M. C. INDAHL & A. L. KNIGHT.

TYPE MOLD.

APPLICATION FILED JUNE 16, 1910.

980,960.

Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.

FIG. 1.

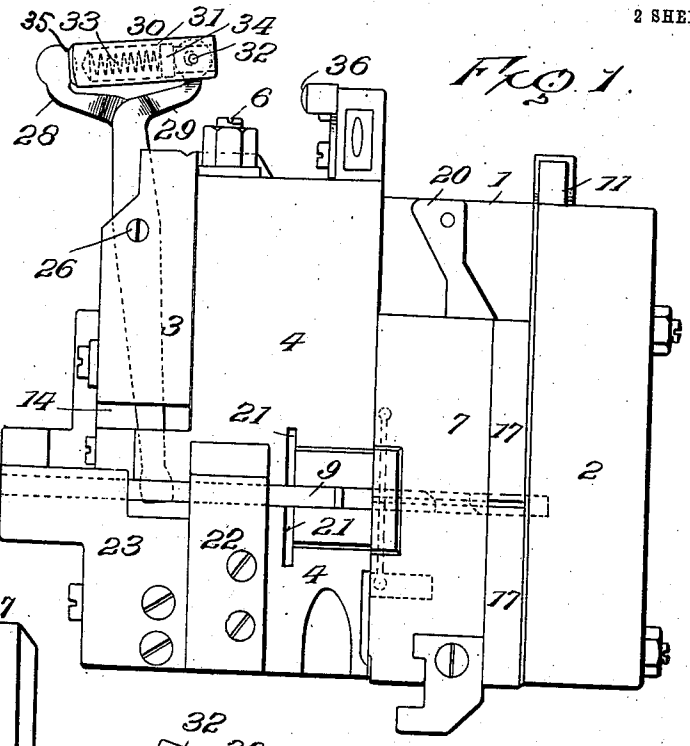
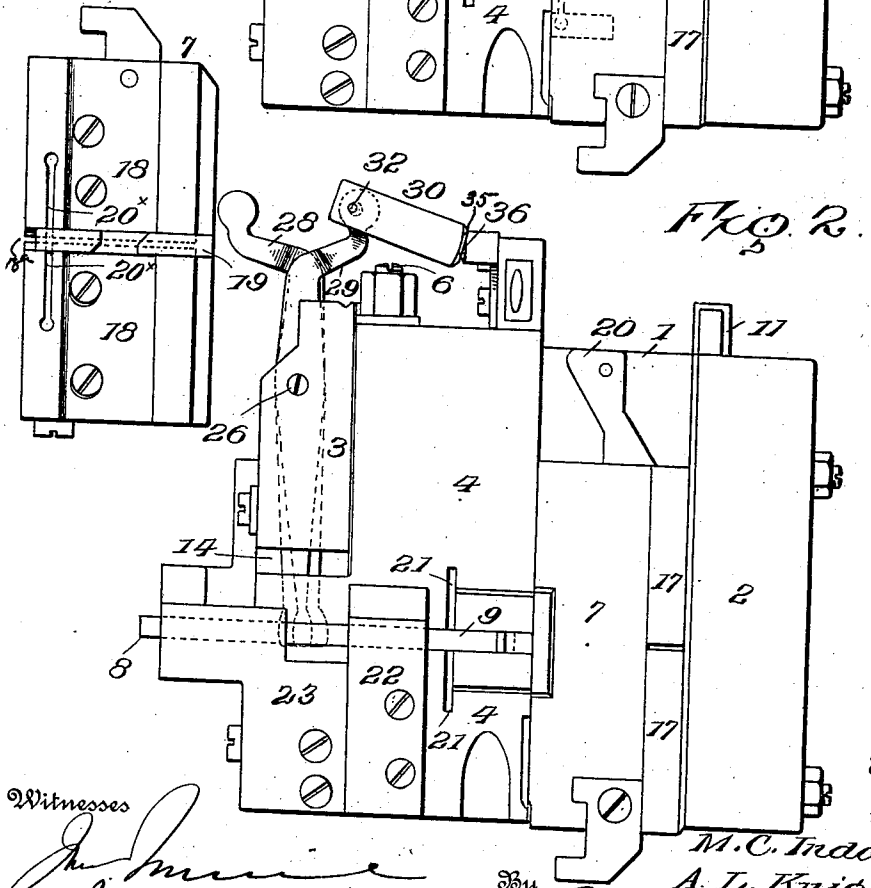


FIG. 2.



