Aug. 17, 1937. M. J. TOPP 2,090,316

METAL FEEDER FOR TYPE CASTING MACHINES

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Fig. 1.

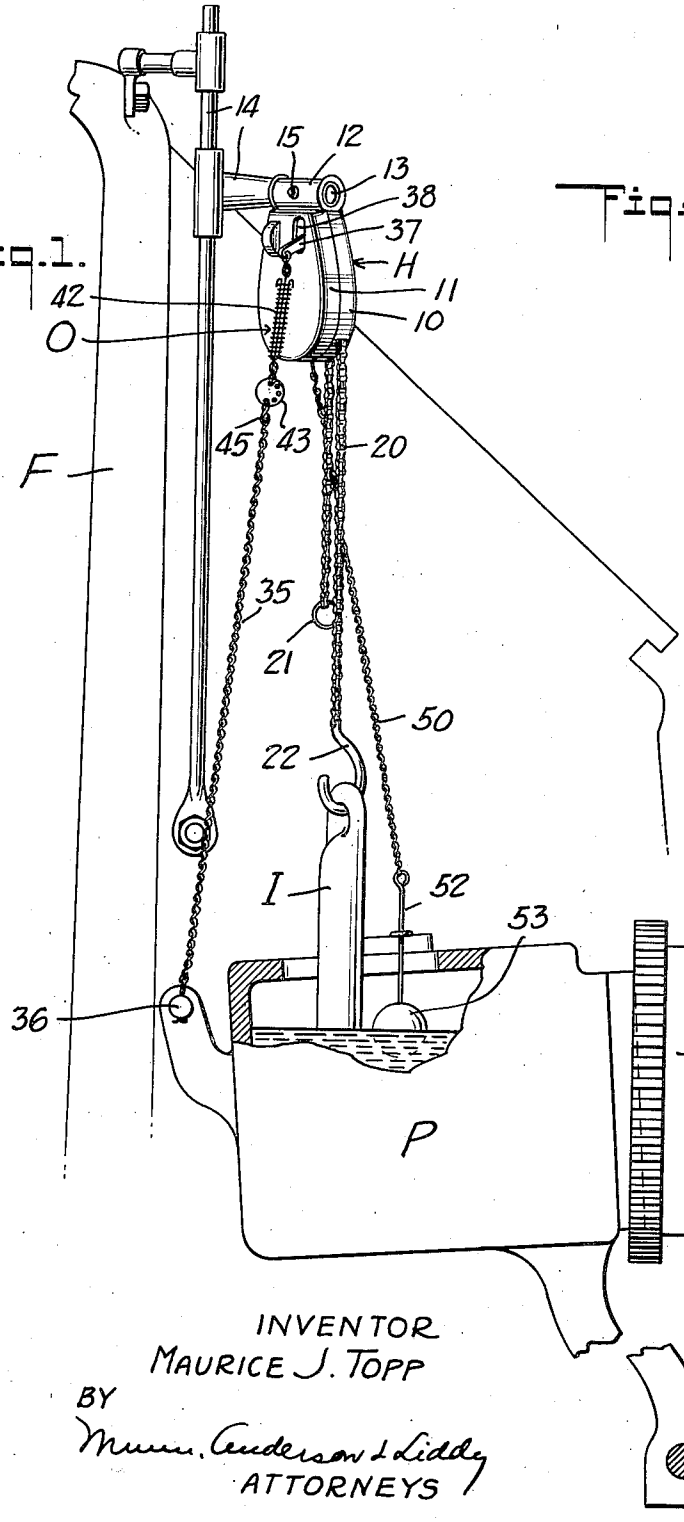
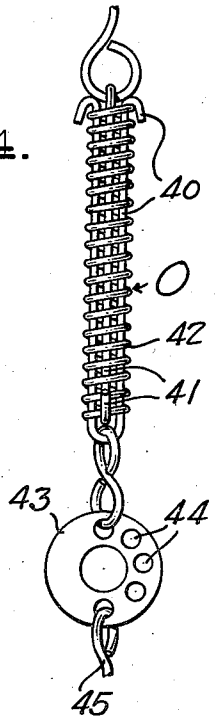


Fig. 4.



