

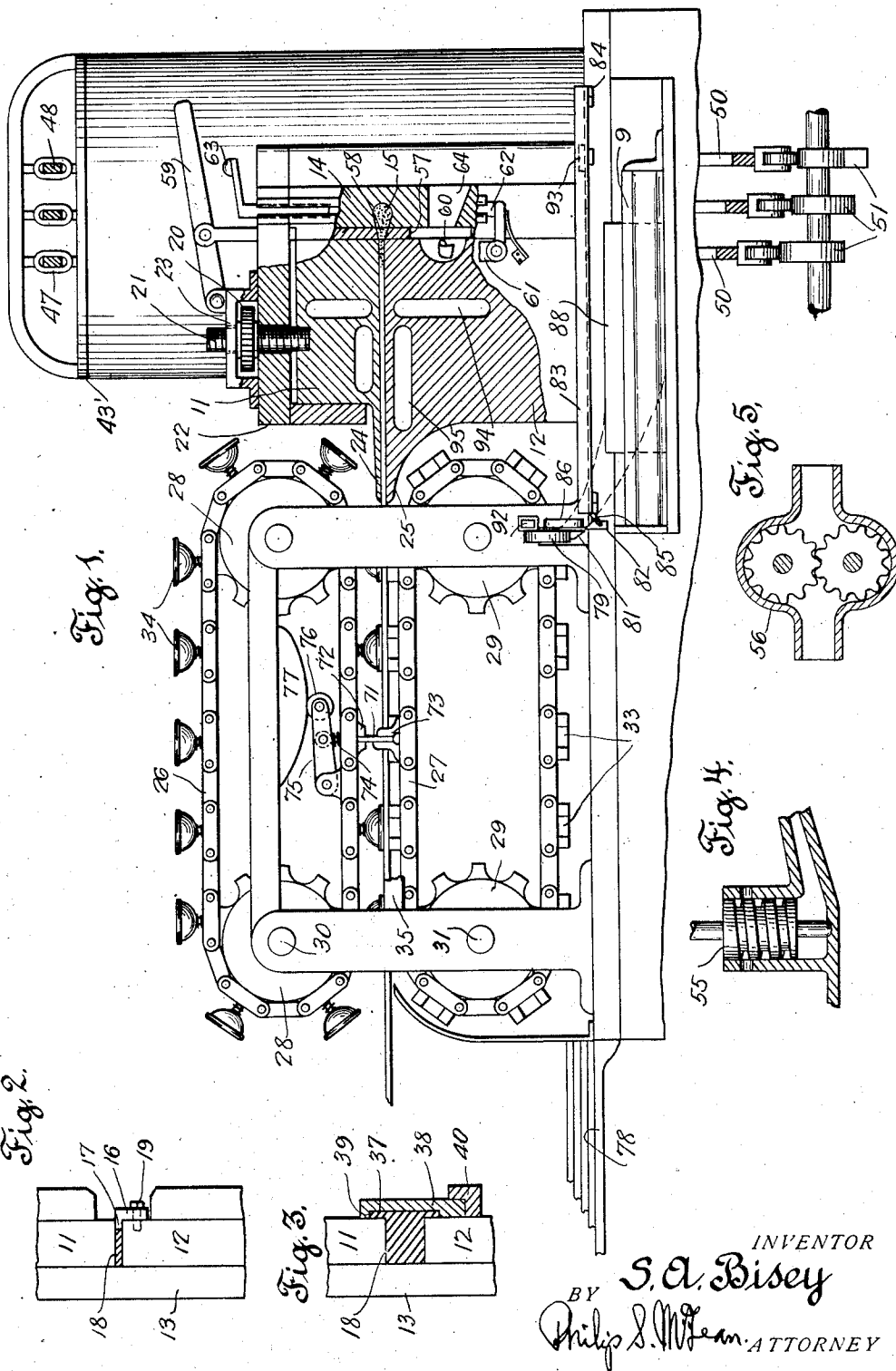
Jan. 5, 1926.

