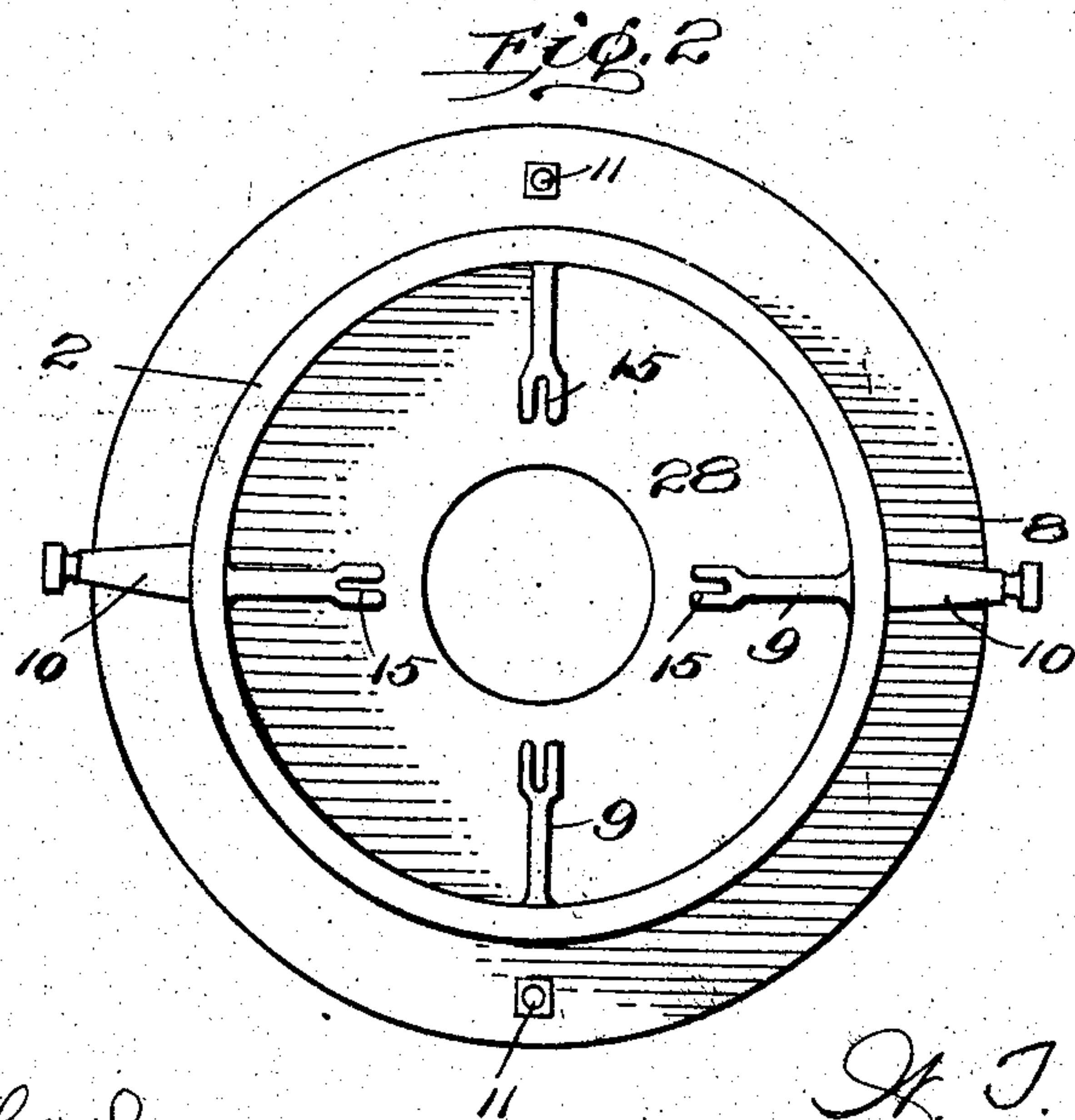
