

No. 676,496.

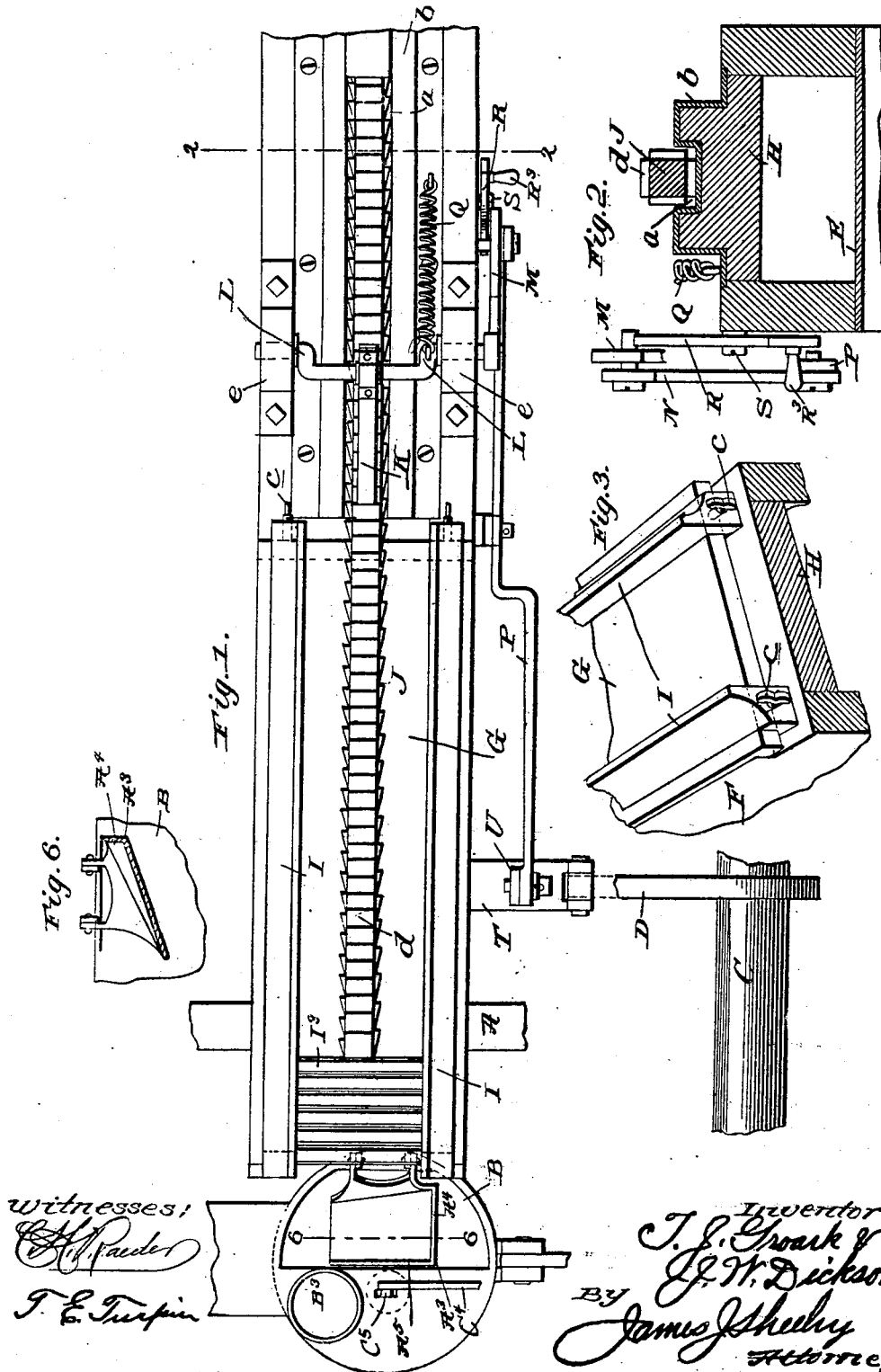
Patented June 18, 1901.

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MECHANISM FOR FEEDING AND MELTING METAL.

(No Model.)

(Application filed Dec. 18, 1900.)

