J. W. GRAHAM.

TYPOGRAPHICAL OR SLUG CASTING MACHINE.

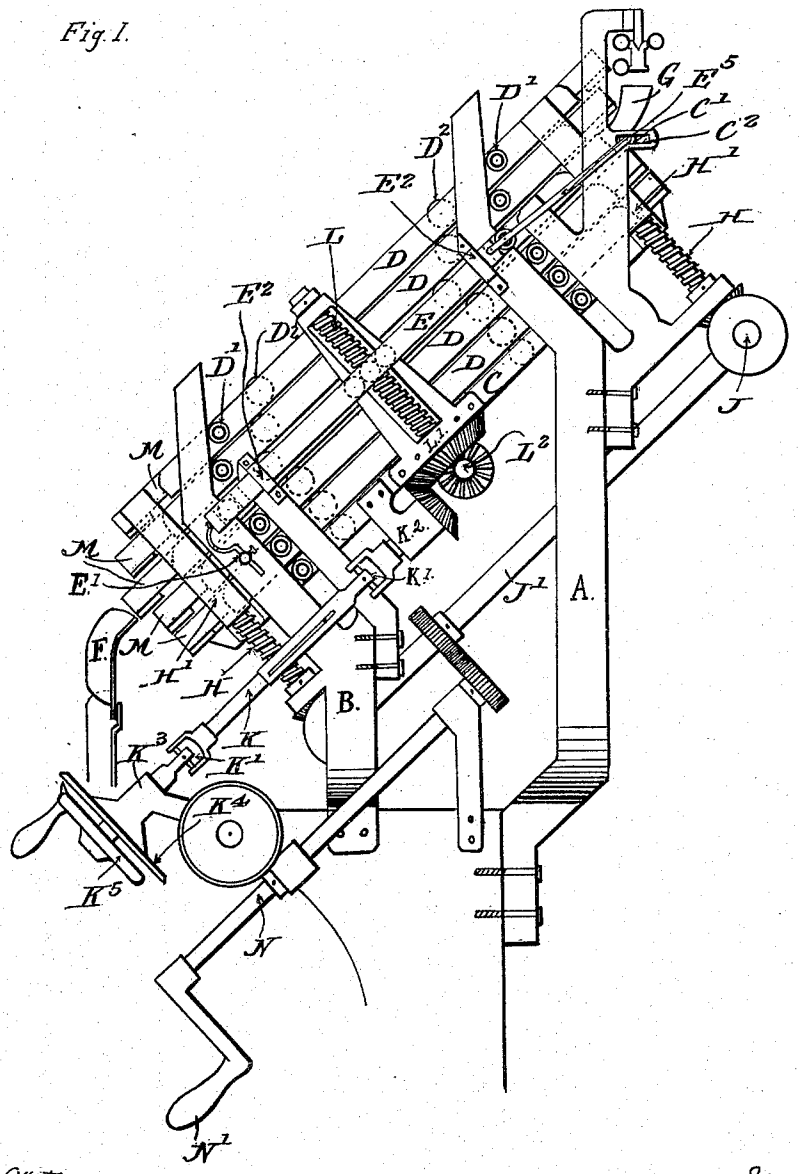
APPLICATION FILED JULY 19, 1915.

1,226,205.

Patented May 15, 1917.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

D. F. Tracey.

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4 SHEETS—SHEET 2.

Fig. 2.

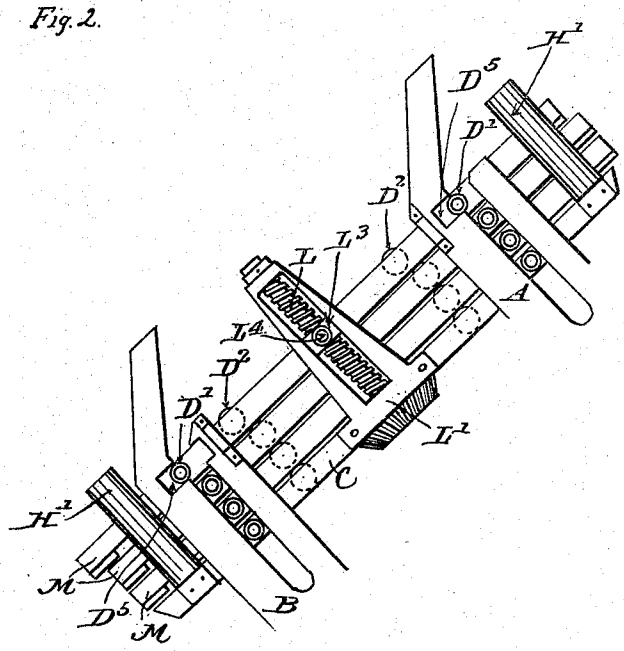


Fig. 3.

