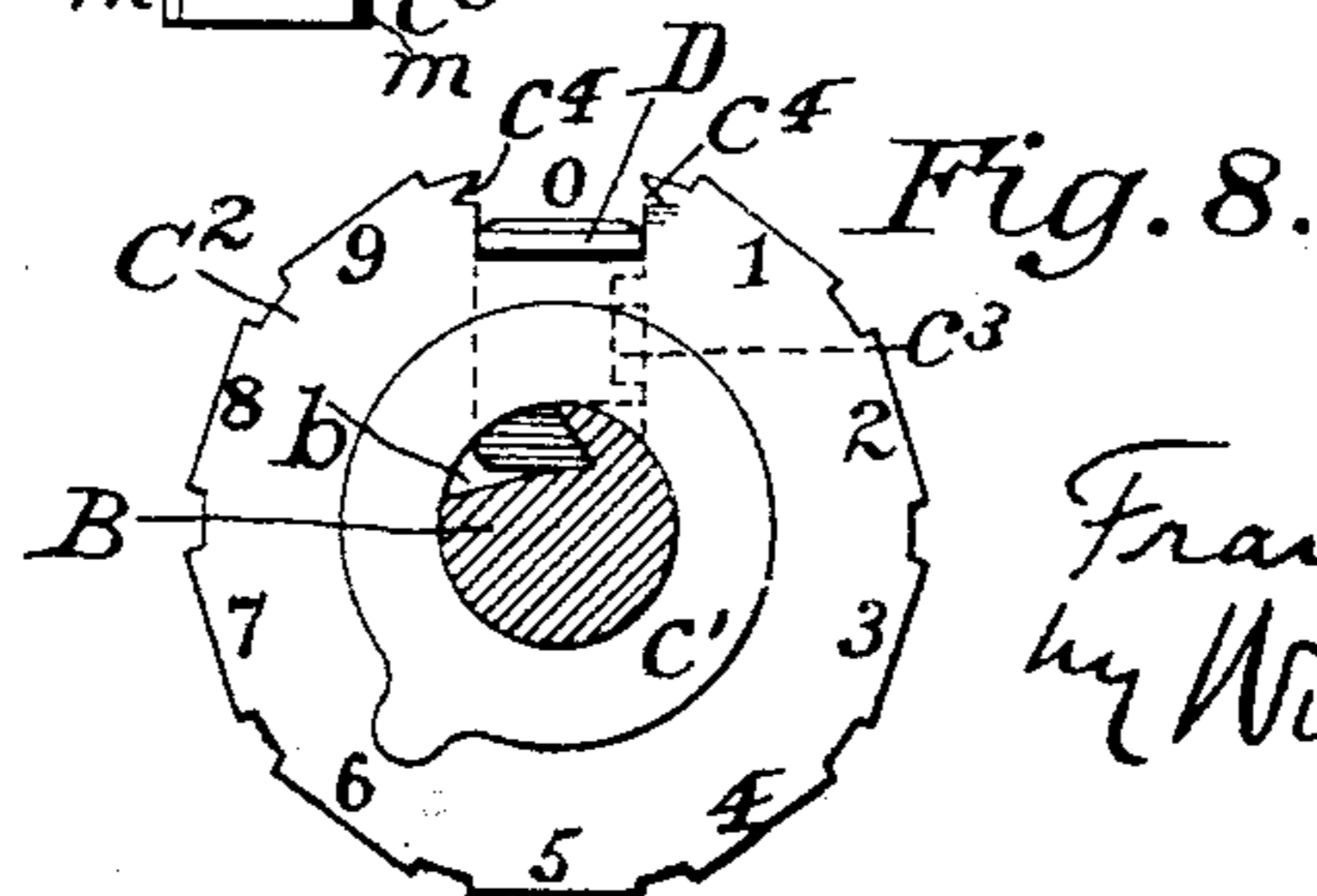
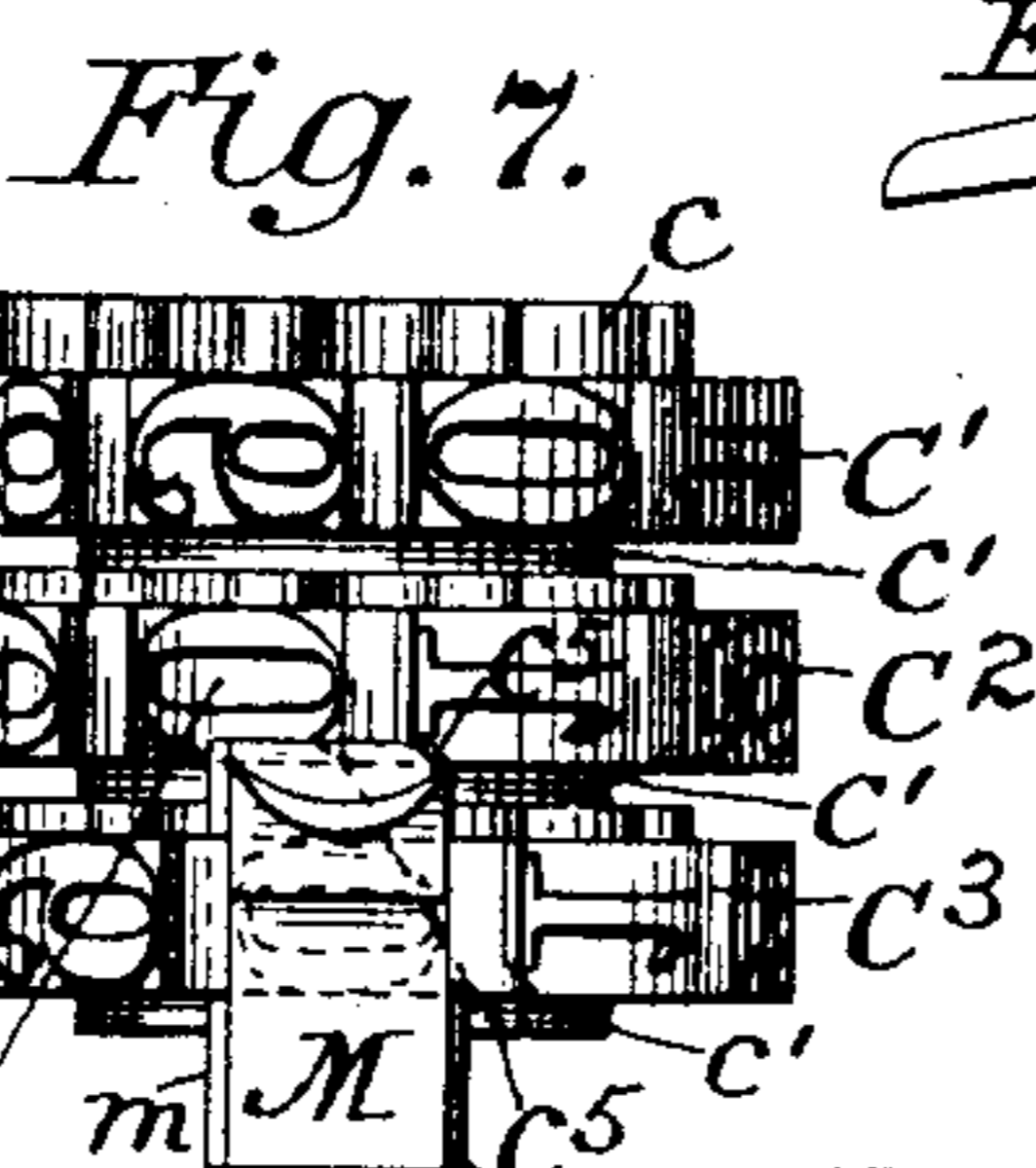
