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MOLD AND MOLD ADJUSTING MECHANISM FOR TYPE CASTING MACHINES.

APPLICATION FILED NOV. 9, 1909.

989,637.

Patented Apr. 18, 1911.

5 SHEETS—SHEET 1.

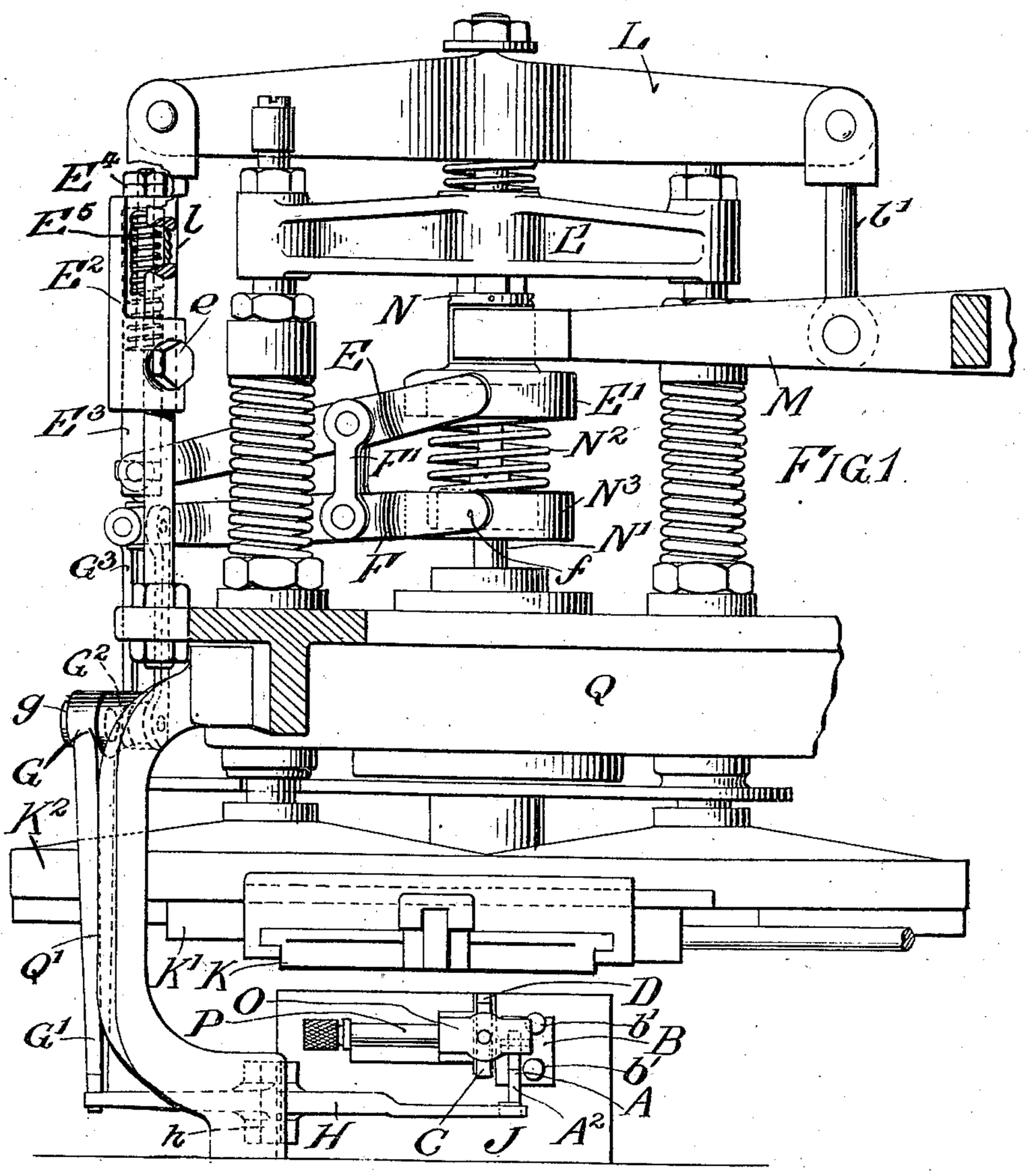

FIG. 1.

