

No. 631,989.

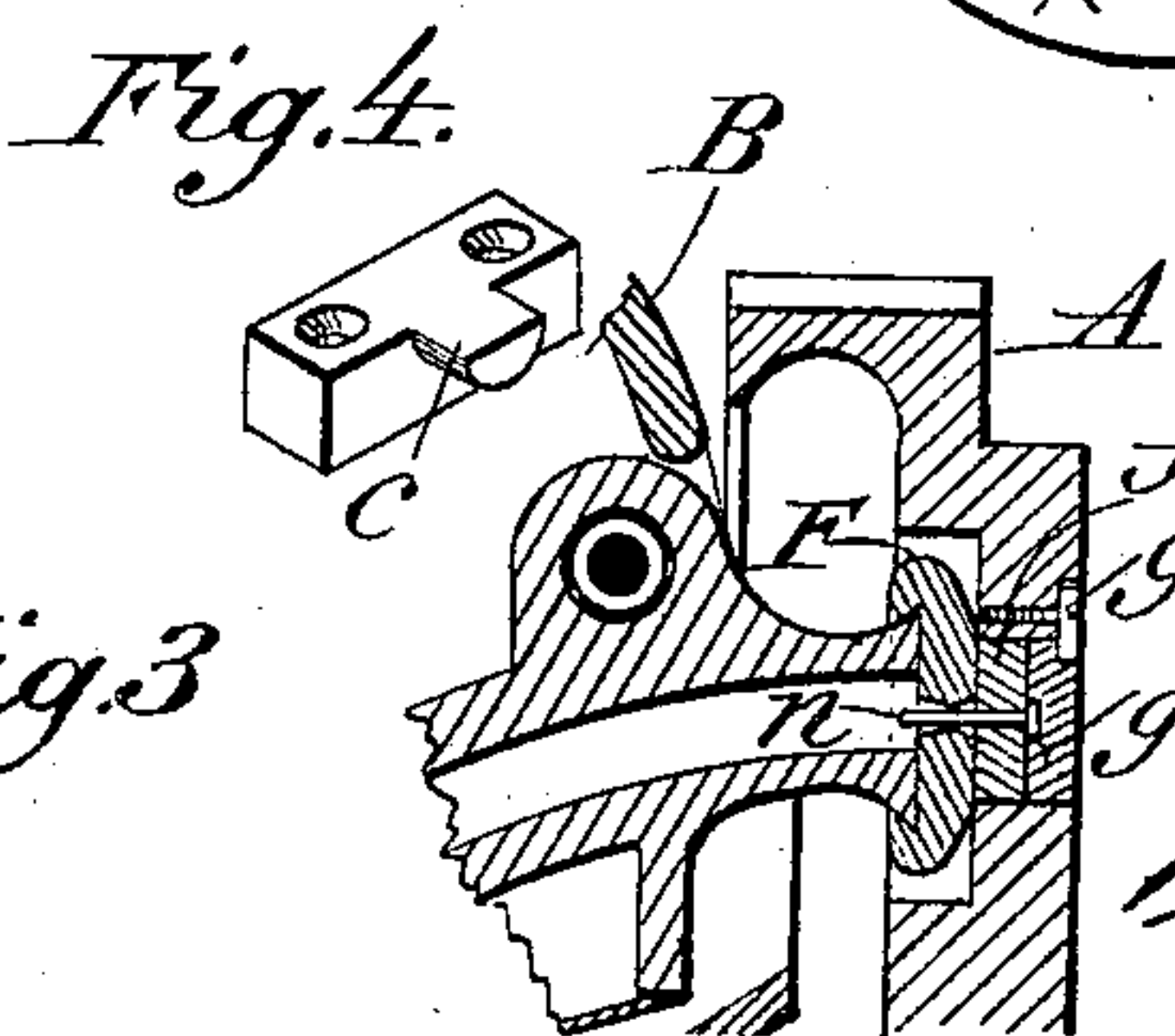
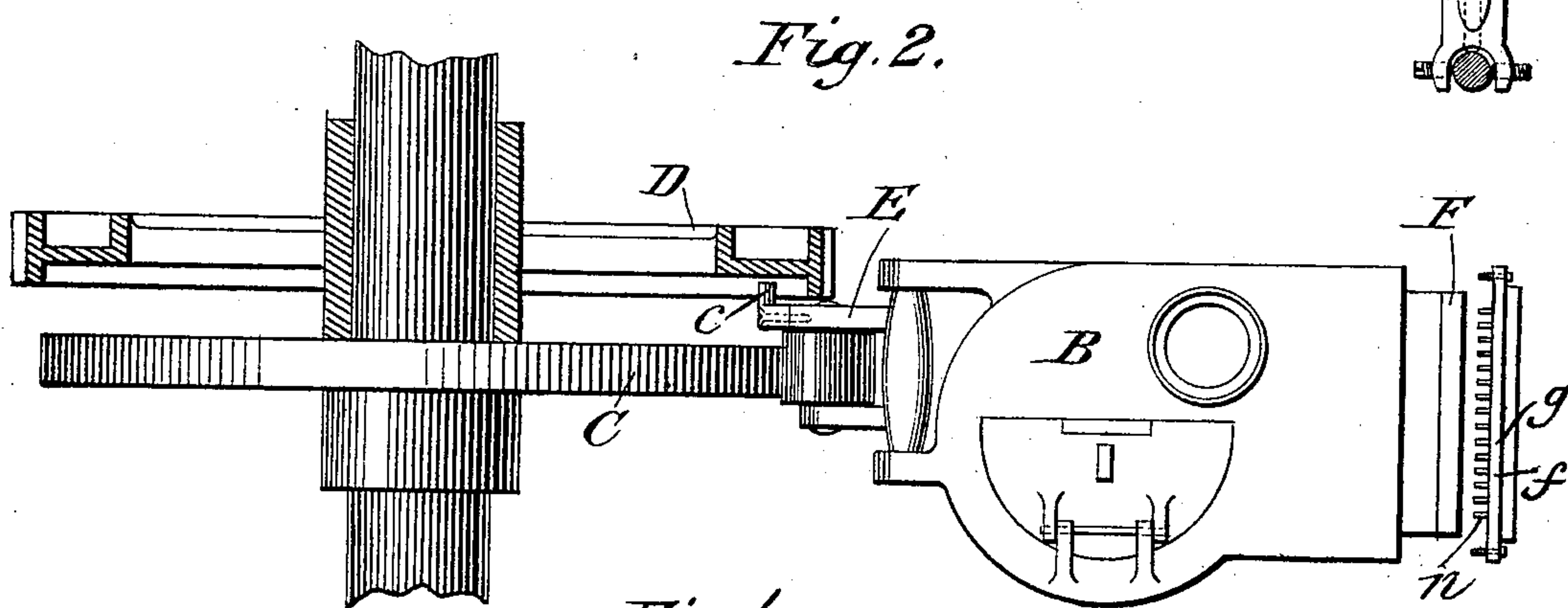
