

Sept. 22, 1925.

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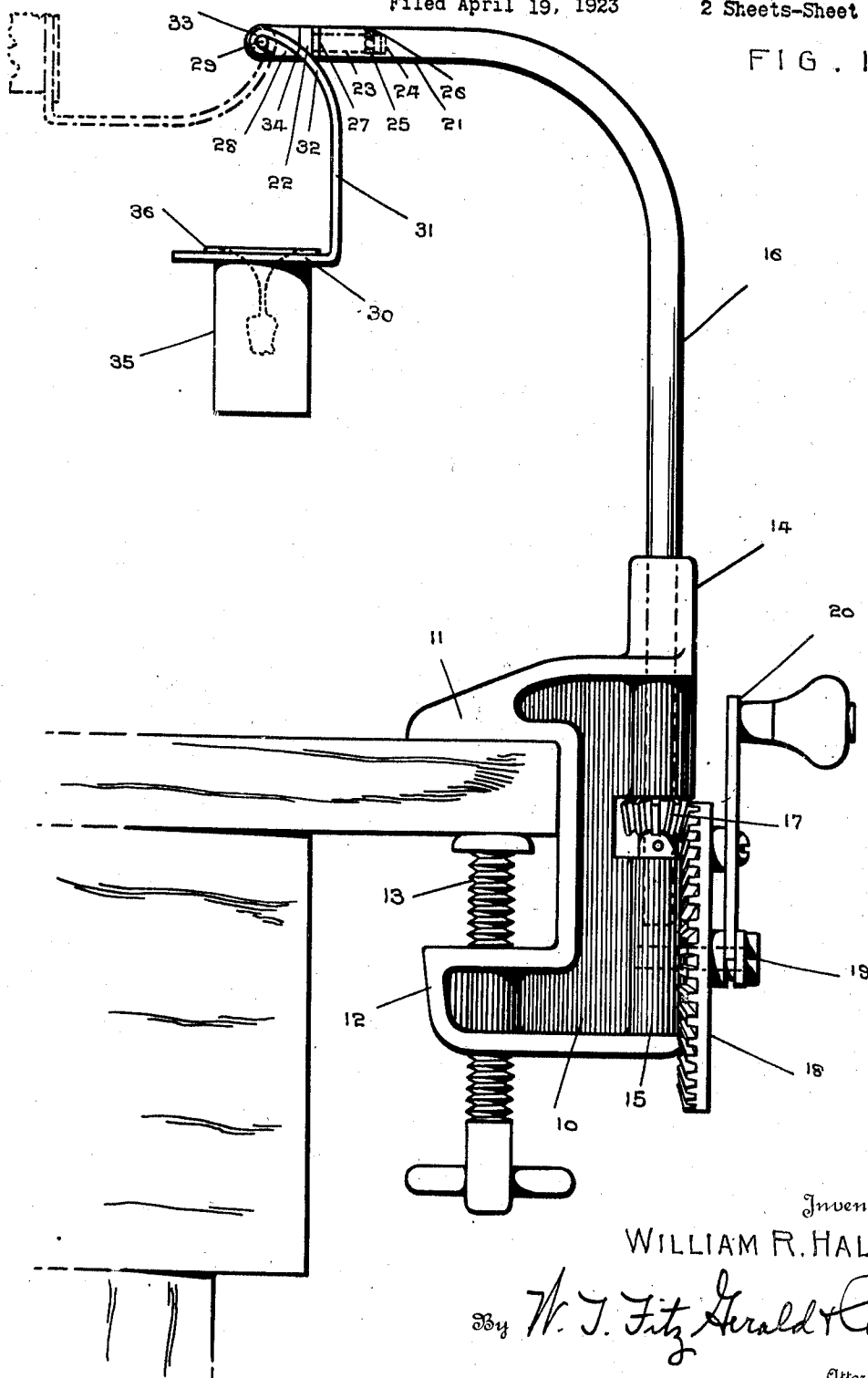
W. R. HALE

CENTRIFUGAL CASTING MACHINE

Filed April 19, 1923

2 Sheets-Sheet 1

FIG. 1.



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FIG. 2.

