

C. HOLLIWELL.
AUTOMATICALLY CORED LINOTYPE MOLD BLOCK.

(Application filed Sept. 20, 1901.)

(No Model.)

4 Sheets—Sheet 1.

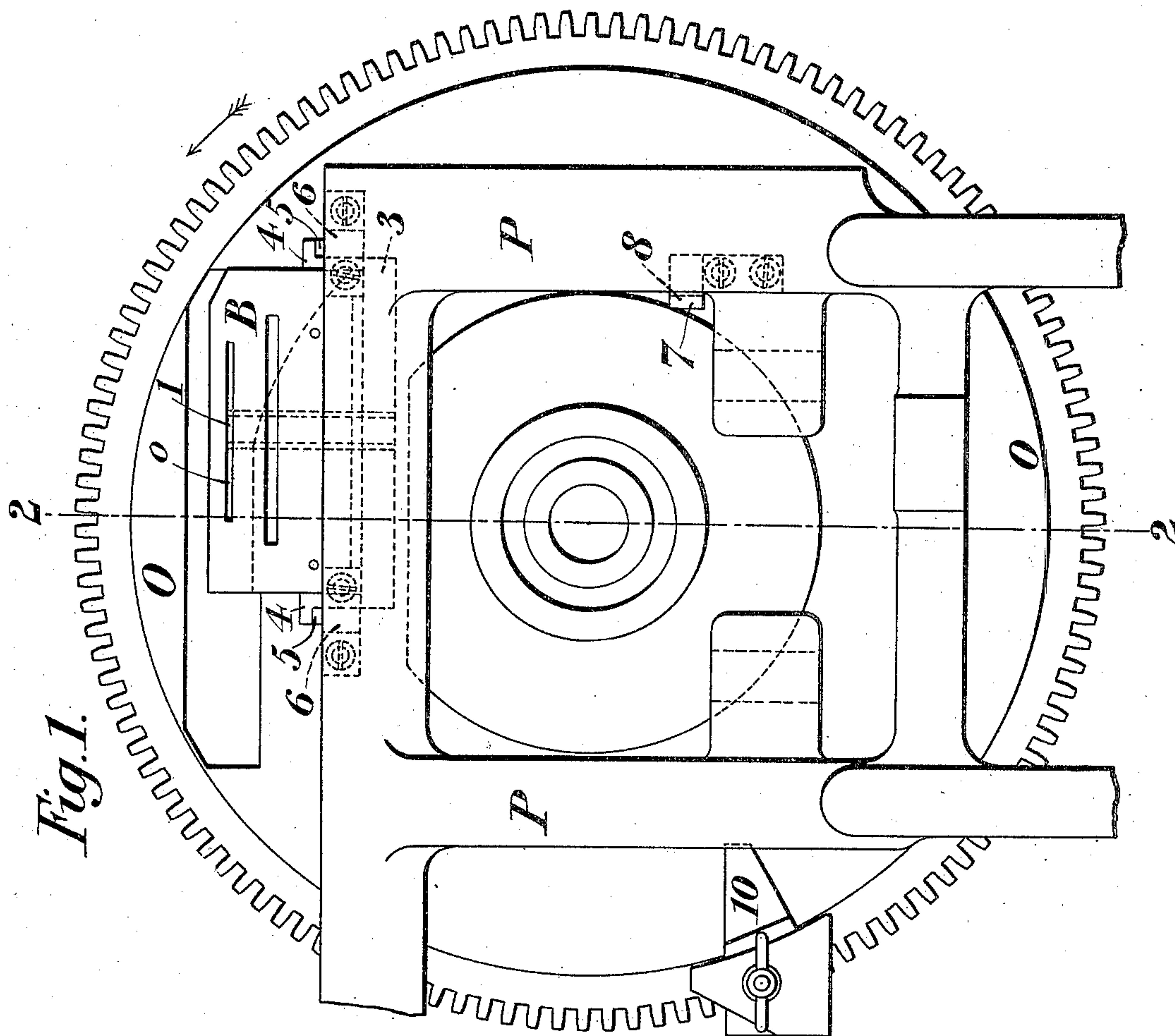
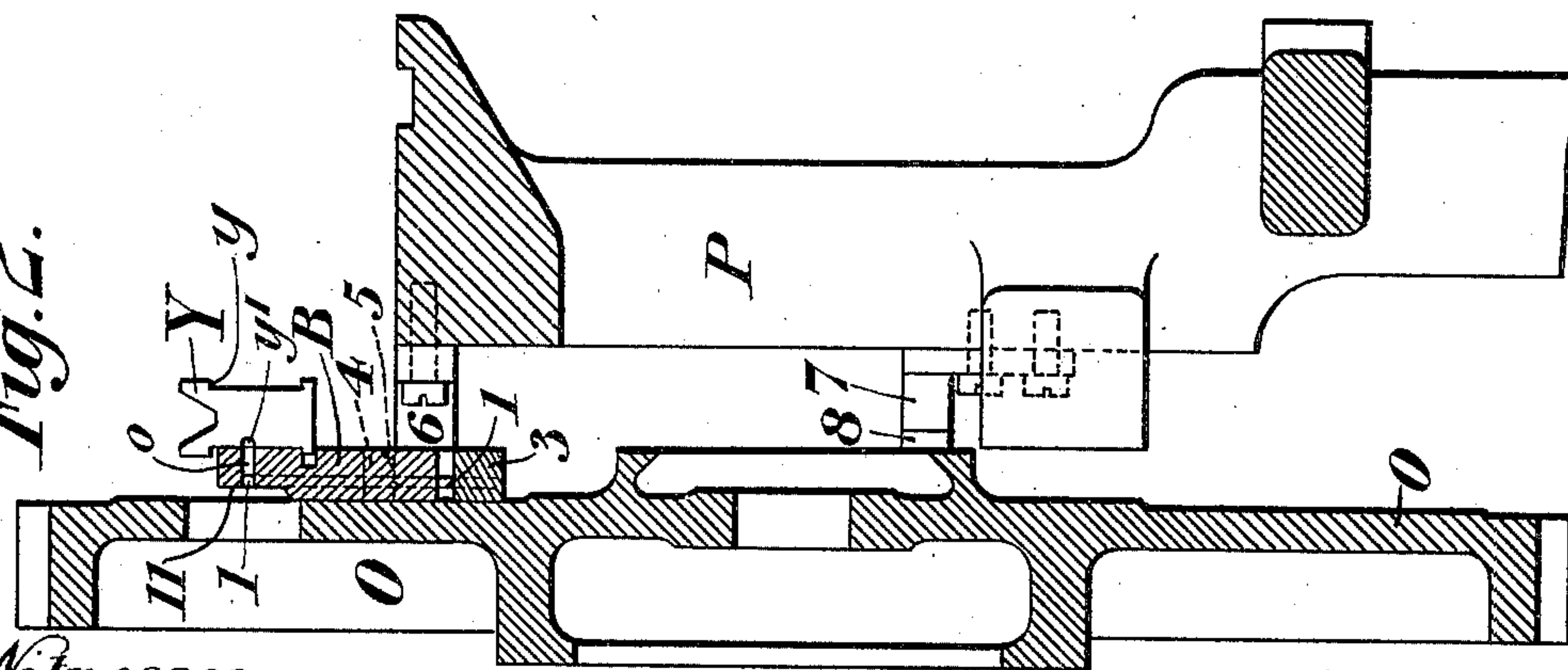


