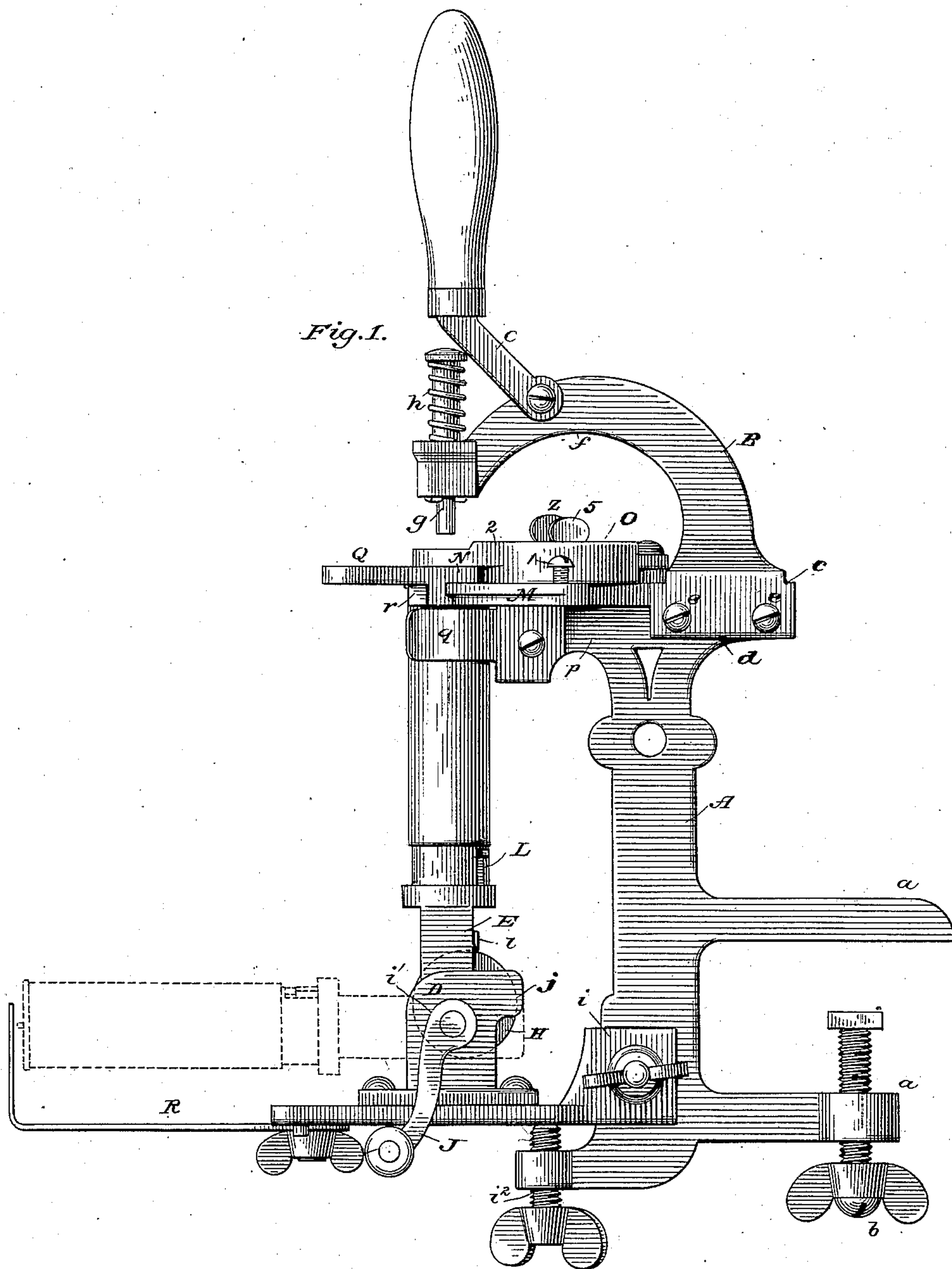


(No Model.)

4 Sheets--Sheet 1.

F. G. FARNHAM.  
Cartridge Capping and Uncapping Implement.  
No. 232,251. Patented Sept. 14, 1880.



Attest:

R. G. Barnes.  
Frank L. Middleton

Inventor:

Frank G. Farnham  
by Lee Lucas  
Attorney

(No Model.)

4 Sheets--Sheet 2.

F. G. FARNHAM.

Cartridge Capping and Uncapping Implement.  
No. 232,251.

Patented Sept. 14, 1880.