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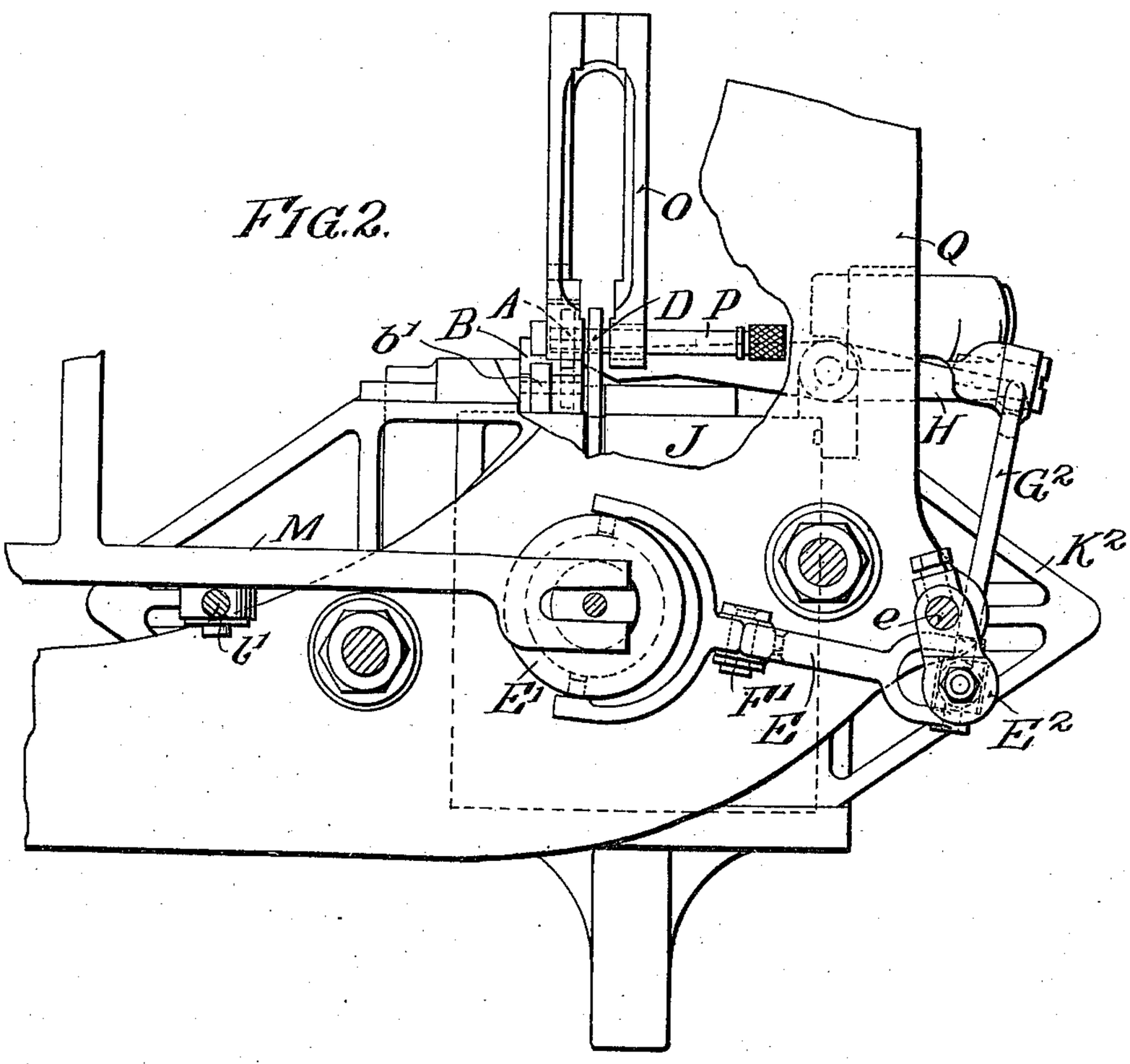
5 SHEETS—SHEET 2.

FIG. 2.



