July 11, 1944. N. JANCO 2,353,339

CENTRIFUGAL CASTING MACHINE

Filed May 16, 1942 3 Sheets-Sheet 1

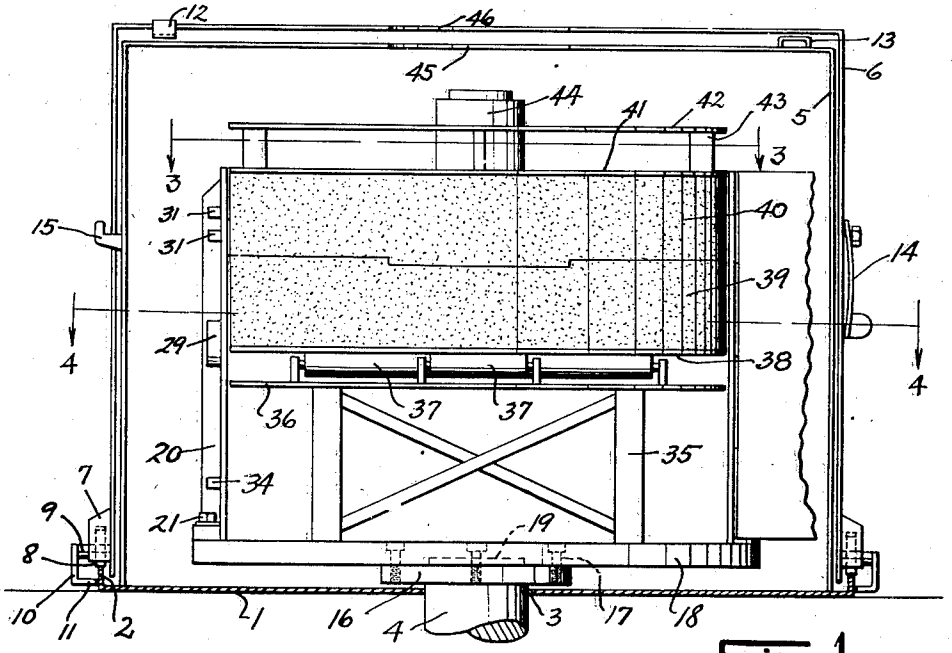


Fig. 1.