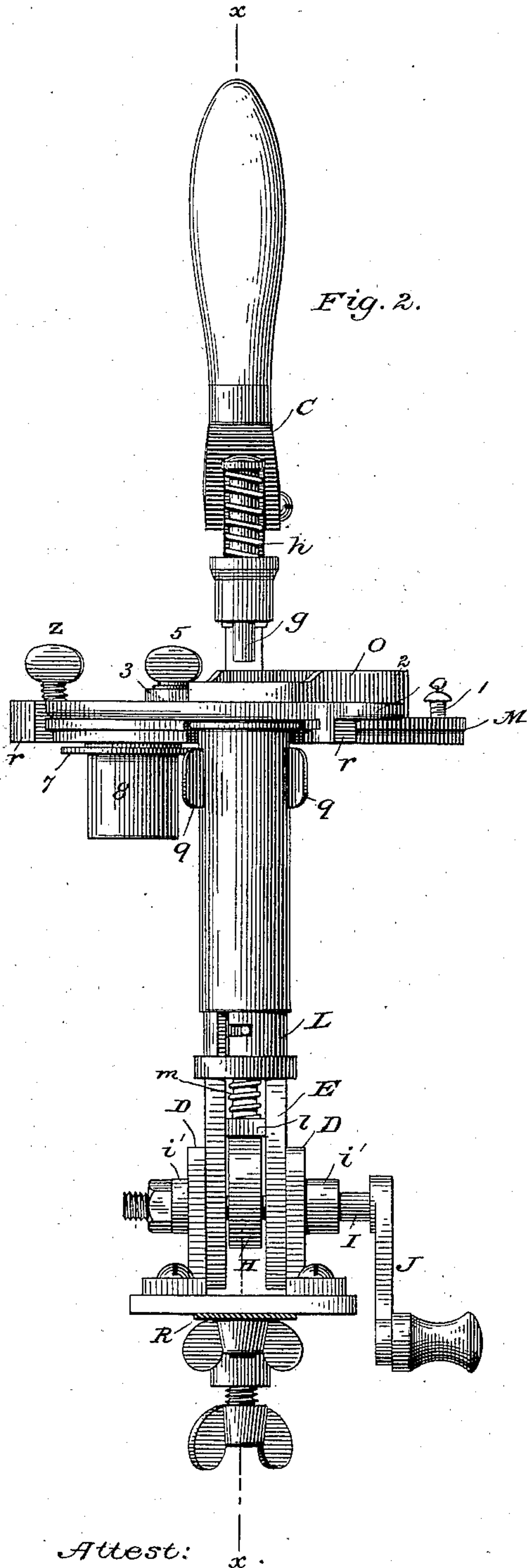


Fig. 2.

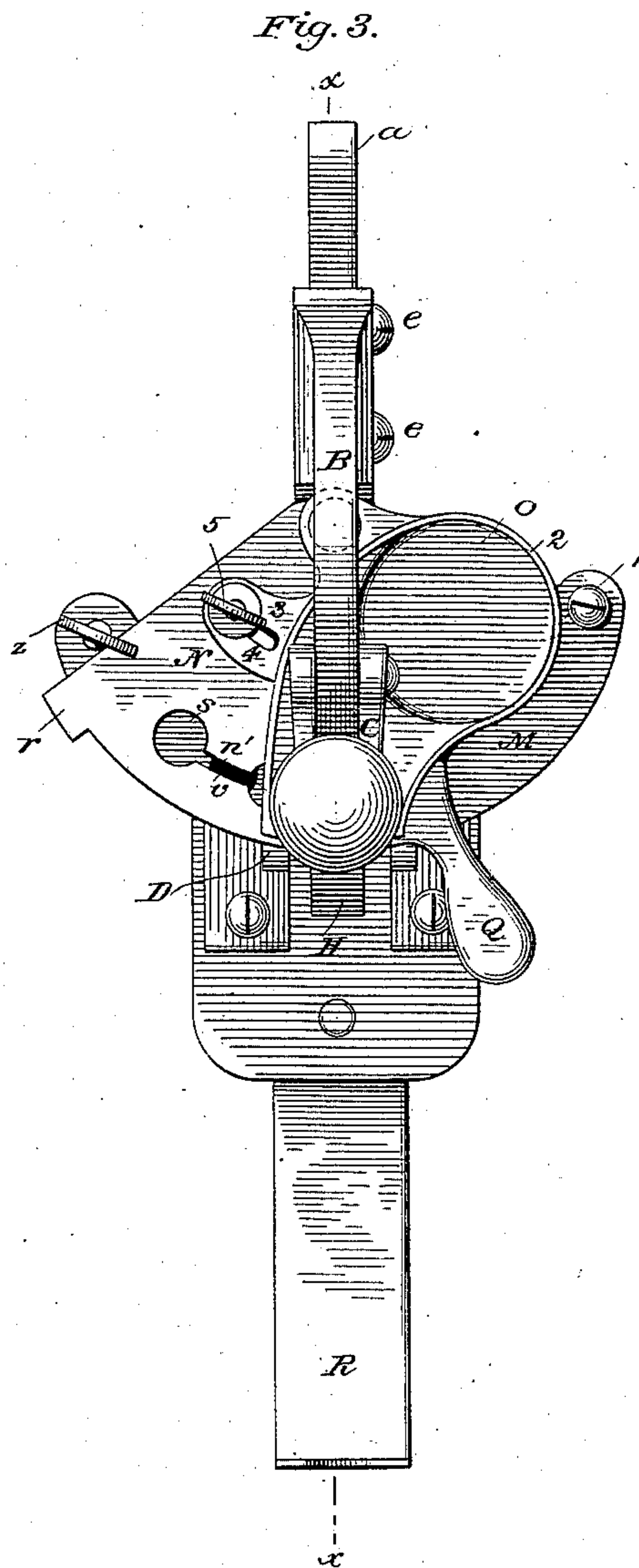


Fig. 3.

