No. 853,647. PATENTED MAY 14, 1907.

P. G. NUERNBERGER & G. RETTIG, Jr.

TYPE CASTING MOLD.

APPLICATION FILED APR. 22, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

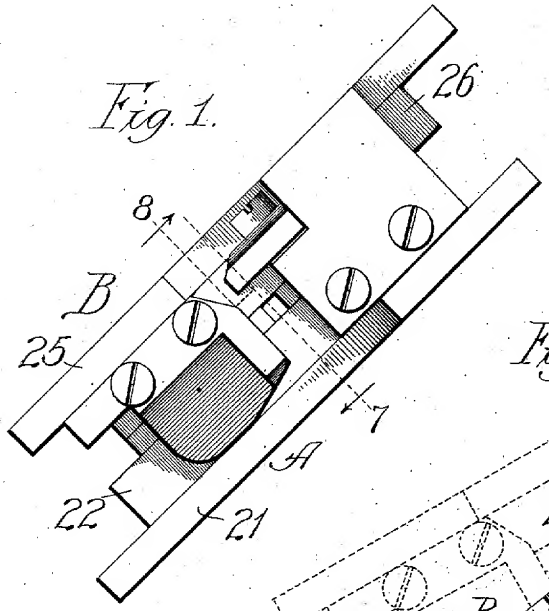

Fig. 2.

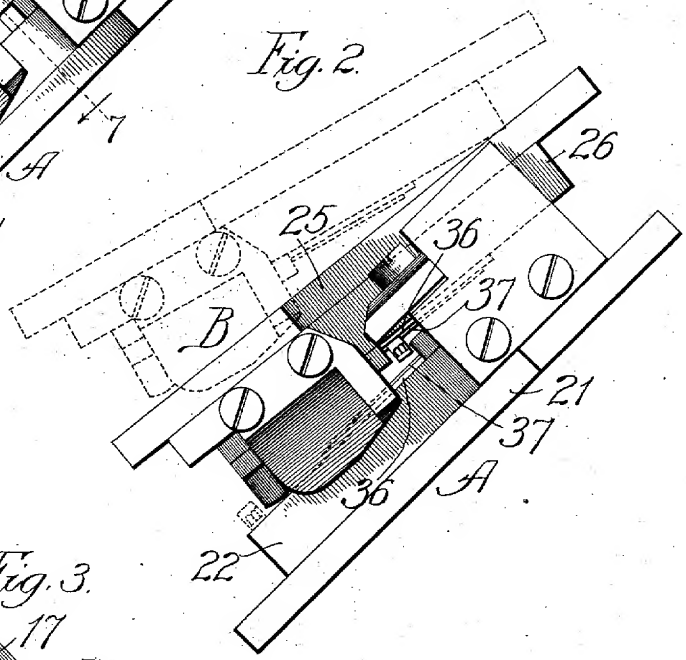

Fig. 3.

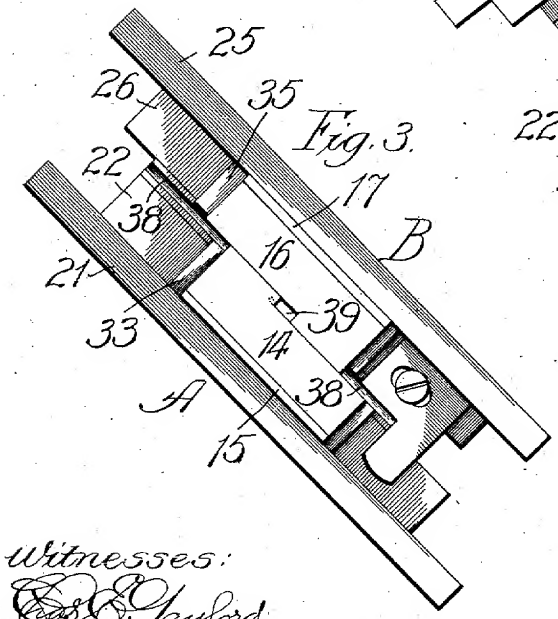

Fig. 4.