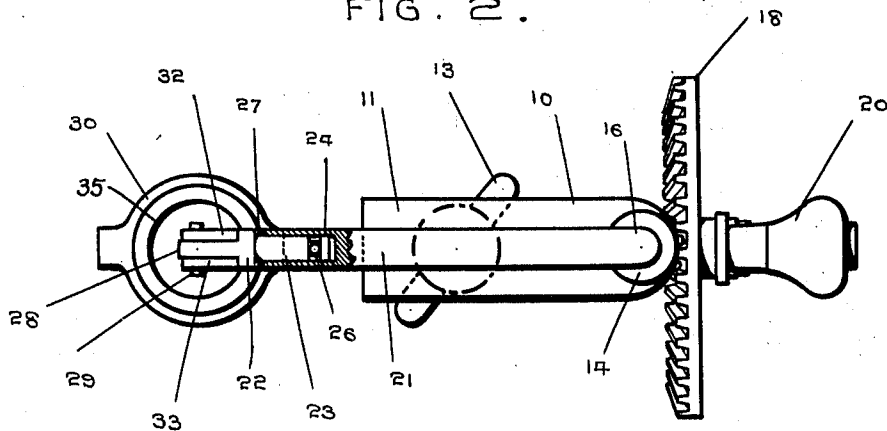


FIG. 3.

FIG. 4.

FIG. 5.

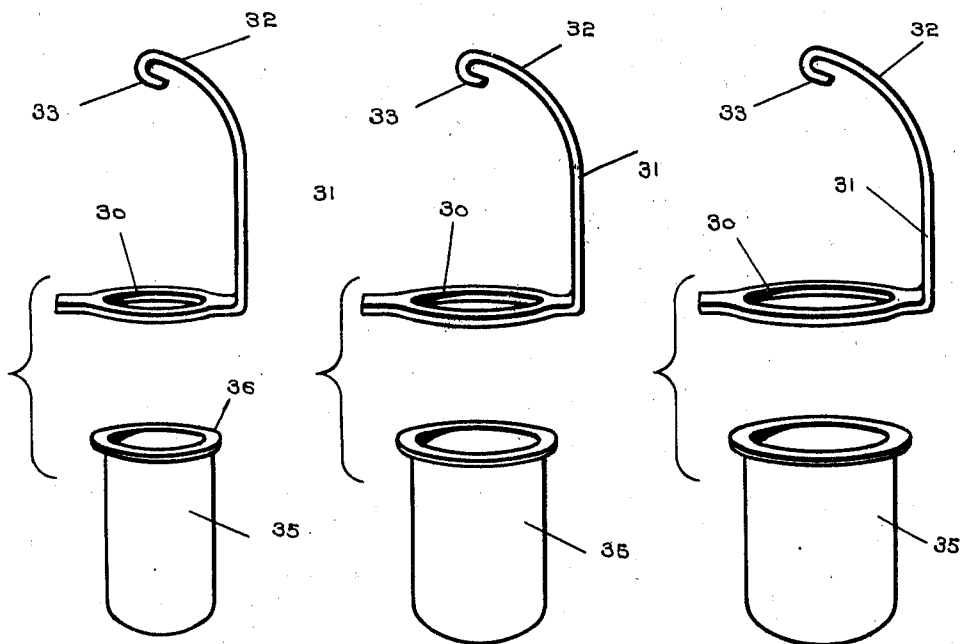
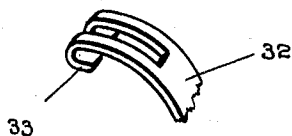


FIG. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM ROY HALE, OF NEW YORK, N. Y.

CENTRIFUGAL CASTING MACHINE.

Application filed April 19, 1923. Serial No. 633,154.

To all whom it may concern:

Be it known that I, WILLIAM R. HALE, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Centrifugal Casting Machines; 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.

The present invention relates to centrifugal casting machines, and aims to provide a simple and efficient device of that kind adapted particularly for use in casting dental inlays, fillings, and the like, and capable of being manufactured and sold at low cost.

Another object of the invention is the provision of novel means for suspending a flask from the rotary arm, in order that the flask can swing away from the axis of rotation when the machine is operated, and to support the flask in an effective manner, when idle, with the mouth of the flask readily accessible and the corresponding parts readily separable.

A further object is the provision of an extremely simple flask suspending member or hanger, and means carried by the rotary member for the connection thereof.

A still further object of the invention is the provision of a novel flexible connection between the flask hanger or carrier and the rotary arm to permit the flask to swing in different directions relatively to said arm, when the arm is rotated, so as to avoid spilling or throwing-out of the molten metal from the flask, especially when the machine is started into operation.

The invention also contemplates the provision of a casting machine of the kind indicated in which flasks of different sizes can be used with equal propriety and success, for making castings of different sizes.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts, as hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of the machine.

