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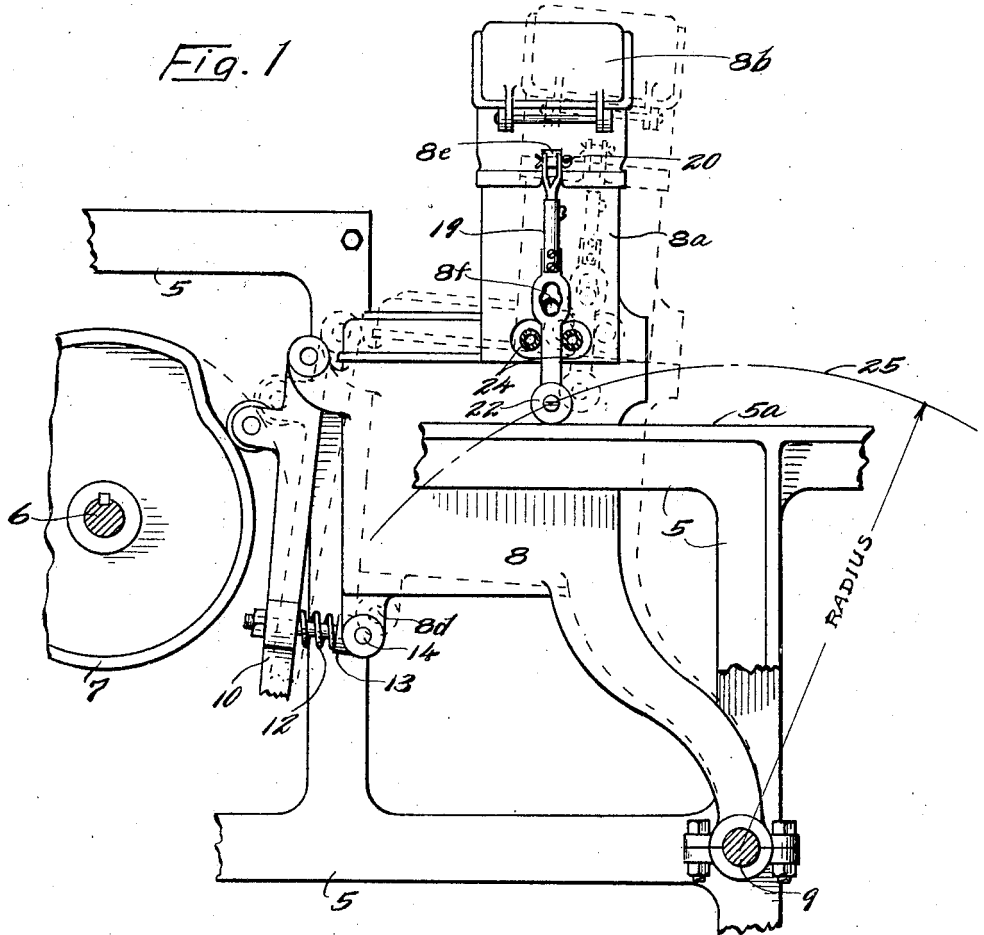
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G. L. CURLE

PUDDLING DEVICE FOR TYPE CASTING MACHINES

Filed May 1, 1925

2 Sheets-Sheet 1



INVENTOR  
GEORGE L. CURLE  
BY HIS ATTORNEYS

*William Reif*  
*William*

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Fig. 3.