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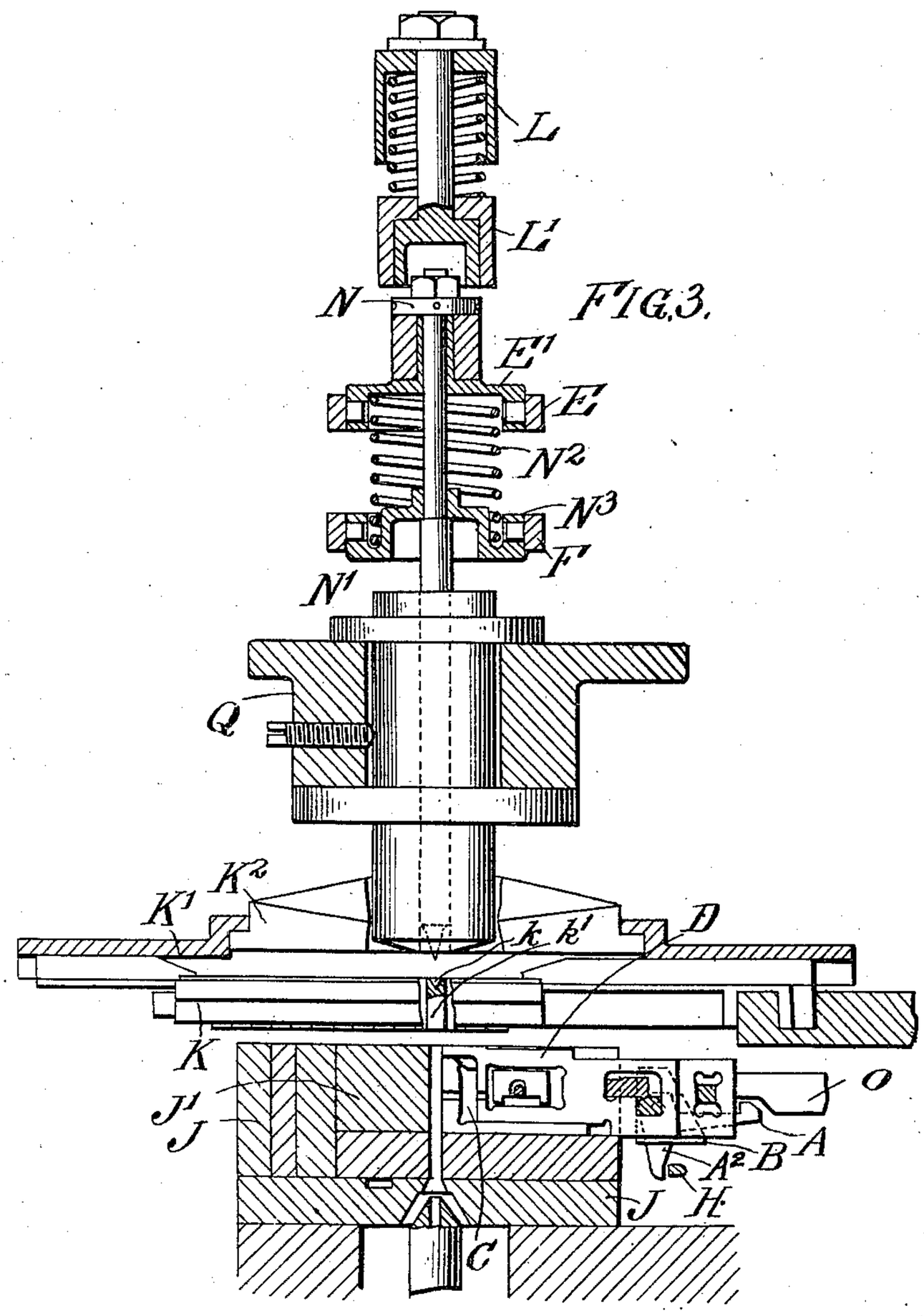

FIG. 3.

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Fig. 8.

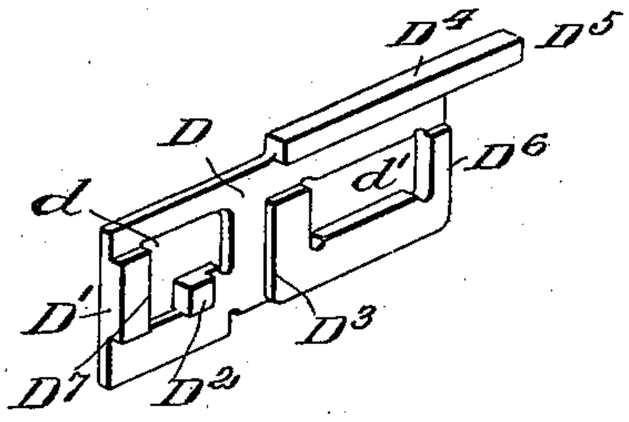


Fig. 9.

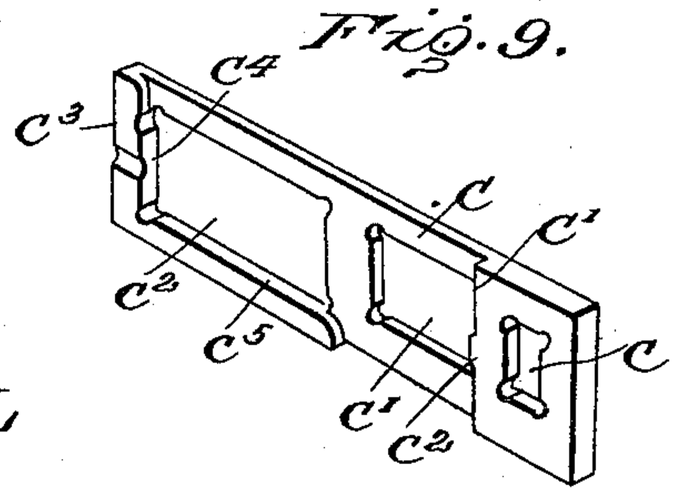
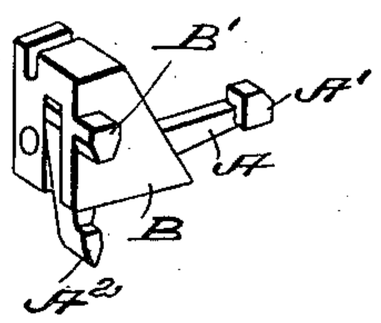


FIG. 4.

Fig. 10.



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5 SHEETS—SHEET 5.

FIG. 5.

