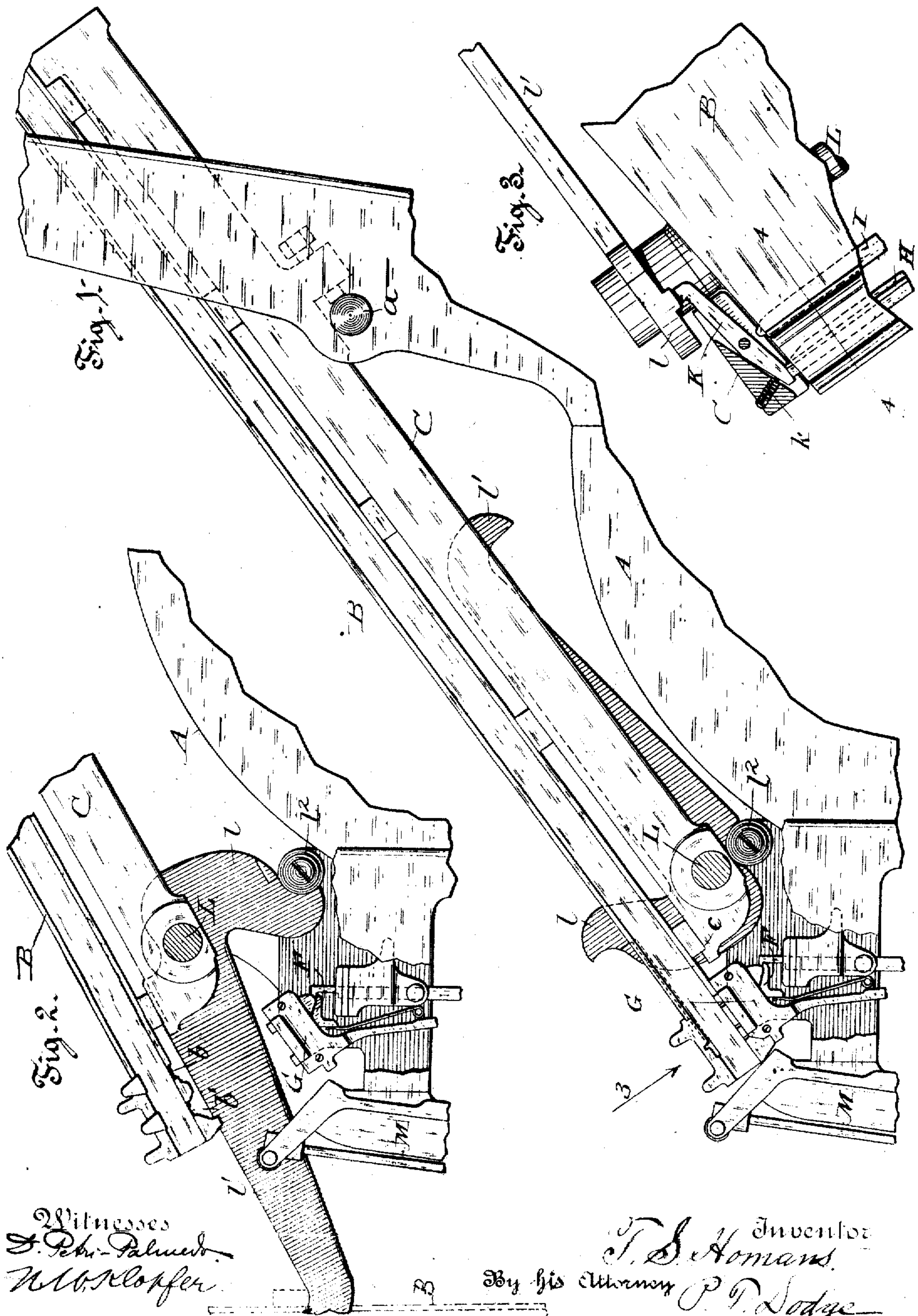


No. 829,868.

PATENTED AUG. 28, 1906.

