

**W. MUIR.**  
**Sewing-Machines.**

No. 147,153.

Patented Feb. 3, 1874.

FIG. 1.

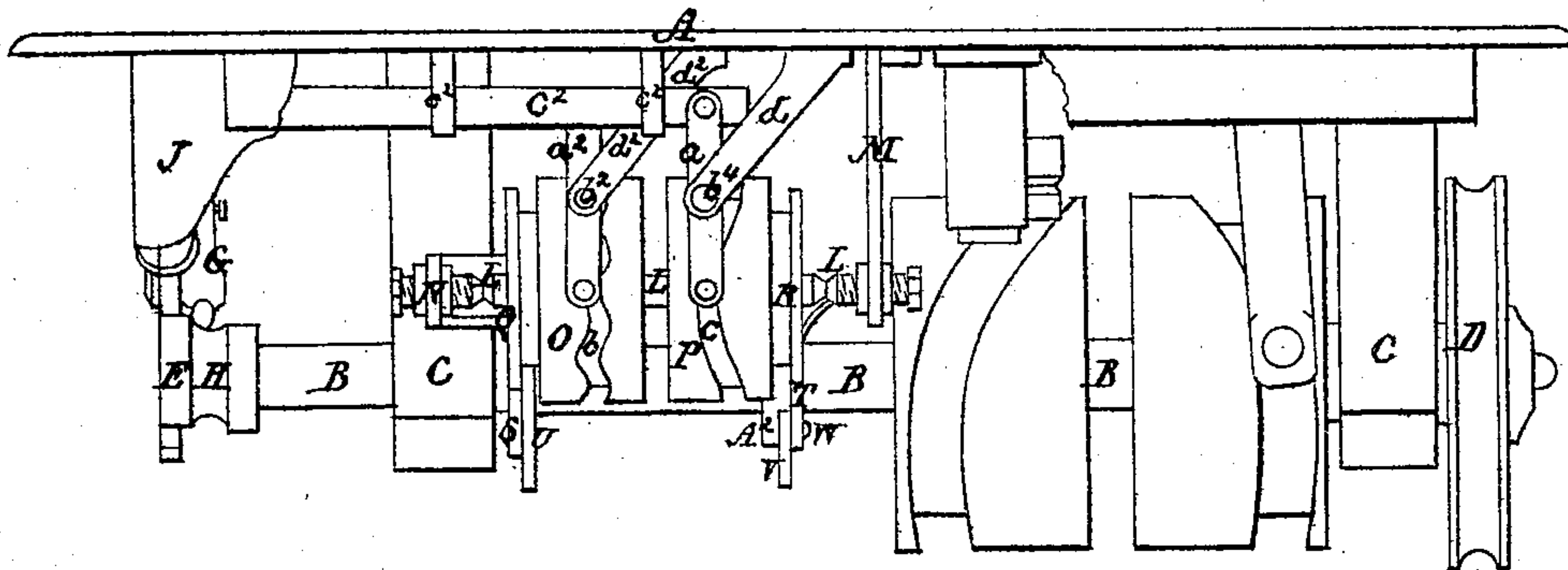
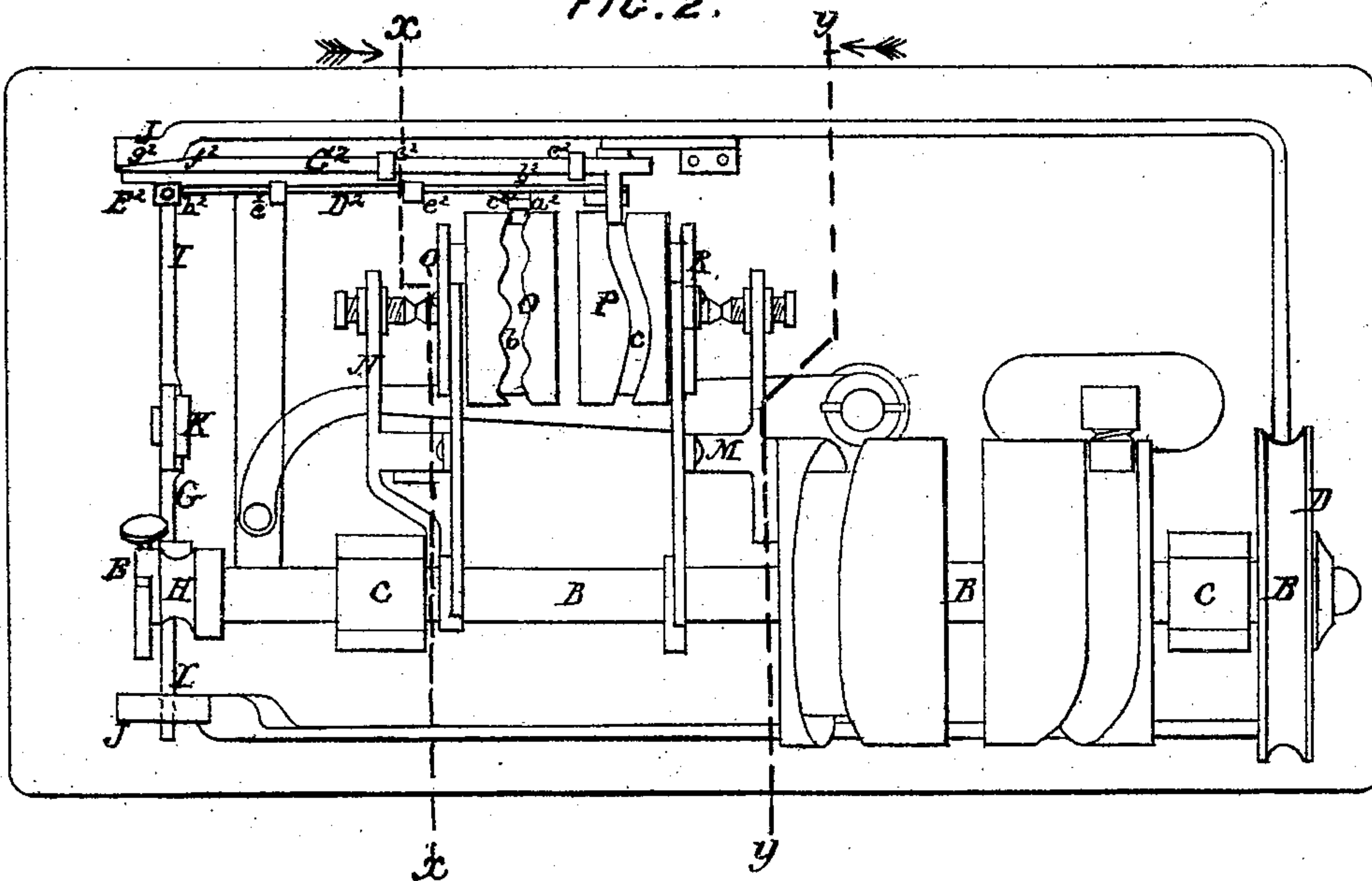


