

No. 613,128.

Patented Oct. 25, 1898.

W. ELY.
ELECTRIC SWITCH.

(Application filed Sept. 5, 1896.)

(No Model.)

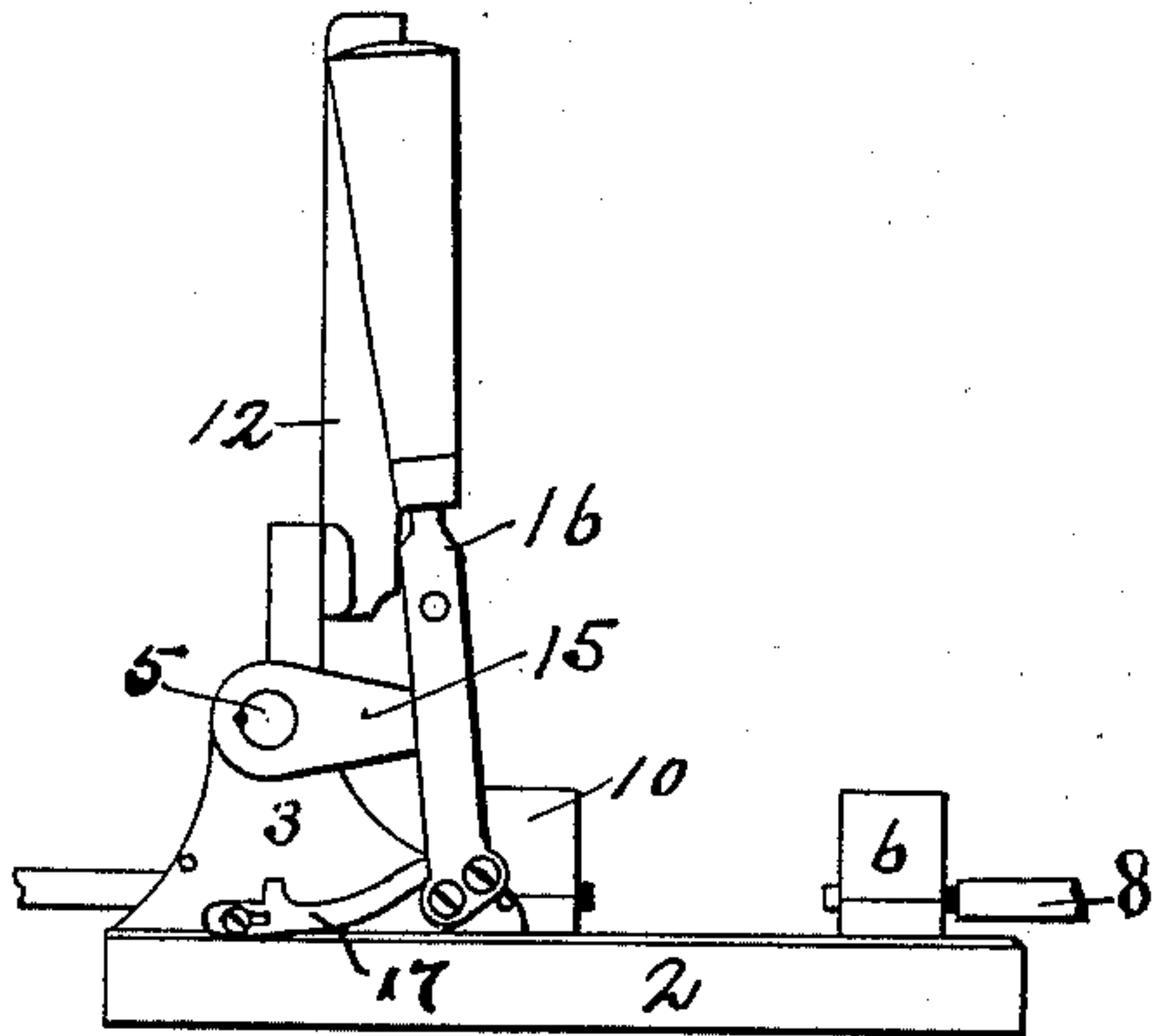


FIG. 4.

