(No Model.)

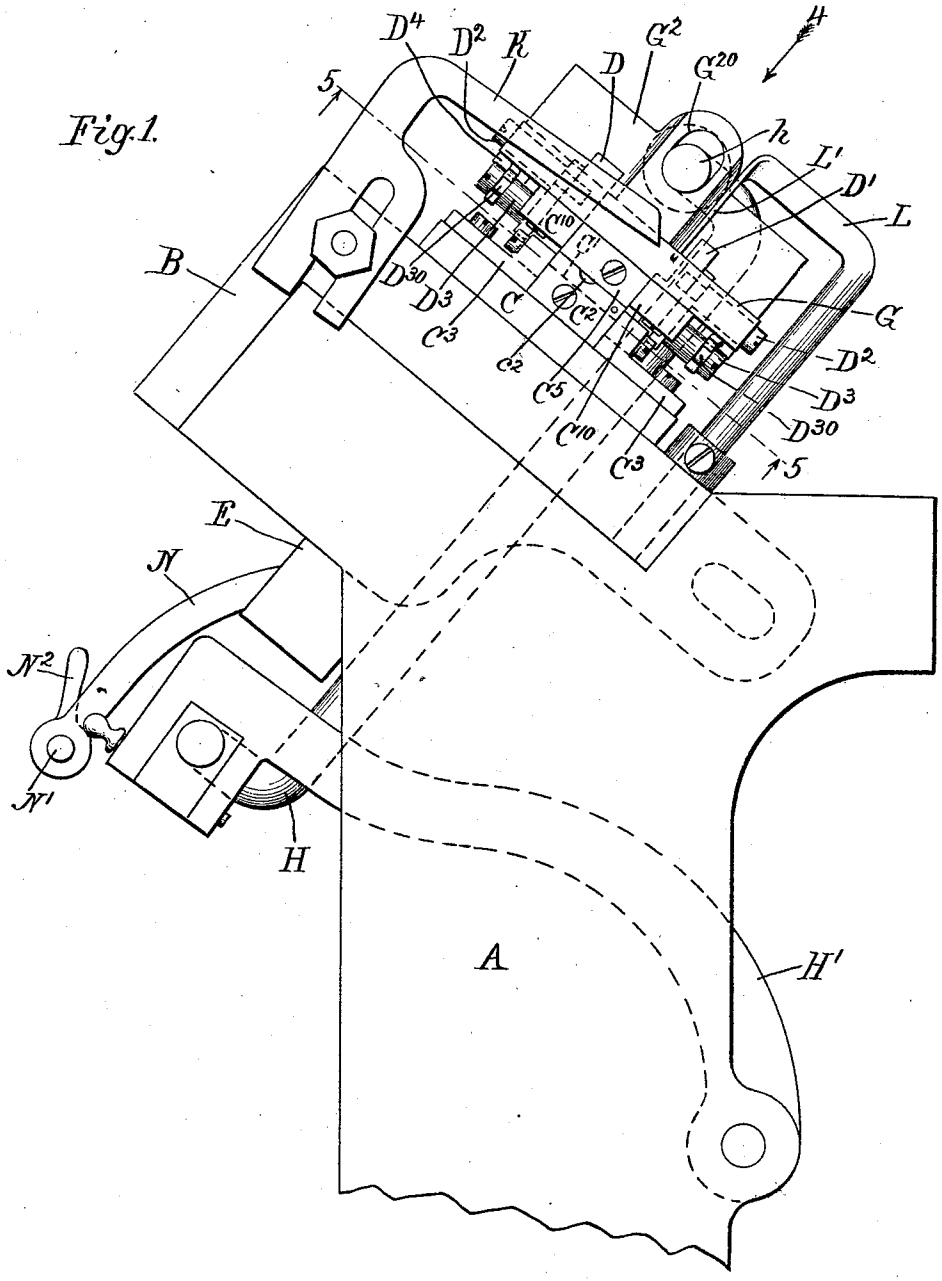
4 Sheets—Sheet 1.

H. HEINEBACH.

TYPE CASTING MACHINE.

No. 517,340. Patented Mar. 27, 1894.

Fig. 1.



