pieces. In the drawings two separate plates K and L on each side are shown, which plates are bent, so as to form the large end of the core G, as well as the sides, as shown more clearly in Fig. 5, the small end M being formed, preferably, in one piece and fitting with the side pieces, as shown at N, Fig. 6. The plates K and L do not meet at the large end, but a space is left between to be occupied by a plate O, Fig. 5, which can be withdrawn to allow for the sides contracting. In the arrangement shown the end M of the core and the filling-in piece O are slackened or drawn in by hand at the proper time by means of lever P, working in a stop-guide P′, links Q, sliding blocks R, and rods S, to which latter the end pieces are fixed; but it will be evident that other means could be employed, such as hand wheels and screws. The connection between the rods S and the end pieces may be made by means of metal straps S′, which are riveted to the rod ends and the end pieces, as shown in Figs. 4 and 5, or sockets S^2 may be formed on the plates, into which the ends of the rods S are

screwed, brazed, or otherwise fixed, as shown in Fig. 13. The sides in this case give automatically to the pressure of the contracting metal. The manner whereby this is done and which is shown in Fig. 7 consists in having a standard T situated in the center of the core and supported by fixed vertical spindles U, Fig. 4, passing through it. Hollow bosses T′ are formed on this standard to receive springs V and the ends of rods W, which latter bear against the springs, the other ends of such rods being fixed to the side plates K and L. In order to give more support to these rods and to prevent the springs forcing the plates K and L beyond the required distance apart, a frame X, Fig. 5, is provided, resting on the bottom of the core and having holes through which the rods W pass. Further, by having collars Y on the rods bearing against the inside of the frame these collars, while not interfering with the rods being pressed inward against the pressure of the springs, will limit their outward movement.

I do not confine myself to the aforementioned automatic arrangement as, if it were deemed advisable, the sides could be contracted by hand by means of levers 1, as shown by dotted lines in Fig. 7, such levers being fulcrumed to arms 2, fixed to the central standard T, and engaging pins on the rods W. Furthermore, in order to make it impossible when springs are used for the side sections of the core to yield before a given time I provide vertical screwed spindles 3, mounted in the central standard T, and bars 4, having pins 5, adapted to enter holes in the rods W. These bars are threaded onto the spindles, and when the pins 5 fixed thereto enter the holes in the rods the latter are locked; but on the hand-wheels being rotated the pins are raised out of the holes in the rods W, thereby freeing the same.

As this mold has been designed principally for baths having flanges, I provide for this as follows:

6, Fig. 9, is a loose strip of metal curved in cross-section, as shown, and extending all around the edge of the bath and supported by screws 7, by means of which its height is adjusted between the flange 8 and the outer casing A.

9 represents brackets which support the flange 8 and serve as nuts for the screws 7.

10 is a piece similar to the piece 6 and is also free to be moved vertically by the screw 11.

12 is an angle-iron one flange of which is removably secured to the flange 8 of the outer casing A, its other flange being attached to a bridge-piece 13. The latter in addition to forming nuts for the screw-pins 11 also serves to connect the angle-iron 12 with a skeleton frame 14, which is attached to the top of the central standard T by nuts screwed on the end of vertical rods U, which pass through the frame 14.

In order to better support and guide the filling-piece O, Fig. 5, I may extend the central standard T, as shown in Figs. 10 and 11, and form a recess or slot 15 therein to receive the extended portion 16 of the filling-piece O. Pins 17 pass through elongated holes 18 in the standard T and through the portion 16 of the filling-piece O, the latter being also supported by the rod S, which is operated by the lever P, Fig. 4, in the manner before described.

The adjacent edges of the side plates K and L of the core are preferably sloping, as shown in Fig. 8, with an overlapping strip 18, fixed to the upper plate.