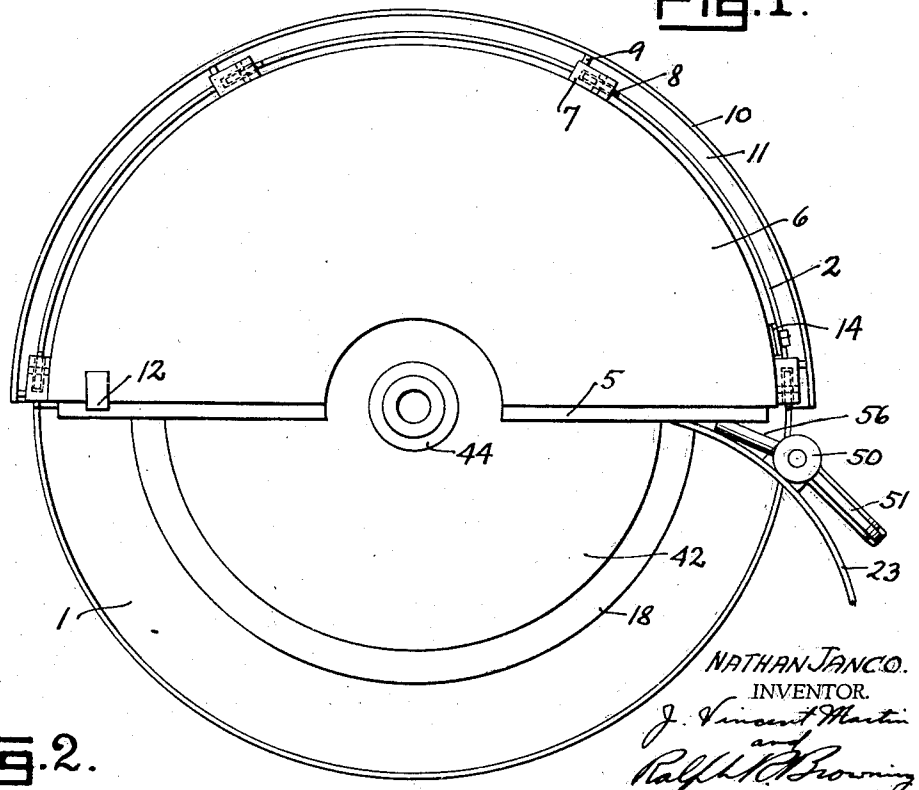


Fig. 2.

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Filed May 16, 1942 3 Sheets-Sheet 2

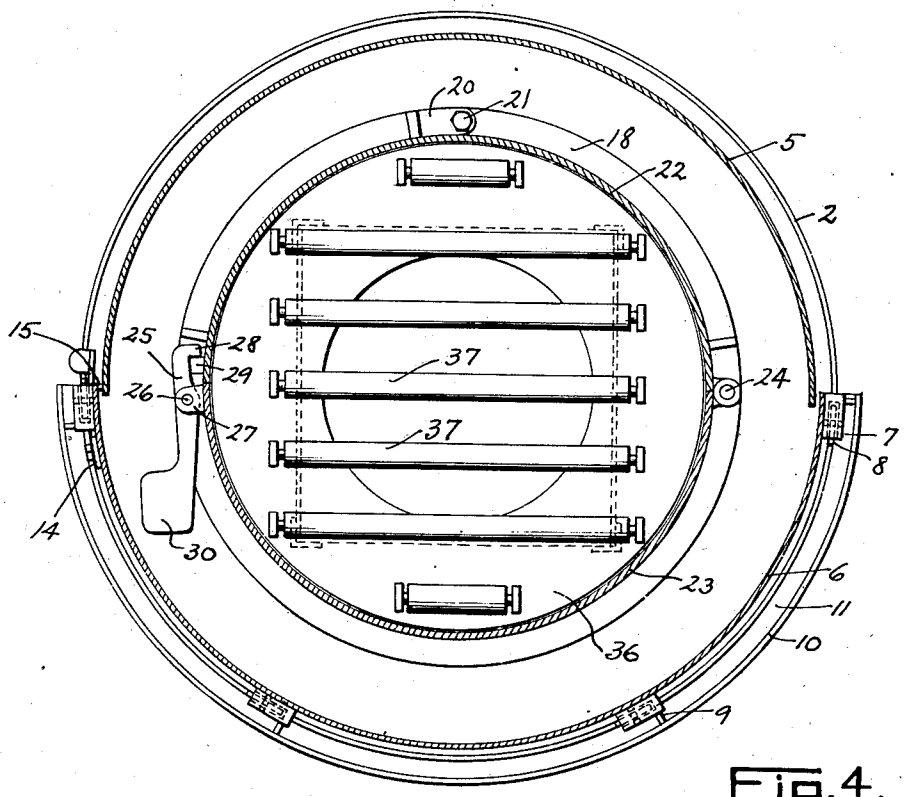


Fig. 4.