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Fig. 2.

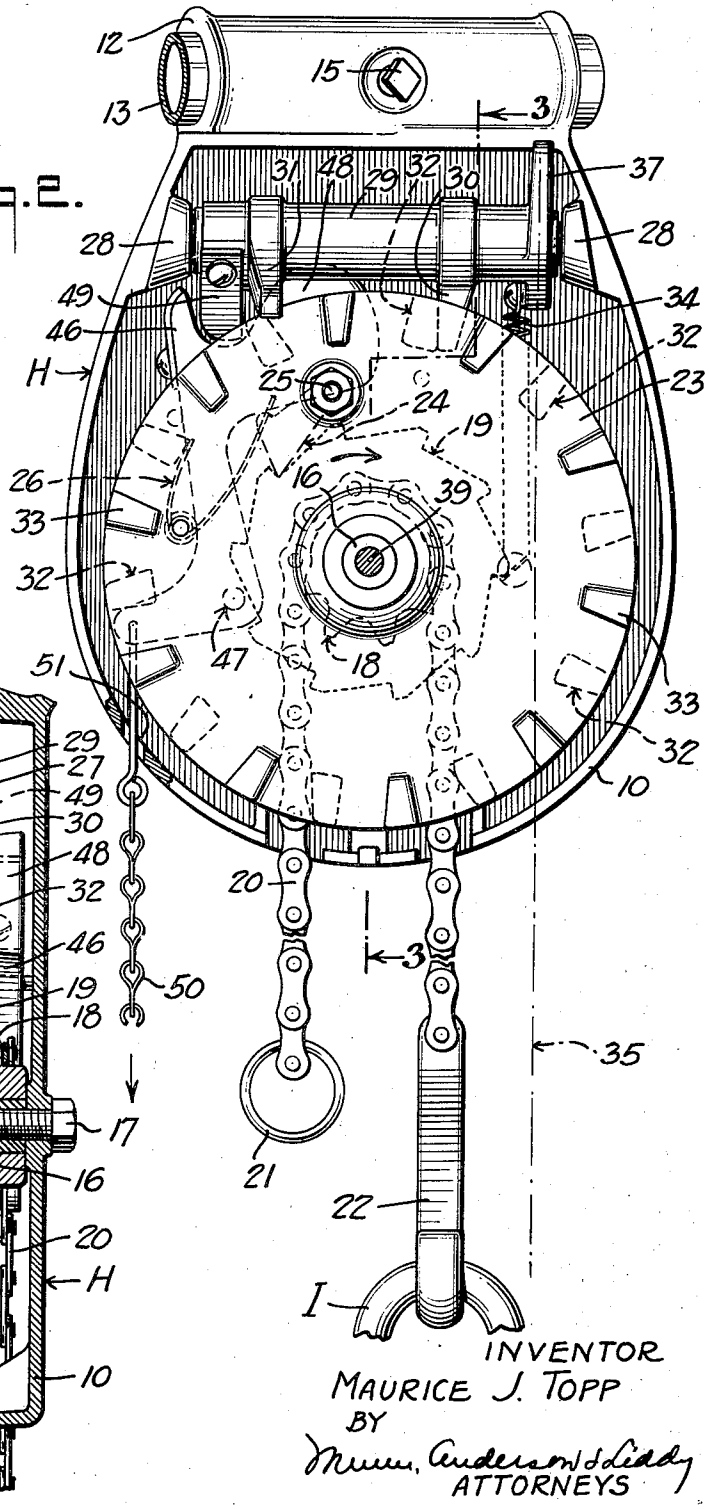
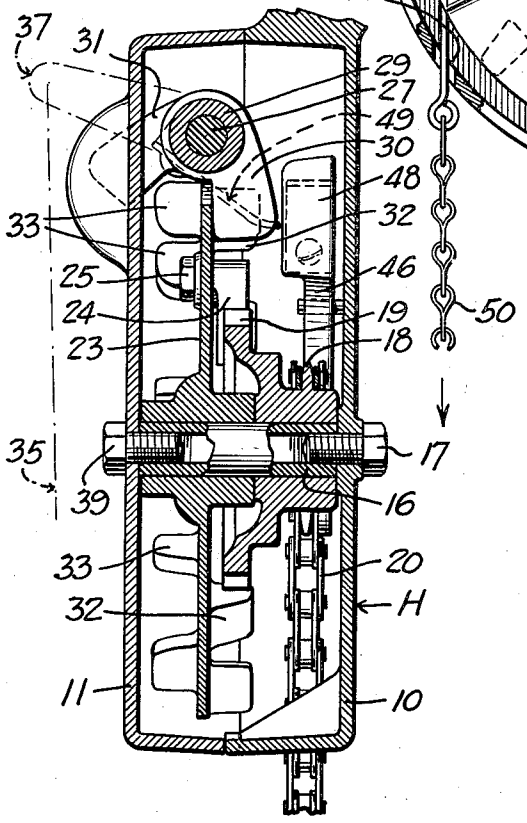