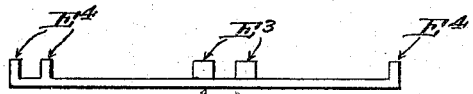
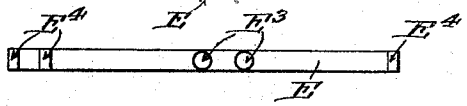


Fig. 3. A.



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4 SHEETS—SHEET 3.

Fig. 4.

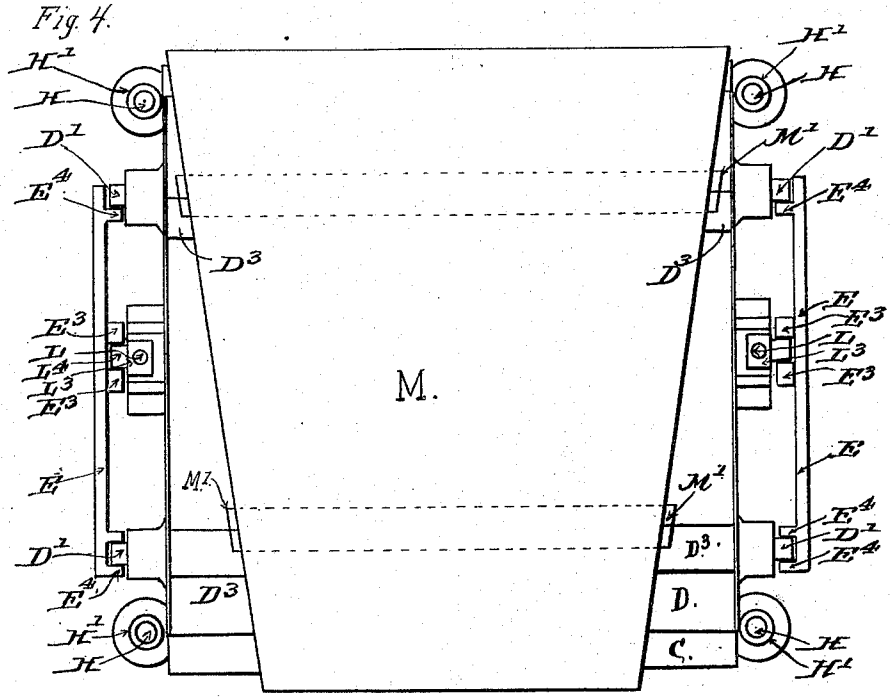


Fig. 5.

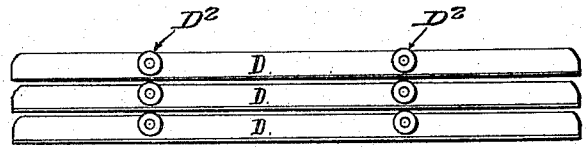


Fig. 6.

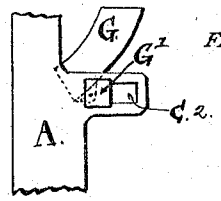
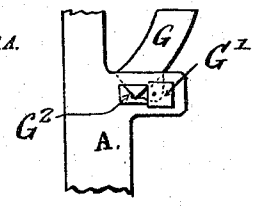


Fig. 6.A.



Witnesses

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4 SHEETS—SHEET 4.

Fig. 7.

