G. P. SALISBURY & C. S. WELLS.

MACHINES FOR TESTING CARTRIDGE SHELLS.

No. 181,364. Patented Aug. 22, 1876.

Fig. 1.

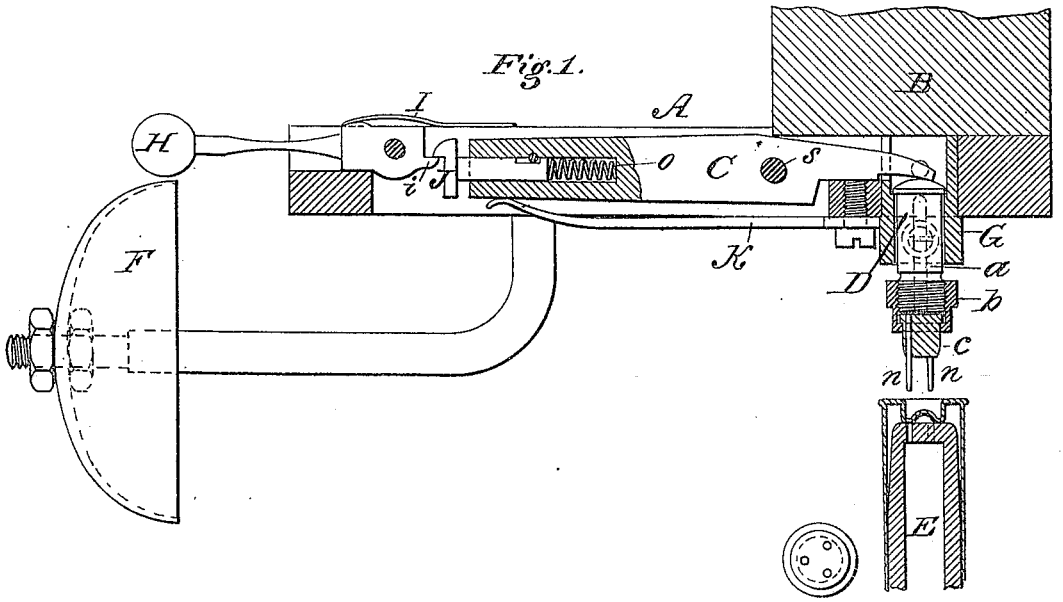
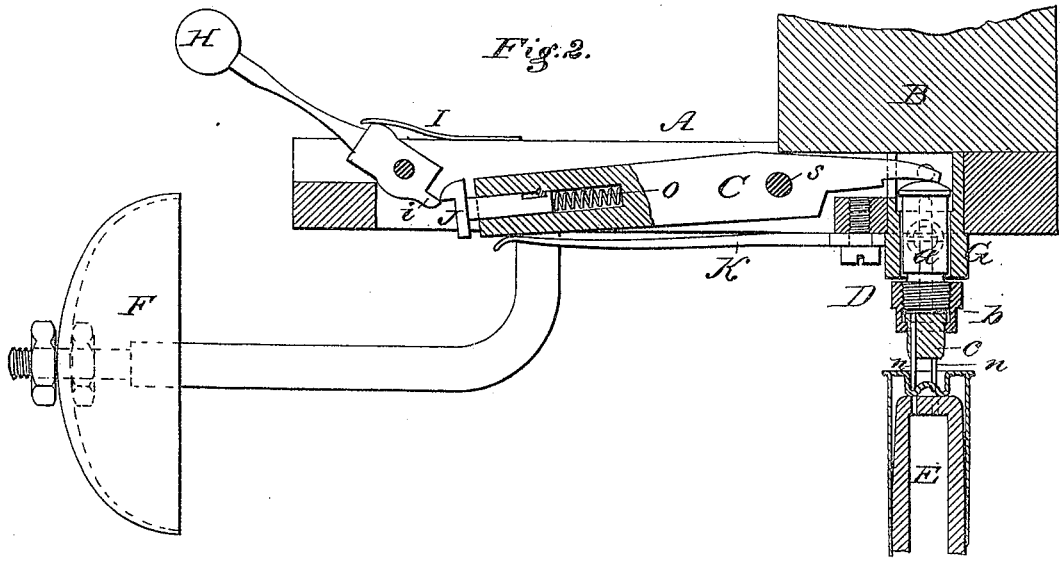


Fig. 2.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MACHINES FOR TESTING CARTRIDGE-SHELLS.

Specification forming part of Letters Patent No. 181,364, dated August 22, 1876; application filed August 3, 1876.

To all whom it may concern:

Be it known that we, GEORGE P. SALISBURY and CHARLES S. WELLS, of New Haven, in the county of New Haven and State of Connecticut, have invented certain Improvements in Cartridge-Testing Apparatus, of which the following is a specification:

Our invention consists in a novel device for automatically inspecting or testing cartridge-shells and indicating their condition, as hereinafter more fully explained.

In the drawing, Figure 1 is a longitudinal section of our improved device, showing the reciprocating head-block of the machine in an elevated position; and Fig. 2 is a similar section, showing the apparatus in the act of giving an alarm.