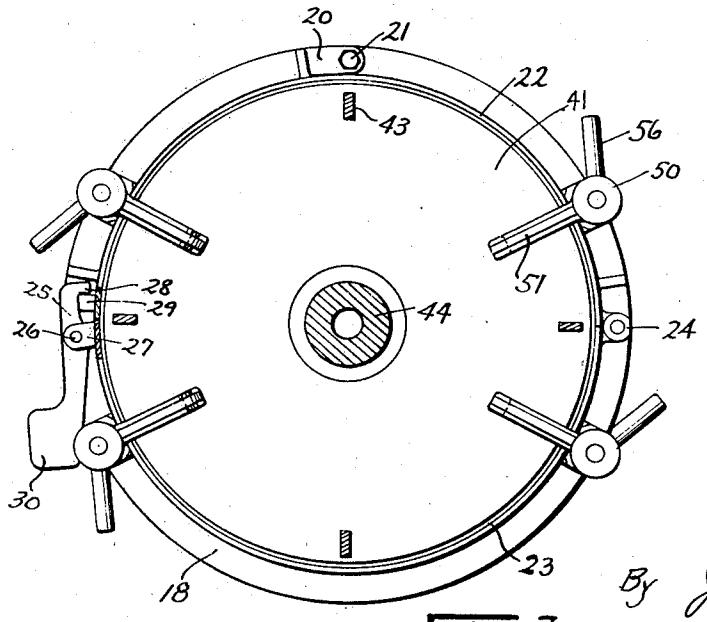


Fig. 3.

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CENTRIFUGAL CASTING MACHINE

Filed May 16, 1942 3 Sheets-Sheet 3

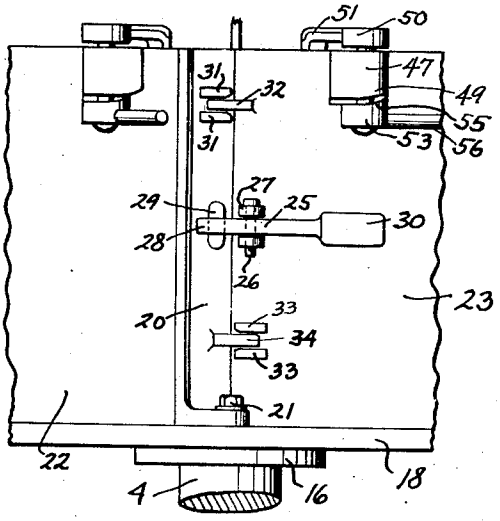


Fig. 5.

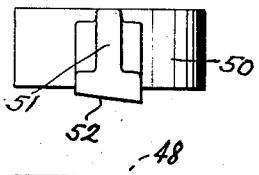


Fig. 6.

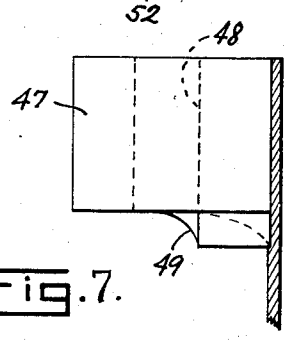


Fig. 7.

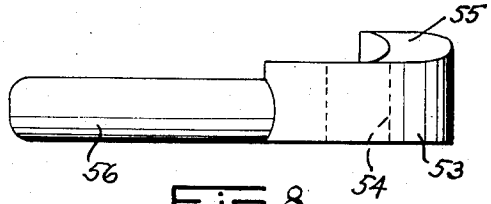


Fig. 8.

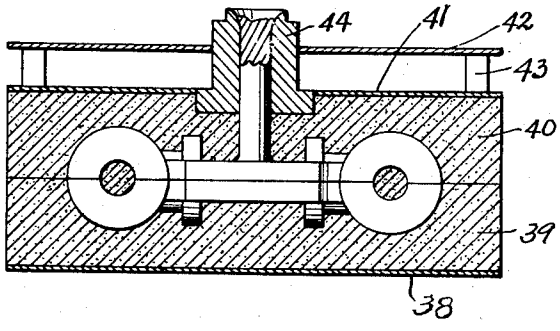


Fig. 10.

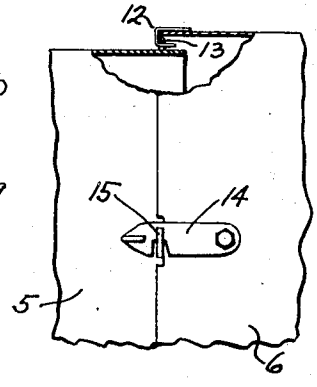


Fig. 9.