FIG. 2.



**WITNESSES.**

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**FIG. 3.**

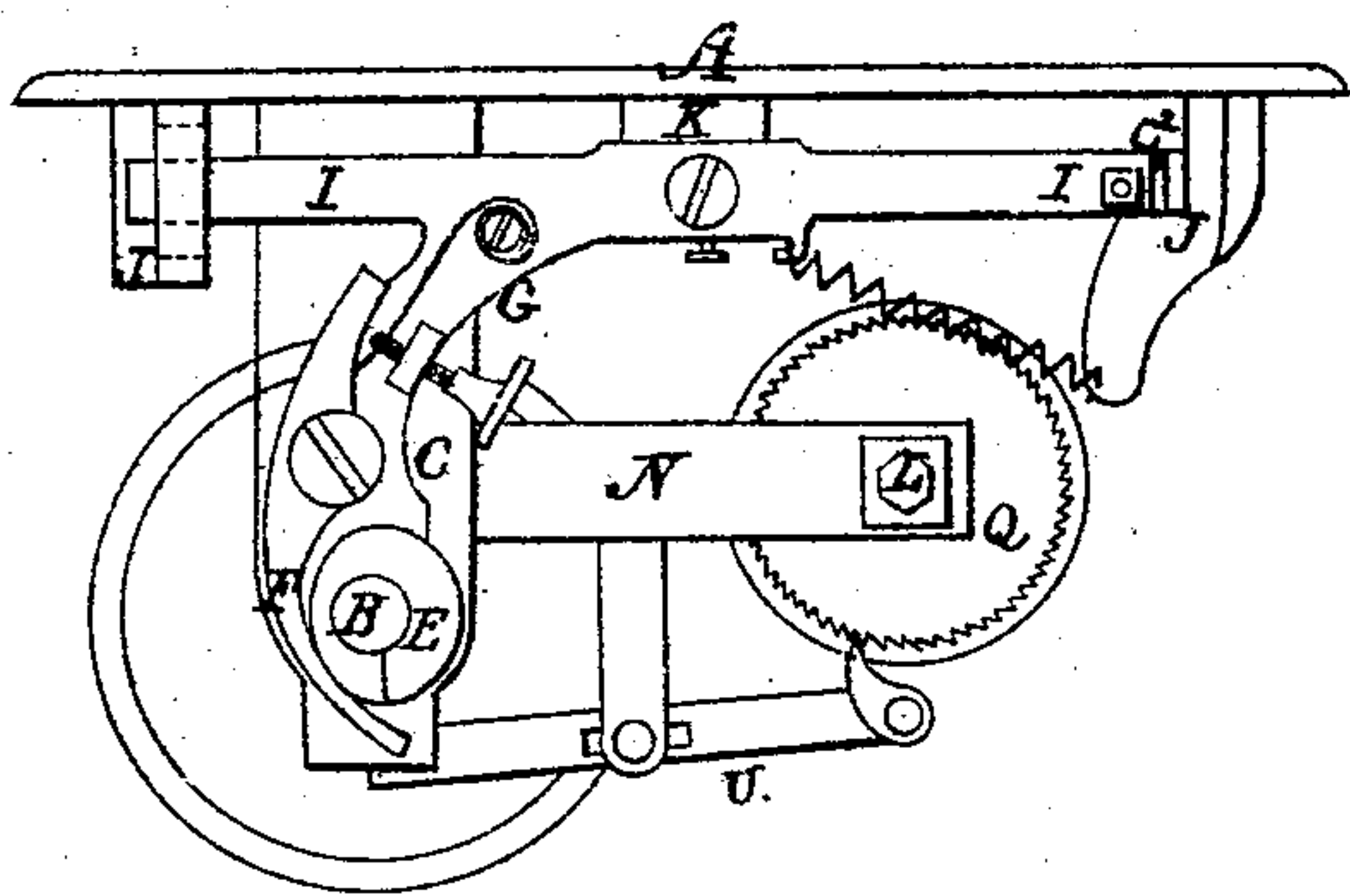
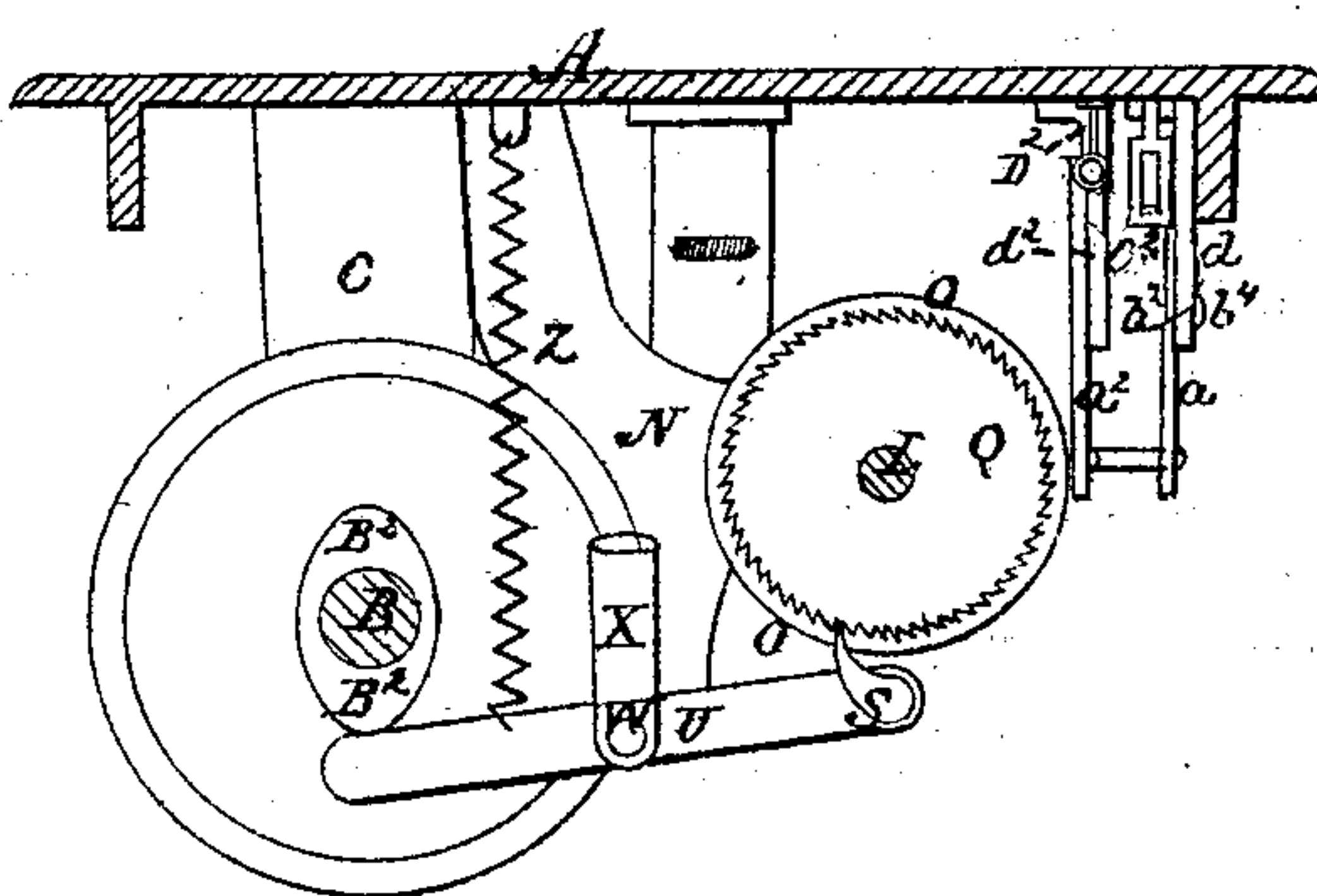
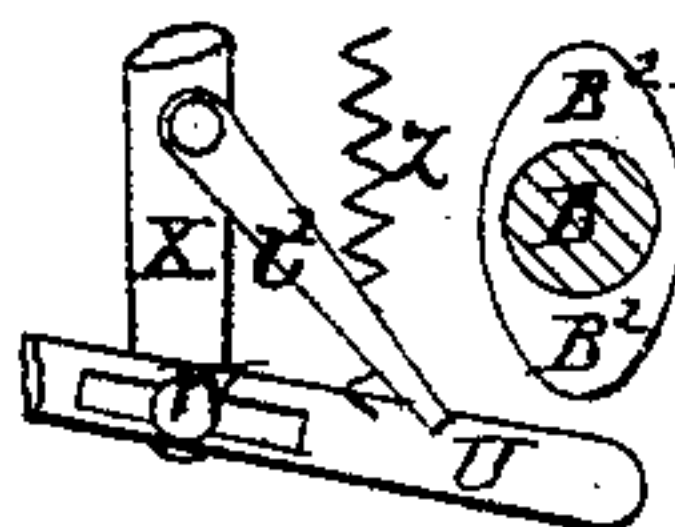