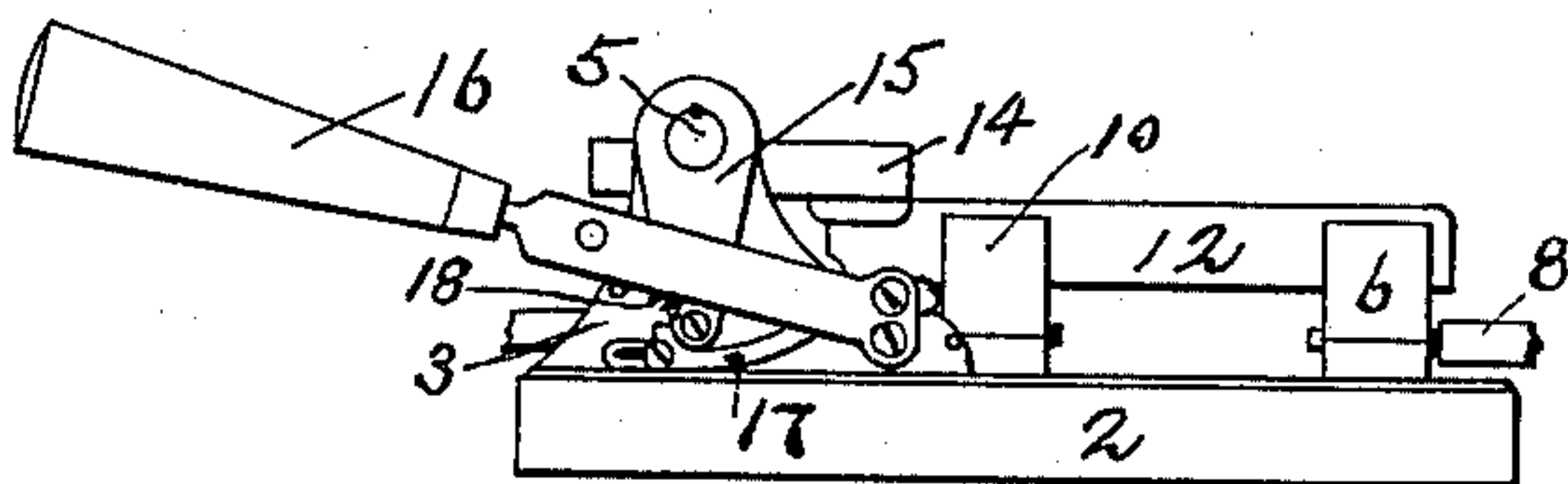


FIG. 1.

