July 28, 1931. M. W. GOLDBERG 1,816,185

POURING DEVICE

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Fig. 1

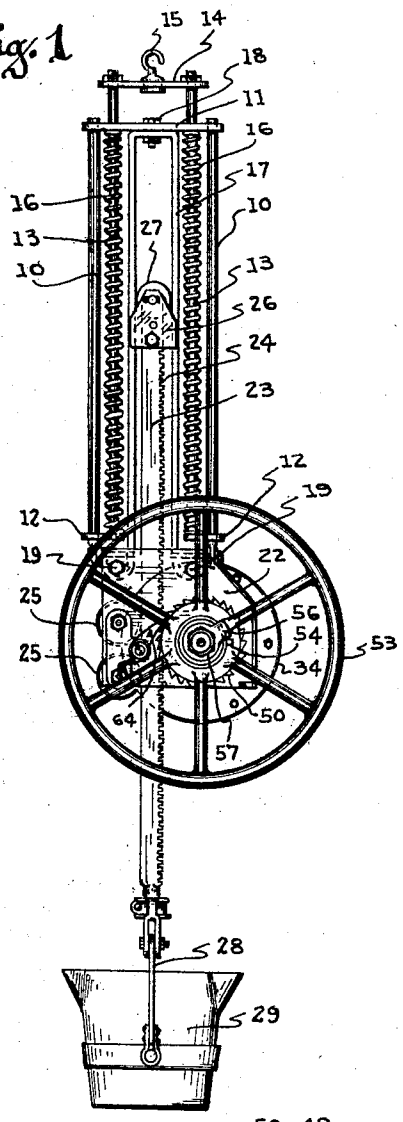


Fig. 2

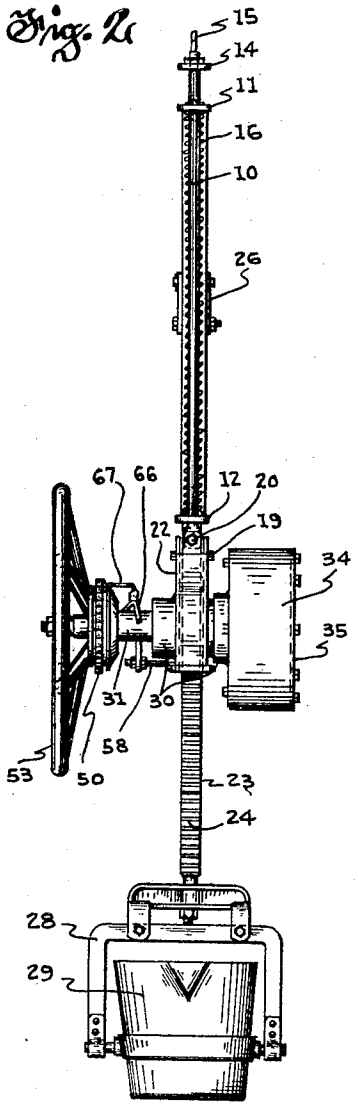
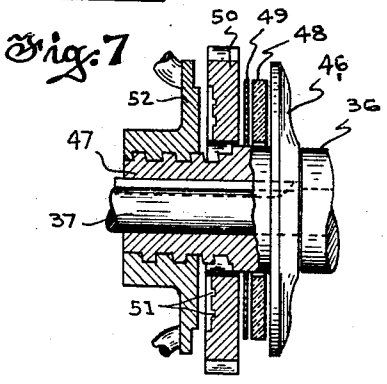