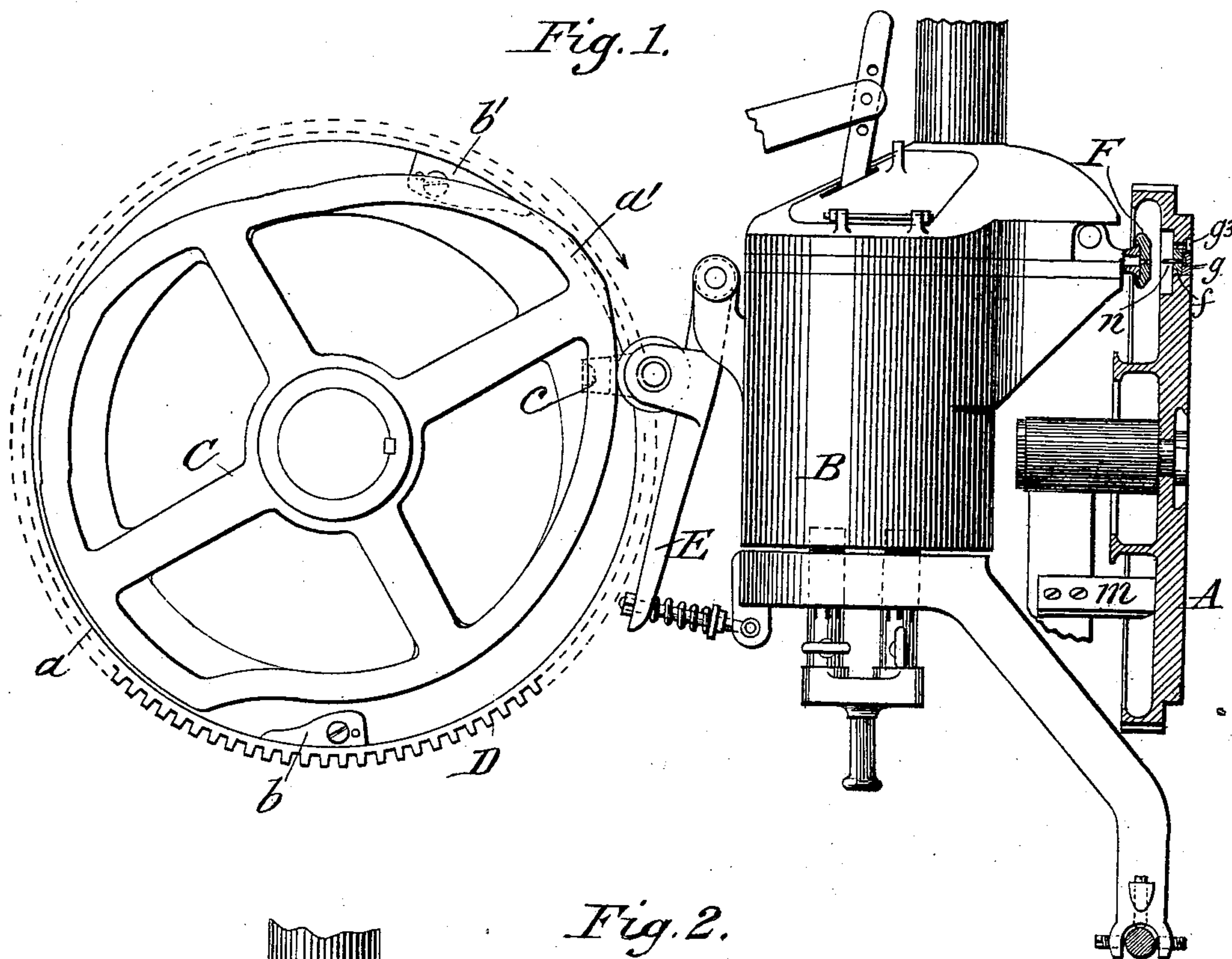
Patented Aug. 29, 1899.

