

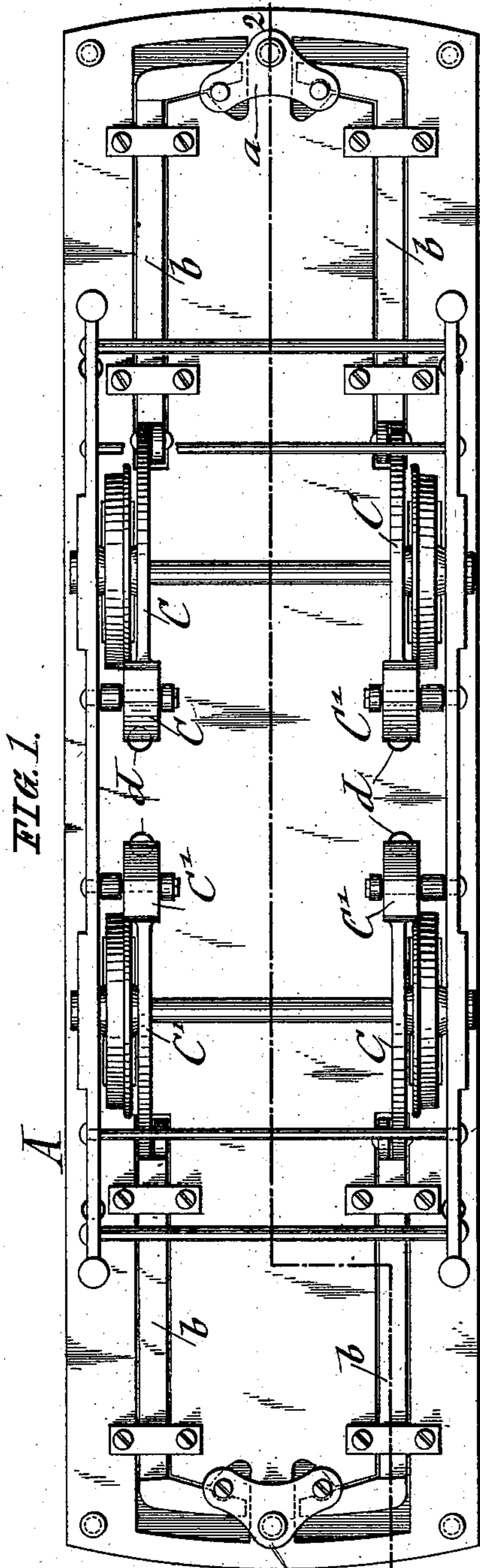
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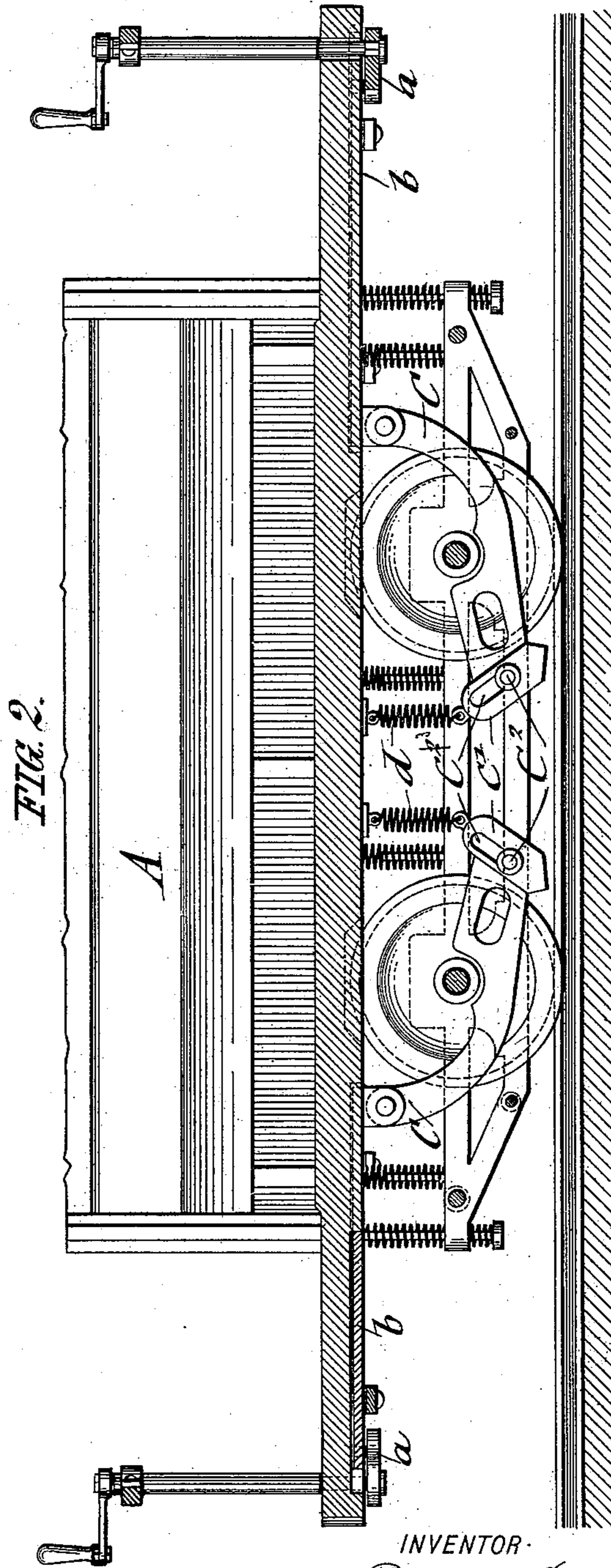
P. BOCH.  
RAILWAY SWITCH.