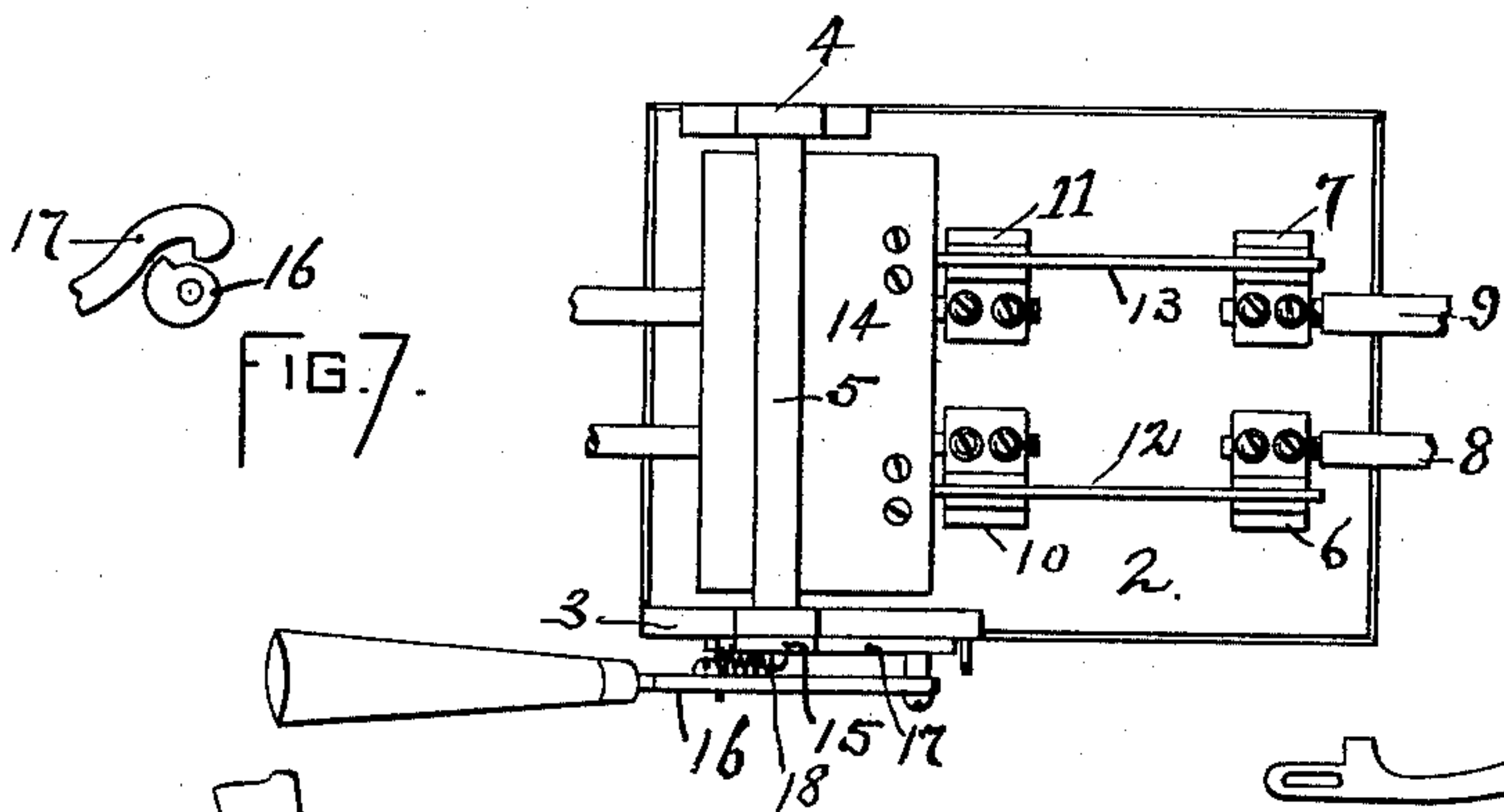


FIG. 5.

