Dec. 3, 1929. C. W. REAGAN 1,737,865

METAL FEEDER

Filed Feb. 8, 1926

Fig. 1.

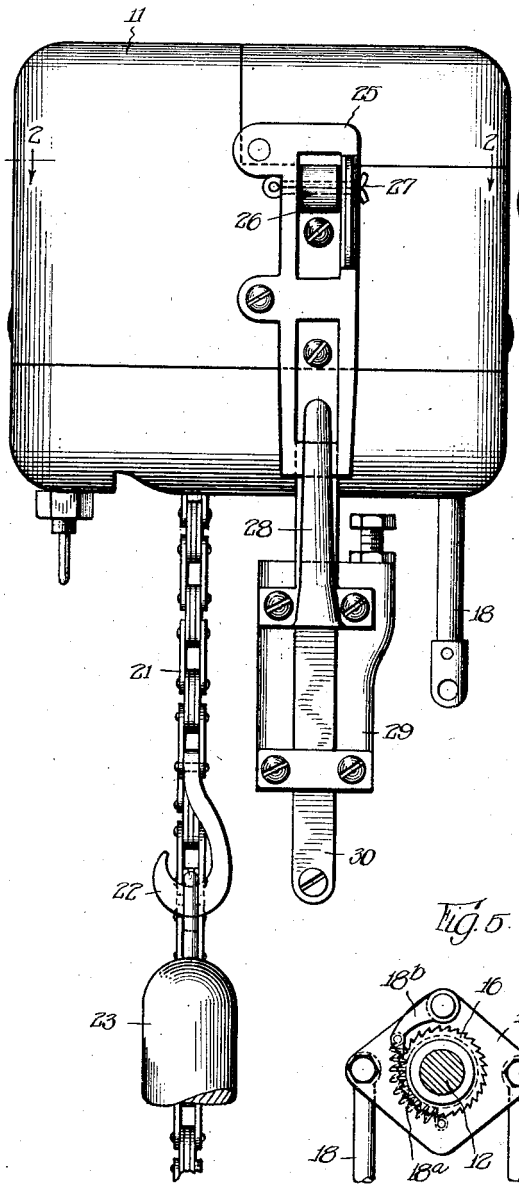


Fig. 2.

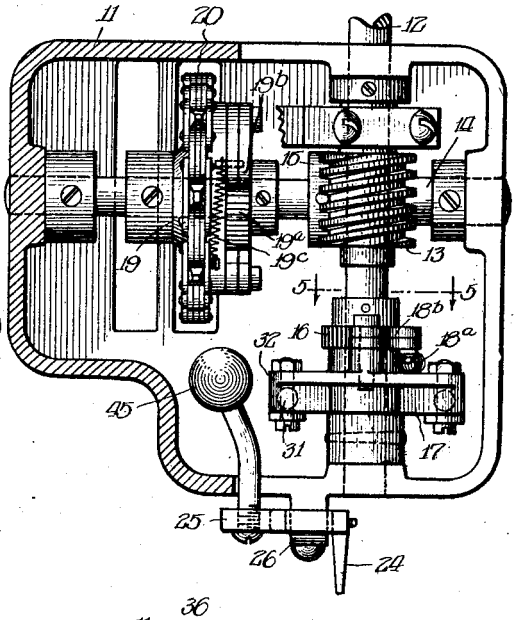


Fig. 4.

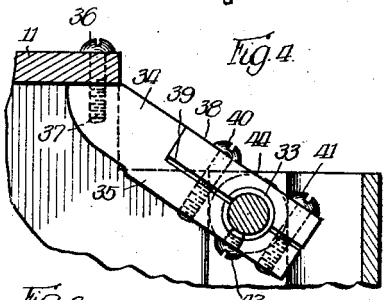
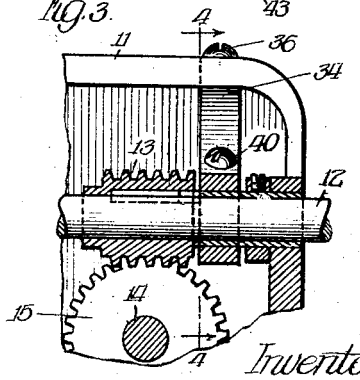


Fig. 5.

Fig. 3.



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Patented Dec. 3, 1929

1,737,865

UNITED STATES PATENT OFFICE

CLIFFORD W. REAGAN, OF CHAMPAIGN, ILLINOIS

METAL FEEDER

Application filed February 8, 1926. Serial No. 86,689.

The invention has to do with stabilizing devices adapted to be associated with machines for feeding soft metals, to monotype or other type casting machines such as are now in use.