Fig. 3.



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METAL FEEDER FOR TYPE CASTING MACHINES

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4 Claims. (Cl. 22—80)

This invention relates generally to machines for casting type and more particularly to the metal pots thereof.

An object of the invention is to provide a device for automatically feeding metal to the metal pot of a type casting machine, in accordance with the use of metal in casting operations, so as to continuously add to the body of molten metal in the pot, all in such manner as to maintain a predetermined metal level in the pot without the necessity of any hand feeding, regardless of the demand of the machine; to maintain positive control of the ingot being fed to the pot; to prevent a low metal level in the pot with the attendant casting of spongy slugs; and to insure a uniform feed of metal into the pot so that the constant temperature required to properly cast slugs can readily be maintained.

Another object of the invention is to provide a metal feeder of the above described character which is simple and compact in construction; inexpensive to manufacture; readily installed on type casting machines without any alteration thereof; is easily assembled and disassembled; is absolutely positive in operation; and requires no servicing or attention whatsoever except to replace a melted ingot with a new one.

With these and other objects in view, the invention consists in the combinations, arrangements and functional relationships of elements as set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawings,

Figure 1 is a view showing in perspective the metal feeder in its applied position on a type casting machine;

Figure 2 is an enlarged view of the metal feeder in side elevation and with a housing cover removed;

Figure 3 is a vertical sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a view in side elevation of an operative connection embodied in the metal feeder.

Referring specifically to the drawings, the invention comprises a support in the form of a metal housing H composed of a body section 10 and a cover 11. The body is provided with a sleeve 12 which receives a horizontal arm 13 of a tubular frame structure 14 secured to the frame F of a conventional type casting machine. A set screw 15 secures the body section 10 to the arm 13 so as to rigidly support the housing in an elevated position above the metal pot P which, as is well known in the art, is pivotally mounted for rocking movement and is actuated in synchronism with the operation of the machine to occupy casting and non-casting positions with respect to the mold M of the machine.

An axle 16 is fixed in the body by a cap screw 17, and has rotatably mounted thereon a sprocket wheel 18 formed integrally with a ratchet wheel 19. Trained about the sprocket wheel is a length of chain 20 which depends therefrom in two stretches passing freely through slots in the body section 10. One end of the chain is provided with a stop ring 21 and the other end is provided with a hook 22 from which is adapted to be suspended an ingot I of type metal.

A feed member in the form of a metal disk 23 is also rotatably mounted on the axle 16 and is operatively connected to the ratchet wheel 19 by a pawl 24 pivoted at 25 on the disk and urged by a spring 26 into engagement with the teeth of the ratchet wheel so as to co-act therewith in providing a uni-directional clutch.

