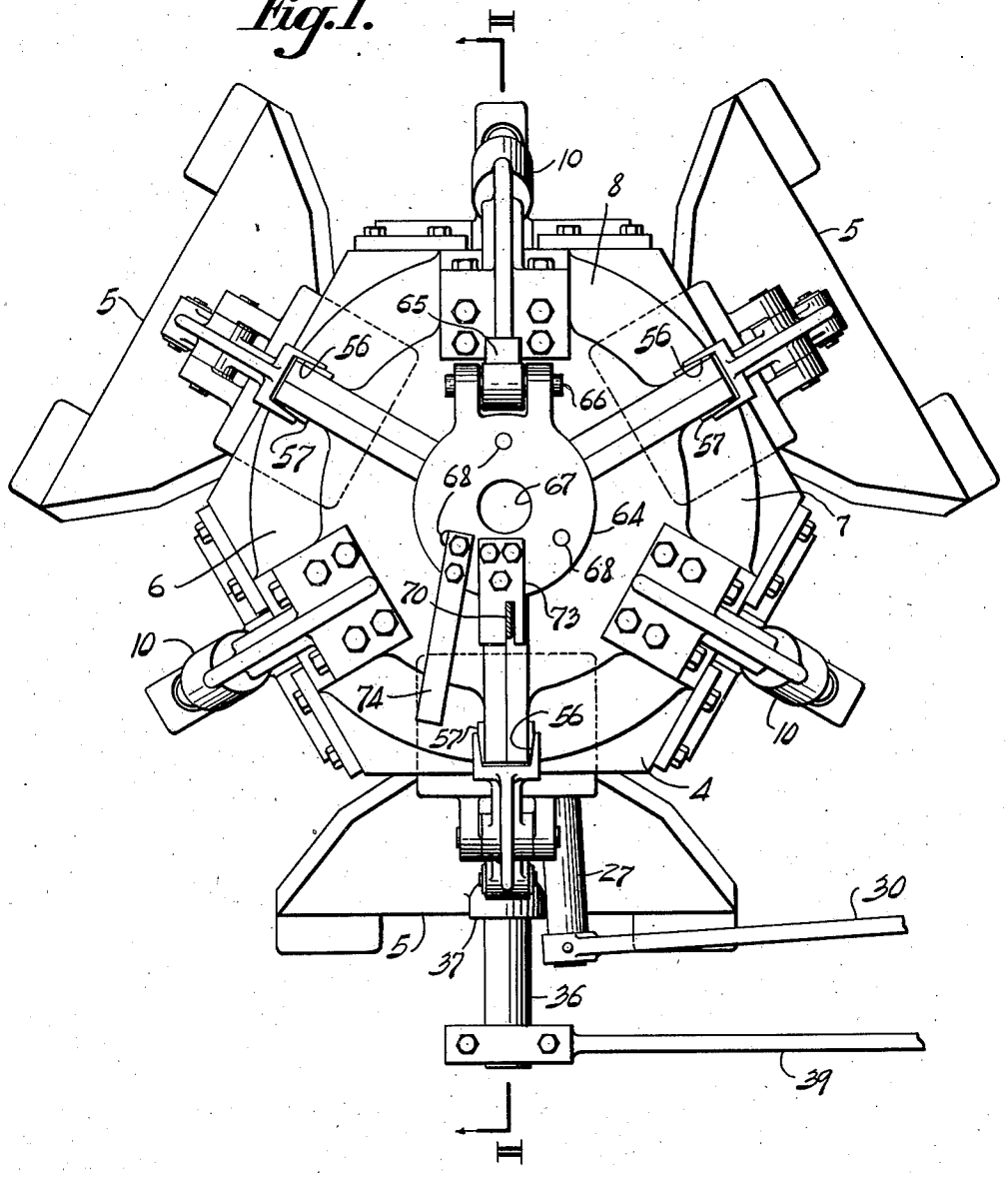
Oct. 27, 1936. M. GUYOT 2,058,442

CASTING APPARATUS

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Fig. 1.