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UNITED STATES PATENT OFFICE

2,353,339

CENTRIFUGAL CASTING MACHINE

Nathan Janco, Tulsa, Okla.

Application May 16, 1942, Serial No. 443,225

10 Claims. (Cl. 22—65)

This invention relates to a centrifugal casting machine and has for its general object the provision of such a machine which will be capable of handling a wide variety of shapes and sizes of castings and will be very efficient and rapid in its operation.

A more specific object of this invention is to provide a machine in which different sizes of molds may be accommodated by means of changes that can be easily and quickly made.

Another object of this invention is to provide a machine of the type referred to which will produce castings at a rate several times as fast as previously known equipment for the same purpose.

Another object of this invention is to provide a machine of the type referred to in which the molds may be removed and replaced with new molds much more rapidly than has been possible with any previously known similar equipment.

Another object of this invention is to provide a flask body which will serve to automatically center the mold in the machine and hold it firmly in position with its center coinciding with the center of rotation of the machine.

Another object of this invention is to provide a flask body lock for locking such a flask body closed, the same being quick acting both in locking and unlocking the flask body and being of such design that when the mold is being rotated it will tend to urge the body lock more firmly into locking position.

Another object of this invention is to provide a means on the flask body for holding a cover down firmly against the mold so as to rigidly hold the entire assembly during the pouring operation and prevent the cope from separating or rising from the drag.

Another object of this invention is to provide a means for supporting the mold such that molds of even great weight may be readily moved laterally into and out of the flask body.

Another object of this invention is to provide a machine of the type referred to in which molds of different overall heights can be used in the same flask body.

Another object of this invention is to provide a machine of the type referred to in which molds of green sand, dry sand, and various other mold forming materials can be used interchangeably.

One other object of this invention is to provide a machine of the type referred to in which a metal mold may be employed if so desired.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein is illustrated by way of example one embodiment of the invention.

In the drawings:

Fig. 1 is a view partly in vertical cross section and partly in side elevation illustrating a machine constructed in accordance with this invention with both the guard and the flask body open and in the position that they would occupy during the changing of molds.

Fig. 2 is a top plan view of the machine illustrated in Fig. 1.

Fig. 3 is a horizontal cross section taken along the line 3—3 of Fig. 1.

Fig. 4 is a horizontal cross section taken along the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary side elevation of a portion of the flask body illustrating various details of the flask body lock, the means of mounting the flask body, and the lock assembly for clamping the cover down firmly against the mold and holding the mold together during the pouring operation.

Fig. 6 shows an end view of the cover lock arm forming a part of the lock assembly.

Fig. 7 shows a side elevation of the lock bearing forming a part of the lock assembly.

Fig. 8 is a side elevation illustrating the lock handle forming a part of the lock assembly.

Fig. 9 is a view partly in side elevation and partly in vertical cross section and illustrating a fragmentary portion of the guard which encloses the centrifugal casting machine during the pouring operation.

Fig. 10 shows a vertical cross section through a mold adapted to be used in the casting machine illustrated in the other figures.

Referring particularly to Fig. 1 of the drawings, the machine is there illustrated as enclosed within a guard. This guard consists of a bottom member 1 which may be mounted upon any suitable support and which has an upturned flange 2 about its outer edge. The guard bottom 1 is preferably of a circular outline and has an opening 3 centrally thereof through which extends the shaft 4 which drives the machine in the manner presently to be described. The remainder of the guard is made up of two semi-cylindrical sections 5 and 6, the section 5 having its open lower end fixedly secured to the bottom 1 by any suitable means such as welding. The section 6 is slightly larger than the section 5 so that it may fit over the section 5, and is provided adjacent its lower end and on its outer surface with blocks 7 welded or otherwise suitably se-

cured thereto and serving to house rollers 8 by which the outer section of housing 6 is mounted on the bottom 1. Suitably carried on pins 9 or the like extending outwardly from the blocks 7 is a semicircular angle iron 10 having its lower flange 11 extending radially inwardly to a point adjacent the outer surface of the flange 2, this angle iron 10 being for the purpose of serving as a guide for the guard member 6 to keep the rollers 8 in proper position on the flange 2.