Fig. 7



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Fig. 3

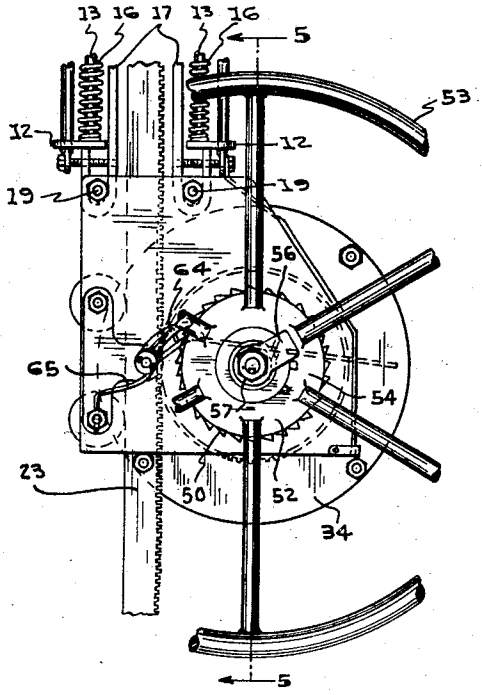


Fig. 4

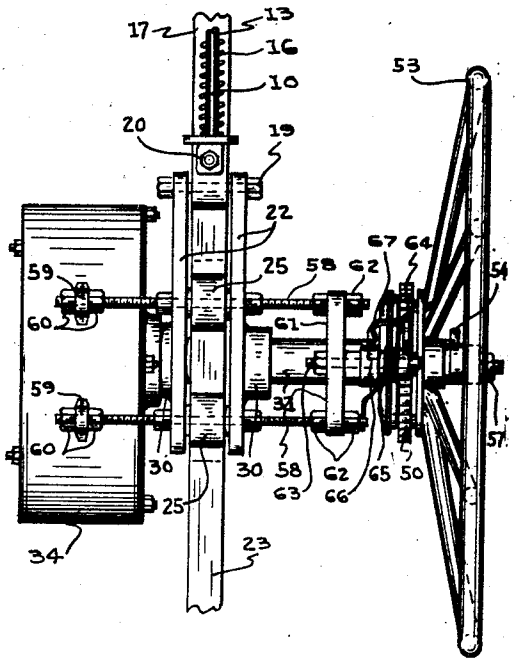


Fig. 5

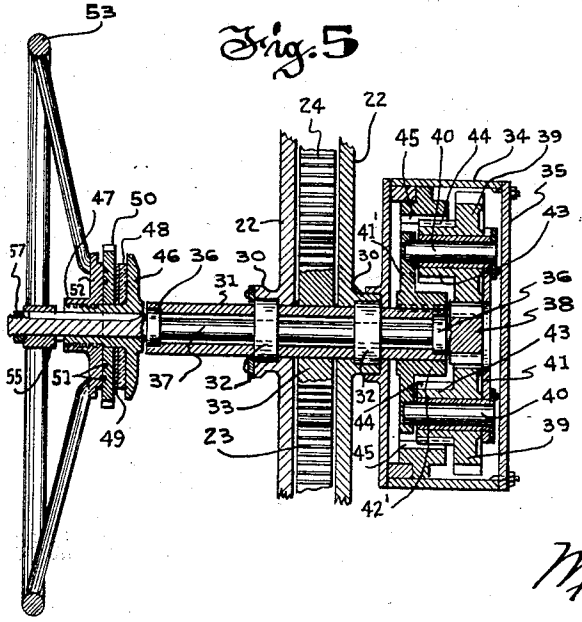
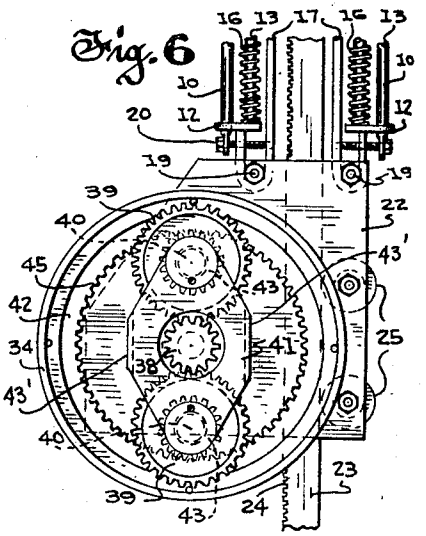


Fig. 6



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Patented July 28, 1931

1,816,185

UNITED STATES PATENT OFFICE

MAX W. GOLDBERG, OF PORT WASHINGTON, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MODERN EQUIPMENT COMPANY, OF PORT WASHINGTON, WISCONSIN, A CORPORATION OF WISCONSIN

POURING DEVICE

Application filed September 3, 1929. Serial No. 390,057.