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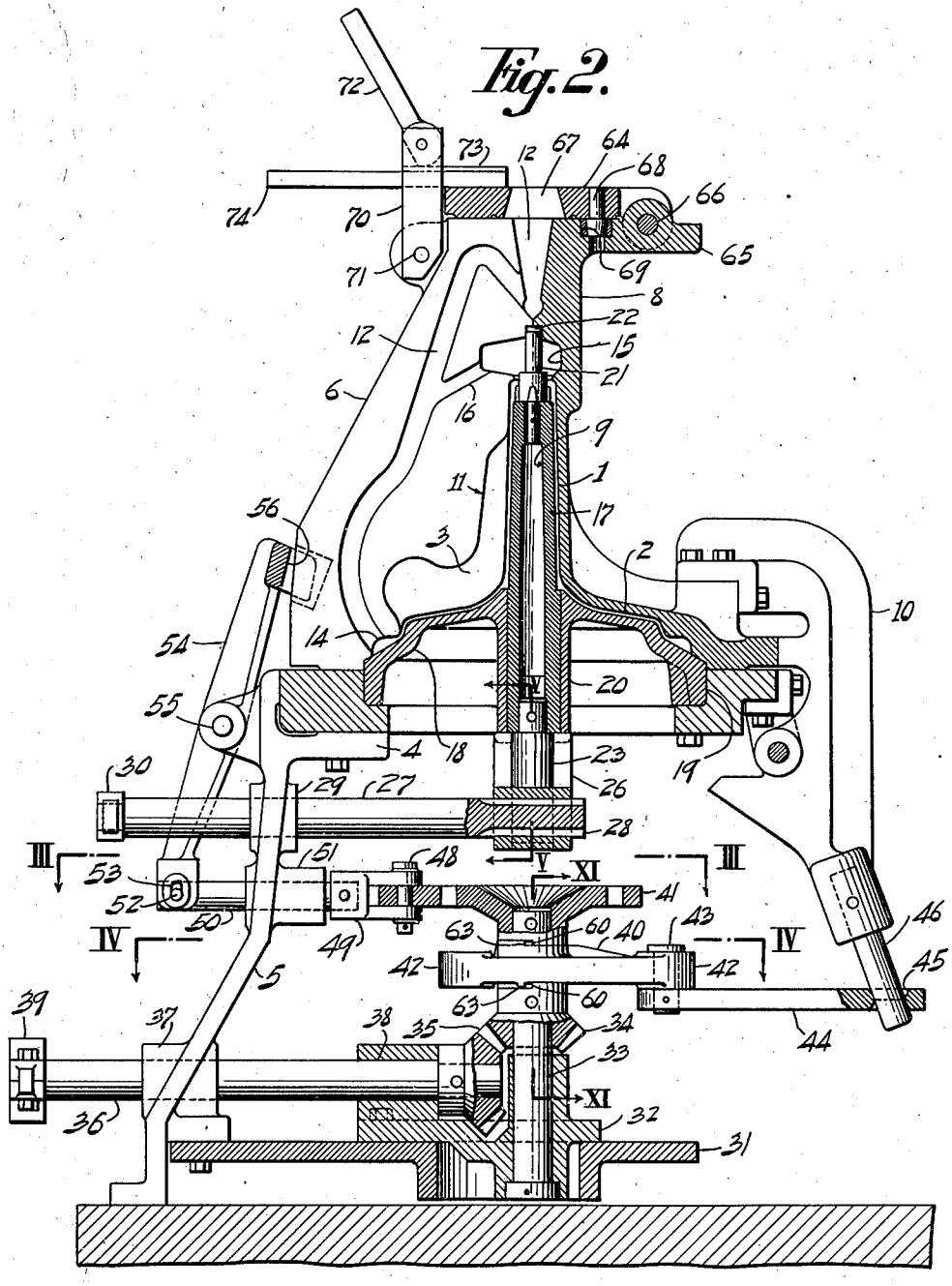
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Fig. 2.



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Fig. 3.

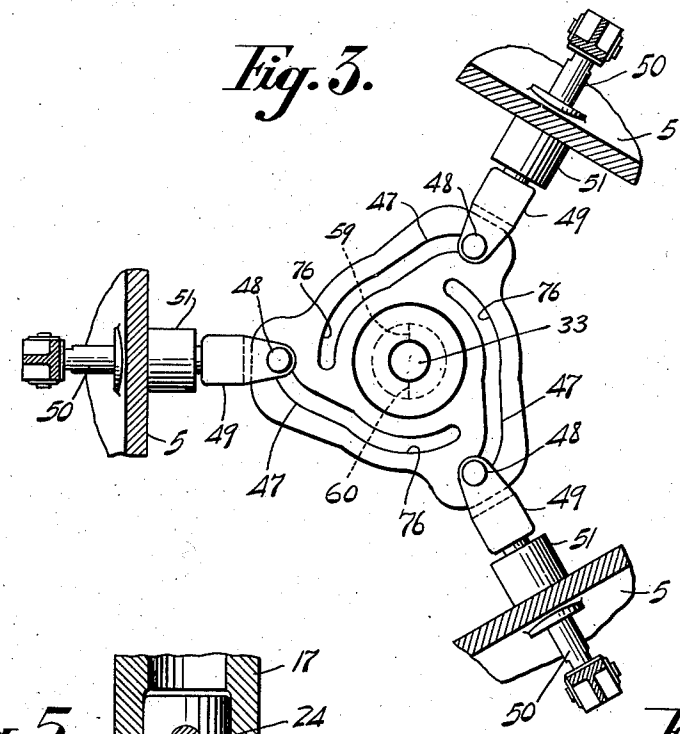


Fig. 5.

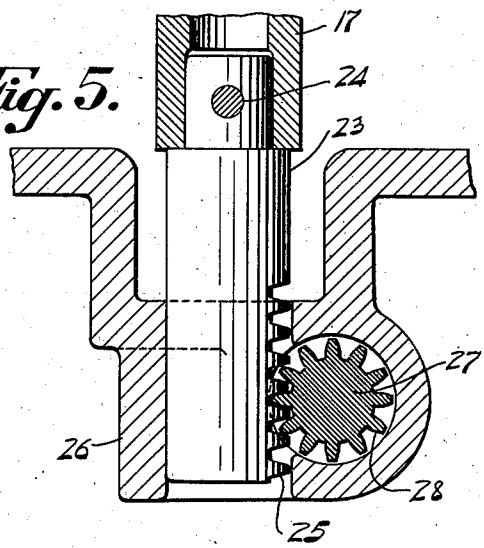


Fig. 9.

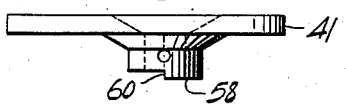
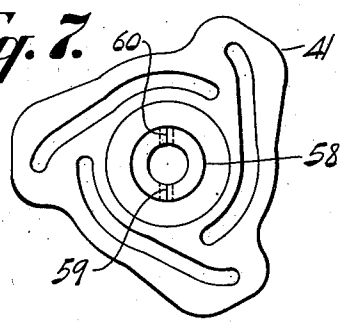


Fig. 7.



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Fig. 6.

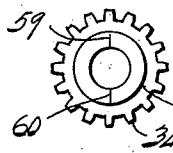


Fig. 4.

