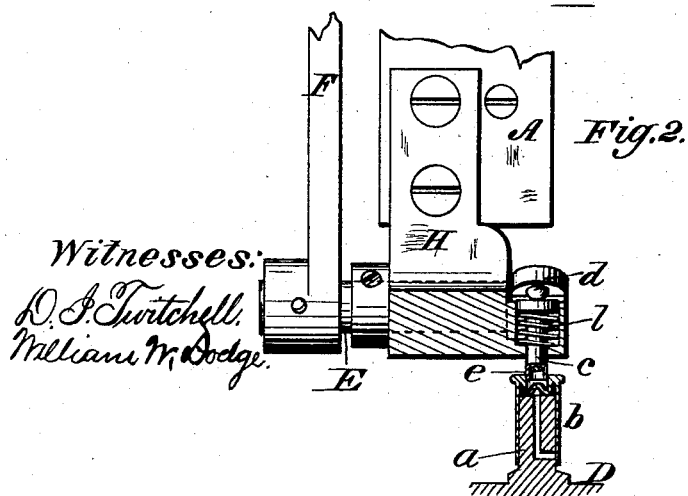
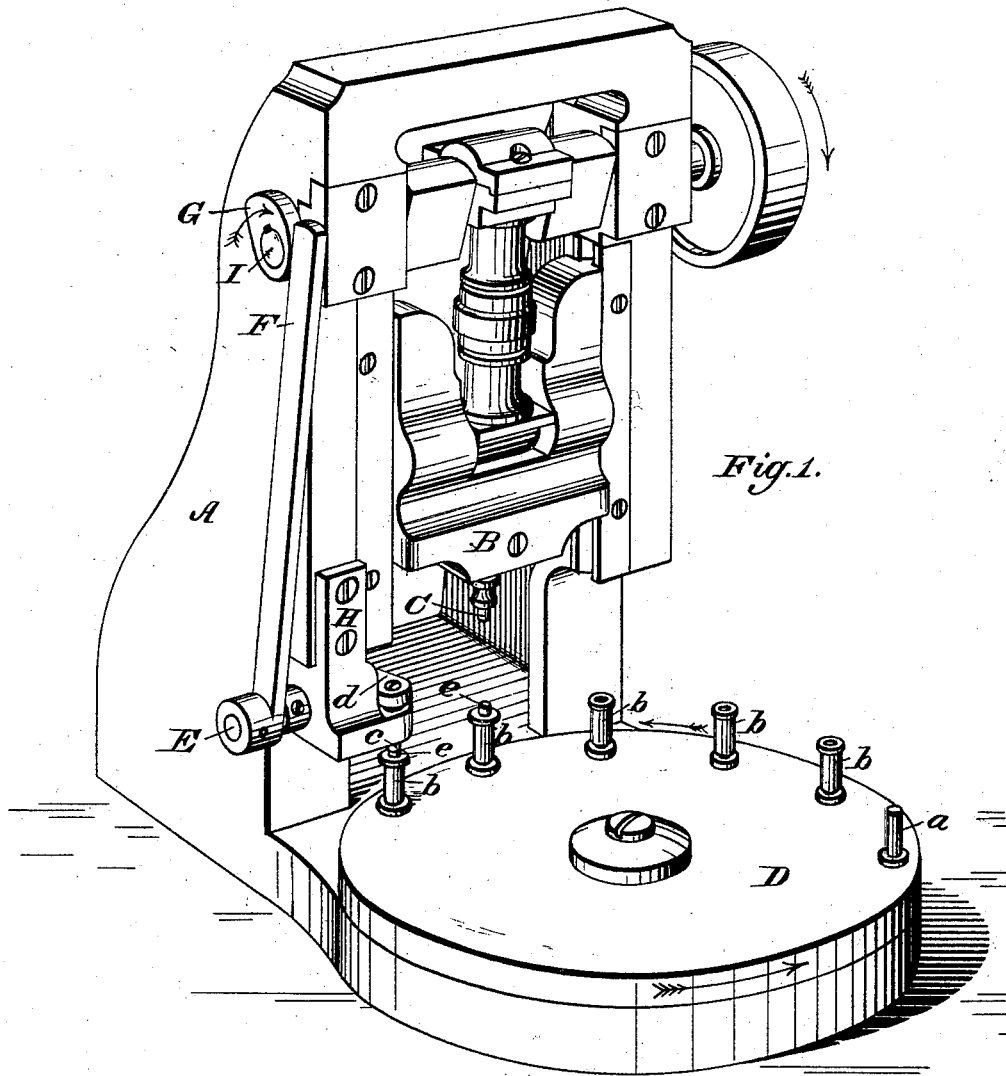


