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G. H. STRYKER

2,557,705

TYPOGRAPHIC MOLD

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FIG. 1.

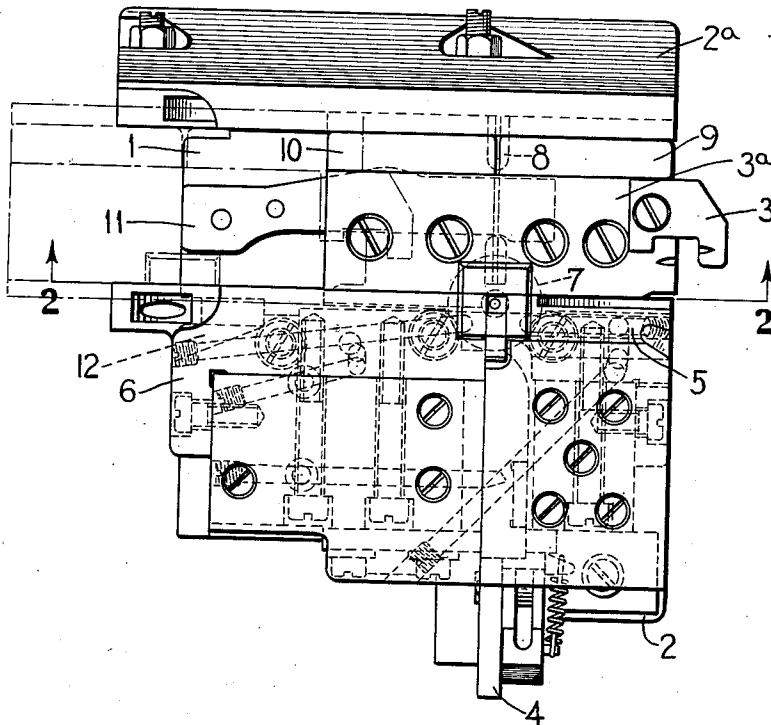


FIG. 2.

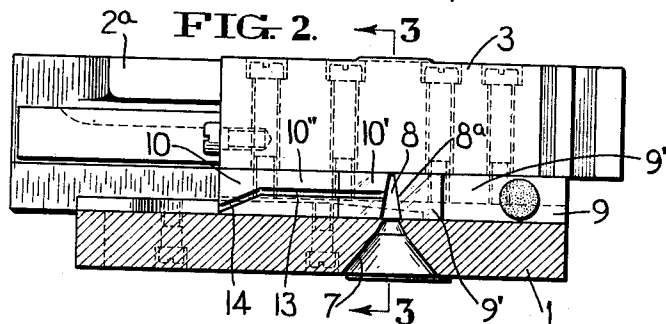


FIG. 3.

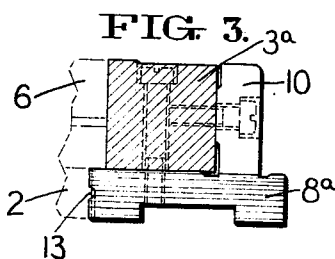
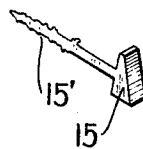


FIG. 4.



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TYPOGRAPHIC MOLD

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2 Claims. (Cl. 199—91)

1 This invention relates to molds for casting elements of printing forms, such as printers' types, and has for its principal object the production of a mold provided with a vent or passage for the escape of air from the mold cavity and entrance-gate cavity, which vent is so located and designed as to result in the production of types of great solidity and strength and having substantially perfect feet. This and other objects will be more particularly described hereinafter in connection with the following description of the embodiment of the invention shown in the accompanying drawings. Molds of this kind are adapted to be used with a suitable typographic casting machine, and the mold shown is for use in connection with typecasting machines well known in the art as being the product of Lanston Monotype Machine Company. Such a machine is provided with a pot for molten metal, a metal pump and nozzle and mechanisms connected with the mold blade and with the cross block of the mold, as well as being provided with other necessary mechanisms for the casting of type, all of these mechanisms operating in properly timed relation, as will readily be understood by those skilled in the art. A further description of this well-known typographic machine and its operation in association with the mold is deemed unnecessary.

An embodiment of the invention is shown in the accompanying drawings, in which

Fig. 1 is a plan view of the mold.

Fig. 2 is a cross section on substantially the line 2—2 of Fig. 1.

