

(No Model.)

4 Sheets—Sheet 1.

W. MASON.

MACHINE FOR REDUCING AND FINISHING CARTRIDGE SHELLS.

No. 463,403.

Patented Nov. 17, 1891.

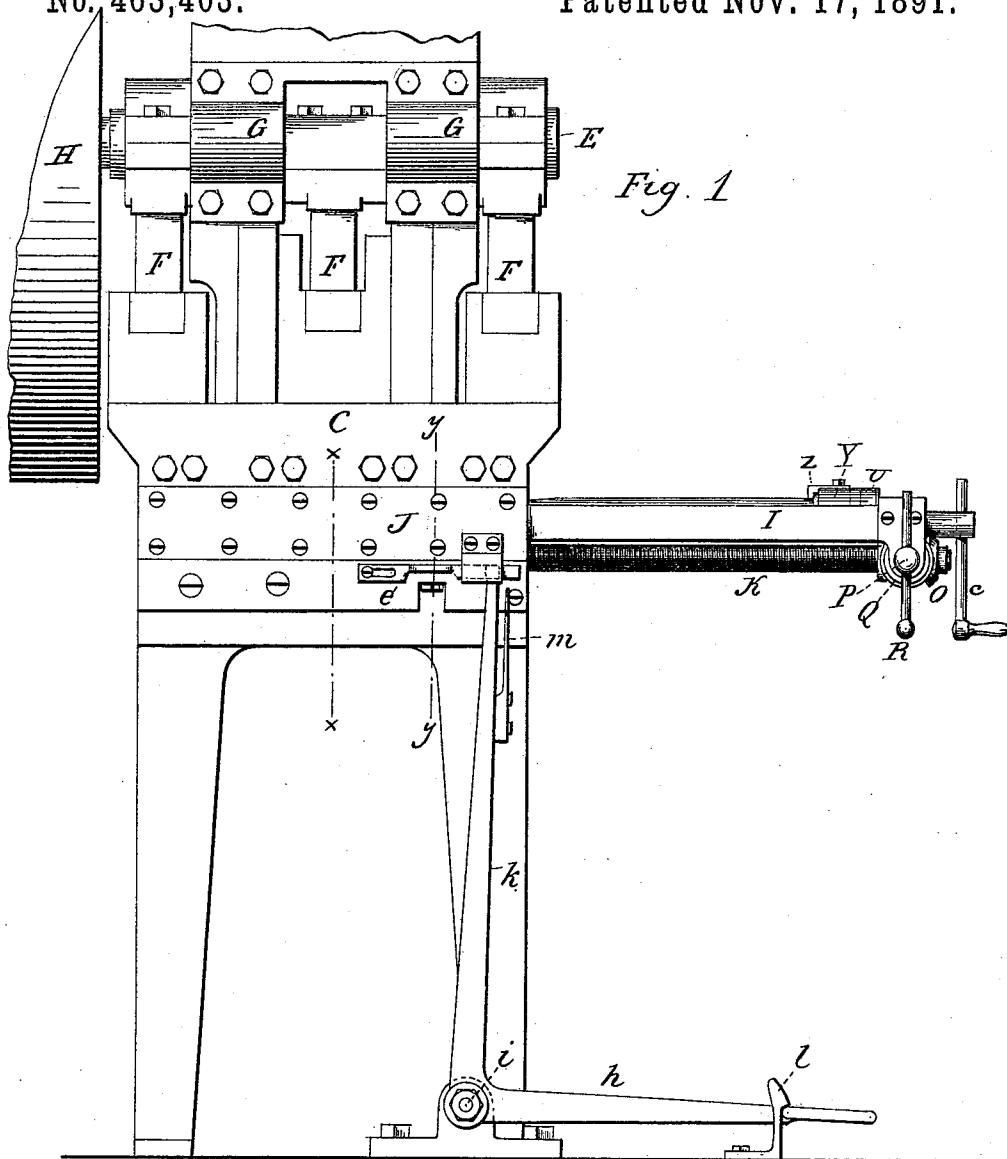


Fig. 1

Witnesses.

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Inventor:

William Mason
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Earle Heyman

(No Model.)