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R. F. Barnes.  
Frank L. Middleton

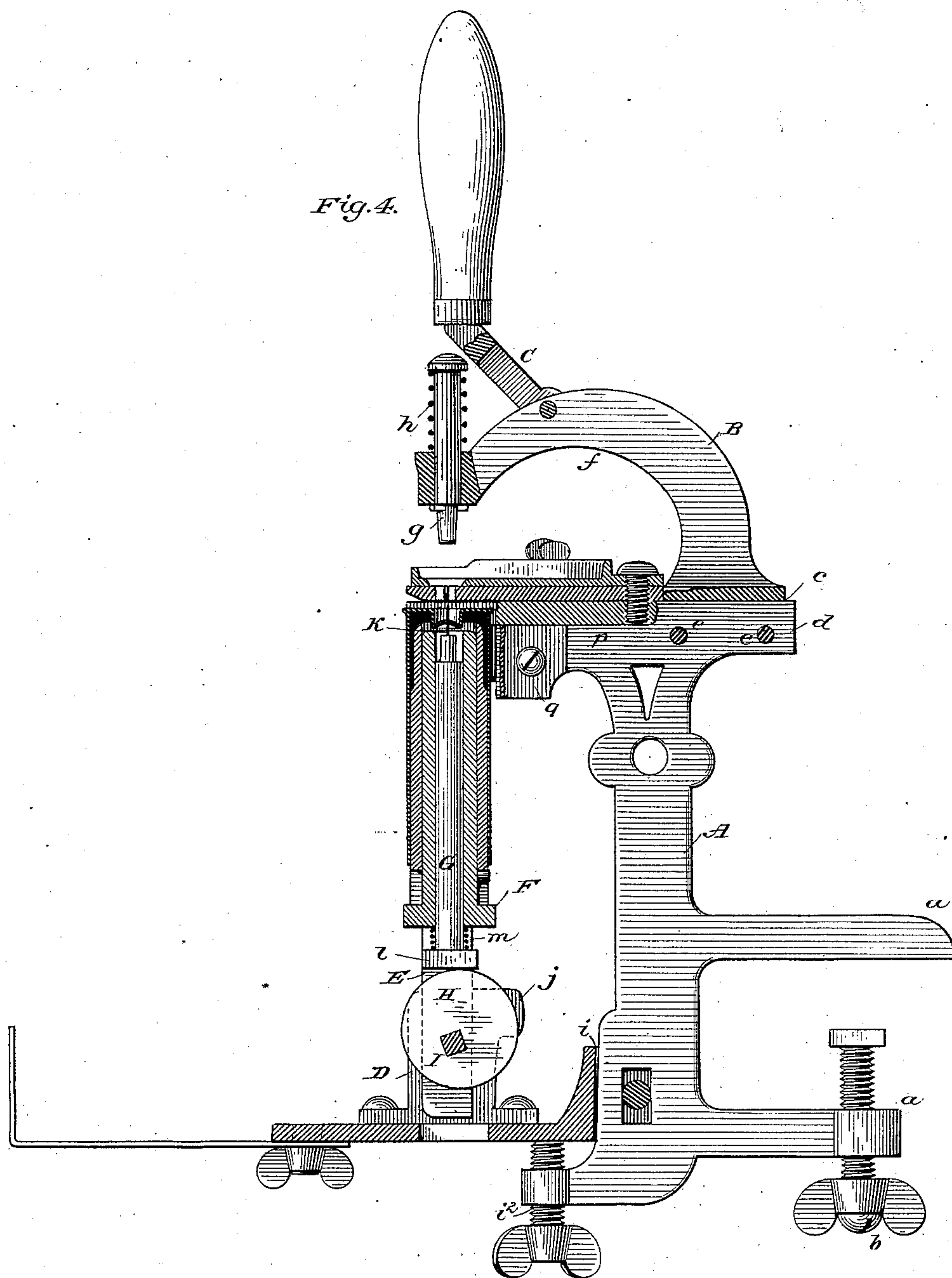
Inventor:

Frank G. Farnham  
by L. W. Swan  
Attorney.

(No Model.)

4 Sheets—Sheet 3.

F. G. FARNHAM.  
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No. 232,251. Patented Sept. 14, 1880.



Attest:

R. G. Barnes.

Frank L. Middleton

Inventor:

Frank G. Farnham,

by Geo. L. Lusk

Attorney.



(No Model.)

4 Sheets—Sheet 4.

F. G. FARNHAM.

Cartridge Capping and Uncapping Implement.  
No. 232,251.

Patented Sept. 14, 1880.