Witnesses,
E. T. Wray
Jean Elliott

Inventor:
Herman Heinebach
By Burton & Burton
his attys

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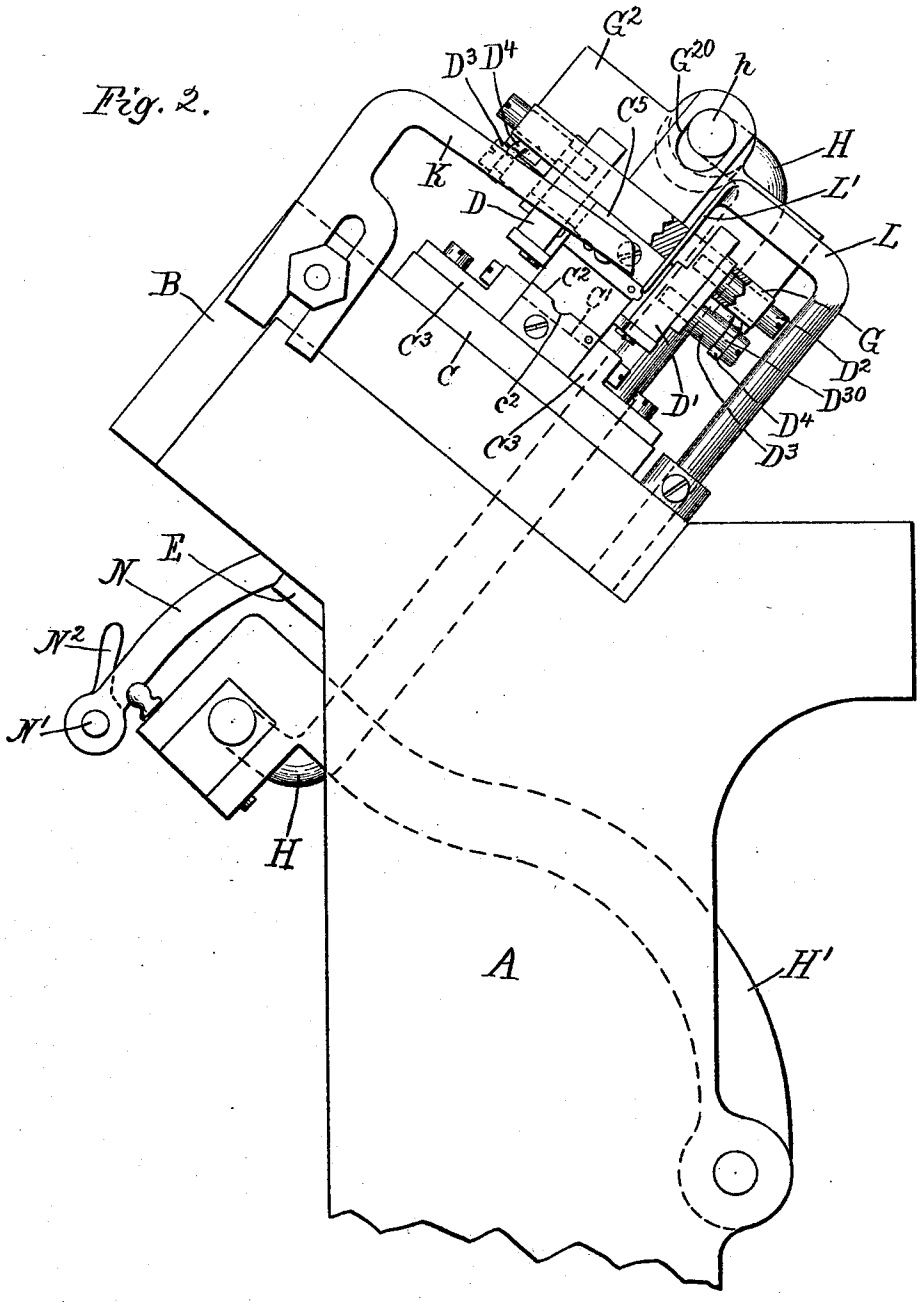
Fig. 2.



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(No Model.)

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H. HEINEBACH.

TYPE CASTING MACHINE.