1,568,047

S. A. BISEY

TYPOGRAPHICAL CASTING MACHINE

Filed August 31, 1921 2 Sheets-Sheet 1



INVENTOR

BY *S. A. Bisey*
Philip S. McLean ATTORNEY

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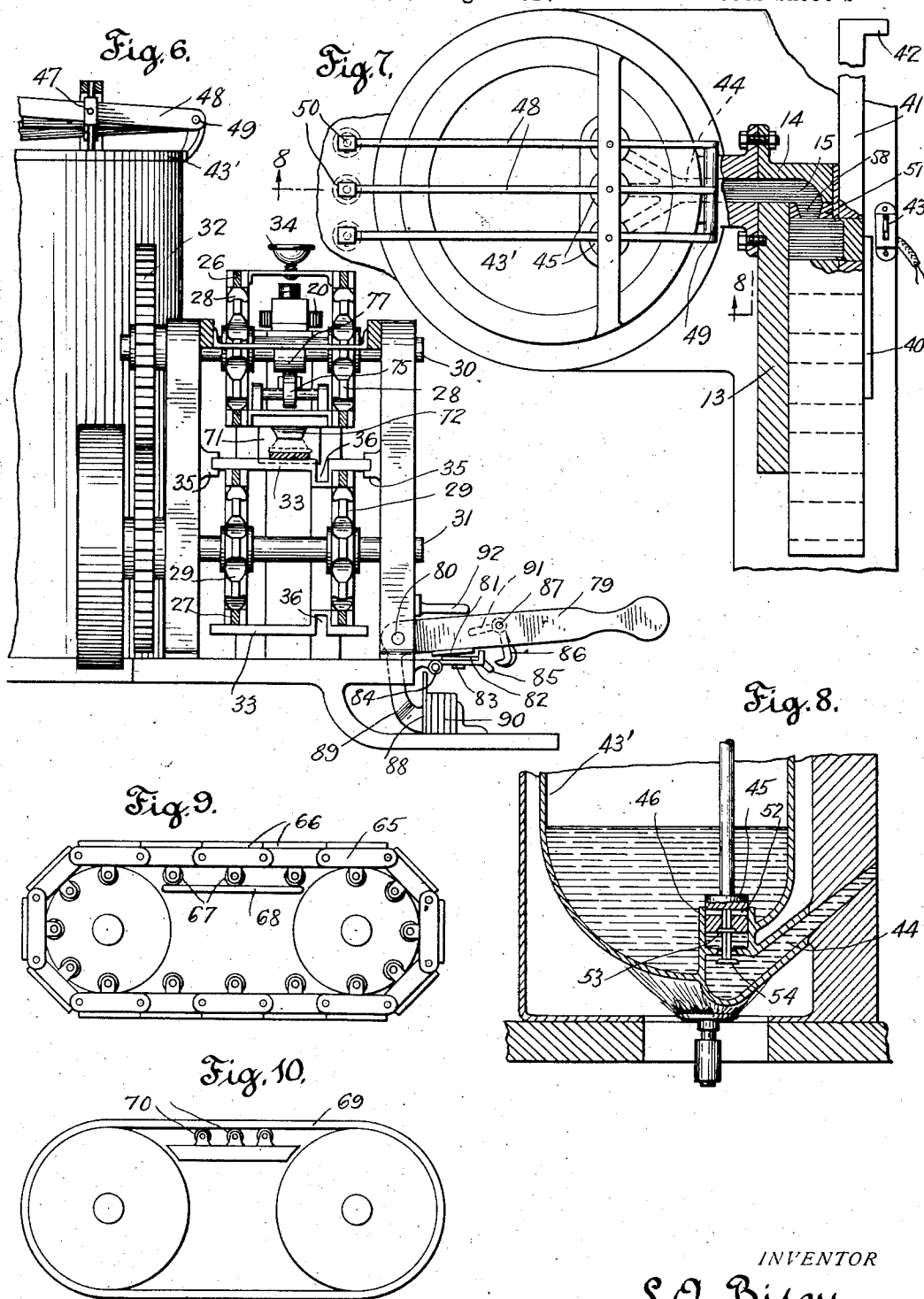
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UNITED STATES PATENT OFFICE.

SUNKER ABAJI BISEY, OF NEW YORK, N. Y.

TYPOGRAPHICAL CASTING MACHINE.