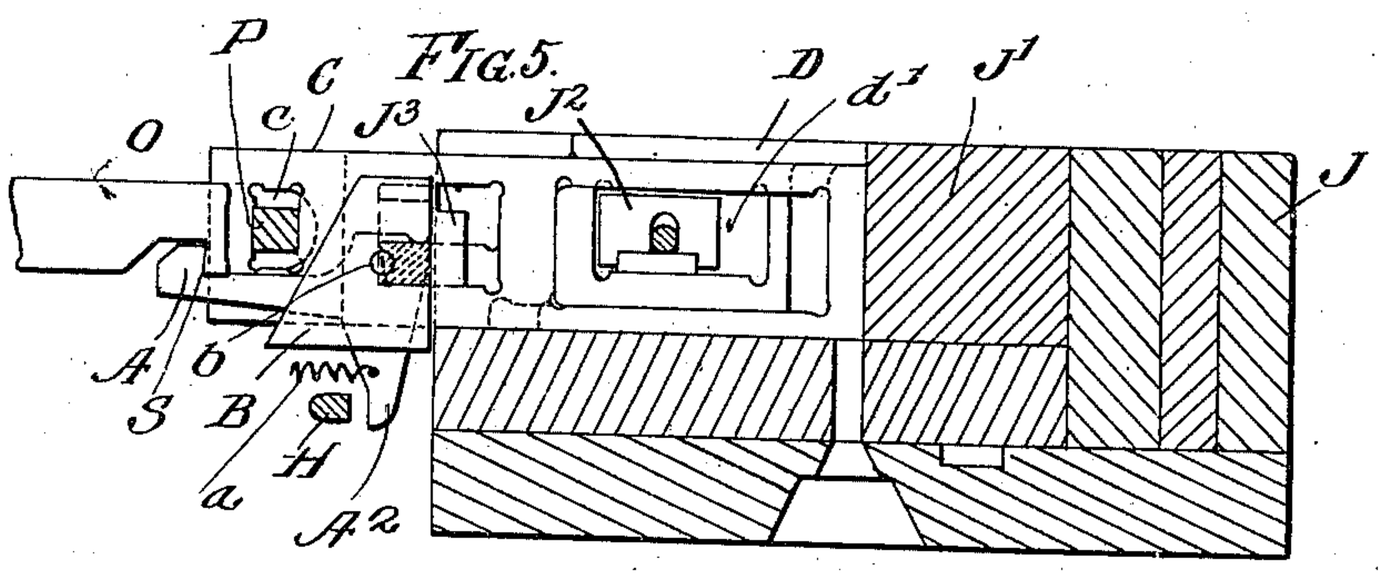


FIG. 6.

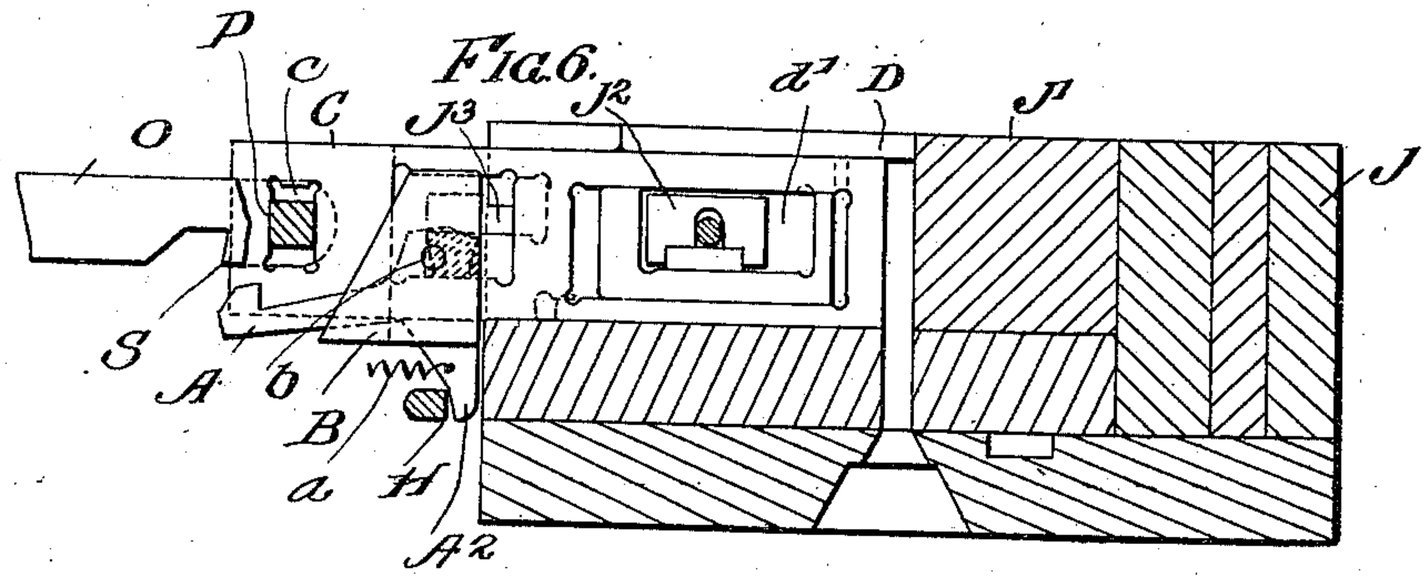
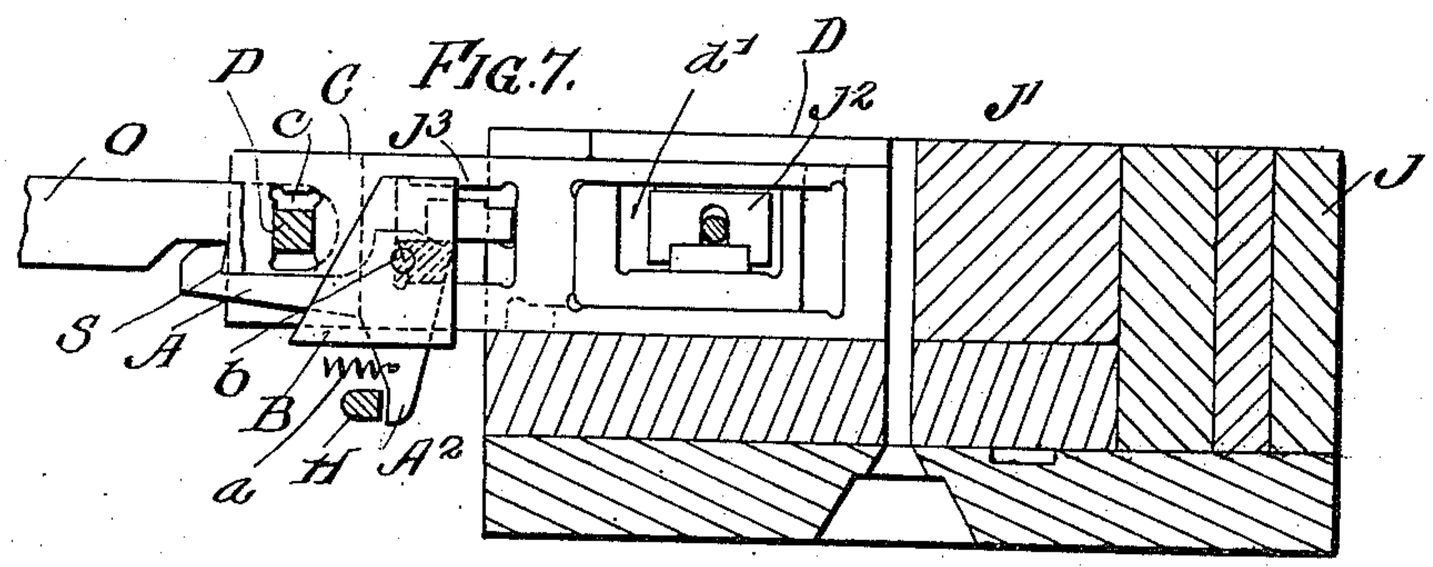