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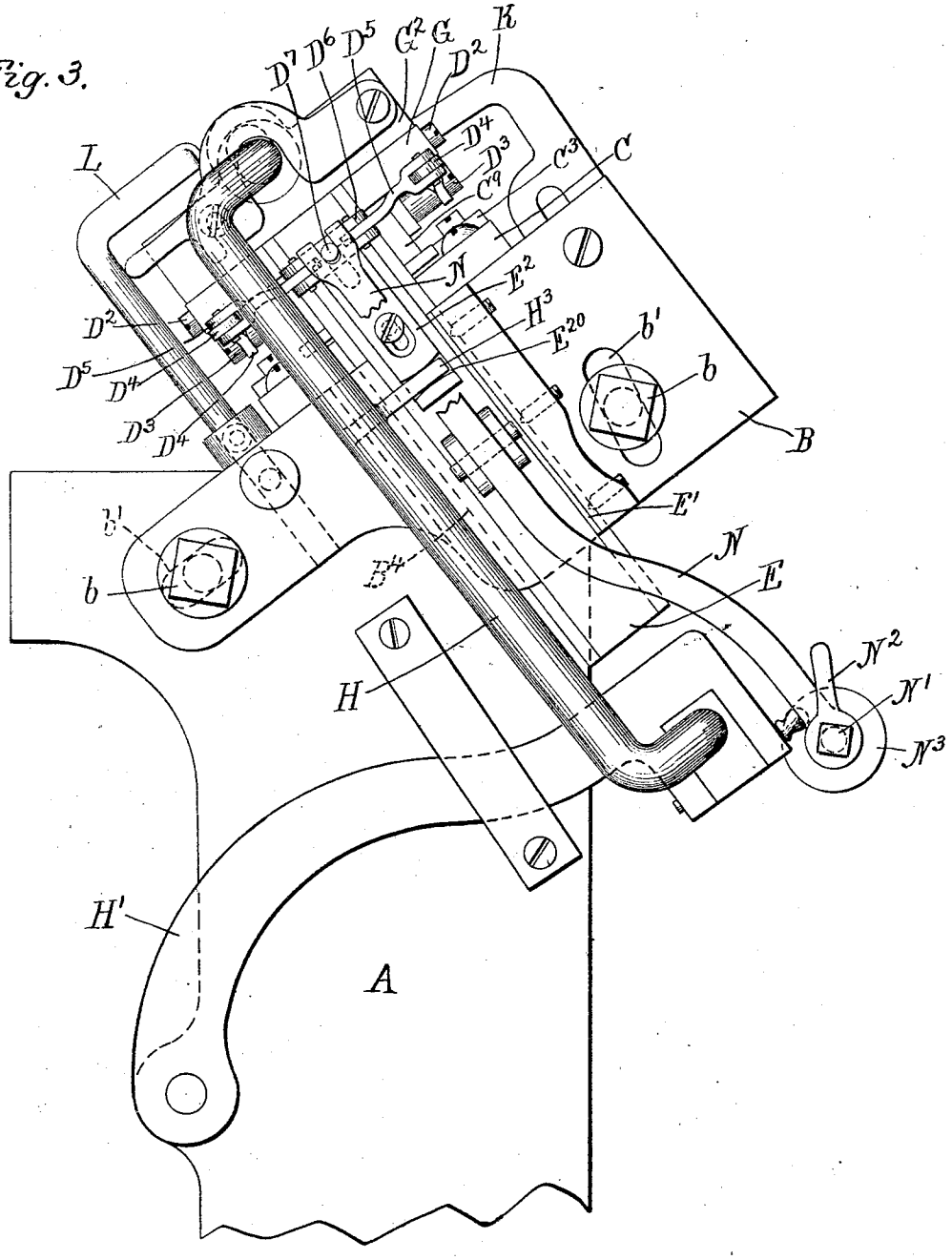
Fig. 3.



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(No Model.) 4 Sheets—Sheet 4.

H. HEINEBACH.

TYPE CASTING MACHINE.

No. 517,340. Patented Mar. 27, 1894.

Fig. 4.