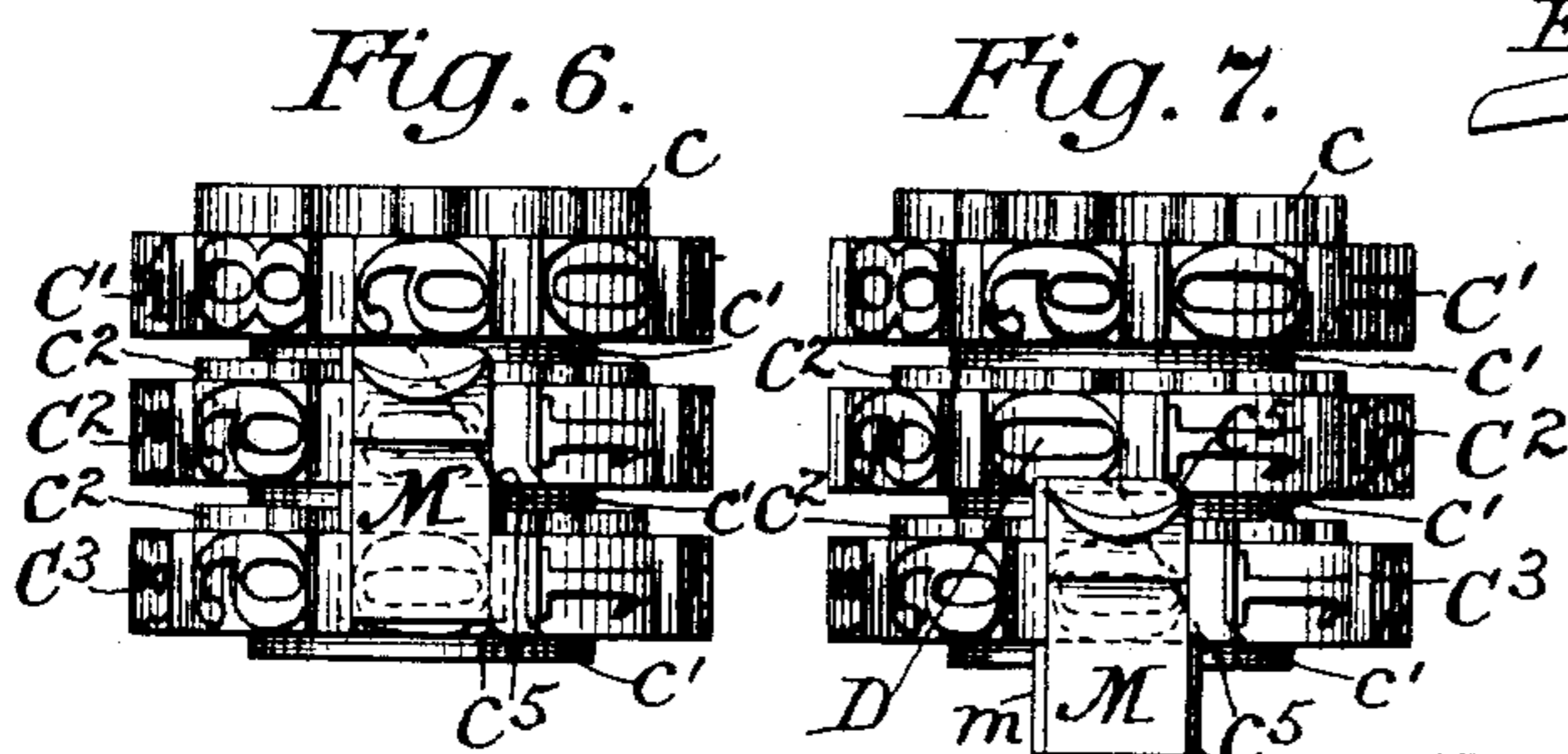
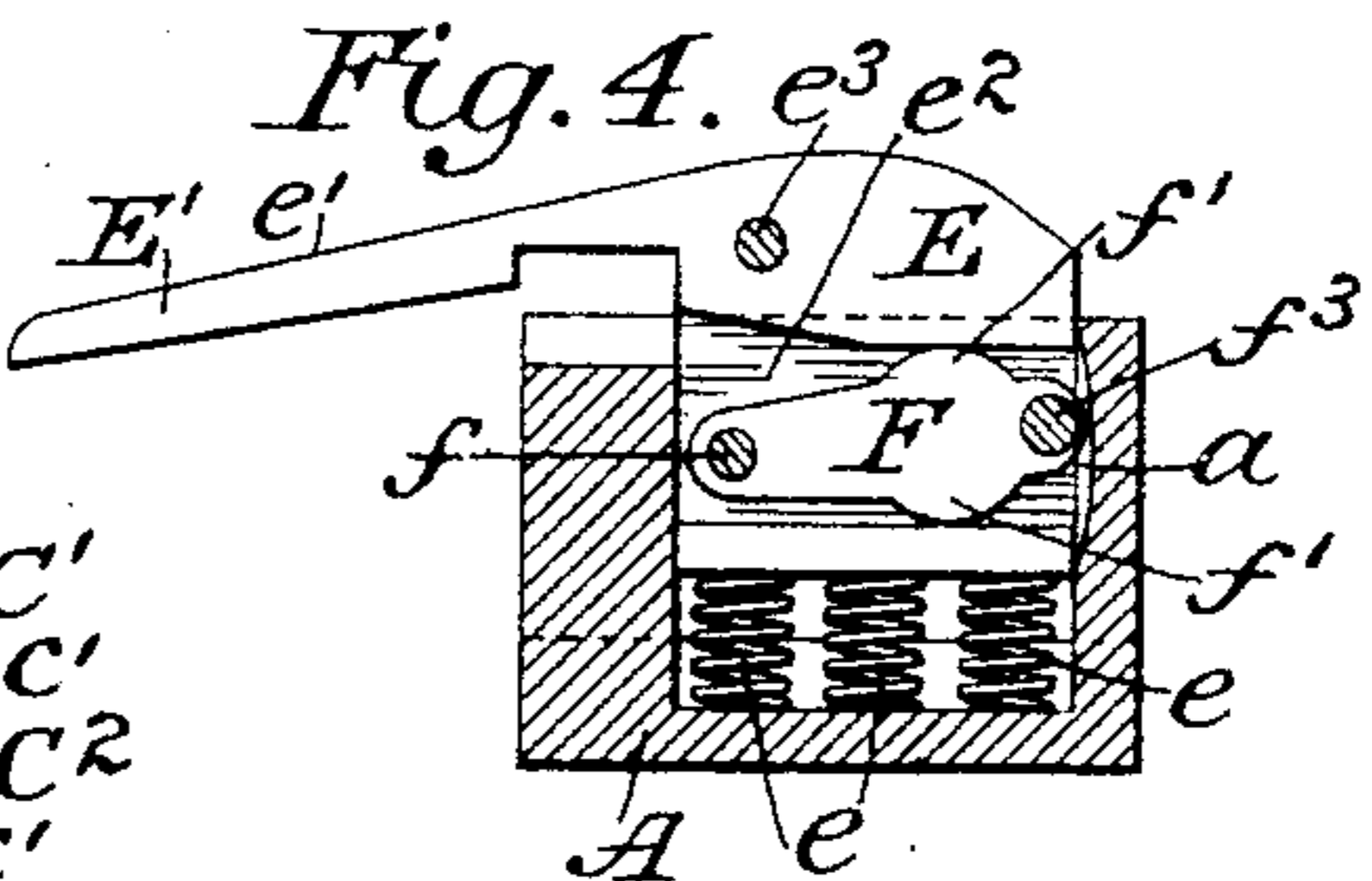
