

(No Model.)

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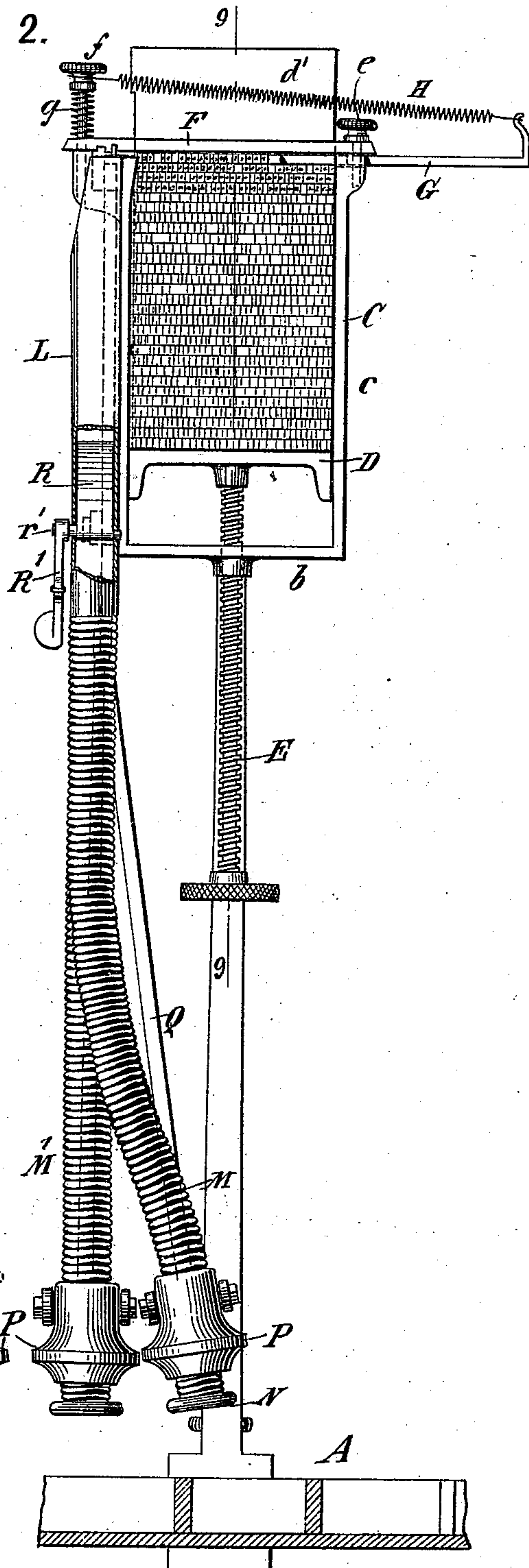
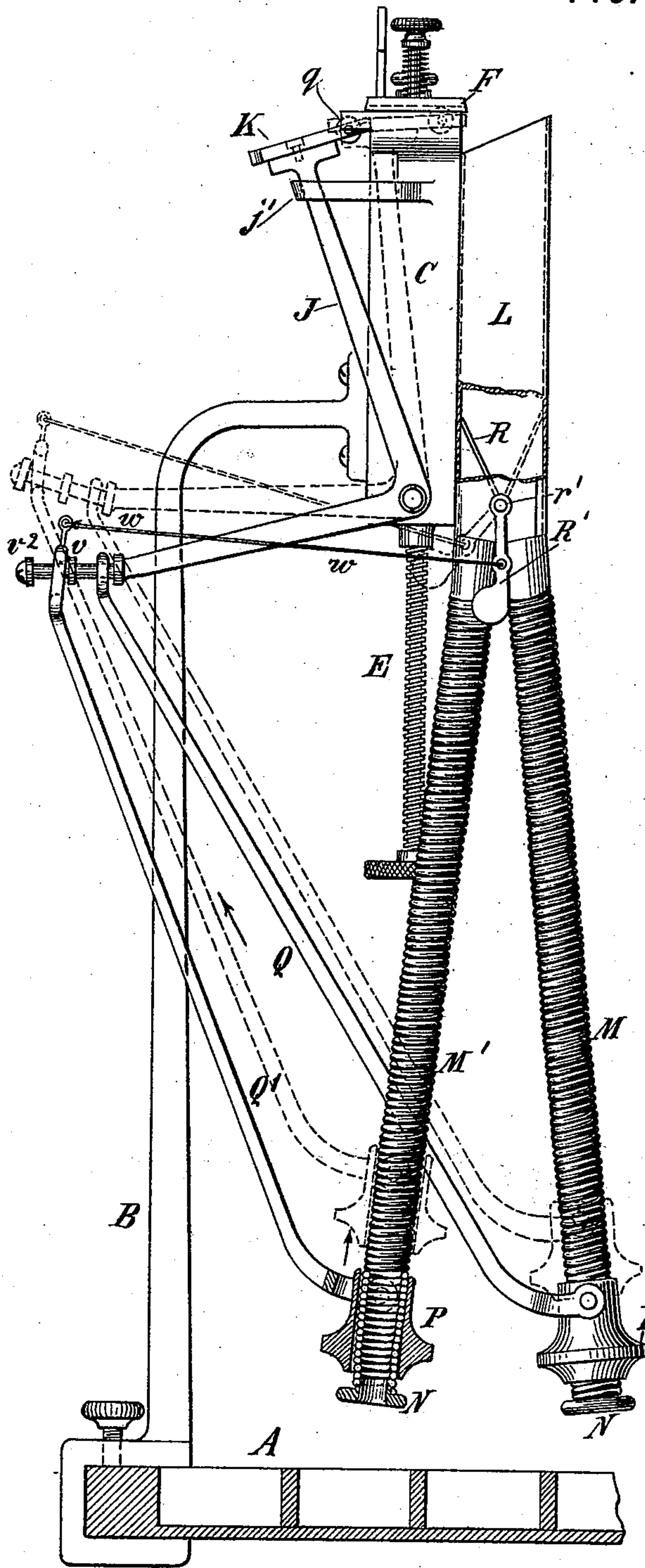
O. S. BOWMAN.
TYPE DISTRIBUTING MACHINE.

No. 501,597.

Patented July 18, 1893.

FIG. 1.

FIG. 2.



WITNESSES:

John Becker
Fred White

INVENTOR:

Oliver S. Bowman,

By his Attorneys,

Arthur C. Fraser & Co.,

(No Model.)

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FIG. 3.

