

J. POWER.
MOLD FOR CASTING METAL POTS, &c.
APPLICATION FILED JULY 19, 1909.

936,939.

Patented Oct. 12, 1909.
5 SHEETS—SHEET 1.

Fig. 1.

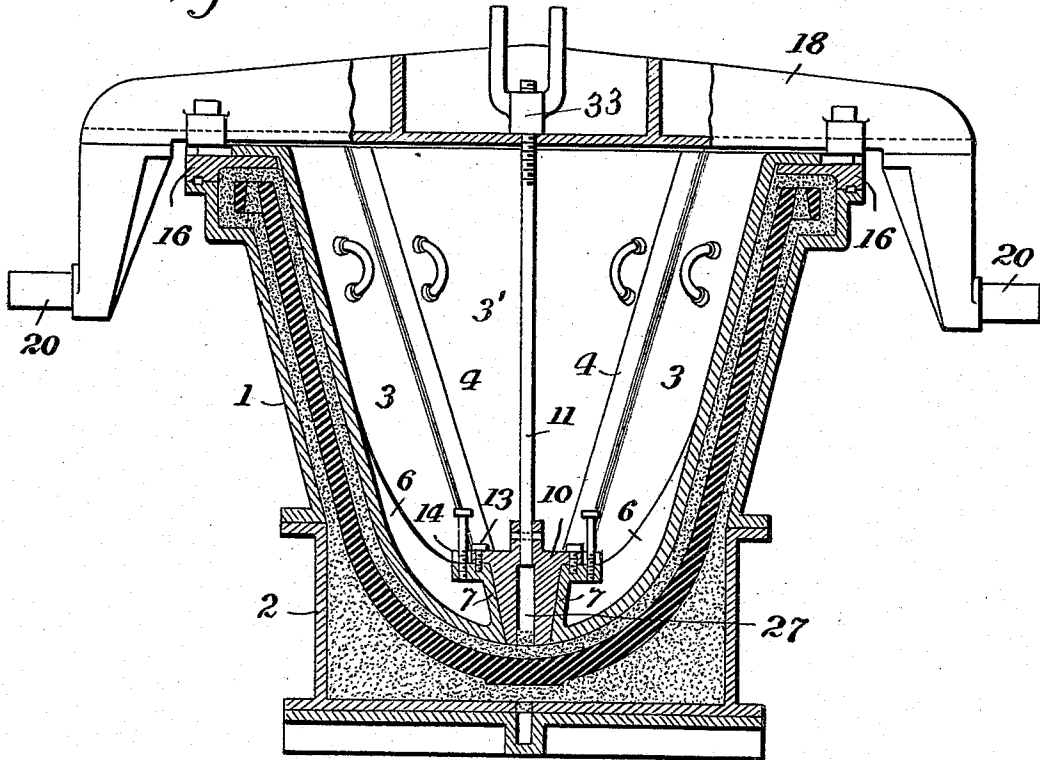
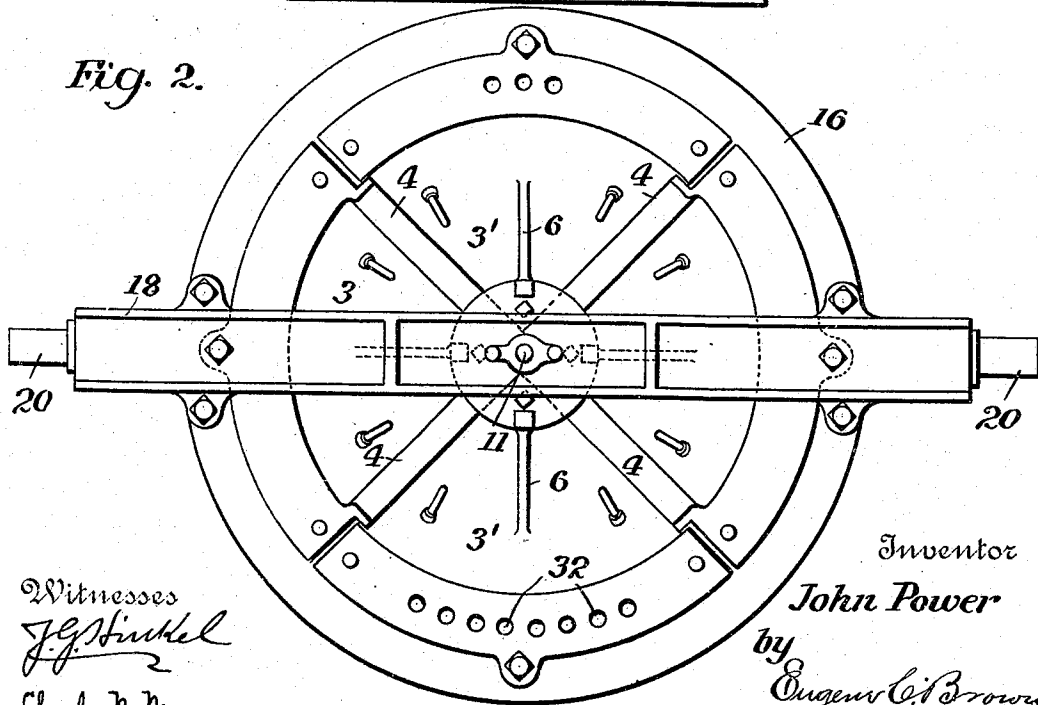