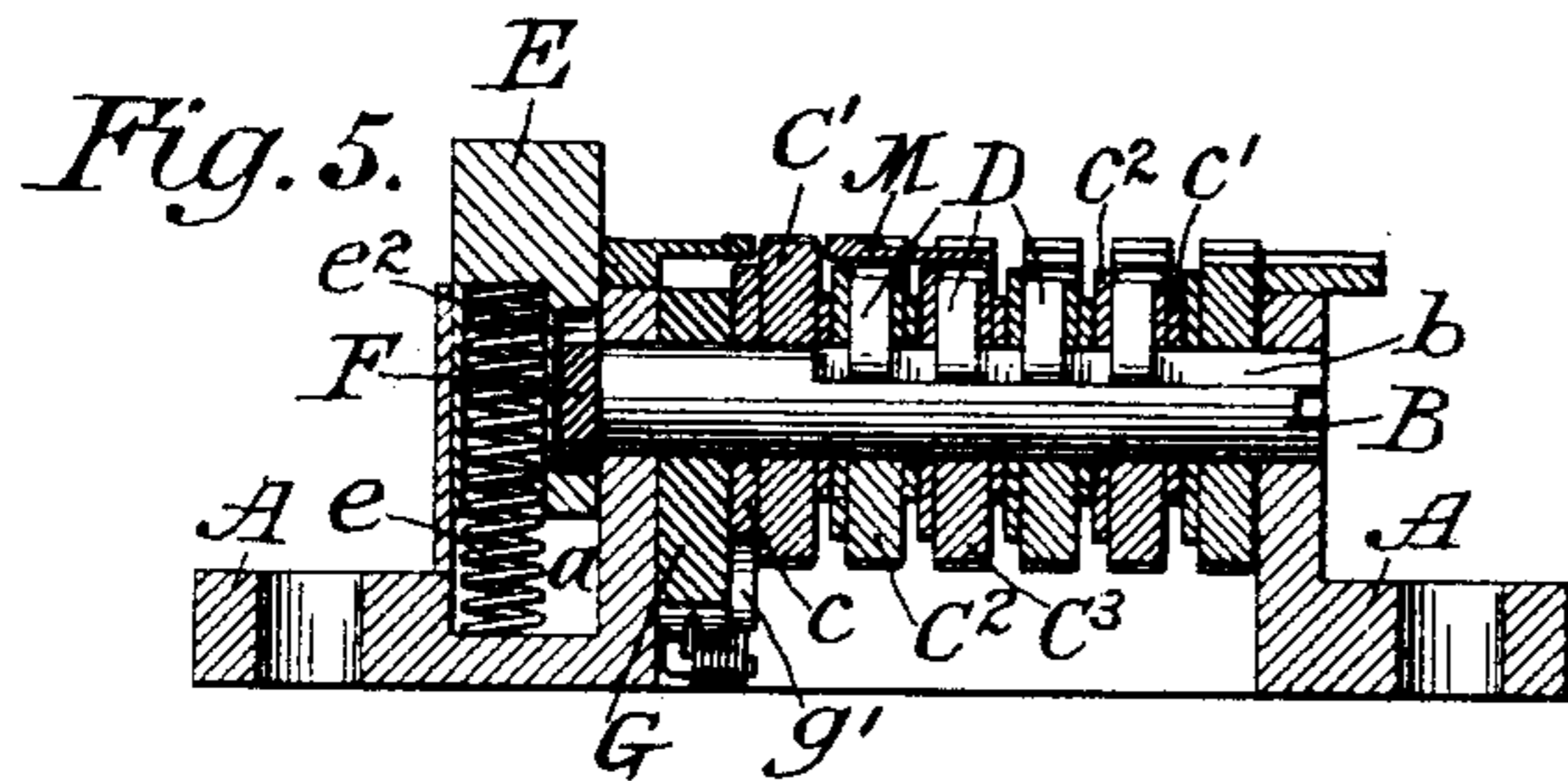