Application filed August 31, 1921. Serial No. 497,229.

To all whom it may concern:

Be it known that I, SUNKER ABAJI BISEY, a subject of the King of Great Britain, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Typographical Casting Machines, of which the following is a specification.

My present invention is a machine for casting leads, rules or slugs of typographical matter and differs from machines of the prior art principally in that the leads, rules or other matter are produced in finished form or a continuous, as distinguished from an intermittent casting operation. This means greater speed and uniformity of product, as well as many other advantages which will appear as the specification proceeds.

In the accompanying drawings illustrating various embodiments of the invention,

Fig. 1 is a broken side elevation of the machine, with the mold shown in section.

Figs. 2 and 3 are end views of the mold with the cast product issuing from the mold shown in section.

Figs. 4 and 5 are sectional views of screw and gear types of pumps for the metal.

Fig. 6 is a part sectional end view of the machine.

Fig. 7 is a part sectional plan view.

Fig. 8 is a cross sectional view on substantially the plane of line 8-8 of Fig. 7.

Figs. 9 and 10 are plan views of forms of continuous mold sides.

The mold, as best shown in Fig. 1, consists of upper and lower relatively adjustable mold blocks 11 and 12, and an inner side wall member 13 having a back or rear wall 14 provided with a nozzle passage 15 for flowing the molten metal into the space thus defined (Fig. 7).

The outer side of this mold channel may be closed by a relatively fixed wall such as I have shown at 16 in Fig. 2. For casting leads this side wall member will have an angular extension 17 projecting in between the top and bottom blocks 11 and 12 to reduce the width of the cast product, which latter is indicated at 18. This outer side wall member may be removable and adjustably held in place as by means of securing screws 19 engaged in seats provided therefor in the bottom mold block.

The upper mold block is shown as adjusted to vary the thickness of the casting by means of a nut 20 (Fig. 1) engaged on a

screw stem 21 fast to the upper mold block, said nut being rotatably held between the top of the framing 22 in which this upper block slides and a bridge or abutment 23. With this construction it will be seen that upon turning the nut 20 the upper mold block will be shifted vertically toward and away from the lower relatively fixed lower block so as to vary the height of the mold channel.

The upper and lower blocks are shown as provided at their exit ends with tapered extensions 24 and 25 forming lips for guiding the solidified product to the drawing out mechanism.

This drawing out mechanism consists in the present disclosure of upper and lower sets of conveyor chains 26 and 27 carried by sprockets 28, 28 and 29, 29. These upper and lower sets of chains are connected to travel in unison as by connecting their supporting shafts 30, 31 at one end with suitable gearing 32.

The cast product is gripped between the cross bars or plates 33 of the lower conveyor and the universally adjustable spring pressed cups 34 of the upper conveyor. The cross bars of the lower chains are shown as guided and supported during the active period of their operation by having their ends engaged in suitable guides 35 of the supporting framing (Fig. 6) and are further shown as recessed at 36 to take the head of typographical matter cast with an "overhang."

In casting type bars or other matter with an overhang such as shown at 37 in Fig. 3 the outer side of the mold channel is closed by a plate 38 grooved or channeled at 39 to provide the chamber for the metal of the overhang.

This mold side is shown as supported in a guide 40 so that it may slide along with the casting. This sliding feature is further illustrated in Fig. 7 where the mold side is in the form of a slidable matrix holder 41, shown as provided with a trip lug 42 to operate a switch 43 for stopping the machine when the cast is completed.

The metal is forced from the melting pot 43' under pressure through a passage 44 to the nozzle. In the first form of the invention illustrated the pressure is supplied by a series of three pistons 45 operating in cylinders 46, said pistons being connected at their upper ends at 47 with links 48 pivoted at 49, said links being reciprocated from

connecting rods 50 connected by the cams 51. These cams are set so as to operate the three pumps in such sequence as to maintain a continuous pressure, sufficient to keep the mold chamber filled during the operation of the machine. The pump pistons are shown equipped with inlets 52 and with check valves 53 as is common in this art and in addition there are shown check valves 54 to prevent the operation of one pump exerting back pressure or suction on the other pumps.