Fig. 5.

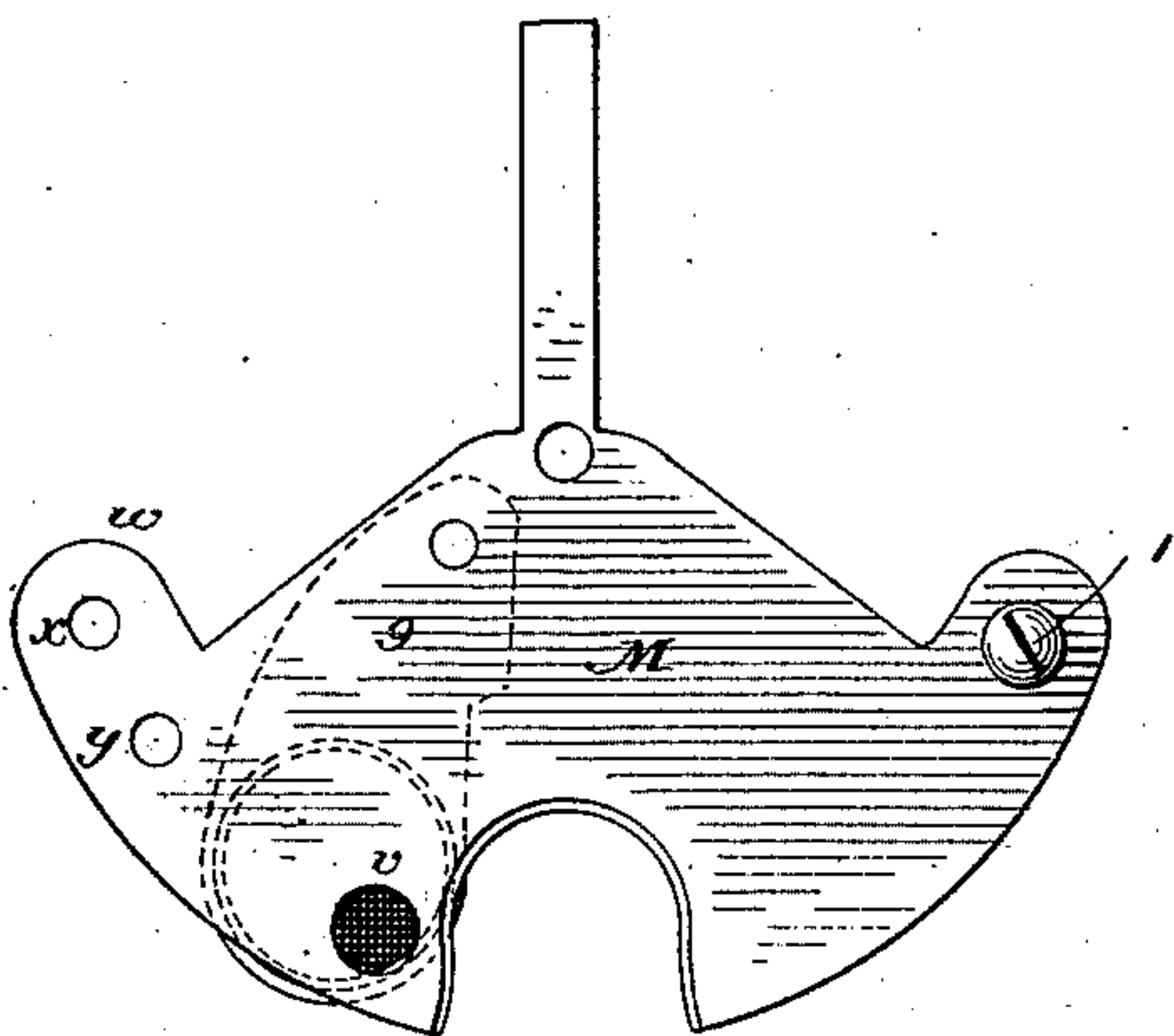


Fig. 6.