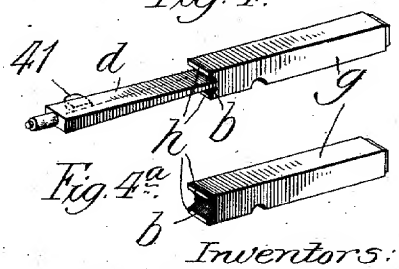

Fig. 4a.

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3 SHEETS—SHEET 2.

Fig. 5.

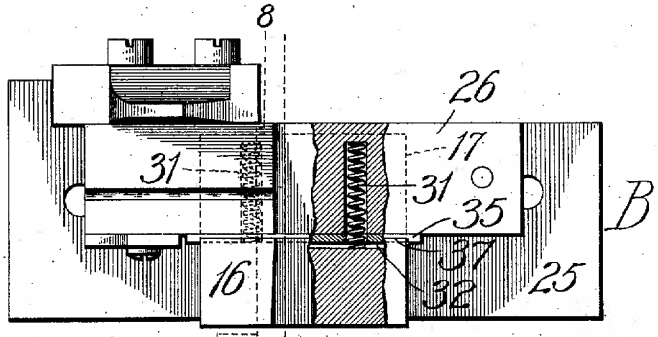


Fig. 6.

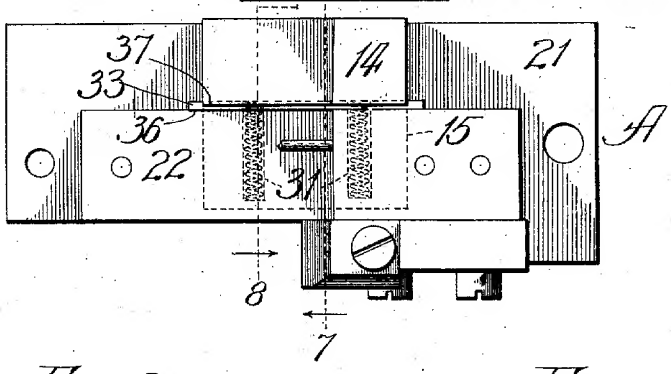


Fig. 8.

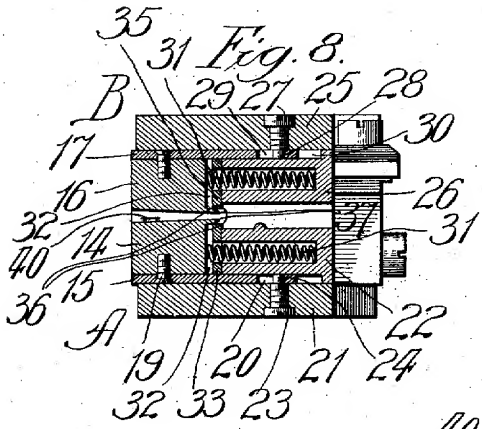


Fig. 7.

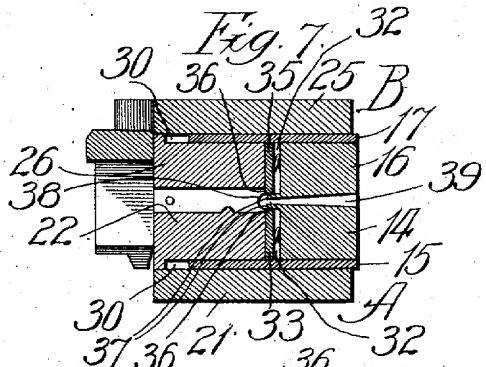


Fig. 9.

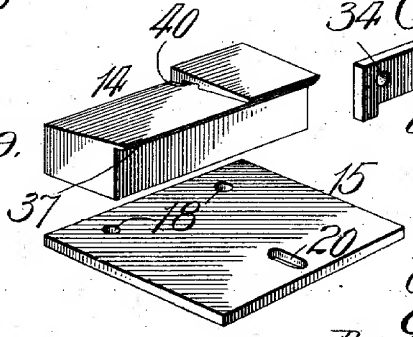
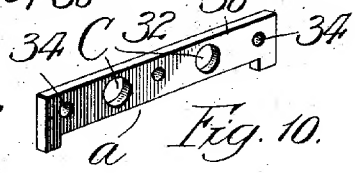


Fig. 10.