Other forms of continuous feed pump mechanism may be employed such as the screw type of pump shown at 55 in Fig. 4 or the gear type of pump illustrated at 56 in Fig. 5, the main requirement being that the pump mechanism shall be of such a nature as to keep the mold chamber continuously filled with metal while the casting is solidifying and passing out of the forward end of the chamber.

The flow to the mold chamber is controlled in the illustration by a gate valve 57 (Fig. 1) sliding in front of the supply nozzle and having a port 58 for registry therewith. This gate is shown as operated by a pivoted lever 59. When the gate is brought down to shut off the flow of metal, the "sprue" in the port 58 is automatically knocked out by a tappet 60 carried by the bell crank 61 and operated by a slide 62 engaged at its upper end at 63 by the gate handle 59, toward the end of its downward movement. The parts are so timed that the tappet will not be operated until the port has been brought down into registry with the tappet, in which event the ejected metal will fall through a discharge opening 64.

In Fig. 9 I have illustrated an endless chain 65 carrying matrix side sections 66, matching end to end to form a continuously moving closure for the open outer side of the mold. These mold sections are held pressed against the side of the mold by rollers 67 traversing a guide 68.

In Fig. 10 I have shown how a continuous band 69 may be employed as a movable matrix wall, said band being held up to a mold closing position by supporting rollers 70.

The cast product as it is withdrawn from the mold may be automatically cut in predetermined lengths by a knife 71 slidably mounted in guides 72 on the upper chains and adapted to cooperate with guides 73 on the lower chains.

This knife is normally retracted by a spring 74 and is forced down into the cutting position shown in Fig. 1 by a pivoted lever 75 connected with the stem of the knife and carrying a roll 76 riding over a cam 77 on the supporting frame.

The cut sections ejected from the machine may be stacked on a suitable support-

ing shelf or table 78 at the discharge end of the machine.

If it is desired to cut the cast sections in shorter lengths this may be done by means of a lever 79 pivoted at the side of the machine at 80 and carrying a knife 81 to cooperate with the relatively stationary blade 82. This latter blade is carried by the shelf 83 pivoted at 84 and carrying a lug 85 to be engaged by hook 86 pivoted at 87 on the knife lever. On the down stroke of the knife a section of the lead, rule or other matter is cut from the piece supported on the shelf and as the lever is lifted the hook catches the lug 85, tilting the shelf upward so as to drop the cut section thereon down so the slug just cut engages the top of the rear slug and the front face of the packer 88 carried by an arm 89 dependent from the knife lever. On the rear stroke of packer 88 the slug drops between the packer and the rear slug. The cut sections are thus automatically packed in a galley at 90. The hook 86 has a trip arm 91 engaging an abutment 92 so as to be automatically released at a predetermined point in the up stroke of the knife handle.

As an aid to the cutting of the strips in the desired lengths, I have shown a gage 93 on the shelf 83 against which the ends of the strip may be placed. This gage is adjustable for different lengths and a scale may be provided to assist in the adjustment of the same.

My invention, it will be seen, makes it possible to produce leads, rules and slugs of typographical matter in finished form and ready for instant use, rapidly and by a continuous casting operation. These castings, furthermore, are free of any inherent lines of weakness such as are naturally present where fused joints are relied on to connect successively cast sections. The pressure employed in filling the mold chamber and keeping it filled during the casting operations is of great advantage in that it consolidates the metal, forming uniform close-grained castings, assists in ejecting the cast product and prevents the drawing out mechanism from attenuating or otherwise weakening the castings.

To assist in a quick but not too-rapid "setting" of the metal, the exit side of the mold is preferably isolated from the hot-metal end thereof by air gaps 94 and the upper and lower mold blocks may be water-cooled at the exit side of this air insulation, as I have indicated by the water circulation passages 95.

What I claim is:

1. In a machine of the character disclosed, a relatively adjustable mold for casting finished leads, rules or typographical line slugs, in different sizes determined by the adjustment of the mold, said mold being

open at one end, means for forcing the casting metal under substantially continuous pressure into the opposite end of the mold irrespective of the various adjustments of the same and means for continuously withdrawing the cast product from the exit end of the mold.

2. The structure of claim 1 with a slidably supported gate having a sprue opening for controlling the entry of the molten metal.