Fig. 2.



Witnesses
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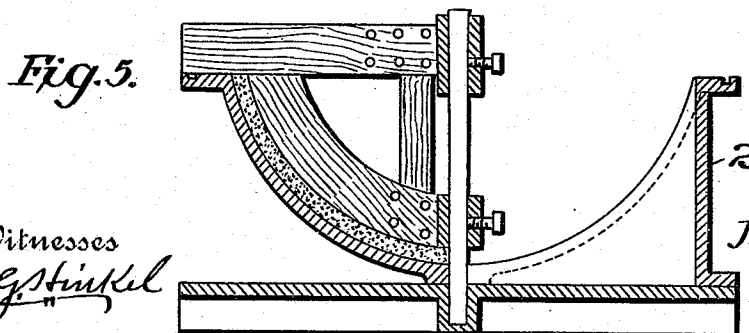
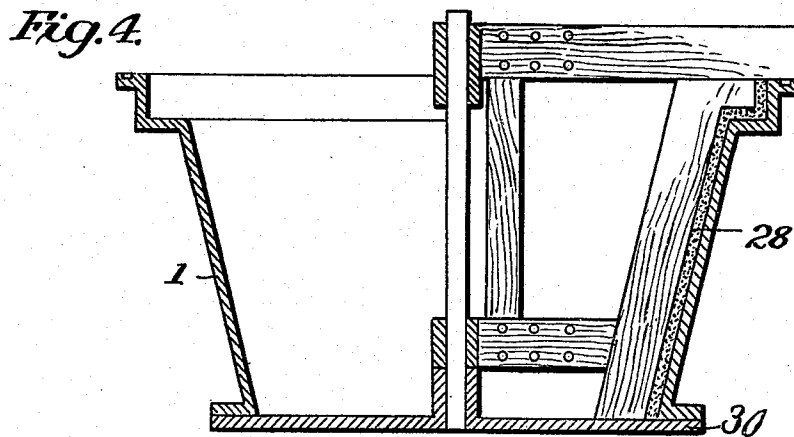
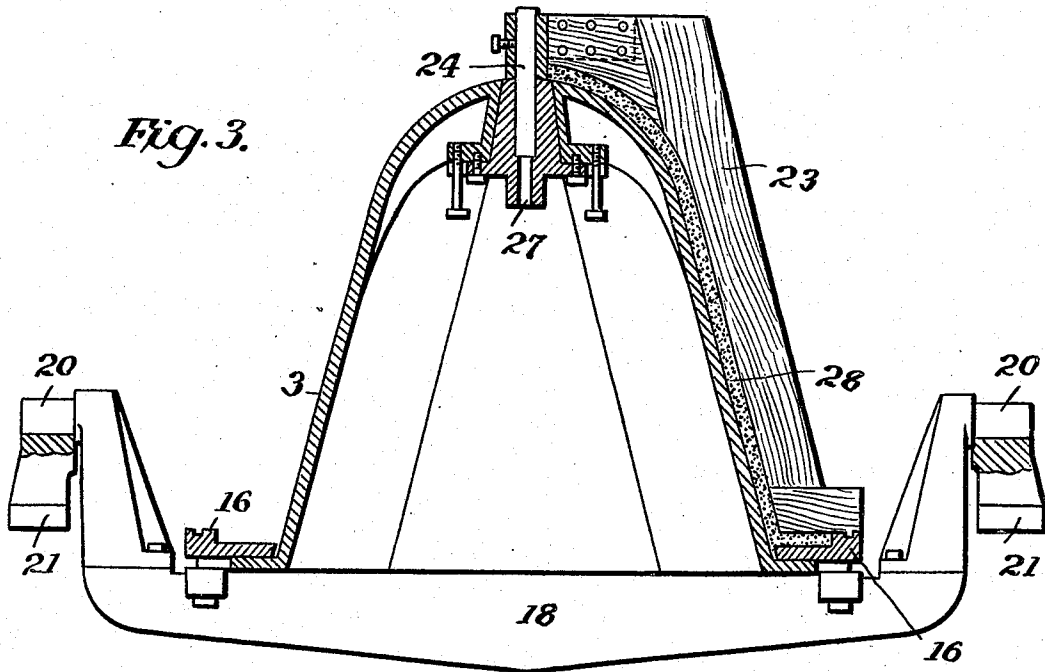
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6 SHEETS—SHEET 2.