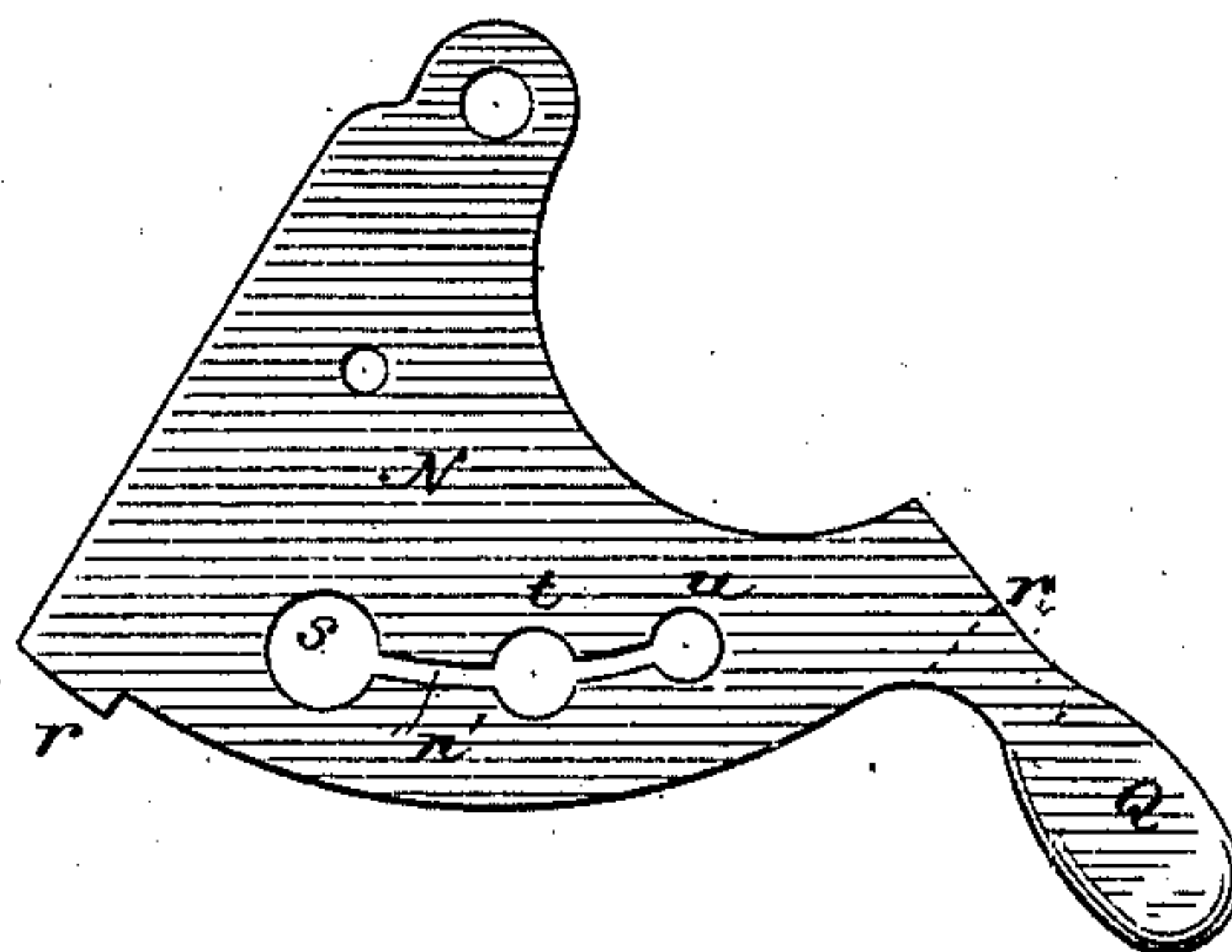


Fig. 7.

