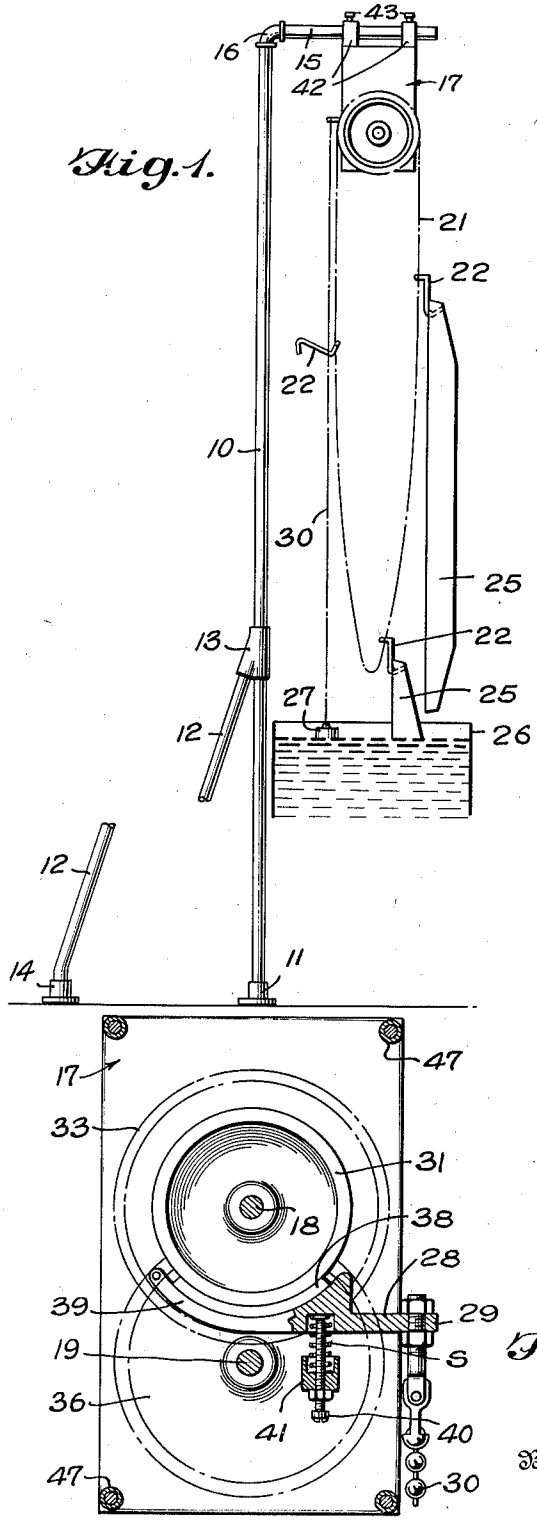
Feb. 6, 1940. A. H. JUNG 2,189,113

FEEDER APPARATUS

Filed Oct. 17, 1939

Fig. 1.



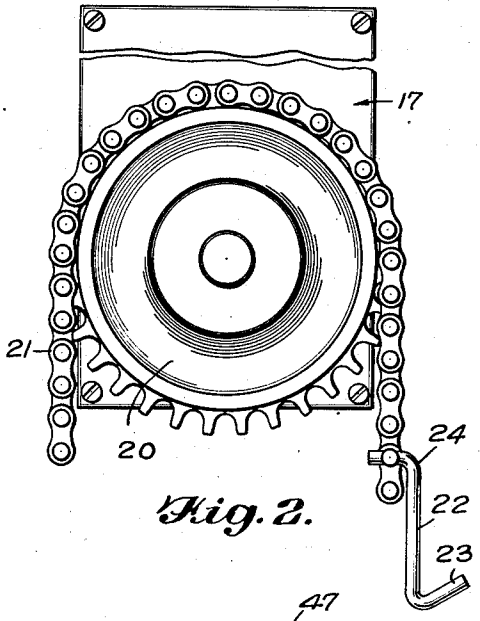


Fig. 2.

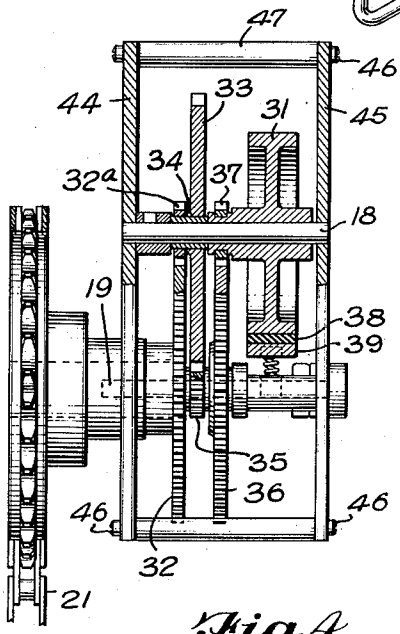


Fig. 4.