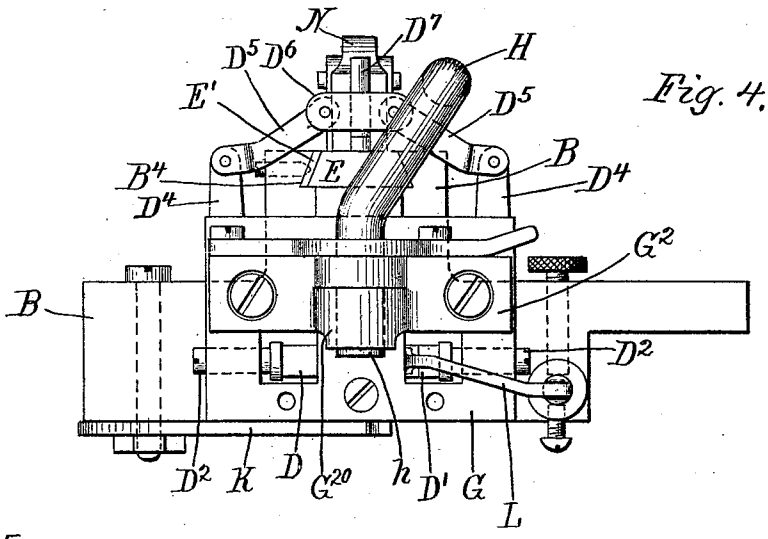


Fig. 5.

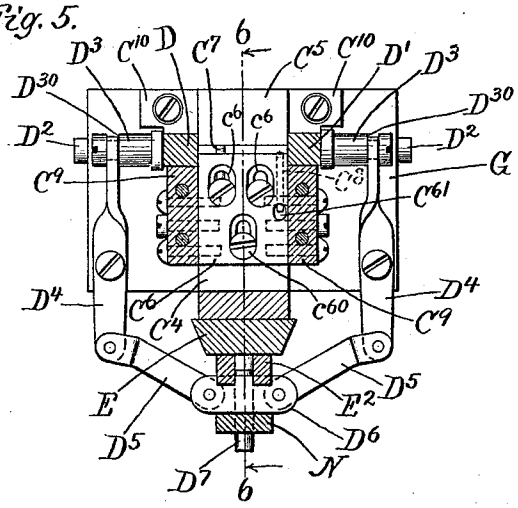


Fig. 6.

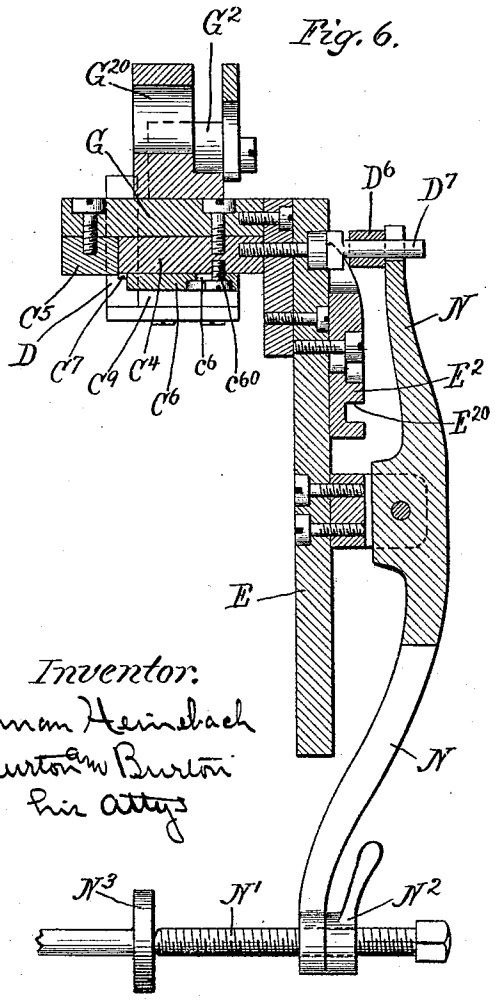
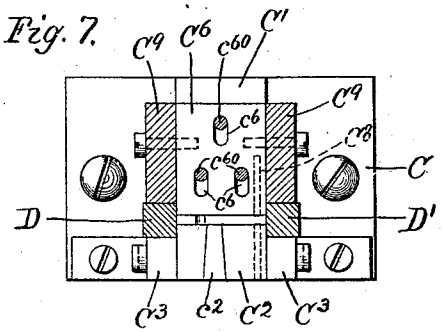


Fig. 7.



Witnesses.
E. T. Wray.
Jean Elliott

Inventor:
Herman Heinebach
By Burton & Burton
his attys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HERMAN HEINEBACH, OF CHICAGO, ILLINOIS.

TYPE-CASTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 517,340, dated March 27, 1894.

Application filed May 6, 1893. Serial No. 473,324. (No model.)