Heretofore it has been thought impracticable to provide metal feeders for monotype machines or others which vibrate to a high degree during operation. The vibration interferes with the operation of the feeding mechanism and permits the metal to slip and feed into the metal pot more rapidly than it is consumed, thus resulting in the overflow of the metal pot and a consequent interruption of the operation of the typecasting machine. The metal feeding machine thus ceases to be automatic in its operation as it requires the attention of the operator from time to time to care for and manipulate the rate of feed of metal into the pot.

The primary object of the invention is the provision of improvements in machines of the class referred to whereby the difficulties enumerated are overcome and the metal feeding machine becomes automatic and positive in operation.

A further object of the invention is the provision of a device which may be easily and economically manufactured and incorporated in metal feeding machines now on the market to adapt them to operate successfully with monotype machines or other machines which vibrate excessively.

That the invention may be better understood reference is had to the accompanying drawings wherein is shown a machine similar to one of the present commercial feeders with improvements incorporated therein comprising a stabilizing device constructed after the principles of my invention. It is to be understood that the drawings and specification are presented for illustrative purposes only, and are not intended to be construed to limit the scope of the protection sought as the same is defined in the appended claims.

In the drawings:

Fig. 1 discloses a side elevation of the machine showing a portion of an ingot of type metal, a locking catch on the side of the machine and the housing of the machine;

Fig. 2 is a view taken on line 2—2 of Fig. 1 showing the operating mechanism;

Fig. 3 is a detailed view in cross section showing the connection of a brake or stabilizing device to the driving shaft of the machine;

Fig. 4 is a detailed view taken on line 4—4 of Fig. 3 showing a side view of the stabilizing device referred to, and

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2 showing in detail the means for connecting the feeder to a type casting machine.

I shall first describe a metal feeder of conventional type and then shall explain the construction and operation of a preferred form of my invention which is incorporated therein to prevent slippage of the feeder due to the vibration of the machine upon which it is mounted.

The metal feeder is housed in a casing 11 and comprises a transverse shaft 12 journalled in the side walls of said casing, a worm gear 13 secured to said shaft, a second shaft 14 mounted perpendicularly to the shaft 12 and having a bevelled gear 15 mounted thereon and positioned so as to engage the worm gear 13. A sprocket wheel 19 is loosely mounted in the shaft 14 and is provided with a chain 20, the end 21 of which is equipped with a hook 22 to engage and hold an ingot of type metal 23.

The sprocket wheel 19 is driven by the shaft 14 through means of a ratchet gear 19^a which is fixedly mounted on the shaft 14 adjacent the sprocket and a dog 19^b which is pivotally mounted on the side of the sprocket 19 so as to engage the ratchet upon movement of the shaft in one direction, in this case clockwise, and to ride on the ratchet upon counterclockwise movement of the sprocket.

The feeder is driven from the machine with which it is connected through means of the rod 18 in the usual manner. The rod 18 is connected to a rocker arm 17 which is loosely mounted on the shaft 12 adjacent a ratchet gear 16, the latter being fixedly secured to the shaft 12. Connection is made between the ratchet and the rocker arm by means of a dog 18^b which is pivotally mounted on the rocker

arm 17. A coil spring 18[a] is associated with the dog 18[b] to retain the same in engagement with the teeth of the ratchet gear.

As the rod 18 moves up and down it oscillates the rocker arm 17 so that feeding movement is transmitted through dog 18[b] to the ratchet gear 16 during clockwise movement of the rocker arm. During counter-clockwise movement of the rocker arm the dog slides over the ratchet gear teeth to the end of the stroke and again engages the teeth of the ratchet gear.

With each complete stroke of the rod 18 the metal ingot 23 is advanced into the metal pot of the type casting machine. When the amount of metal in the pot has risen to a predetermined point feeding of the metal is stopped by means of a float (not shown) which rides on the metal in the pot and is hooked to the arm 24. The arm 24 operates a catch 25 which is pivotally mounted on the outer side of the casing by means of a block 26 and a cotter key 27. A weight 45 is secured to the top of said catch and is adapted to swing the lower end of same from the side wall of the casing as the float rises. A latch 28 is provided in association with a weight 29 which rides upon an arm 30, the latter being positioned directly below the catch 25. The weight 29 is connected to the rocker arm 17 at the end 31 by means of a rod 32. Thus when the rocker arm oscillates it raises and lowers the weight 29 and the latch 28 on the arm 30.