Witnesses

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FIG. 3.

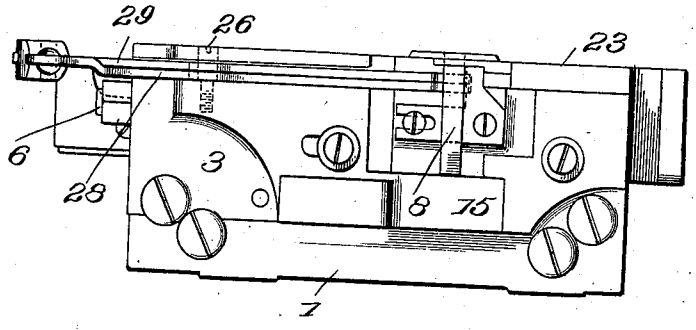


FIG. 4.

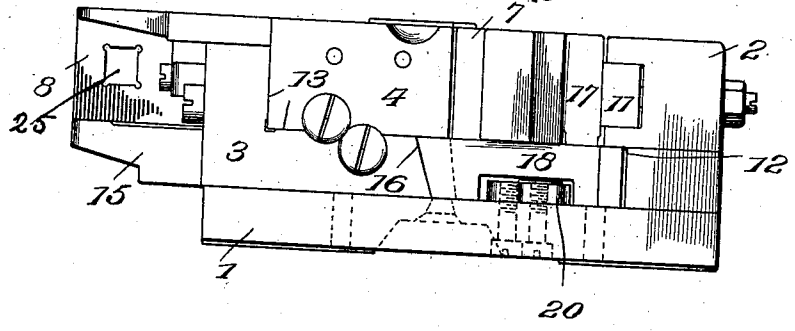
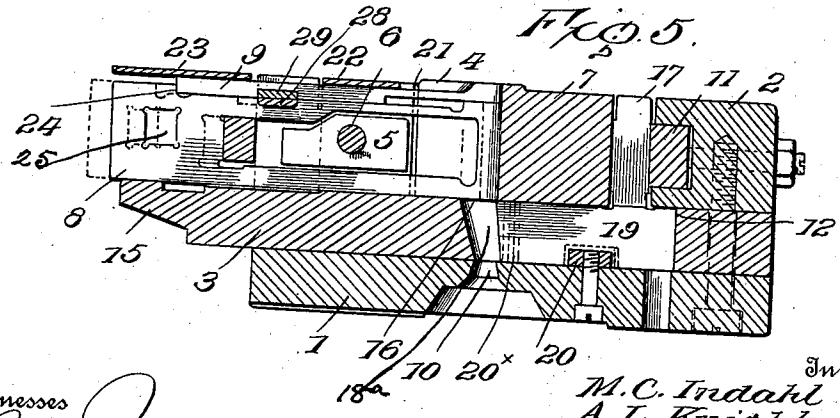


FIG. 5.



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UNITED STATES PATENT OFFICE.

MAURITZ C. INDAHL AND AMOS L. KNIGHT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO LANSTON MONOTYPE MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF VIRGINIA.

TYPE-MOLD.

980,960. Specification of Letters Patent. **Patented Jan. 10, 1911.**

Application filed June 16, 1910. Serial No. 567,276.