T. S. HOMANS.
LINOTYPE MACHINE.
APPLICATION FILED SEPT. 5, 1906.

2 SHEETS—SHEET 1.



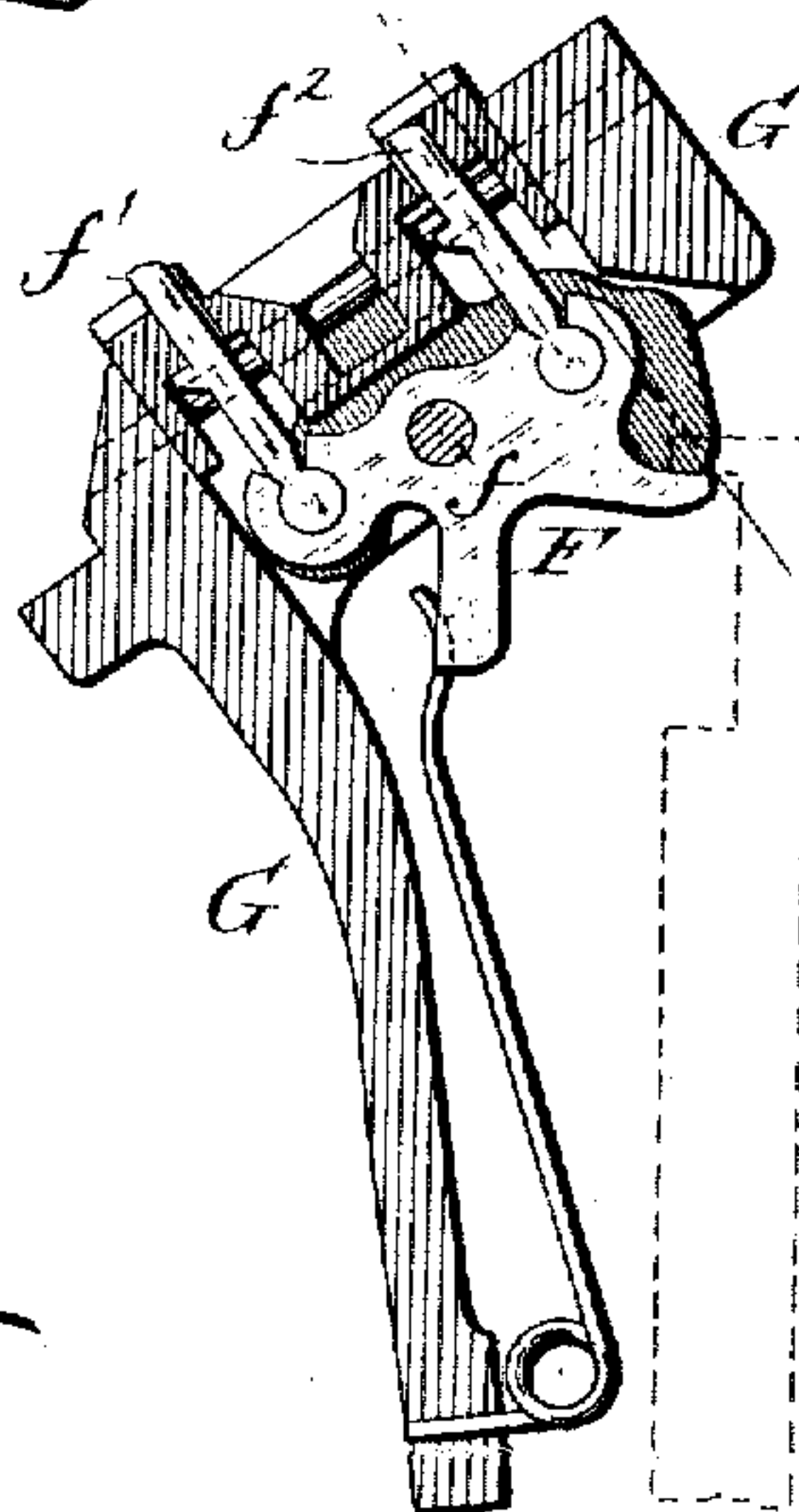
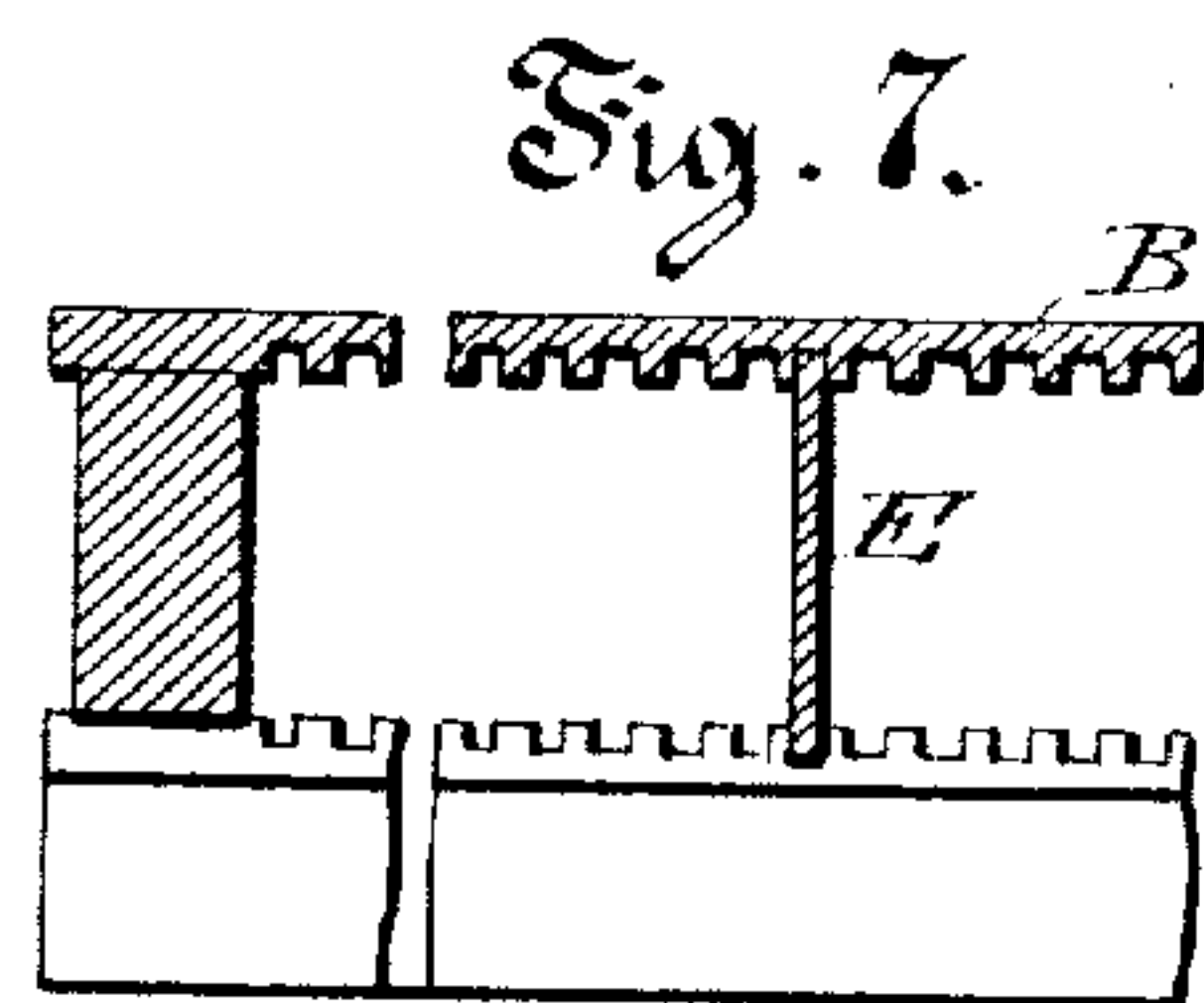