Fig. 2 is a plan view thereof, a portion being shown in section to show the swivel joint.

Figs. 3, 4 and 5 are perspective views showing flasks and their hangers of different sizes, with the parts separated.

Fig. 6 is a perspective detail view showing the bifurcated hooked end of a flask hanger or carrier.

The machine has a body or frame member 10 formed with a clamp for securing it to the edge portion of a table top, bench, shelf or other support. The clamp or vise of the member 10 comprises the upper and lower jaws 11 and 12, respectively, projecting from said member, and a clamping screw 13 threaded through the lower jaw 12 to clamp the upper jaw on the support and hold the member 10 rigid during the operation of the machine.

The member 10 is formed with the upper and lower bearings 14 and 15 which are in vertical alinement, and the lower terminal portion of a vertical shaft 16 is journaled for rotation in said bearings. The actuating means for rotating said shaft includes a bevel pinion 17 secured on the shaft 16 between the bearings 14 and 15, which are spaced apart, and meshing with a bevel gear wheel 18 mounted for rotation on a stud 19 carried by the member 10. A hand crank 20 is secured to the wheel 18 for rotating it, so as to impart a high speed of rotation to the shaft 16.

The shaft 16 is bent near its upper end on a gentle curve of comparatively large radius, so that the upper terminal of the shaft provides a horizontal arm 21 extending away from the vertical axis of the shaft, said arm being the upper terminal of the shaft as an integral part thereof, and the shaft is readily bent to form such arm, to provide a simple and inexpensive construction.

An end piece or member 22 is connected to the end of the arm 21 by a swivel joint. Thus, the piece or member 22 has a shank or stem 23 fitted for rotation in a bore or socket 24 drilled or otherwise formed in the terminal of the arm 21. Said stem 23 has an annular groove 25 receiving a screw 26 or other retaining element engaged in the arm 21, to hold the end piece 22 assembled with the arm, but permitting said end piece to turn about the axis of the arm 21, to provide the swivel connection between them.

The end piece or member 22 has an outstanding flat tongue or projection 28 provided at opposite sides with the studs or lugs 29. The stem 23 and tongue 28 project in opposite directions, and said tongue 28 with its studs 29 provides means for the connection of the flask hanger or carrier.

The hanger or carrier for the flask comprises a flat ring 30 and an arm 31 extending at right angles from said ring at the edge thereof, said ring and arm being stamped from a single piece or blank of sheet metal, so as to be inexpensively manufactured. The upper terminal 32 of the arm is curved or bent, on a gentle curve, toward the axis of the ring 30, and the end portion of said arm is bifurcated and bent back downwardly to form a hook, as at 33. Such bifurcated hooked end of the arm is substantially in the axis of the ring 30, and the bifurcated portion or hook 33 can receive the tongue 28 so that the two portions of the hook can be engaged over or around the studs 29, thereby pivotally suspending the hanger or carrier from the end piece 22 of the arm 21. In applying the hanger to the arm 21, the arm 31 is positioned at that side of the axis of the ring 30 nearest to the shaft 16, as seen in Fig. 1, and the piece or member 22 has the shoulders 34 against which the upper curved portion 32 of the arm 31 bears, thereby preventing the hanger from swinging toward the shaft 16 beyond the normal pendant position of the hanger. The portion 32 of the hanger bears inwardly and upwardly against the shoulders 34, to prevent the hanger from being accidentally disconnected from the arm 21, should the hanger be accidentally touched or struck in making preparations for the casting operation. By swinging the hanger away from the shaft 16, and lifting the hanger, the hook 33 can be disengaged from the studs 29 and tongue 28. This permits of the interchangeable use of hangers or carriers of different sizes, as shown in Figs. 3, 4 and 5, a flask 35 of appropriate size being provided for each flask hanger. The flasks are of suitable sizes to slip down in the rings 30, and have the outturned flanges 36 at their rims to seat on the rings 30. The upper terminals of the arms 31 of the different sizes of flask hangers are so curved to overhang the rings 30, that the hooks 33 are substantially in the axes of the rings 30 and corresponding flasks 36, and the portion 32 of each arm 31 is so shaped as to bear snugly against the shoulders 34 of the end piece or member 22 of the arm 21. The different sizes of flasks can be used interchangeably, and the larger flasks will enable castings to be made of larger sizes, such as for inlays or fillings for a set of teeth.