The operation of the device thus far described can be briefly summarized as follows. The rod 18 is caused to move up and down by the casting machine with which the feeder is associated. This movement causes the rocker arm 17 to operate the shaft 12 and at the same time to raise and lower the latch 28. The worm gear 13 transmits the movement of the shaft 12 through the gear 15 to the shaft 14. The movement of the shaft 14 is transmitted to the sprocket wheel 19 through means of the ratchet 19[a] and the dog 19[b]. The rotation of the sprocket wheel lowers the chain end 22 and slowly feeds the ingot of metal 23 into the metal pot. As the metal in the pot reaches the desired level, the arm 24 is raised by the float and the catch 25 is swung on its pivot 27 away from the side wall of the casing 11, thus causing it to engage the latch 28 and stop the movement of the rocker arm 17. Positive feeding of the metal by the machine then ceases until the metal in the pot recedes to the point where the dropping of the float 18 causes the latch 25 to release the catch 28.

The machine as thus far described is of a common commercial type and has been found satisfactory when employed with linotype machines but on monotype and others where the vibration is great the weight of the ingot 23 will pull the sprocket wheel forward against the resistance of the machine even when the float in the metal pot is up and the machine is supposedly held inoperative.

This difficulty may be overcome by the addition of improvements in the form of a stabilizer or brake adapted to prohibit movement of the shaft 12 except when positively operated by the machine with which the device is associated. A practical form of such a stabilizer is shown in Figs. 2, 3 and 4, and comprises a split bushing 33 which is mounted on the shaft 12 and held in place by a support 34. The support 34 comprises an arm 35 which is secured to the top of the housing 11 by means of a bolt 36 which is screw threaded in a correspondingly shaped opening 37, provided in the supporting arm. The bushing 33 is maintained in association with the supporting arm by means of a metal block 38 which is adapted to interfit in a slot 39 provided in the supporting arm 35. The block 39 is held in place by means of two tension bolts 40 and 41 which pass through openings provided in the block and are screw-threaded on each side of the split bushing 33 into the supporting arm 35.

The bushing 33 is secured by means of a set screw 43 which is threaded in the supporting arm 35 and is set in an opening provided in the bushing. An oil hole 44 is provided in the block 38 and is aligned with a port in the bushing to permit lubrication.

The tension of the bushing 33 on the shaft 12 is regulated by means of the screws 40 and 41 and is adjustable to provide sufficient braking influence on the shaft to overcome the force exerted by the ingot 23 and to permit normal operation of the feeding machine.

I claim:

1. The combination with a charge feeder for type-casting machines having feed means for regulating the feed of the charge to the melting pot and float governed regulating means for controlling operation of the feed means, of a stabilizing device effective on the feed means independently of the control means to resist feeding movement of the charge.

2. In a charging device for type-casting machines, in combination with feeding mechanism operable periodically to feed charging metal to the melting pot, control mechanism for regulating operation of the feed mechanism and governed by the height of the molten charge, and a stabilizing device effective on the feed mechanism independently of the control mechanism to prevent self-feeding of the charging metal.

3. In a charge feeding apparatus for type-casting machines, in combination, feeding mechanism for controlling the feed of charging metal to the melting pot, actuating means for operating the feed mechanism to feed the

charge, control means for controlling the effectiveness of the actuating means on the feed mechanism, and a stabilizing device effective on the feed mechanism independently of the actuating means and restraining the feed mechanism against operation.

4. In charge regulating apparatus for type-casting machines, in combination, feed mechanism for sustaining the weight of the charging metal, actuating means for positively driving the feed mechanism to feed the charge, control mechanism for regulating the effectiveness of the actuating means on the feed mechanism, and a stabilizing device effective on the feed mechanism independently of the actuating means to restrain the feed mechanism against operation by the weight of the charging metal.

5. A combination as specified in claim 4 wherein the stabilizing device is adjustable to vary its effectiveness on the feed mechanism.

6. In a charge-feeding apparatus for type-casting machines, in combination, feed mechanism for controlling gravity feed of the charging metal, actuating means, a ratchet driving connection for transmitting motion from the actuating means to the feed mechanism, control mechanism for governing the effectiveness of the actuating means on the feed mechanism, and a stabilizing device for restraining the feed mechanism against overthrow, said stabilizing device being adjustable in its effectiveness on the feed mechanism.

7. In combination, a charge feeding device for type casting machines comprising a housing having a feeding mechanism and an actuating mechanism and control means for the actuating mechanism within the casing, and a stabilizing device rigidly connected with the casing and having a definite engagement with the actuating mechanism, said stabilizing device being entirely independent of the control of the actuating mechanism.

In testimony whereof I have hereunto subscribed my name.

CLIFFORD W. REAGAN.