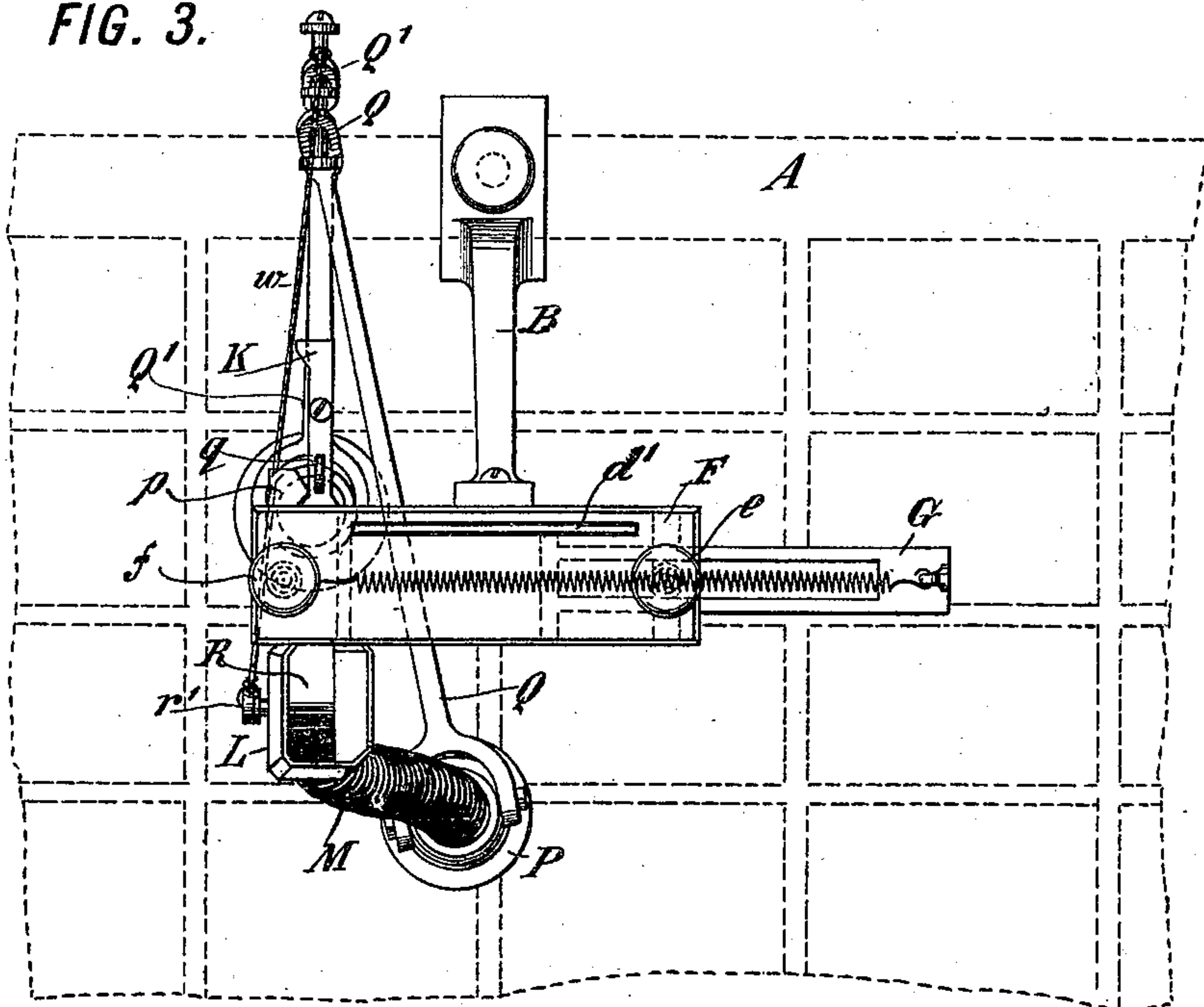


FIG. 4.

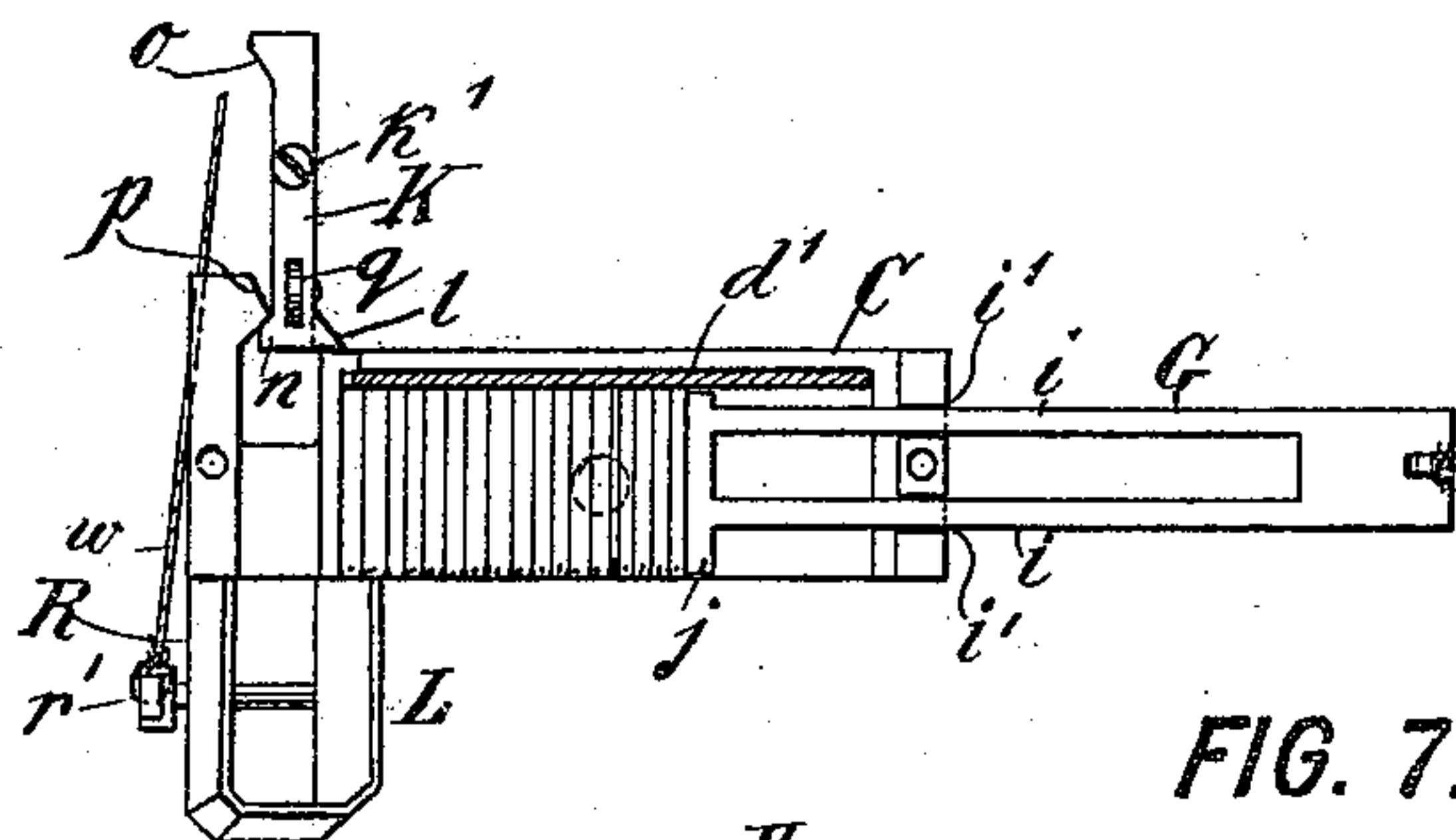


FIG. 5.