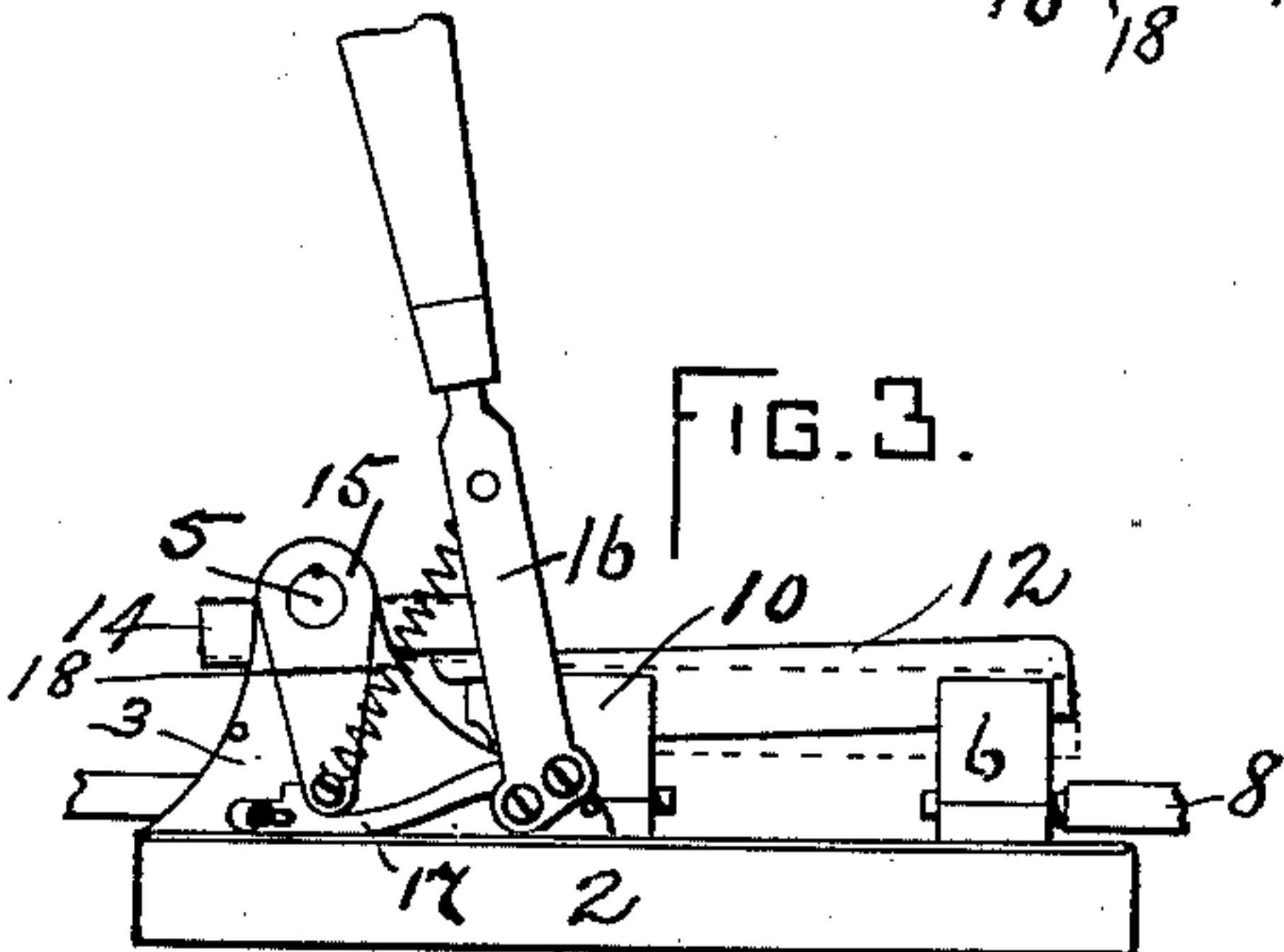


FIG. 3.