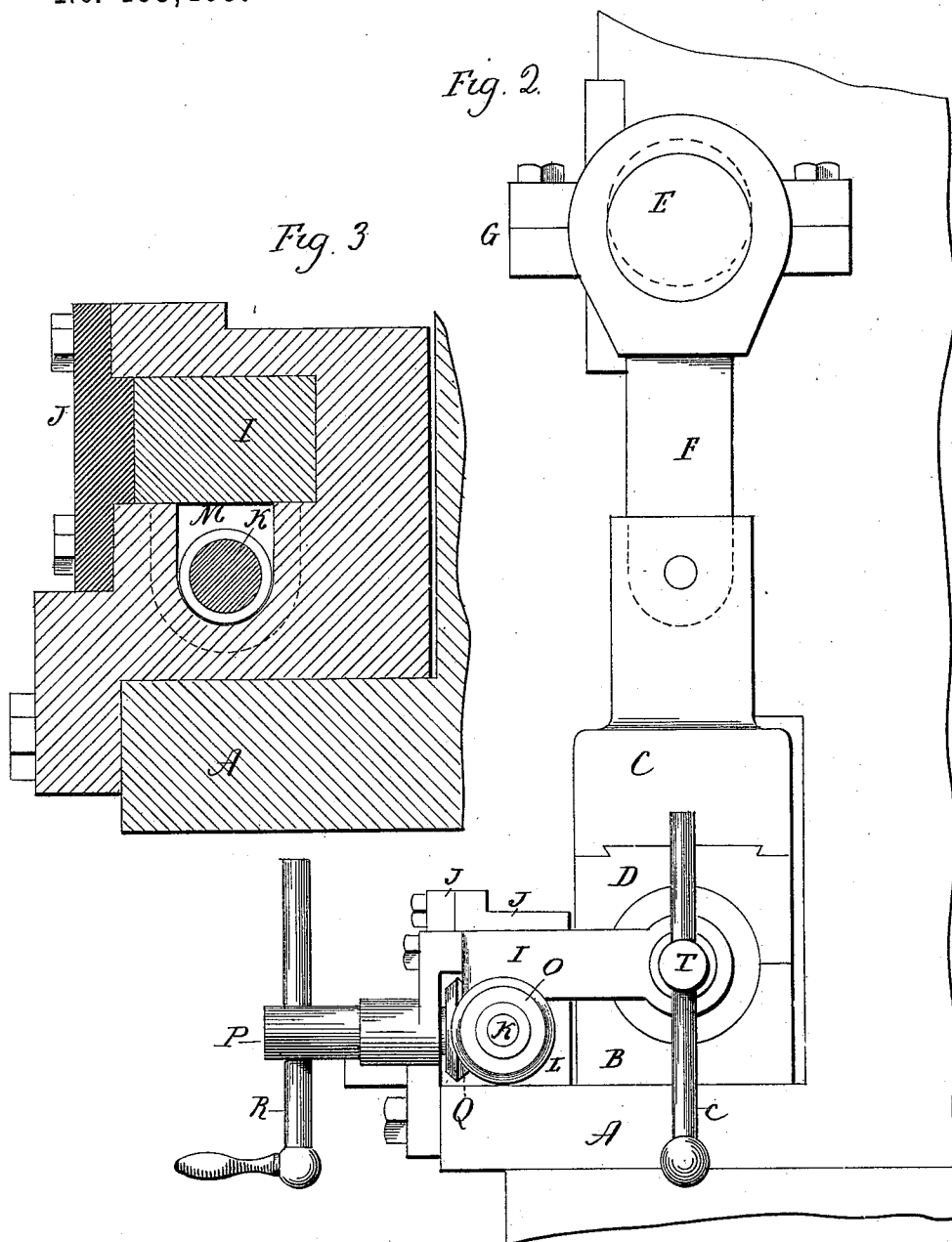
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Witnesses:

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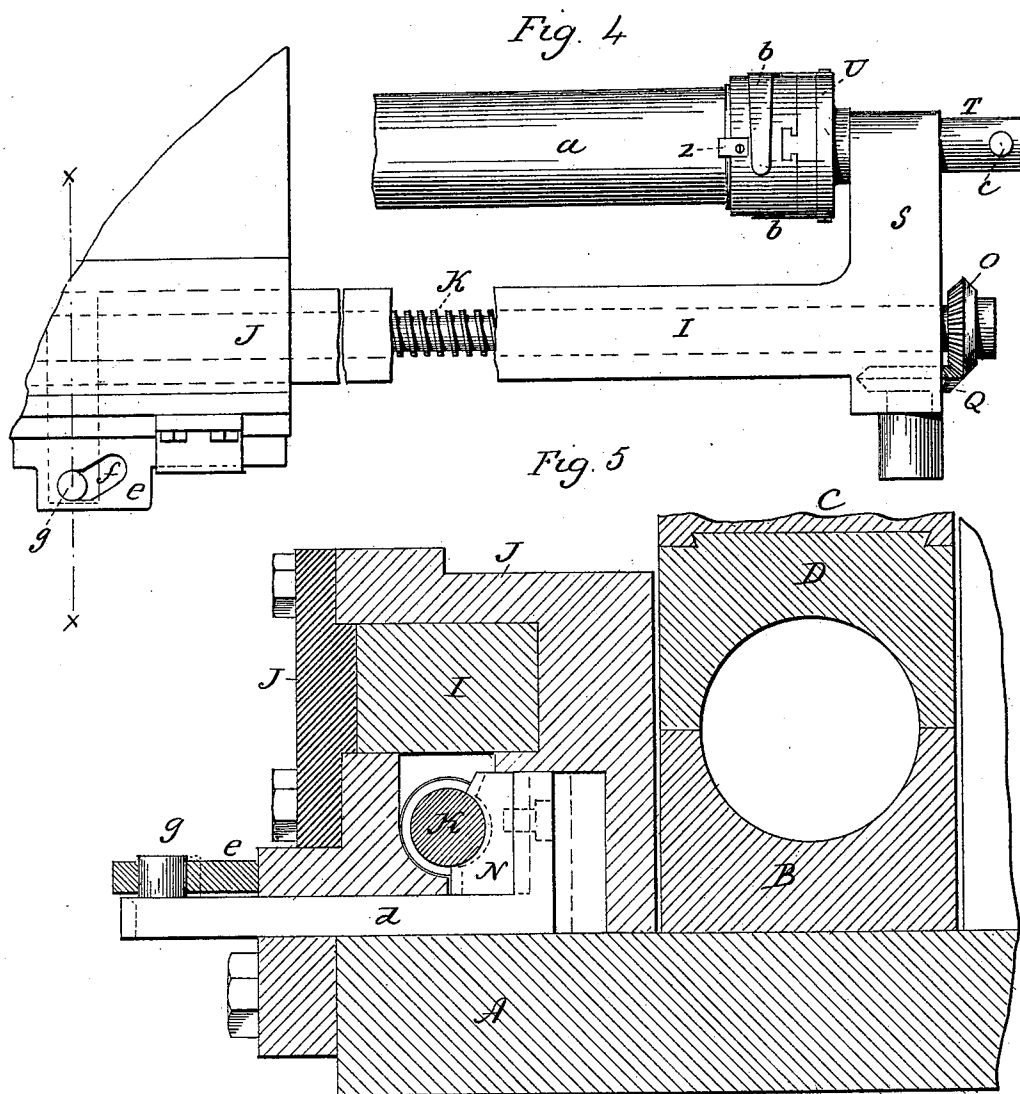
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Witnesses:
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Fig. 6