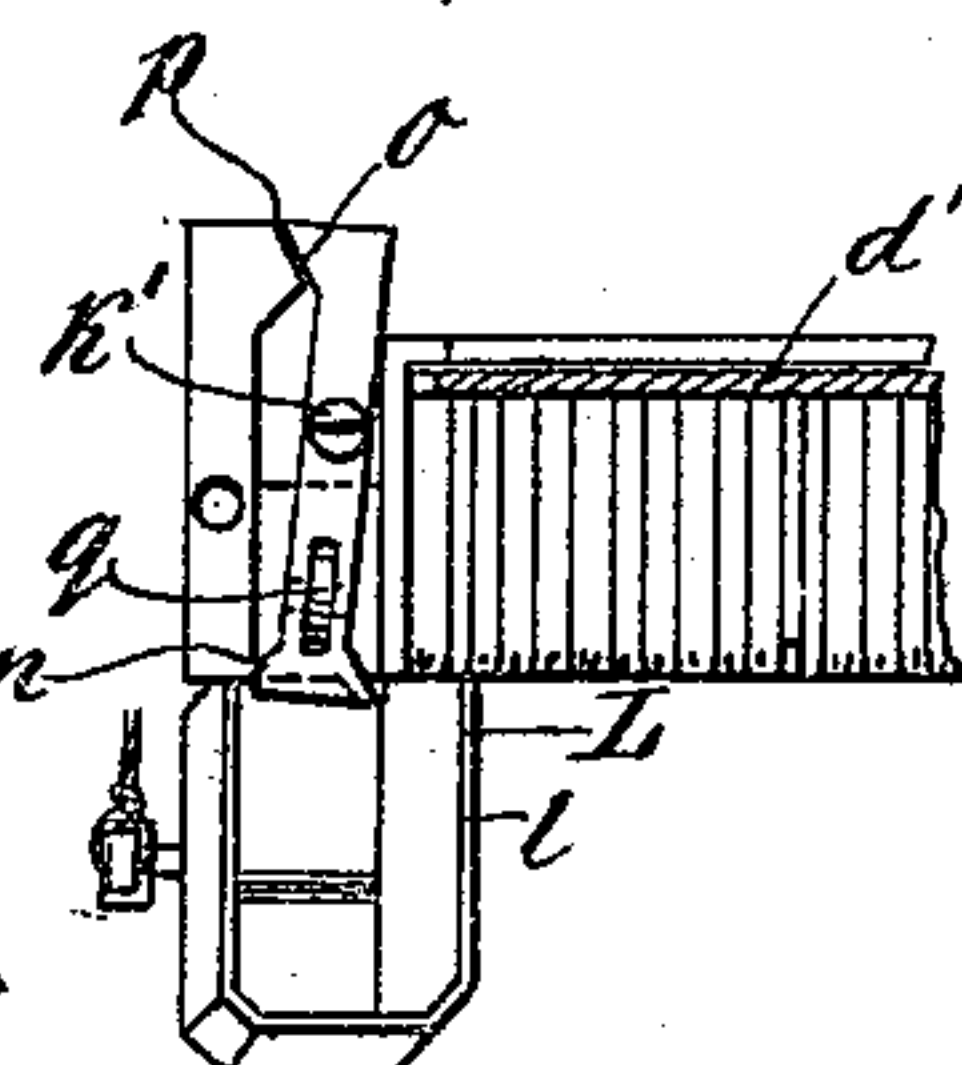


FIG. 6.

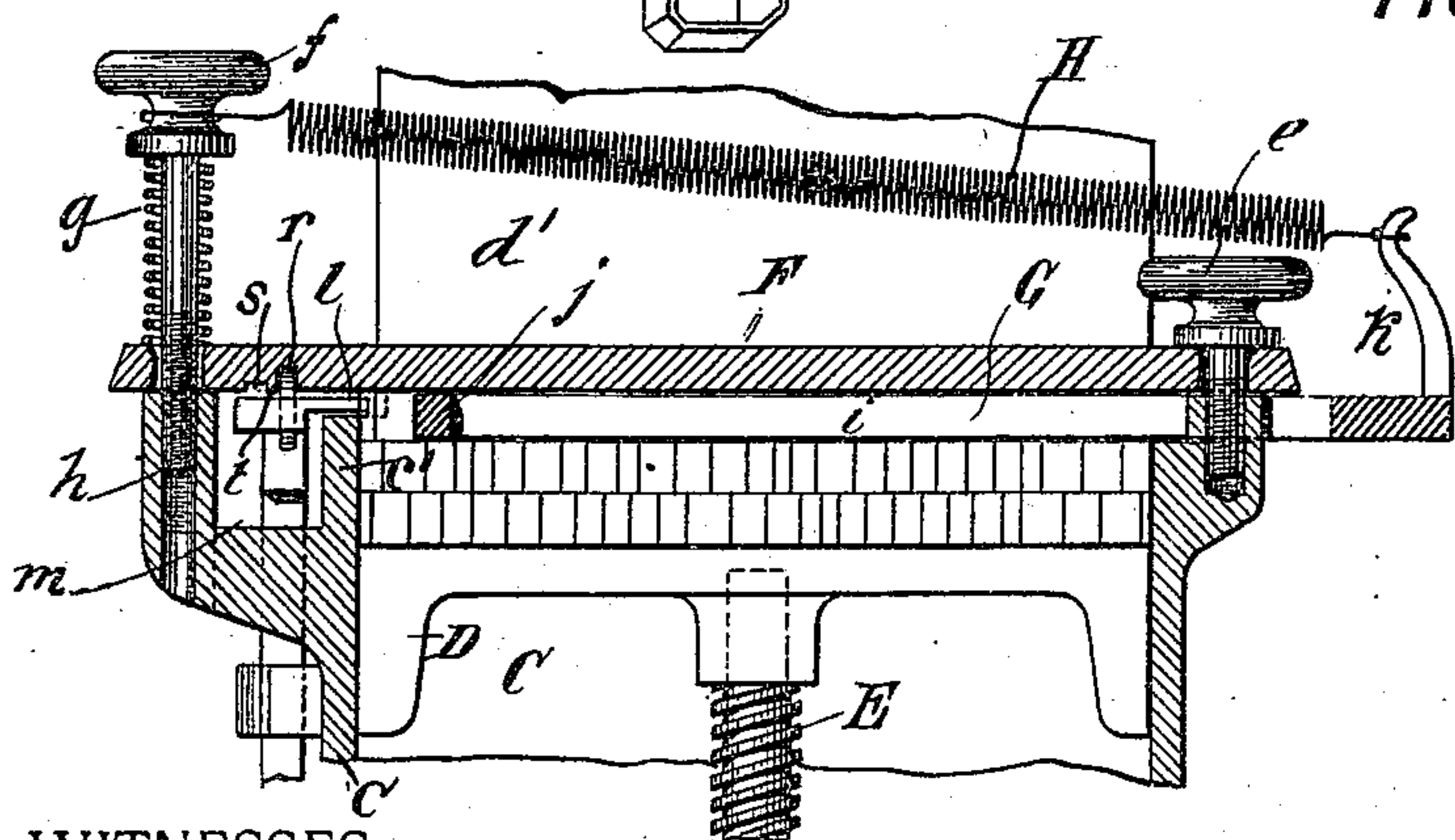
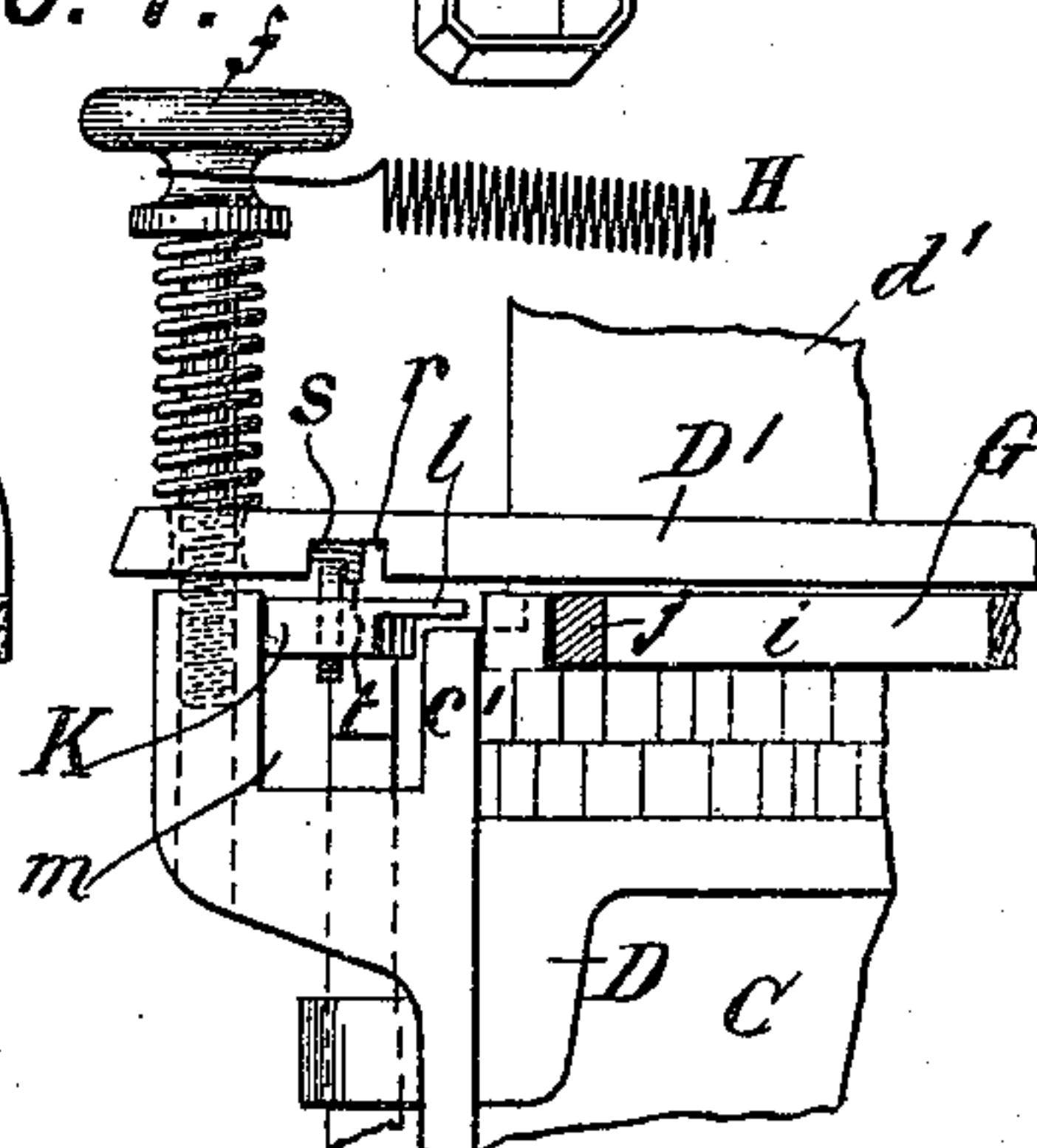