A. GREENLEAF.
LINOTYPE MACHINE.

Application filed Jan. 5, 1895. Renewed Mar 16, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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No. 631,989.

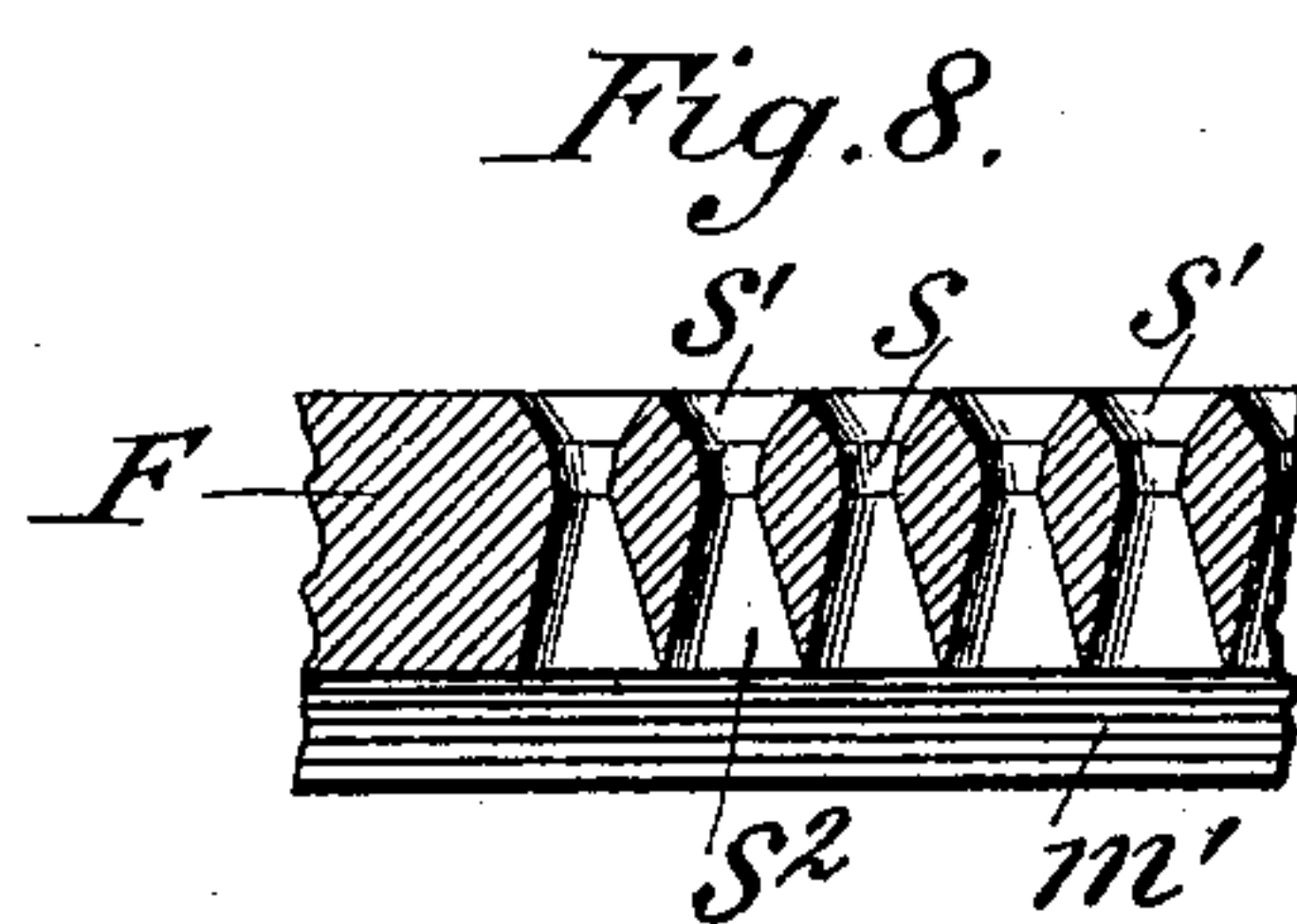
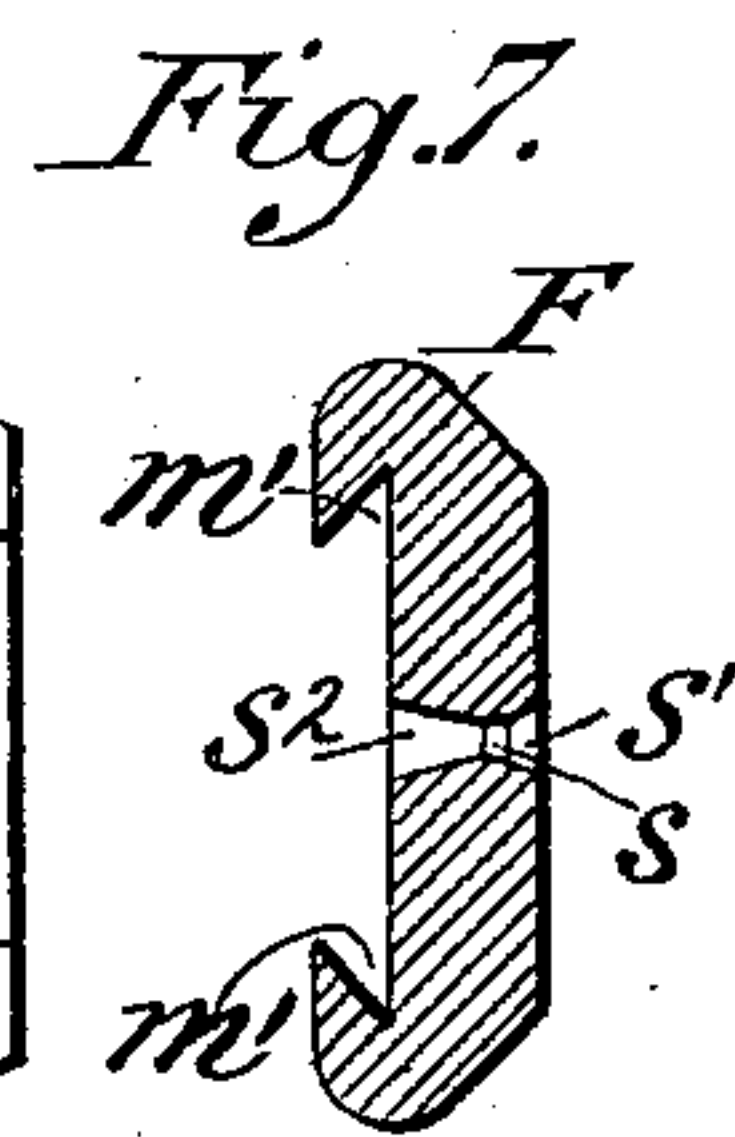
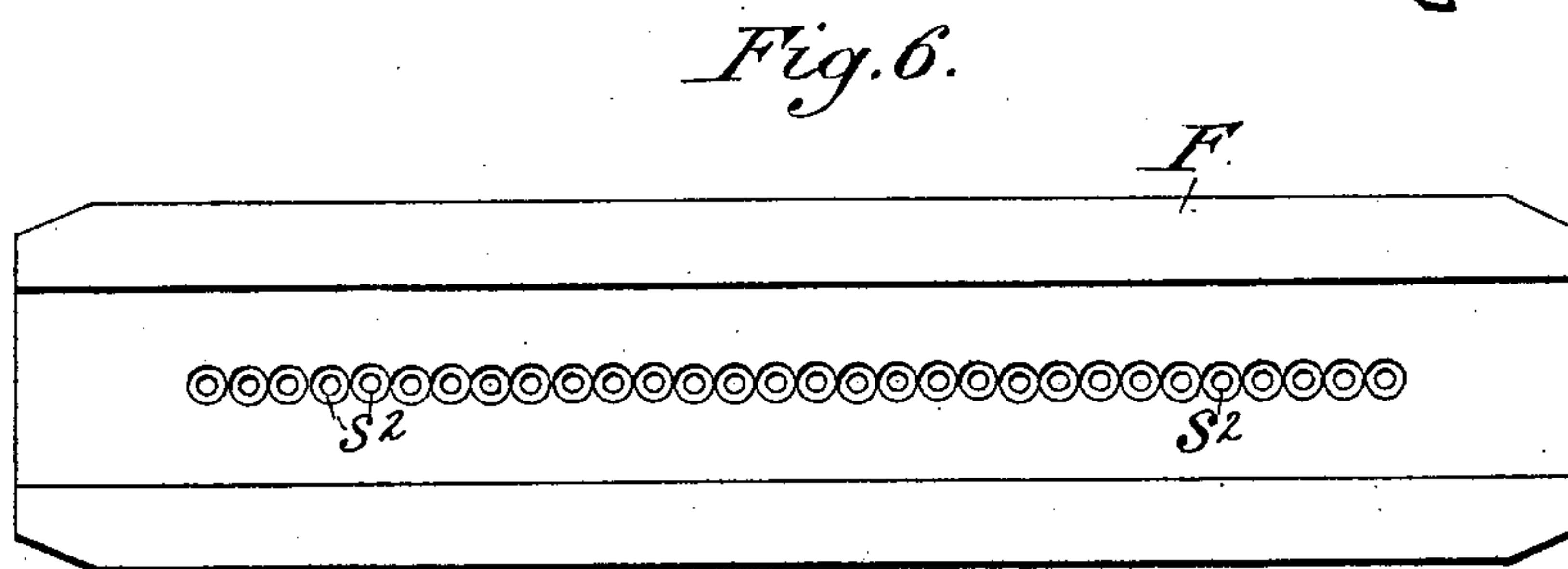
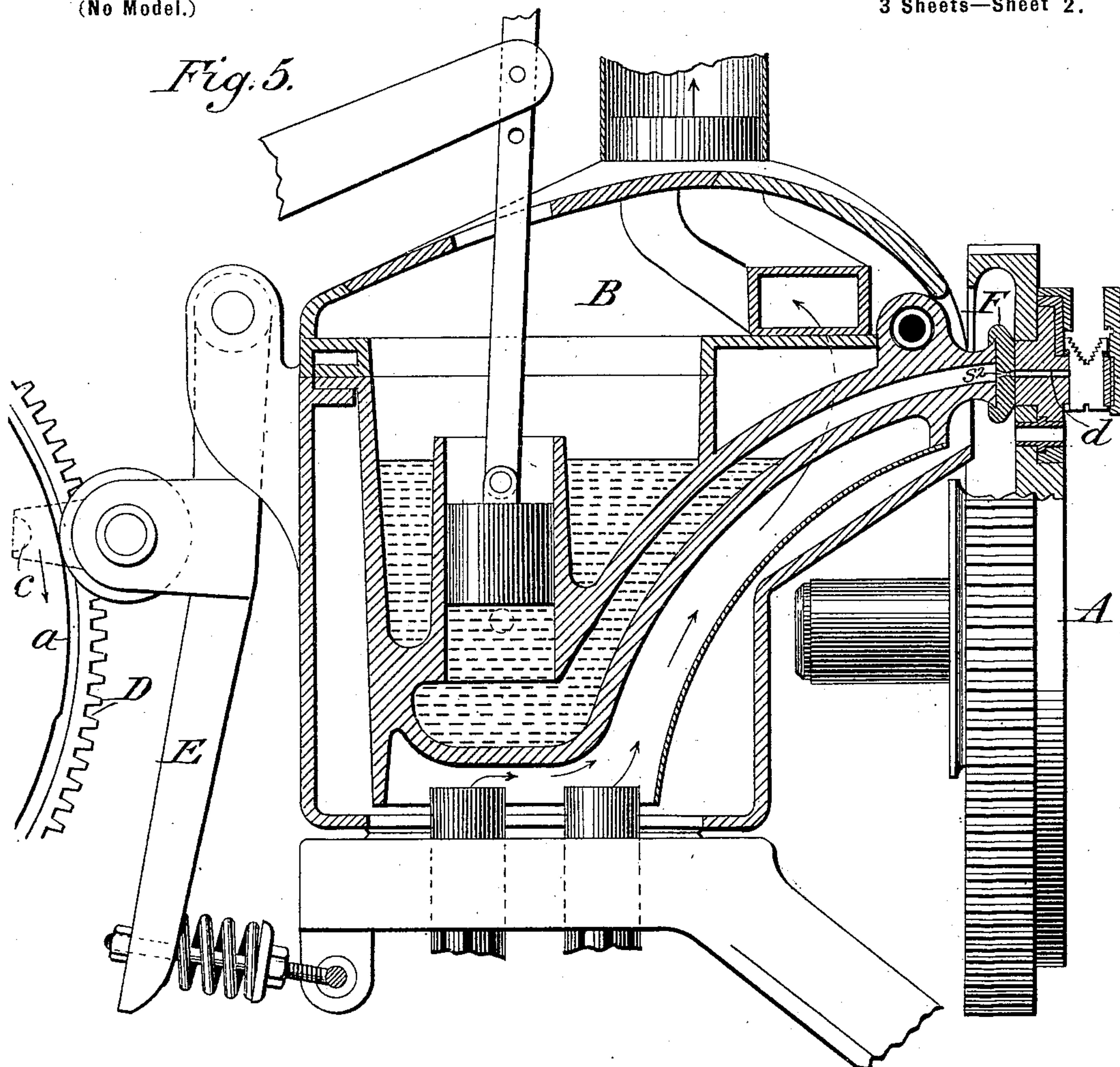
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(No Model.)