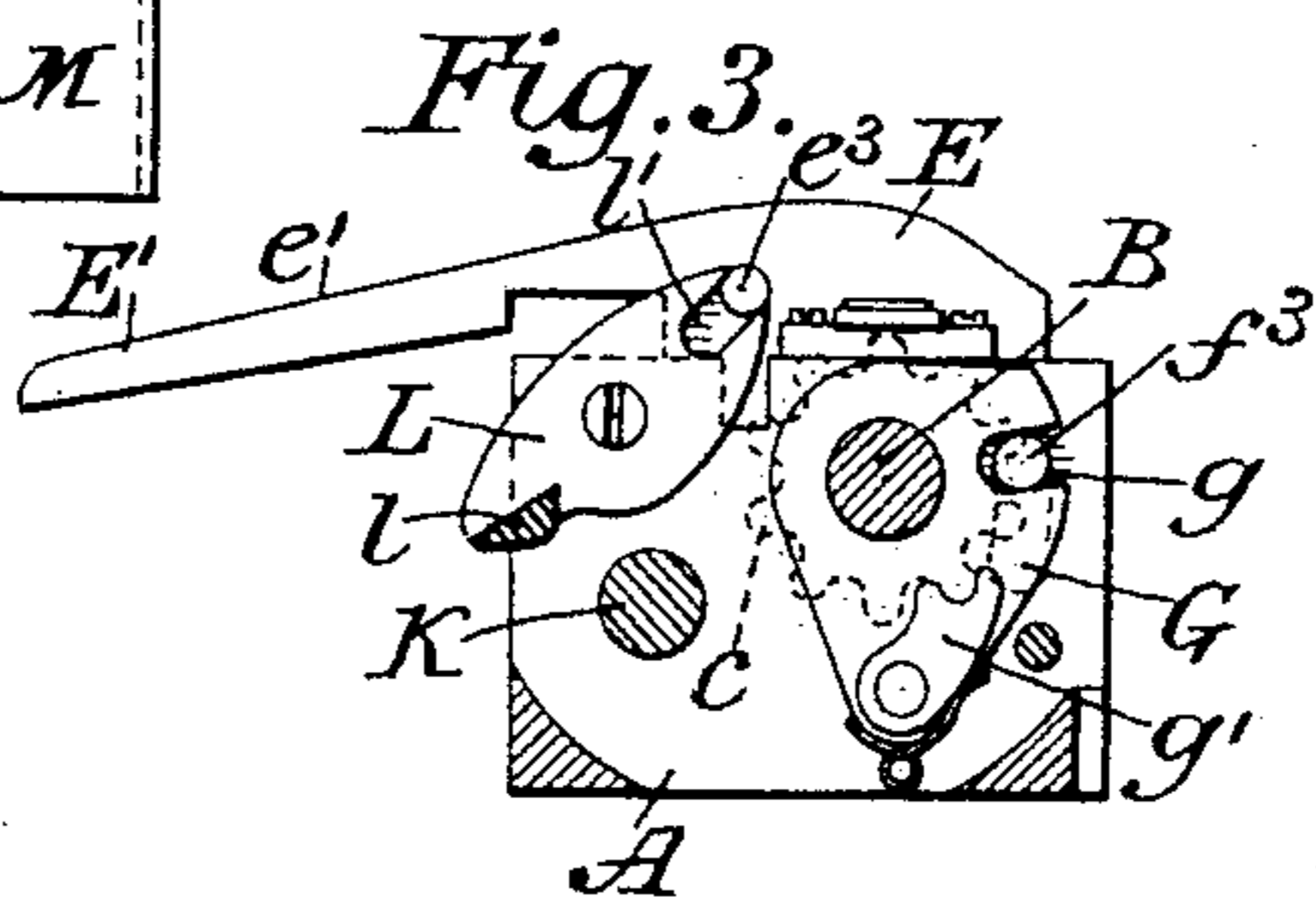
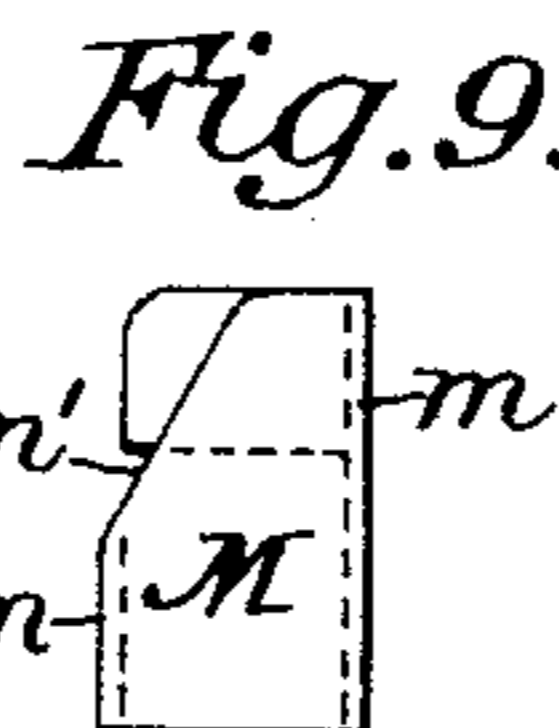