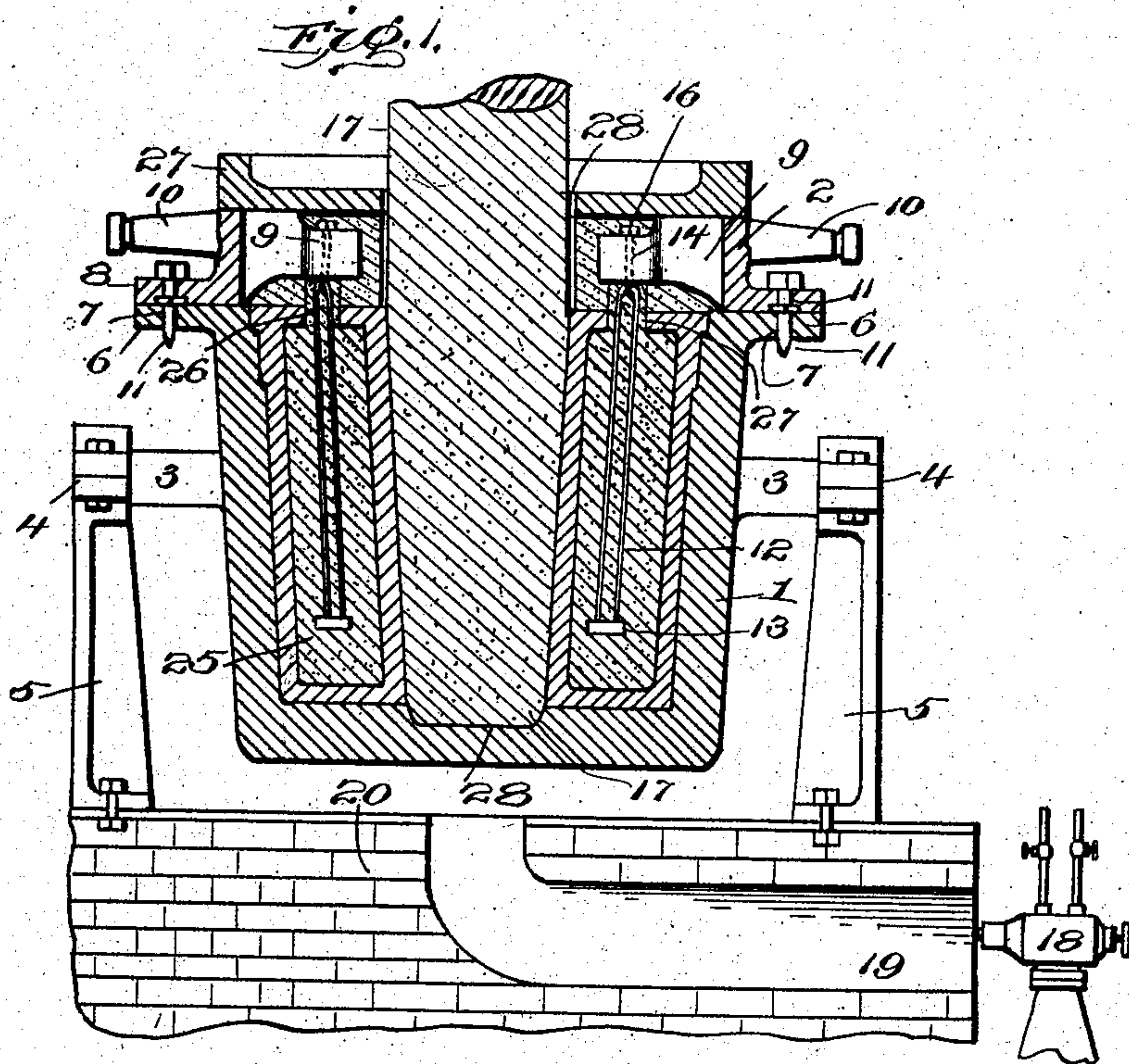