Under the weight of an ingot I suspended from the hook 22, the chain 20 and sprocket wheel 18 co-act to rotate the feed disk 23 in the direction of the arrow in Figure 2, through the ratchet wheel 19 and pawl 24 in order for the ingot to feed through an opening in the top wall of the metal pot P and be melted to add to the supply of molten metal in the pot. The feed disk 23 is releasably retained against rotation by the ingot in a manner to be intermittently released to effect a step by step feeding of the ingot. For this purpose a shaft 27 is fixed at its ends in lugs 28—28 projecting from the body section 10, and has rockably mounted thereon by means of a relatively long hub 29, dogs 30 and 31 formed integral with the hub at spaced points along its length, and angularly related circumferentially of the hub. The dogs are adapted to respectively co-act with circumferential series of stops 32 and 33 which are staggered circumferentially relative to each other.

The dogs 30 and 31 are urged as a unit by a spring 34 to one extreme position wherein the dog 30 is disposed in the path of the stops 32. The arrangement of the two series of stops is such that the dogs will alternately hold and release the disk 23 for rotational movement step by step under the weight of the ingot, and neither dog will become disengaged from a stop of the series with which it co-acts before the other dog is disposed in the path of the stops of the series with which it co-acts. Thus at no position in the rocking movement of the dogs is the feed disk free of both dogs, with the result that the feed disk can only be advanced through the angular

distance between a stop of one series and the next succeeding stop of the other series, each time the dogs are moved from one extreme position to the other.

In the present instance, the dogs are moved to their other extreme position against the urging action of the spring 34 in synchronism with the operation of the machine, and specifically each time the metal pot is moved from casting to non-casting position. For this purpose, a flexible line in the form of a chain 35 is connected at one end to the pot lever shaft 36 of the metal pot P, and at its other end to a yieldable operative connection O interposed between the chain and an arm 37 projecting from the hub 29 through an opening 38 in the cover 11 which is removably secured to the body section 10 by a cap screw 39 threaded into the axle 16. The operative connection O consists of two extensibly connected parts 40 and 41 normally urged to a contracted position by a spring 42, one of the parts being pivotally connected to the arm 37, and the other of the parts being connected to a disk 43 having a circumferential series of openings 44 any one of which can receive a hook 45 on said other end of the chain 35 to provide for an adjustment of the chain as to its length.

In order to regulate the feed of the ingot so as to maintain a predetermined metal level in the pot P, a latch 46 in the form of a bell crank is pivoted at 47 in the body section 10 and is urged by a weight 48 into the path of a stop arm 49 secured to the hub 29 so as to prevent rocking movement of the dogs 30 and 31 by the actuating chain 35. A flexible line in the form of a chain 50 is connected to the latch 46 and passes freely through an opening 51 in the body section 10. The vertically guided stem 52 of a metallic float 53 is secured to the chain 50 and is adapted to be buoyed by the molten metal in the pot P. The weight of the float is such that when imposed upon the latch 46, the latter will be moved to the non-latching position shown in Figure 2 relative to the stop arm 49 so as to permit rocking movement of the dogs.

The operation of the invention is as follows:

With an ingot I applied to the hook 22 of the chain 20, and assuming that the molten metal in the pot P is at the predetermined level required for the proper casting of type, the float 53 will be buoyed by the molten metal at a height to relieve the latch 46 of the weight of the float, so that the latch will co-act with the stop arm 49 in preventing rocking movement of the dogs 30 and 31 as a unit.

However, during movement of the metal pot P to non-casting position following each casting of type, a pull is exerted on the actuating chain 35, which is compensated for by the yielding of the spring 42 of the operative connection O.