To all whom it may concern:

Be it known that I, HERMAN HEINEBACH, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Type-Casting Machines, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide a mold and mechanism for operating with it to cast type having faces at both ends. Specifically, it is adapted to produce a type having the usual upraised printing face at one end, and at the other end an impressed face or matrix; type of this character being adapted and designed, when set up, to afford a means of producing from one end, as from a matrix, a printing face in rubber or other material, while the other end affords a means of taking a proof in the ordinary manner to test the correctness of the composition, or printing for any other purpose.

In the drawings,—Figure 1 is an elevation of a portion of a type-casting machine, whose general style is familiar, comprising the upper end of the apron or vibrating frame which carries the mold to and from the melting pot, the mold itself, and immediately operating mechanism mounted upon the upper end of such apron, the view being in the direction looking from the melting pot toward what is commonly called the rear side of the mold, the mold being closed. Fig. 2 is a similar view with the mold open, showing the type being dislodged, part of the upper member being broken away to show the action of the type discharger or substitute for the stool of the ordinary machine. Fig. 3 is a front elevation of the same parts, showing the mold closed. Fig. 4 is a plan of the same, or a view looking in the direction of the arrow 4 on Fig. 1. Fig. 5 is a section at the plane of the line 5—5 on Fig. 1, designed especially to show the connections by which the matrices or dies are operated to withdraw them from the cast. Fig. 6 is a detail section at the line 6—6 on Fig. 5. Fig. 7 is a section at the plane of the parting of the two mold members, showing the type cast therein.

A is the vibrating apron of the type-casting machine.

B is the mold-carrying block or bracket secured to the vibrating end of the apron in the usual position by the bolts $b\,b$, and having the usual adaptation for adjustment in relation to the melting pot by the elongation of the bolt-holes $b'\,b'$. The lower member of the mold comprises the type body piece C′, which bounds the lower horizontal face of the cast, and the side piece C^2, which bounds one vertical side of the cast, and which in this construction forms the jet-piece, since it has the port c^2, through which the metal enters the mold and in which the jet is formed. The angle brackets C^3 C^3 serve to secure the jet piece rigidly in its relation to the lower body piece C, which, in turn, is bolted rigidly to the mold-carrying block B. The upper member of the mold comprises the upper block C^4, which bounds the upper horizontal face of the cast; the jet-piece C^5 which overhangs the piece C^2 of the lower member and completes and forms the upper wall of the jet port c^2; the adjustable block C^6, whose rear end forms the front wall of the mold cavity, facing the vertical surface of the piece C^2 in the lower member. The nick-pin C^7 is lodged between the pieces C^4 and C^6, being rigid with the piece C^4, and the detent or imprint pin C^8 is set into the piece C^6. The adjustment of the piece C^6 is provided for by elongating the screw holes c^6 c^6 c^6, through which the screws c^{60} pass into the piece C^4 to secure the parts together. The hole C^{61} in the piece C^6 gives access to the inner end of the imprint piece C^8, for the purpose of adjusting the latter.

C^9 C^9 are side guards between which the block C′ of the lower member fits snugly. All these parts above described of the lower member of the mold are made rigid by customary means with the upper base G.

It will be understood from the foregoing description that the mold is adapted to receive the metal for the cast at the side of the latter and not at the end, as in the customary forms of type-molds. This adapts the mold to be operated with a matrix at each end of the type space to form a type face at each end of the cast.

D D′ are the two matrices or dies. They are adapted to close the ends of the type space, fitting closely against the sides of the five blocks C′, C^2, C^4, C^5 and C^6, which encom-

pass the type space, being guided into their positions between the ends of the guards C^9 on the one hand and the brackets C^{10} C^{10}, which are secured to the base G, on the other hand. For their further guidance, they are provided with a stem D^2, which extends out through the base G, the length of its stem and of its bearing in said base being sufficient to insure accurate movement of the matrices toward and from their operative positions. For the purpose of moving the matrices into and out of position, they have another stem D^3 above the base G, and to said base near the forward edge are secured, one upon each side of the mold, levers D^4 D^4, which at their rear ends are forked or slotted and engage the annular grooves D^{30} D^{30} in the stems D^3 D^3, so that as the levers rock horizontally about their fulcrums on the base G, they actuate the matrices toward and from their positions at the ends of the type space. The forward ends of the levers D^4 D^4 are connected by links D^5 D^5 to a link D^6, which is guided in fore-and-aft direction on a stud D^7, rigid with the upper member of the mold at the forward side thereof. It will be seen that a fore-and-aft movement communicated to this link D^6 will cause it to actuate the two matrices equally and similarly toward and from their respective operative positions. Such actuating movement is given to the link D^6 in a manner or by a means which will be hereinafter described.