FIG. 7.



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UNITED STATES PATENT OFFICE.

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MOLD AND MOLD-ADJUSTING MECHANISM FOR TYPE-CASTING MACHINES.

989,637. Specification of Letters Patent. Patented Apr. 18, 1911.

Application filed November 9, 1909. Serial No. 527,052.

To all whom it may concern:

Be it known that I, FRANK HINMAN PIERPONT, a citizen of the United States, temporarily residing at Horley, in the county of Surrey, England, have invented a certain new and useful Improvement in Molds and Mold-Adjusting Mechanism for Type-Casting Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to molds and mold-actuating mechanism for type-casting machines wherein the mold has a dimensioning and type-ejecting blade which constitutes a wall of the mold and is divided longitudinally or formed in two parts or sections movable together for the production of full-height type bodies and relative to one another for the production of low quads or spaces.

The chief object of the present invention is to provide improved and simplified mechanism for controlling and effecting the adjustment of the mold or the sections of the mold blade for the production of low quads or spaces.

According to the present invention a sliding or movable block (carried independently of both blade-sections upon the mold body) engages the cut-off or low quad-producing section of the mold-blade to retract it, and this block, in order to move the cut-off section rearward, carries one or more latches or dogs adapted to engage with a member which moves the mechanism in both directions, the forward movement of the cut-off section being effected positively by the main section. The latch is released when the two parts are in their forward position, to permit the cut-off section to remain forward and thus shorten the length of the mold, thereby effecting the production of low body-types, while the main section is retracted to dimension the mold.

The present invention also contemplates mechanism actuated through a variation in the movement of the matrix clamping mechanism brought about by a specially shaped matrix, after the manner disclosed in Patent No. 828,450, dated August 14, 1906, for controlling the mold-blade mechanism. This mechanism, controlled by the specially shaped matrix, effects the disconnection of the two mold-blade sections, and it comprises a pair of floating levers or tongs having their inner ends connected one with the driving and the other with the driven member of the matrix clamping mechanism, while the outer end of one lever is connected to a bell-crank lever adapted to actuate the latch, and the outer end of the other lever is connected to a stationary support through a spring.