Fig. 2.



Witnesses.

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per *C. T. Dodge* Attorney.

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4 Sheets—Sheet 2.

Fig. 3.

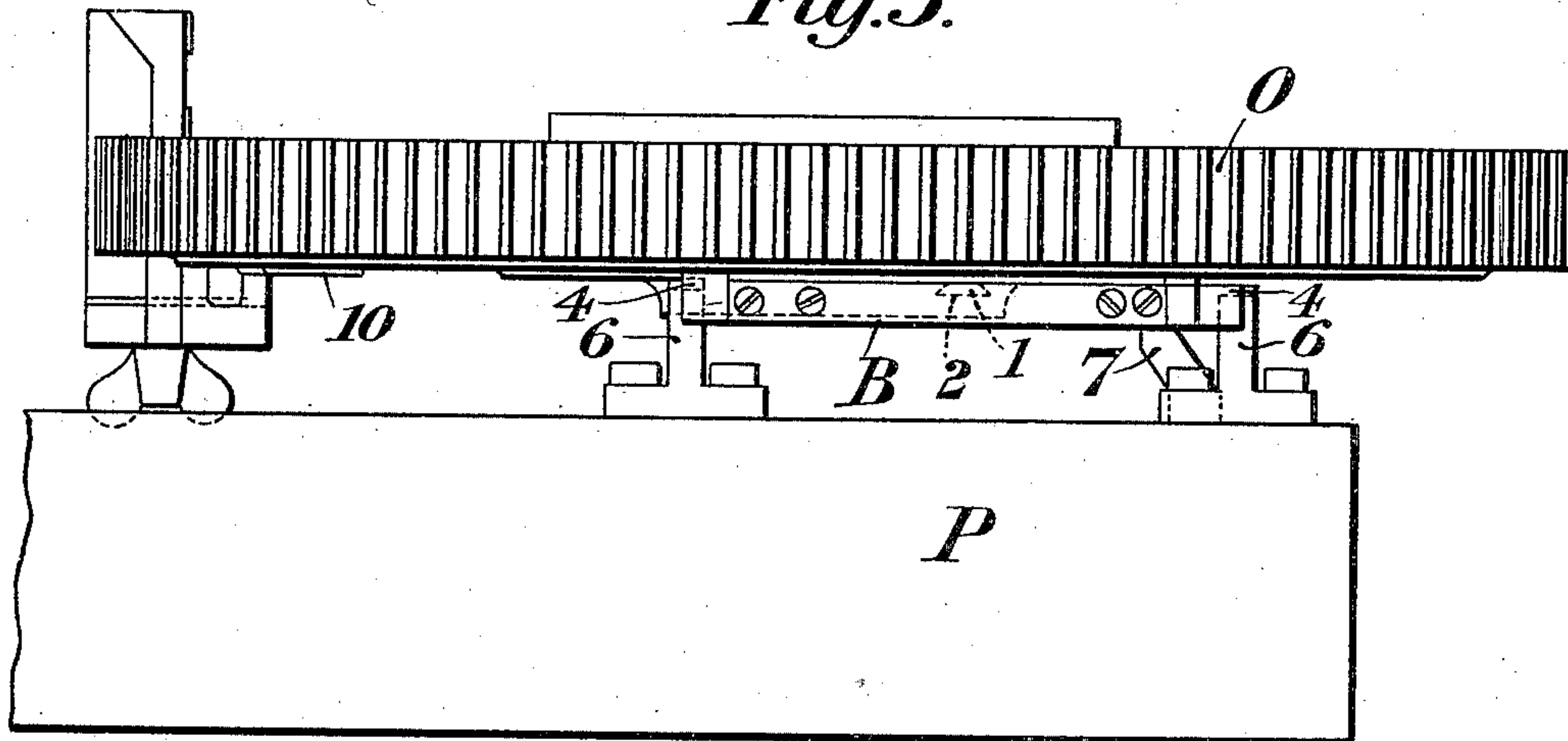


Fig. 7.

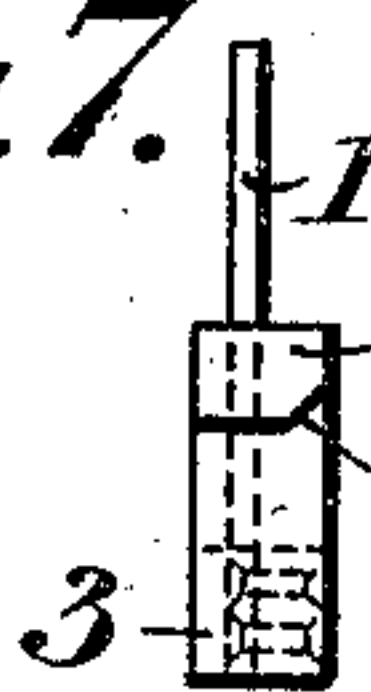


Fig. 6.