A. L. HOWARD
Machine for Capping Cartridge-Shells.
No. 221,563. Patented Nov. 11, 1879.



Witnesses:
D. J. Twitchell.
William W. Dodge.

Inventor:
A. L. Howard.
by Dodge & Son.
Atty's.

UNITED STATES PATENT OFFICE.

ARTHUR L. HOWARD, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE
WINCHESTER REPEATING ARMS COMPANY, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR CAPPING CARTRIDGE-SHELLS.

Specification forming part of Letters Patent No. **221,563**, dated November 11, 1879; application filed
September 25, 1879.

To all whom it may concern:

Be it known that I, ARTHUR L. HOWARD, of New Haven, in the county of New Haven and State of Connecticut, have invented certain Improvements in Machines for Setting Primers in Metallic Cartridges, of which the following is a specification.

My invention relates to the setting of primers in metallic cartridges; and the invention consists in providing means for first setting the primer by a slight and quick pressure or stroke, just sufficient to hold it in place, and then forcing it home to its seat by a gradual and continuous pressure, by which the danger of explosion is avoided, all as hereinafter more fully set forth.

Figure 1 is a perspective view of a machine embodying my invention; and Fig. 2 is a front elevation, partly in section and enlarged, of the pressure device, to more fully illustrate its construction and mode of operation.

As is well known, metallic cartridges are now made with a primer seated in a cavity, technically termed a "pocket," made in the external surface of the head of the shell, and as this primer is required to be so fitted and seated in the pocket as to render the joint between it and the walls of the pocket gas-tight, it has to be crowded or forced into the pocket as tightly as possible without crushing it. Heretofore this has been done by a punch operated by a crank in a machine similar to that shown in the drawings, the punch operating at the rate of about sixty strokes per minute, the shells being placed on the pins *a* of the dial *D*, or equivalent feeding device, which is moved at intervals just far enough to bring the shells successively under the punch, the primers being applied to the head of the shells before passing under the punch. As these machines are in common use and well known to those familiar with the manufacture of cartridges, a further description is deemed unnecessary.

With cartridges intended for the old style of arms, in which the hammer is made to deliver a heavy or strong blow, and which, therefore, did not require that the primer should be very sensitive or easily exploded, this method of setting the primers operates very well, although occasionally even such primers are

exploded by the stroke of the punch in setting them in the shell.

Of late, however, another class of locks has come into use on fire-arms, one style being known as "rebounding locks," and another known as "double-action locks," these latter being generally applied to revolvers, and are so constructed that the hammer is both cocked and released by merely pulling the trigger. With arms using these locks, and more especially the latter kind, it is desirable to use primers which are far more sensitive than those used for the ordinary style of arms, because the blow delivered by the hammer of these double-action locks is usually much lighter than that of the old-style locks; and it is found in practice next to impossible to set these sensitive primers by a stroke of the punch without exploding them.

It is to remedy this difficulty and provide a safe and sure means of setting the primers that is the object of my present invention, which I will now proceed to describe.