This invention relates to improvements in pouring devices.

It is one of the objects of this invention to provide an improved metal pouring device, of the type which is suspended from an overhead crane, in which the raising and lowering of the ladle, to adjust it to molds of various heights, is accomplished in a simple and novel manner.

A further object of this invention is to provide a pouring device in which a hand wheel is utilized for accomplishing both the raising and lowering, said hand wheel being so geared to the movable member as to permit raising of the ladle with the minimum amount of effort.

It is a further object of this invention to provide a device of the class described in which the ladle may be lowered either rapidly by means of gravity or slowly by hand.

A further object of this invention is to provide means for automatically locking said ladle in any desired position against further downward movement by gravity.

A further object of this invention is to provide an improved pouring device which is comparatively simple in construction, and which can readily be operated by one man.

With the above and other objects in view, the invention consists of the improved pouring device, and all its parts and combinations, as set forth in the claims, and all equivalents thereof.

In the accompanying drawings, illustrating one complete embodiment of the preferred form of the invention, in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a front elevation of the device;

Fig. 2 is a side view thereof;

Fig. 3 is an enlarged detail front view of the portion of the device adjacent the hand wheel, parts being broken away;

Fig. 4 is a side view of the portion of the device shown in Fig. 3;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is an enlarged detail view showing the gear housing with the cover removed; and

Fig. 7 is a sectional detail view of the clutch mechanism.

Referring to the drawings, the upper frame comprises a pair of rods 10 having their upper ends secured to a cross piece 11 and having their lower ends slidable in openings in short cross pieces 12. Rods 13 have their lower ends secured to the cross pieces 12 and have their upper ends slidable in openings in the cross piece 11. The extreme upper ends of the rods 13 are connected by a bar 14. The latter is provided with a centrally position swivel hook 15 which is adapted to be connected to an overhead crane (not shown). Coil springs 16, which surround the rods 13 are positioned between the cross piece 11 and the cross pieces 12.

An inverted elongated U-shaped member 17 has its upper end secured to the cross piece 11 by a bolt 18 and has its lower ends curved to extend around bolts 19 of the lower frame. The said lower ends of the U-shaped member are secured by bolts 20 to the lower ends of the rods 10.

The lower frame comprises a pair of spaced apart plates 22. A rack bar 23, having teeth 24 extending along one side thereof, is slidably positioned between said plates 22, the outer side of said rack bar engaging friction reducing rollers 25 which are rotatably mounted between the plates 22. Plates 26, which are secured to each side of the rack bar at its upper end extend beyond the edges of said rack bar and slidably embrace the sides of the U-shaped member 17. A roller 27 is rotatably carried between said plates 26 at their extreme upper ends. The lower end of the rack bar carries a bail 28 within which a ladle 29 is pivotally mounted.

Journaled through bearing portions 30 of the plates 22 is a tubular shaft 31. Roller bearings 32 within the bearing portions 30 surround said shaft. A pinion 33, which is keyed to the shaft 31 is positioned between the plates 22 and engages the teeth 24 of the rack bar 23. A gear housing 34, having a removable cover 35, extends from one of the bearing portions 30.

Journaled in roller bearings 36, within

the tubular shaft 31 is a smaller shaft 37, each end of which projects beyond the corresponding end of the tubular shaft 31, one of said ends being within the housing 34. On said end a gear 38 is rigidly mounted, the said gear meshing with larger gears 39. The gears 39 are loosely mounted on shafts 40 which are connected between a plate 41 and the inner face of a plate 41′. Hubs 43 of the gears 39 are formed with teeth 44 which engage the teeth 45 of a ring gear 42. The ring gear is rigidly connected to the side of the casing. The plate 41′ is integral with a hub member 42′, the latter being keyed to the tubular shaft 31. Side pieces 43′ connect the plate 41′ and the plate 41.