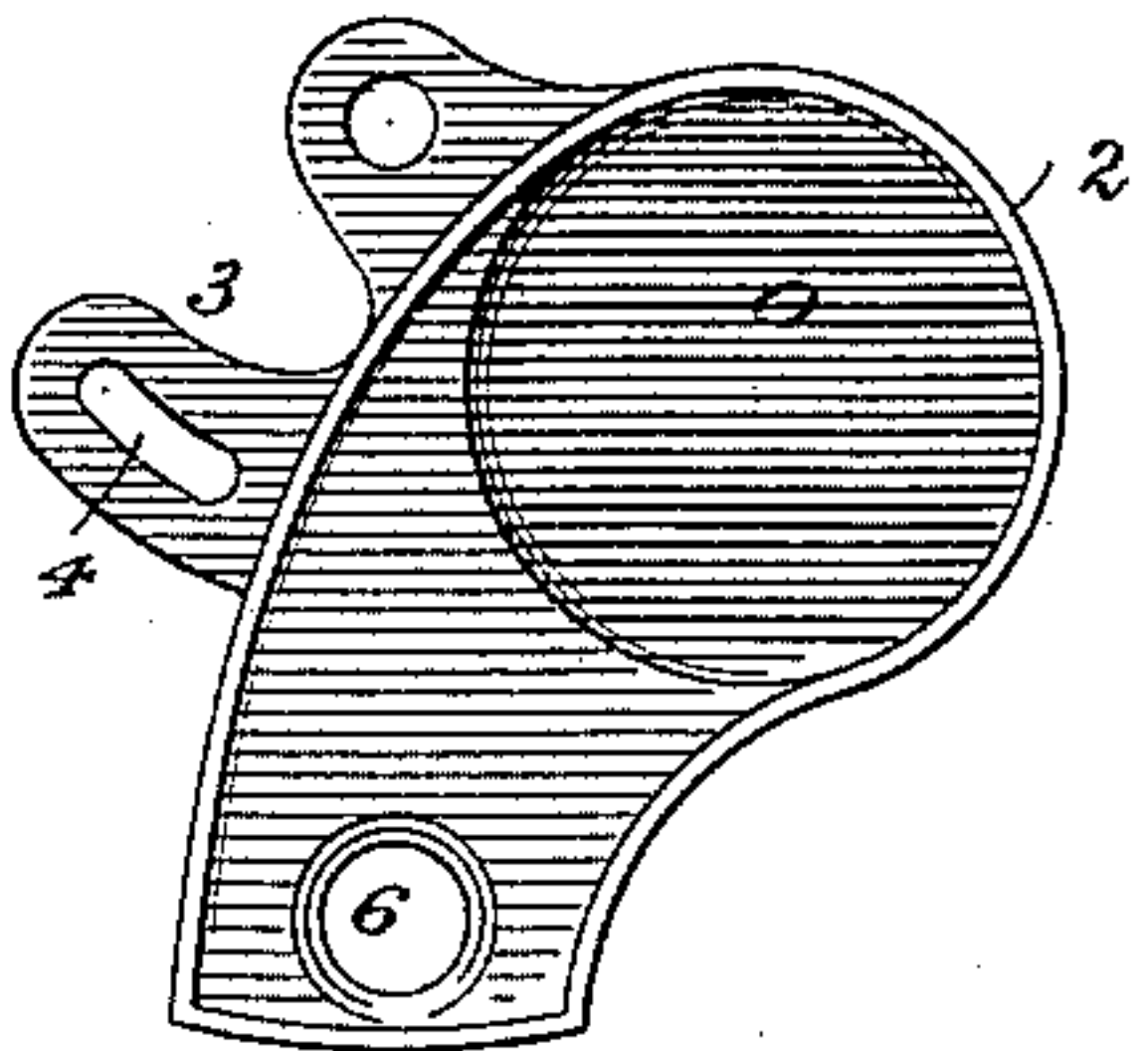
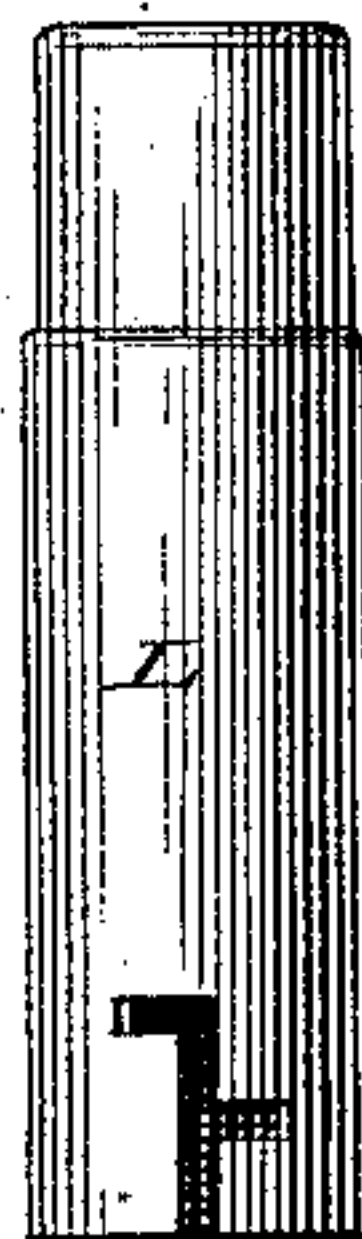


Fig. 8.



Fig. 9.



Attest:

R. G. Barnes.  
Frank L. Middleton

Inventor:

Frank G. Farnham  
by L. W. Lucas  
Attorney.

# UNITED STATES PATENT OFFICE.

FRANK G. FARNHAM, OF WHITE MILLS, PENNSYLVANIA.

## CARTRIDGE CAPPING AND UNCAPPING IMPLEMENT.

SPECIFICATION forming part of Letters Patent No. 232,251, dated September 14, 1880.

Application filed May 12, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK G. FARNHAM, a citizen of the United States, residing at White Mills, in the county of Wayne and State of Pennsylvania, have invented certain new and useful Improvements in Capping and Uncapping Cartridge-Shells; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to an improved device for inserting the caps or primers in cartridge-shells and for extracting such primers when exploded; and my object is to provide a compact and convenient machine of simple construction, in which the operations of capping and uncapping can be made continuous without loss of time, and the work performed thoroughly and with great rapidity.

My invention consists partly in the peculiar construction of the top and feeding plates; further, in the pivoted cylinders for holding the shell and the devices for supporting them; further, in the devices for operating the extracting-rods; and, finally, in the general construction and arrangement and the various combinations of the operative parts, all as fully hereinafter explained.

In the accompanying drawings, Figure 1 is a side view; Fig. 2, a front view; Fig. 4, a central section on  $x x$ , and Fig. 3 a top view; Fig. 5, a separate view of the feed-plate; Fig. 6, a view of the top plate; Fig. 7, a view of the cap-box; Figs. 8 and 9, details of cylinders for paper and metal cartridges, respectively.

A represents the frame of the machine, which may be cast in a single piece, if desired. It is provided with two jaws,  $a a$ , and with a set-screw,  $b$ , by which it is secured to a table or work-bench.