It will be seen that when the mold is being changed, this outer section of the guard may be rolled around on its rollers until it overlies the inner section 5 of the guard. After the mold has been changed and it is desired to again operate the machine, the guard may be closed by rolling the outer section 6 around until it occupies the position illustrated in Fig. 4 of the drawings. When it reaches a completely closed position, its rotating movement may be halted by engagement of the stop member 12 with a corresponding stop member 13 on the guard section 5. The guard may then be latched in its closed position by means of a latch 14 adapted to engage the keeper 15 on the inner guard section 5.

The shaft 4 has suitably mounted on its upper end the sub-table 16 which is in the form of a flat disk or flange having tapped openings spaced about its outer periphery for the purpose of receiving the screws 17 whereby the table 18 is securely mounted thereon. This sub-table is preferably provided with a raised portion 19 adjacent its center and the table 18 is provided with a depression of substantially the same size as the raised portion 19 for the purpose of receiving the same and properly correlating the table 18 with the sub-table 16.

Mounted upon the table 18 and secured thereto by means of brackets 20 and screws 21 is a two piece flask body comprising a fixed section 22 which is not movable with respect to the table 18, and a hinged section 23 which is hinged to the fixed section by means of a hinge 24. This hinged section 23 is not fixedly secured to the table 18 but is mounted to swing about its hinge connection 24 with respect to the table 18 and with respect to the fixed section 22. This hinged section of the flask body is adapted to be held in closed position by means of a latch in the form of a hook-shaped member 25 adjacent its free edge, the same being mounted thereon by means of a pivot 26 carried in a bracket 27 that is in turn welded or otherwise secured to the flask body. This hook-shaped member 25 has its hook-shaped end 28 pointing inwardly toward the flask body and adapted to engage a lug 29 on the fixed portion of the flask body. It extends beyond the pivot 26 and is provided with a heavy weighted end 30 of such a nature that when the machine is rotated as will be hereinafter described the centrifugal force will tend to throw the end 30 outwardly thus urging the hook-shaped end 28 inwardly to more firmly engage the lug 29 and thus to lock the two halves of the flask body together.

Referring particularly to Fig. 5 it will be seen that adjacent the upper end thereof the fixed section of the flask body is provided with spaced lugs 31 adapted to receive between them the single lug 32 on the movable section of the flask body. Likewise, adjacent the lower end of the flask body the movable section is provided with spaced lugs 33 adapted to receive between them a single lug 34 on the fixed section of the flask body.

Referring again to Fig. 1, it will be seen that there is mounted upon the table 18 within the flask body a framework which may be termed a stool 35. On this stool, which is removably mounted upon the table 18, there is carried a roller table 36 having rollers 37 thereon adapted to serve as supports for the plate 38 on which the lower section of the mold is carried. This lower section of the mold is indicated at 39 and the upper section which rests on it is indicated at 40. After both sections of the mold have been placed together upon the plate 38, the same may be rolled into position upon the rollers 37, the entire mold being pushed back into the flask body until it comes in contact with the rear or fixed portion 22 of the flask body. The mold is made of such a size as to just fit within the flask body so that when the hinged section 23 of the flask body is swung to closed position, the mold will be perfectly centered within the flask body and upon the center of rotation of the shaft 4.

Carried on top of the mold is a cover which may be in the form of two plates 41 and 42 joined together in spaced relation by means of spacers 43. The spacers 43 in the plates 41 and 42 may be welded or otherwise suitably secured together. As illustrated, the plates 41 and 42 are provided with a central aperture in which the runner cup 44 is carried. The guard sections 5 and 6 have apertures 45 and 46 respectively located centrally thereof in their upper ends, so that the pouring may take place through the opening in the upper end of the guard directly into the runner cup while the mold is being rotated.

