W. S. HADAWAY, JR.

HEATER FOR LINOTYPE POTS.

APPLICATION FILED DEC. 23, 1915.

1,321,071.

Patented Nov. 4, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

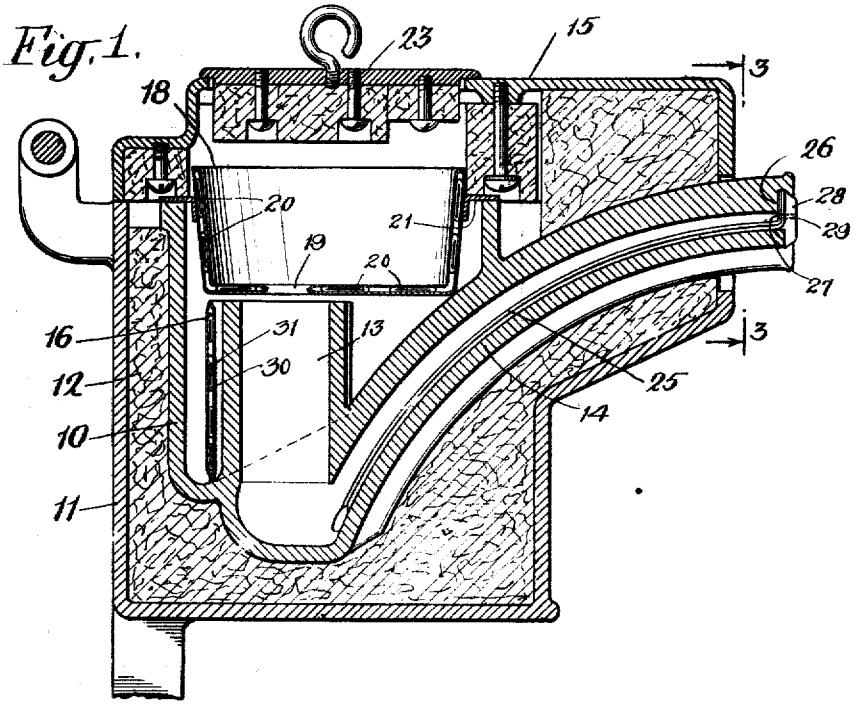


Fig. 2.

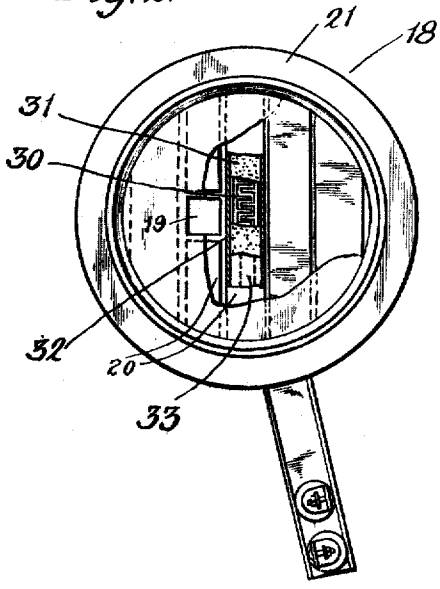
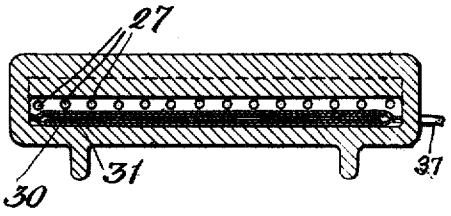


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 1.