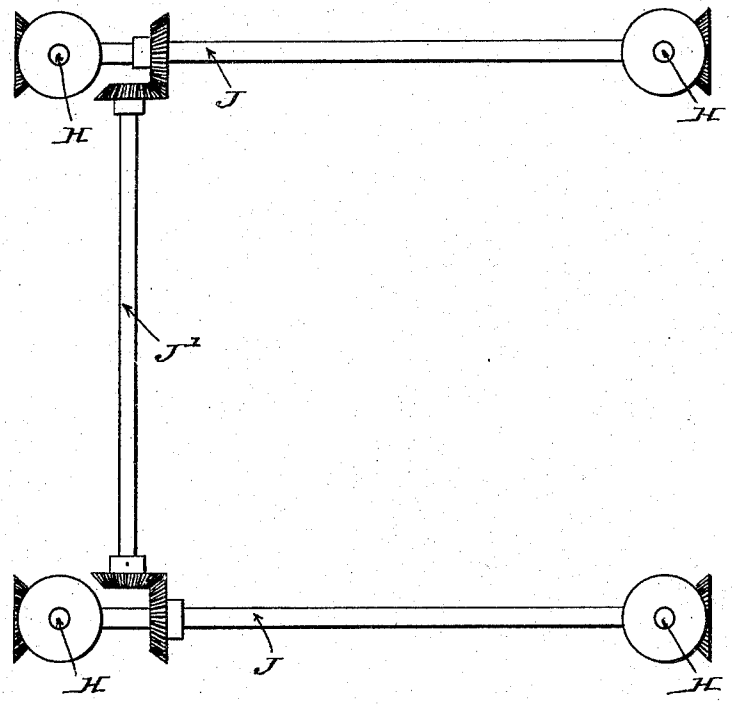
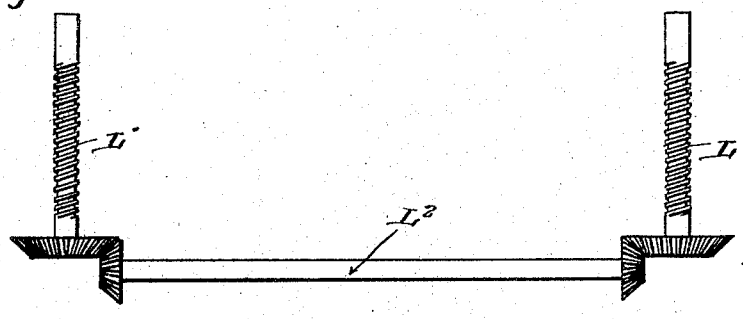


Fig. 8.



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J. W. Graham

UNITED STATES PATENT OFFICE.

JOHN W. GRAHAM, OF HINTON, WEST VIRGINIA.

TYPOGRAPHICAL OR SLUG-CASTING MACHINE.

1,226,205. Specification of Letters Patent. Patented May 15, 1917.

Application filed July 19, 1915. Serial No. 40,804.

To all whom it may concern:

Be it known that I, JOHN W. GRAHAM, a citizen of the United States, residing at Hinton, in the county of Summers and State of West Virginia, have invented certain new and useful Improvements in Typographical or Slug-Casting Machines, of which the following is a specification.

My invention relates to typographical machines such as linotypes of the original construction, wherein circulating matrices are released from a magazine in the order in which their characters are to appear in print, and then assembled in line, together with expanding spacers, the composed line brought in contact with the face of a mold, the mold filled with molten metal to form a line of type or slug against the face of the matrices, which produce the type characters thereon, and the matrices thereafter returned to the magazine from which they were originally drawn.

More particularly it relates to that class of machines having a series of magazines, in connection with means whereby any magazine of the series may be brought into operative position, and wherein the magazines are removable and interchangeable.

My invention is embodied in the new and novel construction of the frame which supports and guides the magazines up and down on their line of travel, and in the automatic locking device, and particularly in the feature of the locking device, whereby the magazine in operative position when locked is moved forward, and wherein the guide rollers D^1 are engaged in slots provided in the arms A and B, and the further feature that when the lock operating roller L^4 is moved to any magazine which is desired to be next brought into operative position, that the magazine already in operative position is automatically unlocked and thrown back, so that the guide rollers are disengaged from the slots, and the magazines are free to be moved up or down as desired, and whereby when the dial is set to change from the magazine in operative position, to any other magazine, and the series of magazines is then raised and lowered as desired, the magazine which is set to come in operative position moves forward and is locked in position automatically. My invention also covers the feature whereby the entrance channel slides outward automatically when the magazine is unlocked. The entrance channel is also hinged to the block on which it slides, and may be turned back by hand at any time without interfering with the lock, but this last feature is no part of this invention.

In the accompanying drawings I have shown my invention as applied to a linotype machine, but obviously it may be applied to other machines, and many changes and variations could be made therein without departing from the spirit or principle of this invention, and I wish it understood that I do not limit myself to any form or embodiment except in so far as such form or embodiment is specified in the claims.

Referring to the drawings, Figure 1 is a side view of a portion of a linotype machine having my invention applied thereto. Fig. 2 shows a side view of a portion of Fig. 1 with the lock operating bar E, removed. Figs. 3 and 3^A are views at right angles showing the lock operating bar. Fig. 4 shows a top view of a magazine resting in its rack, and also the locking mechanism. Fig. 5 is a side view of the racks showing how each rack supports the rack above by its rollers D^2. Fig. 6 and Fig. 6^A show the channel entrance in and out of operative position. Fig. 7 shows part of the mechanism for raising and lowering the magazines. Fig. 8 shows the screws to raise and lower the lock operating rollers, and the shaft connecting the two screws.