3. The structure of claim 1 with a gate controlling the entry of molten metal, said gate having a sprue opening, means for operating the gate and means for automatically clearing said sprue opening of cast metal.

4. The structure of claim 1 in which the drawing out mechanism is equipped with means for automatically severing the cast product in desired lengths.

5. The structure of claim 1 in which the drawing out mechanism consists in cooperating traveling clamps continuously traveling in one direction, engaging opposite sides of the cast product and traveling at a rate corresponding to the rate of congealing of the metal.

6. The structure of claim 1 in which the drawing out mechanism comprises endless conveyors at opposite sides of the cast product carrying clamps engaging the same.

7. The structure of claim 1 in which the exit end of the mold is isolated from the hot-metal end thereof by air gaps and in which the exit end furthermore is water-cooled.

8. The structure of claim 1 in which the mold is made up of upper and lower relatively adjustable blocks, a side wall and a back wall having an inlet nozzle opening into the space between the upper and lower blocks.

9. The structure of claim 1 in which the mold is made up of upper and lower relatively adjustable blocks, a side wall, a back wall having an inlet nozzle opening into the space between the upper and lower blocks and an adjustable mold side opposite the side wall aforesaid.

10. The structure of claim 1 in which the mold comprises upper and lower relatively adjustable mold blocks, a fixed side wall and an adjustable side wall.

11. The structure of claim 1 in which the mold comprises upper and lower relatively adjustable mold blocks, a fixed side wall and an adjustable side wall, the latter having an extension entered in between the relatively adjustable blocks.

12. The structure of claim 1 in which the mold comprises upper and lower relatively adjustable mold blocks, a fixed side wall and an adjustable side wall, the latter being supported to slide at the side of the mold.

13. The structure of claim 1 in which the

mold comprises upper and lower relatively adjustable mold blocks, a fixed side wall and an adjustable side wall, the latter being in the form of a closure traveling in conformity with the movement of the casting.

14. The structure of claim 1 in which the drawing out mechanism consists of cooperating carriers and a knife operated thereby for severing the cast product in predetermined lengths.

15. The structure of claim 1 with manually operable means for cutting the cast product in measured lengths.

16. The structure of claim 1 with means for cutting the cast product in desired lengths and for automatically packing the same in a galley.

17. In a machine of the character disclosed, a mold open at one end for delivery of the product therefrom, continuously operating endless conveyers at the delivery end of said mold and disposed in opposed relation to grip the cast product at opposite sides of the same and means for continuously pumping molten metal under positive mechanical force into the opposite end portion of the mold.

18. In a machine of the character disclosed, a mold for casting finished leads, rules or typographical line slugs and open at one end for the continuous discharge of the cast product therefrom, a metal pot connected with the opposite end of the mold and open for charging with type metal at all times so as to enable continuous casting of the product, mechanically operating pressure feed mechanism for forcing the molten metal from the open metal pot into the supply end of the mold and a supporting carrier for the finished product issuing from the exit end of the mold.

19. A combination as in claim 18 with a gate controlling flow of molten metal into the mold, said gate having a sprue opening, means for operating the gate and means for automatically clearing the sprue opening of cast metal.

20. A combination as in claim 18 with a readily accessible cut-off device outside the metal pot for controlling the feed of metal into the mold.

21. A combination as in claim 18 with means for automatically severing the cast product in desired lengths.

22. A combination as in claim 18 with manually operable means for cutting the cast product in desired lengths.

23. A combination as in claim 18 with means for cutting the cast product in desired lengths and for automatically packing the same in a galley.

24. A combination as in claim 18 in which the mold is made up of upper and lower relatively adjustable mold blocks and a side

wall which is adjustably supported with respect to the upper and lower mold blocks.

25. A combination as in claim 18 in which the supporting carrier for the finished product comprises continuously traveling mechanism for withdrawing the product.

26. A combination as in claim 18 in which the mold has relatively adjustable parts

for producing different sizes of molded product and in which the metal feeding connections are operative to supply the mold irrespective of various adjustments of the same. 10

In witness whereof, I have hereunto set my hand this 29th day of August, 1921.

SUNKER ABAJI BISEY.