A. T. DAWSON & G. T. BUCKHAM.

FIRING MECHANISM OF BREECH LOADING GUNS.

APPLICATION FILED MAR. 8, 1910.

994,704.

Patented June 6, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

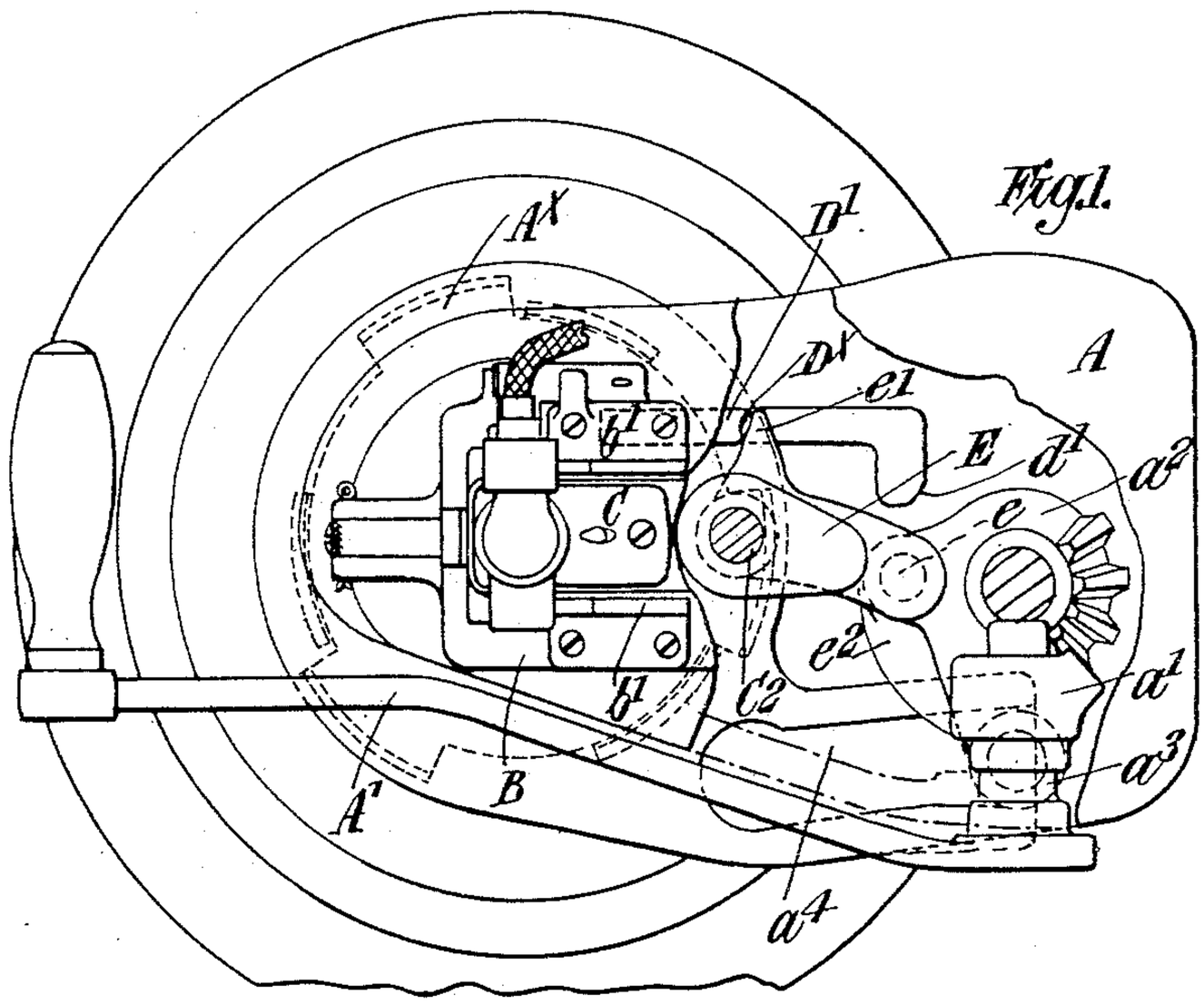
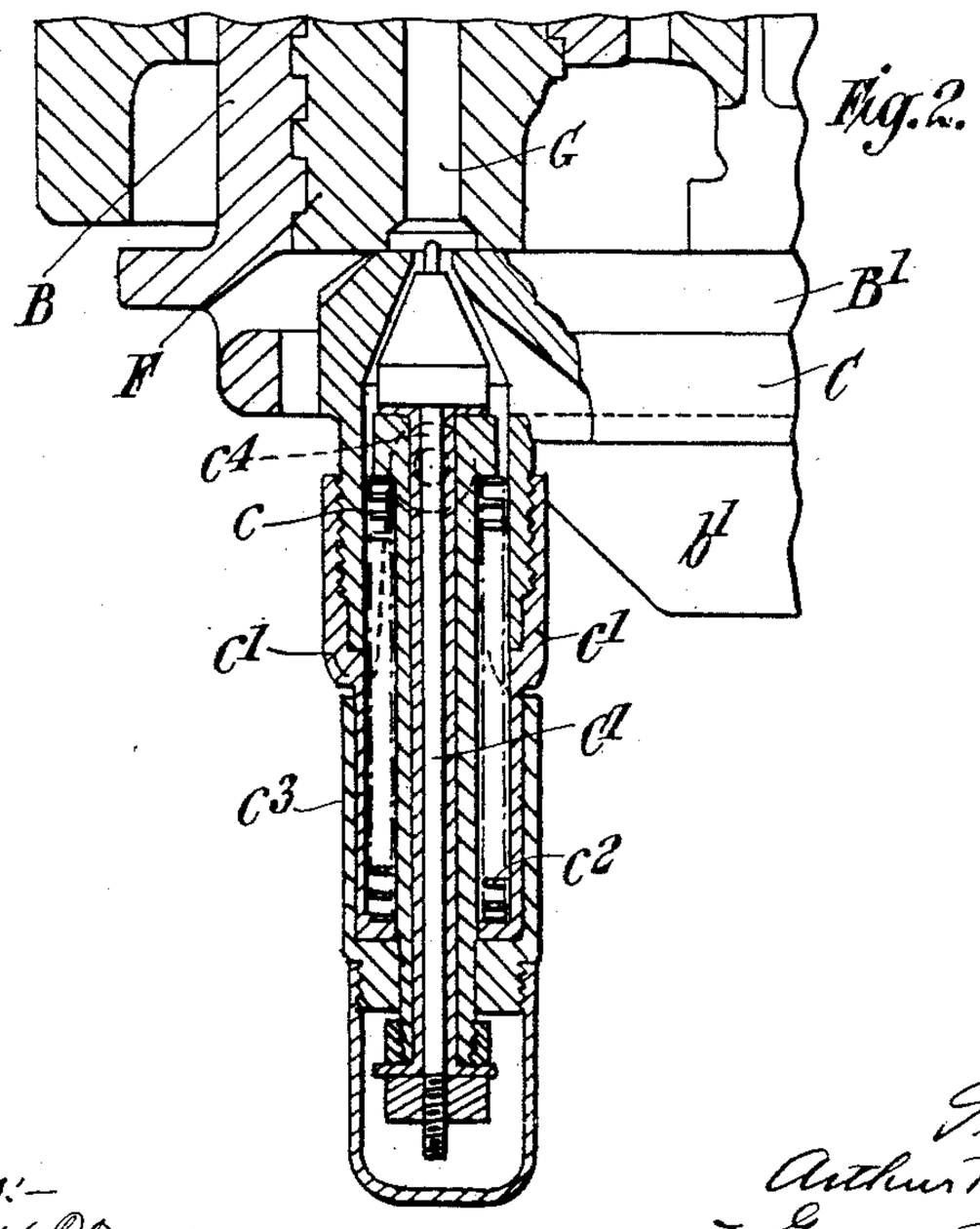