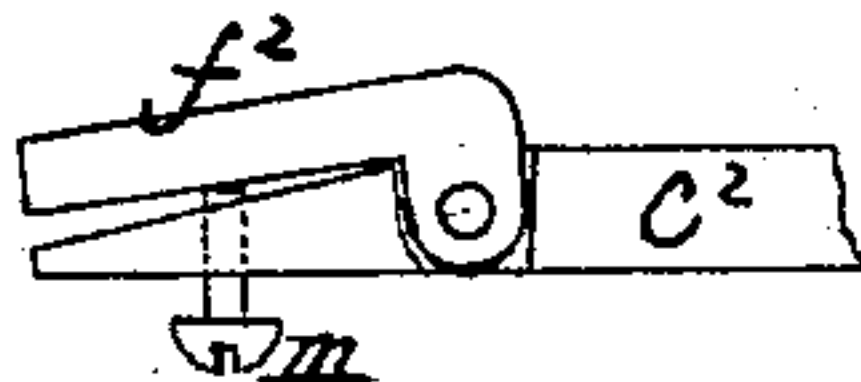
FIG. 4.



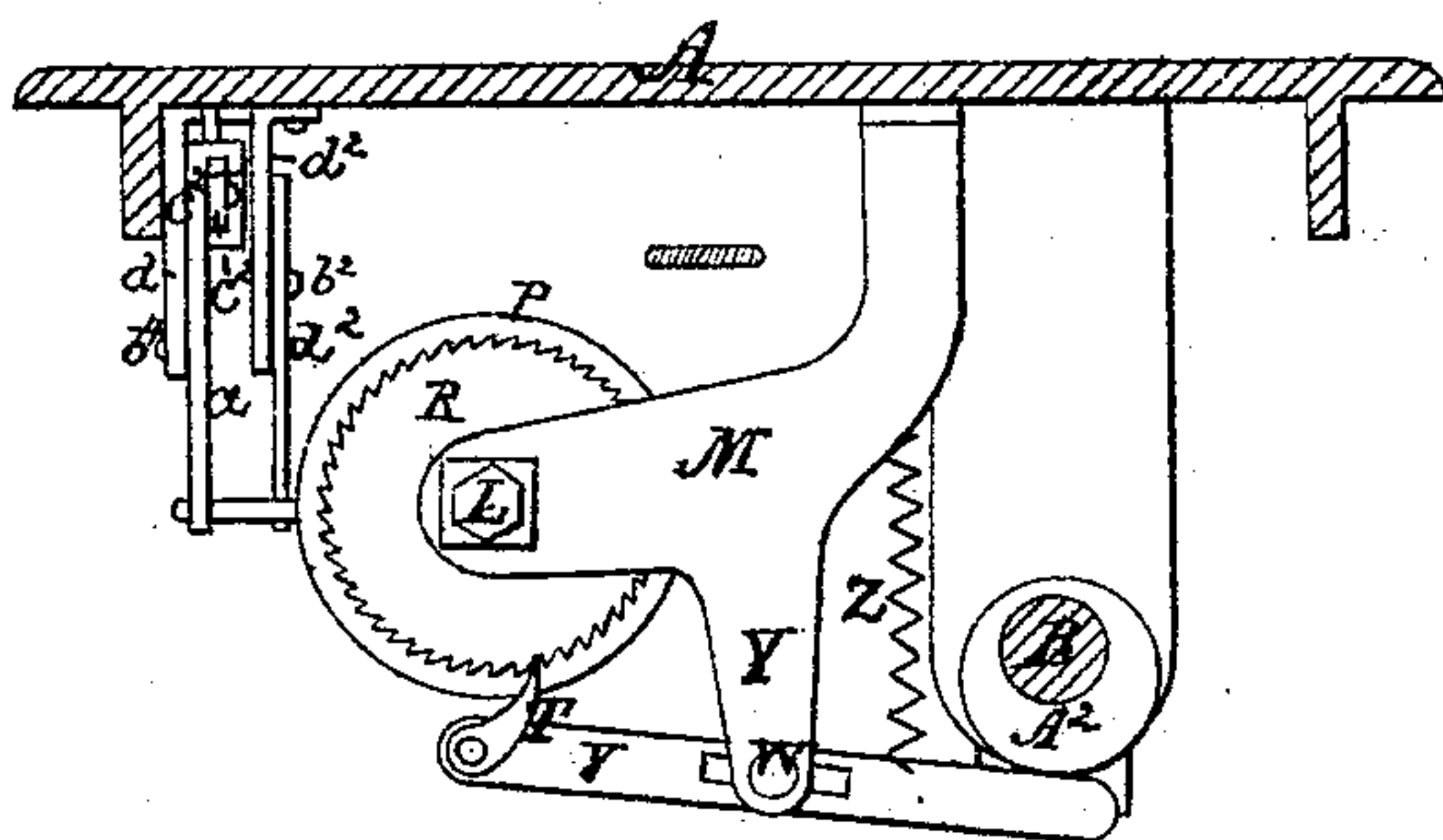
**FIG. 6.**



**FIG. 7.**



**FIG. 5.**



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **147,153**, dated February 3, 1874; application filed January 29, 1874.