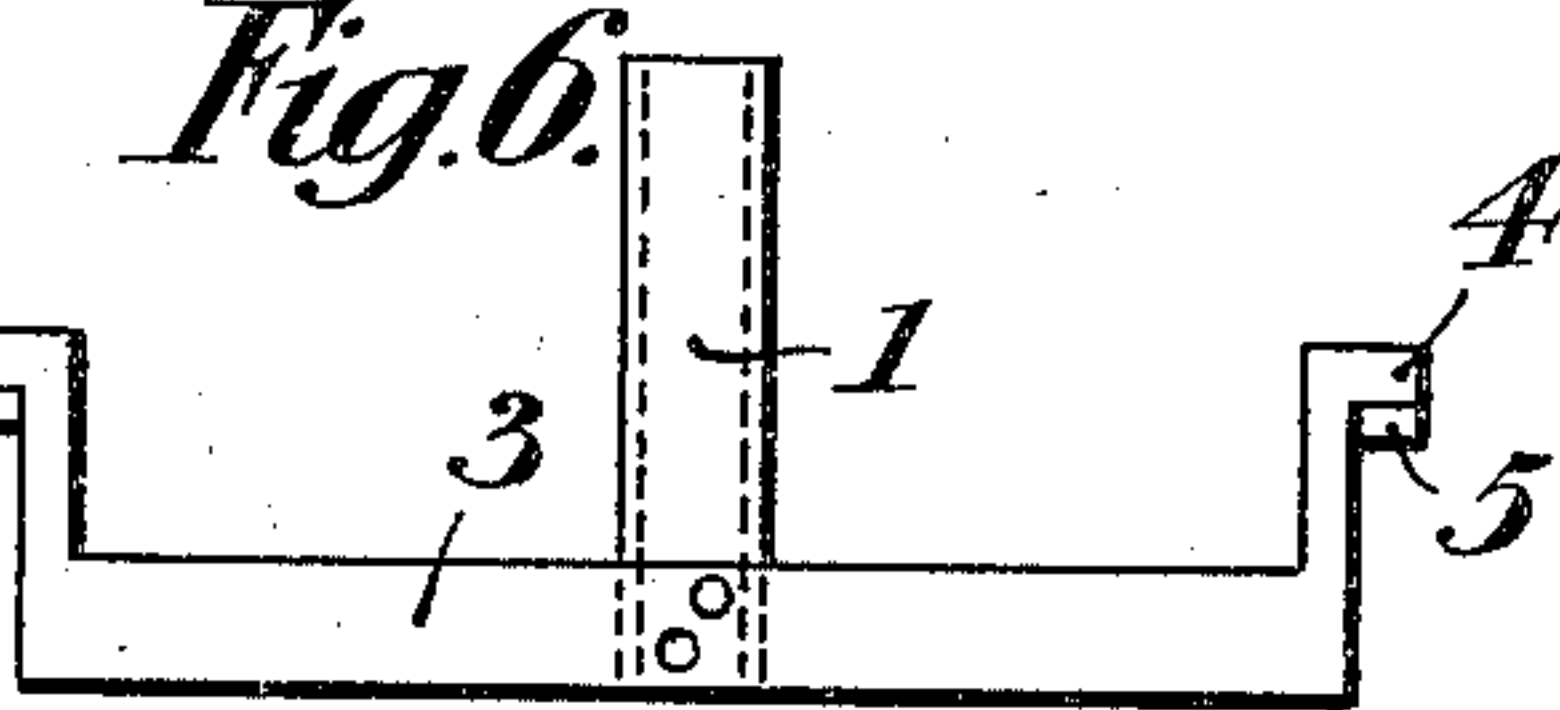
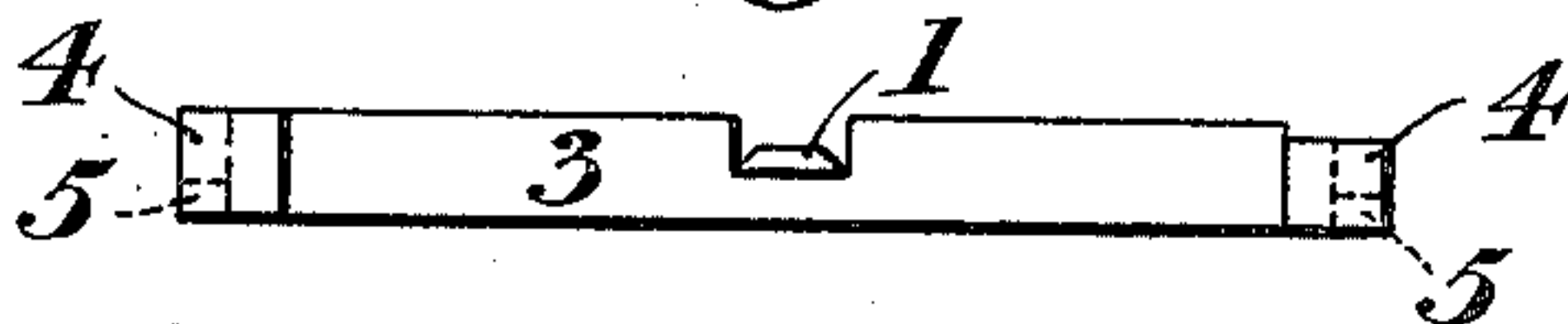


Fig. 8.



Witnesses.