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P. G. NUERNBERGER & G. RETTIG, Jr.

TYPE CASTING MOLD.

APPLICATION FILED APR. 22, 1905.

3 SHEETS—SHEET 3.

Fig. 11.

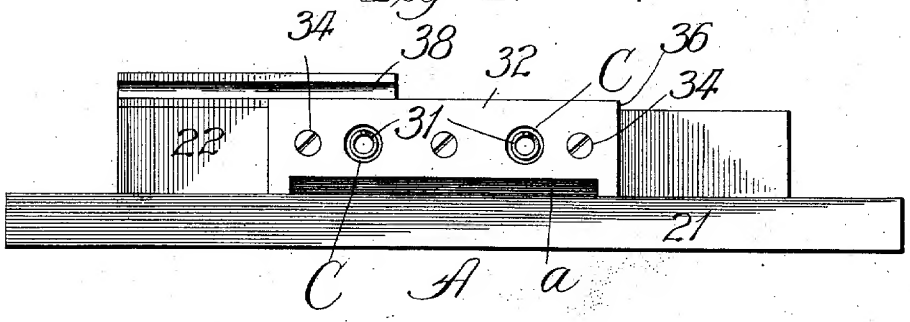


Fig. 12.

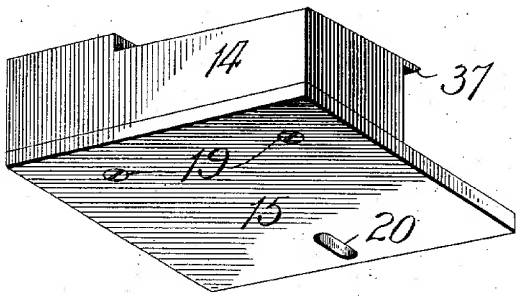
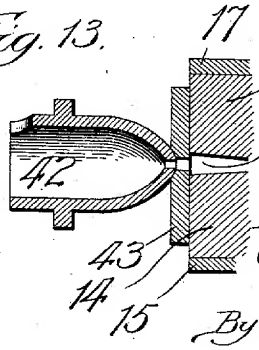


Fig. 13.



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UNITED STATES PATENT OFFICE.

PHILIP G. NUERNBERGER AND GEORGE RETTIG, JR., OF CHICAGO, ILLINOIS.

TYPE-CASTING MOLD.

No. 853,647. Specification of Letters Patent. Patented May 14, 1907.

Application filed April 22, 1905. Serial No. 256,930.

To all whom it may concern:

Be it known that we, PHILIP G. NUERNBERGER and GEORGE RETTIG, Jr., citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Type-Casting Molds, of which the following is a specification.

This invention relates to improvements in molds used in metal casting machines and more especially to molds used for casting printing type; and has for its chief object to provide a mold with means included therein whereby the "jet" may be automatically and perfectly separated from the type and the latter provided with a groove and a smooth finished base in the operation of casting, the type being thereby produced in condition for printers' use.

Many attempts have been made to attain this result, but, so far as we are aware, without success, the type cast being rough where the jet is broken off or otherwise in need of further treatment before they can be satisfactorily used for printing. But by the means hereinafter described the type is discharged from the mold a finished product ready to go into the compositor's case for immediate use.