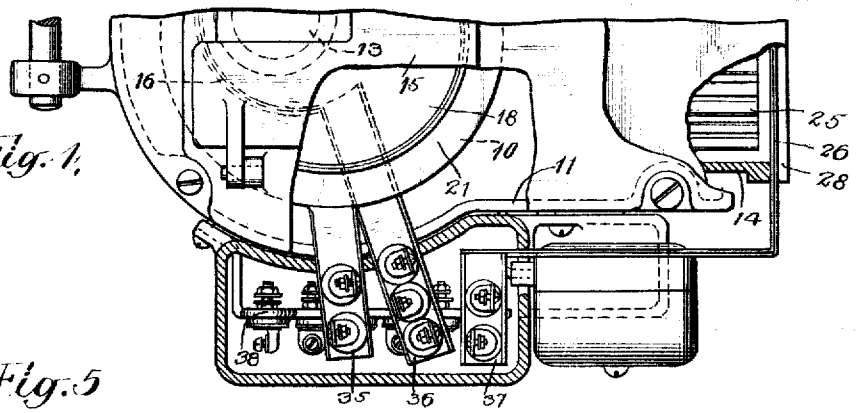


Fig. 5

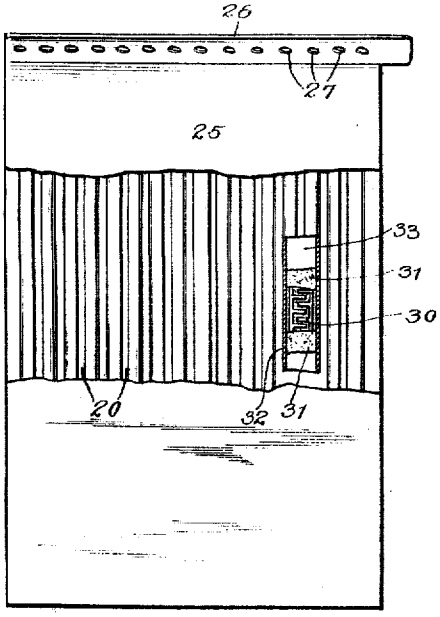


Fig. 6.

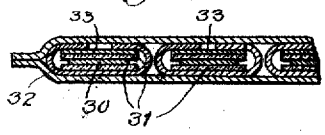
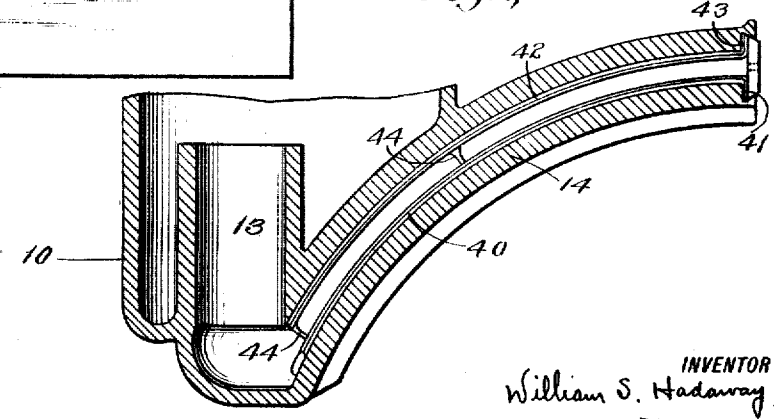


Fig. 7.



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UNITED STATES PATENT OFFICE.

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HEATER FOR LINOTYPE-POTS.

1,321,071. Specification of Letters Patent. Patented Nov. 4, 1919.

Application filed December 23, 1915. Serial No. 68,334.

To all whom it may concern:

Be it known that I, WILLIAM S. HADAWAY, Jr., a citizen of the United States of America, and a resident of New Rochelle, Westchester county, and State of New York, have invented certain new and useful Improvements in Heaters for Linotype-Pots, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to electric heaters and has special reference to the heating of melting pots for linotype machines and machines of like character.

Lintoype pots have hitherto been provided with electric heaters to melt the metal and to keep the metal in a molten condition as it passes through the throat and mouth of the pot. When heaters for the mouth and throat are applied externally, the heat being conducted through the walls of the pot, there is obviously considerable loss of heat and furthermore, the walls of the pot itself are heated and consequently accumulate extraneous matter which is very difficult to remove.

Furthermore, when heaters are relied upon for melting the fresh slugs of metal in the body of the pot, there is sure to be considerable fluctuation in the temperature and variation in the condition of the metal in the pot, depending on the amount of cold metal introduced and the frequency with which it is put in.

By the use of my present invention I have avoided the inherent disadvantages above outlined, by providing a preheater for melting the slugs, and one or more removable internal heaters for the mouth and throat.

One object of my invention is to provide an internal mouth and throat heater for linotype pots that shall be readily removable, practically indestructible and which shall in no wise interfere with the operation of the pot.