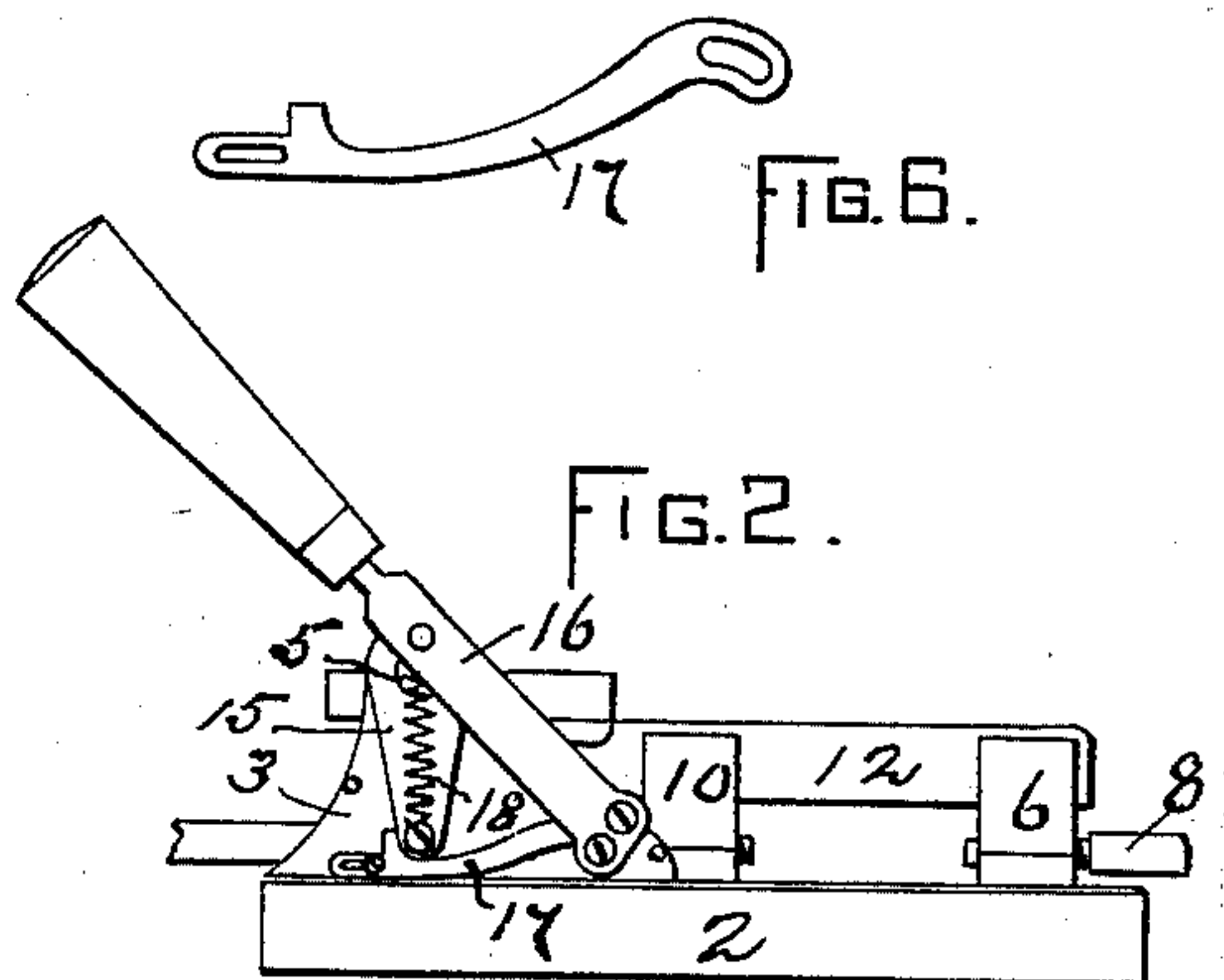


FIG. 2.

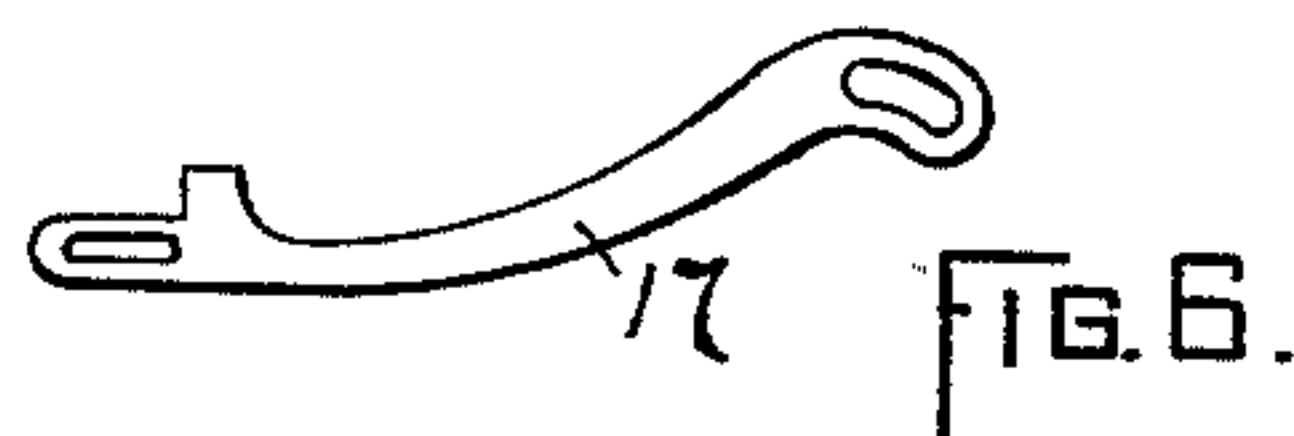


FIG. 6.