In the drawings, Figure 1 represents a front elevation of the closed mold; Fig. 2 is a similar view of the same partly open, the full open position being indicated by dotted lines; Fig. 3 shows the mold in rear elevation; Fig. 4 is a detail perspective view of a type-body and jet; Fig. 4ª is a detail perspective view of the type after the jet or sprue has been broken away. Fig. 5 is a detail view of the inside of the upper mold member partly broken away; Fig. 6 is a detail plan view of the lower mold member; Fig. 7 represents a transverse section on line 7 of Figs. 1, 5 and 6, looking in the direction indicated by the arrow; Fig. 8 represents a transverse section on line 8 of Figs. 1, 5 and 6; Fig. 9 represents in perspective the jet part of the lower mold member and a plate on which the same is mounted; Fig. 10 represents a mold plate, detached, in perspective; Fig. 11 represents a rear side elevation of the lower mold member, the jet part thereof being removed; Fig. 12 represents in perspective the parts shown in Fig. 9, assembled; Fig. 13 illustrates in detail the relative position of the nozzle-plate, the nozzle or spout and the jet parts when the mold is ready for a charge of metal.

A and B designate respectively the stationary lower mold-member and the upper mold-member, which together form the mold cavity between them; said cavity in the present instance being adapted to form a printer's type. These parts are in the main of usual form.

The gate consists of a lower section or member 14 and an upper section or member 16, correspondingly recessed in their inner faces to leave an inlet passage or recess 39 between them, in which the jet is formed, said passage communicating at its rear end with the mold cavity. The said gate-members or sections are not fixed to the respective mold-members, in which they fit, nor to the mold carriage, but are movable independently thereof outward and inward to a limited extent, the lower gate member 14 being mounted on a movable plate 15 and the upper gate-member 16 being similarly mounted on a corresponding movable plate 17, and said gate-members being fastened to said plates respectively by screws 19 passing through screw-holes 18 in said plates. Thus the gate as a whole may move inward or outward independently of the body of the mold. Also the said gate is entirely separate from the spout or nipple, which is the metal-supplying device for the mold, and is quite independent thereof in its operation, the only relation of said gate to said spout being as a recipient of the molten metal and a means for directing the same into the mold cavity. The said mold members are provided respectively with outside mold plates 21 and 25, having screws 23 and 27 set in them, with reduced unthreaded inner ends 24 and 28 entering slots 20 and 29 in the inner edges of plates 15 and 17. These latter plates are fitted between the outside mold plates 21, 25 and the proximate parts of the two members or sections 22, 26 which compose the mold-carriage. The said screws and slots permit the limited outward and inward movement of the gate hereinbefore mentioned. The construction and arrangement of the corresponding elements in the upper and lower parts of the device is substantially identical. Behind each plate 15 or 17 in its normal position is a space 30, allowing for inward movement.

The mold-carriage members 22 and 26 are recessed to receive a number of springs 31,

which bear outward (as shown in Fig. 8) against the gate members 14 and 16, holding them normally in their outermost position, leaving behind each of them a space 32, between it and the proximate part of the carriage. The width of spaces 30 and 32 is equal to the maximum amount of forward or outward extension of the gate, so that when the two members of the latter and their sliding plates 15, 17 are forced back against the resistance of the said springs to their innermost position their rear faces will be in contact with the plates 33 and 35 described below.

The inner ends of those parts of the gate-members which immediately surround the jet-forming passage are provided with lips or flanges forming a tapering tubular projection or nozzle 37, extending inwardly into a recess or passage 38 at the receiving end of the mold cavity beyond the surface of the foot of the type. The bore of this projection of course is the terminal inner part of the jet-forming passage or recess and its inner end constitutes a discharge aperture for the molten metal flowing into the mold.

Plates 33 and 35 are secured to and cover those portions of the two carriage members which are opposed to the rear faces of the two gate-members. One of these plates (33) is shown in detail in Fig. 10, the construction of the two being identical. The holes C therein are for the springs 31 to work through. The lower edge of the plate is cut out at *a* to provide for the insertion and movement of the said sliding plate 15. The fastening screws are countersunk in holes 34 of said plate, that there may be no impediment to the contact of the latter with the gate at all points when the latter is moved inward. The inner edges of these plates 33 and 35 extend beyond the carriage members into the recess 38 at the receiving end of the mold cavity and toward the inner, tubular, discharging projection 37 aforesaid of the gate. Said plates thus form an inward shoulder 36 on each carriage member, and these shoulders fit against the said tapering projection 37 near its base when the gate is in its innermost position.