In operation, the investment mold is

formed in the flask 35 in the well known manner by the use of a wax pattern, or the like, and the mold formed of plaster of Paris, or the like, the wax being melted out after the mold has set, to leave the cavity of the desired formation to receive the metal or other material. The flask is used as a crucible in which to melt the metal or material, which is deposited in the mouth of the flask or mold, and the lamp or heater can be placed on the support to which the machine is attached, below the flask, with the parts in position as seen in Fig. 1. When the metal or material has melted, the crank 20 is rotated with gradually increasing speed so as to give the arm 21 and flask a number of rotations. Centrifugal force will swing the flask and hanger away from the shaft 16 into substantial coaxial relation with the arm 21 when the shaft 16 is rotated, and the molten globule of metal in the mouth of the mold is compelled, by the centrifugal force, to enter the cavity of the mold and to conform to the configuration thereof. When the rotation of the shaft 16 is stopped, the flask and hanger will swing down to normal position, and the arm 31 will come to rest against the shoulders or stops 34 of the end piece 22.

The studs 29 connect the flask hanger with the arm 21 for the swinging movement of the flask and hanger about an axis transversely of the arm 21, so that the flask can move away from the shaft 16 from below the end of the arm 21 to a position beyond the end of the arm in alinement therewith. However, by the provision of the swivel connection between the end piece 22 and arm 21, the flask and hanger can also swing relatively to the arm about the axis of the arm. This is for the purpose of preventing the spilling of the molten material from the mouth of the mold, especially when the machine is started. When the rotation of the flask is started, there is a tendency for the molten material to remain in its original position, due to inertia, which would possibly result in the material spilling from the mold, if the machine is started suddenly. However, with the present machine, when the rotation of the shaft 16 is started, the flask and hanger can swing upwardly in rear of the arm 21, so as to trail from said arm, and then as the speed of rotation is increased, the flask and hanger will swing outwardly by centrifugal force, the rearward swinging movement being caused by inertia, while the outward swinging movement is caused by centrifugal force. Thus, when the rotation is started, the arm 21 will have a tendency to move away from the flask, and the flask will therefore swing upwardly in rear of the terminal of the arm 21, the end piece 22 turning with the flask hanger about the axis of the arm 21, and the flask and

hanger can then swing outwardly around the axis of the studs 29 at right angles with the axis of the arm 21. Thus, the rearward and upward swinging movement of the flask with reference to the arm 21 takes care of the inertia and as the centrifugal force is increased, the flask and hanger can swing outwardly, thereby holding the molten globule of metal at the center of the mold until it is compelled, by the centrifugal force, to enter the cavity of the mold, thus avoiding the spilling of the metal. This will avoid waste of the metal, which may be of value, and will also avoid an imperfect casting that might result by some of the material being spilled from the mold.

Having thus described the invention, what is claimed as new is:—

1. A centrifugal casting machine comprising a member rotatable about a vertical axis and having an end piece, and a flask hanger pivotally connected with and suspended from said end piece, said hanger and piece having portions to contact and limit the movement of the hanger when the hanger is swung to a vertical position toward said axis.

2. A centrifugal casting machine comprising a rotary member having an end piece with opposite studs, and a flask hanger having a bifurcated hooked end to engage said studs, said end piece having a shoulder for the contact of said hanger when the hanger is in pendant position.

3. A centrifugal casting machine comprising a rotary member, and a flask hanger having a flask-receiving ring and an arm ex-

tending at an angle from said ring, the terminal portion of the arm being bent to the axis of said ring and having a pivotal connection with said member, said member having a shoulder for the contact of said arm.

4. A centrifugal casting machine comprising a rotary member having opposite pivot studs, a flask hanger having a flask-receiving ring and an arm extending at an angle from the ring, the terminal portion of the arm being curved to the axis of said ring and being bifurcated and hooked to engage said studs, said member having a shoulder for the contact of the curved portion of said arm when the hanger is in pendant position.

5. A centrifugal casting machine comprising a rotary shaft having an arm extending at an angle therefrom, an end piece for the arm having a swivel connection therewith to turn about the axis of said arm, and a flask hanger having a pivotal connection with said end piece to swing away from said shaft.

6. A centrifugal casting machine comprising a rotary shaft having an arm extending at an angle therefrom, an end piece for the arm having a swivel connection therewith to turn about the axis of said arm, and a flask hanger having a pivotal connection with said end piece to swing away from said shaft, said end piece having a portion for the contact of said hanger when the hanger swings toward said shaft.

In testimony whereof I have signed my name to this specification.

WILLIAM ROY HALE.