Another object is to provide a preheater which may be set into pots of the usual form and which is adapted not only to gradually melt the metal, but furthermore to constitute a hot diaphragm or screen to keep the solid metal slugs out of the body or well of the pot until they are melted.

Another object is to provide a simple and economical means for imparting heat directly to the mouthpiece of a linotype pot.

Other objects and advantages of my invention will be set forth hereinafter, and in order that my invention may be thoroughly understood I will now proceed to describe the same in the following specification and then point out the novel features thereof in appended claims.

Referring to the drawings:

Figure 1 is a transverse sectional elevation of a linotype pot equipped with the heaters of my invention.

Fig. 2 is a plan view of the preheater which is utilized in Fig. 1, and

Fig. 3 is a transverse sectional elevation taken on the line 3—3 of Fig. 1 and showing the internal throat heater.

Fig. 4 is a plan view of the linotype pot with certain of the parts broken away to show the heaters within.

Figs. 5 and 6 are detail views of the throat and mouth heater,

Fig. 6 being drawn to a larger scale.

Fig. 7 is a transverse sectional elevation of a modification of my invention in which two internal throat heaters instead of one, are employed.

In Figs. 1 and 4, 10 represents the body of the linotype pot, and 11 the outer shell with the insulation 12 between the two. The plunger well is indicated at 13; 14 is the throat and 15 is the cover.

In the body of the pot surrounding the well 13 is a heater 16 which is in the form of a segment of a hollow cylinder and preferably comprises insulated resistance elements closely incased in a metallic armor or shell as hereinafter set forth.

Mounted in the opening of the pot above the well is a preheater 18 which, as clearly shown in Fig. 2, is in the form of a dish or receptacle having a hole 19 in its bottom surface and armored electric heating elements 20 in its bottom and side walls. The preheater has a flange 21 which may rest upon the rim of the pot and supports it in the position desired, although some other suitable means may be employed. It may be mounted on the well heater 16 for example. The usual lid 23, provided in the cover 15, permits slugs of metal to be introduced readily to the preheater.

The size and capacity of the preheater may of course be considerably varied from the proportions illustrated, depending upon the requirements of the work. I prefer to make the preheater sufficiently large, allowing it to extend upward outside of the pot if

necessary, to enable the apparatus to be used for relatively long periods without requiring an addition of new metal.

In the throat extending from the bottom of the well to the mouth is an armored heater 25. It is curved to conform to the throat and at its outer end has an upturned flange 26 in which are perforations 27.

The heater 25 is relatively thin and flat so that it occupies a small space within the throat of the linotype pot. At the same time it may be easily removed as it is only held in place by the upturned flange 26.

The flange 26 is an active part of the heater and constitutes an effective, direct and economical means of imparting heat to the mouth piece 28 which is wedged against it. The holes 27 in the heater coincide in position to the usual holes 29 in the mouthpiece.

The arrangement of parts is such that the heater acts in the most effective way in keeping the molten metal at the proper temperature as it passes from the well upwardly through the throat and mouthpiece of the pot, to the cavity of the mold wheel (not shown).

All of the heat generated in both the body and flange of the heater is utilized for its intended purpose so that it is particularly efficient and economical. Furthermore, the walls of the pot are not depended upon to transfer heat to the metal and consequently hardened dross, antimony, and other extraneous matter will not coat the inside walls of the throat. The heater can obviously be removed and cleaned with great facility so that the extraneous matter does no harm.

The metal is forced through the small holes 27 in the upturned flange 26.

The temperature of the metal in the body of the pot is easily maintained substantially constantly by the heater 16 because the solid metal slugs are not dropped into the metal in the pot but are held in the preheater 18. In this dish-like heater they are gradually melted and the molten metal becomes a part of the volume in the body of the pot. The liquid level will usually be maintained slightly above the bottom of the preheater.

The heaters 16, 18 and 25 may be constructed in any suitable manner and I prefer to employ a heater of the so-called "armored" type which is sealed in sheet metal and hence is not injured if molten metal is thrown into contact with it, or when it is immersed in molten metal.