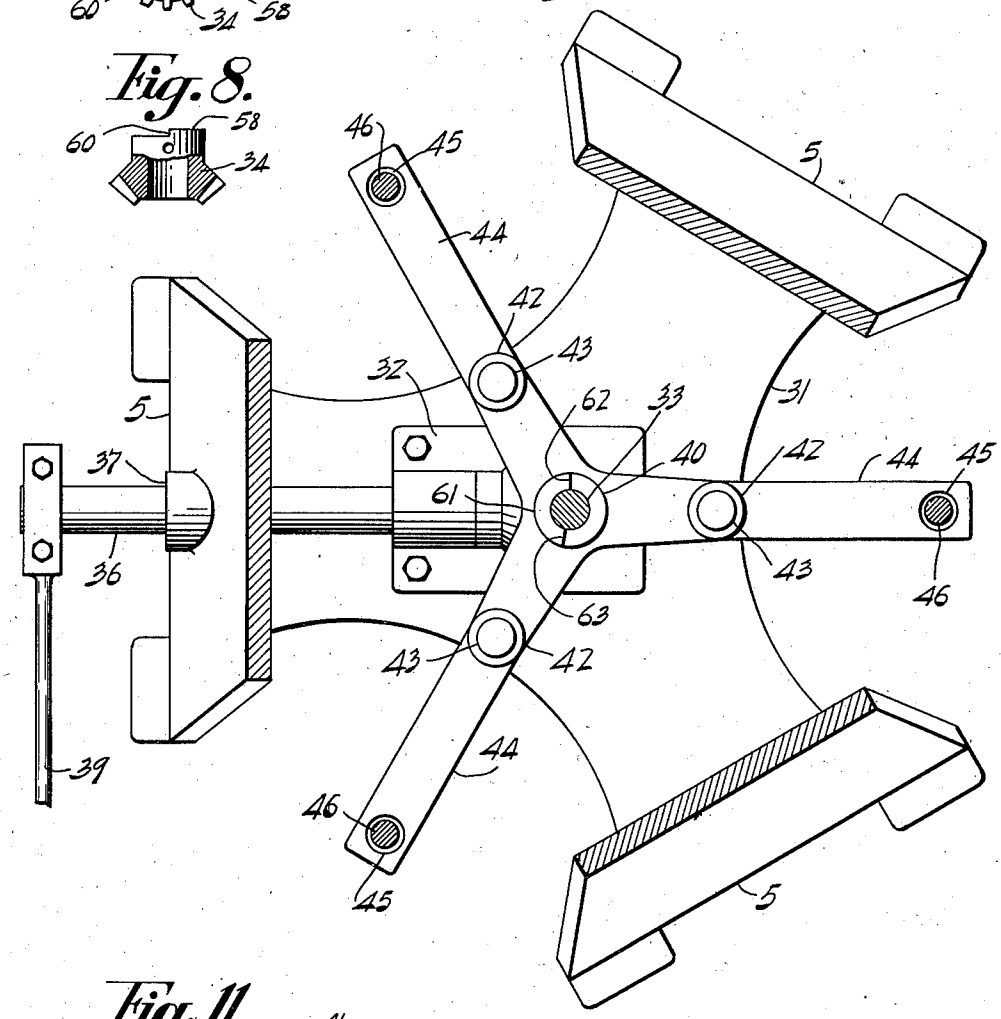


Fig. 8.

Fig. 11.

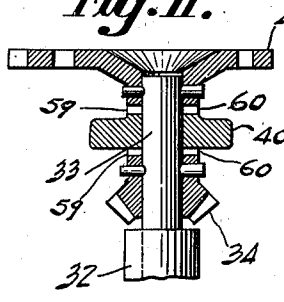
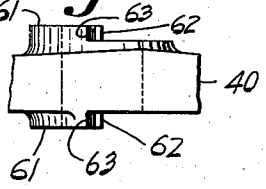


Fig. 10.



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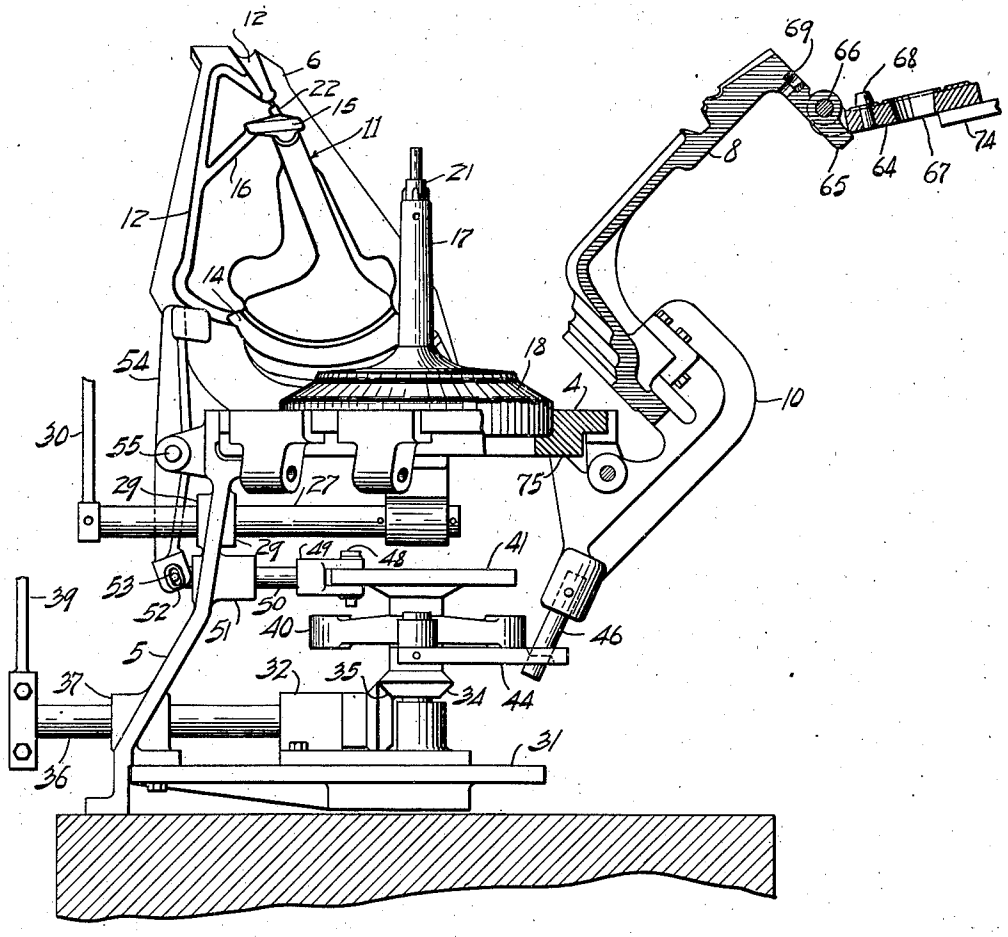
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Fig. 12.