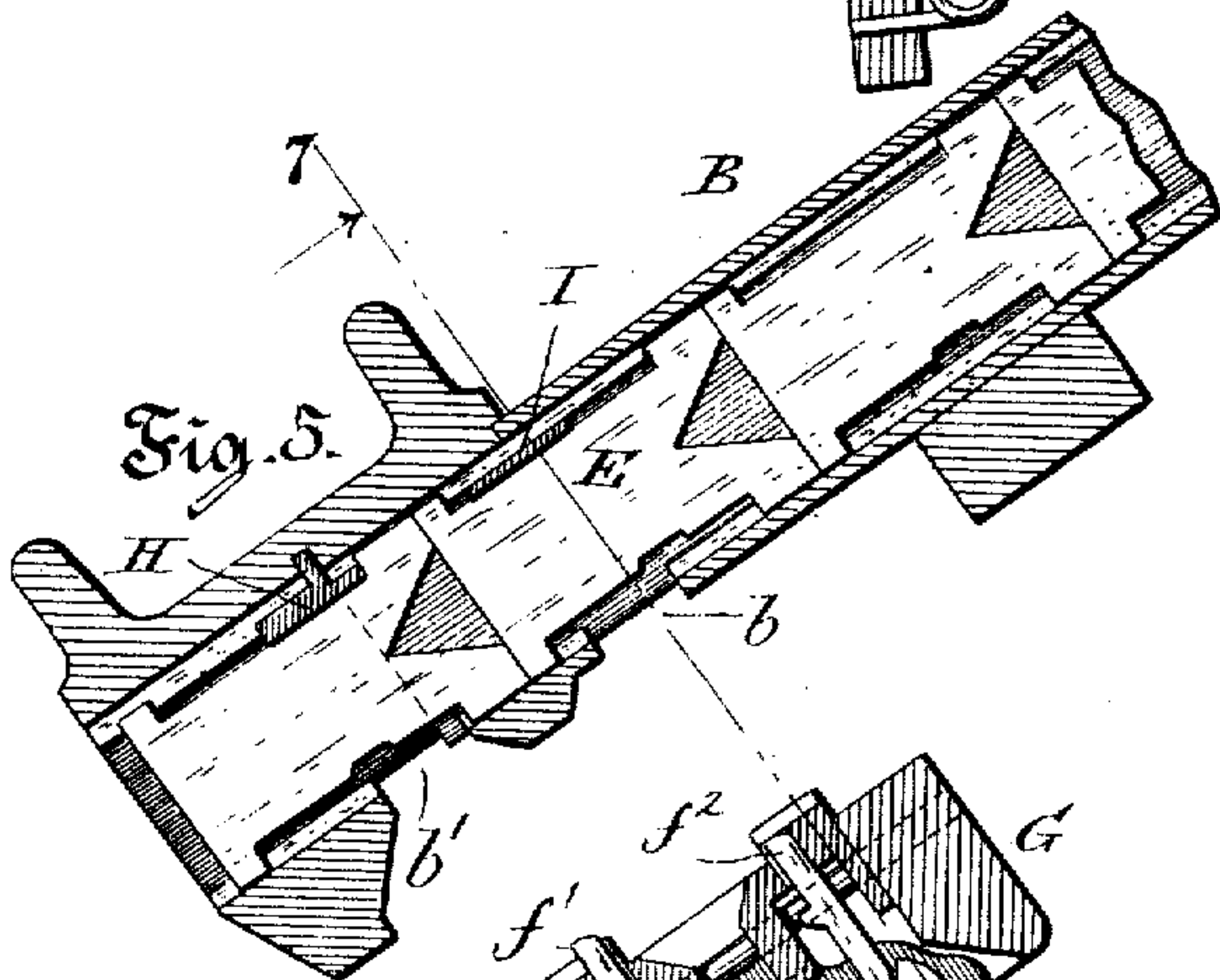
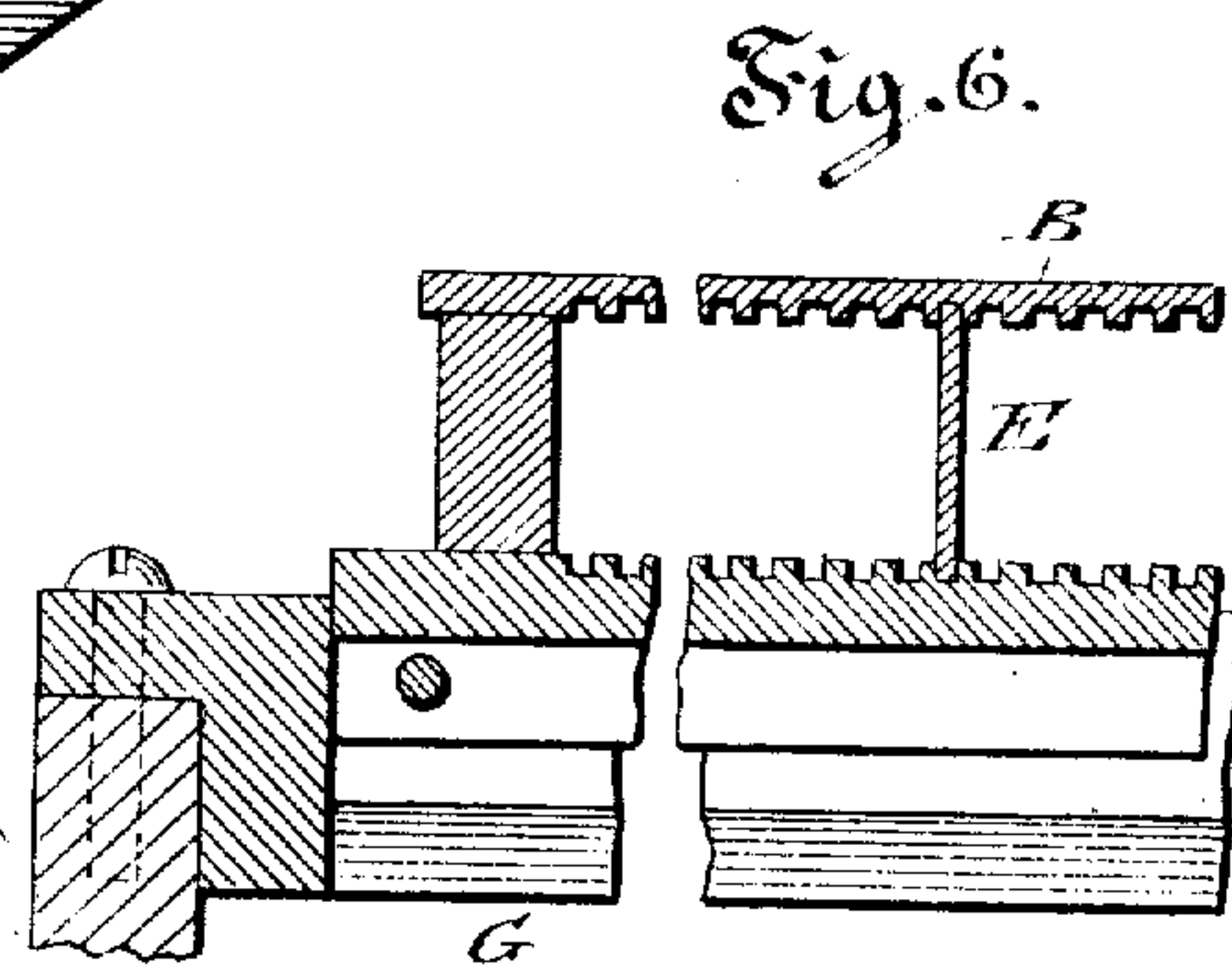
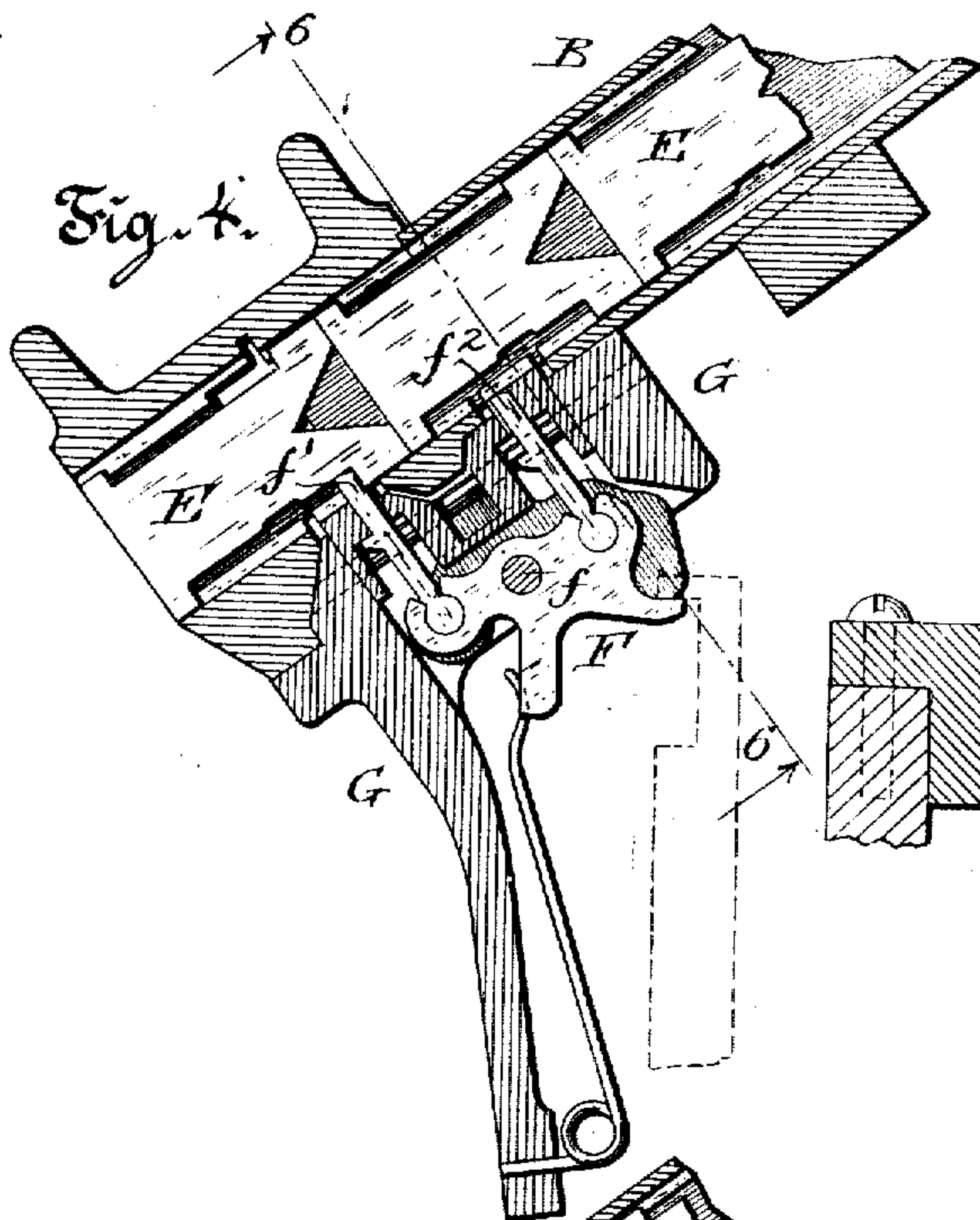
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2 SHEETS—SHEET 2.