The heater 18 comprises an outer and inner shell formed by two nesting dishes or receptacles welded at their edges, so that the heating elements which are within, are completely protected and sealed. The elements are however, very thin and actually occupy a much less space than is indicated in the drawings. Each heating element preferably comprises a resistance ribbon 30 protected by a mica ribbon or other suitable insulation 31 and laid in a channel formed by metal strips 32 which are welded to one of the shells of the heater. When the insulated element is laid in the channel the edges of the channel are folded down over a reinforcing metal strip 33 and thus the heater is very fully protected and at the same time attached to one shell of the heater. The other shell is pressed firmly against the protected heaters so that a particularly rigid and compact structure is produced.

The details of the heater form no part of my present invention, but I also prefer to utilize a structure similar to that described for the heater 18, for each of the heaters 16 and 25, and the corresponding parts of the heaters are designated by the same reference characters in each case.

The terminal leads 35, 36, and 37 for the several heaters are clearly shown in Fig. 4, and are conveniently arranged for connection with a terminal block 38.

It is particularly important that the metal shall be at the proper temperature as it enters the mold cavity and this is fully cared for in my invention by the direct application of heat to the mouthpiece.

Among the other advantages of my invention, attention is directed to the following:

The electric energy is used to the best advantage.

No special machining of the pot to make close contact as in the case of external heaters, is required. The necessity for clamps for pressing the heater against the surface of the pot is avoided, thereby also rendering the heater readily removable.

Extraneous matter gathers on the heater where it can be readily removed instead of on the inside walls of the pot. The necessity for automatic regulation is avoided although it may be desirable in many cases. Adjustments will of course be made to accommodate the character of the work being done in the type-setting machine.

As shown in Fig. 7, more than one heater may be used in the throat. In this arrangement a heater 40 which has a down-turned flange 41 and a spaced top heater 42 having a flange 43, take the place of the heater 25 of the other figures. The flanges 41 and 43 impart heat to the mouthpiece.

The top heater has projections 44 by which it is held in place, although either or both heaters may have projections or lugs for this purpose.

My invention is obviously not restricted to the use of a preheater of the character shown, or in fact, to the use of any preheater, and the advantages of the internal throat and mouth heater alone will be read-

ily appreciated by those skilled in this art. I therefore intend that only such limitations be imposed as are indicated in the appended claims.

For convenience I have used the term "linotype pot" as representative of any typesetting machine crucible.

What I claim is:

1. An internal heater for linotype pots having a body and a throat or outlet through which molten metal is adapted to be discharged, said heater being formed and adapted to be inserted in the throat or outlet and to impart heat to the molten metal therein without interfering with the flow of metal therethrough.

2. An internal heater for linotype pots having a body and a throat or outlet through which molten metal is adapted to be discharged, said heater being curved to conform to the interior walls of the throat or outlet and adapted to be inserted therein and to impart heat to the molten metal without interfering with the flow of metal therethrough.

3. An electric heater for linotype pots comprising a curved armored electric heater having a flange at its outer end engaging the mouth of the pot and a body shaped to conform to the throat of the heater.

4. An electric heater for linotype pots comprising a thin, armored heater curved to conform to and adapted to extend into the throat of the linotype pot and having an upturned flange at its outer end adapted to engage the mouth of the pot.

5. An electric heater for linotype pots comprising a curved armored electric heater having a perforated flange at its outer end engaging the mouth of the pot and a body shaped to conform to the throat of the heater.

6. An electric heater for linotype pots comprising a thin, armored heater curved to conform to and adapted to extend into the throat of the linotype pot and having an upturned perforated flange at its outer end adapted to engage the mouth of the pot.

7. A heater for linotype pots comprising an electric heater in the form of a dish or receptacle having a perforated bottom and adapted to be suspended in the body of the pot to receive metal slugs, and internal means for heating the metal in the throat of the pot.

8. A heater for linotype pots comprising an electric heater in the form of a dish or receptacle having a perforated bottom and adapted to be suspended in the body of the pot to receive metal slugs, means for imparting heat to the metal in the well of the pot, and internal means for heating the metal in the throat of the pot.

9. A heater for linotype pots comprising an electric heater in the form of a dish or receptacle having a perforated bottom and adapted to be suspended in the body of the pot to receive metal slugs, and a throat heater comprising a thin, armored heater curved to conform to and adapted to extend into the throat of the linotype pot and having an upturned flange at its outer end adapted to engage the mouth of the pot.