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UNITED STATES PATENT OFFICE

2,058,442

CASTING APPARATUS

Marius Guyot, Rocky River, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania

Application June 9, 1933, Serial No. 675,047
Renewed January 11, 1936

13 Claims. (Cl. 22—136)

This invention relates in general to multipart permanent molds for casting metals. It is particularly concerned with casting apparatus in which certain movable mold and core elements can be quickly and easily secured in proper aligned relationship with a minimum expenditure of effort on the part of the operator.

Products made from light metals and their alloys, such as aluminum and alloys thereof, are, as regards physical properties, especially suited to commercial usage if their design is such that they can be cast in metal molds, frequently termed permanent molds, or chill molds. A very successful mold of this general type comprises a stationary base upon which suitable hinged mold parts are so connected as to permit their alignment with respect to a core associated therewith to form a casting cavity and gate and riser cavities within the mold parts.

In practice the mold parts are preferably moved into alignment with a core member, the mold parts thereafter being clamped and secured in their aligned position, and the molten metal is then introduced into the casting cavity through a suitable gate and riser leading thereto. A casting having solidified within the mold assembly, these operations are carried out in the reverse order, namely, the clamps are released, the mold parts swung open, the core preferably retracted, and the cast article removed.

Attention is directed to the mold-closing and opening operations and the clamping mechanism provided therefor, since my invention is primarily concerned with the mechanical mechanism for accomplishing these feats. In general a satisfactory casting apparatus should be capable of ready operation, and incorporate in its construction a minimum number of elements, the operation of the organized apparatus being such as to require only a slight expenditure of energy, since it is customary for one operator to manipulate one or more molds repeatedly and rapidly.

Heretofore in the operation of casting assemblies, when a casting had solidified the operator released the mold-clamping mechanism and then usually inserted a lever between projecting portions provided on adjacent mold parts and by application of force on the end of the lever separated the mold parts. This procedure has been usually customary, although in some cases it was possible, by a certain amount of physical exertion, to separate the mold parts manually without a lever.

It is accordingly one object of the present invention to provide a casting assembly or apparatus which incorporates movable mold parts, mechanical means being associated with the mold parts for the easy operation thereof into open and closed position.

Another object of the invention is to provide a casting assembly or apparatus in which movable parts, associated with a core member, are mechanically operated to be brought into open or closed position, the means for performing this duty being adapted to automatically clamp the mold parts on completion of the mold-closing operation.

A further object of the invention is to provide a mold-opening and closing mechanism incorporating in its construction a mold-unclamping and clamping mechanism, both of said mechanisms being coordinated in timed relationship, with respect to each other, in such a manner that they perform their functions in proper sequence.

Other objects and advantages will present themselves on consideration of the drawings and accompanying description.

In the drawings accompanying this specification and forming a part thereof, one physical embodiment, which my inventive concept may assume, has been shown. Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended thereto, the invention itself as to its objects and advantages, the mode of its operation, and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which:

Fig. 1 represents a top plan view of a casting apparatus and its associated parts in which the principle of my inventive concept is embodied;

Fig. 2 represents a vertical sectional elevation taken along the line II—II of Fig. 1;

Fig. 3 represents a sectional plan view taken along the line III—III of Fig. 2;

Fig. 4 represents a sectional plan view taken along the line IV—IV of Fig. 2;

Fig. 5 represents a fragmentary section taken along the line V—V of Fig. 2;

Fig. 6 represents a plan view of the engaging face of one element of the mold-manipulating mechanism;

Fig. 7 represents a plan view of the engaging face of another element of the mold-manipulating mechanism;

Figs. 8 and 9 represent side elevational views of the elements shown in Figs. 6 and 7, respectively;

Fig. 10 represents a fragmentary side elevation-

al view of an element which cooperates with the elements illustrated in Figs. 8 and 9;

Fig. 11 represents a fragmentary sectional elevation taken on the line XI—XI of Fig. 2;

Fig. 12 represents a vertical elevation with parts removed and broken away to more clearly show the mode of construction of the casting apparatus, the mold parts being disclosed in their open position.

In describing my improved casting assembly I have elected to disclose it in connection with an apparatus for the manufacture of a conventional product in the form of a washing machine agitator. The general type of this casting apparatus is well known to those versed in the art, but the improvements incorporated in its design and the arrangement of its mechanical elements represents a departure from the mechanisms heretofore in use for this particular purpose.