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6 SHEETS—SHEET 3.

Fig. 6.

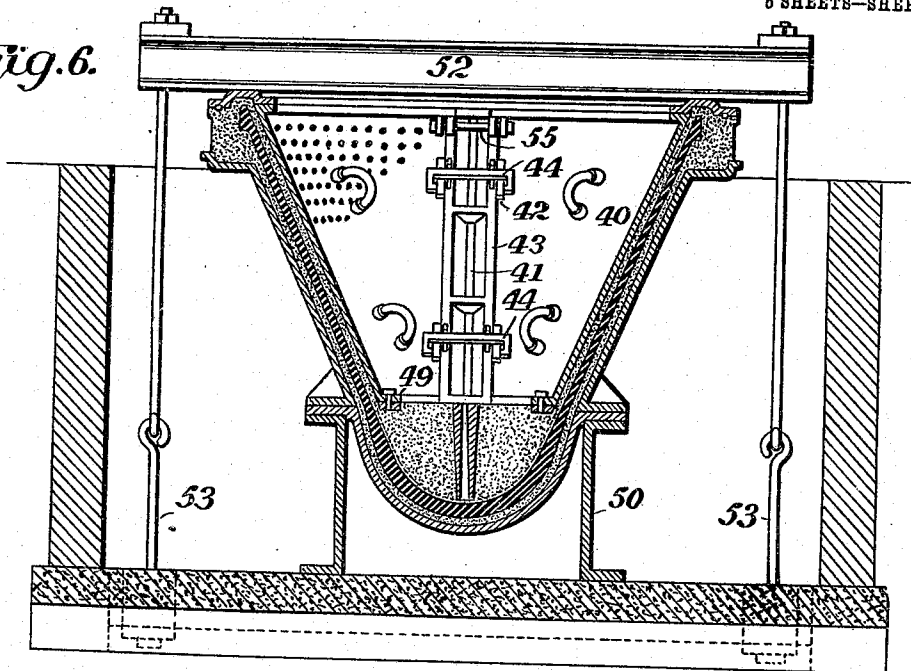


Fig. 7.

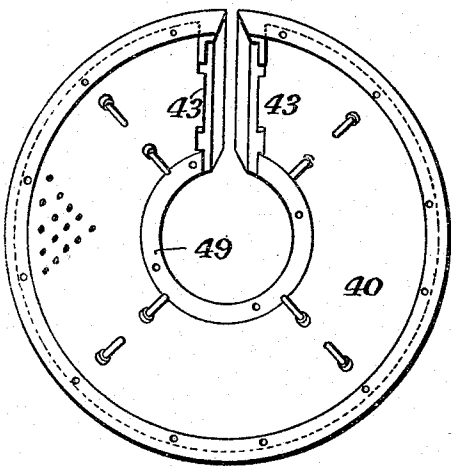


Fig. 8.