Referring to Fig. 1,

A shows the main supporting arm which is forked, one fork protruding upward on each side of the magazines, near their rear ends.

B shows a forked arm made very much the same and doing substantially the same duty, as the arm A, but placed near the frontal end of the magazines. Both arms are slotted to receive the guide rollers D^1 on the racks.

C is the base upon which the magazines and their racks rest.

D shows the racks which house the magazines.

D^1 shows the guide rollers on the racks D.

D^2 shows the supporting rollers on the racks D.

E shows the bar which operates the locking device.

E^1 shows the spring which holds the locking bar back out of operating position.

E^5 is the connecting rod between the lock bar E and the channel entrance G.

F shows the escapement channel.

G shows the entrance channel.

G^1 shows the block to which the entrance channel is hinged.

G^2 shows the slides in which the blocks G^1 work.

H shows the screws to raise and lower the magazines.

H^1 shows the nuts which engage the screws to raise and lower the magazines.

J shows the cross shafts which connect each pair of the screws H.

J^1 shows the shaft which connects the two cross shafts J.

K shows the shaft used to set the locking device; this shaft is telescoped, one part being hollow to receive the other part, and fitted with a slot to engage the key on the inside section so that the shaft can shorten and lengthen as the magazines move up or down from the center.

K^1 shows the joints in the shaft K to allow it to bend.

K^2 shows a bearing which houses the shaft K at its rear end.

K^3 shows a bearing which houses the shaft K at its frontal end.

K^4 shows a dial affixed to the bearing K^3.

K^5 shows a hand wheel on the shaft K, having on it a finger used to designate the number of the magazine, which is set to be brought into operative position.

L shows a screw to raise and lower the lock operating roller L^4 (shown also in Fig. 2).

L^1 shows the casting which houses the screws L, showing the cross shaft which connects the two screws.

L^3 shows the blocks which engage the screws L, and have on them the operating rollers L^4.

M shows a magazine.

N shows a shaft for raising and lowering the magazine.

N^1 shows a crank on the shaft N.

In operating the machine Fig. 1 shows the central magazine locked in position. The magazines are numbered, preferably from the top; in this instance 1, 2, 3, 4, and 5, and the wheel K^5 is so geared to the screw L that $\frac{1}{5}$ of a revolution of the shaft K will turn the screws L sufficiently to move the block with its attached roller L^4 a distance equal to the distance from the center of one rack to the center of the next rack. The dial K^4 is rigidly affixed to the bearing K^3 which supports the frontal end of the shaft K. The hand wheel K^5 on the shaft K has attached to it a pointer or finger; the said dial is graduated to suit the number of magazines in this instance five; therefore the dial is numbered preferably 1, 2, 3, 4, 5. In Fig. 1 the central magazine No. 3 is in operative position; to illustrate, we will assume that it is desirable to bring the lower magazine No. 5 to operative position. To do this the hand wheel K^5 is turned until the finger points to the Fig. 5 on the dial. The shaft K is connected to the screw L on the side of the magazines by bevel gears and these gears are so proportioned that the said turn of the hand wheel K operates the said screw sufficiently to bring the roller L^4 down to the center of the lower magazine No. 5. The roller L^4 is affixed to the block L^3 which block is in the form of a threaded nut, the thread of which engages the screw L. When the block L^3 with its connected roller L^4 is lowered as above stated it allows the spring E′ to throw the bar E back and disengages the guide rollers D^1 from the notches in the arms. The crank N^1 on the shaft N is now turned and the magazines raised. When the lower magazine No. 5 is about to come into operative position the roller L^4 which is standing central of this magazine and which moves upward with the series of magazines, engages the stationary rollers E^3 on the bar E, Fig. 1, forcing the bar forward and locking the desired magazine No. 5 into the notches provided in the guide arms. The roller L^4 can be brought to rest at any desired magazine and the said magazine automatically locked in operative position as above illustrated. The entrance channel G is moved automatically in and out of operative position by means of the connecting rod E^5. The arms A and B are made slotted so as to receive the guide rollers D^1 and guide the racks in their travel. The arms are bent back at a point above the operative position so as to guide the uppermost magazines back out of the way of the operator.