Fig. 3 is a cross section of the cross block on substantially the line 3—3 of Fig. 2, with the adjoining water base and a type block shown in dot and dash lines, and

Fig. 4 is a perspective view of the gate discharged from the mold and having the air vent fin attached to it.

The mold shown is generally of the construction shown in United States Letters Patent No. 2,029,529 issued in the name of M. C. Indahl and patented Feb. 4, 1936. In both the patented mold and the mold shown herewith there are, for example, the base comprising the base plate 1 and the water base 2, also known as the squaring block, and the front abutment 2a. Both molds include also the cross block 3 to operate at right angles to the mold blade 4, the end of which nearest the cross block is slidable between adjacent ends of type blocks 5 and 6. The base is also provided in molds of this kind with a conical nozzle opening 7, in which the pump nozzle

2 seats and through which the molten metal is introduced. The nozzle, as is well known, is lowered between castings and rises to seat in the nozzle opening during the casting operation. The mold cavity or type cavity into which the metal is forced by the pump is formed as to its four sides by the type blocks, the mold blade end and a face or wall of the cross block. It is understood, of course, that a matrix is ordinarily seated on top of these parts to form the top wall of the mold cavity.

These molds are also provided with a jet cavity or gate cavity below the mold cavity, the side walls of said gate cavity being formed in the cross block, one end of the gate cavity being formed by the face of the water base 2 against which the cross block slides and the other end of said cavity being formed by the adjacent end wall of the gate pusher 8. The side walls 8a of the gate cavity slope upwardly to form an inverted-V cavity which the gate pusher fits and through which the metal from the nozzle is directed into the mold cavity. These side walls are the adjacent walls of gate blocks 9 and 10 which are beveled and located slightly apart and secured to the cross block top block 3a by screws, as is well known, these parts comprising the cross block proper. The gate pusher 8 is operative cross-wise of the cross block and is controlled by the usual cam 11 secured on the upper surface of the base 1 and effective to retract the pusher to provide the gate cavity at the time of casting and to move it toward the water base to eject the gate when the cross block has been moved to gate ejecting position as shown in dot-and-dash lines in Fig. 1. The ejected gate falls into the melting pot through the usual opening 12 shown dotted in Fig. 1. As usual, the cross block is moved slightly in the opposite direction prior to moving to ejecting position in order to sever the jet from the body of type cast into mold cavity.

In the usual construction of these molds the gate blocks 9 and 10 are highly finished near the gate cavity on the sides which slide upon the water base, thus forming bearing pads 9' and 10'; but beyond these pads, in some constructions and as clearly shown in Fig. 2, the faces of these sides are cut back slightly as indicated at 9'' and 10'' as a clearance which in molds of generally used point sizes may be about .00015 of an inch. The extremely narrow vertical slot between the gate block 10 and the water base thus formed by this clearance space will be referred to hereinafter.

These molds or molds of the same general kind

have been used for many years on the machines with which they are adapted to be used, but the types produced have at times been defective, particularly because of the undue amount of air entrapped in them. When a type was broken into pieces, this defect would appear as a relatively large bubble or as numerous small cavities making the type weak so as not to stand up under processes which employ high pressures. The feet of such type may be ill-formed and may have the condition known as "bleeding feet." It is possible to correct these defects in some cases by changing the temperature of the molten metal, by altering the spring pressure exerted on the pump piston or the timing of pump and nozzle action or by other adjustments of the casting machine. The present invention corrects these defects to a material extent and makes possible the production of practically perfect types without any of the above mentioned manipulations or adjustments being necessary. Nor are any such adjustments necessary when molds of different point sizes are substituted one for the other, which was the practice formerly.

The bearing face or pad 10' on the gate block 10 is provided, in accordance with this invention, with a vent groove 13 shown extending from the gate cavity to the end of the gate block so as to provide a passage from said cavity to the atmosphere at the time of casting. This groove, in molds for the usual sizes of reading matter, is conveniently made by a grinding wheel having a radius of about .0415 of an inch and is about .012 of an inch deep. Air which is driven from the mold cavities, through this groove traverses the groove to the end of the block. The outer end of the groove 13 may be angled downwardly as at 14. Excess metal follows the air and to some extent travels with it, being forced out of the end of the vent in a mist or dust. It is believed that in molds provided with a clearance space 10'' between the water base and the gate block 10, some air escapes into such clearance space, since the rod or fin 15' of metal which congeals in the vent after the vent stream has come to rest and which is attached to the gate 15 and is ejected along with the gate, often has serrated or roughened edges, as shown at 15' in Fig. 4, indicating that air has escaped and in doing so has produced these rough edges. It is evident however that the extreme narrowness of the clearance space is such that metal does not appreciably enter into it nor is it necessary in accordance with the spirit of this invention that a clearance space should be provided. The portion 14 of the groove is preferably provided to direct air and spitting metal particles in a downward direction and toward the pot. The rod 15' ejected with the gate 15, rarely extends as far as the sloping portion 14 of the vent groove but may do so in some cases, depending on conditions of the moment. The ejected gate and attached rod or fin falls into the pot through the usual opening 12 in the base. A shield or guard may be suitably arranged, if desired, to catch and direct toward the pot, metal which may not have fallen directly into the pot.