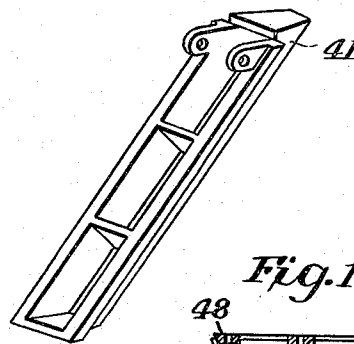


Fig. 10.

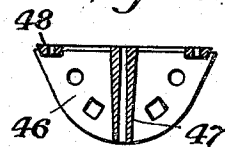
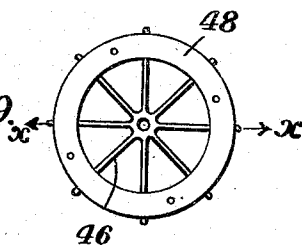


Fig. 9.



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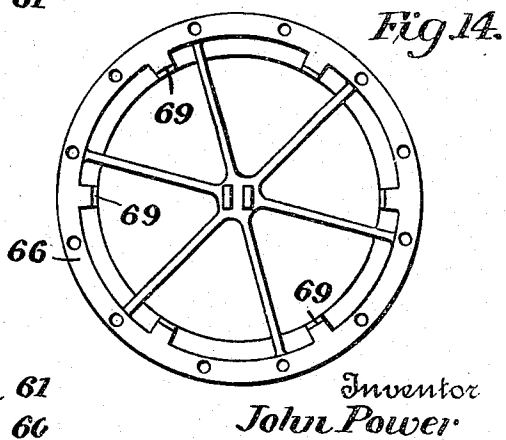
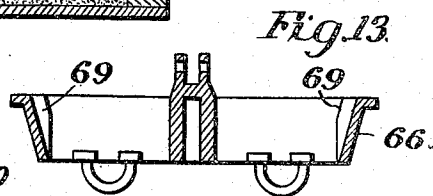
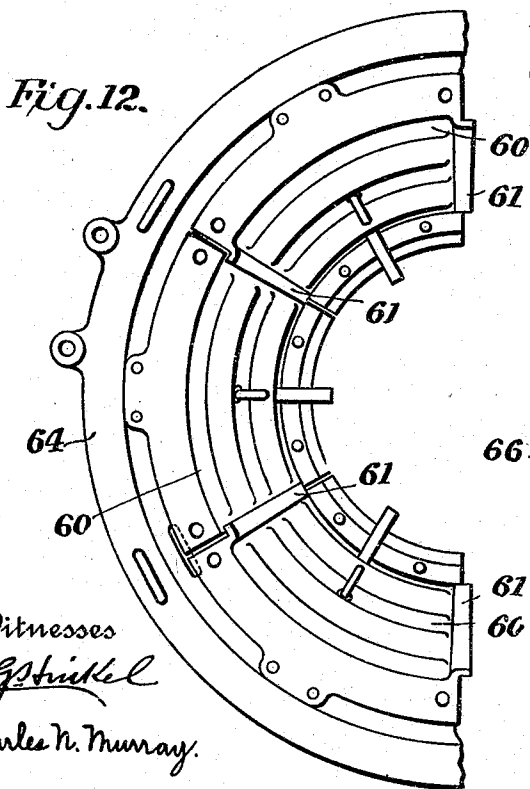
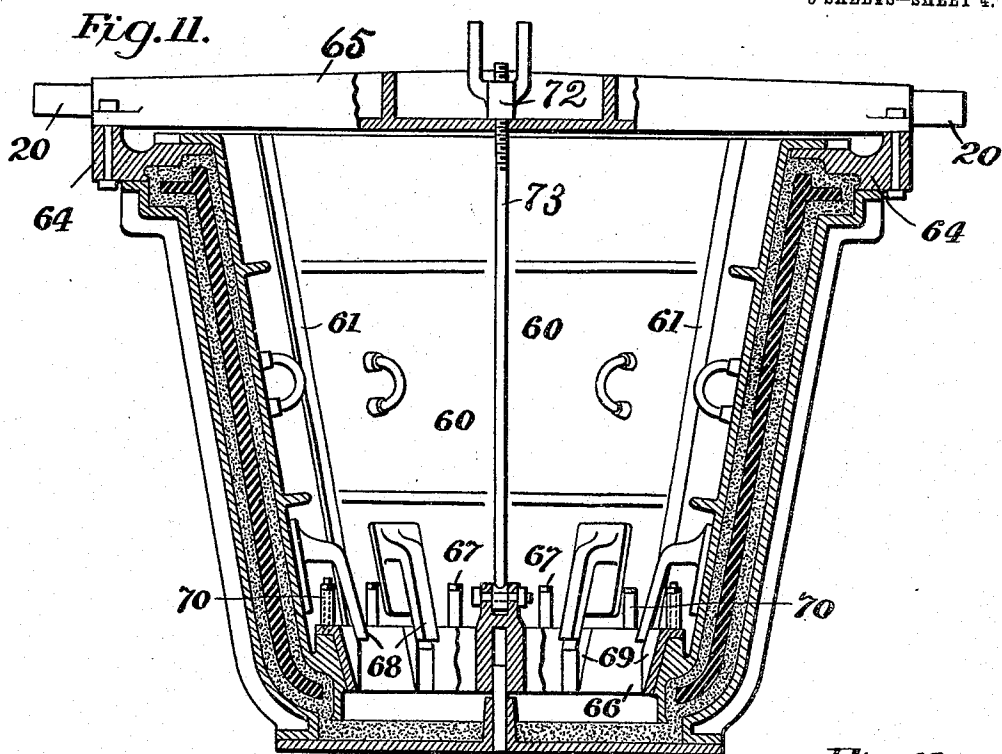
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5 SHEETS—SHEET 4.