Referring now to the drawings, a casting apparatus is illustrated which is adaptable to the formation of a washing machine agitator having an upwardly extending, substantially cylindrical, central hollow portion 1 and an outwardly flared base portion 2. Fins or flanges 3 are provided integral with the upper surface of the flared base and cylindrical central portion. Preferably the agitator is cast from a suitable metal having a low specific gravity, as compared with iron, such as aluminum, magnesium, their alloys, or any other similar light metals and their alloys.

Referring specifically to the drawings, the casting assembly for the manufacture of the article in question comprises a suitable main base member 4 supported upon standards or legs 5, or the like. Mounted upon the upper surface of the base member are three relatively movable mold sections 6, 7, and 8, which sections are adapted to cooperate with each other and with a suitable movable core member 9 to constitute a metal-receiving cavity therebetween. It is to be understood that the invention is not limited to a three-section mold, since any suitable number of sections may be incorporated in a casting assembly of this general type.

The mold sections 6, 7, and 8 are generally wedge-shaped (Fig. 1) and each section is provided with two working faces in engagement and flush with the others when in their closed position. Each of the mold sections is hingedly connected to the base member 4 by suitable hinge members 10, which construction permits them to be pivotally moved outwardly relative to each other and their common central vertical axis. The adjacent contacting mold faces are suitably recessed to form the main casting cavity represented in entirety by the reference numeral 11, as shown to best advantage in Figs. 2 and 12, and gates 12 are provided which open into an annular runner 14, located adjacent the agitator base 2, from which the molten metal introduced through the gates 12 rises upwardly into the casting cavity 11, as will be hereinafter more clearly understood. An auxiliary riser 15 is also preferably provided in the form of cooperating recesses in the mold sections adjacent the upper portion of the casting, which may also be connected with the inlet gates 12 by communicating passages 16. As shown in Fig. 2, it is usual in practice to provide a gate 12 in the plane of each of the fins 3, there being three such gates in the casting assembly here illustrated.

The movable core 9 comprises a substantially cylindrical elongated member 17 which projects vertically through an annular base member 18 positioned within a complementary cavity 19 in the main base 4. In the particular apparatus selected for purposes of illustrating the invention the base member 18 is detached from the core member 17 and is secured within the base 4 as by cap screws. An alternative construction of the core 9 would consist of forming the base 18 and cylindrical member 17 integrally, as will be readily understood by those skilled in this art.

The base member 18, besides cooperating with the mold sections 6, 7, and 8 to constitute the casting cavity 11, acts in the capacity of a guide or pilot member for the core 9. This is accomplished through the medium of the central bearing or sleeve 20 formed integral with the base member 18 and within which the lower end of the vertically extending portion of the core is slidably supported. The upper end of the core is centrally positioned against lateral play or displacement relative to the mold cavity by means of a shouldered pin member 21, one end of which is positioned within the upper end of the core and the opposite end of which enters a bore 22 formed by cooperating recesses in the mold sections.

Means for reciprocating the core 9 with respect to the casting cavity, for the well known purpose of relieving the same from a cast article on completion of a casting operation, is provided in the form of a vertical stub shaft 23 (Figs. 2 and 5), which is secured to the lower end of the central portion 17 of the core 9 by means of a through pin 24. The stub shaft 23 is provided with suitable rack teeth 25 and extends and is guided within a housing 26 secured to the under side of the casting assembly or main base 4. The housing 26 also provides a bearing for a horizontal shaft 27 having pinion teeth 28 cut in its periphery adjacent and in mesh with the rack teeth 25. The opposite end of this shaft is supported within and extends exteriorly of a bearing 29 formed in one of the legs 5. For manipulation purposes a handle or lever 30 is clamped to the extending end of the shaft 27 by means of which a rotary movement may be imparted to this shaft and the core reciprocated within the casting cavity.

The main feature of the invention concerns the mechanism which is provided for manipulating the mold sections 6, 7, and 8 into and out of metal-receiving position with respect to each other and the core 9. This mechanism and its organized relationship, with respect to the previously described casting apparatus, will now be described.

Situated beneath the casting assembly and secured as by cap screws to the legs 5 is a base plate 31 (Figs. 2, 4 and 12), upon which a central bearing bracket 32 is suitably secured. A shaft 33 is rotatably mounted in this bearing bracket 32 and extends vertically therethrough to an appreciable distance above the bracket. Secured to the shaft 33 is a bevel gear 34 which meshes with a similar bevel gear 35 secured to the overhung or projecting end of a horizontal shaft 36 supported within a bearing 37 formed integral with one of the legs 5 and a second bearing 38 incorporated in the aforementioned bearing bracket 32. A suitable handle or operating lever 39 clamped to the exterior end of the shaft 36 provides means for imparting rotation to the vertical shaft 33 through the medium of the intermeshing bevel gears 34, 35.

The bevel gear 34 in cooperative relationship with a hinge-manipulating member or spider 40 and a clamp-manipulating cam 41 constitute an

organized mechanism the elements of which are so constructed that a definite timed relationship exists between the functions which these elements perform, as will hereinafter be described. The spider 40 (Figs. 2, 4, 10, and 11) is rotatably mounted and free to turn an appreciable amount on the shaft 33 with respect to the bevel gear 34 and cam 41, the latter two elements being secured to the shaft 33 by means of through pins or the like and between which the spider is positioned. Spider 40 has three extending legs the extremities of which are provided with suitable bearing bosses 42 which receive headed connecting pins 43 to which link members 44 are attached. These link members are mounted for oscillatory movement with respect to the bearings 42 and their opposite ends are provided with beveled apertures 45 within which extension pins 46, secured within the hinge members 10, are received.