10. A heater for linotype pots comprising an electric heater in the form of a dish or receptacle having a perforated bottom and adapted to be suspended in the body of the pot to receive metal slugs, a curved heater in the pot surrounding the well, and comprising a thin, armored heater curved to conform to and adapted to extend into the throat of the linotype pot and having an upturned flange at its outer end adapted to engage the mouth of the pot.

11. A heater for linotype pots comprising a curved body adapted to extend into and heat the metal in the throat of the pot, and a projection adapted to impart heat directly to the mouthpiece of the pot.

12. A heater for linotype pots comprising a curved body adapted to extend into and heat the metal in the throat of the pot, and an up-turned flange adapted to impart heat directly to the mouthpiece of the pot.

13. A heater for linotype pots comprising a curved body adapted to extend into and heat the metal in the throat of the pot, and an upturned flange adapted to be wedged into close contact with the mouth-piece of the pot and to impart heat directly thereto.

14. Heating apparatus for linotype pots comprising a pair of spaced heaters adapted to be inserted in the throat of the pot and to engage the respective surfaces thereof.

15. Heating apparatus for linotype pots comprising a pair of spaced heaters adapted to be inserted in the throat of the pot and forming a lining therefor, at least one of said heaters having means for imparting heat directly to the mouth-piece of the pot.

16. Heating apparatus for linotype pots comprising a pair of spaced heaters adapted to be inserted in the throat of the pot and forming a lining therefor, each of said heaters having an end flange adapted to be wedged into contact with the mouth-piece of the pot and to impart heat directly thereto.

17. The combination with a melting pot having a branch or outlet, of a heater extending within the branch or outlet without preventing the discharge of molten metal therethrough.

18. The combination with a melting pot having a branch or outlet, a removable heater extending within the branch or outlet without obstructing the same and adapted to impart heat to the molten metal as it is discharged therethrough.

19. A flat, relatively thin heater for linotype pots shaped to substantially conform to the interior walls of the throat or outlet of the pot and adapted to be inserted in said throat or outlet.

20. An electric heater for linotype pots adapted to extend into the throat or outlet of the pot, shaped to substantially conform to the interior walls thereof, and embodying means for concentrating heat at the mouth of the throat or outlet.

21. A heater for linotype pots comprising a body adapted to extend into and heat the metal in the throat of the pot, and means for concentrating heat at the outlet of the pot.

22. A heater for linotype pots comprising a body adapted to extend into and heat the metal in the throat of the pot, and means adapted to impart heat directly to the mouth piece of the pot.

23. Heating apparatus for linotype pots comprising a plurality of heaters adapted to be inserted in the throat of the pot and to engage the interior surfaces thereof.

24. Heating apparatus for linotype pots comprising a plurality of heaters adapted to be inserted in the throat of the pot and to engage the interior surfaces thereof, each of said heaters having means for imparting heat directly to the mouth piece of the pot.

25. Heating apparatus for linotype pots comprising a plurality of heaters adapted to be inserted in the throat of the pot and to engage the interior surfaces thereof, each of said heaters having a flange for imparting heat directly to the mouth piece of the pot.

26. A heater for linotype pots having a body adapted to contain molten metal and an outlet through which the molten metal is discharged, said heater comprising a metallic receptacle having an opening from which molten metal is discharged into the body of the pot, the walls of said heater having electric heating elements embedded therein.

27. A heater for linotype pots comprising an electric heater in the form of a dish or receptacle having a perforated bottom and adapted to be suspended in the body of the pot to receive metal slugs.

28. A preheater for linotype pots comprising a receptacle adapted to contain metallic slugs and to extend within the body of the pot, said receptacle having a perforated lower wall to permit molten metal to pass between the receptacle and the body of the pot, and electric heaters for gradually melting the metal in the receptacles.

29. The combination with a linotype pot having a body adapted to contain molten metal and an outlet from which the metal is discharged, a preheater comprising a metal receptacle having electric heaters embedded in its walls, said heater being set in the top of the body melting pot and having discharge openings to constitute a screen for holding solid metal and for permitting molten metal to pass between the receptacle and the body of the pot.

In witness whereof, I have hereunto set my hand this 21 day of December, 1915.

WILLIAM S. HADAWAY, Jr.