Witnesses
S. P. Dehner
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Inventor
T. S. Homans
By his Attorney P. P. Dodge

UNITED STATES PATENT OFFICE.

THOMAS S. HOMANS, OF BROOKLYN, NEW YORK, ASSIGNOR TO MERGENTHALER LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

LINOTYPE-MACHINE.

No. 829,868.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed September 5, 1905. Serial No. 277,027.

To all whom it may concern:

Be it known that I, THOMAS S. HOMANS, of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Linotype-Machines, of which the following is a specification.

This invention has reference to linotype-machines in which a series of circulating matrices stored in a magazine are released one at a time by escapement devices, assembled in line, the line presented to a casting mechanism to form the type characters on the edge of a slug or linotype, and finally the line presented to a distributing mechanism by which the individual matrices are returned to their appropriate channels in the magazine, as represented for illustration in Letters Patent of the United States No. 557,000.

In order to adapt the machine for producing type-faces differing in size or style, it is customary to remove the magazine containing matrices of one font and to substitute another magazine containing matrices of a different font.

The aim of the present invention is to facilitate the removal and application of the magazines, to adapt the magazines to carry a maximum number of matrices, and to adapt one series of escapements to cooperate with any magazine which may be applied to the machine; also, to prevent the removal of the magazine until the matrices have been locked securely therein.

To this end the invention consists in the combination of an independently-removable magazine with a series of escapements fixed in the machine and arranged to project laterally into the channels of the magazine when the latter is in operative position; also, in a magazine having its delivery end adapted to project beyond the cooperating escapements with which it is removably combined in order to confine and guide the matrices to the point of delivery; also, in the combination of means for locking the matrices in the magazine with means controlling the position of the magazine.

I have shown my improvement applied to a Mergenthaler linotype-machine having the general organization shown in the patent above referred to. Except as to the features specifically described and shown herein the

machine may be of any ordinary or suitable construction.

Figure 1 is a side view of the upper portion of the main frame with a magazine and attendant parts in operative position. Fig. 2 is a similar view with the delivery end of the magazine raised preparatory to its removal. Fig. 3 is a view looking downward in the direction of the arrow 3, Fig. 1, showing the means for locking the matrices within the magazine, a portion being broken away to expose the internal construction. Fig. 4 is a longitudinal vertical section through the lower end of the magazine and the escapements on the line 4 4, Fig. 3, with the parts in operative position. Fig. 5 is a similar view showing the magazine lifted clear of the escapements preparatory to its removal from the machine. Fig. 6 is a cross-section on the line 6 6, Fig. 4. Fig. 7 is a cross-section on the line 7 7, Fig. 5.

Referring to the drawings, A represents the rigid main frame, which may be of any form adapted to sustain the other parts.

B is the inclined detachable magazine to carry the matrices.

C is a base-frame underlying and supporting the detachable magazine. This base-frame, which forms a permanent part of the machine, is supported near its upper end upon and arranged to swing around a horizontal rod or shaft *a*, seated in the main frame, and this in order that the magazine may be lifted clear of the escapement devices preparatory to its removal, as hereinafter explained. The lower end of frame C rests when in operative position upon the main frame, or it may be otherwise supported in any suitable manner.

The magazine consists, as usual, of two parallel plates secured to intermediate spacing-bars and provided in their inner faces with longitudinal grooves or channels to receive and guide the upper and lower edges of the matrices E, which will be delivered into the upper ends of the channels by a distributing mechanism, as usual. The matrices resting upon and sustained by the under plate pass downward by gravity through the magazine, and being released one at a time by the usual escapement devices F, controlled by finger-keys or equivalent escapements, one for each

channel, they continue their course over the bottom plate beyond the escapements and out of the end of the magazine. Each escapement consists, as heretofore, of a centrally-pivoted lever carrying at opposite ends two upright pawls, which are projected alternately upward into the lower side of the magazine by the oscillation of the lever, the result of the movement to and fro being to discharge the foremost matrix and permit the next matrix to assume its place in the end of the magazine, ready for delivery. Instead of attaching the escapements to the under side of the magazine, as heretofore, I mount them in an independent supporting frame or bar G, which is secured at its ends rigidly but detachably to the main frame. This frame G is adapted, as shown, to sustain the horizontal pivot F of the escapement-levers, and also adapted to guide the upper ends of the escapement-pawls f' and f'' , keeping them in proper relation to one another and limiting their vertical movement.

The magazine is provided on its under side near the delivery end with two transverse slots $b b'$, and the top of the frame G is formed with corresponding ribs, in which the upper ends of the pawls are guided. These ribs are adapted to fit within and close the grooves in the magazine. Their upper surfaces are grooved or channeled to correspond with the channels in the magazine. When, therefore, the magazine is seated in its operative position on top of the escapement-bar G, as shown in Fig. 4, the ribs of the frame form narrow portions of the bottom of the magazine. The channels in the top of the ribs being in register with the channels in the magazine, the matrices are permitted to slide therethrough, subject to the control of the escapements, in the same manner that they are controlled in the ordinary machine having the escapements fixed to the magazine. Owing to the fact that the escapements are supported independently on the main frame, the magazine may be lifted and removed from the machine, leaving the escapements behind, and another magazine may be placed in position to cooperate with the escapements.

It will be observed that the construction shown admits of the magazine being made of the same length as those to which the escapements are attached, so that it is adapted to carry the maximum number of matrices—a matter of great importance in machines which are rapidly operated for the composition of long lines demanding the employment of many matrices at one time.

It is to be noted that the entire magazine is in one continuous body containing all the matrices in the machine and that by reason of its extension beyond the escapements it is adapted when removed to carry with it all

the matrices. In this respect the construction is superior to those in which a shortened detachable magazine is combined with a fixed escapement mechanism having channels which are continuations of those in the magazine and which normally contain matrices which must be returned from the escapement-channels to the magazine before the latter is removed. The present construction avoids the necessity for returning matrices to the magazine and admits of the latter carrying the full number of matrices demanded without making it more than the ordinary length.