In the accompanying drawings illustrating a preferred form of embodiment—Figure 1 is a side elevation of the die-case positioning mechanism and mold of a type-casting machine having mechanism according to this invention for operating the sections of the mold-blade. Fig. 2 is a plan of the mechanism shown in Fig. 1, some of the parts being cut away for the sake of clearness. Fig. 3 is a sectional side elevation of the mechanism shown in Fig. 1, and Fig. 4 is a side elevation looking from the opposite side of the machine to that shown at Fig. 3. Figs. 5, 6 and 7 are sectional views of the mold showing the mold-blade sections in the various positions they assume. Fig. 8 is a perspective view of the cut-off section of the mold-blade. Fig. 9 is a perspective view of the main section of the mold-blade, and Fig. 10 is a perspective view of the sliding block having the pivoted latch for locking the two parts of the blade for simultaneous movement, and the projection which engages the cut-off section.

In all the views of the drawings the same letters of reference indicate the same parts.

A is the pivoted latch which connects the two parts of the mold-blade for simultaneous movement; B is the sliding block carrying the pivoted latch and the fixed catch or projection; C is the main portion of the mold-blade; D the cut-off section; E and F are the floating levers or tongs controlled by the matrix clamping mechanism; G is the bell-crank lever connected to one terminal of the floating lever mechanism and adapted to operate a lever H which acts upon the pivoted latch A.

The improvements, by way of illustrating a practical embodiment of the invention, are

shown applied to a type-casting and composing machine according to Letters Patent No. 625,998, of May 30, 1899. As many of the parts of that machine are immaterial to the present invention, it is not necessary here either to describe in detail the construction of the machine or its operation. It is deemed sufficient to refer briefly to the parts thereof which are related to or coöperate with the improvements forming the subject of the present invention.

J is the mold provided with two side blocks, an intermediate mold-dimensioning and type-ejecting mold-blade comprising sections C, D, and a cross-block J′.

K is the die-case movable in a carrying frame K′, the latter mounted to move in a holder K², so that by these two movements, which are at right angles to one another, any matrix in the die-case can be brought over the mold cavity. A lever L fulcrumed to a post *l* acts on a cross-head L′, and, when a matrix has been brought over the mold cavity, lowers the die-case with its holder and carrier.

M is the main actuating lever to which the cross-head is connected by a link *l′* and which is also connected to the die-centering plunger N′ through a movable head N and a compression spring N² which rests on a head N³ on the plunger N′. The plunger N′ is lowered and enters a hole in the end of the selected matrix to accurately center and clamp it on top of the mold.

O is a forked rod or slide carrying a cross-pin P by which the mold-blade is reciprocated.

Q is the bridge which carries the mechanism for lowering and raising the die-case and the centering plunger.

Supported to reciprocate in parallel with the mold-blade is a block B carrying a latch A fulcrumed upon a pin *b*. Block B is mounted upon a guide, such as that furnished by two pins or rods *b′* fixed or secured to the back of the mold J. The latch A which locks the two sections of the mold-blade for simultaneous action is in the form of a bell-crank lever pivoted in a slot in the block B and carries on one arm a nose A′ adapted to engage with a recess or shoulder S on the forked rod or slide O connected with the cross-pin P, by which the main section of the mold-blade is moved positively to dimension the mold and eject the cast type. The latch A is constantly maintained in engagement with this shoulder by a spring *a*, Fig 4, connected at one end to the downwardly extending arm A² of the latch, and at the other end attached to a pin on the mold or other convenient stationary support. The latch A is thus connected to and moves with the sliding block B which has a catch or projection B′ arranged to extend within an opening *d* in the rear end of the cut-off section D of the mold-blade, and cause that section of the blade to move rearwardly with the block B.

The projection B′ on the block B as seen in Fig. 10 is beveled or tapered so that it only engages the rear wall of the opening *d* over a small portion of its surface and midway of the height of the mold-blade so that when the block is retracted or moving backward to carry the mold-blade with it, there is no tendency on the part of the mold-blade to be tilted through the action of the latch. As the latch A and the blade-actuating mechanism are carried on a block which is independent of both mold-blade sections there is no tendency of this mold-blade actuating mechanism to twist or warp the mold-blade sections, and the mold-blade is not weakened in any way by having to carry part of the actuating mechanism, a feature of considerable importance when the proportion of these mold-blade sections, especially for the molds casting small type bodies, is considered.

The cross-pin P to which the slide O for operating the blade is connected passes through an opening *c* in the rear part of the main section C, but does not engage, nor is it directly connected to, the cut-off section D. The two sections are placed side by side and together form a mold-blade of full length and width. Both sections on their meeting faces are cut away in parts to fit into each other, but allowing for relative movement. The main part C of the mold-blade (see Fig. 9) which is of a constant height throughout its entire length, is somewhat longer than the cut-off section D. In addition to the opening *c* the main section has an opening *c′* for the reception of the front stop J³ and another opening *c²* for the reception of the point block and top bearing J². For the reception of the cut-off section D this section C is cut away on one side from the top to a portion of its depth between the rear wall of opening *c′* and front wall of the opening *c²*, and to its full depth from the rib between the openings *c* and *c′* and that between the opening *c′* and the rear wall of the opening *c²*. The rear-end wall D′ of the cut-off section D, Fig. 8, bears against a shoulder C′ on the main section, and this shoulder is not in contact throughout the entire depth of the blade with the rear wall of the cut-off section, but is formed midway with a slight projection C² which forms the bearing or gaging surface; this bearing being midway of the height of the blade prevents any tendency of the cut-off section to be tilted or displaced when pushed forward by the main section. The cut-off section is maintained in contact with the gaging bearing on the main section by the latch A.