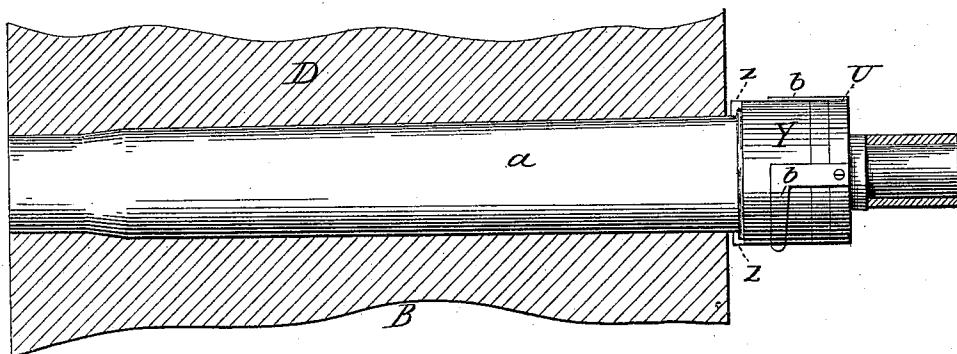


Fig. 9

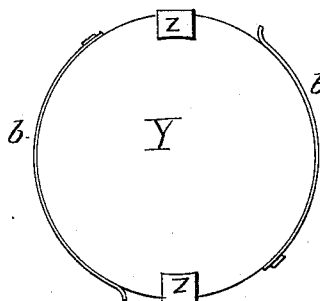


Fig. 7

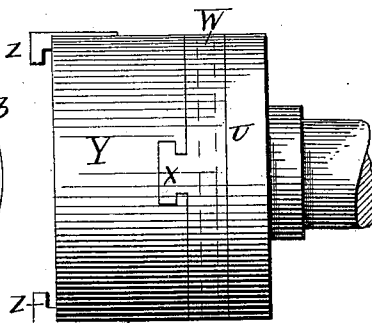
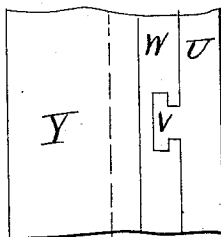


Fig. 8



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UNITED STATES PATENT OFFICE.

WILLIAM MASON, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE
WINCHESTER REPEATING ARMS COMPANY, OF SAME PLACE.

MACHINE FOR REDUCING AND FINISHING CARTRIDGE-SHELLS.

SPECIFICATION forming part of Letters Patent No. 463,403, dated November 17, 1891.

Application filed September 21, 1891. Serial No. 406,373. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MASON, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Reducing and Finishing Cartridge-Shells; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view of the machine, the upper portion being omitted as not essential to the invention; Fig. 2, a side view looking from the left of Fig. 1; Fig. 3, a transverse section through the slide cutting on line $x x$ of Fig. 4; Fig. 4, a top or plan view of the slide and a portion of its guides; Fig. 5, a vertical transverse section cutting on line $y y$ of Fig. 1; Fig. 6, a vertical central section cutting through the two dies and showing the shell as between the dies; Fig. 7, a side view of the chuck, looking toward the end of the rib on the disk W; Fig. 8, a partial side view of the chuck, turned one-fourth around from Fig. 7 and looking toward the end of the rib on the head U; Fig. 9, a face view of the holder for the chuck. All the figures enlarged from Fig. 1.

This invention relates to an improvement in machines for sizing and finally shaping and finishing cartridge cases or shells of the larger class, the object of the invention being to bring the shells to a perfectly uniform size and shape externally; and the invention consists in the combination and arrangement of mechanism, as hereinafter described, and particularly recited in the claims.

A represents the bed of the machine, and on which is arranged one part B of the shaping and finishing die, this part being made stationary on the bed. Above the part B is a vertical slide C, carrying the other part D of the die. To the slide C a vertical reciprocating movement is imparted by eccentrics on the driving-shaft E through connecting-rods F mounted thereon and in connection with the slide C, the slide being suitably guided. The shaft E is supported in bearings G, and power is applied thereto through a pulley H

or otherwise, and so that under the rotation of the shaft the vertical reciprocating movement will be imparted to the slide C and the die D which it carries. The dies have a recess in their faces, as seen in Fig. 6, which corresponds to the shape of the finished cartridge-shell, the recess extending through from end to end of the dies, the length of the dies corresponding to the length of shell to be operated upon. Rapid reciprocating movement is imparted to the die D, and the shell is introduced from the larger open end of the dies and gradually inserted, and at the same time a rotative movement is imparted to the shell, so that the dies operate thereon as hammers to gradually reduce the shell, and so that as the shell is advanced and finally brought to a position entirely within the dies the exterior of the shell will conform to the shape of the dies from head to mouth, and all the shells so finished will be of a uniform shape and size.