No. 815,181.

PATENTED MAR. 13, 1906.

W. T. KRAUSE.
CASTING MECHANISM.
APPLICATION FILED APR. 12, 1905.

2 SHEETS—SHEET 1.



Witnesses
M. Fowler Jr.
Cassell Severance

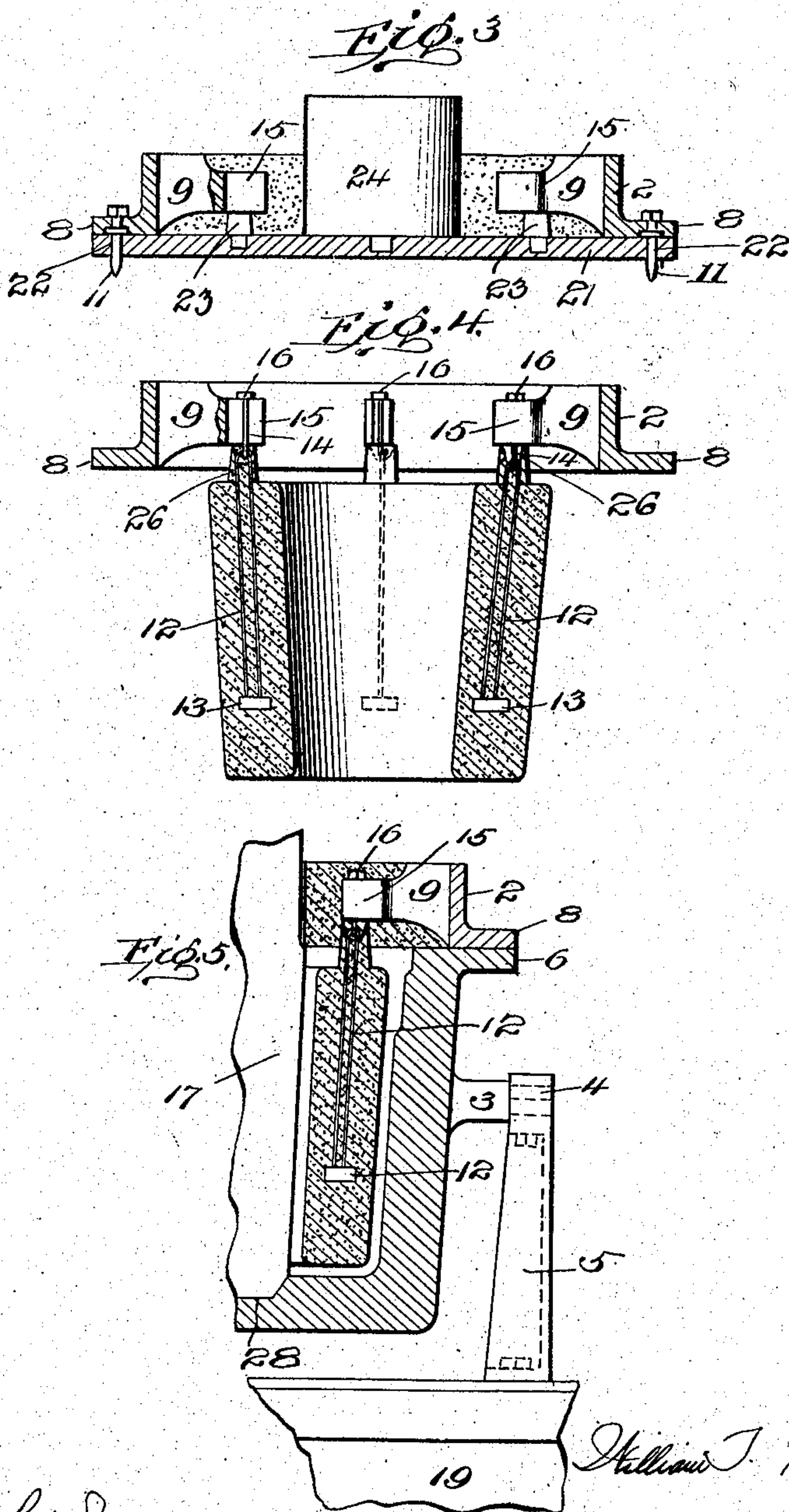
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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ONE-THIRD TO DAVID R. STEELE AND ONE-THIRD TO HARRY D.
HARVEY, OF BALTIMORE, MARYLAND.

CASTING MECHANISM.

No. 815,181

Specification of Letters Patent.

Patented March 13, 1906.

Application filed April 12, 1905. Serial No. 255,130.