The upper or cut-off section, as shown in Fig. 8, is not of full height throughout its

length but is cut away on its lower edge so that it takes a bearing on the projecting part C^5 of the main section. The nose D^5 which forms the part by which the mold is shortened is part of a rib D^4 which overlaps and bears upon the top of the main section. The cut-off section has an opening *d* through which the front stop J^3 passes and another opening *d'* for the passage of the block J^2. The cut-off section has a lateral projection D^3 D^6 which extends into the opening c^2 in the main section, the projection D^3 D^6 being of such length as to allow the main section to move relatively to the cut-off section to dimension the mold. At its rear part the cut-off section has two lateral projections D^2 D^7 which extend within the opening *c'* in the main section, these parts being so arranged as to allow the full movement of the main part of the mold-blade relatively to the cut-off section when necessary.

The stop J^3 which passes through the opening *c'* in the main section C and opening *d* in cut-off section D limits the forward motion of the blade in ejecting the type, the forward motion of the cut-off section D being limited by the movement of the main section inasmuch as the latter by its shoulder C' moves the cut-off section forward positively. The main section is moved directly and positively by the cross-pin, and when the latch is engaged the cut-off section is indirectly but positively connected to the cross-pin through the engagement of projection B' on block B with the rear end of opening *d* in section D thereby holding D' in contact with the gaging surface C^2 so that the two sections when moving together for full-height type present a flush casting surface. The stop J^3 and block J^2 also act as top guides for the two sections.

In order to effect the relative movement or displacement of the two mold-blade sections, pressure is applied to the latch A when the two sections have advanced and ejected the last cast type from the mold. A horizontally-disposed lever H is pivoted to a lug *h* on the mold and one end of the lever is arranged in position to engage the downwardly-extending arm A^2 of the pivoted latch A, while the other end of the lever is located in the path of movement of the downwardly-extending arm G' of the bell crank lever G. This lever G is fulcrumed to a lug *g* carried by the bridge Q. The upper arm G^2 of the bell-crank lever G is connected by a link G^3, conveniently duplicated as shown, to the outer or free end of the lever F of the floating levers E, F.

The floating levers E, F, by which the movement of the bell crank lever is effected, are adapted to be operated as already stated by the matrix clamping mechanism of the machine. The inner end of the upper lever E is forked to embrace the head E' to which it is connected, and the head E' follows the movement of the centering-plunger-operating lever M, carrying the end of the lever E with it. The corresponding end of the lower floating lever F is forked and embraces the head N^3 to which it is connected, and this head N^3 follows the movement of the matrix centering plunger N', and between these two heads is arranged the compression spring N^2 which keeps them apart and transmits the drive from the lever to the plunger.

The two levers E, F, are linked together by a connecting link F' intermediate their ends, and the outer end of the upper lever E is pivotally attached to the lower end of a rod E^3, the latter guided in a stationary bracket E^2 and adjustably secured to post *l*. The upper end of rod E^3 is provided with an adjustable nut E^4 contacting with the upper end of bracket E^2 and held in elastic engagement therewith by a spring E^5 interposed between the bracket and a shoulder on rod E^3. The bracket is adjustably secured by bolt *e*, to stationary post *l* for the purpose of regulating the position of levers G and H relative to latch A and spring E^5 serves as a yielding member to avoid damage to the mechanism if excessive pressure comes upon the levers E and F. The two levers are so positioned and arranged that so long as the heads E' and N^3 move in company, or practically so, as when a character matrix is presented, they do not operate the lever G, or do not operate it sufficiently to actuate the lever H and to allow for a slight or normal differential movement between the levers E, F, a lost motion or play is allowed between the levers G and H.

In the normal operation of the machine for full-height type bodies, as lever M moves downward to center the matrix the lower end of the plunger N' enters a hole in the upper end of the matrix far enough to allow the plunger to perform its full travel. In so doing spring N^2 is slightly compressed and the outer ends of levers E, F, correspondingly separated but owing to the allowance made for lost motion no movement or displacement of latch A is effected.