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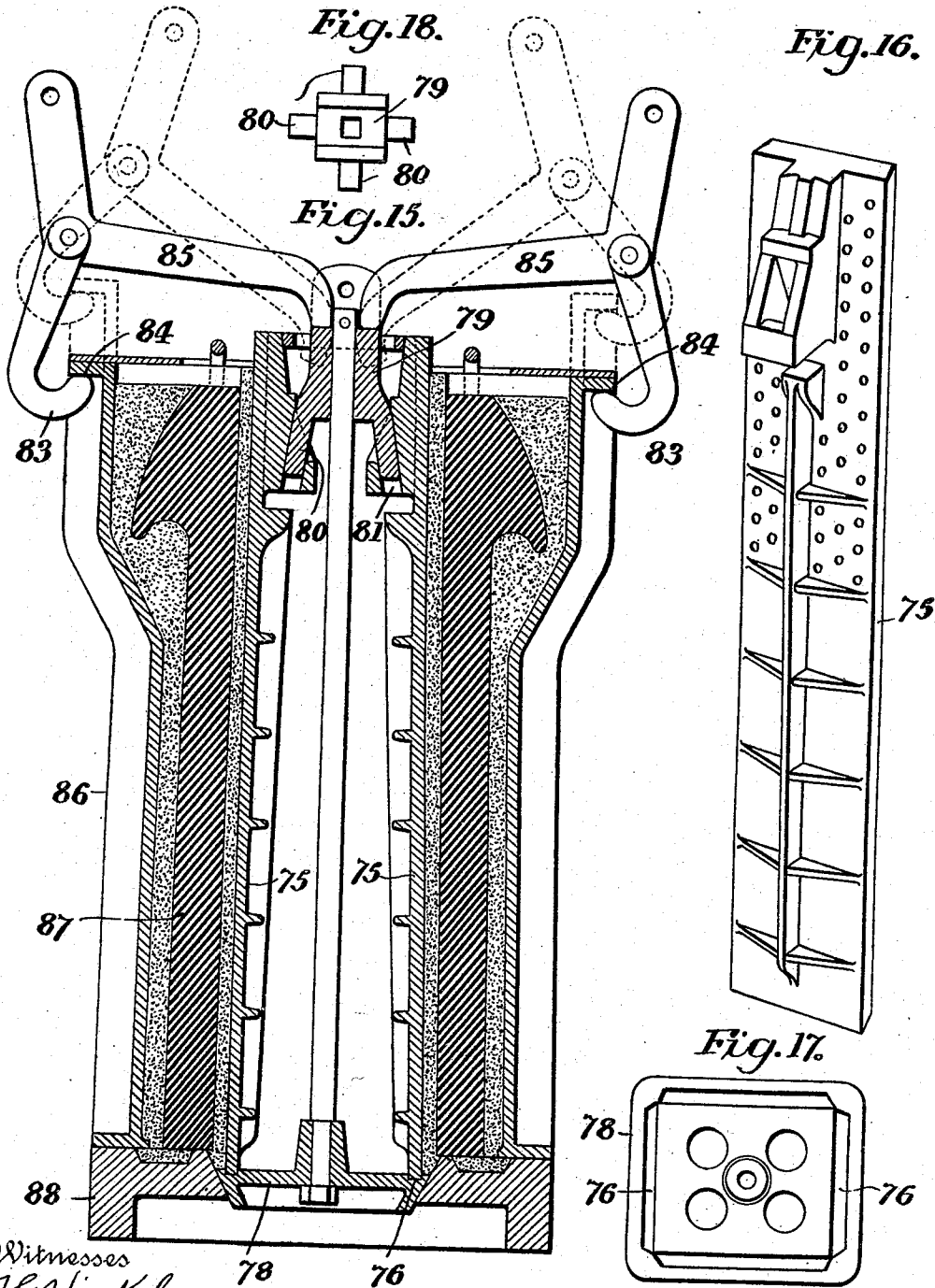
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