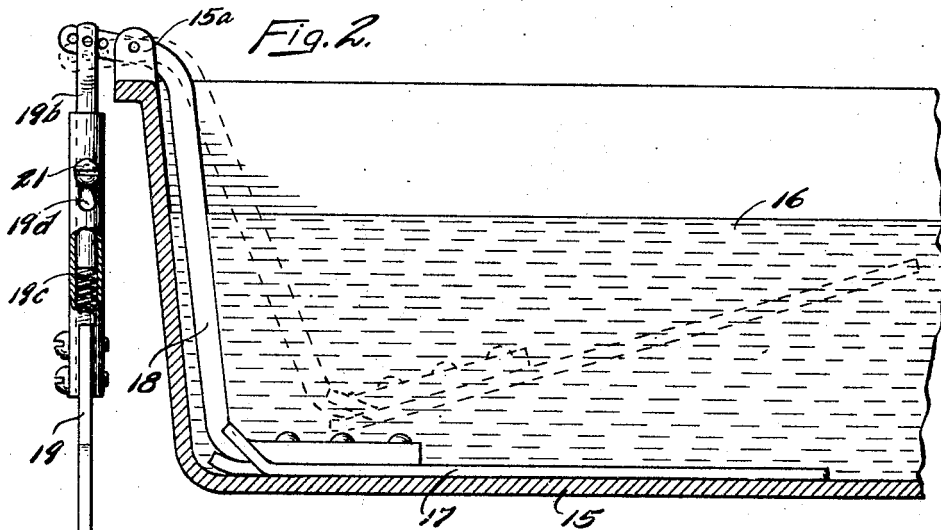
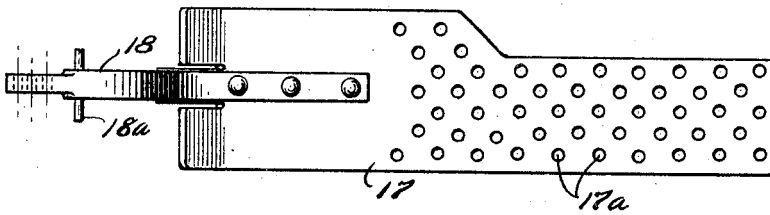


Fig. 2.

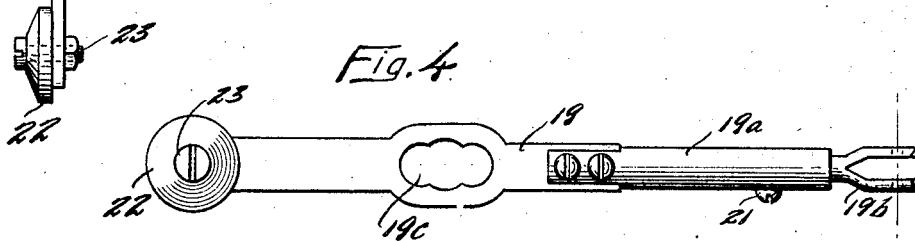


Fig. 4.

INVENTOR  
GEORGE L. CURLE  
BY HIS ATTORNEYS

*William Reif & William*

# UNITED STATES PATENT OFFICE.

GEORGE L. CURLE, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO ROY E. HOLLAND, OF MINNEAPOLIS, MINNESOTA.

## PUDDLING DEVICE FOR TYPE-CASTING MACHINES.

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This invention relates to a type casting machine and particularly to a puddling device used in connection with the molten melting pot of such a machine. As is well known, in certain types of type casting machines the metal is maintained in a molten condition and it is desirable to stir or puddle this metal frequently so that any dirt in the metal will be freed therefrom and forced to the top by the agitation of the metal. The dirt is skimmed from the top of the pot at intervals. It is also desirable, for other reasons, to puddle or agitate the metal in the pot.

It is an object of this invention, therefore, to provide a simple and efficient puddling device for the metal pot which preferably is operated by the customary movements of the machine.

It is a further object of the invention to provide a puddling device for the metal pot of the type casting constituting a lever arm, which lever has secured thereto an arm carrying a cam member adapted to engage a stationary part of a machine, so that when the part of the machine carrying the metal pot is moved, the cam and said lever will be operated by relative motion of the latter part and the stationary part of the machine.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings, in which like reference characters refer to similar parts through the different views, and in which

Fig. 1 is a view in side elevation of a portion of a type casting machine;

Fig. 2 is a vertical section through the metal pot containing the puddling device, showing some parts in side elevation;

Fig. 3 is a top plan view of the puddling device proper; and

Fig. 4 is a view in side elevation of the cam arm used.

Referring to the drawings, particularly Fig. 1, a portion of a type casting machine is shown including the part of the stationary frame 5 in which is mounted a cam shaft 6 having thereon the cam 7, a part of said frame 5 having a flat top surface 5<sup>a</sup>. In such type casting machines, the portion of the machine including the melting pot is periodically moved at intervals in the operation of casting a slug. The movable part of

the machine is indicated in Fig. 1 generally as 8, said part carrying the casing 8<sup>a</sup> thereon, in which casing the melting pot is disposed. The movable part of the frame 8 is arranged to swing about the shaft 9 as a pivot, said shaft being mounted in the stationary part 5 of the frame. The movable part of the frame 8 has a lug 8<sup>b</sup>, to which is connected a cam roller arm 10, carried in lugs projecting therefrom the cam roller 11. The arm 10 is backed by a spring 12 disposed between the same and the flat base of a bolt or stud 13, which is pivotally mounted on pivot 14 carried in a depending lug 8<sup>c</sup> of the portion 8.