It is manifest that the magazine may be supported in any suitable manner, provided it is adapted to be lifted from the escapements and withdrawn from the machine. In order to permit the speedy and easy handling of the magazines, I prefer to employ the tilting frame C, as shown, and to combine therewith means by which its lower end may be raised and supported during the removal and application of the magazines.

As shown in the drawings, a rock-shaft L is extended through the lower end of the frame C and provided at each end with a lever fashioned at one end into a cam l and at the opposite end into an arm l' . The parts stand normally in the position shown in Fig. 1, the arms l' extending rearward, while the cams l are turned upward out of action. The under side of the magazine at this time rests upon the escapement bar or frame, as shown in Fig. 4. By pulling or swinging the arm l' forward to the position shown in Fig. 2 the cams l , bearing on studs or rollers l'' on the main frame, are caused to lift the frame C and the magazine thereon to the position shown in Fig. 2 and sustain them in such position. The magazine, being now sustained above the escapements and attendant parts, may be drawn forward and downward from the frame C and removed from the machine. The magazine is adapted to interlock with the frame C in any suitable manner to prevent its accidental escape. For example, one of the stiffening-bars secured transversely to the under side of the magazine may interlock with a shoulder on the frame C, as shown at c , Fig. 1. One of the stiffening-bars near the upper end of the magazine is preferably extended at its ends in such manner that when the magazine is partially withdrawn this bar will rest upon the forwardly-extended arms l' and suspend the magazine in an upright position, as indicated in dotted lines in Fig. 2. The swinging frame C to support the magazine, the lifting cams therefor, and the supporting-arms for the magazine are the subject of a separate application for patent filed September 9, 1905, No. 277,650, and are not claimed herein except in the combinations hereinafter specified.

As regards the employment of a series of escapements fixed in the machine, in combination with a removable magazine, my invention includes any construction or combination of parts in which a removable magazine and the matrices therein extend past or beyond the escapement devices in such form or manner as to sustain and carry all the contained matrices when the magazine is lifted away from its operative position and from the escapements, and it is manifest that the details of the parts may be variously modified without passing beyond the limits of my invention. When the magazine is separated from the escapements, as described, the effect will be to release the matrices. It is therefore necessary to provide means for locking them in the magazine. For this purpose I may employ any suitable means; but I prefer to employ a removable transverse bar II, which is thrust through the magazine from one side in position to engage under the upper ears of the foremost matrices, as shown in Fig. 5. In order to prevent this bar from springing or bending edgewise under the ears of the matrices, it is preferably constructed, as shown, with a longitudinal rib on its upper side to enter a corresponding groove in the top plate of the magazine. In order to prevent the second matrices in the magazine from being accidentally carried backward when the magazine is removed, in such manner that their ears will fall into the slot, I propose to lock them forward. This may be accomplished in various ways—for example, by means of a locking-bar I, thrust through the magazine from side to side, as shown in Fig. 5, in position to engage behind the lower or foremost ears of the matrices.

In order to prevent the magazine from being lifted before the matrices are locked, I provide means to prevent the lifting of the magazine before the matrix-locking devices are in position. In the form shown this contrivance consists of a lever K, Fig. 3, pivoted in the frame C and having one end adapted to interlock with a shoulder on the lifting-cam *l*, while the opposite end, acted upon by a spring *k*, is in position to be acted upon by the end of the matrix-locking bar H as the latter completes its inward-locking movement. The drawings illustrate the position of the parts after the locking-bar has been carried home to its place, the lever being disengaged from the cam and the latter partly turned to lift the magazine. My invention in this regard consists, broadly, in the combination of a matrix-locking device so constructed and arranged as to prevent the magazine from being separated from the escapements until the matrices are locked within the magazine, so that their escape therefrom will be prevented when the magazine is separated from the es-

capement. It is manifest that this device may be made in any suitable form and arranged to coöperate with the main frame or with any other part of the mechanism which will insure the action described.

While I prefer to employ the mechanism shown for lifting the frame C, it is to be understood that any other mechanism may be employed or that the frame C may be stationary, as usual, and the magazine lifted therefrom by hand.

While I have shown my invention as incorporated in a linotype-machine using matrices with intaglio characters, it is to be understood that it is applicable to all machines having removable magazines containing type-matrices, type-dies, or type characters, or, in short, to typographic machines in general.

The magazine is arranged, as usual, to deliver the matrices into the upright channeled plate M, fixed to the front of the main frame, the matrices descending through this plate to the assembling-belt and through assembling devices, as usual. When the magazine is lifted by the frame C, as before described, its delivery end is carried above the channeled plate or guide M, so that it may pass readily thereover. The frame C and the supporting-arms *l'* prevent the magazine from contacting with the plate M.

It is to be noted that in the present organization the escapement mechanism is independent of the magazine, or, in other words, is sustained and actuated without attachment to or dependence on the magazine.

What I claim as my invention is—

1. In a typographic machine, the combination of a main frame, an escapement mechanism, and an independently-removable magazine having an open delivery end extending past the escapement mechanism substantially as described.