To all whom it may concern:

Be it known that I, WILLIAM T. KRAUSE, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Molding or Casting Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in mechanism for casting articles, and particularly to mechanism for casting or molding metal articles in a metal mold.

The invention comprises certain novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view through my casting mechanism, the trunnions being shown in elevation. Fig. 2 is a top plan view of the cope. Fig. 3 is a detail sectional view taken through the cope and the forming and shaping plate upon which the cope is supported when the molding-sand is rammed within the same. Fig. 4 is a detail sectional view showing the cope after it has been packed with sand and having a core suspended therefrom. Fig. 5 is a detail sectional view through a portion of the mold, showing the cope and core in position in readiness for the pouring of the metal.

It is the object of the present invention to so form a molding apparatus that articles to be molded may be cast and removed from the mold in comparatively quick succession.

The invention involves the molding or casting of articles in a metallic mold which requires no sand in the body portion of the mold. In connection with the metallic body portion or drag of the mold a cope is employed in which molding-sand is tightly rammed or tamped, and guiding means is provided for effecting the quick and yet accurate seating of the cope upon the drag of the mold, insuring an accurate centering of the core or cores employed in connection with the flask or mold.

In the accompanying drawings I have illustrated a practical mechanism for carrying out the spirit of the invention, the said mech-

anism being made up of a metallic drag or body portion of a flask, as 1, and a cope 2, which completes the flask, resting upon the upper edges of the body portion 1. The drag or lower member of the mold is preferably provided with trunnions 3, which engage bearings 4, formed in supporting-stands 5. By thus mounting the mold it may be tipped for facilitating the discharging of the molded articles therefrom. The interior of the drag or lower member 1 of the mold or flask is shaped in accordance with the contour which it is desired to impart to the article cast. The upper edge of the said drag 1 is provided with outwardly-extending flanges 6, which receive and support the ring or frame of the cope 2. Apertures 7 are formed in the said flange 6 for receiving pins, bolts, or projections carried by the cope-frame and used in centering and properly positioning the cope with respect to the drag when the members of the mold or flask are brought together. The flask 2 is formed with a ring-body portion having a lower laterally-projecting flange 8, which fits upon the flange 6 of the drag. Projecting inwardly from the walls of the cope are core-supporting arms 9. There may be any desired number of such core-supporting arms; but four arms diametrically opposite to each other usually suffice for properly holding a core in position. The cope is preferably formed with means for supporting it in such a manner that it may be turned over, so that when it is to be tamped with sand it is rolled over with one edge uppermost, and when it is to have a core secured thereto it is turned with the other edge up, after which it is again rotated for bringing the core in a suspended position beneath the cope and in readiness for insertion within the metallic drag or mold. A simple means of facilitating these movements of the cope is shown in the drawings and consists of laterally-extending arms or trunnions 10, which are usually formed upon the body portion of the cope. The cope may be raised upon rails properly spaced apart or horses of any mechanical type desired. The projecting ends of the trunnions resting upon such supports will permit of the cope being rotated or turned over as needed in preparing it for the molding operation. The flange of the cope is provided with guiding or centering

pins 11, which project downwardly therefrom a sufficient distance to engage the apertures 7, formed in the flanges 6 of the drag.

A molding or casting mechanism made in accordance with this invention is particularly well suited for the casting of twyers, such as are commonly used in furnaces of various types. In the drawings I have illustrated the mechanism as adapted for casting twyers of an ordinary type, the twyers being usually formed of brass and made with an annular hollow portion or recess around the outer edge thereof, while at the center there is a passage-way or aperture extending entirely through the said twyer. The life of these twyers in use may be greatly lengthened if the walls of the twyers are made of a uniform thickness throughout, and the molding device forming the subject-matter of this invention is especially well adapted for accurately producing such twyers with walls of uniform thickness throughout.