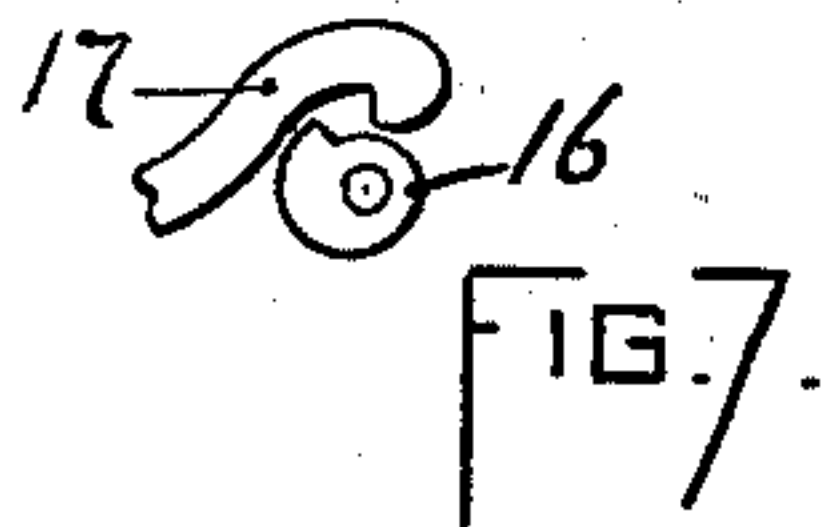


FIG. 7.

WITNESSES:

Henry J. Garceau
Edward L. Allen

INVENTOR:

William Ely
By Henry Marsh, Jr.
ATTY.

UNITED STATES PATENT OFFICE.

WILLIAM ELY, OF PROVIDENCE, RHODE ISLAND.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 613,128, dated October 25, 1898.

Application filed September 5, 1896. Serial No. 604,925. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ELY, a citizen of the United States, residing in the city and county of Providence, in the State of Rhode Island, have invented a new and useful Electric Switch, of which the following is a specification.

In electric switches having knives or arms for connecting contact posts or brushes arranged in pairs or in series and adapted to be actuated to make and break the circuit it is essential that said knives be caused to enter and leave the posts or brushes with a sudden positive movement in order to prevent short-circuiting or the formation of an arc between said knives and posts or brushes.

My invention relates to electric switches of the class described; and it consists in the special and novel construction and arrangement of the knife-actuating mechanism hereinafter described.

In the accompanying drawings, Figure 1 is a side elevation of an electric switch embodying my invention, the knives being shown in contact with the posts to make the circuit. Fig. 2 is a side elevation of the same, showing the knife-actuating mechanism just started in its movement to break the contact between the knives and posts or brushes. Fig. 3 is a similar view showing the knives being raised to overcome the frictional and other resistance between them and the posts or brushes. Fig. 4 is a similar view showing the knives and the circuit broken. Fig. 5 is a plan view of the switch with the knives connecting the posts or brushes to form the circuit. Figs. 6 and 7 illustrate modifications of parts of the mechanism.

Similar reference-numerals indicate like parts where they occur in the drawings.

2 represents the base, provided with upright housings or frames 3 and 4, in which the rotatable shaft 5 is journaled.

6 and 7 are contact posts or brushes secured upon said base, and 8 and 9 are the main wires secured to said posts.

10 and 11 are other contact posts or brushes arranged in line with said posts 6 and 7 and serving also as the binding-posts, to which the service-wires are secured.