Fig. 2.



Witnesses:—
Kennicott Bennie
Frank A. Hennessy.

Inventors
Arthur Trevor Dawson
& George Thomas Buckham
by Bennie Goldsborough
their attorneys

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Fig. 3.

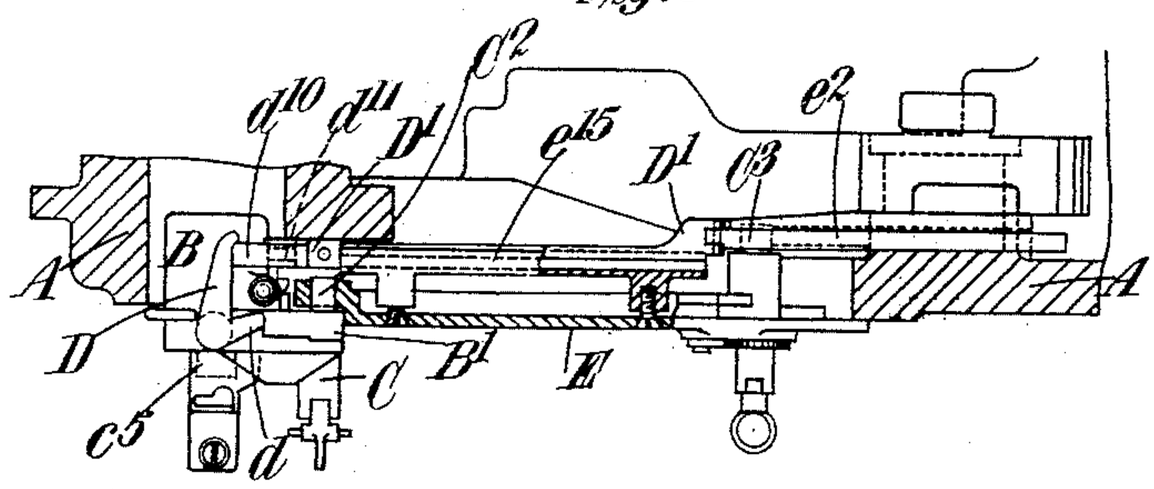


Fig. 4.