A disk clutch 46 having a threaded hub portion 47 is keyed to the outer end of the shaft 37. The outer face of said clutch carries a fibre disk 48, and adjacent said disk a washer 49 is loosely positioned. Loosely surrounding the hub portion 47 adjacent the washer is a ratchet 50 having oil grooves 51 on its outer face. Threaded on the hub 47 of the clutch is the hub 52 of a hand wheel 53, said hub 52 having a lug projecting outwardly therefrom. Keyed to the extreme outer end of the shaft 37 is a collar 55 carrying a laterally extending lug 56 which is adapted to engage the lug 54. A nut 57 holds said collar on the shaft.

Rods 58, extending through the plates 22 have one end extending through lugs 59 of the gear housing, nuts 60 being threaded on each side of said lugs. The other ends of said rods extend through a bar 61 and have nuts 62 threaded thereon. The bar 61 carries a pin 63 on which a dog 64 is loosely mounted, the said dog being normally held in engagement with the teeth of the ratchet 50 by a spring 65. A lever 66 which has its inner end loosely mounted on the pin 63 is adapted to engage an extension 67 of the dog 64 to move the latter out of engagement with the ratchet.

In operation of the device, when it is desired to raise the ladle, the hand wheel is rotated in a clockwise direction. When so rotated the hub of the wheel 53 threads against the ratchet 50 forcing the latter against the clutch 46 as shown in Fig. 5, the dog 64 sliding over the teeth of the ratchet. When the hand wheel is thus turned, the lugs 54 and 56 are out of engagement as shown by the full fines in Fig. 3, the rotation of the shaft 37 being caused by frictional engagement between the hand wheel hub 52, the ratchet 50 and the clutch disk 45, the latter being in keyed connection with the shaft 37. Rotation of the shaft 37 causes rotation of the gear 38 and the gears 39 and 43, the gears 43 traveling around within the stationary ring gear 42. As the latter gears 39 and 43 revolve the plates 41 and 41′ are also rotated as is the hub portion 42′ of the plate 41′. Through the hub 42′ which is mounted rigidly on the tubular shaft 31 said shaft is rotated and also the pinion 33, the pinion engaging the teeth of the rack bar 23 and moving the same upwardly. The gear arrangement above described permits raising of the ladle with a minimum amount of effort.

To slowly lower the rack bar, the hand wheel is turned in a counterclockwise direction, its hub 52 being threaded away from the ratchet 50 as shown in Fig. 7 just far enough so that the ratchet does not engage the clutch 46. The loosely mounted ratchet will then be held stationary by the dog 64 and the lug 54 on the wheel hub 52 will engage the lug 56 on the collar 55 as shown by the dotted lines in Fig. 3 to cause rotation of the shaft 37. As soon as the manipulation of the hand wheel is stopped, the weight of the ladle acting through the rack bar and gears will cause a slight rotation of the shaft 37 causing the hub 47 of the clutch 46 to be threaded into the hub 52 of the hand wheel so that the clutch disk 46 will engage the ratchet 48 which is locked by the dog 64, to prevent downward movement of the ladle by gravity. Thus the clutch mechanism will automatically act as a brake to hold the ladle in any desired position.

If it is desired to lower the ladle rapidly by gravity, the lever 66 is operated to disengage the dog 64 from the ratchet. Upon releasing the lever, the spring 65 will bring the dog back into engagement with the ratchet and the clutch will immediately act to hold the ladle and rack bar in the desired lowered position.

Although only the preferred form of the invention has been shown and described, it is not desired to be limited to the exact showing as the broad concept of the invention contemplates all changes and modifications as may come within the scope of the claims.

What I claim is:

1. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, and a single means for raising and lowering said vertically movable member.