FIG. 7.



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FIG. 8.

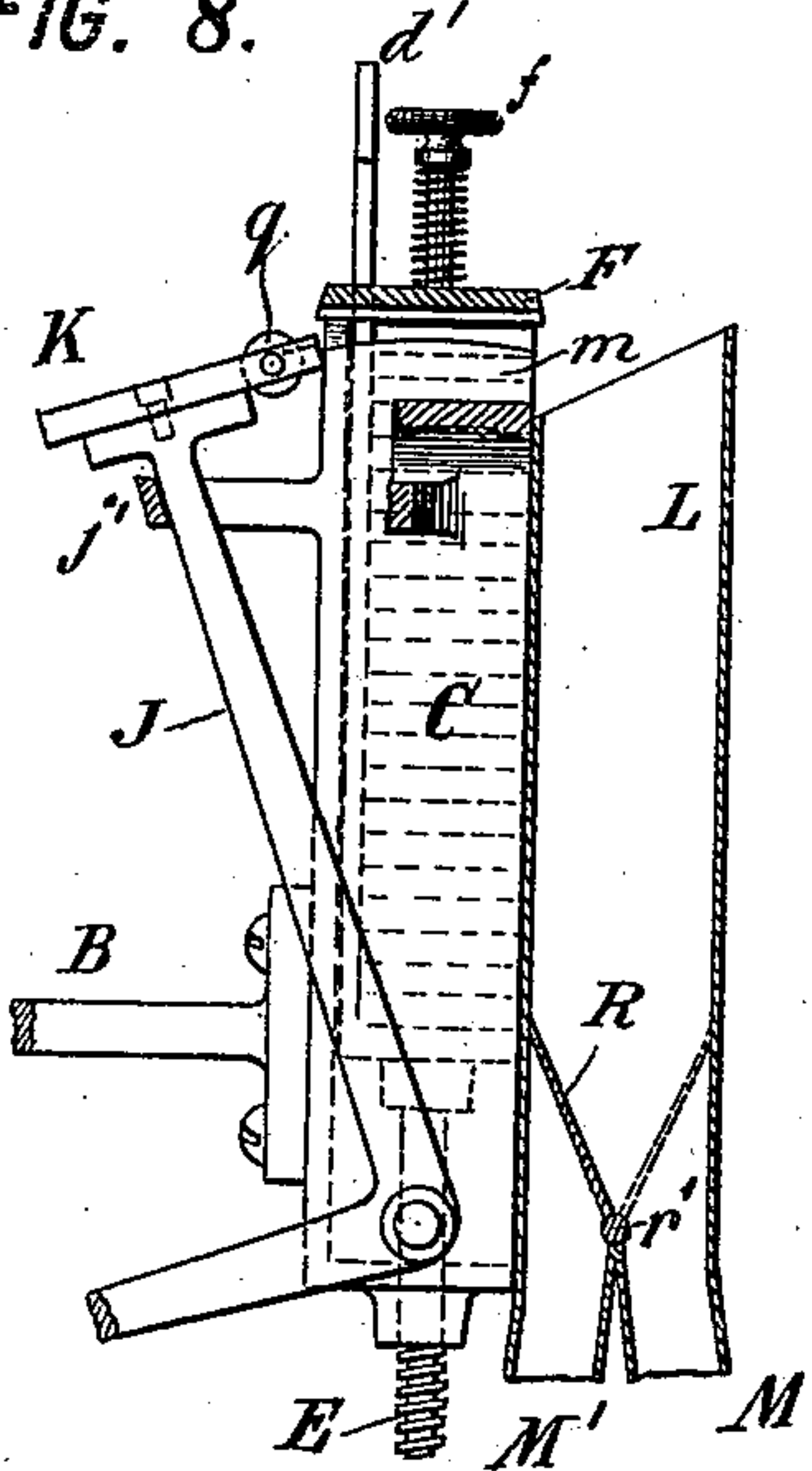


FIG. 9.