The mold clamp-manipulating cam 41, shown to best advantage in Figs. 3, 7, and 9, is provided with three openings or apertures 47 which receive headed pins 48 extending through clevises 49 attached to the inner ends of horizontal connecting rods 50. The opposite ends of the rods 50 are slidably mounted within bearings 51, formed integral with the legs 5, and extend an appreciable distance beyond the legs where pins 52, extending through the connecting rods 50, are received within the slotted apertures 53 of pivotally mounted, mold-securing, clamp members 54. The mold-securing, clamp members are pivotally attached or fulcrumed to the leg members 5, as by bracket and pin connections 55, and the upper ends of the clamp members 54 are provided with bifurcated pockets 56, the opposite interiorly disposed faces of the pockets being tapered to engage complementary tapered shoes 57, secured to or formed integral with the exterior faces of the contacting adjacent faces of the mold sections 6, 7 and 8 when in their closed metal-receiving position, as shown in Figs. 1 and 2.

Referring to the views of the clamp-manipulating cam 41 (Figs. 7 and 9), the level gear 34 (Figs. 6 and 8), and the spider 40 (Figs. 4 and 10), the hub faces of these three elements are constructed with engaging surfaces so that they cause rotation of the spider relative to the cam and bevel gear only during a portion of the rotary movement imparted to the shaft 33. The faces of the extending hubs of the gear 34 and cam 41 are similarly constructed and are formed with projecting shoulder portions 58 constituting substantially 180° of the hub faces and providing the vertical engaging surfaces 59 and 60. Likewise, the hub of spider 40, which is symmetrical about a horizontal center line (Fig. 10), is constructed with projecting shoulder portions 61 constituting appreciably less than 180° of the hub faces and providing vertical engaging surfaces 62 and 63. As illustrated in Figs. 2 and 11, the vertical engaging surfaces 59 and 60 of the gear 34 and cam 41 and the vertical engaging surfaces 62 and 63 of the spider 40 are arranged in such a manner that rotation of the shaft 33 imparts rotation to the bevel gear and cam secured thereto, whereas rotation of the spider 40 occurs only after contact is made between the engaging surfaces 59 and 62 or 60 and 63. In this connection it will be readily understood that the relationship which the projecting shoulders 58 and 61 bear with respect to the circumference of the hubs of these associated elements introduces a time lag or delayed movement of the spider 40 relative to the movement of the cam 41 and bevel gear 34.

Referring to Figs. 1, 2, and 12, an auxiliary mold-clamping mechanism is shown, by means of which the mold sections may be rigidly secured in closed position. This mechanism comprises a top annular plate member 64 which may be hinged to the top of any one of the mold sections, and in the present instance is hinged to section 8, the top portion of which is provided with a hinge lug 65 for supporting a suitable hinge pin 66 upon which the plate is hingedly supported. The plate 64 is provided with a metal-pouring opening 67 in registry with the central sprue or gate 12, and hardened dowel pins 68 projecting through the plate are adapted to register with suitable tapered bushings 69, one of which is provided in the top surface of each of the mold sections 6, 7, and 8. A latching and clamping means associated with the plate 64 is provided in the form of a link 70 hingedly connected as at 71 to mold section 6, a cam lever 72 being pivotally secured to the link 70 and adapted to be brought into bearing or clamping relationship upon the top surface of a bifurcated plate 73 projecting from the annular top plate 64. A handle 74 projecting from the plate 64 provides means for rotating the plate out of closed position with respect to the mold sections, whereby the dowel pins 68 are removed from their tapered bushings 69 and the assembly is in readiness to permit opening of the mold sections.

The operation of the improved casting apparatus above described, assuming a cast article has been removed therefrom and the various elements of the mechanism in the relative positions illustrated in Fig. 12, entails, as the initial operation, the rotation of the core-manipulating lever 30 through an angle of 90 degrees in a clockwise direction, which action, through the medium of pinion 28 and rack teeth 25, advances the core 9 into its upper position as indicated in Fig. 2. Thereafter the lever 39 is likewise rotated through an angle of 90 degrees in a clockwise direction, which action, through the shaft 36 and intermeshing bevel gears 34, 35, imparts an anticlockwise rotation to the vertical shaft 33.

In the open position of the casting apparatus (Fig. 12) the engaging hub faces of the mold-manipulating elements 34, 40, and 41 are so positioned relative to each other that the vertical surfaces 60 of the cam 41 and bevel gear 34 are in contact with the vertical surfaces 63 of the spider 40, and an appreciable distance, approximately 10° of arc in the illustration shown, exists between the vertical surfaces 59 of the cam 41 and bevel gear 34, and the vertical surfaces 62 of the spider 40. Rotation of the lever 39 in a clockwise direction to close the mold and clamp the same preparatory to a casting operation, as above mentioned, rotates the gear 34 and cam 41 simultaneously relative to the spider 40 until the vertical surfaces 59 of the cam and bevel gear engage or abut against the vertical surfaces 62 of the spider, and thereafter the three elements, namely, the cam, spider, and bevel gear, move in unison during the remainder of the rotary movement of shaft 33 from open position (Fig. 12) to closed position (Fig. 2) of the mold sections.

Rotation of the spider 40 in this manner forces the links 44 into a straight-line position (Fig. 4), with respect to the legs of the spider, in which position the hinge members 10 are rotated out of contact, as at 75, with the under side of the main

base 4, into the vertical position shown in Fig. 2, through the engagement of links 44 with the hinge-extension pins 46. Also, rotation of the cam 41 in an anti-clockwise direction reciprocates the connecting rods 50 outwardly from their position shown in Fig. 12 to that shown in Figs. 2 and 3. This action of the connecting rods causes the fulcrumed, mold-securing members 54 to pivot about their supports 55 in such a manner that their bifurcated pockets 56 embrace and wedge into contact with the tapered shoes 57 on the exterior faces of adjacent pairs of contacting mold faces.