The matrix or matrices for the low quads and spaces are, as already stated, formed differently from the other matrices in this respect, as shown in Fig. 3, that the centering opening *k* in the matrix *k'* is of less than normal depth so that the centering plunger N' is prevented from performing its full or normal travel or stroke, hence when the head E' is moved by lever M to lower the plunger N' through the spring N^2, the advance of the plunger is retarded and its motion arrested short of its full stroke by the contact of its end with the shallow cavity *k* in the matrix, and the head E' continuing to descend, causes spring N^2 to be compressed to a greater extent and the ends

of the levers E and F connected respectively to the heads E′ and N³ to approach one another. The differential movement between the levers E and F is more than can be accounted for by the lost motion between levers G and H, so that the excess motion of lever E, in descending due to the presence of the high matrix, is transmitted through the link F′ to the lever F. Lever F turning on the pivot *f* by which it is connected to the head N³, now transmits motion from its outer end to link G³ thereby forcing said link downward and causing the bell-crank lever G to turn on its fulcrum and operate the lever H, the amount of motion in this case being sufficient to cause the end G′ of the lever G to travel across the intervening space between it and the end of the lever H and impart an amount of movement to the lever H sufficient to disengage the catch A. In the cycle of operations of the machine, this releasing of the latch takes place when both sections C and D of the mold-blade are in their advanced or type-ejecting position shown in Fig. 5. In the continued cycle of the machine the mold-blade will be moved backward to dimension the mold cavity for the next type, but owing to the catch having been released, only the main section will be moved backward, and the section D will remain forward or be slightly advanced to the position shown in Fig. 6 so as to shorten the mold cavity by the depth of the projecting part D⁵ of the section D. After having been drawn back to dimension the mold, and after the quad is cast, section C is moved forward to eject the quad and pressure having been removed from lever H by the ascent of the die-case and the centering plunger the latch A is now free and under the action of its spring *a* again engages the shoulder S of the fork O, *i. e.*, when the parts are again in the position shown in Fig. 5. The parts C, D, having now been locked together by the latch A for simultaneous movement by the fork O, they are drawn back together to dimension the mold for a full height-type body, as shown in Fig. 7.

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

1. In a mold for a type-casting machine the combination with a two-sectioned mold-blade, of a sliding block carried independently of both blade-sections, a fixed catch on the block engaging one section of the blade and a latch on the block for connecting the block with a member for actuating the main blade for the purpose described.

2. In a mold for a type-casting machine, the combination with a two-sectioned mold-blade of a pivoted latch carried independently of both sections and adapted to lock or connect them for simultaneous movement.

3. In a mold for a type-casting machine, the combination with a two-sectioned mold-blade and a main actuating member positively connected to one section, of a sliding block carried by the mold-body and a fixed catch carried on the block and adapted to connect the other section with the sliding block.

4. In a mold for a type-casting machine, the combination with a mold-blade having main and supplemental sections and a main actuating member for positively moving the main section in both directions, of a shoulder on this section for advancing the cut-off or supplemental section and a sliding block or member carried independently of both sections and having a fixed stop or catch to engage the cut-off section to retract it and a spring-controlled latch on the sliding member to connect the block to the main or main-section actuating-member.

5. A low quad mold for type casting machines comprising, in combination, a sectional mold blade and a member supported to reciprocate independently of and parallel with the mold-blade sections and provided with a shoulder for engaging one of said sections and an opposing latch for engaging the other section.

6. In a type casting machine provided with a low quad mold and in combination with the sectional mold blade thereof, a reciprocatory member or block engaging one mold blade section and provided with an opposed latch for engaging the other section, to maintain the two sections with their casting faces in alinement, actuating devices coupled with one mold-blade section, a front stop for gaging the extreme forward or ejecting position of both mold blade sections, and actuating devices for the latch timed to engage and release the latter when the sections are in the extreme forward position preliminary to the retraction of the main section for dimensioning the mold cavity.

7. In a type casting machine, the combination of the following elements, to-wit; a low quad mold provided with a sectional mold blade and means for detachably connecting the sections of the latter for simultaneous adjustment, means engaging one mold blade section to reciprocate the latter for ejecting and dimensioning purposes; a matrix; matrix clamping mechanism; and means for actuating the detachable connection between the mold blade sections, said means being coupled with and controlled by the matrix clamping mechanism and so timed as to open the connection between the mold-blade sections when the latter are in their forward or ejecting position, to permit the adjustment of the main section while the cut off section retains its advanced position.

8. A type mold equipped with a sectional

mold-blade, one section whereof is provided with a gaging shoulder of less depth than the other section and located midway the upper and lower edges of the latter.

9. A type mold provided with a sectional mold blade whereof the lower or main section is provided with a restricted gaging surface C^2 located midway of the upper and lower edges of the cut-off section and engaging the latter.

10. A type mold provided with a sectional mold blade, the lower or main section whereof is provided with a gaging surface at a point opposite the cut-off section and midway the upper and lower edges of the latter, and a block mounted to reciprocate parallel with the mold blade and provided with a latch and a gaging surface engaging the cut-off section midway the upper and lower edges of the latter.

11. In a type casting machine such as described, provided with a low quad mold and matrix clamping means including a reciprocatory matrix clamping member, an actuator therefor and an interposed spring and in combination therewith a controlling mechanism for the mold the same comprising a pair of pivotally connected floating levers, whereof one member is interposed between and coupled with the matrix clamping member and the transmission devices for the mold, and the other member is coupled at one end to said actuator, a rod pivotally connected to said last named member of the floating levers, a longitudinally adjustable bearing for said rod and a spring interposed between said bearing and rod to sustain the latter against longitudinal displacement.

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