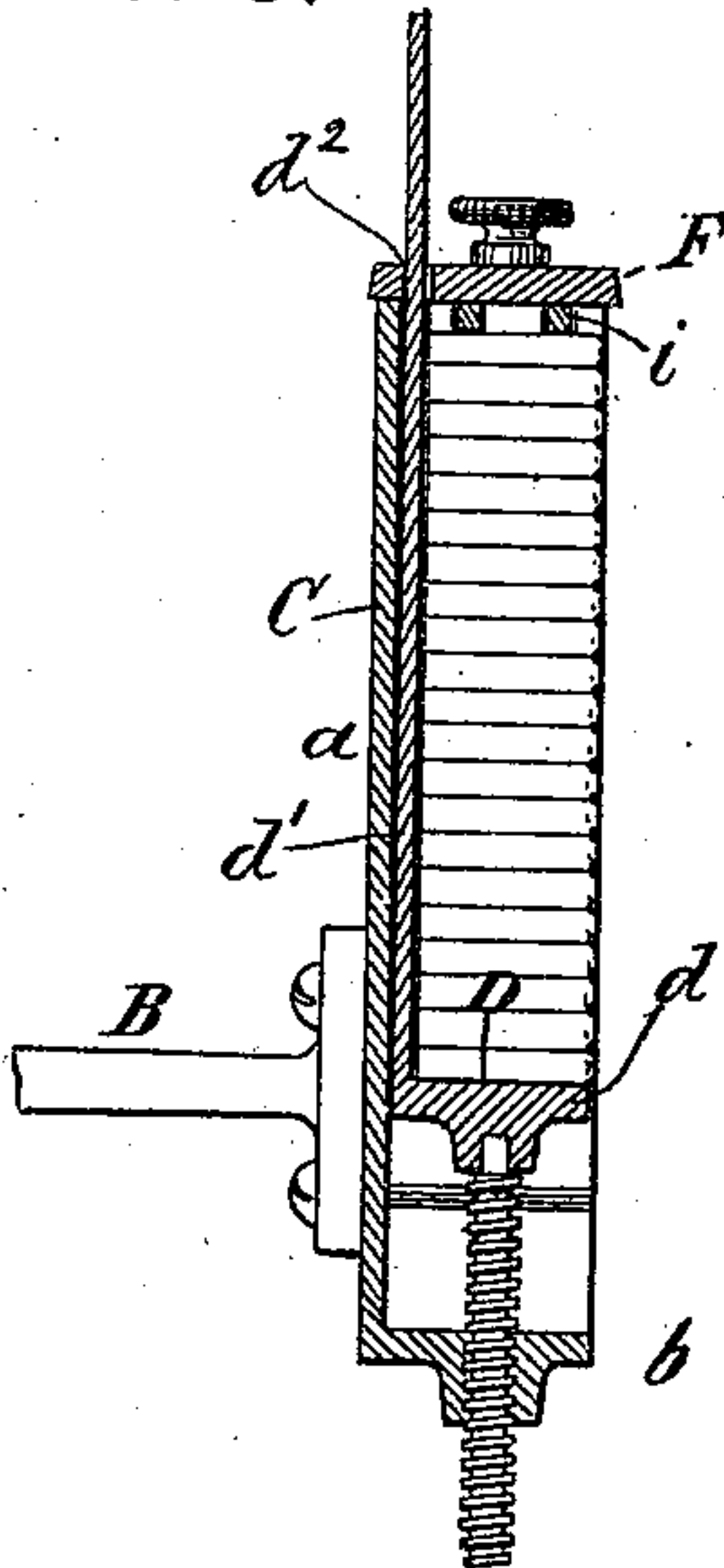


FIG. 10.

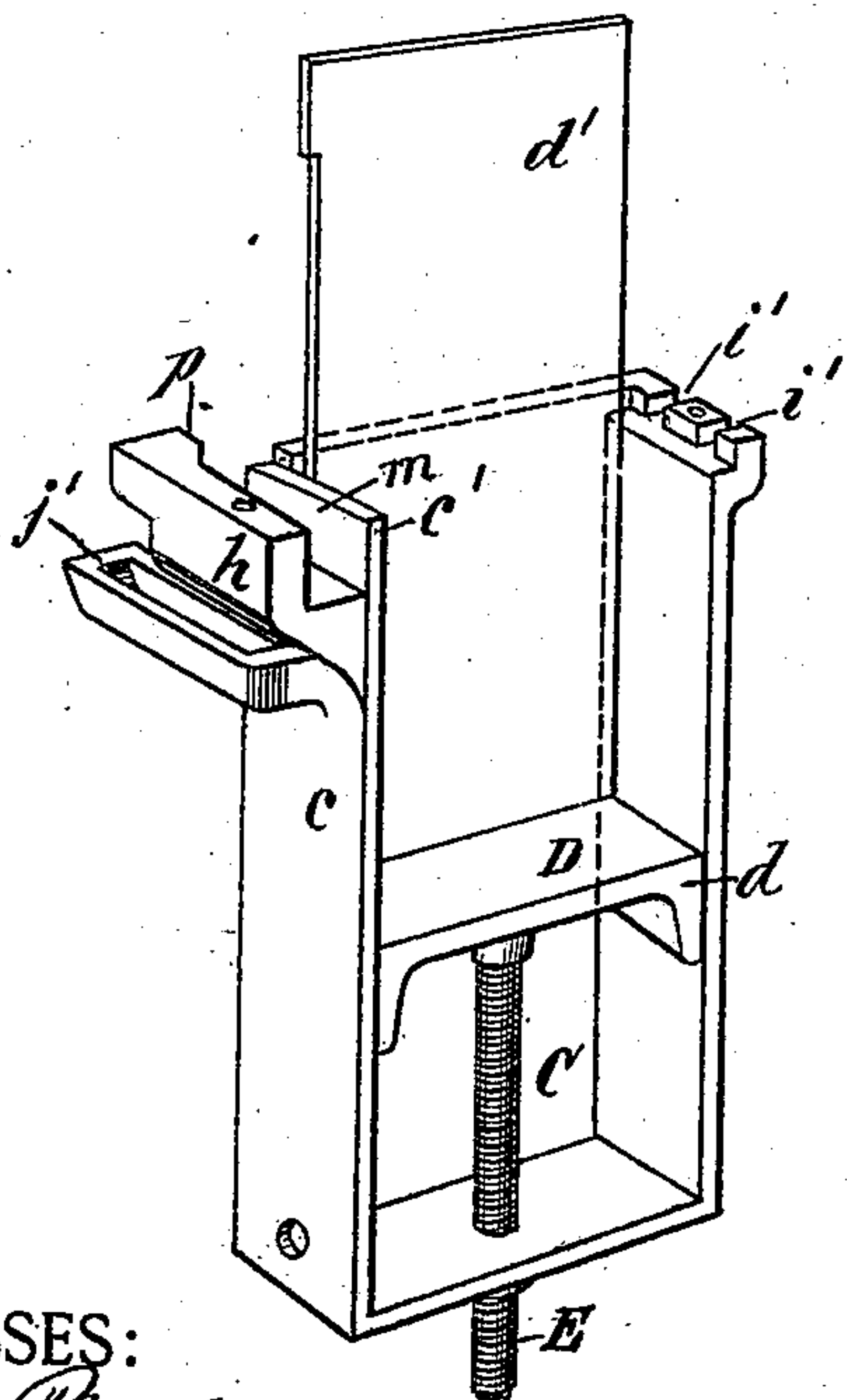


FIG. 11.