To introduce the shell and at the same time impart to it the required rotative movement, a longitudinal slide I is arranged in a suitable guide J, and so as to move in a path parallel with the axis of the dies. Below the slide I is a leading-screw K, which is hung at its outer end in a bracket L, projecting downward from the slide and so that the screw may revolve freely therein, but without longitudinal movement independent of the slide I. The screw is parallel with the slide I, and runs through a groove M below the slide I, as seen in Figs. 3 and 5. In this groove a half-nut N is arranged, with which the screw may engage, the nut being stationary. Hence a revolution imparted to the screw K will draw the nut forward or cause it to retreat, according to the direction in which the screw is turned, and in such longitudinal movement of the screw a corresponding longitudinal movement will be imparted to the slide I. At its outer end a screw is provided with a beveled pinion O, and in the same bracket is a transverse shaft P, carrying a like bevel-pinion Q, and the shaft P is provided with a crank R, by which the pinion Q is rotated, and thus the rotation of the crank R will impart a corresponding rotation to the screw K, so that by turning

the crank K in one direction the slide will be correspondingly advanced, or turned in the opposite direction the slide will be withdrawn. At its outer end the slide I is turned
5 at right angles to form an arm S, in which a spindle T is arranged longitudinally and in substantially axial line with the die, and upon the inner end of this spindle T the chuck is arranged.

10 The chuck consists of a head U, made fast to the spindle, and diametrically across the face of this chuck is a dovetail or undercut rib V, (see Fig. 8,) and on this rib a disk W is arranged, so as to slide freely on said rib and
15 in a path diametrically across the head U. The disk W is constructed with a dovetail or undercut rib X diametrically across its face, as seen in Fig. 7, but at right angles to the rib V, and on this rib X the holding part
20 Y of the chuck is arranged and so that it may slide upon the rib X as the disk W does upon the rib V, thus giving to the two parts of the chuck combined a universal diametrical or radial movement. On the face of the holder
25 Y a pair of jaws Z Z are arranged, which are adapted to receive the head of the cartridge-shell, as seen in Figs. 4 and 6, a representing the cartridge-shell. The two diametrical or radially-moving parts W Y are normally supported in a central position by means of circumferential springs b, these springs being
30 made fast to the head U.

In operation a rapid reciprocating movement is imparted to the movable part of the die, the slide I is withdrawn, as represented
35 in Figs. 1 and 4, the cartridge is placed in position with its flange between the jaws Z Z, as seen in Fig. 4, and then a rotative movement is imparted to the screw K, which gradually advances the cartridge between the dies.
40 The rapid reciprocation of the dies causes them to operate as hammers upon the surface of the shell. During this advance of the cartridge-shell a rotative movement is imparted
45 to the cartridge by means of a crank c on the outer end of the spindle T. The rotation of the cartridge-shell should be slow, but so that a constant change of position of the shell will be produced with relation to the die. The
50 cartridge is thus advanced and rotated until its head is brought against the outer end of the die, when farther advance will be arrested; but at this time the shell will have been reduced and shaped corresponding to the shape
55 and size of the interior of the dies.

It is to be understood that the shell is brought to an approximate size and shape before its introduction to this machine. The universal diametrical or radial movement of
60 the chuck permits it to adapt itself at all times to the head of the shell, so that if any irregularities in the shell should at any time throw the head end to an eccentric position, as it frequently will do, the chuck accommodates
65 itself thereto; but in the final operation or completion of the work the shell will be brought to a concentric position with relation to the