2. In a typographic machine, the combination of a removable magazine having an open end for the delivery of matrices, and an independent escapement mechanism acting through the side of the magazine in advance of the delivery end, and means distinct from the escapement mechanism for locking the matrices in the magazine preparatory to removal.

3. In a typographic machine, the combination of a main frame, a removable magazine adapted to contain all the matrices in the machine and having an open end for the delivery of the matrices, and an independently-sustained escapement mechanism arranged to act through the side of the magazine, and means for confining the matrices within the magazine when it is separated from the escapement mechanism.

4. In a typographic machine, a fixed escapement mechanism having operative mem-

bers arranged to act through the side of the magazine, in combination with a complete independently-removable magazine having its delivery end extended beyond the escapements, whereby the use of a continuous magazine of maximum length is permitted and the one escapement mechanism rendered available for a number of magazines.

5. In a typographic machine, the combination of a main frame, a removable magazine, open at its end for the discharge of the matrices and having openings in one side in advance of the delivery end to admit the escapement devices, in combination with an independently-supported escapement mechanism having its active members projected through the openings into the magazine.

6. In a typographic machine, the combination of a magazine removable as a whole, and an escapement mechanism constructed and sustained independently of the magazine and acting through the side of the latter in advance of the delivery end to control the passing matrices.

7. In a typographic machine, a main frame, a channeled magazine detachably mounted thereon and provided near the delivery end with transverse grooves extending inward from the exterior, in combination with an escapement mechanism having ribs to fill said grooves and pawls projecting through said ribs; said magazine and escapement mechanism being separable at will, substantially as described.

8. In a typographic machine, the combination of a main frame, an inclined vertically-swinging frame, C, thereon, an escapement mechanism, F, and channel-plate, M, both fixed to the main frame, and a magazine, B, seated on the frame C, and overlying the escapement mechanism and removable at the front of the machine.

9. In a typographic machine, the combination of a main frame, an inclined swinging frame C therein, means for lifting and sustaining the frame C, an inclined magazine mounted on said frame and removable in a forward direction, and an escapement mechanism fixed on the main frame independently of the magazine and cooperating with the same.

10. In a typographic machine, the combination of the following elements: a main frame, an inclined movable frame therein, a magazine mounted on the movable frame and adapted for removal in a forward direction, escapement mechanism sustained on the frame independently of the magazine and cooperating therewith in advance of its delivery end, and means independent of the escapements for securing the matrices within the magazine.

11. In a linotype-machine, the combina-

tion of the removable magazine and means for displacing the same preparatory to its removal, and means for confining the matrices within the magazine, said confining and displacing devices arranged to interact, substantially as described.

12. In a linotype-machine, a detachable magazine, means for moving the same from its operative position preparatory to its detachment, means for locking said moving devices, and means for confining the matrices within the magazine and unlocking said locking device.

13. In combination with the frame C, the magazine thereon and the lifting-cam *l*, a locking device K for said cam, and a matrix-locking device-H arranged to release the device K.

14. In a linotype-machine, a channeled magazine having slots in its side in combination with matrices having ears or shoulders at their ends, and the two locking devices adapted to engage the respective shoulders, whereby the matrices are prevented from shifting in either direction.

15. In a channeled linotype-magazine substantially as described, a matrix-locking bar H having a longitudinal rib to engage the magazine substantially as described, whereby the yielding of the bar under the weight of the matrices is prevented.

16. The magazine for a linotype-machine comprising the parallel plates having in their opposing faces the grooves or channels to guide the matrices, and also having near the delivery end, the two transverse grooves *b* and *b'*, adapted to permit the introduction of escapement devices from the exterior.

17. In a linotype-machine, the combination of a removable magazine, a stationary-magazine delivery-mouth, and escapements for the matrices secured to a fixed part and operating through the removable magazine.

18. In a linotype-machine, the combination with a magazine having slots in the under side thereof, of a stationary-magazine delivery-mouth into which the matrices are delivered from the magazine, and pawls pivoted to a fixed part and alining with the slots and thereby adapted to engage the matrices in the magazine.

19. In a linotype-machine, the combination of a main frame, an escapement mechanism fixed thereon, a detachable magazine cooperating with and extended beyond the escapement mechanism with openings in its side for the entrance of the escapement devices, and means for moving the magazine relatively to the escapement mechanism preparatory to its removal; whereby all the matrices contained in the machine may be lifted clear of the escapement mechanism for removal with the magazine.

20. In a linotype-machine, a magazine containing longitudinal channels to guide the matrices, and transverse grooves *b*, *b'*, in combination with an escapement mechanism
5 having ribs to enter said grooves, said ribs containing channels corresponding with those in the magazine.

In testimony whereof I hereunto set my hand, this 28th day of August, 1905, in the presence of two attesting witnesses.

THOMAS S. HOMANS.

Witnesses:

W. H. RANDALL,
L. B. MOREHOUSE.