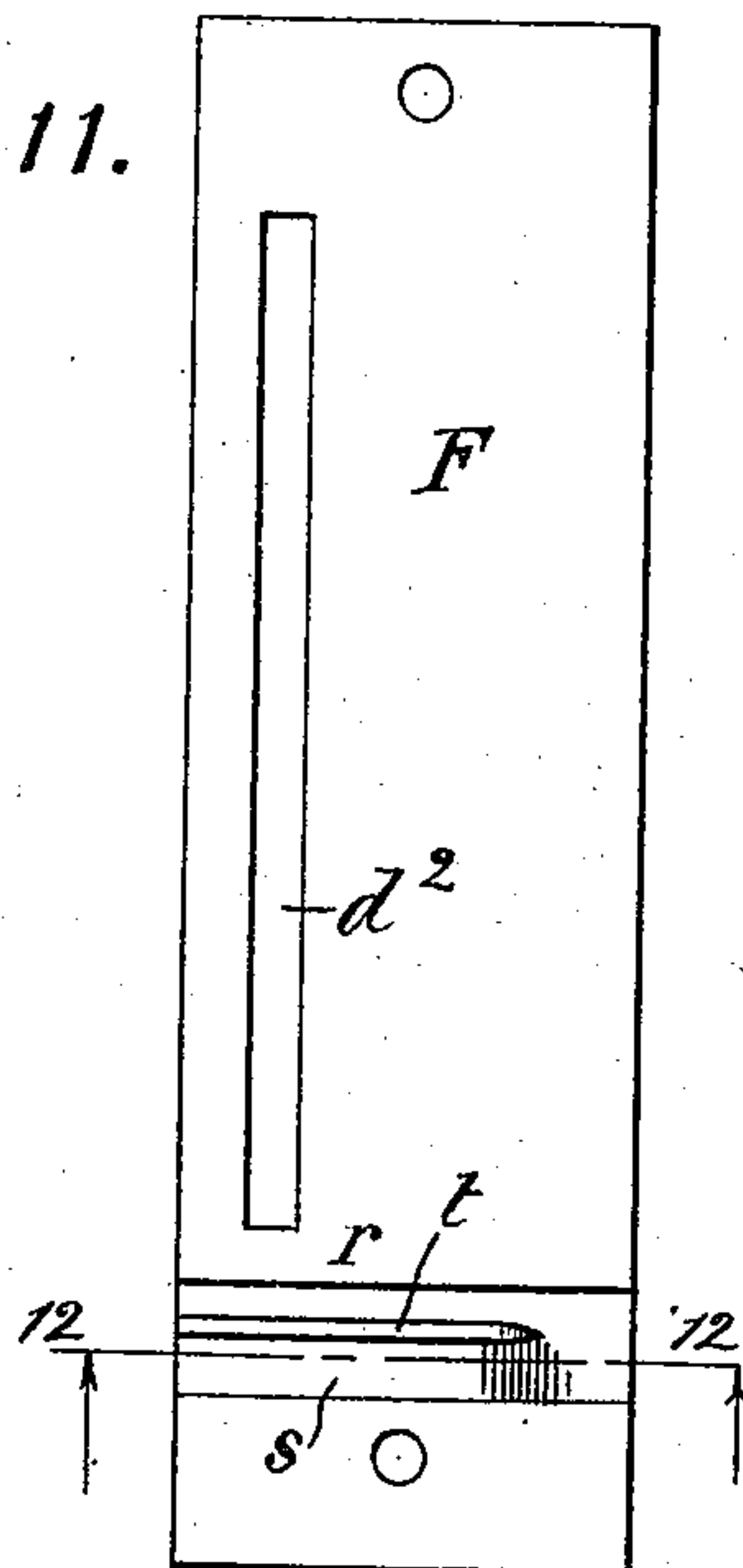


FIG. 12.



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UNITED STATES PATENT OFFICE.

OLIVER S. BOWMAN, OF SALT LAKE CITY, UTAH TERRITORY.

TYPE-DISTRIBUTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 501,597, dated July 18, 1893.

Application filed February 4, 1893. Serial No. 461,015. (No model.)

To all whom it may concern:

Be it known that I, OLIVER S. BOWMAN, a citizen of the United States, residing in Salt Lake City, in the county of Salt Lake, Utah Territory, have invented certain new and useful Improvements in Type-Distributing Machines, of which the following is a specification.

This invention provides an apparatus for facilitating the distribution of type, its objects being to render the distributing operation more rapid, and to avoid the necessity for wetting the type, and for holding it in the hands.

My improved type distributor is designed to be mounted above a type-case or cases, and comprises a box or receiver for holding the column of type to be distributed, means for feeding the type letter by letter and line by line as the distribution proceeds, an ejector for pushing up the successive types one by one, and one or more (preferably two) flexible tubes through which the ejected types fall and by which they are directed by the hands of the operator into the proper compartments of the type cases. The column of type is mounted vertically opposite the eye of the operator with the faces of the types toward him, so that he is enabled to read the types, and he operates the distributing mechanism by grasping the lower ends of the flexible tubes in his hands and lifting one or the other to operate the ejector, and drop a type down into the flexible tube, at the same time carrying the end of this tube to the compartment in which the type belongs, thereby dropping the type into that compartment.

I will proceed to describe the preferred form of my invention with reference to the accompanying drawings, wherein—

Figure 1 is a side elevation of the mechanism partly in section. Fig. 2 is a front elevation thereof. Fig. 3 is a plan thereof. Fig. 4 is a horizontal section taken just beneath the top plate. Fig. 5 is a fragment of Fig. 4, showing the parts in a different position. Fig. 6 is a fragmentary vertical section of the upper portion of the type-holding box on a larger scale. Fig. 7 is a fragment thereof on the same scale as Fig. 6, and showing the parts in a different position. Fig. 8 is a fragmentary side elevation partly in vertical section.

Fig. 9 is a vertical section on the line 9—9 in Fig. 2. Fig. 10 is a perspective view of the type-holding box and slide. Fig. 11 is a plan of the under side of the top-plate. Fig. 12 is a transverse section thereof on the line 12—12 in Fig. 11.

In the drawings, A designates a type-case which may be of the same construction as those ordinarily used in printing offices.

B is a standard for supporting the type distributing mechanism, and which may be conveniently constructed to be clamped to the type-case as shown in Fig. 1. Attached to this standard is a type-holding box C, constructed with a back *a* and bottom *b*, and sides *c c*, which may be all in one piece. In this box works a type feeding slide D, constructed with a bottom plate *d* and a back plate *d'*. The column of type to be distributed is placed within the box C, resting on the bottom of the slide D, and with the feet of the type against the back *d'* of this slide, so that the type faces are exposed at the open front of the box. In order to feed the column of type upward as each line is distributed, I may provide any suitable means for elevating the slide D. In the construction shown this means consists of a propelling screw E passing through a threaded hole in the bottom *b*, and having its upper end swiveled to the bottom of the slide.

On the top of the type-box C is mounted a top plate F, being fastened down at one end by a screw *e* screwing into the top part of the right-hand wall *c* of the type-box, and being pressed down at the other end by a spring *g* reacting against an adjusting screw *f*, which passes freely through a hole in the top plate and screws into a projection *h* from the left-hand side of the type-box. In operation the column of type is elevated by the slide D until its top line bears against the under side of this top plate. The back plate *d'* of the slide passes through a slot *d²* in the top plate (Fig. 11).

In order to feed the types of the top line laterally as the successive types are ejected, I provide a slide G of a thickness approximately equal to the thickness of the type bodies, and moving close beneath the top plate F. This slide is constructed preferably of two parallel bars *i i* moving in slots *i' i'* formed across the

top of the right-hand wall *c* of the type-box (see Fig. 10), the end of the slide which bears against the type being a continuous cross-bar *j*, while at the opposite end of the slide is a projecting arm *k* which constitutes a handle for drawing back the slide after each line of type has been distributed. For feeding the slide forward, a spring *H* is provided, which may be conveniently connected from the handle *k* across to the screw *f*.