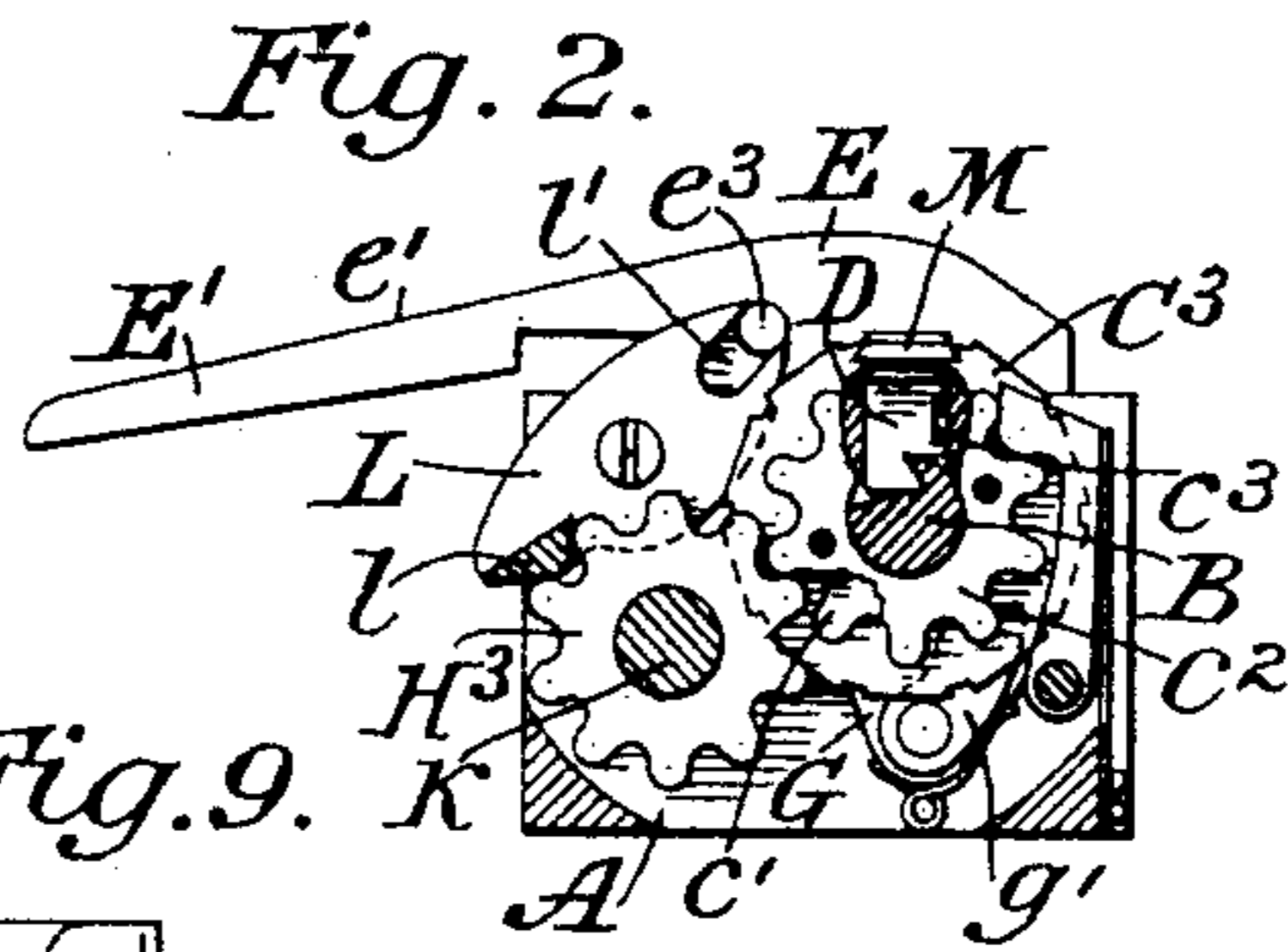
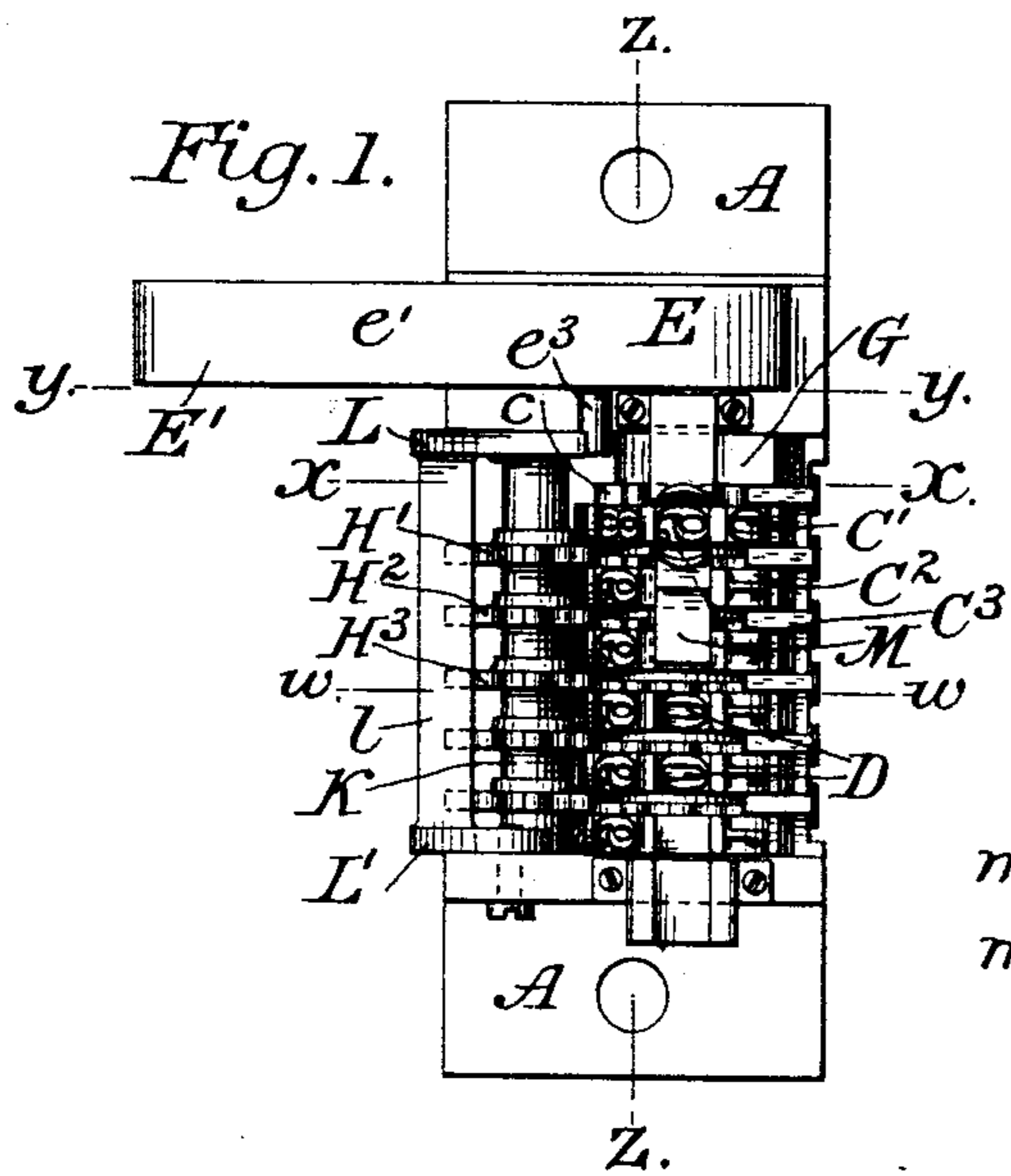