3 Sheets—Sheet 2.



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A. GREENLEAF.
LINOTYPE MACHINE.

(Application filed Jan. 5, 1895. Renewed Mar 16, 1899.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 9.

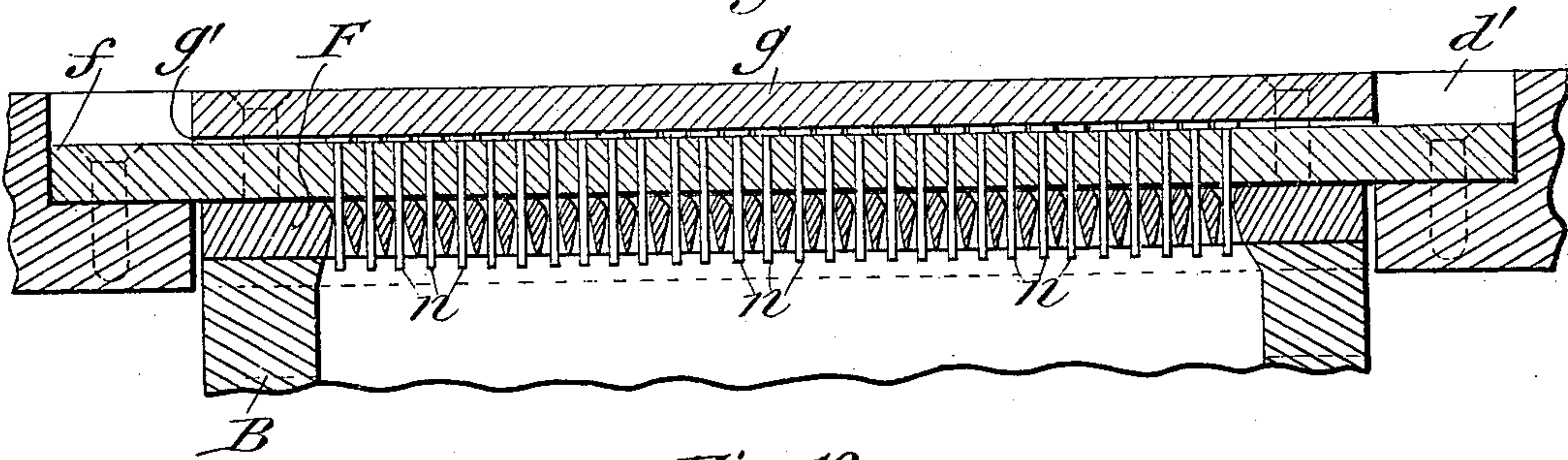


Fig. 10.

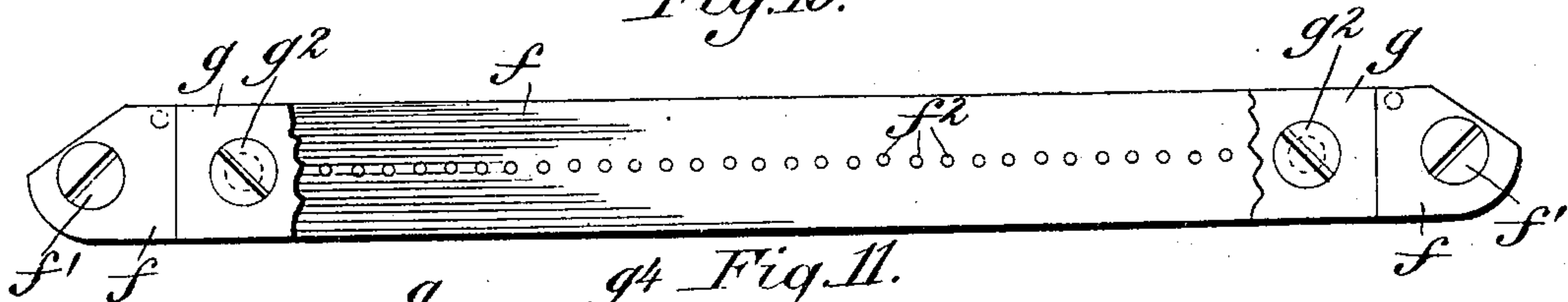


Fig. 11.

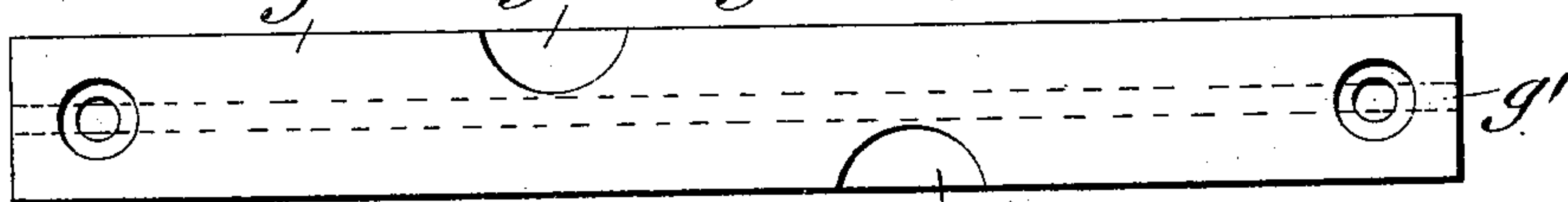


Fig. 12.

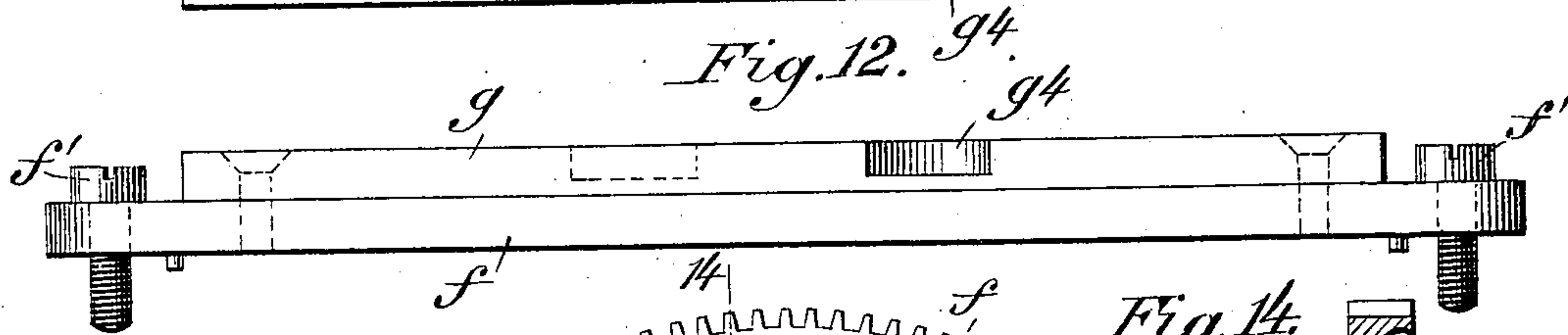


Fig. 13.