I will now describe the ejecting mechanism. An ejector lever *J*, which is preferably an elbow-lever as shown, is pivoted at the side of the type-box *C*, as shown in Fig. 1, or otherwise suitably mounted. Its upper arm is guided and its movement limited by a stop-guide *j'*. On the T-shaped upper end of the lever is pivoted the ejector *K*, which in the construction shown consists of a short bar, preferably of steel, the shape of which is shown in Figs. 4 and 5, and which is pivoted to the lever *J* at about its middle by a screw *k'*. At its front end it is formed with an ejector-tooth *l*, preferably of reduced thickness as shown in Figs. 6 and 7. It is this tooth which engages with and pushes out the types. As the lever *J* is vibrated, the forward end of the ejector *K* plays back and forth through a groove or chamber *m* formed at the upper left-hand side of the type-box. Between this chamber and the type chamber of the box, the side wall *c* projects up to constitute a fixed abutment or stop *c'* (see Figs. 6 and 7), against which the line of type being distributed is kept pressed by the spring-actuated slide *G*.

During the forward movement of the ejector *K*, its tooth *l* projects over the top of the stop-wall *c'*, as shown in Fig. 6, far enough to engage the first type, and by entering back of this type and moving forward, pushes the type in front of it and ejects it from the type chamber. During the return movement of the ejector its tooth *l* is retracted to the left, as shown in Fig. 7, so that it does not engage the types. These right and left movements of the forward end of the ejector may be variously accomplished, the preferable means for this purpose being by the construction shown, the ejector *K* being formed at opposite ends with oppositely inclined projections *n* and *o*, so arranged as to impinge, at the opposite extremes of the movements of the ejector, against a fixed projection *p*. When the ejector is drawn fully backward, its incline *n* strikes the projection *p* and throws its tooth *l* to the right, as shown in Fig. 4; while upon the completion of the forward movement of the ejector its incline *o* strikes the projection *p* and throws the forward end of the ejector to the left, as shown in Fig. 5. The ejector after being thus tilted to either position, might retain its position during the respective forward or backward movements without the provision of special means for retaining it, but to prevent any possibility of its displacement, I prefer to provide means for positively guiding it. To this end I provide one

arm of the ejector with an upward projection *q*, which for the avoidance of friction I construct preferably in the form of an antifriction roller or disk; and in the under side of the top plate *F* I provide two guiding grooves *r* and *s* separated by a projecting rib or tongue *t*, as best shown in Figs. 6 and 7. After the front end of the ejector has been thrown to the right, as shown in Fig. 4, upon commencing its forward movement this roller *q* enters the groove *r*, or in other words, passes on one side of the rib *t*, so that it is thereby guided and its tooth *l* held to the requisite projection for engaging and pushing out the type. At the termination of its forward movement, and when thrown to the left as shown in Fig. 5, the roller *q* comes opposite the groove *s*, and upon the backward movement of the ejector it enters this groove on the opposite side of the tongue *t*, and is guided thereby so that its tooth *l* is held retracted out of reach of the types. Just before reaching the rearward position in which the ejector is again deflected to the right, the roller *q* passes out of the groove *s*. These grooves *r* and *s*, and intervening rib *t*, are shown in Fig. 11.

In order to prevent the ejection of more than one type at a time, the top plate *F* being pressed down by the tension of the spring *g*, maintains a friction against the types of the top line, which effectually resists the displacement of all of them except the one which is being acted upon by the ejector. But this friction to be effective for this purpose, is necessarily so great as to interfere with the feeding forward of the line of type to bring the next succeeding type into position against the wall *c'*, and consequently to facilitate the feeding of the line of type, I provide for relaxing the pressure or tension of the top plate after the ejection of each type, so that the slide *G* may freely advance the line of type. To this end, the top plate *F* is forcibly elevated against the tension of the spring *g* after each ejecting movement is completed and before the next is commenced. The most suitable and effective means for accomplishing this result is that provided by the construction shown, whereby the retractile or backward movement of the ejector serves to momentarily lift the top plate and thereby admit of the automatic feeding forward of the top line of types.

By referring to Figs. 6 and 7, it will be observed that the groove *s* through which the roller *q* travels during the retractile movement, is of less depth than the groove *r*. The groove *s* is thus made so shallow that the roller *q* bears against the bottom of the groove, and by the decreasing depth of the groove as the roller advances under it, the roller is caused to lift the top plate bodily for a short distance, or just sufficient to relax the tension upon the top line of type. This lifting of the plate continues during the greater part of the retractile stroke of the ejector.

As each type is ejected it falls into a chute

L, mounted in front of and to the left of the type-box. This chute extends from the type ejecting position vertically downward, and from its bottom lead two type-conveying flexible tubes M M'. These tubes may be variously constructed, it being only essential that they be readily flexible, and also to a suitable extent extensible or collapsible, in order that their lower ends may be grasped by the hands of the operator, and moved to any position over the type-case A, so as to guide the types and drop them into the proper compartments. The capacity of extensibility of these tubes is desirable by reason of the fact that the remote compartments near the edges of the type-case are farther from the point of attachment of the tubes than those directly beneath; and a further object of this capacity is to enable the lower ends of the tubes to be lifted to operate the type-ejecting mechanism. The preferred construction of these tubes consists of coils of wire, which has the advantage of preserving the full cross-section of the tube during its flexure or distension. The tubes may be properly lined or constructed to prevent the types while falling through them catching against the convolutions of the wires. At the bottom end of each tube is fitted a flanged thimble N adapted to be readily grasped by the hand of the operator. Freely engaging the lower portion of each tube is a pusher P, preferably constructed as shown as a sleeve freely embracing the tube. The respective pushers are connected by rods Q Q' to the lower arm of the ejector lever J, which arm projects rearwardly as shown in Fig. 1. The arm is formed with shoulders or fixed collars v , v' , v^2 , somewhat widely spaced apart, the rods Q, Q', terminating in eyes loosely fitting the arm between these collars, the rod Q engaging it between the collars v and v' , and the rod Q' between the collars v' and v^2 . This construction allows of universal motion, the rods Q Q' swinging in any direction as the pushers P P are carried to different positions by the movement of the lower portions of the tubes M M'. As either tube is stretched downward it slides freely through its pusher P, the latter being held from descending with it by being hung through the rod Q or Q' from the lever J. When, however, the operator lifts the end of either tube, his fingers grasping the thimble N strike the under side of the pusher P and lift this pusher with the tube, thereby communicating a lifting thrust through the rod Q or Q' to the lever J, and vibrating this lever to impart to the ejector K its forward movement to expel the type. Upon dropping the end of the tube the weight of the parts effects a retractile movement of the ejector, or if desired a retracting spring may be provided for increasing the energy of the retractile movement.