Although the frame may be cast in one piece, I prefer to cast the lower portion, including the jaws, solid, while the part B is cast separate, and is provided with a groove,  $c$ , matching with a projection,  $d$ , on the rear upper part of the frame, screws  $e e$  securing the two rigidly together.

The upper portion,  $f$ , of the part B is bent

or curved forward, and at its end, working in an opening made to receive it, is a punch,  $g$ , having a spring,  $h$ , against the pressure of which it is forced down, and which keeps it elevated when in its normal position. Pivoted to the curved arm  $f$  is a lever, C, having a flat face, which bears against the upper end of the punch and forces it down.

To the frame of the machine is attached, by projecting arms  $i i$ , an adjustable bed-plate, through which a set-screw works. An adjusting-screw,  $i^2$ , passes through the lower arm of the main frame. On this bed-plate are standards D D, which form the bearings for a tilting frame, E, provided with trunnions  $i'$ . On the standards are offsets  $j$ , which hold the frame in proper position, whether vertical or horizontal.

Secured to the top plate of the frame E is a hollow rod, F, in which reciprocates the extracting-rod G, provided at its upper end with a needle,  $k$ . The lowest end of the rod G is attached to a flat plate,  $l$ , and between such plate and the top of frame E is a spring,  $m$ , which forces the rod to its lowest position and holds it there in position. The ejecting-rod is actuated by means of an eccentric, H, whose shaft I passes through the hollow trunnions of the pivoted frame and turns loosely therein. On the end of the cam-shaft is a crank-handle, J, as shown, by which it is operated.

It will be seen that a very compact and convenient construction is afforded, the parts just described all operating from one center.

In machines as heretofore generally constructed only a single gage of shell could be conveniently primed, and when various sizes could be accommodated it has been necessary to use complicated and expensive adjusting devices, resulting in loss of time and an increased liability to get out of repair.

In my machines, by a simple device now to be described I am enabled to perform the work of several of the ordinary machines, and to dispense with all complicated adjustments of the operating parts.

K L represent cylinders, preferably constructed of metal. The cylinder K, Fig. 8, is made the same length as the hollow rod F, and is adapted to the ordinary paper shells in daily use, some of which have their interior top face flat, some concave or other shapes,



and for the purpose of strengthening their bases are provided with interior flanges or shoulders of variable lengths, and such cylinder is cut away on its outer top circumference and beveled, in order that these interior flanges may not bear or rest upon this beveled edge, but that the interior top face may rest upon the end of the cylinder. Since the conical-base shell has a thinner base than that with the flat interior face, it is evident that the same cylinder that serves for one will not serve for the other; and to obviate this I provide a number of right-angle slots, more or less distant from the base of the cylinder, which, engaging with a pin upon the hollow rod F, will adjust the same to any style of base, either thin, thick, concave, or flat.

The cylinder L is adapted to the common form of metallic shell. It is of greater length than the cylinder K, and is reduced on its outer top circumference for about an inch, as with the cylinder K, to allow for irregularities on the inner circumference of the shell near the bottom, and the shell rests upon the flange, as in the case of the paper shell. It is evident, therefore, that while the bore of the cylinders must be the same in all cases to fit the rod F, any number of such cylinders of differing external diameters may be used for shells of different gages, and may be kept on hand and readily changed whenever desired, it being only necessary to place the cylinder on the rod F, in which rod the extractor reciprocates, as before described, and the shells on the cylinders.

M represents the top plate of the machine, which is preferably cast with the frame, though it may be removably secured thereto. On the bottom of this plate is a block or stud, *p*, to which are secured the spring-clips *q*, which catch and retain in a vertical position the cartridge, when carried by the pivoted frame, and the front of the frame is recessed to receive the head of the cartridge, as shown.

The plate M is made preferably fan-shaped, having its outer edge formed on the arc of a circle, and above this plate, and pivoted thereto, is the fan-shaped feeding-plate N, which is provided with guide-lugs *r r*, bearing against the outer edge of the plate M. This plate N is also provided with a discharge-opening, *s*, and two feed-openings, *t u*, connected by a slot, *n'*, the former, *t*, being adapted to the ordinary large metal primers used for metallic shells, and the latter to the common small primers for paper shells.

In the plate M is also a discharge-opening, *v*, and on a projection, *w*, are screw-holes *x y*, in which is placed a stop-pin or screw, *z*, such holes being at the same distance apart as the feed-holes *t u*, for the purpose hereinafter described.

On the opposite side of the plate M is a stop, 1, to limit the motion of the feed-plate in that direction.

On the top of the feed-plate, and secured by

the same pivot that attaches the feed to the top plate, is a cap-holding receptacle, O, having an upwardly-turned edge, 2, and on a projection, 3, a slot, 4, in which is a set-screw, 5. An opening, 6, in the end of this cap-holder may be made to register with either of the feed-holes *t* or *u* by means of the slot and screw. This device is not essential to the perfect operation of my device; but I prefer to use it, as it is very convenient for holding several caps and makes it easier to feed them.