2 Sheets—Sheet 1



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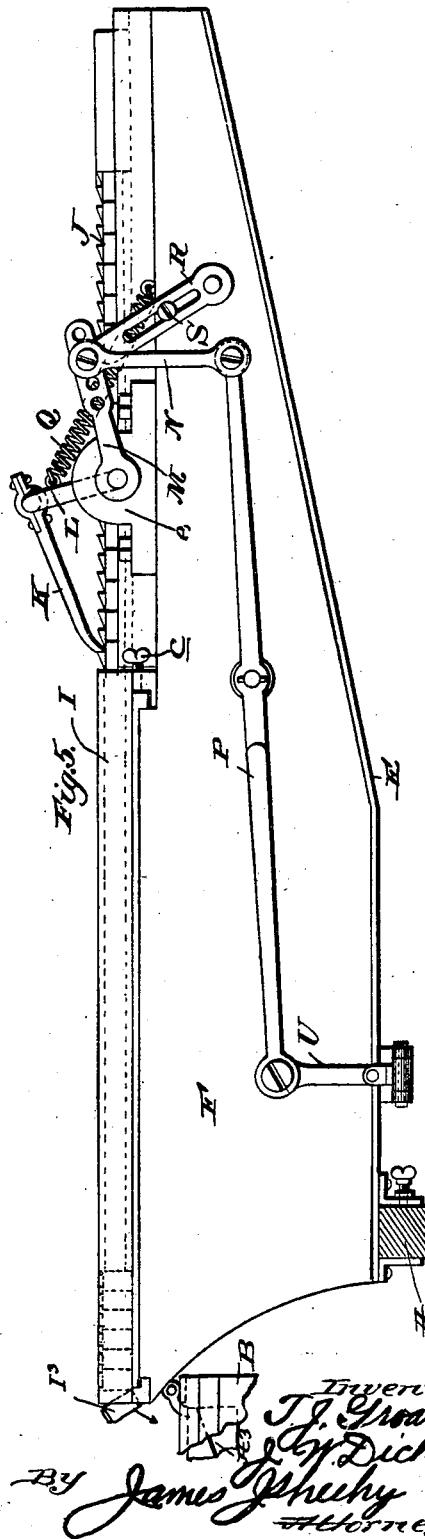
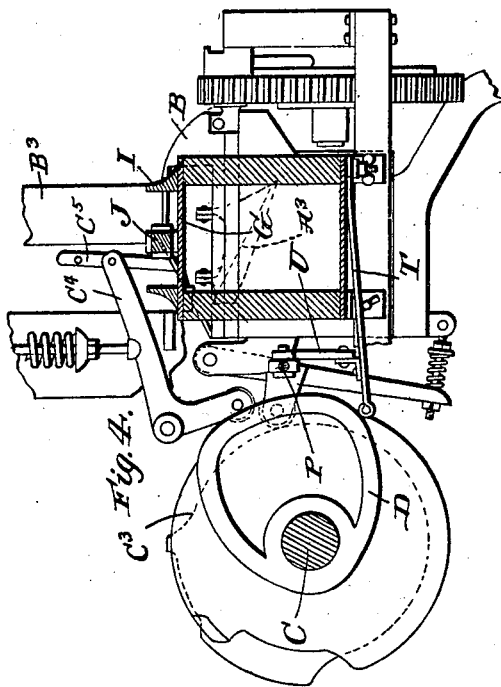
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# UNITED STATES PATENT OFFICE.

THOMAS J. GROARK AND JAMES W. DICKSON, OF LOUISVILLE, KENTUCKY.

## MECHANISM FOR FEEDING AND MELTING METAL.

SPECIFICATION forming part of Letters Patent No. 676,496, dated June 18, 1901.

Application filed December 13, 1900. Serial No. 39,706. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS J. GROARK and JAMES W. DICKSON, citizens of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Mechanism for Feeding and Melting Metal, of which the following is a specification.

Our invention relates to improvements in mechanism for feeding and melting metal, designed more particularly for use in the Mergenthaler linotype-machine, such as represented in Letters Patent No. 436,532, of September 16, 1890; and it has for its general object the provision of advantageous means through the medium of which lines of type after being used are fed gradually to the melting-pot of the machine, thus to maintain a uniform quantity of metal in the pots, which is always heated to the same degree, and thereby insure the casting of lines of uniform solidity, the faces of the type of which do not vary, such uniform lines of type being obviously adapted to be used for book and other fine work and all calculated to withstand a large number of impressions.