The mode of action is as follows: After screwing up the different parts, so as to make the joints tight, the mold is turned into the position shown in Fig. 1, and the metal is poured into the mold, a suitable air-vent being provided. I assume that it will take at least forty-five seconds for the spelter to chill and become set, and immediately sufficient metal has been poured in the mold is inverted, and the different sections forming the core are freed, so as to give automatically to the pressure exerted by the contracting metal or are drawn in by means of levers or otherwise. After casting, the core and its connections are raised and the cast article removed. The molds by constant use are kept at a high temperature, and this prevents any sudden chilling of the spelter in casting.

This invention is specially suitable in cases where a large number of castings are wanted of one and the same pattern.

I declare that what I claim is—

1. In a mold for casting baths and like articles, the combination of a core built up of sections adapted to yield under the pressure of the article being cast, an outer casing of the shape of the article to be cast, trunnions supporting said casing at each end in such manner that the mold and core can be turned upside down, an aperture in the bottom of said outer casing through which the molten metal can be poured, and a plug H to prevent the excessive wearing away of the core beneath said aperture, substantially as described.

2. In a mold for casting baths and like articles, the combination of an outer casing having the shape of the article to be cast, a core consisting of a bottom formed in one piece, two sides each of which is made up of two or more pieces one above another and extending around to nearly meet at the large end of the core, a removable piece adapted to fill in the space between their nearly-meeting edges, an end piece at the small end of the core, means for drawing back said end piece when required, and means for expanding or contracting the side pieces, substantially as described.

3. In a mold for casting baths and like articles, the combination of an outer casing A, a core G built up of a plurality of sections, means whereby the sections may be made to yield under pressure; a detached flange 8, surrounding the margin of the casing A; sup-

porting-brackets 9, connecting said flange with the casing A; angle-irons 12 connected to the flange 8; an inner skeleton frame 14; bridge-pieces 13 connecting the angle-irons 12 and skeleton frame 14; relatively adjustable strips 6 and 10 bridging the space between the flange 8 and the casing A and core G respectively; and screws 7 and 11 on which the strips 6 and 10 are respectively mounted turning in fixed nuts in the brackets 9 and bridge-pieces 13 respectively, to effect the vertical adjustment of the strips 6 and 10, substantially as and for the purposes set forth.

4. In a mold for casting baths and like articles, the combination of an outer casing having the shape of the article to be cast, a core made up of a plurality of sections, a standard provided with bosses, a spring in each such boss, a rod guided in each boss the end of said rod being in contact with said spring, the other end of each rod being rigidly connected to one of the sections of said core, and means for preventing said rods from forcing back said springs and sliding deeper into said bosses for as long a time as desired, substantially as described.

5. In a mold for casting baths and like articles, the combination of a casing A, a core G built up of sections, a central standard T, rods W connecting said sections of the core to said standard in such manner as to allow said core to yield to the pressure of the article being cast, screwed rods 3 and arms 4 working on said rods, and pins 5 carried by said arms and adapted to engage and hold the rods W, substantially as and for the purpose set forth.

6. In a mold for casting baths and like articles, the combination of a core G built up of sections, a central standard T within said core, rods W connecting said standard to the sections of said core in such manner as to allow said core to yield under the pressure of the article being cast, collars Y on said rods, and a frame X surrounding the standard T through which the rods W pass, and against which the collars Y are adapted to bear, substantially as described.

7. In a mold for casting baths and like articles, the combination of an outer casing A, a core G built up of a plurality of sections, a standard T within said core, rods W connecting the sections of said core to the standards in such manner as to allow said core to yield under the pressure of the article being cast, a frame X surrounding the standard T through which frame the rods W connecting the sections of the core to the standard pass, collars X on said rods adapted to bear against said frame, brackets 9 mounted on said outer casing A, plates 6 adjustably mounted in said brackets, a flange 8 mounted on said brackets, an angle-iron 12 connected to said flange 8, a bridge-piece 13 connected to said angle-iron, a skeleton frame 14 connected to said bridge-piece, and plates 10 adjustably mounted on said bridge-piece, substantially as described.

In witness whereof I have hereunto signed my name, this 8th day of December, 1900, in the presence of two subscribing witnesses.

WILLIAM WARD CHAPMAN.

Witnesses:
G. C. DYMOND,
ALBERT C. B. HENRI.