The member 13 has a shank passing through spring 12 and through an aperture in arm 10 and has a threaded end equipped with a suitable nut, so that the tension of spring 12 may be adjusted. From the described structure, it will be seen that when shaft 6 is rotated, cam 7, acting on the roller 11, will swing the portion 8, together with the casing 8<sup>a</sup> about the shaft 9, as indicated by the dotted line position of the parts in Fig. 1.

The melting pot disposed in the casing 8<sup>a</sup> is shown in Fig. 2 as 15, having therein the molten type metal 16. A puddling device or agitator is provided, comprising a flat plate 17 of general rectangular shape somewhat wider at one end than the other and provided with a multiplicity of apertures or perforations 17<sup>a</sup>. Plate 17 has secured to one end thereof by suitable rivets the lower end of a lever 18, plate 17 being slotted at one end and turned up slightly at each side of the lever 18. As shown in Fig. 2, the lower portion of lever 18 extends almost at a right angle to the main portion thereof. The upper end of lever 18 is curved outwardly and provided with a pair of oppositely extending trunnion pins 18<sup>a</sup> adapted to be disposed in a pair of spaced lugs 15<sup>a</sup> at the upper edge of pot 15. The end of the lever 18 beyond the pins 18<sup>a</sup> is arranged to project through an aperture 8<sup>c</sup> in the casing 8<sup>a</sup> and is provided with a plurality of holes, one of which is adapted to receive a connecting member connecting said end of the lever to the forked upper end of a cam arm 19 disposed outside of the casing 8<sup>a</sup>. While the connecting member of the parts 18 and 19 may be of various kinds, in the embodiment of the invention

illustrated, the same is shown as an ordinary cotter pin 20.

The arm 19 comprises a tubular portion 19<sup>a</sup> at its upper end in which is disposed the upper forked portion 19<sup>b</sup>, the latter being seated in a coil compression spring 19<sup>c</sup> in portion 19<sup>a</sup>, said spring seating on the end of the main flat portion of arm 19 which is secured to portion 19<sup>a</sup>. A screw 21 carried by portion 19<sup>b</sup> extends through a slot 19<sup>d</sup> in portion 19<sup>a</sup> and limits movement of portion 19<sup>b</sup>. The arm 19 carries at its lower end a cam roller 22 journaled on a headed or nutted bolt or stud 23 in said arm 19. In the embodiment of the invention illustrated the arm 19 is shown as having a widened intermediate portion provided with a central aperture or slot 19<sup>e</sup>. This slot in the assembling of the parts alines with an opening 8<sup>f</sup> in the casing 8<sup>a</sup> and forms a sight-hole for inspecting the burner which is disposed beneath the melting pot 15. The arm 19 is also shown as being disposed between a pair of members 24 and, while these members may take various forms, in the embodiment of the invention illustrated, the same form gas pipes which supply gas to the burner used to melt the metal.

In operation, the parts normally are disposed as shown in Fig. 1. In this position, the roller 22 engages the flat top 5<sup>a</sup> of the stationary frame 5 and the arm 19 is pushed up to the position shown in full lines in Figs. 1 and 2. This position of arm 19 swings the outer end of lever 18 upwardly so that the puddling or agitating plate 17 is substantially at the bottom of pot 15, as shown in Fig. 2. The plate 17 and lever 18 are made of steel or other material which is adapted to withstand the temperature of the molten metal and the plate 17 tends to float in the molten metal as it has a lower specific gravity than said metal.