To all whom it may concern:

Be it known that we, MAURITZ C. INDAHL and AMOS L. KNIGHT, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Type-Molds; and we 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 improvements in type machine molds and is especially designed for use in connection with a sorts caster such as that illustrated in reissued Patent No. 12,819, of June 23, 1908, and it has for its principal objects to provide a low quad mold adapted to the requirements of such machines, and to overcome in a measure distortion and interference with the normal functions of the mold members through the heating and incident expansion occasioned by the molten metal in the jet opening or passage intermediate the pump nozzle and the casting chamber, and in the latter.

To these ends the invention consists in the novel construction, combination and arrangements of parts hereinafter fully described and specified in the appended claims.

In the accompanying drawings illustrating a preferred form of embodiment—Figure 1 is a top plan view of the mold equipment when set for full body type. Fig. 2 is a similar view, the levers being set for a low quad. Fig. 3 is a rear elevation. Fig. 4 is a left end view and Fig. 5 a vertical section to one side of the mold blade, and Fig. 6 is a bottom plan view of the cross block.

The same numerals designate corresponding parts in the several views.

The mold illustrated comprises a base plate 1, front abutment 2, squaring block 3, side blocks 4, point block 5, through bolt 6, cross block 7 and a divided mold blade composed of lower or main section 8 and upper or cut-off section 9.

The base plate is provided with the usual nozzle seat and jet opening 10; the front abutment with an adjustable shoe 11 and groove 12 on its inner face; the squaring block with angular seats 13 for the side blocks, an intermediate notch or recess 14 for the mold blade, and a rear extension 15 opposite said notch to serve as a support for the rear end of the mold blade beneath the point of attachment of the actuating devices; the side blocks when fastened in their seats 13 on the squaring block project beyond the inner edge thereof to form an undercut groove or way 16; the point block is interposed between the proximate faces of the side blocks which latter are clamped thereon by the through bolt, to maintain said faces in parallel planes perpendicular to the surface of the squaring blocks; the divided mold blade is fitted to the channel between the side blocks; and the cross block, arranged to reciprocate across the inner faces of the side blocks, to alternately close and open or uncover one end of the mold blade channel, is provided with a wear plate 17 contacting with shoe 11, which wear plate, together with the base, is formed by two so-called jet blocks 18, disposed in sequence with a space between them to form a jet opening 18^a at one end of a transverse channel in which is located the jet ejector 19, the latter notched to straddle and be engaged by a cam 20, secured to base plate 1. The combined jet blocks and wear plate extend laterally beyond the faces to the cross-block, forming guides, whereof the one extends into groove 12 on the front abutment and the other into the groove 16 beneath the inner ends of the side blocks.

The casting chamber, located at the inner end of the mold-blade channel immediately above the jet opening 10, is rectangular in cross section, two opposite walls being provided by the side blocks, and the remaining two by the cross block and mold blade, respectively. The distance between the side blocks as fixed by the point block determines the point dimensions of the type body, while the interval between the cross-block and adjustable mold blade determines the set-wise dimensions.

The upper faces of the side blocks, cross block and mold blade where said members join to form the casting chamber are dressed to a plane at right angles to the sides of said chamber to form a seat for the reception of the matrix, and when the cross

block is in casting position the jet opening 18ª at one end of the channel between the proximate ends of the jet blocks registers with and forms a passage between the jet opening 10 beneath and the casting chamber above said jet blocks, the jet ejector being at the time held retracted by its cam, to open said passage beneath the overhanging ends of the side blocks. After the cast is made the cross block is moved to uncover one side of the casting chamber for the delivery of the type, and in so doing the jet or body of metal contained in the jet opening is severed from the type and carried to the edge of the base plate, at which point the jet ejector is advanced by its cam to discharge the jet. If, at the time the cast is made, the two sections of the mold blade are held with their casting faces in alinement the length of the type will be determined by the matrix and its set-wise dimensions by the position of the mold blade relatively to the cross-block; but if at such time the upper or cut-off section of the mold blade is advanced into contact with the cross-block, thereby closing the upper end of the casting chamber, the type produced will be proportionately shorter, its set-wise dimensions being in such case determined by an adjustment of the lower or main section of the mold blade alone.