As the level of molten metal falls in the pot due to the use of the metal in casting, the weight of the float 53 will be imposed on the latch 46 to move it to non-latching position wherein the latch is clear of the stop arm 49, as shown in Figure 2, thus permitting the dogs 30 and 31 to be rocked in one direction by the spring 34, and in the other direction by the chain 35, for co-action with the stops 32 and 33, respectively, in rendering the feed disk 23 free intermittently for progressive rotational movement step by step by the ingot. Until the predetermined metal level has been restored by the melting of sufficient metal from the ingot, the step by step feeding of the ingot will be effected each time the pot P is moved to and from casting position. It will be appreciated that the spring 42 is of sufficient strength to provide the necessary operative connection for transferring the pulling movement of the actuating chain 25 to the arm 37 so long as the latch 46 is maintained in non-latching position by the weight of the float 53, and yields when the dogs are latched against rocking movement or when the metal pot approaches non-casting position.

When an ingot has been exhausted, it is only necessary to pull the stop ring 21 downwardly until the hook 22 has been raised to its most elevated position for the application of a new ingot to the hook. It will be manifest that this mode of operation is permitted by the ratchet wheel and pawl connection between the sprocket wheel 18 and the feed disk 23, as the sprocket wheel is thus rendered free of the feed disk for retrograte movement by the chain 20.

It will be manifest that by the positive and automatically regulated feed of the ingot as is effected by the above described invention, that a predetermined metal level can be maintained until an ingot is exhausted, and it is to be understood that by this method of feeding the ingot, the casting of slugs from six to sixty point can be effected without any hand feeding and without any sticking, slipping or "skidding" of the ingot into the metal pot.

What is claimed is:

1. A metal feeder for type casting machines comprising a support; a feed member rotatably mounted on the support; means for suspending an ingot from the member to tend to rotate the latter in one direction under the weight of the ingot; a plurality of releasable holding elements movably mounted on the support for co-action with the feed member in alternately holding and releasing the latter so as to effect a step by step rotation of the member by the ingot in order for the latter to be fed; means for actuating said holding elements; and means for latching the holding elements against actuation to prevent rotation of the feed member.

2. A metal feeder for type casting machines comprising a support; a feed member rotatably mounted on the support; means for suspending an ingot from the member to tend to rotate the latter in one direction under the weight of the ingot; a plurality of releasable holding elements movably mounted on the support for co-action with the feed member in alternately holding and releasing the latter so as to effect a step by step rotation of the member by the ingot in order for the latter to be fed; means for actuating said holding elements; a latch normally urged to prevent actuation of said holding elements; and a float carrying line operatively connected to the latch to move the latter to an unlatching position under the weight of the float.

3. A metal feeder for type casting machines comprising a support; a feed disk rotatably mounted on the support and having circumferential series of stops projecting from opposite sides thereof and offset circumferentially relative to each other; a sprocket wheel rotatably mounted on the support co-axially of the feed disk; ratchet wheel and pawl means co-acting with the feed member and sprocket wheel to provide a driving connection therebetween in one direction; a chain trained about the sprocket wheel and adapted to suspend an ingot, the weight of which tends to rotate the disk in said one direction through the driving connection; a plurality of holding dogs mounted on the support for rocking movement

as a unit to co-act with the respective series of stops in rendering the feed disk rotatable step by step in response to rocking movement of the dogs; and actuating means for the dogs.

4. A metal feeder for type casing machines comprising a support; a feed disk rotatably mounted on the support and having circumferential series of stops projecting from opposite sides thereof and offset circumferentially relative to each other; a sprocket wheel rotatably mounted on the support co-axially of the feed disk; ratchet wheel and pawl means co-acting with the feed member and sprocket wheel to provide a driving connection therebetween in one direction; a chain trained about the sprocket wheel and adapted to suspend an ingot, the weight of which tends to rotate the disk in said one direction through the driving connection; a plurality of holding dogs mounted on the support for rocking movement as a unit to co-act with the respective series of stops in rendering the feed disk rotatable step by step in response to rocking movement of the dogs; means for urging the dogs to one extreme position; an actuating line connected to the dogs and adapted for operative connection to a moving part of the machine to move the dogs to the other extreme position; a latch movably urged to prevent actuation of the dogs; and a float carrying line connected to the latch to move the latter to unlatching position under the weight of the float.

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