*To all whom it may concern:*

Be it known that I, WILLIAM MUIR, of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Sewing-Machines; and that the following description, taken in connection with the accompanying plates of drawing hereinafter referred to and forming a part of the same, is a full and exact specification thereof.

The present invention relates to ordinary sewing-machines having a "drop-feed," so called; and it consists in the application to such sewing-machines of mechanical devices, as hereinafter described, receiving motion from the driving-shaft of the machine, and so arranged and connected with the feed-bar that the revolution of the driving-shaft will impart to said feed-bar a lateral movement across the direction of its ordinary feed-movement, and thereby feed the goods under the needle so as to produce zigzag, serpentine, or other similar lines of stitches.

In the accompanying plates of drawings my improvements in sewing-machines are illustrated.

In Plate 1, Figure 1 is a side elevation of my invention, showing the mechanism under the cloth-plate; Fig. 2, a plan view; in Plate 2, Fig. 3, a front elevation; Fig. 4, a sectional elevation on line *x x*, Fig. 2, Plate 1; Fig. 5, a sectional elevation on line *y y*, Fig. 2, Plate 1; Figs. 6 and 7, detail views to be hereinafter referred to.

A in the drawings is the bed-plate, B the main or driving-shaft turning in bearings of posts C', and provided with a driving-pulley, D. E, a cam fixed on outer end of shaft B. This cam E is of the configuration shown in Fig. 3, and against its periphery bears one end of a bent lever, F, pivoted to the outer end of a curved arm, G, that also bears against the portion H of said cam E, and is extended so that by its two arms I I it is just beneath the under side of bed A, moving in guide-posts J of the bed A. This curved arm G carries the feed-block K, the roughened surface of which projects above the bed-plate A through an opening therein. This feed device so far described is not new. L is a horizontal shaft located at one side of the shaft B, and secured

between a fixed post, M, of the bed-plate A, and a projecting arm, N, fixed to one of the bearing-posts C of the driving-shaft B. On this shaft are arranged loosely two cam-cylinders, O and P, each having a peripheral cam-groove, *b* and *c*, respectively, of the general shape and outline shown in the drawings. Q and R are ratchet-wheels concentrically fixed, the one, Q, to the end of cam-cylinder O, and the other, R, to the end of cam-cylinder P. For turning the ratchet-wheel O a spring-pawl, S, is provided, and for turning the ratchet-wheel R a spring pawl, T. The pawls S and T are hung the one to the outer end of a lever, U, and the other to the outer end of a lever, V, both of which are hung upon fulcrum or centers W, respectively, of fixed posts X and Y. The ends of the levers U and V are held by springs. *a a*<sup>2</sup> are vertical arms, turning upon separate fulcrums at *b*<sup>4</sup> *b*<sup>2</sup>, respectively, of arms *d d*<sup>2</sup>, secured to the bed-plate A. These arms *a a*<sup>2</sup>, at one end, engage with the grooves *c* and *b* of the cam-cylinders P and O; and at their other ends are pivoted the one, *a*, to the end of a slide-bar, C<sup>2</sup>, and the other, *a*<sup>2</sup>, to the end of a pitman-rod, D<sup>2</sup>. The slide-bar C<sup>2</sup>, wedge-shaped at its outer end, is supported in stationary guide-loops *e*<sup>2</sup>, and extends along under the bed-plate against the end E<sup>2</sup> of feed-bar, and between it and the guide-block J. The pitman-rod D<sup>2</sup> is supported in stationary guide-loops *e*<sup>2</sup>, and is connected at its outer end with the feed-bar at *h*. Lateral movement is given to the feed-bar by the cam-cylinder O, and the length of the forward movement is controlled by the cam-cylinder P. The cam-cylinder O receives motion from its ratchet-wheel Q, which is operated, by its pawl S on the lever U, twice for each revolution of the shaft B by the cam B<sup>2</sup> thereon. This intermittent rotation of the cam O, through the pitman-rod D<sup>2</sup> attached to the feed-bar, moves such bar intermittingly, first in one direction, and then in the other, across the line of forward feed.