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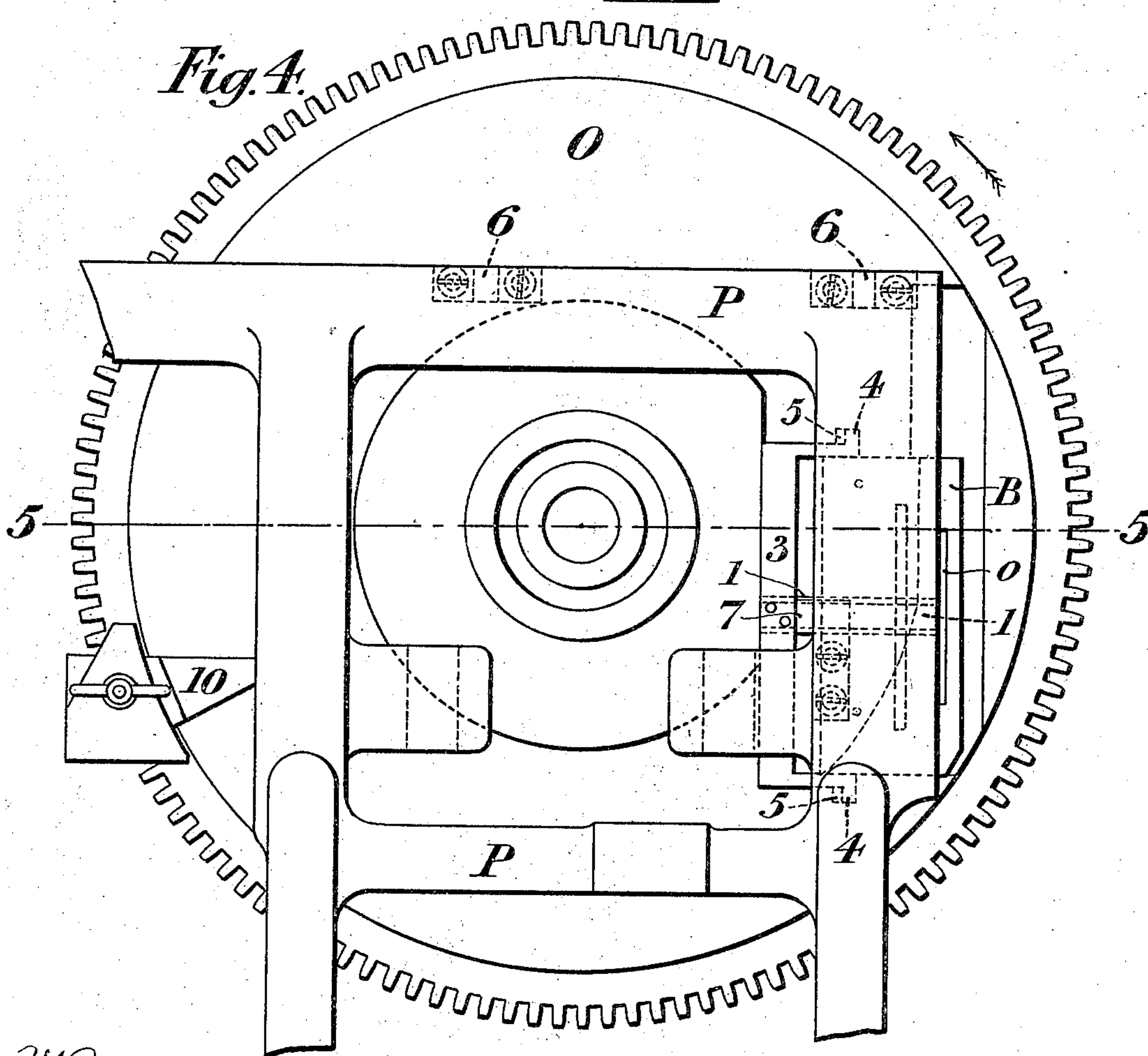
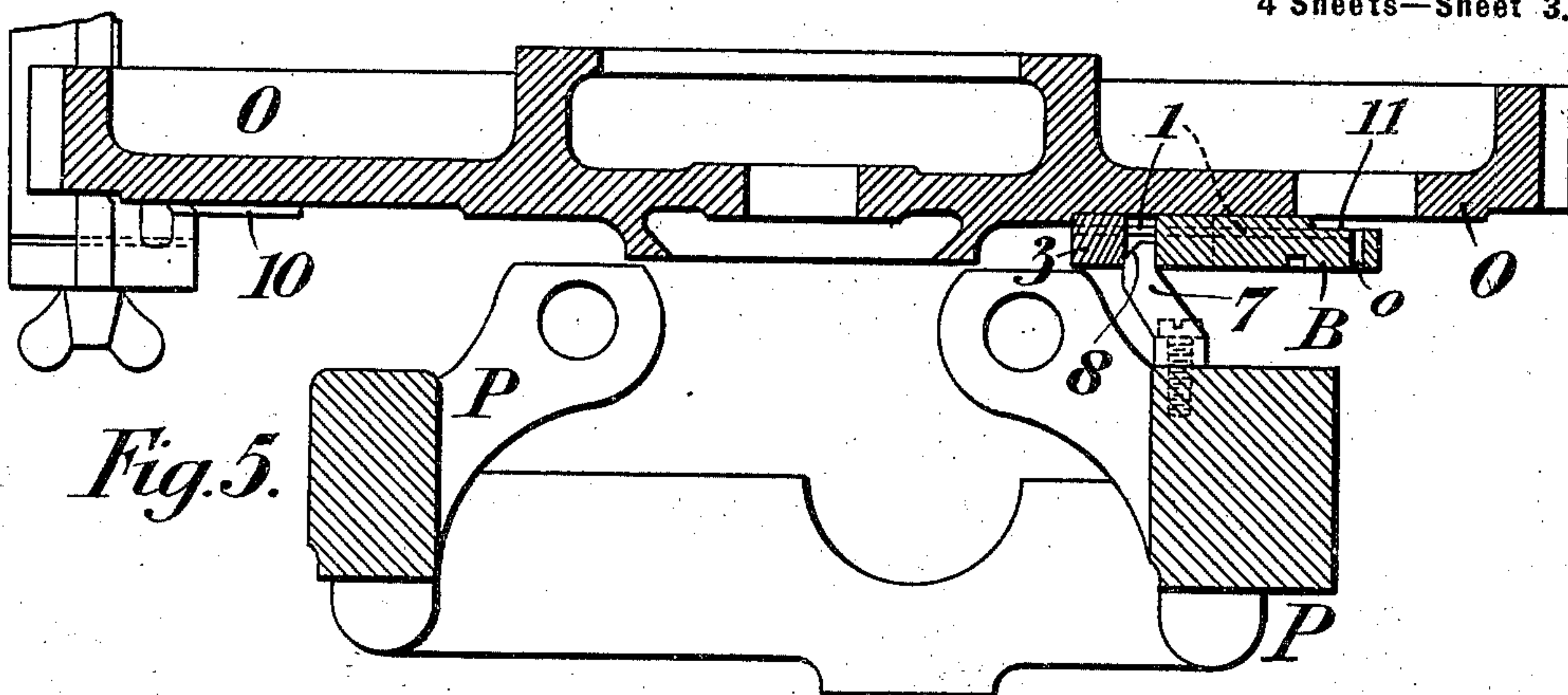
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4 Sheets—Sheet 3.