It is necessary to direct the type falling through the chute L into whichever of the tubes M M' is designed to receive it. To ac-

complish this I provide a valve R in the lower part of the chute L, this valve consisting of a pivoted plate mounted on an axial rod r' , having bearings in the opposite sides of the chute, and passing out through one side, and having fixed to it an arm R', which extends downward and which is connected by a cord, chain, wire or rod w to an upright prolongation of the rod Q' above its connection with the elbow-lever J. The lower end of the arm R' is weighted so that normally the valve R occupies the position shown in Fig. 1. If the lever J be operated from the tube M through the rod Q, the valve R will remain in this position. But if the lever J be operated from the tube M', the upward thrust exerted through the rod Q' will cause the upper end of this rod engaging the arm of the lever J in the free space between the collars v' v^2 , to first slide along the arm until it abuts against the collar v^2 before it begins to lift the arm; and by this sliding movement it exerts a pull through the connection w , which throws over the valve R to the position shown in dotted lines in Fig. 8, and during the ejecting movement the valve is held in this position so that the ejected type as it falls through the chute L is deflected into the backward subdivision thereof and falls into the tube M'. Thus the operation of either tube M or M' results in the ejected type falling into that tube, so that by bringing the lower end of that tube over the compartment in which the type belongs it may be dropped into that compartment.

The operation of the apparatus is as follows:—The slide D being brought down to the lower portion of the type-box C, the column of type to be distributed is placed upside down in the type-box on this slide, with the type bottoms against the back plate d' and their faces disposed at the front, being the same positions as in distributing by hand. The slide G being fully drawn out to the right, the screw E is turned to elevate the slide D until the top line of type bears with the requisite firmness against the top plate F. The slide G being then released, presses the top line of type toward the left, bringing the left-hand type against the wall or abutment c' . The operator then grasps the thimbles N N in the right and left hands between the thumb and first and second fingers, so that the third finger of each hand will naturally take a position underneath and closing the end of the tube. The operator will then work the distributor by drawing out and contracting the tubes alternately. As he lifts the thimble of either tube, he thereby displaces upwardly the loosely hanging pusher P and vibrates the lever J, causing the ejector K to push out the end type of the top line, this type thereupon falling through the chute L and the flexible tube from which the impulse proceeded, and dropping through this tube. Immediately after the upward movement, the operator pulls the end of the tube downward and carries it over the compartment into which the type is to

be dropped, at the same instant uncovering its bottom by removing his finger from beneath it. If the falling type reaches the bottom end of the tube before the operator has carried the tube into coincidence with the proper compartment, the type will be stopped against his finger until by removing his finger he drops it, but otherwise the type will fall out immediately. During the downward or stretching movement of the end of the tube the retraction of the ejector occurs, the top plate F being lifted to permit the slide G to push along the top line of type to bring the next succeeding type into position to be ejected, as already described. When the line of type is distributed, the operator draws the slide G back to the right and propels up the slide G to bring the next following line against the top plate, whereupon the operation is resumed.

My improved apparatus has the following advantages:—

The necessity for wetting the type is avoided.

The type does not have to be held in the hand.

The printer in distributing has the type constantly before him and loses no time in reading it.

No time is lost in picking up the type word by word. This item will save at least one-fourth of the time required in hand distribution.

The printer is enabled to use both hands in distributing instead of one, thereby greatly increasing the speed of distribution.

The injury to the fingers of the printer due to taking wet type that has been washed with lye in the fingers is avoided, the lye being very injurious to the hands.

It must not be inferred from the particularity of detail with which I have described the special construction of apparatus shown, that my invention is necessarily limited to this specific construction, since in fact my invention admits of considerable modification as to various details and features of construction. For example, any of the mechanical movements employed in the mechanism described may be substituted by other known movements, and the parts of the apparatus may be re-arranged or substituted by equivalent parts, without thereby departing from my invention.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. In a type-distributor, a flexible tube connected at its upper end to receive the ejected types, and free at its lower end to direct them to their destined compartments.

2. In a type-distributor, a flexible distensible tube through which the types fall, having its lower end free, whereby it may be drawn down and moved into communication with the several compartments of the type-case.

3. In a type-distributor, a flexible tube con-

nected at its upper end to receive the ejected types, and free at its lower end, combined with an ejecting mechanism for expelling the types, connected to the lower portion of said tube to be operated by the manipulation thereof.

4. In a type-distributor, a flexible tube connected at its upper end to receive the ejected types, and free at its lower end, combined with an ejecting mechanism for expelling the types, comprising a pusher loosely engaging the tube, adapted to be displaced upwardly by raising the lower end of the tube, to operate the ejector.

5. In a type-distributor, the combination of an ejecting mechanism, two flexible tubes through which the ejected types may fall, and an operative connection between the ejecting mechanism and each tube, whereby the operation of either tube will cause the ejection of a type to fall through that tube.

6. In a type-distributor, the combination of an ejecting mechanism, two flexible tubes through which the ejected types may fall, two pushers loosely engaging the respective tubes and connected to the ejecting mechanism to operate it on being thrust upwardly, a valve for directing the ejected type into either tube, and a connection between said valve and one of said pushers, for operating the valve to insure the dropping of the type into the tube from which the ejector was operated.

7. In a type-distributor, the combination of a type-box for holding the type, an ejector movable relatively to said box to push out the end type of the top line, means for reciprocating said ejector, and means for displacing it laterally to bring it into engagement with the type during its forward stroke and out of engagement therewith during its backward stroke.

8. In a type-distributor, the combination of a type-box for holding the type, having a top plate, and means for pressing the type against said top plate, an ejector movable relatively to said type-box to push out one type at a time, and a spring exerting a downward pressure on said top plate to cause it to frictionally engage the type and prevent other than the one type engaged by the ejector from being pushed out.

9. In a type-distributor, the combination of a type-box having a top plate, an ejector movable relatively to said box to engage and push out the end type, means for reciprocating said ejector, a slide for feeding the top line of type to the ejector, and means for elevating the top plate during the retractile movement of said ejector to relieve its tension upon the type and permit said slide to operate.

10. In a type-distributor, the combination of a type-box having a top plate, a spring for pressing down said top plate, an ejector adapted to push out one type at a time, means for reciprocating said ejector, and said ejector and top plate constructed relatively to each other to cause the ejector during its rearward

movement to engage and lift the top plate against the tension of said spring.

11. In a type-distributer, the combination of a type-box constructed with sides for confining the type and open in front, a top plate for said box, a slide movable in said box to press the type up against said top plate, and means for feeding said slide upwardly as line after line of the type is distributed.

12. The combination of type-box C, top plate F, slide G, and ejector K, the latter having inclines *o* and *n*, with stationary projection *p* adapted to be engaged by said inclines to displace the ejector laterally, so that in moving forward it shall engage the end type of the top line and eject it, and in moving backward it shall be out of contact therewith.

13. The combination of type-box C, top plate F, slide G and ejector K, with means for laterally displacing the ejector to bring it into or out of engagement with the end type, and a rib *t* on the top plate adapted to engage the ejector and prevent its lateral displacement during its movement

14. The combination of type-box C, top plate F, spring *g*, for pressing down the top plate, spring-pressed slide G and ejector K, the latter provided with a roller *q* engaging

the under side of the top plate, movable freely in a groove thereof during the forward movement of the ejector, and impinging upon the under surface of the top plate during the retractile movement of the ejector, whereby it lifts the top plate against the tension of said spring.

15. The combination of type-box C, ejector K, ejector-lever J, flexible tube M, pusher P engaging said tube, and rod Q connecting said pusher to said ejector-lever for operating the ejector by an upward displacement of said pusher.

16. The combination of type-box C, ejector K, ejector-lever J, chute L, tubes M M', valve R, pushers P P loosely engaging said tubes, rods Q Q' connecting said pushers to said ejector-lever, and a connection *w* from one of said rods to said valve for operating the latter.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

OLIVER S. BOWMAN.

Witnesses:

F. W. WHEELER,
C. J. PETTEE.