The lower gate member 14 is provided with a key cavity 40, communicating with the jet forming recess or passage 39, into which cavity some of the molten metal will flow to form a retaining tongue 41 on each jet. This locks the jet in place against the action of the reciprocating parts of the gate.

The spout or nozzle 42 which delivers the molten metal is attached to or provided with a nozzle plate 43 and preferably held stationary, the mold being carried up to it; though of course this arrangement might be reversed, moving the spout and holding the mold stationary, without changing the construction hereinbefore described or the general operation of the mold. This operation is as follows. The gate, being normally in its outward position, is forced inward when moved into contact with the nozzle plate or other fixed attachment of the spout, while the latter supplies molten metal to the inner jet-forming recess or passage 39, whence this metal flows into the mold-cavity, filling the same and at last returning against the shoulders 36 surrounding the discharge projection 37. As the metal cools, a recess or groove *b* is formed by the said projection in the base of the type, and the line of junction of the jet with said type is necessarily at the inner end of this recess, considerably above said base and within the same. Consequently the jet may be broken off from the type without leaving any visible or tangible roughness, for the base itself, being formed against the shoulders 36, will be perfectly smooth. This breaking is effected by the straight thrust of the springs 31, as the mold is drawn away from the spout. They act promptly on relief from pressure, breaking off the jets at the right point, neatly and effectively, the shoulders 36 meanwhile anchoring the type.

It is obvious that various mechanical means other than those shown may be employed to actuate the movable gate. We do not limit ourselves to the precise devices shown, but may make such changes as practical working shall require from time to time without departing from the spirit and scope of our invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a mold for casting type, an outwardly movable gate separate from and independent of the metal supplying device, having an aperture leading to the mold cavity and a jet-forming recess communicating with said aperture.

2. In a mold for casting type, an outwardly movable gate separate from and independent of the metal supplying device having an aperture surrounded at its inner terminal by a jet-breaking projection extending inwardly beyond the surface of the foot of the type and having a jet-forming recess communicating with said aperture.

3. In a mold for casting type, an outwardly movable gate separate from the metal supplying device, having an aperture leading to the mold cavity and a jet forming recess communicating with said aperture and serving in its outward movement to break off the jet.

4. In a mold an outwardly moving part having a jet-forming recess discharging into the mold cavity and also provided with a lateral recess for excess metal communicating with such jet-forming recess, the outward movement of said part serving to break off the jet substantially as set forth.

5. In a mold, an outwardly moving part consisting of two sections, independent of the means of supply, having an aperture discharging into the mold cavity and also provided with a recess communicating with said aperture, for excess metal, to be subsequently removed.

6. In a mold, an outwardly moving part consisting of two sections, having an aperture discharging into the mold cavity, a rearward part surrounding said aperture and projecting into said cavity and a recess for excess metal communicating with such aperture.

7. In a mold, an outwardly moving part consisting of two sections, independent of the means of supply, having an aperture discharging into the mold cavity, a rearward part surrounding said aperture and projecting into said cavity and a recess for excess metal, in combination with means engaging the body of the casting for breaking off such excess metal as the said movable part recedes from the mold cavity.

8. A mold provided with an outwardly movable gate containing a jet-forming recess, in combination with means for moving said gate outward in a straight line to break off said jet the said gate being provided with a part surrounding the outlet of said recess and projecting into the mold cavity for the purpose set forth.

9. In a type-casting mold, the combination of an outwardly movable gate with means for moving it straight outward by force applied in its line of motion, a relatively fixed shoulder attached to the body of the mold and engaging the base of the type to prevent its withdrawal and means for forming a recess in the said base making the point of junction of the jet and the type at the inner end of the said recess substantially as set forth.

10. In a type-casting mold, a movable part containing a jet-forming passage, the inner end of which is prolonged as a metal discharging projection into the mold cavity, in combination with means for moving said part outward, base-forming devices fitting on said projection and permitting the latter to form a recess in the base and means for moving the said part and projection to break off the jet at the inner end of said recess.