It is to be understood that in molds and casting machines and especially in those which operate at a speed to produce 140 or more types per minute, there exists a pulsing of metal in the pump and nozzle so that at each casting cycle when the nozzle is in removed position the metal level therein may be at times low and at others relatively high; thus the volume of air in the

nozzle varies. At all times, when in this removed position, there is considerable air in the nozzle and when, later in the cycle of operation of the machine, the nozzle is raised to its position of being seated in the nozzle seat 7 and the pump piston moves in its operating stroke, such nozzle air, whatever its volume, is forced under pressure ahead of any metal into the gate and mold cavities. The nozzle air thus forced is released to the atmosphere through the gate cavity and the vent passage 13, and when the metal follows to stream into the mold cavity, air in such cavity is forced backwardly to escape, along with air in the gate cavity, through the same vent. Excess metal, of course, finally flows into the vent and it solidifies there as well as in the gate cavity, after the pump ceases to force additional metal into the cavities, being in the form of a fin or rod 15'. This fin is detached from the vent when the gate is ejected and both fin and gate fall into the pot as a single piece, as has been previously set forth. The result of the use of this construction is the production of types having practically perfect lower ends, or feet, so that the types have a firm foundation on which to stand upright. This mold construction also gives greater solidity to the types cast by it because of their containing a minimum amount of entrapped air, this extra degree of solidity being shown by the fact that types made by the vented mold described weigh materially more than when produced by molds of constructions known heretofore—even to the extent of 25% more.

I claim:

1. A typographic mold for producing single types, comprising a base including a water-base, type blocks, a mold blade, a cross-block, said blocks and blade forming a type cavity, one wall of the cross block being slidable on the type blocks, said cross block including gate blocks forming an inverted V-gate cavity with a narrow slit connection between the gate cavity and the type cavity, a wall of a gate block being slidable on a wall of the water-base, a vent between said last mentioned walls extending in the direction of movement of the slidable gate block and leading from the gate cavity to the atmosphere, whereby during the casting operation air and molten metal flow from said gate cavity through said vent and escape to the atmosphere before congealing, a gate pusher carried by the cross block and slidable in the gate cavity, and means carried by the base to move the pusher during the ejection operation to eject the congealed gate and metal attached to it which has congealed in the vent.

2. A typographic mold for producing single types, comprising a base including a water-base, type blocks, a mold blade, a cross block, said blocks and blade forming a type cavity, one wall of the cross block being slidable on the type blocks, said cross block including gate blocks forming an inverted V-gate cavity with a narrow slit connection between the gate cavity and the type cavity, a wall of the gate block being slidable on a wall of the water-base and having a highly finished bearing pad in proximity to the gate cavity to fit against the water-base wall on which it slides, but having a clearance space beyond the pad to the end of the block, a vent in the form of a groove extending across said pad and gate block from the gate cavity to the end of the block, and being deeper than said clearance space, whereby, during the casting operation air and molten metal flow through the groove

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and escape from the end thereof to the atmosphere, and air escapes from the groove into said clearance space, a gate pusher carried by the cross block and slidable in the gate cavity, and means carried by the base to move the pusher during the ejection operation to eject the congealed gate and metal attached to it which has congealed in the vent.

GEORGE H. STRYKER.

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The following references are of record in the file of this patent:

6

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1,897,012	Severin	Feb. 7, 1933
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OTHER REFERENCES

- 10 "The Intertype; A Book of Instruction for its Operation and General Maintenance" published by the Intertype Corporation, 360 Furman St., Brooklyn 2, N. Y. Pages 82 and 83, copyright 1943. (Copy in Division 17.)