For the purpose of holding the mold together and holding the entire assemblage in proper relationship to each other, there is provided a plurality of lock assemblies, two being shown in this instance on each section of the flask body. Each lock assembly consists of a lock bearing such as illustrated in Fig. 7 which is welded or otherwise firmly secured to the exterior of the flask body section adjacent the upper edge thereof. This lock bearing is in the form of a block of metal 47 having an opening 48 therethrough adapted to receive a shaft. The lower surface of this block is provided adjacent one side portion with an inclined or tapered part 49 so that adjacent one of its edges this block is much thicker than adjacent the other edge.

On the upper end of the shaft which passes through the bearing block 47 there is mounted a lock arm such as illustrated in Fig. 6, this lock arm also being further illustrated in Figs. 3 and 5. It consists of an enlarged end portion 50 having a central aperture therein adapted to receive the shaft just referred to and having an arm 51 extending laterally therefrom. The outer end of this arm is provided with a downturned portion having a slightly beveled surface 52 thereon, this surface being adapted to come in contact with the upper surface of the cover plate 41. The lower end of the shaft just referred to is provided with a lock handle such as illustrated in Fig. 8. This lock handle consists of an enlarged portion 53 having an opening 54 therethrough adapted to receive the shaft and having a tapered or inclined portion 55 on its upper surface of substantially the same inclination as the surface 49 on the bearing block 47. The lock handle also has extending from the block 53 in one direction a handle portion 56.

It will be seen that when the mold has been put in place and the flask body closed, the handle 56 may be grasped and rotated in such a direction as

to swing the lock arms 51 over the cover plate 41 whereupon the beveled surfaces 52 of these lock arms will engage the upper surface of the cover plate 41. Further rotation of the handle 56 will cause the inclined portion 55 thereon to ride downwardly along the inclined surface 49 on the bearing block and thus draw the lock arms 51 downwardly to more firmly engage the cover plate 41 and hold the cover plate down during the pouring operation.

From the foregoing it will be quite apparent that the entire assemblage including the table 18, the stool 35, the flask body cover and mold may all be very readily removed from the machine and replaced with similar parts of different size so that molds of various diameters may be employed as desired. It will further be appreciated that this assemblage may be replaced if and when desired by a metal mold.

In addition to the foregoing, it will be seen that any type of mold material may be employed in making the mold illustrated, the invention not being limited to any particular type of mold material. The mold will be supported on all sides by the plates 38 and 41 and by the flask body during the pouring operation and will by these parts also be held in perfectly centered position.

It will be seen that the molds may be readily removed and replaced during the operation of the device because of the fact that they rest upon the rollers 37 and may simply be rolled out of the flask body after the same has been opened and replaced with a new mold.

It will furthermore be seen that molds of different heights may be employed by merely replacing the stool 35 with a stool of a different height.

The construction of the flask body lock and of the locking assemblies for holding down the mold during the pouring operation are such that these parts may be operated very quickly and easily thus greatly facilitating the use of the device and the speed with which it may be made to produce castings.

In operation, the parts will be arranged as illustrated in Figs. 1 and 2 and the mold put in place. The flask body will then be closed and locked shut after which the locking assemblies will be actuated to lock the flask cover down and hold the mold sections in place during the pouring operation. The guard may then be closed by moving the guard section 6 in a circumferential direction until it is fully closed and then latching it in fully closed position by means of the latch 14 and the keeper 15. Power may then be applied and the pouring operation carried out, any desired speed being employed during the pouring and cooling operations. When the machine has stopped the hold-down locks for the flask cover may be removed, the flask body opened and the mold removed for replacement with a new mold.

In view of the foregoing, it will be seen that a means has been provided for carrying out all of the objects and advantages sought by this invention.

Having described my invention, I claim:

1. In a centrifugal casting machine, a table, means for rotating said table, a flask body mounted on said table and comprising a plurality of separable segmental parts, one of which is secured to the table, whereby said flask body may be opened to permit lateral insertion and removal of a mold, means for latching the parts of the flask body together with a mold therein, a cover adapted to rest upon a mold in said flask body, and lock means carried by the flask body for engaging said cover to hold down the mold during the pouring operation.