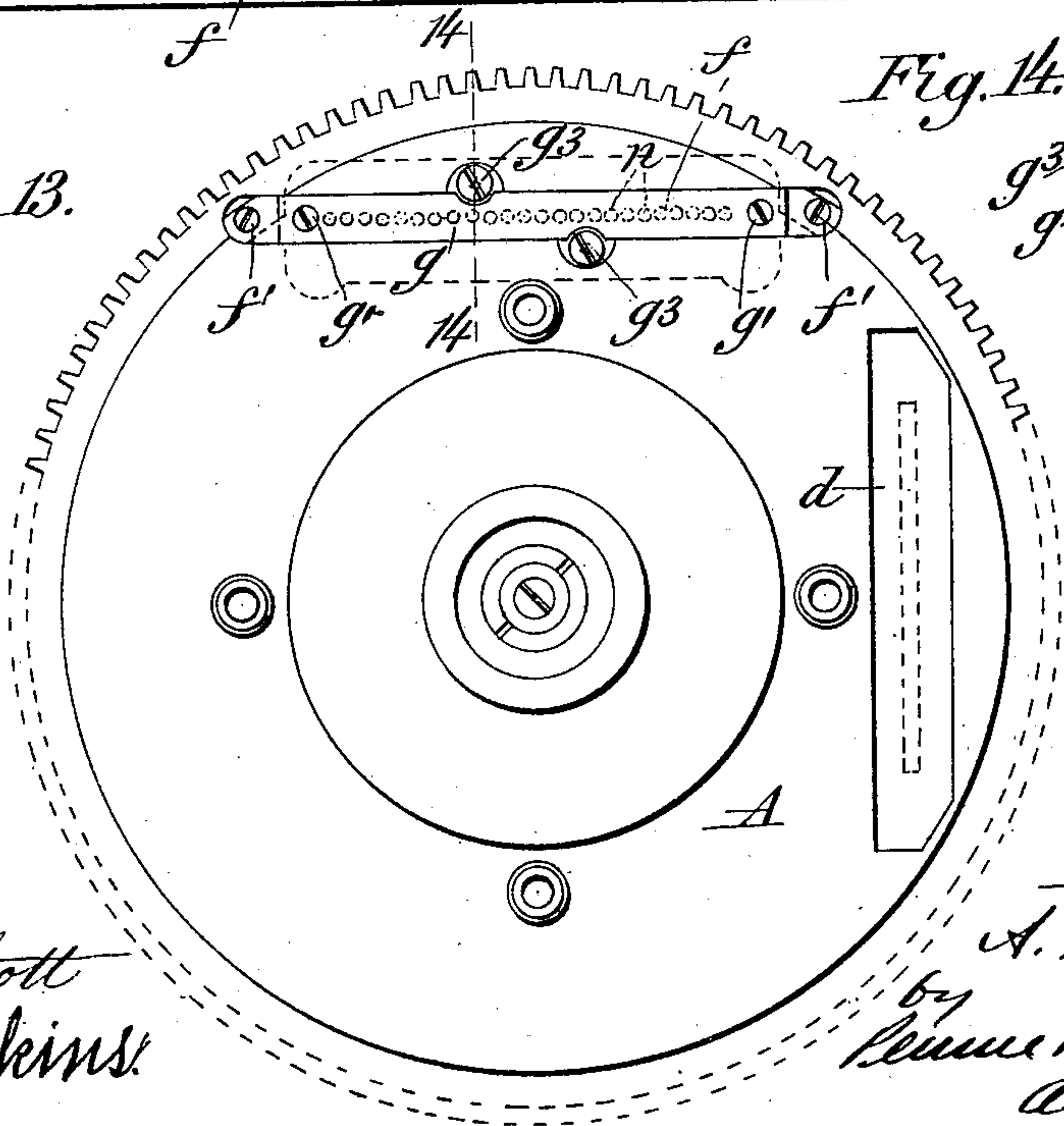
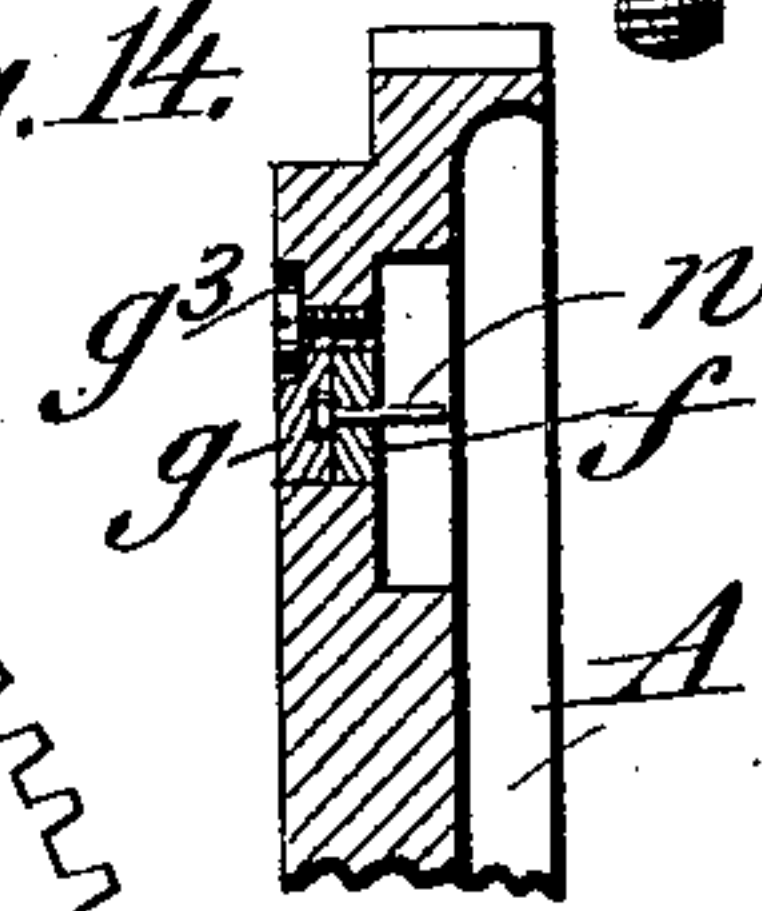


Fig. 14.



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UNITED STATES PATENT OFFICE.

ABNER GREENLEAF, OF BALTIMORE, MARYLAND.

LINOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 631,989, dated August 29, 1899.

Application filed January 5, 1895. Renewed March 16, 1899. Serial No. 709,359. (No model.)