Pivoted to the lower side of the plate M is a plate, 7, having a circular opening to hold a cap-receiver, 8, which is supported by a flange on its upper edge. The plate 7 has an offset, 9, to permit the flanged top of the receiver 8 to slide beneath the plate M under the discharge-opening.

In the operation of ejecting the exploded caps from cartridge-shells a cylinder of proper gage to fit the shell is placed on the hollow rod F and the shell placed on the cylinder, (the parts being horizontal,) and the pivoted frame adjusted in height according to the thickness of the base of the shell and raised until the cartridge enters the recess in the plate M, and is held by the spring-catches. One turn of the crank and eccentric forces up the ejecting-rod, the needle of which drives out the cap. The feeding-plate N is then turned by means of its handle Q, pushing the cap to the discharge-opening until the edge of the plate bears on the stop *z*, and the discharge-opening in the plate N having registered with that in the plate M, the cap drops into the receiver 8, and the feed-plate is moved back against the stop 1. Supposing paper shells are being manipulated, the opening in the cap-holder O is made to register with the small feed-opening *u*, in which case the stop *z* is placed in the hole *x* in the plate M.

It will be observed that the slot *n'* prevents the possibility of injury to the extracting-needle from being forced up against a solid plate.

While the extracting operation is being performed a primer has been placed in the feed-opening *u*, and the movement of the feed-plate to discharge the ejected cap brings the opening *u* in line with the center of the cartridge and under the punch *g*, which is forced down and fixes the cap. The cartridge-holder is then lowered and a new shell placed on the cylinder, its cap ejected, and a new cap inserted, the operation being continuous and capable of being performed with great rapidity.

For priming metallic shells the cylinders would be changed and the cap-holder O adjusted to feed into the opening *t*, the stop *z* being placed in the opening *y*.

It will be seen that the plate N acts as a stop for the cartridge, preventing it from being forced off the cylinder by the action of the ejector.

In order that caps may be extracted, if preferred, while the cartridge-holder is in a hori-



zontal position, I have devised the attachment R, which is a metal plate secured by a screw to the lower side of the bed-plate. Its outer end is bent at right angles and is recessed, as shown.

In extracting, the cartridge-holder is placed in its horizontal position and the plate R moved outward, so that it will bear on the end of the shell. The extractor can then be operated in the usual manner.

I prefer to use two or more different ejecting-rods, provided with either round or square topped needles, to fit either the flat-topped caps or those provided with projecting anvils. These rods, being placed loosely in the hollow rod F, are readily removed and changed when necessary; but the needles can also be made interchangeable, if desired, to fit one rod.

The principal advantages of my device lie in its simplicity, the rapidity with which it can be operated, and its general convenience. The operation of discharging the ejected cap brings another cap in position for insertion, which materially reduces the amount of time usually required.

The advantages of my device, however, will be readily appreciated by those skilled in the art, and require no detailed description.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A device for capping and uncapping cartridge-shells, consisting, essentially, of a cartridge-holder, a reciprocating ejector, a movable plate provided with an opening through which the cap is ejected from the shell, and with one or more feed-openings, the movement of the plate to discharge the ejected cap bringing the feed-opening into alignment with the shell, substantially as described and shown.

2. In combination, a pivoted cartridge-holder, an ejecting-rod for removing the caps from a shell, a pivoted plate for discharging such ejected cap and for placing a fresh cap in position for insertion, and a punch, all substantially as and for the purposes set forth.

3. In combination with a reciprocating eject-

or, a top plate, M, having a discharge-opening, and a feed-plate, N, having a discharge-opening adapted to register therewith, as set forth.

4. In combination with a pivoted cartridge-holder carrying the rod F, provided with the pin, the longitudinally-adjustable cylinders having the slots, substantially as described and shown.

5. In combination, the pivoted frame E, the hollow rod, the reciprocating ejecting-rod, and the eccentric, as set forth.

6. In combination with the pivoted cartridge-holder, the spring-clips *g*, substantially as described and shown.

7. In a device for capping and uncapping cartridge-shells, the adjustable feed-plate N, having discharge opening *s*, feed-openings *t u*, and slot *n'*, in combination with a reciprocating ejecting-needle and with a punch, substantially as described.

8. The combination of plate M, the feed-plate N, having openings *t u*, and the adjustable stop *z*, substantially as and for the purpose set forth.

9. In combination with the plate N, having feed-openings *t u*, the adjustable cap-box O, provided with a discharge-opening.

10. In combination with the main frame and devices, substantially as described, for ejecting primers from and inserting them in cartridge-shells, the pivoted cartridge-holder consisting of a rod carrying cylinders to receive the shells, such cartridge-holder being vertically adjustable on the main frame, as described.

11. The described cartridge-holder, consisting of the frame E, the rod F, and the cylinders, such frame being provided with jaws *i* and set-screw, and adjustable thereby on the main frame, substantially as described and shown.

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

FRANK G. FARNHAM.

Witnesses:

F. C. FARNHAM,  
F. W. FARNHAM.