Having described my invention, its construction and operation, what I claim and desire to secure by Letters Patent of the United States, is as follows:

1. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers on said racks, arms to engage the guide rollers, there being notches in the said arms to receive the guide rollers of the magazine to be locked in operative position.

2. In a typographical machine the combination of a plurality of removable magazines, racks therefor; guide rollers for said racks, arms to receive the guide rollers, there being notches in the said arms for the purpose specified, and operating bars made with projections extending inward to engage the

guide rollers of the magazines in operative position.

3. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers for said racks, arms to receive the guide rollers, there being notches in said slotted arms, operating bars, projections on the said operating bars, rollers on the said operating bars, a screw mechanism passing up each side of the series of magazines, blocks on the said screws, rollers on the said blocks and means to engage the rollers on the bars with the rollers on the screws.

4. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers on said racks, arms to receive the guide rollers, there being notches in the said arms, lock operating bars, projections on the said bars, a screw mechanism passing up each side of the series of magazines, and blocks movable up and down on said screws coöperating with the projections on said bars.

5. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers on said racks, arms, there being notches in the said arms, lock operating bars, projections on the said bars, screws passing up the sides of the series of magazines, blocks movable up and down on said screws, and a roller affixed to each of the said blocks coöperating with the projections on said bars.

6. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers on said racks, arms, there being notches in the said arms, lock operating bars, projections on the said bars, screws passing up the sides of the series of magazines, blocks movable on the said screws, rollers affixed to the said blocks coöperating with the projections on said bars, and means whereby the screws can be operated simultaneously in either direction.

7. In a typographical machine the combination of a plurality of removable magazines, racks to house the said magazines, guide rollers on the said racks, arms, there being notches in the said arms, lock operating bars, projections on the said bars, screws passing up the sides of the series of magazines, blocks movable on the said screws, rollers affixed to the said blocks coöperating with the projections on said bars, a hand wheel to operate the said screws simultaneously, a finger on the said hand wheel, and a dial graduated to show where to set the finger so as to bring the said rollers to the proper point to automatically lock any desired magazine in position.

8. In a typographical machine the combination of a plurality of removable magazines, racks to house the said magazines, guide rollers affixed to said racks, arms, there being notches in the said arms, screws passing up the sides of the series of magazines, threaded blocks on the said screws, operating rollers affixed to the said blocks, lock operating bars, projections on the said bars, and rollers on the said operating bars to engage the operating rollers on the blocks.

9. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers on said racks, arms, there being notches in the said arms, lock operating bars, projections on the said operating bars to engage the operating rollers on the screws, and springs to force the locking bars back to free the guide rollers from the notches in the arms, automatically, and a dial to show the position of the operating rollers on the screws, relative to the magazines.

10. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers on said racks, arms, there being notches in the said arms, lock bars, an entrance channel movable into and out of operative position, and a slide in which the entrance channel moves.

11. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers on said racks, arms, there being notches in the said arms, lock bars, an entrance channel movable into and out of operating position, a slide in which the entrance channel moves, a rod connecting the channel entrance with the lock operating bar, an indicating dial, and means whereby when the dial is set for any magazine of the series other than the one in operative position the magazine is automatically unlocked, and the channel entrance moved back automatically without changing its upright position.

12. In a typographical machine the combination of a series of removable magazines, racks therefor, guide rollers on said racks, slotted arms to engage said guide rollers, there being notches in the said slotted arms, normally operative lock bars, projections on the said bars, an indicating dial, springs to automatically unlock the lock bars when the dial is set, an entrance channel which moves into and out of operative position on a slide, and means whereby the entrance channel moves into and out of operative position automatically with the locking or unlocking of the magazine.

13. In a typographical machine the combination of a plurality of removable magazines, racks therefor, guide rollers on said racks, slotted arms, there being notches in the said slotted arms, normally operative locking bars movable backward and forward, projections on the said bars, springs to force the bars to unlocked position, rollers on the operating bars, raising and lowering screws, operating rollers movable up and

down on screws, means to set the said operating roller at any magazine, and screw means to lower or raise the magazines.

14. In a typographical machine the combination of a series of removable magazines, racks therefor, guide rollers on said racks, slotted arms to engage the said guide rollers, there being notches in the slotted arms, operating bars having projections thereon and capable of being moved forward and backward, and means whereby the operating bars are automatically forced forward, thereby forcing the guide rollers of the desired magazine into the notches provided in the slotted arms and forcing the desired magazine forward so that it stands projected outward farther than the other magazines of the series.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. GRAHAM.

Witnesses:
D. F. TRACEY,
E. O. HUTCHISON.