2. A metal pouring device comprising a portable frame, a vertically movable rack bar carried thereby and having means for holding a container, a pinion rotatably mounted in said frame and engaging said rack bar, and a single means for rotating said pinion to cause raising and lowering of the rack bar.

3. A metal pouring device comprising a portable frame, a vertically movable rack bar carried thereby and having means for holding a container, a pinion rotatably mounted in said frame and engaging said rack bar, a

hand wheel, a gear reduction means between said pinion and said hand wheel to provide for raising said rack bar with the minimum amount of effort.

4. A metal pouring device comprising a portable frame, a vertically movable rack bar carried thereby and having means for holding a container, a tubular shaft journaled in said frame, a pinion mounted rigidly on said shaft and engaging said rack bar, a second shaft journaled within said tubular shaft, a pinion rigidly mounted on a second shaft, gear means between said second mentioned pinion and said first mentioned shaft, and means for rotating said second mentioned shaft to cause raising and lowering of the rack bar.

5. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, and controlling mechanism for said vertically movable member, said controlling mechanism providing for positive lowering of the vertically movable member by hand at a limited speed and rapid lowering of said member by gravity.

6. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, controlling mechanism for said vertically movable member, said controlling mechanism providing for positive lowering of the vertically movable member by hand at a limited speed and rapid lowering of said member by gravity, and automatic clutch means for holding said vertically movable member in a desired position.

7. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, controlling mechanism for said vertically movable member, clutch means in connection with said controlling mechanism, and means embodied in the connection between the clutch means and the controlling mechanism for causing said clutch to automatically hold said vertically movable member in any desired position and for causing said clutch to be automatically rendered ineffective when said controlling mechanism is being operated to raise and lower said vertically movable member.

8. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, controlling mechanism for said vertically movable member, clutch means normally holding said vertically movable member against descent by gravity, and a connection between said clutch means and the controlling mechanism for causing said clutch means to be automatically rendered ineffective when said controlling mechanism is being operated to lower said vertically movable member.

9. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, a single controlling means for said vertically movable member, said controlling means providing for manual lowering and raising of the vertically movable member, and clutch means automatically brought into effectiveness by the weight of the container for holding said vertically movable member in a desired position.

10. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, a single controlling means for said vertically movable member, said controlling means providing for positive lowering of the vertically movable member by hand at a limited speed and rapid lowering of said member by gravity, and automatic clutch means for holding said vertically movable member in a desired position.

11. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, clutch means normally holding said vertically movable member against descent by gravity, and a horizontally movable rotatable member for controlling said vertically movable member, operation of said rotatable member to lower the vertically movable member causing horizontal movement of said rotatable member and automatic disengagement of said clutch.

12. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, clutch means normally holding said vertically movable member against descent by gravity, and a rotatable member for controlling said vertically movable member threaded adjacent said clutch means, operation of said rotatable member to lower the vertically movable member causing threading of the rotatable member away from said clutch means and automatic disengagement of the latter.

13. A metal pouring device comprising a portable frame, a vertically movable member carried thereby and having means for holding a container, controlling mechanism for said vertically movable member including a rotatable member, a disk clutch having a threaded hub portion rigidly mounted on said rotatable member, a ratchet wheel loosely mounted on said hub portion adjacent the clutch disk, a dog carried by the frame and normally engaging said ratchet wheel, a hand wheel threaded on said clutch hub portion adjacent the ratchet wheel, and a lug carried by said rotatable member, said

hand wheel when turned in one direction being threaded toward said ratchet wheel and clutch disk to frictionally engage the same and to cause raising of the vertically movable member, the dog sliding along said ratchet wheel, and said hand wheel when turned in the other direction being threaded away from said clutch disk and engaging the lug on the rotatable member to cause lowering of said vertically movable member, and when said hand wheel is not being operated the weight of the container causing said clutch disk to be threaded against said ratchet wheel to prevent further descent of the vertically movable member.

In testimony whereof, I affix my signature.

MAX W. GOLDBERG.