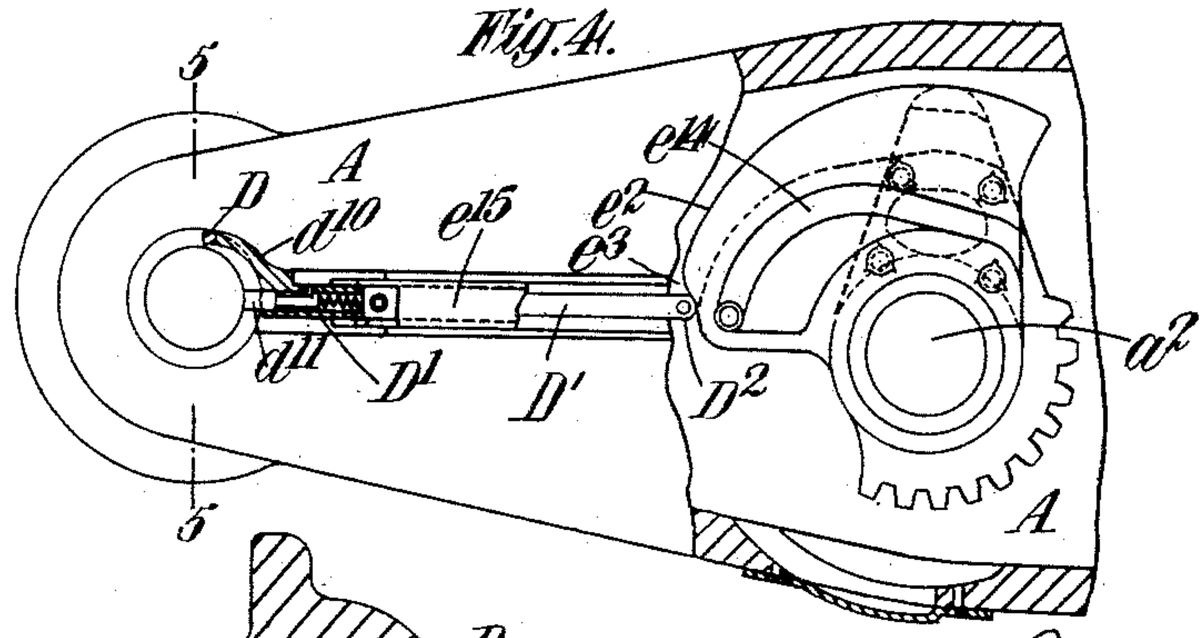


Fig. 5

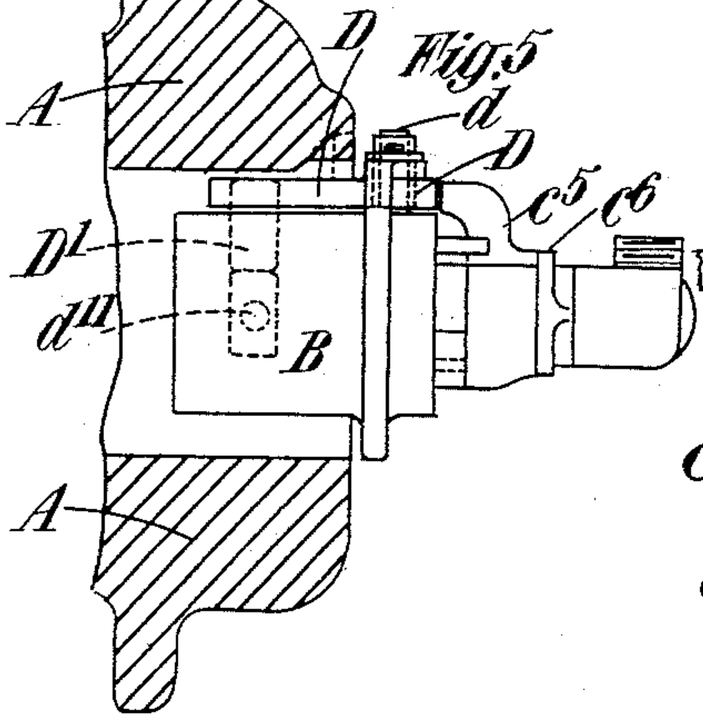
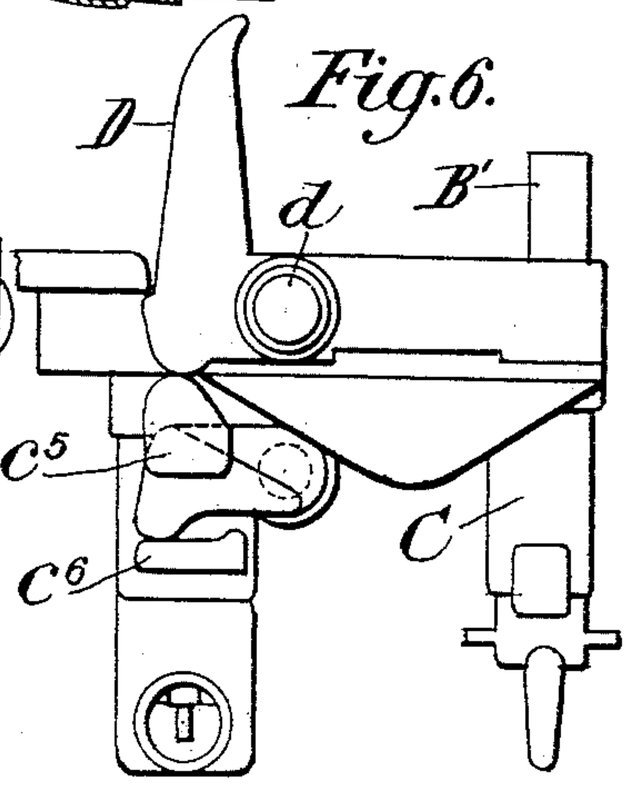


Fig. 6.



Witnesses:—
Kenneth B. Hennie
Frank A. Hennessy.

Inventors:—
Arthur Trevor Dawson
George Thomas Buckham
by Pennie Goldsborough
their attorneys

UNITED STATES PATENT OFFICE.

ARTHUR TREVOR DAWSON AND GEORGE THOMAS BUCKHAM, OF WESTMINSTER, LONDON, ENGLAND, ASSIGNORS TO VICKERS SONS & MAXIM, LIMITED, OF WESTMINSTER, ENGLAND.

FIRING MECHANISM OF BREECH-LOADING GUNS.