When an operator or an attendant is depended on to place pigs or billets of type-metal in the melting-pot of a type-casting machine at intervals, the supply of metal in the pot frequently gets very low, with the result that the lines cast are porous and light and not calculated to withstand a large number of impressions. Then when the operator places two or three pigs in the pot the heated metal is chilled, and in consequence the lines cast are very solid. Because of the difference in solidity between the lines cast when the supply of metal in the pot is low and those cast immediately subsequent to the placing of pigs in the pot the faces of the type of the different lines vary, which unfits the said lines for use in fine work. Our improvements gradually replenish the supply of metal in the melting-pot as metal is taken therefrom to be cast into lines of type, and consequently maintain a uniform supply of metal in the pot and obviate the difficulties mentioned in the foregoing. Moreover, they are entirely automatic in their action, the operator having but to place a number of used

lines of type in position at required intervals.

With the foregoing in mind our invention will be fully understood from the following description and claims when taken in conjunction with the accompanying drawings, in which—

Figure 1 is a plan view illustrating our improvements as connected to the main frame of a Mergenthaler linotype-machine and arranged in proper operative position with relation to the melting-pot thereof. Fig. 2 is a transverse section taken in the plane indicated by the broken line 2 2 of Fig. 1. Fig. 3 is a sectional perspective view illustrating the rear end of the magazine in which the used lines of type are placed precedent to being discharged into the melting-pot. Fig. 4 is a transverse section taken through said magazine and illustrating the shaft from which the usual pump of the melting-pot is operated and the driving connection between said shaft and the pusher or follower of our improvements. Fig. 5 is an elevation of that side of our improved mechanism adjacent to the said shaft, and Fig. 6 is a transverse section taken on broken line 6 6 of Fig. 1.

In the said drawings similar letters of reference designate corresponding parts in all of the views, referring to which—

A is a portion of the main or heavy frame of a Mergenthaler linotype-machine.

B is the melting-pot of the machine, provided with the usual pipe B<sup>3</sup>.

C is the shaft, from which the pump of the melting-pot is operated after the usual manner through the medium of a cam C<sup>3</sup> on the shaft and a bell-crank lever C<sup>4</sup>, arranged to be engaged by said cam and connected to the rod C<sup>5</sup> of the pump-piston, (see Fig. 4,) and D is another cam on said shaft.

The parts shown in Fig. 4 and not herein referred to simply constitute elements of the ordinary Mergenthaler linotype-machine and do not form any part of our invention.

E is the main frame of our improved mechanism. This frame is disposed as shown with reference to the melting-pot and is arranged on and fixedly connected to the frame portion A, as best shown in Fig. 5. In the preferred embodiment of the invention it com-

prises side walls F, which may be of any suitable material, a horizontal wall G, preferably of brass, interposed between and connected to the upper edges of the forward portions of the side walls, and a thick horizontal wall H, which is interposed between and connected to the side walls in rear of the brass wall G, as best shown in Fig. 2, and is provided in its upper side with a longitudinal central groove *a* and has said upper side covered by sheet metal *b*. The horizontal wall G is of about the proportional length illustrated, and, in conjunction with side bars I, of brass or other suitable material, it forms a magazine for the reception of used lines of type I<sup>3</sup>, the said lines being designed to be arranged transversely and side by side in the magazine, after the manner shown in Fig. 1. The side bars I of the magazine are adjustable laterally on the wall G and are adapted to be adjustably fixed through the medium of set-screws *c*, arranged to engage the rear and comparatively thick end of the wall G, after the manner best shown in Fig. 3. By virtue of this construction the proximate faces of the bars I may be adjustably fixed at various distances apart and the magazine adapted to snugly receive lines of type of different lengths.

Arranged in and guided by the groove *a* in the wall H of frame F is a rectilinearly-movable pusher or follower for advancing the lines of type in the magazine and ejecting said lines of type one by one from said magazine. The said pusher or follower, which is designated by J, is designed to bear against the rear line of type of the series in the magazine and also to be moved forwardly step by step such a distance as to cause the foremost line of type to drop from the forward end of the magazine into the melting-pot incident to each forward movement of the pusher or follower. The pusher or follower is in the preferred embodiment of the invention of rectangular form in cross-section and is provided on its four sides with four different sizes of beveled teeth *d*, this in order to adapt it to properly advance lines of type of different sizes in and eject the same from the magazine. As shown in Figs. 1 and 5, the pusher or follower is arranged to advance and eject lines of type of the greatest thickness that it is adapted to handle, and when lines of type of a less thickness are to be handled it is simply turned in the groove *a* to present the teeth corresponding in length to the thickness of the latter lines of type to the pawl K, through the medium of which it is advanced step by step.