In the drawings, *A* represents the frame, *D* the dial or feed plate, and *B* the cross head or slide, of an ordinary machine, the cross-head carrying a small punch, *C*, and being operated by a crank-shaft, *I*, by any suitable means or power, as usual. In this case I so adjust the punch *C* that instead of pushing the primer *e* into the pocket to its seat, as is usually done, it simply presses it in sufficiently to hold it from falling off when the dial is moved, the body of the primer being left protruding above the end of the shell after it has been thus lightly struck by the punch. The next movement of the dial then carries the shell, with its primer thus protruding, under an additional pressing device, as represented at the left-hand side of Fig. 1. This device or attachment, which constitutes the main part of my invention, may be constructed in a variety of ways, the essential requisite being that it shall operate to press the primer *e* down into the pocket by a gradual and continuous pressure.

A very simple construction, and by which it can be readily attached to existing machines, is shown in the drawings, in which *H* is a bracket secured to the frame *A*, and in the lower end of which is mounted a horizontal

rock-shaft, E, to the inner end of which is rigidly secured an arm, *d*, the front part of which bears upon a vertical plunger or piston, *c*, which is raised by a spiral spring, *l*, when released from the pressure of the arm *d*, as shown in Fig. 2.

To the outer end of the rock-shaft E is secured an arm or lever, F, which extends upward and bears against the face of a cam, G, secured to the end of the crank-shaft I, as shown in Fig. 1, so that as the crank-shaft rotates the cam G operates upon the arm or lever F, and thereby imparts a gradual motion to the piston *c*, pressing it gradually and slowly down upon the primer *e*, and thus crowding it into the pocket by a continuous and quiet pressure, instead of by a quick or sudden blow, as is done by the punch when set by that alone, and thus these sensitive primers can be set with but little, if any, danger of exploding them.

It will be readily seen that by giving the proper shape to the cam G the piston *c* may be made to occupy a longer or shorter time in its movement in pressing home the primer, the only limit being that it must rise in time to permit the dial to be moved; but as this movement of the dial occupies only about half or less than half the time occupied at each operation, it follows that the piston *c* can be made to operate upon the primer for at least half the time of each revolution of the crank-shaft, whereas the punch can rest or operate upon the primer but for a very small fraction of the same time.

In order to secure the very best results, it is obvious that the time occupied by the piston *c* in its pressure upon the primer should be made as long as possible, and not interfere with the movements of the dial.

It is obvious that instead of the arrangement of parts here shown for operating the piston *c*, others may be substituted and made to operate the same. For instance, instead of the rock-shaft with its arm *d*, a pivoted le-

ver may be arranged to press upon the piston, said lever being operated by a vertical rod or slide to be moved by a cam on the rock-shaft; or a sliding rod or bar may be so arranged that its upper end shall be brought under a cam on the shaft and its lower end made to operate direct upon the primer.

The plan represented in the drawings is designed to illustrate the principle, and at the same time serves to show how my invention may be applied to the ordinary machines now in use; but in constructing new machines especially for this purpose any mechanic skilled in the art can readily modify the special devices used, or their arrangement, as may be necessary or most convenient, and hence I do not wish to be understood as limiting myself to the special construction here shown.

Having thus described my invention, what I claim is—

1. In an organized machine for setting primers in cartridge-shells, the combination, with suitable operating mechanism, of a reciprocating punch, C, arranged to operate on the primer with sufficient force to hold it temporarily in place, and a piston or pressure device, *c*, arranged to force the primer to its seat by a gradual or prolonged pressure, substantially as described.

2. In combination with the dial D, or equivalent feeding device, the reciprocating punch C and the pressure-piston *c*, all arranged to operate substantially as and for the purpose set forth.

3. In combination with the reciprocating punch C, the rock-shaft E, with its arm *d* and pressure-piston *c* at one end, with the arm or lever F attached thereto and arranged to be operated by the cam G, substantially as shown and described.

ARTHUR L. HOWARD.

Witnesses:

DANIEL H. VEADER,
W. C. DODGE.