The first lateral movement, above stated, of the feed-bar takes place at the same time the feed-bar is being moved to feed the goods forward, thereby feeding the goods forward and laterally; and the second lateral movement takes place as the feed-bar is lowered and is



returning to its normal position to again feed the goods forward. This double lateral movement of the feed-bar occurs at and during each distinct ordinary operation of the feed-bar, as above described, the cam-groove  $b$  in its whole length being of suitable form therefor.

The cam-cylinder  $P$  receives motion from its ratchet-wheel through its pawl  $T$  on lever  $V$ , operated once for each revolution of the driving-shaft. This intermittent rotation of the cylinder  $P$  intermittently moves the slide-bar  $C^2$ , and, according to the formation of the cam-groove  $c$ , brings its end  $E^2$ , having wedge-face  $f^2$ , into a position so as to increase or reduce, as the case may be, the distance which the feed-bar will move in its ordinary forward movement under the action of the cam  $E$ .

By the lateral movement of the feed-bar, through the cam  $O$ , it is obvious, with a proper-shaped cam-groove,  $b$ , stitching may be done in a serpentine, zigzag, or other irregular line; and that, furthermore, with a proper-shaped cam-groove,  $c$ , in connection with the cam-groove  $b$ , stitches of a uniform length can be and will be formed.

By the double lateral movements of the feed-bar in one revolution of the driving-shaft  $B$ , it is obvious the goods can be fed laterally a greater or less distance—that is, for more or less stitches—with a hole through the bed-plate to receive the feed-block  $K$ , of no greater width than a width equal to the greatest lateral feed of the goods at any one lateral movement of the feed-bar, for the reason that after each lateral movement of the feed-bar it is returned to its normal position before again operating on the goods.

In Fig. 6 is shown a device,  $7^2$ , hung to the post  $X$  in proper position, to throw the lever  $U$  off from the cams  $B^2$  of the driving-shaft  $B$ ,

thus putting, as it were, out of gear the lateral-feed devices, should it be desired not to give a lateral feed to the goods. With a similar device, adapted in the same way for the lever  $V$ , the operation of the slide-bar  $C^2$  can be stopped at pleasure.

The wedge-face  $f^2$  of the slide-bar  $C^2$ , shown in Fig. 7, is for the purpose of increasing and decreasing the forward movement of the feed-bar; and the wedge-face is hinged to the bar  $C^2$ , so that, by a set-screw,  $m$ , it can be set out, or adapted to be forced or brought in, so as to be more or less in a straight line with the slide-bar  $C^2$ .

This construction of the wedge-face  $f^2$  is adaptable to other forms of mechanisms for variable feed than that herein described, and it is not intended to limit it to the particular slide-bar  $C^2$ , herein specially employed.

Having thus described my invention, I shall state my claim, as follows:

1. The combination, with the feed-bar, of the rod  $D^2$ , connected to the arm  $a^2$  working in the groove  $b$  of the loosely-hung cam-cylinder  $O$ , in combination with the ratchet-wheel  $Q$ , pawl  $S$ , and lever  $U$ , operated by a cam on the shaft  $B$ , in the manner and for the purposes herein set forth.

2. The cam-cylinders  $O$   $P$ , rod  $D^2$ , slide-bar  $C^2$ , ratchet-wheels  $Q$   $R$ , feed-bar  $I$   $K$ , and driving-shaft  $B$ , constructed, arranged, and operating substantially as described, and for the purposes set forth.

The above specification of my invention signed by me this 30th day of March, A. D. 1872.

WM. MUIR.

Witnesses:

EDWIN W. BROWN,  
ALBERT W. BROWN.