At this point in the operation of the casting apparatus it is important to note that, during approximately half of the rotary movement of cam 41 in an anti-clockwise or mold-closing and clamping direction, no motion is imparted to the connecting rods 50. This delayed movement of rods 50 is essential to the successful operation of the mold-closing and mold-securing mechanism, since it insures the proper closing of the mold sections prior to the functioning of the clamping elements 54. This delayed operation of the rods 50 in a mold-closing operation is obtained through the medium of the compound arcuate form of the apertures 47 in the cam 41, similar portions 76 of these apertures having common radii with respect to the vertical axis of the shaft 33, the portions of common radii insuring the absence of reciprocatory movement in the rods 50 while the clevis pins 48 are embraced within the portions 76 of the cam apertures.

The mold sections 6, 7, and 8 having been brought into their closed position and secured therein, as above described, the auxiliary clamp plate 64 is swung into position whereby the dowel pins 68 enter their respective bushings 69 and the cam lever 72 is drawn up into clamping relationship with the plate 73. The mechanism (Figs. 1 and 2) is now in condition to receive molten metal in the performance of a casting operation.

On completion of a casting operation, the metal having solidified within the casting cavity, the above operations are repeated in their reverse order, whereby the cast article may be removed from the casting cavity and relieved of its excess gate and runner metal by any suitable cutting or similar operation. It is to be noted that rotation of the operating lever 39 in an anti-clockwise direction through an angle of 90 degrees to unclamp and open the mold sections necessitates the initial actuation or withdrawal of the clamp members 54 and thereafter the rotation of the hinge members 10. In this connection, it will be noted, the clockwise rotation of shaft 33 and its attached elements 34 and 41 is initially relative to the spider 40 in view of the distance separating the vertical engaging surfaces 60 of the cam and gear and the vertical engaging surfaces 63 of the spider. During this relative movement the cam 41 functions to draw the connecting rods 50 inwardly to release the clamping action of the members 54, at the completion of which operation, the pins 48 enter the portions 76 of apertures 47 and terminate the movement of rods 50. Simultaneously with the termination of the reciprocatory movement of rods 50 the engaging surfaces 60 and 63 contact and impart rotation to the spider 40 in a clockwise direction, whereby the mold sections are swung into their open position (Fig. 12).

Having thus described and explained my invention and its manner of operation, it is to be understood that the particular casting assembly selected was merely for purposes of illustration and that variations in the form and arrangement of elements shown and described herein may be made without departing from the nature and scope of my invention except as defined in the claims appended hereto.

What I claim is:

1. In a casting apparatus, a base member, a plurality of mold sections rotatably hinged to said base member, said mold sections being recessed to provide a casting cavity, means for rotating said mold sections into and out of metal-receving position, said means including a spider associated with said mold hinges and rotatably supported upon a shaft, mold-securing means including mold-engaging members, means comprising a cam secured to said shaft for actuating the mold-securing means, said spider and cam having projecting portions adapted to engage with each other during rotary movement of said shaft, and said projecting portions being spaced from each other to permit relative movement between said spider and cam, whereby the mold sections are rotatable into and out of metal-receiving position and secured and released in proper timed sequence.

2. A casting apparatus which comprises a plurality of recessed mold sections hingedly connected to a base member for movement into and out of metal-receiving relationship, a mold-manipulating mechanism for mechanically closing said mold sections and clamping the same, said mechanism being also adapted to unclamp and open said mold sections, said mechanism comprising clamping means and hinge-actuating means, a cam secured to a rotatable shaft interconnected with said clamping means, a spider rotatably mounted on said shaft interconnected with said hinge means, said cam and spider having hub portions adapted to engage with each other during a portion of the rotary movement of said shaft, said hub portions being so formed as to permit relative rotation of the cam with respect to the spider whereby the cam is adapted to function to permit unclamping of the mold sections prior to actuation of the spider to open said mold sections.

3. In a casting apparatus, a base member, a plurality of recessed mold sections hingedly attached to said base member for rotation into and out of metal-receiving relationship, a mechanism supported beneath said base for mechanically rotating said mold sections into and out of metal-receiving position and clamping and unclamping the same in proper sequence, said mechanism comprising a vertical shaft upon which a bevel gear and a clamp-manipulating cam are rigidly secured in spaced relationship, a hinge-manipulating spider rotatably mounted upon said shaft and disposed between the bevel gear and cam, means for rotating the vertical shaft, a lost motion connection between said spider, cam, and bevel gear whereby the cam and bevel gear may be rotated a definite amount relative to the spider in both directions of rotation of the vertical shaft, means connecting said spider with the hinges on said mold sections, clamping and unclamping means associated with said cam, said spider and cam being adapted to actuate said mold hinges and clamping and unclamping means to close and open and clamp and unclamp the mold sections in proper sequence.

4. In a casting apparatus, a base member, a plurality of recessed mold sections movably mounted with respect to said base and each other,

hinges connecting said mold sections to said base, a mold-manipulating mechanism located beneath said base, said mechanism being adapted to move said mold sections into and out of metal-receiving relationship and clamp and unclamp said mold sections in proper sequence, said mechanism comprising a vertical shaft for supporting a hinge-manipulating spider and a clamp-manipulating cam, said spider being connected by link members to said hinges, said cam having portions in engagement with horizontal connecting rods, clamping levers pivotally mounted intermediate their ends on said base member adjacent the contacting faces of adjacent mold sections, bifurcated ends incorporated in said clamping levers adapted to engage and wedge the adjacent faces of each pair of mold sections into metal-receiving relationship, the opposite ends of said clamping levers being connected to said horizontal connecting rods, a hub on said cam having a projecting shoulder portion, a hub on said spider having a projecting shoulder portion adapted to engage the cam projecting shoulder portion, means for rotating said vertical shaft to impart a rotary movement to said cam and spider, said projecting shoulders permitting relative movement of the cam with respect to said spider whereby the horizontal connecting rods are reciprocated to clamp and unclamp the mold sections and the spider is thereafter permitted to actuate the hinge members to move the mold sections into and out of metal-receiving position in proper sequence.