Witnesses.

H. R. Kennedy
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UNITED STATES PATENT OFFICE.

CHARLES HOLLIWELL, OF BROADHEATH, ENGLAND, ASSIGNOR TO THE
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AUTOMATICALLY-CORED LINOTYPE MOLD-BLOCK.

SPECIFICATION forming part of Letters Patent No. 696,637, dated April 1, 1902.

Application filed September 20, 1901. Serial No. 75,661. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HOLLIWELL, of the Linotype Works, Broadheath, in the county of Chester, England, have invented certain new and useful Improvements in Automatically-Cored Linotype Mold-Blocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in the automatically-cored mold-blocks of linotype-machines, and is specially applicable to the Mergenthaler linotype-machine described in the specification of Letters Patent No. 436,532, dated September 16, 1890. In this machine the mold for the printing edge of the linotype consists of a row of formative cavities or matrices proper in the edges of a row of metal plates or so-called "matrices," which row is held in the casting position by a pair of vise-jaws and a backing-up abutment. The mold for the body of the linotype is a slot in a mold-block held to the face of a so-called "mold-wheel," so that the length of it is parallel with a diameter of the wheel and the depth of the slot, corresponding with the depth or height of the linotype or distance across it from its foot to its printing edge, parallel with the axis of the mold-wheel. The latter is moved forward at the proper moment from its rearmost position until the front face of the mold-block bears metal-tight against the rear face of the row of matrices, which closes the mold-slot on that side. A metal-pot and pump follow the body-mold till the nozzle or mouthpiece of said pot fits metal-tight against the rear face of the mold-block, so as to close the mold-slot on that side. The pump then injects metal into the linotype-mold, and a linotype is cast, after which the metal-pot and pump are moved back. The mold-wheel is also moved back to enable the type-faces on the linotype to clear their mold and then turned through three-quarters of a circle, so carrying the foot of the linotype past a trimming-knife, which cuts it true, and leaving the body-mold, with the linotype still in it, standing vertical and opposite to a pair

of trimming-knives, one on each side of the ejection-port. The mold-wheel is then moved forward into its foremost position, and an ejector is also moved forward to push the linotype out of the said mold and through the ejection-port into the galley, the pair of trimming-knives trimming its sides as it is pushed between them. The mold-wheel is then again moved backward into its rearmost position and then turned through the remaining quarter of a circle, which leaves its mold-block horizontal and ready to be again moved forward preparatory to the next casting operation. The mold-wheel between its partial rotative movements remains stationary in the casting and ejecting positions sufficiently long to enable these operations to be properly carried out.

The depth of normal linotypes is proper for their standing "type high," as it is called, when they are on their feet, and stereoplates and turtles are as thick as types are high. It has become the practice of late years to insert late-news linotypes in the stereoplate or in the turtle by having a rectangular hole in one column, in which is fitted a detachable tray or "fudge-box," to use the name by which it is known in the printing trade. A fudge-box is not deep enough to take type-high linotypes, "fudge-linotypes," or linotypes having late news on their printing edges, being, as a rule, only about half as deep or high as normal linotypes.

According to a recent invention the mold-block is reduced from the normal depth to the one corresponding with the depth or height of the fudge-linotypes, this reduction being effected from the rear of the mold-block—that is, from the side on which are the metal-pot and pump. The nozzle or mouthpiece of the said pot is longer than heretofore to enable it to reach the rear face of the reduced mold-block. The metal-pot is mounted on an axis below it and sufficiently far in front of its center of gravity to make it maintain contact through an antifriction-roller on the rear side of it with the cam that moves it forward. The said antifriction-roller is larger than that used in the casting of type-high linotypes, so as to cause the metal-pot

to be oscillated by its cam in a more advanced zone to enable it to reach the correspondingly-advanced rear face of the mold-block.

The knife for trimming the feet of the fudge-linotypes is fixed to the mold-wheel guide or other suitable part of the machine-frame. Means for automatically coring the mold-blocks of the Mergenthaler linotype-machine are described in the specifications of Letters Patent No. 637,117, of November 14, 1899, and No. 644,558, of February 27, 1900.