The cope is made to support the core of the twyer or other article cast, and for securing such core to the cope slender loops of cast material, preferably iron, as at 12, are mounted in the core, the core being formed and baked around the said loops. The loops are made sufficiently slender to be easily broken when the core is to be taken out of the casting, but are sufficiently strong to firmly hold the core in place upon the cope. The lower ends of the supporting-loops 12 are provided with heads or enlargements, as at 13, which assist in anchoring the said loops within the body portion of the core. The upper bent ends of the loops 12 are engaged by hooked bolts 14, which are supported upon the arms 9 and engage the bifurcated inner ends 15 thereof. A nut 16 upon the upper end of each of said bolts serves to draw the bolts upwardly and make the loops 12, together with the core, rigid with the cope. The arms 9 are arranged in radial relation to the cope-frame, so that the bolts 14 may be drawn inwardly for a small-sized core or placed at a greater distance from the center when using a larger-sized core. The cope-frame with the core-supporting arms is thus adaptable for the casting or founding of different-sized articles. In forming the twyers such as above referred to a central core 17 is used, which is set into the drag or lower member of the mold, a central aperture being left in the sand packed in the cope for the entrance of said core. The central core 17 is formed of baked sand or like suitable material.

In molding metal in a metallic mold it is needful to keep the mold at a proper temperature, and I therefore provide heating means for this purpose. In order to properly heat the mold, I provide means which is arranged beneath the mold when in its normal molding position. While any heating agent may be employed, I preferably use a

burner, as 18, which is mounted opposite the open end of a passage 19, formed in the base or brickwork 20 beneath the mold. The passage-way 19 leads to a point directly beneath the mold, so that the flames and products of combustion from the burner will be delivered against the bottom of the mold and may be made to thoroughly heat the same. If a hydrocarbon-oil burner is employed, the degree of heat applied may be varied as required for preserving the proper temperature in the mold. By heating the mold in this manner I find that the metal which is poured into the mold lies against the inner surface of the mold so closely as to receive a smooth and even surface after it has become set and hardened.

In using the mold the cope is removed from the body portion of the mold and is set upon a plate 21, which is provided with apertures 22 to receive the pins 11. The plate is formed with upwardly-projecting studs or bosses 23, which are arranged in exact correspondence with the position of the core-suspending loops 12. Centrally located upon the plate is a cylindrical block 24, which is made slightly larger in diameter than the mold-core 17. Molding-sand or some similar composition is then packed in the cope and tamped down tightly against the plate 21 and around the core-supporting arms 9. The cope is then inverted by being rolled over upon its supporting-trunnions 10, and the plate 21, with its bosses and stem 24, is carefully removed, leaving the sand packed in the cope in the desired shape. The core 25 with its securing loops 12 are next secured to the supporting-arms 9. The said core 25 is molded and baked with upwardly-extending conical projections 26, which surround the upper ends of the loops 12 and form apertures 27 in the top wall of the twyers which are cast, through which the core may be removed after it has been broken up or pulverized. The upper ends of the conical projections 26 are slightly broken from about the ends of the loops 12 in order to hook the bolts 14 in the ends of the loops, and thus be able to suspend the core from the arms 9 of the cope. The cope after the core has been secured to it is then turned over upon its trunnions, and any suitably-arranged hoisting means is applied thereto, and it is lifted and swung over the mold. The cope supporting the core is then lowered over the mold, the core entering the same, and the pins 11 are brought into engagement with apertures 7 for directing the movement of the cope as it is seated upon the mold and for accurately and properly centering the position of the core and cope with respect to said mold. A top plate 27 is preferably placed upon the top of the cope, as shown in Fig. 1. An aperture is made in the top plate a little larger than the diameter of the central core 17, and

as above pointed out, the aperture formed in the sand of the cope is also slightly larger than the central core, and a gate for pouring the metal is thus formed around the core 17, as shown in Fig. 1. The molten metal of which the twyer or other article is to be formed is poured into the gate 28 and fills the space between the core 25 and the mold and between the inner core 17 and the outer core 25. As soon as the metal is hardened sufficiently the cope is separated from the core, lifted off, and the mold is tipped upon its trunnions for turning the article out of the same. The core 25 is broken within the twyer, and the loops 12 may be broken and removed from their positions, after which the pulverized inner core can be blown or otherwise removed from the apertures 26 formed in the end wall of the twyer.

The lower end of the central core 17 is finished off perpendicular with the axis of the core and fits upon a flat central surface 28, formed in the bottom of the core, so that when the core 17 is set in position for casting it will occupy a concentric position in the mold and cope.