As best shown in Figs. 1 and 5, the pawl K is pivotally connected to a crank L, disposed transversely of and journaled at its ends in bearings *e* on the frame E. This crank L is provided at one end with an arm M, which is apertured, as shown, or otherwise adapted for the adjustable connection of a link N, interposed between it and one end of a lever P,

fulcrumed at an intermediate point of its length on one side wall F of the main frame. A spring Q is interposed between and connected to the crank L and the main frame, and a stop R is arranged on said frame below and in a position to be engaged by the arm M, so as to limit the rearward movement of said arm M and crank L under the action of said spring Q. From this it follows that when the lever P is rocked the pawl K, operating in conjunction with the teeth of the pusher or follower presented to it, will advance said pusher or follower step by step, and also that each forward movement of the pusher or follower will correspond in length to the length of the teeth presented to the pawl. The stop R is preferably in the form of a slotted bar provided with a handle R<sup>3</sup> and is adjustably connected to a side wall F of the frame by set-screw S, which takes through its slot, as shown. From this it follows that the said stop may be adjusted and adjustably fixed so as to limit the downward movement of arm M, and thereby regulate the throw of the pawl K and suit said pawl to the different sizes of teeth presented to it.

T is a spring-bar connected to the frame E at the under side thereof and having one of its ends arranged to be engaged by the cam D, before mentioned, and U is a link interposed between and connecting said spring-bar and the arm of the lever P opposite to that to which the link N is connected. The cam D, bar T, link U, lever P, link N, arm M, crank L, and pawl K constitute the driving connection intermediate of the shaft C and pusher or follower J, which we prefer to employ for actuating said pusher or follower.

The cam D is so timed that it makes one revolution coincident with the casting of each line of type. With this understanding it will be appreciated that our improved mechanism is adapted to maintain a uniform quantity of metal in the melting-pot, for it will be seen that incident to each revolution of the cam the spring-bar T is depressed, the lever P and crank L are rocked, and the pusher or follower J moved forwardly through the medium of the pawl K to discharge the foremost line of type from the magazine into the melting-pot, after the manner illustrated at the left of Fig. 5. When the bar T is permitted by the cam D to resume its normal position, the spring Q operates to draw the pawl K back and into engagement with the tooth in rear of that previously engaged by the pawl. When the supply of used lines of type in the magazine is almost depleted, the operator has but to raise the pawl K and move the pusher or follower rearwardly and then place a fresh supply of lines of type in the magazine and move the pusher or follower forwardly until it bears against the rear line of type.

A<sup>3</sup> (see Figs. 1 and 6) is a chute which is arranged to receive lines of type from the magazine G or heavy billets from the hand of

the attendant and discharge the same gently into the melting-pot, this with a view of preventing splashing of the molten metal. The said chute is preferably made of spring-brass and connected in a hinged manner to the lugs to which the cover of the melting-pot is ordinarily connected. It rests within the pot with its lower end adjacent to or slightly below the surface of the molten metal and is inclined downwardly from its point of connection to the pot and also laterally, as best shown in Fig. 6. At its upper side and lower end it has flanges A<sup>4</sup> A<sup>5</sup>, respectively, the latter having for its purpose to prevent the lines or billets from dropping on the well in the pot.

It will be appreciated from the foregoing that our improvements are calculated to automatically maintain a uniform quantity of metal in the melting-pot B with a view of insuring the casting of lines of type of uniform solidity, which is a highly-important advantage when the type or lines of type are to be used for book and other fine work. It will also be appreciated that by virtue of our improvements the conversion of used lines of type into new lines of type is materially simplified. This will be more apparent when it is remembered that especially in bookwork the prevailing mode is to melt the used lines of type and cast the metal into pigs or billets, which latter are designed to be placed in the melting-pot by hand, after the manner before described.

While our improvements are designed more particularly for the Mergenthaler linotype-machine, we desire it distinctly understood that they may be embodied in or used in conjunction with other kinds of linotype-machines and casting-machines.