The present invention relates to special means for coring the above-named fudge mold-blocks and will be best understood by reference to the accompanying drawings, which are to be taken as part of this specification and read therewith, and wherein—

Figure 1 is a front elevation of the mold-wheel, mold-block, a portion of the vise-frame, and other adjacent parts of the linotype-machine, the mold-wheel and mold-block being in the casting position; Fig. 2, a vertical section on the line 2 2 of Fig. 1; Fig. 3, a plan of Fig. 1; Fig. 4, an elevation corresponding to Fig. 1, but showing the mold-wheel and mold-block in the ejecting position; Fig. 5, a horizontal section on the line 5 5 of Fig. 4; Figs. 6, 7, and 8, a front elevation, an end elevation, and a plan, respectively, of the core and core-operating bar attached thereto; Fig. 9, a vertical section through the mold-block and yoke, transporter, or elevator head, with a matrix and core in position for casting a cored fudge-linotype; and Fig. 10, an elevation of one of the resultant linotypes. Figs. 9 and 10 are drawn to a scale larger than that to which the other figures are drawn.

Similar letters and numerals of reference are used to indicate like parts throughout the several figures of the drawings.

For the purpose of identification the reference-letters used in the above-mentioned specification, No. 436,532, are employed in the present one to indicate the same or similar parts wherever they occur.

N, Fig. 9, is the head of the "yoke," "transporter," or "elevator" as it is variously called. This head consists of a pair of parallel rails. Its function is to receive the composed line of matrices Y and space-bars from the shifter, (not shown in the drawings,) carry them down into the casting position, (the one illustrated in Figs. 2 and 9,) hold them there during the act of justification and the process of casting, and to then carry them up to or bring them within the sphere of operation of the distributing mechanism. The matrices are supported in the head N by the engagement of their top shoulders y y in corresponding grooves in the said head.

O is the mold-wheel, carrying the mold-block B, the rear face 11 of which around the mold-cavity o is a vertical plane against which the mouth of the delivery pipe or nozzle from the melting-pot (not shown) is adapted to fit metal-tight, so as to close in the back of the mold-cavity o , while the front face of the said

mold-block is likewise a vertical plane adapted, as shown in Figs. 2 and 9, to fit metal-tight against the rear face of the above-mentioned composed line of matrices Y and to close in the line of formative cavities or matrices proper, y' , in the said face.

P is the head of the vise-frame.

All the parts above enumerated are substantially as described in the before-mentioned specification, No. 436,532, the only material difference being in the thickness or depth of the mold-block B, which, being in the present example required to produce fudge-linotypes instead of the usual type-high linotypes, is of about half the thickness of the ordinary mold-block.

According to the present invention either a single core 1, as shown in the drawings, or two or more such cores is or are provided and arranged to slide each in a suitable groove or guide 2 in the rear face of the mold-block B, so that its effective end may project completely across the mold-slot o , as shown in Figs. 1, 2, and 9, sufficient friction being present to retain the core in either of its two positions until it is positively moved therefrom in the manner hereinafter described. The opposite end of the core 1—that is to say, the end nearest the axis of the mold-wheel O—is secured to a bar 3, which at its two outer extremities is provided with lugs 4, having inclined or cam surfaces 5, adapted to engage, as hereinafter more fully explained, with projections 6 6, extending rearwardly from the vise-frame P. The vise-frame is also provided with a third projection 7, having an inclined or cam surface 8, adapted, as shown in Fig. 5, to act on a central part of the bar 3 to withdraw the core 1 from the mold-slot o .

When the mold-wheel O and mold-block B (then in their rearmost position) are turned through a quarter of a revolution from the ejecting position, and the mold-slot o is therefore horizontal and opposite to and in the same horizontal plane as the row of formative cavities y' , the two cam-surfaces 5 5 are directly in line with the projections 6 6, so that at the immediately-ensuing forward motion of the mold-wheel O the said cam-surfaces are pressed against the projections 6 6, as shown in Figs. 1, 2, and 3, and thereby the bar 3 is raised and the core 1 projected across the mold-slot o . The linotype is then cast in the usual manner, with the result that it has formed in its foot a recess 9, Fig. 10, corresponding in shape with the cross-sectional form of the core 1. In the drawings this is represented as of dovetail form; but it may be of any other desired form, the recess 9 or the shape thereof in itself constituting no individual feature of the invention. The mold-wheel O, as ordinarily, is then moved backward, carrying with it the cast linotype, so that the printing-face of the latter is clear of the matrices Y, and then turned in the direction indicated by the arrows in Figs. 1 and 4 through three-quarters of a revolution, thus

bringing the mold-slot *o* into the vertical or ejecting position in which it is represented in Figs. 4 and 5. The mold-wheel *O* is then moved forward to bring the mold-slot *o* adjacent to the knives, (not shown in the drawings,) by which in the subsequent ejection of the linotype the sides of the latter are in the ordinary manner trimmed off. It is this forward movement of the mold-wheel *O* which is utilized for retracting the core *1* from the mold-slot. This is effected by the bar *3* at or near its center being (by such movement) forced onto the before-described incline or cam surface *8*, as indicated in Figs. 4 and 5. The ejector (which is not represented in the drawings) is then moved forward and the linotype thereby pushed out of the front of the mold-block *B* and simultaneously trimmed by the above-named knives, after which the mold-wheel is rotated through the remaining quarter of its revolution into the casting position, as illustrated in Figs. 1, 2, and 3, ready for the commencement of the next cycle of operations.