It is essential to the successful operation of a mold of this kind that the joints between the several members which go to form the casting chamber, including the jet passage, should be metal tight, in order to prevent the escape of the molten metal and the formation of fins upon the type bodies. and, further, that the opposing walls of the casting chamber should be maintained as nearly as possible in parallel planes and at right angles to the other pair of walls. to the end that the produced type body shall be rectangular in cross-section with parallel opposite surfaces, and to obtain and maintain this condition under the varying conditions of use is one of the most serious and vexatious problems presented to the mold maker, more especially when the conditions involve, as they do here, two or more movable members such as the cross block and mold blade. The metal is supplied to the mold under pressure and at a high degree of temperature, and although an effort is made to control in a measure the effect thereof by providing the stationary members, *i. e.*, side blocks, with a water circulation, this method has proved inadequate to eliminate all the troubles incident to the local heating and consequent unequal expansion of the parts. This is more especially true with respect to molds for the larger sizes of type, although not entirely confined thereto, where the volume of metal delivered at each cast is relatively large and the heating effect upon the parts of the mold brought into immediate contact therewith is greatly increased, Two prolific sources of trouble in this line are the cross-block and point-block. Accurate fitting of the cross-block and its attached jet blocks with the inner ends of the side blocks and inner edge of the squaring block, respectively, is necessary, and in order to maintain the joints closed, and at the same time permit the requisite freedom of movement, lateral pressure is applied to the cross-block through shoe 11. When the type machine is speeded up, or relatively large volumes of metal are successively injected into the mold the heating effect is localized and concentrated upon the walls of the jet opening or passage, with the result that these portions of the jet blocks are expanded more rapidly or to a greater degree than the remainder of the cross block, in consequence whereof the initial adjustment is changed and the pressure correspondingly increased to such an extent as to interfere with the free movement of the cross-block, to unduly increase the friction thereon, or in some instances to produce distortion of the cross-block or the jet blocks. To remedy this is one object of the present invention and is accomplished by forming the jet blocks next the squaring block and in the vicinity of the jet opening slightly elastic so they can yield under excessive pressure. This is preferably accomplished by forming a slot 20ˣ in each jet block, said slot opening into the jet ejector channel immediately in rear of the end of said ejector when in its retracted or casting position. The inner or rear end of each slot is preferably made circular, to increase the elasticity of the outer wall and to prevent the formation of angles such as would favor rupture. Another cause of distortion which has also been traced to the rapid local heating of the mold where large type are produced is the point block. The parallelism of the walls of the mold blade channel, hence of opposite faces of the casting chamber, is produced and determined by the point block interposed between the side blocks and upon which the latter are clamped by the through bolt. It has been observed, at times, more especially when the larger sizes of type were being cast, that the product was not rectangular in section, indicating a lack of parallelism in the mold blade faces of the side blocks. Upon careful investigation this was found to be true, and the cause thereof has been traced to the unequal expansion of the point block due to the fact that the heat given out by the molten metal was transmitted in a direct line through the side blocks to the end or edge of the point block nearest the casting chamber, whereby said front edge or end

of the point block was expanded to a greater degree than the rear portion thereof and the side blocks forced out of parallel. To remedy this the direct line of heat transmission between the casting chamber and point block has been interrupted, as by forming slots or openings 21 in the mold blade faces of the side blocks, thus providing an air gap or insulating section and diverting the lines of transmission into and through the bodies of the side blocks. By this means the heat transmitted through the side blocks to the point block is not only diminished in quantity but is more equally distributed throughout the whole extent of the point block.

Although located within an opening in the main section 8 of the mold blade, point block 5 does not contact with and to that extent is insulated from said section, hence other means must be provided for holding the mold blade down to its seat in the mold blade channel. This is accomplished in the present instance by the application of top bearing plates 22, 23, to the upper or cut-off section 9, the plate 22 engaging the mold blade near the casting chamber and the plate 23 near the rear end.