This mold differs from those of common construction in that the upper member, instead of being hinged to the lower member and approaching and departing from it by an oscillation about its hinge pivot, is adapted to move bodily directly toward and away from the lower member to close and open the mold. To adapt it for such movement, it is provided with a rigid stem E, and the mold-carrying block B has at the forward side a groove or channel B^4 to receive the stem E, said stem and channel being dove-tailed in cross-section, and a gib E′ is provided to render the slide-bearing of the stem in the channel properly close. Movement is communicated to the upper mold member by the usual means,—viz: a link H, connected to the arm H′, which is fulcrumed on the apron and operated in a well-known manner about its fulcrum by the rocking of the apron A. The eye G^{20} in the rib G^2 of the upper base G, which receives the wrist pin *h* at the end of the link H, is elongated vertically, or at right angles to the plane of parting of the mold, so that a short upward movement of the wrist occurs before it operates the mold to open it. On the forward side of the stem E, a slide E^2 is provided, having its upper end tapered and operating as a wedge behind a link D^6, the tapered or wedge-shaped end of said wedge being slit or forked so that it obtains guidance by striking the stud D^7. To actuate the cam or wedge E^2, an arm or finger H^3 is provided on the link H, which engages the slot or notch E^{20} in the wedge or cam E^2, and during the short movement of said link which takes place while its finger is playing in the elongated eye G^{20}, the link by this engagement of its finger moves the wedge upward and causes it to force outward or forward the link or cross-head D^6, thereby through the medium of the link and lever connections from said cross-head to the matrices or dies D D′ respectively, withdrawing said matrices from the cast, so that when, by the further movement, the upper member of the mold is carried up bodily from the lower member, the cast is free from the matrices. It is, however, carried bodily in the upper moving member of the mold by the detent pin C^8, and is dislodged therefrom by the collision of the end of the jet or sprue with a discharge arm K secured to the fixed member of the mold and overhanging the port end of the jet in the usual manner, and the concurrent collision of one, or if necessary, both of the ends of the type with the part L, which, because of the identity of function with the commonly employed stool, I designate by that name, although its construction is quite different from the usual "stool." It consists of an arm adjustably secured to the mold-carrying block B, extending up outside the upper member of the mold and overhanging it, and having a long flat thin finger L′, which extends downward directly above the space which intervenes between the end of the mold and the matrix when the latter has been withdrawn, and in such position, therefore, that as the mold rises it protrudes through the space and encounters the projecting end of the type and assists in dislodging it.

When the particular form of type is that herein shown, having an upraised face at one end only and a depressed face at the other, there is at the end having the depressed face no projecting portion of the type beyond the plane at which the matrix seats over the end of the mold cavity, and hence, such a stool cannot be employed at that end; nor is it necessary, because the engagement of the discharge arm with the jet which extends out from the side of the type body would alone in most instances be sufficient to cause the type to be properly dislodged, but for greater certainty and accuracy, the stool is provided at the end which has an upraised face, and which consequently has a projecting portion.

For the purpose of forcing and holding the matrices firmly against the ends of the mold during the process of casting, I employ the usual lever N. It is fulcrumed on the stem E, and adapted at the upper end to stride the stud D^7 and bear against the forward side of the link D^6, and at the lower end it has the usual adjusting screw N′ set through it and provided with a check nut N^2. The end of this screw encounters the rigid stop disk N^3, precisely as in the common style of machines when the apron rocks toward the melting pot and the mold closes; and thereby, the upper end of the lever N is forced inward or rear-