JOHN POWER, OF PUEBLO, COLORADO.

MOLD FOR CASTING METAL POTS, &c.

936,939.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed July 19, 1909. Serial No. 508,500.

To all whom it may concern:

Be it known that I, JOHN POWER, a citizen of the United States, residing at Pueblo, in the county of Pueblo and State of Colorado, have invented certain new and useful Improvements in Molds for Casting Metal Pots, &c., of which the following is a specification.

This invention relates to apparatus for casting metal pots and ingot molds, and more particularly to improvements in collapsible core arbors for casting molds which may be readily removed from the casting.

One of the objects of my invention is to provide a collapsible core arbor which may be readily secured in position within the casting flask and maintained rigidly during the casting operation, with means for quickly contracting and loosening it from the cast article so that the arbor may be entirely removed, permitting the casting to shrink freely as it cools.

Another object of my invention is to provide a core arbor which may be readily loamed, together with means for loaming and sweeping the same.

Other objects of my invention will be apparent from the following description, while the scope of my invention will be defined in the appended claims.

In order that my invention may be better understood, reference is made to the accompanying drawings, in which—

Figure 1 is a vertical section of one form of my collapsible core-arbor, shown in position in a flask for casting large closed bottom metal pots, after the metal has been poured; Fig. 2 is a top plan view of the same; Fig. 3 is a vertical section of the core shown in Fig. 1, illustrating the manner of loaming and sweeping the same preparatory to the casting operation; Figs. 4 and 5 are vertical sections of the top and bottom portions of the flask shown in Fig. 1, illustrating the manner of loaming and sweeping the same; Fig. 6 is a vertical section of a modified form of my collapsible core arbor in which the arbor is integral and is spread into the position for casting by means of a metal wedge extending the entire length of the arbor, the flask being bolted in position in the casting pit and the metal having been poured; Fig. 7 is a top plan view of the core with the wedge removed; Fig. 8 is a detailed view of the wedge; Fig. 9 is a plan

view of the ring-plate which is bolted to the bottom of the core when in casting position; Fig. 10 is a vertical section on the line $x-x$ of Fig. 9. Fig. 11 is a vertical section of another form of my casting mold, showing the collapsible core arbor made up of a plurality of sections secured to a ring at the top and held at the bottom in casting position by a tapered plug, this type being arranged for casting pots or shells having an open bottom; Fig. 12 is a partial top view of Fig. 11; Figs. 13 and 14 are a vertical section and top plan view, respectively, of the tapered plug; Fig. 15 is a vertical section of a flask and collapsible core adapted for casting ingot molds; Fig. 16 is a perspective view of one of the sections of the collapsible core; Fig. 17 is a top plan view of the base of the core; and Fig. 18 is a top plan view of the wedging block for spreading the upper ends of the collapsible core members.