Fig. 3.

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FEEDER APPARATUS

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5 Claims. (Cl. 22—80)

This invention relates to metal feeders and more particularly to an automatic device for feeding metal ingots to a melting pot.

Prior to the instant invention, it has been customary to provide in association with line casting and type setting machines an automatic feeder whereby type metal pigs or ingots are fed to a melting pot in accordance with the level of molten metal within the pot. Such prior feeders have generally included a feeder chain having a hook to which may be attached an ingot to be fed to the bath. As the metal in the bath is used in the line casting or type setting machine, the lever therein is lowered and the machine operated to lower the ingot into the bath until the metal again rises to a predetermined level. When a complete ingot has been fed to the bath, some reversing mechanism is provided for bringing the feeder chain back into its original position whereby another ingot may be associated with the the feeder hook and the cycle repeated. Such arrangements have been relatively complicated in their mechanisms, expensive to manufacture and hence their widespread use in association with the line casting and type setting machine has never been effected.

It is an object of the invention to provide an automatic type metal ingot feeder of relatively few and simple parts whereby it may be manufactured inexpensively.

It is a further object of the invention to provide an automatic type metal ingot feeder which lends itself readily for use in connection with line casting or type setting machines and to which ingots may be readily associated with a minimum of attention from the operator.

Other objects and the nature and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawing, wherein:

Fig. 1 is a view in elevation of the feeder in operation;

Fig. 2 is a fragmentary elevational view illustrating the sprocket gear and feeder chain relationship and further the association of one of the feeder hooks with the feeder chain;

Fig. 3 is a view in elevation, with parts in section, of the brake mechanism associated with the device; and,

Fig. 4 is a side elevation of the upper portion of the feeder, with parts broken away, illustrating the sprocket gear and the brake mechanism.

Referring to Fig. 1, a stand 10, which may be of metal piping, is supported by the base socket 11 and reinforced by the brace 12 which also may be of metal piping and associated at one end with the stand 10 by the connecting piece 13, and at its opposite end with the base socket 14. At the uppermost portion of the stand 10 a relatively short horizontal cross piece 15 is associated therewith by means of the elbow connector 16.

Suspended from the cross piece 15 is the feeder box 17 which carries the stationary shaft 18, see Fig. 4, and the rotatable shaft 19 to which latter shaft the sprocket wheel 20, see Fig. 2, is secured by suitable means. In a novel manner, the endless feeder chain 21 is associated with the sprocket wheel 20 and hangs therefrom in a manner to form a catenary at its lower portion. At spaced intervals about the feeder chain 21, feeder hooks 22 are associated therewith and each may simply comprise a length of metal rod bent to form a hook 23 at one end and an attaching portion 24 at the opposite end which is associated with the feeder chain. The spacing of the feeder hooks 22 on the feeder chain 21 is slightly less than the length of the ingot 25 in order that the feeding of the ingots 25 to the melting pot 26 will be continuous, the adjacent ends of successive ingots slightly overlapping.

To control the feeding of the ingots 25 to the melting pot 26 in a predetermined manner, a float 27, see Fig. 1, arranged on the surface of the molten liquid within the melting pot 26, acts to prevent the brake lever 28 from being moved upwardly under the influence of the spring S, for the weight of the float 27 will exert a pull downwardly on the outer end 29 of the lever 28 through the float chain 30. The drive from the sprocket wheel 20 to the brake drum 31 is effected through the rotating shaft 19 which is secured to the sprocket wheel 20, the relatively large gear 32 which is also secured to the rotating shaft 19 and which drives the relatively small gear or pinion 32a which is associated with the relatively large gear 33 through the medium of the common shaft 34 to which the gears 32a and 33 are secured. The relatively large gear 33 in turn drives the relatively small gear or pinion 35 which is secured to the relatively large gear 36 through the medium of a common shaft similar to the shaft 34. The relatively large gear 36 drives the relatively small gear or pinion 37 which is secured to the brake drum 31 on the periphery of which, the brake lining 38, see Figs. 3 and 4, which is secured to the brake shoe 39, acts to effect the proper control.

The gearing described, acts to gear down the pull on the feeder chain effected by the weight

of the ingots being fed, whereby a relatively weak spring S may be utilized to produce the necessary braking action to stop the feeder when the float 27 is at a predetermined high lever and the flexible feeder chain 30 sufficiently slack so as not to interfere with the action of the spring S which may be adjusted by rotating the adjusting screw 40 in a manner to raise or lower the spring retainer 41. When the adjusting screw is turned in one direction the force exerted by the spring is lessened; and when the adjusting screw is turned in the opposite direction the force exerted by the spring is increased, whereby the desired braking action may be effected by the apparatus disclosed.