994,704. Specification of Letters Patent. **Patented June 6, 1911.**

Original application filed May 6, 1908, Serial No. 431,098. Divided and this application filed March 8, 1910. Serial No. 548,020.

To all whom it may concern:

Be it known that we, ARTHUR TREVOR DAWSON and GEORGE THOMAS BUCKHAM, both subjects of the King of Great Britain, residing at 32 Victoria street, Westminster, in the county of London, England, have invented certain new and useful Improvements in Firing Mechanism of Breech-Loading Guns, of which the following is a specification.

This invention relates to the firing mechanism of breech loading guns of the class wherein the breech screw is opened and closed by means of a hand lever adapted to impart a partial rotation in one direction or the other to a pinion carried by a swinging carrier and arranged to transmit through a suitable connection a corresponding movement to the breech screw and a lateral movement to a slide which normally covers the axial vent of the gun when the breech is closed. In mechanism of this class it is customary to mount the striker or firing pin upon the aforesaid slide, and to utilize the lateral movement thereof simultaneously to retract the striker to its cocked position, this operation being effected by projections on the striker which engage with cam surfaces on the frame in which the slide works when the hand lever is operated to withdraw the slide to uncover the axial vent.

It has been found in practice that when the aforesaid projections and cam surfaces become worn, a sufficient movement of the slide takes place before the commencement of the retraction of the striker to break or materially damage the same in the event of its end being embedded in the head of the primer.

The present invention consists in causing the striker to be partly retracted prior to the commencement of the lateral movement of the slide by means of a retracting lever pivoted to the slide box and adapted to be operated through the intervention of a retracting rod, the latter receiving its movement directly from the sector pinion which is also arranged directly to actuate the slide link for moving the slide to cover or uncover the vent axial.

In order that the said invention may be clearly understood and readily carried into effect, the same is described with reference to the accompanying drawings, in which:—

Figure 1 is an end elevation of a gun breech showing the ordinary mechanism for actuating the same, and mechanism actuated by the sector pinion for retracting the striker. Fig. 2 is a horizontal section of part of Fig. 1, drawn to an enlarged scale. Fig. 3 is a plan of a portion of a gun breech, part of which is shown in section. Fig. 4 is an end elevation of a portion of the swinging carrier partly broken away to show the striker retracting mechanism, and Fig. 5 is a section taken approximately on line 5, 5, of Fig. 3. Fig. 6 is an enlarged view of a part of Fig. 3.

The following is a description of an existing type of breech mechanism to which the invention is applied:—

A represents the swinging carrier which is hinged to one side of the breech end of the gun and supports the breech screw $A^{\times}$.

A′ is the breech actuating hand lever to which is connected a sector pinion a' gearing with a similar sector pinion a^2 pivoted on the carrier. This pinion is provided with a roller crank pin a^3 which engages with a groove a^4 formed in a projection extending from a portion of the breech screw, so that a partial rotary motion is imparted to such screw by the pinion a^2 when the hand lever is moved in a direction away from the breech with the result that a threaded portion of the breech screw is disengaged from a corresponding threaded portion in the gun, whereupon the breech screw can be opened by continuing the movement of the hand lever in the direction above mentioned. Mounted on the carrier A is a piece of mechanism technically termed a "slide box" one portion B of which embraces the spindle F of the axial vent and another portion B′ constitutes a slide bed for a slide C. Projecting from the latter is a hollow boss c, Fig. 2, on which is mounted a casing c' and situated within these parts is the striker C′ and spring c^2 for actuating the same. The striker is connected to a sleeve c^3 which is slidably mounted on the casing c' and car-

ries projections or rollers c^4 adapted to be brought into engagement with projections b' on the slide bed B′ for retracting and cocking the striker when the slide C is moved laterally toward the right to uncover the axial vent. This movement is effected by a bolt C^2 which passes through such slide and forms a pivot for one end of a link E the other end of which is connected to a crank pin e on the sector wheel a^2. When the breech is closed, the slide is moved by the aforesaid bolt C^2 and link E to bring the end of the striker C′ into line with the axial vent as shown in Fig. 2. In this view the end of the striker is shown embedded in the head of the primer G and it will be readily understood that if any wear takes place between the roller c^4 and the projection b' on the slide bed B′ the slide will move before the commencement of the retraction of the striker and the latter will be damaged or broken.