The main section 8 is provided with a gaging shoulder 24 against which the rear end of cut-off section 9 abuts when the casting faces of the two sections are in alinement, and section 8 is also provided with an opening 25 for the reception of the cross-pin by which it is coupled with the adjusting devices.

Pivotally supported, as at 26, upon squaring block 3, are two levers 28, 29, whereof the inner end of 28 is coupled with main-section 8 of the mold-blade and that of 29 with the cut-off section 9. One of said levers (28) carries a tensioning member 30, preferably composed of a tubular body 31 closed at its outer end and provided with a pin 32 at its inner end, said pin passing through an enlarged bearing in the end of the lever, with a spring 33 interposed between the closed end of said tubular body and a block 34, the latter contacting with lever 28. The closed end of this tensioning member is provided with a seat 35 adapted to engage either lever 28 or a bearing 36 on the mold. When said tensioning member is coupled with lever 29 the spring, operating to separate the outer ends of levers 28, 29, closes the opposite ends and thereby presses and maintains cut-off section 9 in engagement with the gaging shoulder 24 of section 8, at the same time permitting free longitudinal movement of the mold blade in response to its adjusting and ejecting devices. By disengaging the tensioning member from lever 28 and engaging the same with bearing 36 the direction in which the spring acts upon lever 28 is reversed, the latter being freed from the main section and advanced to close the upper end of the mold cavity, leaving the main section 8 free to respond to the adjusting and ejecting mechanisms.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is—

1. A cross-block for a type mold such as described provided with a jet opening, the side walls whereof are slotted as and for the purpose set forth.

2. A type mold such as described comprising a base plate, front abutment, squaring block, side-blocks, mold-blade and cross-block the base section whereof containing the jet opening is provided with elastic bearing surfaces contacting with the squaring block.

3. In a type mold such as described provided with a base plate, front abutment, squaring block, side-blocks and mold-blade, and in combination therewith, a cross-block provided with spaced jet blocks the proximate ends whereof forming the ejector channel and jet passage are slotted at points in rear of the jet passage end of the ejector and in parallel with the bearing surface engaging the squaring block.

4. A type mold provided with side-blocks the proximate faces whereof engaging a point block, to form the mold blade channel and opposed walls of the casting chamber, are slotted at points intermediate the point block and casting chamber.

5. A type mold provided with side-blocks, an interposed point-block, and a mold-blade wherein the mold blade faces of the side blocks contain insulating slots or air gaps, on either side of the mold blade channel intermediate the casting chamber and point block.

6. A type mold including a base plate, front abutment, squaring block, side blocks, point block, mold blade and cross block wherein the base of the cross block is provided with elastic bearings in the vicinity of the jet opening engaging the squaring block and the mold blade faces of the side blocks are interrupted intermediate the casting chamber and point block.

7. A type mold provided with side blocks, interposed point block, and mold blade, wherein the point block is insulated from the mold blade and the mold blade faces of the side blocks are interrupted intermediate the casting chamber and points of contact with the point block.

8. A type mold provided with side blocks and an interposed point block forming a mold blade channel one end whereof furnishes opposing walls of the casting chamber, the latter insulated from the point block by slots or recesses in the mold blade faces of the side blocks, a sectional mold blade occupying the mold blade channel the lower

or main section whereof is slotted for the passage of the point block without contacting therewith, and top bearings engaging the superposed cut-off section.

9. A type mold provided with a sectional mold blade, two levers each coupled with one mold blade section, and a tensioning device coupled with one of said levers and arranged to be coupled with the other lever or a fixed bearing on the frame.

10. In a type mold such as described, the combination of the following elements, to wit; a sectional or divided mold blade provided with opposing gaging members, two levers each coupled with one of the mold blade sections, and a tensioning member attached to one lever and adapted to be engaged with either of two bearings, the one on the opposite lever and the other on the mold.

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