During the before-described three-quarter rotation of the mold-wheel *O* the foot of the linotype, then contained in the mold-slot *o*, is moved past the stationary knife *10*, which removes any surplus metal therefrom. The knife *10* is rigidly secured to the mold-wheel guide or other convenient stationary part of the machine and projects in front of the mold-wheel in such position that the back face *11* of the mold-block *B* sweeps across the front of it at preferably about the middle of the aforesaid three-quarter rotation.

It will be obvious that the before-described apparatus may be modified without departing from the spirit of the invention. For example, it may be used for producing cored linotypes with dovetail or *L*-shaped projections instead of dovetail recesses in their feet, for which purpose the bar *3* would carry two cores whose opposing edges would have the appropriate angular or stepped form; also, if desired, instead of the inclines *5* and *8* being on the parts indicated they or their equivalents may be on respectively the projections *6* *6* and bar *3*.

I am aware that it is old in linotype-machines to extend movable pins or slides through holes in the body of the mold to form shallow indentations in the side face of the slug. My invention has in view a different result—namely, the production of a cavity or recess in the base of the slug extending across the same from one surface to the other. To this end the essential feature of my invention lies in the formation of a cavity of dovetail or equivalent form in the rear face of the mold transversely thereof and in mounting the core to slide in and fill this cavity flush with the back of the mold during the casting operation. Thus arranged the core serves to fill the back of the mold and give the same a flush surface, that there may be no leakage of metal between the mold and the melting-pot

during the casting operation. It also serves to give a smooth surface on the back, so that the knife which trims the slug flush with the back of the mold will not be endangered by contact with shoulders or projections. Incidentally the dovetail core also serves to hold the slug back within the mold, that it may not be pushed forward during the action of the trimming-knife, the result of which would be to give the slug an undue height.

I claim—

1. In a linotype-casting machine the combination with the fixed frame and mold-wheel, and means in operative connection with the mold-wheel imparting to it intermittent partial rotation and reciprocal axial movement, of a mold-block secured to the mold-wheel, a mold-slot and guide in the mold-block, a core in the guide movable into and out of the mold-slot, projections on the core and cooperating cams on the core projections, and on the fixed frame in the rectilinear path of said projections, for projecting the core into, and retracting it from, the mold-slot substantially as set forth.

2. In a linotype-casting machine the combination with the mold-wheel and a mold-block thereon slotted to form respectively part of the casting-mold and a guide, of a core in the guide movable into and out of the mold-slot transversely and cooperating cams on the core and fixed frame for projecting the core into, and retracting it from the mold-slot substantially as set forth.

3. In a linotype-casting machine the combination with the mold-wheel and means operatively connected therewith alternately moving it rotatively and axially, and a mold-block, on said wheel slotted to form respectively part of the casting-mold and a guide, of a core in the guide, movable into and out of the mold-slot transversely, a bar on the core and fixed devices adapted to engage the bar when the mold-wheel is moved axially for projecting the core into, and retracting it from, the mold-slot substantially as set forth.

4. In a linotype-casting machine the combination with the mold-wheel and means operatively connected therewith alternately imparting partial rotation in the same direction and reciprocal axial motion, and a mold-block on said wheel slotted to form respectively part of the casting-mold and a guide, of a core in the guide, movable into and out of the mold-slot transversely, a bar on the core, cam projections on the bar and cam projections on the fixed machine-frame adapted to engage respectively the bar and the cam projections on the bar when the mold-wheel is moved axially forward substantially as set forth.

5. A mold for a linotype-machine, consisting of a rigid body having parallel front and rear faces, a slot therethrough in which to cast the linotype, and a transverse dovetail groove in the rear face, in combination with a sliding core mounted in said slot and having its rear face flush with that of the mold,

whereby the mold is adapted to support and carry the core, and the core adapted to form a recess in the base of the slug to release the slug, that it may be ejected.

- 5 6. In a linotype-machine, a rigid mold having parallel front and rear faces, a slot in which the linotype is formed, and a transverse groove in its rear face, in combination with a sliding core mounted in said groove
10 and sustained by the mold flush with its sur-

face and with automatic mechanism for advancing the core across the mold-slot and retracting it therefrom.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

CHARLES HOLLIWELL.

Witnesses:

ARTHUR H. SMITH,

CHARLES H. O. POOK.