The casting of large articles or vessels presents great difficulties owing to the large amount of shrinkage of the molten metal upon solidifying, which renders the use of a solid arbor or core impossible. It has, therefore, been the general practice in casting large vessels or pots, to build up a core of brick to support the loam for the mold after the casting was poured the core was broken and dug out. This method was slow and laborious and required the building of a new core for each casting.

My present invention provides a means of casting large vessels rapidly, the same core being used repeatedly, and moreover, by its use insuring a more perfect casting since the core arbor may be removed as soon as the molten metal has solidified, thereby allowing the casting to shrink freely. I have also made especial provision for quickly and accurately covering the core with loam and sweeping into proper shape with a smooth uniform surface. I provide a metal core which may be rigidly secured after assembling and accurately adjusted in the molding flask and which may be collapsed and readily removed from the casting as soon as the molten metal has solidified.

It is old in the art of casting cylindrical pipes to employ a collapsible core-barrel, but in so far as I am aware, there has never been devised, prior to my invention, any means by which the cores of molds for cast-

ing large vessels, ladles, or pots, could be made collapsible and removable from the casting.

In Figs. 1 and 2, I have shown one type of rigging for casting cinder-pots constructed in accordance with my invention. The flask comprises the upper inverted frusto-conical portion 1 and the base portion 2. The core or arbor comprises a plurality of tapering sections 3, 3', the alternate sections 3 being provided with longitudinal flanges 4 which overlap the contiguous edges of the intermediate sections 3'. At the lower end of each section an integral rib 6 terminates in a conical sector 7, forming, when assembled, a conical opening to receive a tapering plug 10, carried by the stem or bar 11, by which it may be forced into position and rigidly secured by means of bolts 13 passing through the annular flange 14 projecting from the plug. The core-sections are bolted at the top to a ring 16, which is bolted to a trunnion beam 18. After the parts of the core have been assembled and rigidly secured together in the manner described, the core may be swung by means of a crane and inverted into the position shown in Fig. 3, with the trunnions 20 resting upon suitable blocks 21. In this position a sweep-frame 23 is placed over the core, with its pivot-bar 24 inserted in the central opening 27 in the plug 10. The loam 28 may now be quickly and evenly swept or spread upon the core by revolving the sweep 23 about its pivot. The flash is prepared in the same manner, the upper portion being placed over a plate 30, as shown in Fig. 4, which is provided with a central opening or socket for the pivot pin of the sweep, and similarly the bottom portion of the flask is loamed and swept into shape as illustrated in Fig. 5. After the several parts of the mold have thus been prepared, the parts are assembled as shown in Fig. 1, and the casting is poured through the casting holes 32. When the molten metal has solidified, the bolts 13 are removed and the plug is released, being withdrawn by turning the nut 33 on the rod 11, until the flange 14 engages the heads of the bolts 34. The several sections 3, 3', can then be loosened by means of a crane and the core be lifted out of the mold, permitting the casting to cool and shrink freely.

In Fig. 6 I have shown a form of my invention which is adapted for casting similar pots. The main portion of the core 40 is formed integral and divided longitudinally by a wedge-shaped slot into which the wedge 41, shown in detail in Fig. 8, is forced and secured by means of keys 42 driven between the flanges 43 and clamps 44. The lower portion of the core is composed of a plurality of radial wings or blades 46, connected to a central tubular stem 47, and united at the top by a ring or annulus 48 by

which it is bolted to the flange 49 of the upper or main portion. The upper and lower core portions are separately loamed and swept in the manner previously described by inserting and attaching a rotary sweep-frame. For this purpose a plate having a socket for the pivot is temporarily bolted to the flange 49 of the upper core part. After the core and flash have been loamed, the core is lowered into position within the flask by means of a crane, the whole resting upon a casting stool 50 in a casting pit and securely held in position during the pouring operation by I-beams 52 across the top, which are bolted to anchor rods projecting from the concrete foundation. After the casting has been poured and a sufficient amount of time elapsed for the metal to set, the wedge is released and pulled back slightly, being supported upon the bolt 55, passing through the flanges 43, thereby permitting the core arbor 40 to spring inward, by which it is freed from the casting and can then be lifted from the mold by means of a crane.