Center-fire cartridge-shells are usually formed with an exterior recess in the head, to receive the cap or primer, and, in order to allow the fire from the cap or primer to enter the shell, it is necessary that one or more small holes should be pierced in the head. These holes are quite small, and consequently the tools by which they are made are delicate and easily broken. Economy of manufacture requires very rapid manipulation, and the machines which perform the punching operation are run as fast as eighty strokes per minute. It will thus be seen that if one or more of the punches are broken, as often happens, the machine, from the rapidity of its motion, will perform imperfectly the required work upon a large number of shells before the imperfection is discovered.

It is customary to inspect the shells, to ascertain whether or not the punching is properly done, persons being employed simply for that purpose. Such shells as are defective from this cause are unsalable, and, consequently, a considerable loss is thus occasioned.

It is to avoid the necessity of inspecting the shells by hand, and to avoid the loss above mentioned, that this device is designed.

In constructing our improved device, we first provide a metal frame, A, which is securely attached to the reciprocating head-block B of the machine in a fixed position. Mounted on the head-block B in this frame A is a vertically-sliding plunger or piston, D, composed of three parts, *a*, *b*, and *c*. The upper portion, *a*, forms the guide for the movement of the plunger, and the lower part, *c*, carries one or more pins, *n*, the object of which will be hereafter explained. The parts *a* and *c* are united by means of the thimble *b*, which engages over a flange on the part *c*, and with a screw-thread on the part *a*, as shown.

It will be seen that this arrangement permits the part *c* with its pins to be turned to the right or left, so as to bring the pins into the proper position to enter the holes in the cartridge-supporting pins E on the dial below; but that when they are once adjusted, the thimble *b* may be screwed up on the plug *a*, drawing the parts *a* and *c* against each other, and holding the pins *n* in a fixed position.

Located in the frame A, and turning freely on the pin S, is a lever, C, the short arm of which extends over and rests upon the upper end of the plunger D, as shown, the long arm of the lever, which would otherwise fall down by reason of its weight, being kept up in a horizontal position by means of a spring, K, as shown. The long arm of the lever C is provided at its outer end with a sliding hook, J, which moves in a recess formed in the end of said lever, and is held outward by a spiral spring, *o*, as shown. This hook J engages over a shoulder, *i*, formed on the rear end of a bell-hammer, H, as shown.

The shells to be pierced are placed on hollow steel pins E, mounted on revolving dials, and are automatically carried around to their proper position under the punch, when the head-block descends and the head of the shell is pierced in the required manner. After this is done, and without removing the shells from their pins on the dial, the dial is carried around a sufficient distance to bring the next shell in position to be pierced, and this movement also brings the last shell pierced directly under the plunger D, the pins *n* of which are placed to correspond exactly with the position of the punches which pierce the head of the shell.

It will readily be seen that if the holes have been perfectly formed in the head of the shell, the pins *n* will readily pass down through the same, and through or into the holes in the pin on which the shell is placed, as the head-block

B descends. If, however, the holes should, from any cause, fail to be formed in the head of the shell, it will be seen that the pins *n* would come in contact with the shell at the point where the hole or holes should have been formed, and that the movement of the plunger D would thus be arrested, while the movement of the head-block B, being continued downward, would cause the short arm of the lever C to be raised or pushed upward, causing a corresponding downward movement of the long arm of the lever, the spring-hook J engaging with the shoulder *i*, and thus causing the hammer H to be elevated until the hook J, riding past the shoulder *i*, would release the hammer H, and allow it to fall on the bell F and sound an alarm, the action of the hammer H being accelerated by means of a spring, I.

It will thus be seen that when the holes are all properly pierced in the head of a shell, the pins *n* pass down through the same, and there is, consequently, no upward pressure on the lever C; but that if a single hole is imperfectly formed the alarm is sounded instantly, thus entirely avoiding the chance of continuing to do the work imperfectly.

In addition to detecting the imperfections in the shells, when such exist, more quickly than could be done by the old hand process of inspection, this device also renders the expense incident to that process unnecessary.

It is obvious that the mechanism for ringing the bell may be differently constructed or arranged and still produce the same results, the only requisite being that, whenever the pins *n* do not enter the holes in the shell, the bell shall be rung to give notice.

The plan shown is a simple and efficient one, and from the description and illustration given, persons skilled in the art will be able to construct the apparatus, with various modifications of the details, and for that reason we wish to be understood as not limiting ourselves to the specific construction or details shown.

Having thus described our invention, what we claim is—

1. An automatic device constructed to operate substantially as described, whereby an alarm is sounded whenever the testing-pins *n* fail to enter holes in the shell, as set forth.

2. In combination with piston D, provided with the pins *n*, the bell F, with intermediate operating mechanism, constructed to operate substantially as described, whereby the movement of the piston D will cause the bell to ring, as set forth.

3. The combination of the sliding piston D, lever C, with its spring-catch J, and bell F, with its pivoted hammer H, all arranged to operate substantially as and for the purpose set forth.

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