To all whom it may concern:

Be it known that I, ABNER GREENLEAF, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Linotype-Machines; 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 object of my invention is to remedy the difficulties frequently encountered in machines for casting type-slugs or linotypes by reason of the tendency of the dross or of the molten type-metal itself at the termination of a cast to remain partially solidified within the pot-mouth opening or openings, so as to obstruct the free passage of metal there-through at succeeding casts, with the resultant effect of producing more or less imperfect products.

The invention consists, broadly stated, in automatically clearing the casting opening or openings of the pot-mouth after a cast has been completed and removed from in front of the casting opening or openings, so as to insure the proper passage of the metal at the next cast.

It consists, furthermore, in improved means for this purpose and in a modified configuration of the pot-mouth openings themselves, (when they consist of a series of holes,) whereby the operation of the clearing devices is made the more effective and certain.

In its application to linotype-machines, and particularly to the well-known Mergenthaler linotype-machines, it comprises, likewise, a particular adaptation and arrangement of the clearing devices with respect to the mold-disk, swinging pot, and the timing-cams, as will be hereinafter more fully set forth.

In the Mergenthaler linotype-machine as now in use, and in connection with which I have herein illustrated my improvements, it will be remembered that at the termination of a cast the pot recedes from the mold-disk, permitting the latter to be rotated in such manner as to bring the mold containing the cast slug or linotype from its original horizontal position to a vertical position, the slug being trimmed by the back knife during this movement of rotation and the trimmed slug

being ejected from the mold when the mold is in a vertical position. While the slug is being ejected the mold-disk is at rest and positioned upon steady-pins of the vise-frame entering corresponding holes in the mold, and in the preferred embodiment of my invention I avail myself of this period to effect the clearing operation.

It is customary in linotype-machines to provide the pot-mouth through which the molten metal is conducted to the mold with a mouthpiece provided with a series of casting-openings arranged closely together and forming metal-ejecting orifices adapted to cover the mold-opening when the mold-disk is at rest in the casting position and the pot correspondingly advanced. In these machines the problem presented is to provide means for automatically clearing this series of casting-openings after the termination of a cast, and for this purpose I provide a row of pins, recessed sufficiently within the mold-disk to escape the back knife as the disk rotates to the slug-ejecting position. When after the termination of a cast the disk has rotated to the slug-ejecting position and is at rest, the row of pins referred to is in juxtaposition to the series of casting-orifices, each pin registering with a corresponding casting-opening in the series and being of a size to fit easily within the opening and of a length slightly greater than the depth of the opening. While the disk remains at rest in this position the pot is caused to advance and the casting-openings to enter upon the pins, whereby any metal or dross that may remain in the openings after the casting operation will be expelled or punched out and returned to the interior of the pot. This advance of the pot is effected by a second rise on the pot-cam, the first rise on the pot-cam being employed, as usual, for advancing the pot to the casting position. In order to have the casting-openings enter fully upon the pins, it is obvious that during the clearing operation the pot must be advanced farther than for the casting operation, and preferably by a distance greater than the thickness of the mouthpiece, which is usually about one-quarter of an inch.

In the accompanying drawings, Figure 1 represents, partly broken away and partly in sec-

tion, the mold-disk, swinging pot, and pot-cams of a Mergenthaler linotype-machine provided with my improvements, the pot being shown as about to advance toward the mold-disk and about to enter the casting-openings upon the clearing-pins. Fig. 2 represents a plan view, partly in section, of the same parts, the main body of the mold-disk being omitted, but the clearing-pins being shown in their proper relative position. Fig. 3 represents in section the pot-mouth and a portion of the mold-disk and illustrates the manner in which the casting-openings enter upon the clearing-pins of the mold-disk. Fig. 4 represents a detached view of the pot-lever nose for the withdrawal of the pot after its advance. Fig. 5 represents, partly in section and partly broken away, the pot, mold-disk, and pot-cam when the parts are in the casting position. Figs. 6, 7, and 8 represent, respectively, a rear elevation, vertical section, and partial longitudinal section of the pot-mouth piece. Fig. 9 represents a longitudinal section through the pot-mouth, mold-disk, and clearing devices at the time the casting-openings have entered upon the clearing-pins. Figs. 10, 11, and 12 represent detail views of the clearing devices. Fig. 13 represents a face view of the mold-disk on the side away from the melting-pot, and Fig. 14 represents a section on the line 14 14 of Fig. 13.

Similar letters of reference indicate similar parts throughout the several views.

Referring to the drawings, A indicates the mold-disk, B the melting-pot, and C the pot-cam, of the well-known Mergenthaler linotype machine, organized as set forth, for instance, in the patent of Mergenthaler, dated September 16, 1890, No. 436,532, in such manner that the mold occupies a horizontal position during the casting operation, the pot-cam advancing the pot-mouth to the mold to make the cast and the pot being then retracted, whereupon the mold-disk is rotated through an angle of two hundred and seventy degrees, so as to bring the mold into the slug-ejecting position and to permit the slug to be trimmed during this movement of partial rotation by the back knife, all as well understood in the art and as set forth in the patent referred to. The advance of the pot to the casting position is effected in the usual manner by the customary rise *a* of the pot-cam, and the withdrawal of the pot from the casting position is effected by the usual rise *b* on the flange of the gear D, said rise *b* cooperating in the customary way with the nose *c* on the pot-cam lever E. The construction and relation of these parts to each other is the same as in the usual Mergenthaler machine referred to.

The relative arrangement of the clearing-pins to the mold will be apparent from Fig. 13, wherein the mold-disk is represented in the slug-ejecting position, the mold *d* lying in a vertical plane and the row of casting-pins in the same horizontal plane formerly

occupied by the mold when the latter was in the casting position. To enable the pins to be conveniently applied to the mold-disk and to facilitate their removal or insertion to suit any change in the length of the line to be cast, or should any of them become worn, bent, or broken, I provide the mold-disk with a recess *d'* for the reception of a plate *f*, adapted to be secured to the mold-disk by means of screws *f'* and having a longitudinal series of apertures *f*² for the reception of the headed pins *n*. These pins are separately insertible and removable within the apertures *f*² and are held in place therein when in use by a backing-plate *g*, having a slot *g'* on its under surface and adapted to be removably secured to the plate *f* by means of the screws *g*². Additional screws *g*³ are provided, having heads which overlap recesses *g*⁴ of the back plate *g* and enter the main body portion of the mold, so as to prevent flexure of the back plate under the strains imposed upon it. The pins are preferably wire-nails and arranged at distances apart corresponding to the distance apart of the centers of the casting-openings, and their diameters are slightly less than the central bore of the casting-openings, so that each pin will pass freely through its corresponding casting-opening during the clearing operation, but so as, nevertheless, to substantially occupy said opening without injurious friction. The free ends of the pins are in a plane just inside of the plane of the edge of the back knife *m*, which trims the slugs, so that on the rotation of the mold-disk they will not come in contact with said back knife.