We have entered into a detail description of the construction and relative arrangement of the parts of our improved mechanism in order to impart a full, clear, and exact understanding of the same. We do not desire, however, to be understood as confining ourselves to such specific construction and arrangement of parts, as such changes or modifications may be made in practice as fairly fall within the scope of our claims.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination of a melting-pot, a magazine for bars of metal, and means for advancing the bars of metal step by step in the magazine and ejecting them one by one therefrom, comprising a slidable presser or follower, a device for moving the same, and means for actuating the device; the said presser or follower being adjustable with respect to the device for moving the same, and having sets of devices for the engagement of the moving device, and also having the devices of one set arranged at a certain distance apart and the devices of the other set or sets arranged a greater or less distance apart than the devices of the first-named set.

2. In a mechanism for feeding and melting metal, the combination of a melting-pot, a magazine for lines of type arranged to discharge into the melting-pot, a ratchet mechanism for advancing the lines of type step by step in the magazine and ejecting them one by one therefrom; said mechanism comprising a rectilinearly-movable bar, a pawl, a crank carrying the pawl and having an arm, a stop for limiting the back movement of said arm, and a spring for returning the pawl to its normal position subsequent to an operation thereof, and means for moving the arm of the crank.

3. The combination of a magazine for lines of type, and ratchet mechanism for advancing the lines of type step by step in the magazine; the said ratchet mechanism comprising an adjustable presser or follower having sets of different-sized teeth, a pawl for engaging said teeth, and means for actuating the pawl.

4. The combination of a magazine for lines of type, a guideway arranged in rear thereof, and ratchet mechanism for advancing the lines of type step by step in the magazine; the said ratchet mechanism comprising a bar movable in the guideway and having teeth of different sizes on its sides, a pawl for engaging said teeth, and suitable means for actuating the pawl.

5. In mechanism for feeding and melting metal, the combination of a melting-pot, a shaft having a cam, a driving connection between said shaft and the pump of the melting-pot, a magazine for lines of type arranged to discharge into the melting-pot, a ratchet mechanism for advancing the lines of type step by step in the magazine and ejecting them one by one therefrom; said mechanism comprising a bar, a pawl, a crank carrying the pawl and having an arm, a spring for returning the pawl to its normal position subsequent to an operation thereof, a tappet arranged to be engaged by the cam on the shaft, and a connection between said tappet and the arm of the crank.

6. In mechanism for feeding and melting metal, the combination of a melting-pot, a shaft having a cam, a driving connection between said shaft and the pump of the melting-pot, a magazine for lines of type arranged to discharge into the melting-pot, a guideway arranged in rear of the magazine, a ratchet mechanism for advancing the lines of type step by step in the magazine and ejecting them one by one therefrom; said mechanism comprising a reversible bar having teeth of different sizes on its sides, and movable in the guideway, a pawl, a crank carrying the pawl and having an arm, an adjustable stop for limiting the back movement of said arm, and a spring for returning the pawl to its normal position subsequent to an operation thereof, and a driving connection intermediate of the cam on the shaft and the arm of the crank.

7. In a mechanism for feeding and melting metal, the combination of a melting-pot, a magazine for lines of type arranged to discharge into the melting-pot, a ratchet mechanism for advancing the lines of type step by step in the magazine and ejecting them one by one therefrom; said mechanism comprising a rectilinearly-movable, reversible bar having teeth of different sizes on its sides, a pawl, a movable pawl-carrying device, means for actuating said pawl-carrying device, an adjustable stop for limiting the return movement of the pawl-carrying device, and a spring for returning said device to its normal position.

8. In a mechanism for feeding and melting metal, the combination of a melting-pot, a magazine for lines of type arranged to discharge into the melting-pot and having an adjustable side wall, a guideway arranged in rear of the magazine, a rectilinearly-movable presser or follower arranged in the guideway

and adapted to advance the lines of type in the magazine and eject them therefrom, and means for moving said presser or follower.

9. In a mechanism for feeding and melting metal, the combination of a melting-pot, a magazine for lines of type arranged to discharge into the melting-pot, means for advancing lines of type in the magazine and ejecting them therefrom, and a chute arranged within the pot in a position to receive from the magazine, and connected to said pot and having its lower end adapted to rest adjacent to the surface of the molten metal in the pot.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

THOMAS J. GROARK.  
JAMES W. DICKSON.

Witnesses:

JAMES H. WATSON,  
CHARLES H. SCHUH.