(No Model.)

F. SANDERS.  
NUMBERING MACHINE.

No. 515,368.

Patented Feb. 27, 1894.



Attest:  
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Atty.

# UNITED STATES PATENT OFFICE.

FRANK SANDERS, OF BROOKLYN, NEW YORK, ASSIGNOR TO JOSEPH WETTER,  
OF SAME PLACE.

## NUMBERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 515,368, dated February 27, 1894.

Application filed August 31, 1893. Serial No. 484,440. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK SANDERS, a subject of the Emperor of Germany, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Numbering-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates particularly to numbering machines which are adapted to be locked in the form with the type or to be secured to the bed plate or cylinder of a press, although certain features of the invention, as will be obvious, may be adopted to advantage in other forms of numbering devices.

In the use of numbering machines of the usual type upon rotary presses some difficulty is experienced by reason of the tendency of the respective numbering wheels to be thrown too far over as each is shifted. Another difficulty experienced, particularly when the diameter of the impression cylinder is large, is that the plunger rises and shifts the wheels before the paper has fairly cleared them, with the result that the impression is blurred.

Accordingly, one object of my invention is to provide a locking device which will effectually prevent the movement of any wheel through more than one space at each impression and a second object is to provide means for preventing the shifting of the wheels until the paper has cleared them.