The mouthpiece F for the melting-pot is preferably made removable, as is customary, by means of the slide-groove *m'* and is provided with the usual series of casting-openings. These casting-openings I prefer to make of the configuration illustrated more fully in Figs. 7 and 8 and consisting, essentially, of a central bore *s*, almost cylindrical, but tapering slightly toward the pins, and flaring ends *s'* *s*², which form no abrupt shoulders to the central bore. The purpose of this construction is to permit the successful ejection of the metal into the mold desirable for the finer qualities of work, such as bookwork, and likewise to provide means for guiding the pins into the central bore of the openings with certainty and without danger to the moving parts in case they should become slightly out of alinement. The projecting or free portions of the pins should be slightly longer than the depth of the casting-openings, or, in other words, than the thickness of the mouthpiece, so that when the casting-openings are fully entered upon the pins the pins will project slightly beyond the casting-openings, as indicated fully in Figs. 3 and 9. It is obvious that in order that the casting-openings shall thus fully enter upon the pins the pot must be advanced to a distance greater than the distance to which it has been ad-

vanced at the casting operation, the excess of movement being represented by a distance slightly greater than the thickness of the mouthpiece. To obtain this movement, I provide the pot-cam with an additional rise a' , so spaced thereon with relation to the first rise that after the casting operation has been completed and the pot has receded from the mold and permitted the rotation of the mold-disk to the proper position it will, while the mold-disk is still at rest and the slug is being ejected, advance the pot toward the mold-disk and enter the casting-openings upon the clearing-pins during the interval of rest of the mold-disk and will then permit the pot to recede before the mold-disk is withdrawn from the steady-pins of the vise-frame and brought back to the original position. To secure the punching out effect desired it is sufficient to have the openings enter but momentarily upon the clearing-pins, and therefore the second cam-rise of the pot-cam is preferably shorter than the first cam-rise thereof. In order to cause the pot to recede from the mold-disk positively at the termination of the clearing operation, I provide the gear D upon its inner flange with a second rise b' , coöperating with the nose c of the pot-cam lever.

For clearness of description and illustration I have shown the mold-disk as provided with but a single mold and a single clearing device; but it will of course be understood that in practice where the mold-disk is provided with two molds arranged oppositely to each other upon the mold-disk, as is frequently the case, an additional clearing device will be employed, arranged diametrically opposite the first clearing device and having a like function and operation.

So far as I am aware it is broadly new to provide as a part of a type-casting machine means for clearing the casting opening or openings at the termination of a cast and after the casting has been removed, or for projecting the metal or dross back into the pot and for automatically actuating said means from a moving part of the machine. I desire, therefore, to be understood as claiming these features generically wherever employed in machines for casting type or linotypes and whatever the character of the casting opening or openings, whether in the form of a single continuous slit, as is sometimes employed, or in the form of a series of holes, as herein particularly illustrated.

It will be understood that when the length or "measure" of the linotype is to be changed the appropriate holes of the series of casting-openings are to be plugged with asbestos, as is customary, and the clearing-pins corresponding in location to the plugged holes removed.

Having thus described my invention, what I claim is—

1. In a linotype-machine, the combination

with the pot-mouth, of a clearer therefor mounted on the mold-disk, so as to register with the pot-mouth when the disk is in the proper position for the ejection of the slug, and means for then causing the clearer to occupy the pot-mouth; substantially as described.

2. In a linotype-machine, the combination with the pot, and the disk, carrying the mold and clearer, of means for advancing the pot to the mold during the casting operation, then causing it to recede to permit the mold to rotate to the slug-ejecting position, and then advancing it upon the clearer while the disk is at rest; substantially as described.

3. In a linotype-machine, the combination with the pot, of the disk, carrying the mold and clearer, the clearer being located back of the plane in which the knife is located, and means for advancing the pot to the mold during the casting operation, then causing it to recede to permit the mold to rotate to the slug-ejecting position, then advancing it farther than the casting position, and causing it to again recede prior to the withdrawal of the disk; substantially as described.

4. In a linotype-machine, the combination with the pot-mouth provided with a casting opening or openings, of a mold-disk, and a clearer mounted on the latter, said clearer having a projection or projections adapted to register with said opening or openings when the disk is at rest in the slug-ejecting position; substantially as described.

5. In a linotype-machine, the combination with the pot-mouth provided with a series of casting-openings, of a mold-disk, and a clearer mounted on the latter, said clearer having a series of pins adapted to register with the pot-mouth openings when the disk is at rest in the slug-ejecting position, and of a diameter to fit easily in the openings, and of a length somewhat greater than the length of the openings; substantially as described.

6. In a linotype-machine, the combination with the mold-disk carrying a series of clearer-pins, of a pot-mouth provided with a series of casting-openings flaring toward the mold-disk and devoid of abrupt shoulders and also flaring inwardly toward the pot, said pins being adapted to register with said openings; substantially as described.

7. In a linotype-machine, the combination with the mold-disk carrying a series of clearer-pins, of a pot-mouth provided with a series of casting-openings flaring at both ends, and with an intermediate portion substantially cylindrical but flaring somewhat toward the disk, said pins being adapted to register with said openings; substantially as described.

8. In a linotype-machine, the combination with the mold-disk, of a pot-mouth clearer recessed within the disk and inside of the plane in which the edge of the back knife is located, so as to avoid the knife when the disk rotates; substantially as described.

9. In a linotype-machine, the combination with the mold-disk of a series of individually removable and replacable clearer-pins and means for locking the series in position in the
5 disk; substantially as described.

10. In a linotype-machine, a mold-disk provided with a recess, and a clearer located within said recess and consisting of a series of pins, a plate having apertures through which the

pins extend, and a locking or backing plate; 10 substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ABNER GREENLEAF.

Witnesses:

G. E. REARDON,
HARRY C. MATHIEU.