I find that in casting metal articles this mechanism is very accurate and capable of producing perfect results, since the parts are properly located with respect to each other and the walls of such articles as twyers can be cast of even thickness throughout without any particular adjustment or careful attention on the part of the operators in bringing the parts together. The process of casting articles with this mechanism is also a speedy one, since by the preparation and ramming of a few copes before the molding operation begins a number of castings may be made in quick succession. The copes can be quickly adjusted over the molds and the metal poured, and very soon thereafter the completed article may be turned out of the mold, when it is in readiness for receiving another cope and forming another casting. In this manner a number of castings may be made in the time ordinarily required for forming a single one by methods in common use. It is desirable to place some preparation upon the inner surface of the mold, which will prevent the metal from adhering thereto, and I find that if the inner surface of the metal mold is rubbed with graphite the articles will come out smooth and well formed, and one such preparation of the interior of the mold will last for a great many castings.

The mounting of the mold upon trunnions and the similar mounting of the cope makes it possible to handle the parts with ease and quickness, and the whole apparatus is simple in structure and not easily gotten out of order.

Of course I do not wish to be understood as limiting myself to the casting of twyers, though the apparatus is admirably adapted

for this purpose, and I consider any change in minor details of the mechanism as clearly within the scope of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A casting mechanism, comprising a metallic mold or drag closed at the bottom, a cope suspended across the open top, a core suspended from said cope and vertically-movable jointed suspending means for supporting said core, the movement of said means effecting the vertical adjustment of the said core.

2. A casting mechanism, comprising a cup-shaped mold forming a metallic drag, supporting-trunnions projecting from the upper portion thereof, a cope extending across the upper edge of the same, supporting-trunnions projecting therefrom, a removable core hung from the under side of the cope, so as to project into said mold or drag and vertically-adjustable articulating supports carrying said core.

3. A casting mechanism comprising a cup-shaped unlined metal mold, a cope mounted on the upper open edge thereof and having core-supports extending inwardly over the mouth of the mold, adjustable suspension means carried by said projections, a core arranged to extend within the mold, and means embedded therein for engaging the said suspension means and thus properly holding the core within the mold.

4. A molding mechanism, comprising a hollow metallic mold, a cope capable of fitting upon said mold, a core, vertically-adjustable suspending means formed of jointed sections for holding the core upon said cope, and means for directing the cope accurately in position upon the mold for properly centering the core therein.

5. A casting mechanism, comprising a metallic mold, a cope capable of being accurately positioned over the same, a core adjustably suspended beneath the cope, the said core having hook-engaging means projecting above its upper surface and vertically-adjustable hooks carried by the cope and engaging said hook-engaging means, for holding the core in place.

6. A casting mechanism comprising a mold, a cope arranged above the same and having inwardly-extending core-supporting arms, a removable core, loops molded in the said core and means carried by said arms for engaging and removably suspending the loops from the said arms.

7. A casting mechanism, comprising a mold, a cope fitting upon the same, comprising a ring or frame, inwardly-projecting arms having slotted inner ends, bolts mounted in the slotted ends of said arms, and core-supporting loops hung upon said bolts for attaching a core to the cope-arms.

8. A casting mechanism, comprising a mold, a cope fitting upon the same and provided with supporting-trunnions by which the cope may be elevated or depressed or
5 may be turned over upon a suitable support, core-supporting arms mounted in the cope and an adjustable jointed means for suspending the core so that it projects into the mold.

9. A casting mechanism comprising a pivotally-mounted mold, a cope fitting upon the same having a sand-receiving body portion, arms projecting within the sand when tamped in the cope, core-supporting hooks mounted upon said arms, fragile loops suspended from
10 the hooks and heads formed upon their lower ends and embedded in the core for facilitating the supporting of the core upon the cope,

and means carried by the cope and engaging the mold for properly centering the core within the mold.

10. A casting mechanism, comprising a metallic mold, a removable cope mounted thereon and carrying a core, the core being capable of projecting into the mold; the cope having a central opening formed therein, and
25 a central removable core arranged within the core-supporting cope.

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

WILLIAM T. KRAUSE.

Witnesses:

FREDERICK S. NICHOLS,
SACKVILLE C. WOLLETT.