The feeder box 17 is suspended from the relatively short cross bar 15 by the loop fittings 42 which include lock screws 43. With this arrangement the entire feeder may be readily removed from the cross bar 15 by merely loosening the screws 43 and laterally slipping the feeder off the cross bar 15. The feeder box 17 comprises two plates 44 and 45, respectively, secured in spaced relation by the bolts 46 within the tubes 47.

In operation of the device, the operator, from time to time, as is necessary in accordance with the amount of work done on the line casting or type setting machine with which the feeder is associated, literally threads the end of an ingot 25 on a feeder hook 22. The weight of the ingot will be transmitted through the shaft 19, gears 32, 32*a*, 33, 35, 36, and 37 to the brake 31, upon the circumferential surface of which, the brake lining 38 of the brake shoe 39 will functionally engage to effect cessation of movement of the feeder chain 31 when the float 27 has risen to a predetermined maximum level and the flexible float chain 30 slackened. When the lever in the melting pot 26 is below a predetermined maximum, the flexible float chain 30 will be held taut under the influence of the weighted float 27 and the brake lever 29 pulled downwardly against the action of the spring S to hold the brake lining 38 of the shoe 39 out of engagement with the circumferential surface of the brake drum 31.

From the above, it will be readily understood that the automatic ingot feeder described comprises a minimum of parts which are relatively inexpensive to manufacture, is rugged in construction and adapted to effect a more universal use of automatic feeders in conjunction with line casting, type setting machines and the like.

It will be obvious to those skilled in the art that various changes may be made in this device without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawing and described in the specification but only as indicated in the appended claims.

I claim:

1. In a type metal ingot feeding and melting apparatus including a melting pot and a feeder mechanism supported above said melting pot, a casing included in such mechanism, a rotatable shaft extending exteriorly of said casing, a sprocket wheel mounted on said shaft and rotatable therewith, regulating means cooperatively connected to said shaft and located within said casing and means for controlling said regulating means including a float adapted to float in the molten metal within said melting pot: the combination of an endless chain operatively engaging said sprocket wheel at its upper end and hanging substantially in the form of a catenary at its lower end, a plurality of ingot receiving hooks pivotally secured at one of their ends to the chain, the pivotal mountings of said hooks being spaced by a distance slightly less than the length of type metal ingots adapted to be fed by the apparatus to the melting pot, whereby feeding and melting of type metal may take place in accordance with the level within the melting pot and substantially continuously as required without interruption.

2. In a type metal feeding and melting apparatus including a melting pot and a feeder mechanism supported above said melting pot, a casing included in said mechanism and a rotatable shaft extending exteriorly of said casing: the combination of a flexible endless conveyor cooperating with said shaft at its upper end and rotatable therewith, said conveyor hanging freely at its lower end generally in the form of a catenary, a plurality of ingot receiving hooks pivotally secured at one of their ends to the conveyor, the pivotal mountings of said hooks being spaced by a distance slightly less than the length of type metal ingots adapted to be fed by the apparatus to the melting pot, whereby feeding and melting of type metal may take place in accordance with the level within the melting pot and substantially continuously as required without interruption.

3. In a type metal ingot feeding and melting apparatus including a melting pot and a feeder mechanism supported above said melting pot, a casing included in said mechanism, a rotatable shaft extending exteriorly of said casing, a sprocket wheel mounted on said shaft and rotatable therewith, regulating means cooperatively connected to said shaft and located within said casing and means for controlling said regulating means including a float adapted to float in the molten metal within said melting pot; the combination of an endless chain operatively engaging said sprocket wheel at its upper end and hanging substantially in the form of a catenary at its lower end, a plurality of ingot receiving hooks pivotally secured at one of their ends to the chain, whereby feeding and melting of type metal may take place in accordance with the level within the melting pot and substantially continuously as required without interruption.

4. In a type metal ingot feeding apparatus adapted to be controlled by the level of molten metal within a melting pot: the combination of an endless flexible conveyor rotatable supported at its upper end directly above said melting pot, said conveyor having a loading side and a second side, a plurality of ingot receiving hooks secured to said conveyor in spaced relation in a position so that the hook or hooks on the said loading side are in ingot engaging position and when loaded will cause movement of said endless conveyor to bring hooks successively into ingot engaging position on the said loading side of said conveyor, whereby feeding and melting of the type metal may take place in accordance with the level of molten metal within the melting pot and substantially continuously as required without interruption.

5. The structure recited in claim 4, said flexible endless conveyor having its lower end hanging freely generally in the form of a catenary.

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