A third object is to enable an automatically shifting mark or slide, which produces the impression of a character immediately at the left of whatever number is printed, to be used with numbering wheels which are fitted with a drop cipher.

Finally, it has been my object to improve generally the construction and operation of typographical numbering machines.

In the accompanying drawings: Figure is a plan view of a typographical numbering machine to which my improvements are applied. Fig. 2 is a transverse section of the same on the line  $w-w$  of Fig. 1. Fig. 3 is a transverse section on the line  $x-x$  of Fig. 1. Fig.

4 is a transverse section on the line  $y-y$  of Fig. 1. Fig. 5 is a longitudinal section on the line  $z-z$  of Fig. 1. Figs. 6 and 7 are plan views of three numbering wheels detached, illustrating the movement of the slide. Fig. 8 is a side view of one of the numbering wheels, the slide being removed and the supporting shaft being shown in section; and Fig. 9 is an under side view of the slide removed from the machine.

In the construction shown for illustration of the invention the frame or casing A of the numbering machine is represented as adapted to be secured to the cylinder of a press outside of the form and as having the usual fixed shaft B upon which the numbering wheels  $C^1$ ,  $C^2$ ,  $C^3$ , are mounted to rotate. Each wheel is also represented as recessed or slotted for the reception of a movable type block or drop cipher D, which may be arranged for operation in any suitable manner and as shown is adapted to rest upon the outer circumference of the shaft B when its type character is required to be in the printing plane, and to drop into a slot or recess  $b$  when it is necessary that its type character should be withdrawn from the plane of print. This is a well known arrangement of the drop cipher, but it will readily be understood that my invention is in no way dependent upon the character of the means whereby the movable type block is brought to or withdrawn from the plane of print.

In a recess  $a$  at one end of the frame or casing A is placed a plunger E which may be seated upon springs  $e$  in the usual manner and is actuated as each impression is made by the press and caused to advance the numbering wheels in the proper manner through suitable intermediate mechanism. Usually in numbering machines of this character the movement of the plunger downward or toward the bed plate upon which it rests has no effect upon the numbering wheels, the movement of the latter being produced as the plunger returns to its normal position after the pressure of the platen or impression cylinder has been removed. Consequently it is desirable, in order to prevent a blurring of the impression, that the plunger shall be held down until the impression cylinder has moved so

far from the numbering wheels as to be entirely clear of them during their movement. If the cylinders of the press are of large diameter it is clear that the plunger might be released and commence to move before the paper, which naturally clings somewhat to the inky faces of the type, has cleared itself entirely from the numbering wheels. Accordingly, I have provided the plunger with an extension  $E'$ , the upper surface  $e'$  of which is approximately parallel with the surface of the platen or type cylinder upon which the numbering machine is secured, whether the same be curved or flat, the upper surface of the extension shown in the drawings being inclined so that it may be approximately parallel with the surface of a cylinder. If the form carrier were flat the surface of the extension would be made parallel therewith and would operate in the same manner to delay the movement of the wheels till the impression cylinder had passed from the extension. The extension is so placed with reference to the main body of the plunger that the latter shall be struck first by the impression cylinder, for if the extension were struck first the plunger would be tilted and caused to bind in its bearings. However, if the plunger has once been depressed it will be retained in position without injury by contact of the impression cylinder with the extension  $E'$ , and the movement of the wheels will therefore be delayed until the impression cylinder has passed from the extension and the paper has been cleared from the numbering wheels.

The means which I prefer to employ for the transmission of the movement of the plunger to the numbering-wheels are shown particularly in Figs. 3, 4 and 5 of the drawings and comprise a lever  $F$  which is pivoted at  $f$  to the side wall of the recess  $a$  and is itself embraced between the walls of the recess  $e^2$  in the side of the plunger  $E$ , the lever  $F$  being formed near its other end with cheek pieces  $f'$  to form bearing points for the lever against the walls of the recess  $e^2$ . The free end of the lever bears a pin  $f^3$  which passes through a slot in the wall of the recess  $a$  and enters a notch  $g$  in a plate or swinging arm  $G$  pivoted on the shaft  $B$ . The plate or swinging arm  $G$  carries a spring pressed pawl  $g'$  which engages a ratchet wheel  $c$  fixed to the side of the first wheel  $C'$ . It is common in numbering machines of this description to extend the swinging arm  $G$  and to provide it with a pawl for each numbering wheel, the pawls being so arranged with reference to the ratchet wheels affixed to the respective numbering wheels as to effect an advance of each wheel through one space upon the completion of the rotation of the wheel of the next lower denomination.

So far as concerns the other features of my invention, such arrangement might be adopted in the present case, but in order that I may conveniently apply to the machine the means heretofore referred to for preventing any im-

proper movement of the wheels or of any of them I prefer the arrangement shown in the drawings which is also common. In this arrangement each numbering wheel has fixed upon one side a single toothed gear  $c'$  which meshes with and drives a ten-toothed gear  $H'$ ,  $H^2$ ,  $H^3$ , &c., the several gears last referred to being mounted upon a fixed shaft  $K$ . Each of the said gears  $H'$ ,  $H^2$ ,  $H^3$ , &c., meshes with and drives a ten-toothed gear  $c^2$  which is fixed upon the side of the corresponding numbering wheel of the next higher denomination, it being understood that the units wheel  $C'$  has the ten-toothed ratchet-wheel  $c$  in place of the ten-toothed gears  $c^2$  of the other numbering wheels. As each numbering wheel of the lower denomination completes a rotation the tooth of its single-toothed gear  $c'$  engages the corresponding gear  $H'$ ,  $H^2$ ,  $H^3$ , &c., and through it advances the numbering wheel of the next higher denomination one space, in a manner which will be understood without further description herein.