The knives or arms 12 and 13 are secured

to an insulated block or plate 14, in turn secured upon the shaft 5. A crank or arm rigidly secured upon said shaft 5 extends at right angles therefrom and is rotatable therewith, the free end of said arm describing or traversing an arc of about ninety degrees in its rotation and said knives moving a corresponding distance simultaneously therewith. To the base or frame at a point preferably outside of the arc described by the free end of said arm 15 in its rotation I pivotally secure one end of a lever 16, and to the same end of said lever I pivotally attach one end of a pawl 17, adapted to engage with its free end the lower or free end of said arm or crank 15 and to partially rotate the latter as actuated by said lever 16, to thereby impart initial movement to said crank to overcome the frictional and other resistance between the knives and the posts or brushes. An extensible spring 18, extending from the free end of said crank to the lever 16 at a point intermediate of the length of the latter, serves to rotate with rapidity the crank in either direction and also serves to complete and accelerate the movement of said crank after the latter has been partially rotated by the action of the pawl 17 in raising the knives from the contact-posts. Said pawl has a limited reciprocating movement as actuated by said lever.

It will be seen that by raising the lever 16 from the position shown in Fig. 1 to the position shown in Fig. 2 the pawl 17 is moved longitudinally, causing the crank 15 to partially rotate, thereby starting the knives sufficiently to overcome the frictional and other resistance between them and the posts or brushes. Further upward movement of the lever to the position shown in Fig. 3 distends the spring 18, which then reacting accelerates the movement of the crank and its connected parts, thereby raising the knives with sudden positiveness into the position shown in Fig. 4 and breaking the circuit. Movement of the lever 16 in the reverse direction rotates the crank and its connected parts to bring the knives into sudden positive contact with the posts or brushes, the pawl 17 moving in advance of and receiving the free end of said crank on the completion of the movement of the latter.

Modifications may be made without departing from the principle or sacrificing the advantages of my invention.

I can cause the pawl 17 to latch onto a tooth 5 or lug formed for that purpose on the face of the lever 16, as I have shown in Fig. 7. The pawl 17 may be provided, as shown in Fig. 6, on each end with a slot adapted to engage with pins or projections on the base or frame 10 and on the lever 16.

I claim as my invention and desire to secure by Letters Patent—

1. In an electric switch having a rotatable shaft, contact parts carried by said shaft, and 15 a crank or arm secured upon said shaft, combined with said parts, the described means for imparting initial movement to said crank and shaft in one direction only, said means consisting of a lever pivoted at one end, and 20 a pawl pivoted at one end to the pivoted end of said lever and adapted with its free end to releasably engage with the free end of said crank, and other means for completing with accelerated movement the rotation of said 25 crank and shaft.

2. In an electric switch having a supporting base or frame, a rotatable shaft journaled therein, a crank or arm secured upon said shaft and rotatable therewith, combined with 30 said parts a lever 16 pivotally attached to said base or frame at a point outside of the arc described by the free end of said crank in its rotation, a pawl 17 pivotally connected at one end to the pivoted end of said lever, and 35 adapted with its free end to releasably engage with the free end of said crank, said lever and said pawl thereby serving to partially rotate

said crank and shaft, and a spring 18 secured to the free end of said crank and to said lever at a point intermediate of the length of the 40 latter and connecting the two, said spring and lever being adapted to serve together as specified to complete with accelerated movement the rotation of said crank and shaft.

3. In an electric switch having a supporting 45 base or frame, a rotatable shaft journaled therein, and a crank or arm secured upon said shaft and rotatable therewith, combined with said parts a lever, 16, pivoted at one end to said base or frame, a pawl, 17, having one 50 end pivotally attached to the pivoted end of said lever, and its opposite or free end capable of releasable engagement with the free end of said crank, said pawl being adapted for limited longitudinal movement as actuated by said lever to thereby give an initial 55 movement to said crank in one direction only, and an extensible spring connecting the free end of said crank with said lever at a point intermediate of the length of the latter, and 60 adapted to serve, as specified, to accelerate and complete the rotation of said crank initiated by said pawl, and also adapted to serve in connection with said lever as the sole means 65 for actuating said crank in the opposite direction.

In testimony whereof I have hereunto set my hand, in presence of two witnesses, this 28th day of August, 1896.

WILLIAM ELY.

Witnesses:

HENRY MARSH, Jr.,
JOHN I. DRAKE.