11. A type casting mold adapted to retain the type and provided with means independent of the opening of the mold and operating outwardly in the axial line of the type for automatically breaking off the jet and leaving the type with a smooth base.

12. A type casting mold provided with means, contained within itself and independent of the metal supplying devices, for forming a recess in its base with the line of junction between the type and jet at the inner end of said recess and means for automatically breaking off the jet at this point, leaving the base of the type unaffected thereby substantially as set forth.

13. A type casting mold adapted to retain the type and provided with resilient means for breaking off the jet by direct outward movement in the axial line of the type before the mold opens.

14. In combination with mold opening devices a type-casting mold provided with automatic means independent of the mold opening devices and operating in line with the type, for breaking off the jet at a point above the base of the type.

15. A type-casting mold provided with jet-forming parts, which are outwardly movable from the mold body independently of the metal-supplying devices and of any movement of a mold section, and means for retaining the type in the mold during such movement, to break off the jet.

16. A mold provided with jet forming parts exclusively attached thereto, which are automatically movable away from the mold cavity independently of the opening movement of the mold, to break the jet, and means for limiting the movement of said parts.

17. A type casting mold adapted to retain the type and provided with a movable gate admitting molten material to the mold cavity, resilient means for automatically moving said gate outward in the axial line of the type to break the jet and means for limiting such movement of the gate.

18. A mold provided with a movable gate admitting molten material to the mold cavity and springs interposed between the body of said mold and said gate to force the latter outward, breaking the jet independently of the opening movement of the mold.

19. A type casting mold adapted to retain the type and provided with means for retaining the cast article in the mold cavity, means independent of the movement of any part except said gate and operating to force the latter outward in the axial line of the type, breaking off the jet.

20. A type-casting mold provided with a type-retaining device, an outwardly movable gate provided with a metal-discharging part extending inwardly through said device and coöperating therewith to cast a type with a recessed base, and springs interposed between the body of the mold and the gate, to force the latter outward, breaking the jet.

21. A type casting mold provided with a gate which normally extends forward beyond the mold body and yielding means for holding the said gate in this normal position and restoring it thereto when pressure is withdrawn.

22. A type-casting mold provided with a gate consisting of two coöperating members, two sliding plates on which these members

are respectively fastened, to move therewith toward and from the mold-cavity, means for limiting this movement of the said plates and means for automatically moving said plates and gate-members outward from the casting position to the normal position.

23. A type-casting mold provided with a gate consisting of two coöperating members, two sliding plates on which these members are respectively fastened to move therewith toward and from the mold cavity, means for limiting this movement of the said plates and resilient means for automatically moving said plates and gate-members simultaneously outward from the casting position to the normal position on the removal of opposing pressure and holding them there until such pressure is again applied.

24. A type-casting mold provided with a gate consisting of two coöperating members, two slotted sliding plates on which these members are respectively fastened to move back and forward therewith, means for automatically moving said gate outward from the jet cavity, and relatively fixed parts entering said slots to limit the said movement substantially as set forth.

25. A type-casting machine provided with a movable gate and means for automatically moving this gate outward into its normal position, in combination with a device for forcing said gate back from its normal position into its casting position when said gate and device are brought into contact.

26. A type-casting mold having movable jet-forming parts whose normal position is away from the carriage part of the mold and a stationary object arranged for contact with the said parts and to force the latter back into the casting position, said mold being further provided with means for returning the said jet-forming parts to their normal position before the mold opens to discharge the type.

27. In a type casting mold, the combination of movable jet-forming parts with springs located in the mold and exerting an outward pressure on the jet-forming parts in returning the same to their normal position and means located in the path of the mold to receive the contact of the said jet-forming parts and force the latter back to their casting position substantially as set forth.

In testimony whereof we affix our signatures, in presence of two subscribing witnesses.

PHILIP G. NUERNBERGER.
GEORGE RETTIG, Jr.

Witnesses:
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M. J. KIRKLAND.