In the position of the parts shown in full lines in Figs. 1 and 2, as above stated, the plate 17 is held in the bottom of the pot. As the part 8 of the frame with the casing 8<sup>a</sup> is swung about shaft 9, the roller 22 is lifted as indicated by the dotted lines in Fig. 1 and by the arcuate line 25. As the roller is thus raised, the metal in pot 15 raises the plate 17 and through lever 18 pushes down on arm 19. This lowers the roller 22 relative to the casing 8<sup>a</sup> so that the roller in practice is maintained substantially in contact with the flat surface 5<sup>a</sup>, the plate 17 being pushed up in the metal 16 as indicated by the dotted lines in Fig. 2. As the portion of frame 8 swings back to its normal position when permitted by cam 7, the roller 22 rides along the flat surface 5<sup>a</sup> and is pushed upwardly as the portion 8 resumes its normal position. This causes the plate 17 to be pushed down again to the full line position shown in Fig. 2, the metal escaping

around said plate and through the holes 17<sup>a</sup>. The metal in the pot is thus efficiently agitated by the plate 17<sup>a</sup> every time the portion 8 and casing 8<sup>a</sup> are swung for the slug casting operation. The metal in pot 15 is thus kept agitated and uniformly mixed and any dirt therein will be separated from the metal and forced to the top surface thereof. The part 19<sup>b</sup> can be adjusted as desired and connected in any one of the holes in the end of lever 18 to suit the conditions and give the desired movement to the puddler 17.

If any hard object should get under member 17 and prevent it moving to the bottom of pot 15, spring 19<sup>c</sup> will yield and prevent breaking or bending of arm 19. The spring 19<sup>c</sup> is, however, sufficiently stiff not to yield appreciably in the ordinary operation of the machine.

From the above description it is seen that applicant has provided a simple and efficient puddling device for type casting machines. The puddler is automatically operated every time a slug is cast. The metal is thus cleaned of dirt and suitably mixed and agitated without any attention from the operator. In the present device the temperature of metal 16 is kept uniform by suitable control means so that the action of the puddling device is quite uniform. The parts of the device are few and simple and are positive in operation.

The device has been amply demonstrated in actual practice and found to be very successful and efficient.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of applicant's invention, which, generally stated, consists in a device capable of carrying out the objects above set forth, in the novel parts and combination of parts disclosed and defined in the appended claims.

What is claimed is:

1. A type casting machine having in combination, a movable melting pot, a lever pivotally connected to one side of said pot, a puddling member carried by one end of said lever and spaced from the walls of said pot, and means connected to the other end of said lever adapted to be engaged in the movement of said pot for actuating said lever and member.

2. A type casting machine, having in combination a stationary frame, a melting pot movable relatively thereto, a puddling device disposed within said pot and of smaller transverse dimension than the inside of said pot, a member carrying said device and pivoted to said pot and means connected to said member engaging the frame and moved by the relative movement of said pot and frame to operate said puddling device.

3. A type casting machine, having in com-

5 bination, a stationary frame, a melting pot  
movable relatively thereto, a puddling de-  
vice disposed in the metal within said pot,  
means connected to said device adapted to  
engage said frame, said puddling device be-  
ing moved in one direction by the metal in  
said pot and being moved in the other direc-  
tion by said means engaging said frame in  
the relative movement of said pot and frame.  
10 4. The combination of the movable melt-  
ing pot of a type casting machine, of a pud-  
dling device comprising a comparatively flat  
perforated plate disposed in the metal in  
said pot and spaced from the walls of said  
15 pot, said plate having a lever arm fulcrumed  
on said pot, a cam arm carrying a cam roller  
adapted to engage a stationary member and  
connected to said lever, said cam being  
moved by engagement of said roller and sta-  
20 tionary member in the movement of said pot  
to move said plate downward in said pot,  
said plate being movable upward by the met-  
al inset pot, whereby said puddling device is  
oscillated in said metal.  
25 5. A type casting machine having in com-  
bination, a stationary frame, a casing mov-

able relative to said frame, a melting pot  
disposed in said casing, a puddling device in  
said pot carrying a lever fulcrumed on said  
pot and projecting through said casing, a 30  
cam arm connected to said lever and dis-  
posed without the casing, having a cam roll-  
er adapted to engage said stationary frame,  
whereby said puddling device is moved in  
one direction in said pot by relative move- 35  
ment of said casing and frame.

6. A type casing machine having in com-  
bination, the pot adapted to contain molten  
metal, a puddling device of a less area than  
the inside of said pot disposed therein, and 40  
cam controlled means connected to said pud-  
dling device for intermittently moving the  
same through the metal in said pot.

7. A type casting machine having in com-  
bination, a pot adapted to contain molten 45  
metal, a puddling member of less dimension  
in plan than the inside of said pot, and  
means connected to said member for moving  
the same through the metal in said pot.

In testimony whereof I affix my signature.

GEORGE L. CURLE.