ward and through the medium of the link and lever connections from the cross-head or link D^6 to the matrices forces the latter "home" and holds them securely until the return movement of the apron releases the lever N, and permits and causes the forward movement of the link D^6, produced by mechanism described, to withdraw the matrices. The jet upon the cast formed in this mold, which extends from one side of the cast as above explained, is preferably so rooted in the cast as not to involve any of the longitudinal corners of the latter, because this facilitates detaching it without mutilating the type body. In order that it may be thus related to the type body, I form one member of the mold, preferably the upper, with part of the rear side wall and the other member with the other part,—that is to say, I make the parting plane of the mold intersect the rear side wall of the type space, and form the entire groove which constitutes the gateway or jet port in one of the members, the parting surface of the other member constituting the wall of the jet port at that side, the depth of the jet port at its junction with the type space being less than the portion of the side-wall of the latter which is formed in the member having its jet port. The feature essential to this particular result, it will be seen, is making the parting plane intersect the side-wall, because of necessity the jet port must be made at that parting plane.

I claim—

1. In a type-casting machine, in combination with a fixed member of the mold having part of the side walls of the type space and a moving member having the remainder of the side walls and two die blocks forming the end walls, the jet port or gate for the molten metal being formed in the surfaces of the two members at their parting plane and leading into the type space in a direction transverse to the length of the latter: substantially as set forth.

2. In a type casting machine, in combination with a fixed member of the mold having part of the side-walls of the type space and the moving member having the remainder of the side walls and two die blocks constituting the end walls, the plane of parting of the two members longitudinally intersecting one side wall of the type space, and the jet port or gate formed in the surfaces of the two members as said plane of parting in a direction transverse to the length of the type, substantially as described, whereby the jet's junction with the type body involves no longitudinal corner of said body.

3. In a type-casting machine, in combination with a frame or apron by which the mold is carried toward and from the melting pot, the mold mounted on such apron having the type space located with its length transverse to the direction of movement of the apron; whereby the space moves up sidewise toward the melting pot; and the jet port or gate formed at the mold's parting plane leading into the type space transversely to the length thereof: substantially as set forth.

4. In a type-casting machine, in combination with the frame or apron by which the mold is carried toward and from the melting pot, the mold on such frame having the type space with its length transverse to the direction of movement of the apron, and comprising a fixed member and a movable member, the latter being provided with guide-bearings with respect to the former, whereby it is adapted to move bodily toward and from the same in closing and opening the mold, all its positions being parallel with each other; the jet port or gate for the molten metal formed in the parting plane of the two members of the mold and leading into the type-space in a direction transverse to the length of the latter: substantially as set forth.

5. In a type-casting machine, in combination with the frame or apron by which the mold is carried toward and from the melting pot, the mold having its type space transverse to the direction of such movement and comprising a fixed and a moving member; the die-blocks mounted upon the moving member and adapted to approach and recede from the ends, respectively, of the type space, and forming the end walls thereof; connections extending from said die-blocks respectively to the forward side of the mold; the mold-opening arm and connections therefrom to the said die-block connections; the eye whereat said arm engages the moving member to operate it being elongated in the direction of the mold opening arm's initial movement to permit the actuation of the die-block connections by said mold-opening-arm before the mold is opened: substantially as set forth.

6. In combination, substantially as set forth, the mold having its type space transverse to the mold's movement toward and from the melting pot and the jet port or gate leading into said type space at the side thereof in a direction transverse to the length of said type space; the die blocks D D′, suitably guided on the moving member of the mold longitudinally with respect to the type space to approach and withdraw from the ends thereof; the levers D^4 D^4 fulcrumed on the moving member and engaging the stems of said die-blocks; the links D^5 D^5, and the connecting link D^6, guided on the mold transversely to the length of the type space; and the cam or wedge on the mold adapted to engage the link D^6; the mold-opening-arm and a finger thereon which engages said wedge, the eye whereat said arm engages the mold being elongated in the direction of the initial opening movement of the arm.

7. In combination with the fixed member of the mold and the moving member guided up and down thereon and having the type space whose length is transverse to the direction of movement of the mold toward and from the melting pot; the die blocks which

constitute the end walls of the type space, and connections therefrom to the forward side of the mold; the lever N fulcrumed on the moving member and extending from its fulcrum in one direction to and abutting against the die-block operating connections; and a fixed stop exposed in the path of said lever at the opposite end and adapted to be encountered thereby as the apron rocks in the direction to close the mold; whereby said lever forces both the dies to their seats when the mold is open: substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 19th day of April, 1893.

HERMAN HEINEBACH.

Witnesses:
CHAS. S. BURTON,
JEAN ELLIOTT.