Another modification of my invention is shown in Fig. 11, and is adapted for casting large open bottom cinder pots, or shells. The core arbor is constructed of a plurality of sections 60, having longitudinal overlapping joints 61, fastened at the top to a ring 64, carried by a trunnion beam 65, and suitably formed at their lower ends to form a tapering central opening into which the annular plug 66 is forced and rigidly fastened by means of bolts 67. Each of the core sections is provided with a tapering finger 68, which overhangs a corresponding tapering lug 69 on the interior of the annular plug. Now when the casting has been poured and the molten metal has solidified, the nuts and sleeves 70 surrounding the bolts 67 are removed and the annular plug 66 is raised slightly by screwing the nut 72 on the rod 73, against the flange on the trunnion beam. This causes each of the tapering lugs 69 to press inwardly upon the corresponding tapering finger 68, whereby the core-sections are moved radially inward at the bottom and releasing the core from the casting and permitting it to be lifted from the mold in the manner previously described.

In Fig. 15, I have shown a collapsible core arbor applied to a mold for casting ingot molds. The core arbor comprises a plurality of sections 75, which fit in grooves 76 in a plate 78, at their lower ends, and are forced outwardly into proper position at the top by means of a tapering plug 79, provided with outwardly spreading fingers 80, which slide in tapering recesses 81 in each of the sections. After the plug has been drawn into proper position to hold the core sections in place, it is rigidly locked or keyed until the casting has been poured,

After the metal has solidified, the locking key is driven out and a pair of specially formed tongs such as shown are placed with their hooks 83, under the top flange 84 of the flask, and their extension arms 85 resting upon the plug. Now by hoisting the tongs by means of a crane, the plug will first be driven downwardly, thereby forcing the core sections inwardly and releasing them from the casting, after which a continued upward movement will lift the flask 86 and casting 87 above the core, which will be left standing upon the casting stool 88.

Each of the forms of my invention above described possesses the advantages of a solid core during the operations of loaming and casting and at the same time the further advantage of being immediately collapsed and withdrawn from the casing as soon as it has solidified. These features of my casting mold will be appreciated by those skilled in this art, to whom it will be apparent that changes may be made in the constructions herein disclosed without departing from the spirit of my invention.

Having now described my invention, I claim and desire to secure by Letters Patent:—

1. A mold for casting metal receptacles, comprising a flask, a collapsible metal core arbor divided longitudinally, a plate adapted to engage and support the core at one end, a wedge arranged to expand the arbor, and detachable means for rigidly securing the arbor in expanded position.

2. A collapsible core arbor for casting molds, comprising a longitudinally divided metal shell or core, means to support the upper end, an annular flange at the lower end, a ring or annulus having radial ribs or blades arranged to be secured to said flange, and a wedge member to expand said core.

3. A collapsible core arbor for casting molds, comprising a core divided longitudinally and having upper and lower annular

flanges, a carrying ring secured to said upper flange, an annulus arranged to be secured to said lower flange, and a wedge to expand said core.

4. A collapsible core arbor for casting molds, comprising a plurality of core sections provided with segmental flanges at their upper ends and with tapering or beveled flanges at their lower ends, a carrying ring secured to said upper flanges, a conical wedge to engage the lower flanges and expand the core sections, and means for retracting the wedges and contracting the core.

5. A collapsible core arbor for casting molds, comprising interfitting core-sections provided with outwardly directed upper flanges and inwardly directed tapering lower flanges, a carrying ring secured to said upper flanges, a conical wedge to engage the lower flanges and expand the core sections, contacting devices upon each core section projecting above said wedge, and means for retracting the wedge and causing it to engage said contacting devices and move the core sections inwardly.

6. A collapsible core arbor for casting molds, comprising interfitting core-sections provided with outwardly directed upper flanges and inwardly directed tapering lower flanges, a carrying ring secured to said upper flanges, an annular wedge to engage the lower flanges and expand the core sections, beveled surfaces upon the interior of said annular wedge, inwardly directed lugs or fingers upon said core sections adapted to engage said beveled surfaces, and means for raising said wedge from engagement with said lower flanges and into engagement with said fingers, causing said core-sections to move inwardly.

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

JOHN POWER.

Witnesses:

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