According to this invention instead of relying solely upon the projecting surfaces b' for retracting the striker, the slide C is connected with the sector pinion a^2 in such a manner that during the initial movement of the latter the slide remains motionless and the initial movement of the sector pinion is utilized for actuating mechanism for partly retracting the striker before any movement of the slide takes place.

In the arrangement shown in Figs. 3, 4 and 5, D represents a retracting lever pivoted at d to the slide bed B′ in such a manner as to be capable of engaging with a cocking lever c^5 pivoted on the slide in proximity to a projection c^6 extending from the striker sleeve. The free end of the lever is arranged to occupy a position adjacent to the end of a rod D′ which is advantageously provided at its opposite end with a roller D^2. E represents the slide actuating link. This link is connected at one end with the slide C by the guide bolt C^2 and at the other end with the sector pinion a^2 by a guide bolt C^3 engaging with a cam groove e^{14} formed in a flange extending from one side of such pinion. The outer edge of such flange terminates in a circular portion e^2 concentrically arranged in relation to the pinion a^2 and provided with an inclined lifting surface e^3. When the breech is closed this inclined surface occupies the position indicated in Fig. 4 and as soon as the sector pinion a^2 is turned in a direction to open the breech, the said inclined surface imparts an endwise movement to the rod D and causes the latter to retract the striker before any movement is imparted by the bolt C^3 to the slide actuating link E, the said rod D′ being slidably mounted in a guide e^{15} carried by the link E and formed with a bent portion d^{10} for engagement with the retracting lever D. d^{11} represents a spring controlled plunger carried by the rod D′ and arranged to exert pressure against the portion B of the slide bed which surrounds the spindle of the vent axial F. This plunger operates to return the rod D′ to the normal position when the segmental flange e^2 permits the opposite end of the rod to assume the position shown in Fig. 4. The cam groove e^{14} is so shaped that no motion will be imparted to the guide bolt C^3 until the rod D′ has been moved by the segmental flange e^2 to the extent necessary for actuating the retracting lever to primarily withdraw the striker.

What we claim and desire to secure by Letters Patent of the United States is:—

1. In firing mechanism of the character described, the combination with the slide, the striker, the striker retracting lever, and the rod for actuating the same, of a sector pinion having a segmental flange for primarily retracting the striker and a cam groove for subsequently withdrawing the slide.

2. In firing mechanism of the character described, the combination with the slide, the striker, the striker retracting lever, and the rod for actuating the same, of a sector pinion having a segmental flange for primarily retracting the striker and a cam groove for subsequently withdrawing the slide, and means for returning the striker retracting rod to its normal position.

3. In firing mechanism of the character described, the combination with the slide, and the striker, of a striker retracting lever pivoted to the slide bed, a rod for actuating the said lever provided at one end with a spring-controlled plunger and at the other end with a roller, a sector pinion having a segmental flange and a cam groove, and means for actuating the slide through the aforesaid cam groove in the sector pinion.

4. In firing mechanism of the character described, the combination with the slide, and the striker, of a striker retracting lever pivoted to the slide bed, a rod for actuating the said lever provided at one end with a spring-controlled plunger and at the other end with a roller, a guide for carrying such rod, a sector pinion having a segmental flange for engagement with said roller, and a cam groove, a slide actuating rod connected at one end with the slide and at the other end with the cam groove.

5. In firing mechanism of the character described, the combination with the slide, and the striker, of a striker retracting lever pivoted to the slide bed, a rod for actuating said lever provided at one end with a spring-controlled plunger and at the other end with

a roller, a sector pinion having a segmental flange and a cam groove, a slide actuating rod connected at one end with the slide and carrying a guide for the reception of the lever actuating rod, and a bolt carried by the slide actuating rod extending into the cam groove in the sector pinion.

In testimony whereof we affix our signatures in presence of two witnesses.

ARTHUR TREVOR DAWSON.
GEORGE THOMAS BUCKHAM.

Witnesses:
HENRY KING,
C. A. SEARLE.