2. In a centrifugal casting machine, a table, means for rotating said table, a flask body mounted on said table and comprising a plurality of separable segmental parts, one of which is secured to the table, whereby said flask body may be opened to permit lateral insertion and removal of a mold, a roller table mounted on said first table within the flask body and having rollers on its upper surface adapted to receive and support a mold, means for latching the parts of the flask body together with a mold therein supported on said roller table, and means carried by the flask body for holding the mold down during the pouring operation.

3. In a centrifugal casting machine, a table, means for rotating said table, a flask body mounted on said table and comprising a plurality of separable segmental parts, one of which is secured to the table whereby said flask body may be opened to permit lateral insertion and removal of a mold, roller means carried on said table within said flask body for supporting a mold and facilitating the insertion and removal thereof in a lateral direction, means for latching the parts of the flask body together with a mold therein, and means carried by the flask body for holding the mold down during the pouring operation.

4. In a centrifugal casting machine, a table, means for rotating said table, means carried by said table for receiving and holding a mold in centered position thereon, said means including a part removable to permit lateral removal and replacement of a mold therein, roller means carried by said table for supporting a mold thereon and facilitating its lateral placement and removal, and means for holding a mold down during the pouring operation.

5. In a centrifugal casting machine, a table, means for rotating said table, a flask body mounted on said table and comprising a plurality of separable segmental parts, one of which is secured to the table, whereby said flask body may be opened to permit lateral insertion and removal of a mold, means for latching the parts of the flask body together with a mold therein, a stool on said table for supporting a mold at a proper level within said flask body, and means carried by the flask body for holding the mold down during the pouring operation.

6. In a centrifugal casting machine, a table, means for rotating said table, means carried by said table for receiving and centering a mold thereon, a part of said means being movable with respect to said table to permit lateral insertion and removal of a mold, means for holding a mold down during the pouring operation, and a stool carried by said table for supporting a mold at a proper level with respect to said hold down means.

7. In a centrifugal casting machine, a table, means for rotating said table, a table having rollers thereon adapted to receive a mold and facilitate the lateral insertion and removal thereof, and a stool supporting said roller table on said first mentioned table and of a height to support a mold on said roller table at a desired level with respect to said first mentioned table.

8. In a centrifugal casting machine, a table, means for rotating said table, a flask body mounted on said table and comprising a plurality of separable segmental parts, one of which is secured to the table, whereby said flask body may be opened to permit lateral insertion and removal

of a mold, means for latching the parts of the flask body together with a mold therein, a stool carried by said table within said flask body, a table having rollers thereon supported on said stool and adapted to support and facilitate lateral insertion and removal of a mold, said table being of a height to support a mold at the proper level with respect to said flask body and means carried by the flask body for holding the mold down during the pouring operation.

9. In a centrifugal casting machine, a table, means for rotating said table, a flask body mounted on said table and comprising a plurality of separable segmental parts, one of which is secured to the table whereby said flask body may be opened to permit lateral insertion and removal of a mold, means for latching the parts of the flask body together with a mold therein, and means carried by the flask body for holding the mold down during the pouring operation, said last mentioned means comprising a plurality of arms rotatable to a position overlying the mold when the flask body is closed and means for drawing said arms in a direction along their axes of rotation when they have been so rotated to a position overlying the mold to tighten them against the top of the mold.

10. In a centrifugal casting machine, a table, means for rotating said table, a flask body mounted on said table and comprising a plurality of separable segmental parts, one of which is secured to the table, whereby said flask body may be opened to permit lateral insertion and removal of a mold, means for latching the part of the flask body together with a mold therein, a stool on said table within said flask body for supporting a mold at a desired level with respect to said flask body, said stool being removable and replaceable with a different size stool to accommodate molds of different heights, and means carried by the flask body for holding the mold down during the pouring operation.

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