When the numbering machine is carefully constructed so that the parts move easily and is used with a rapid press which causes the plunger to be actuated almost as if by the blow of a hammer, it sometimes happens that the wheels of higher denominations are advanced more than one space upon the completion of the rotation of the wheel of the next lower denomination. I have therefore devised a locking device which is intended to prevent such improper movement of the wheels or any of them and which I will now proceed to describe.

At one end of the casing  $A$  is pivoted an arm or plate  $L$  which carries at one end a locking bar  $l$ . If the machine is long enough to require it the free end of the bar  $l$  may be supported by a pivoted plate  $L'$ . The bar  $l$  is parallel with and adjacent to the series of gears  $H'$ ,  $H^2$ ,  $H^3$ , &c., and is adapted to engage said gears and prevent their rotation, preferably presenting an angular edge to the gears so that any gear which has moved a trifle too far may be brought back to position when the bar is brought into engagement therewith. The bar is adapted to be actuated by the movement of the plunger to release the gears and permit their free movement only when the plunger is at or near its lowest position, the bar at all other times engaging the gears and preventing their movement. As represented in the drawings the arm or plate  $L$  is extended and notched, as at  $l'$ , so that it may be engaged by a pin or projection  $e^3$  on the plunger  $E$ . The movement of the gears before the plunger has reached or nearly reached its lowest position is thus rendered impossible and the locking bar again engages the gears so quickly after the plunger commences its upward movement that the movement of any of the wheels through more than one space is rendered impossible, the bar itself immediately bringing back to position any gear which may have been thrown some-

what too far. I have shown the locking bar as adapted to engage the gears  $H'$ ,  $H^2$ ,  $H^3$ , &c., but it will be obvious that the bar might be provided with fingers and so placed as to engage the gears  $c^2$ ,  $c^3$ , which are fixed directly to the numbering wheels. However, I prefer the arrangement shown on account of the facility with which it can be manufactured and its non-liability to derangement.

As before described each numbering wheel except the first or units is equipped in any usual or suitable manner with a movable cipher block. It is desirable for many purposes to print immediately at the left as well as at the right of every number, some mark or character which will prevent the addition of a figure to the printed number. For this purpose therefore I have arranged a slide or movable plate bearing the figure or character desired to slide or be shifted over the depressed cipher blocks as the number of figures is increased, the action of the drop cipher not being interfered with in any manner. The movable type block or drop cipher D slides, as represented, in a recess  $c^3$  formed in the side of the wheel. Near the periphery of the wheel the recess is carried through from side to side of the wheel parallel with the axis, so that when the several wheels stand with the corresponding numbers in line these slots or outer ends of the recesses  $c^3$  form a channel in which a slide or movable plate M is free to move. Grooves  $c^4$  are formed in the sides of the slots to receive the edges  $m$  of the slide or plate M and thereby to retain the same in position. This slide might be shifted by hand but I prefer to bevel the lower portion of the plate, as shown at  $m'$  in Fig. 9, and also to bevel or round one corner of the slot in each wheel, as shown as  $c^5$  in Figs. 6 and 7. This arrangement causes the movement of the slide to be entirely automatic, thus, when the slide is in the position represented in Fig. 1, the number "9" having just been printed, the next movement of the machine will cause the units wheel to advance one space and bring the cipher thereon to the line of print and the tens wheel likewise to advance one space and bring the figure "1" thereon to the line of print. As the tens wheel moves the rounded corner  $c^5$  of the slot therein engages the incline  $m'$  of the slide M and throws the latter back, as represented in Fig. 7, it being understood, of course, that all of the drop ciphers have previously been retired from the plane of print.

It will be readily understood that the drop cipher of each wheel, after it has been uncovered by the slide M, is moved outwardly in the usual manner so that it may stand in the plane of print when the wheel completes its rotation.

I claim as my invention—

1. The combination of a series of numbering wheels, a series of toothed wheels rotating respectively with said numbering wheels, a plunger and intermediate means for advancing said numbering wheels, and a lock adapted to engage said toothed wheels and actuated by said plunger, substantially as shown and described.

2. The combination of a series of numbering wheels, each of said numbering wheels having a toothed wheel fixed thereto, a series of independent toothed wheels meshing with said first named toothed wheel, a plunger and intermediate means, including said last named toothed wheels, for advancing said numbering wheels, and a lock adapted to engage said toothed wheels and actuated by said plunger, substantially as shown and described.

3. The combination of a series of numbering wheels, a series of toothed wheels rotating respectively with said numbering wheels, a plunger and intermediate means for advancing said numbering wheels, a pivoted arm or plate engaged by said plunger, and a bar carried by said arm and adapted to engage said toothed wheels, substantially as shown and described.

4. The combination of a series of numbering wheels, a plunger and intermediate mechanism for advancing said numbering wheels, said plunger having an extension whereby the plunger may be held down while the paper is in contact with the numbering wheels, substantially as shown and described.

5. A numbering wheel for a numbering machine having a radial recess for the reception of a movable type block, the outer end of said recess being cut through from one side to the other of said wheel and the walls of said recess near its outer end being formed with grooves parallel with the axis of the wheel for the reception of a slide, substantially as shown and described.

6. The combination with a casing, a numbering wheel mounted therein and a pawl-carrying arm for actuating said wheel, of a plunger having a recess in its side, and a lever pivoted to the casing and embraced within said recess, said lever having bearing points against the walls of said recess and having its free end connected to said pawl-carrying arm, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK SANDERS.

Witnesses:

WILLIAM WENZ,  
A. N. JESBERA.