5. In a multipart mold, mold-closing means and mold-clamping means, mechanism for actuating said mold-closing and mold-clamping means whereby the parts of the mold are closed and clamped in metal-receiving position in proper sequence, said mechanism comprising a vertical shaft, a bevel gear and a clamp-manipulating cam rigidly secured to the shaft in spaced relative relationship, a mold-manipulating spider rotatably mounted upon said shaft and disposed between the bevel gear and cam, means for rotating the vertical shaft, a lost motion connection between said spider, cam, and bevel gear whereby the cam and bevel gear may be rotated a definite amount relative to the spider in both directions of rotation of the vertical shaft, means connecting the spider with said mold parts, means connecting the cam with the mold-clamping means, said spider and cam being adapted to actuate said mold-closing means and mold-clamping means respectively to close and open and clamp and unclamp the mold parts in proper sequence.

6. A casting apparatus which comprises a plurality of recessed mold sections movably mounted with respect to each other to provide a casting cavity, a shaft, means including an element rotatably mounted upon the shaft for moving said mold sections into and out of metal-receiving position, means including an element secured to said shaft for securing said mold sections in metal-receiving position, said elements having projecting shoulders adapted to engage with each other during movement of said shaft, and said projecting portions being spaced from each other to permit a definite relative movement between said elements, whereby said first and second-mentioned means are operable in timed relationship with respect to each other.

7. A casting apparatus which comprises a plurality of recessed mold sections movably mounted with respect to each other to provide a casting cavity, a shaft, means including an element rotatably mounted upon the shaft for moving said mold sections into and out of metal-receiving position, means including an element secured to said shaft for securing said mold sections in metal-receiving position, and means for imparting rotational movement to said shaft, said elements having projecting shoulders adapted to engage with each other during rotation of said shaft, and said projecting portions being spaced from each other to permit a definite relative movement between said elements, whereby said first and second-mentioned means are operable in timed relationship with respect to each other.

8. A casting apparatus which comprises a multipart permanent mold having a plurality of movable recessed mold sections, a shaft, means including an element rotatably mounted upon the shaft for moving the mold sections into and out of metal-receiving position, a core associated with said mold sections, means for advancing and retracting said core into and out of said casting cavity, means including an element secured to said shaft for securing said mold sections in metal-receiving position, said elements being provided with projecting shoulders adapted to engage with each other during rotational movement of said shaft, and said projections being spaced from each other to constitute a lost motion connection therebetween, whereby rotation of said shaft is adapted to actuate said mold-moving and securing means in proper timed sequence.

9. In a casting apparatus, a plurality of mold sections hingedly secured to a base member, said mold sections being recessed to constitute a casting cavity, a shaft, an element rotatably mounted upon the shaft in association with said mold sections for swing the same from an open to a metal-receiving position, a second element secured to said shaft in association with mold-clamping devices for clamping said mold sections in metal-receiving position, said elements having projecting shoulders engageable with each other during rotation of said shaft, and said projections being spaced from each other to permit relative movement of said elements with respect to each other, whereby rotation of said shaft is adapted to swing said mold sections into metal-receiving position and clamp the same in such position in proper sequence.

10. In a casting assembly, a plurality of mold sections movably mounted upon a base member, hinge members securing said mold sections to said base, a shaft, means including an element rotatably mounted upon the shaft in association with said hinge members for pivotally moving said mold sections into and out of metal-receiving position, means including an element secured to said shaft for securing said mold sections in metal-receiving position, a single manipulating means for actuating said first and second-mentioned means, said elements having projecting portions adapted to engage with each other during rotation of said shaft, and said projecting portions being definitely spaced from one another to permit relative movement between said elements on rotation of said shaft, whereby movement of said mold sections into metal-receiving position and securing the same in such position is performed in definite timed relationship.

11. A casting mechanism comprising a plurality of recessed mold sections movably mounted upon a base member and adapted to be moved into and out of metal-receiving position, a shaft member, means including an element rotatably mounted upon said shaft for moving said mold sections into and out of metal-receiving position, means in-

cluding an element secured to said shaft for clamping and unclamping said mold sections when in metal-receiving position, said elements having projecting portions adapted to contact with each other during rotational movement of said shaft, said projecting portions being disposed in a manner to permit relative movement between the elements as the shaft is rotated, whereby the first and second-mentioned means are operable in definite timed relationship.

12. A casting mechanism comprising mold sections movable into and out of metal-receiving position, a shaft member, means rotatably mounted on said shaft for moving the mold sections, means secured to said shaft for securing said mold sections in metal-receiving position, said moving and securing means being interengageable through a lost motion connection, and means for rotating said shaft whereby on rotation of said shaft relative movement is imparted to said first and second-mentioned means to move said mold sections into metal-receiving position and secure the same in proper timed relationship.

13. In a multipart mold, closing means and securing means, a mechanism for actuating said closing means and securing means, said mechanism comprising an operating shaft, an actuating element rotatably mounted upon the operating shaft and interconnected to said mold parts for closing the same, an element secured to said operating shaft and interconnected to said securing means, said elements having engaging shoulders adapted to contact with each other during rotational movement of said operating shaft, and said engaging shoulders being spaced from each other to permit relative movement between the elements, whereby the closing and securing means function in proper timed sequence.

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