dies, and therefore to be straight and true with its own axis throughout. After the work has been thus performed and the shell completed
70 the shell may be withdrawn by reverse movement of the screw to withdraw the slide and the shell connected therewith; but that the withdrawal may be quickly made and without the necessary return revolutions of the
75 screw the nut N is made as a part of or arranged upon the slide d, so that it may be moved toward and from the screw, as indicated in broken lines, Fig. 5. When thrown
80 from the screw, as indicated in broken lines, the screw, with the slide I, may be freely withdrawn without rotating the screw. To mechanically disengage the nut from the screw,
85 a longitudinal slide e is arranged, and the slide d extends out beneath this slide e, and the slide e is constructed with a cam-shaped groove f, (see Fig. 4,) through which a stud g on the slide d extends, (see Figs. 4 and 5,) so
90 that as the slide e is moved in one direction it will force the slide d inward to disengage the nut from the screw, or moved in the opposite direction will draw the slide d outward and bring the nut N into engagement with the
95 screw. That the operator may conveniently make this disengagement, a pedal h is hung upon an axis i, from which an arm k extends up into engagement with the slide e, as
100 seen in Fig. 1, so that the operator, pressing his foot upon the pedal, may move the slide, so as to draw the nut into engagement with the screw, and when this is done the
105 pedal may be locked by a latch l, so that the nut will be locked during the work upon the cartridge-shell, and when that work is performed by disengaging the latch the slide
110 e will be returned by the action of a spring m, so as to throw the nut out of engagement with the screw to permit the withdrawal of the slide I.

While I prefer to employ the leading-screw K as a means for advancing the cartridge-shell between the dies, it will be evident that the screw may be dispensed with and the operator advance the cartridge by hand.

I claim—

1. In a machine for shaping cartridge-shells, the combination of a die composed of two parts, one part stationary and the other reciprocating, the two parts having in their adjacent faces cavities which, combined, correspond to the shape of the finished shell, the dies open at the head end, a slide arranged in guides parallel with the axis of said dies, mechanism substantially such as described to impart longitudinal movement to said slide,
125 and a rotative chuck arranged in said slide and in substantially axial line with said dies, the said chuck provided with jaws to engage the head of the cartridge, substantially as described.

2. In a machine for shaping cartridge-shells, the combination of a die composed of two parts, one part stationary and the other reciprocating, the two parts having in their ad-
130

jacent faces cavities which, combined, correspond to the shape of the finished shell, the dies open at the head end, a slide arranged in guides parallel with the axis of said dies, a rotative spindle arranged in the outer end of said slide and in axial line with the axis of said dies, a head upon the inner end of said spindle, constructed with a diametrical undercut guide on its face side, a disk arranged upon the said head-guide, the said disk constructed with an undercut guide diametrically across its face, but at right angles to the guide on the head, and a holder arranged on said guide of the disk, the holder provided on its face with jaws adapted to engage the head of the cartridge-shell to be operated upon, with springs arranged to support the said disk and holder normally in a concentric position with the head, substantially as described.

3. In a machine for shaping cartridge-shells, the combination of a die composed of two parts, one part stationary and the other reciprocating, the two parts having in their adjacent faces cavities which, combined, correspond to the shape of the finished shell, the dies open at the head end, a slide arranged in guides parallel with the axis of said dies, a rotative chuck arranged in the outer end of said slide in axial line with the dies and adapted to engage the head of the cartridge-shell, a screw having its outer end hung at the outer end of said slide and so as to revolve therein without longitudinal movement, the screw being parallel with the said slide,

and a nut through which the said screw may run, substantially as described, whereby rotation of the said screw will produce the advance movement of said slide.

4. In a machine for shaping cartridge-shells, the combination of a die composed of two parts, one part stationary and the other reciprocating, the two parts having in their adjacent faces cavities which, combined, correspond to the shape of the finished shell, the dies open at the head end, a longitudinally-guided slide I, the slide carrying a rotative chuck at its outer end in axial line with said dies, the said chuck being adapted to engage the head of the cartridge, a screw K, parallel with the slide I, hung by its outer end to the outer end of said slide and so as to revolve freely therein, but without longitudinal movement independent of said slide, a half-nut N, arranged in the path of said screw and upon a transverse slide *d*, the said slide *d* extending outward, a longitudinal slide *e*, constructed with a cam-shaped slot *f*, the stud *g*, projecting from said slide *d* into the said slot *f*, and means substantially such as described to impart longitudinal movement to said slide *e*, substantially as and for the purpose described.

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

WILLIAM MASON.

Witnesses:

DANIEL H. VEADER,
A. W. EARLE.