No. 601,050.

Patented Mar. 22, 1898.



WITNESSES:  
*Prung von Prüfungsämtern*  
*Herrn A. Jastel*



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*Philipp Boch*  
BY *Ernst Raegner*  
ATTORNEYS.

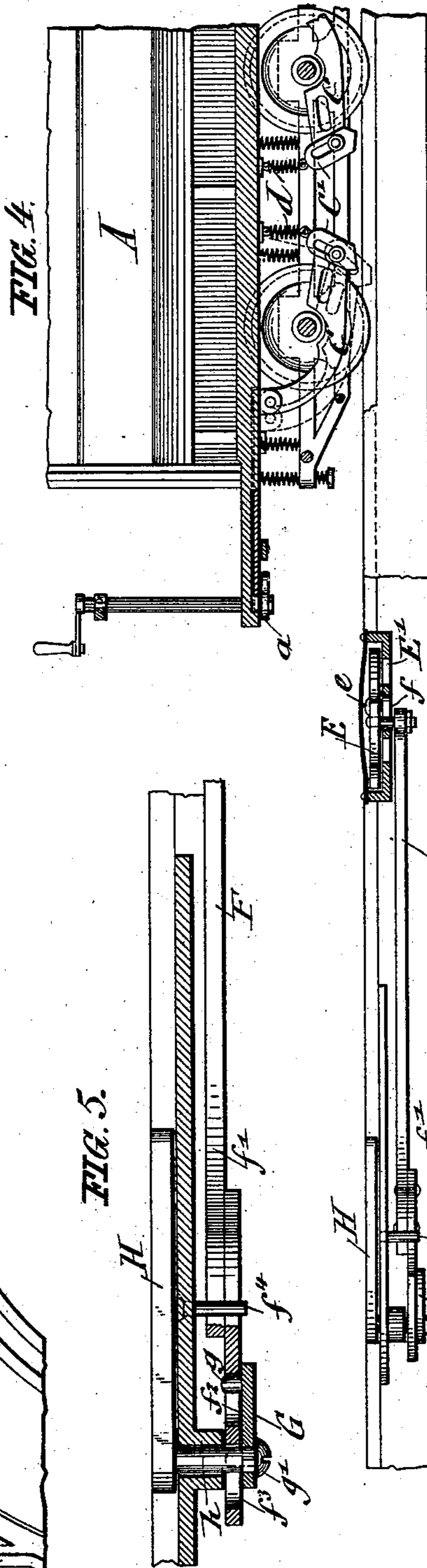
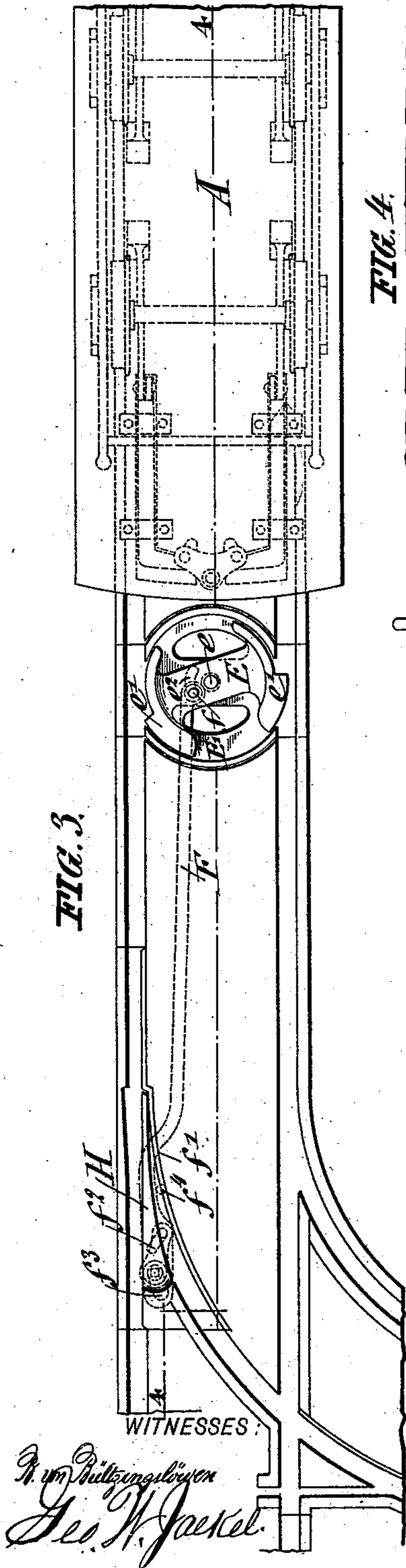
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FIG. 10.

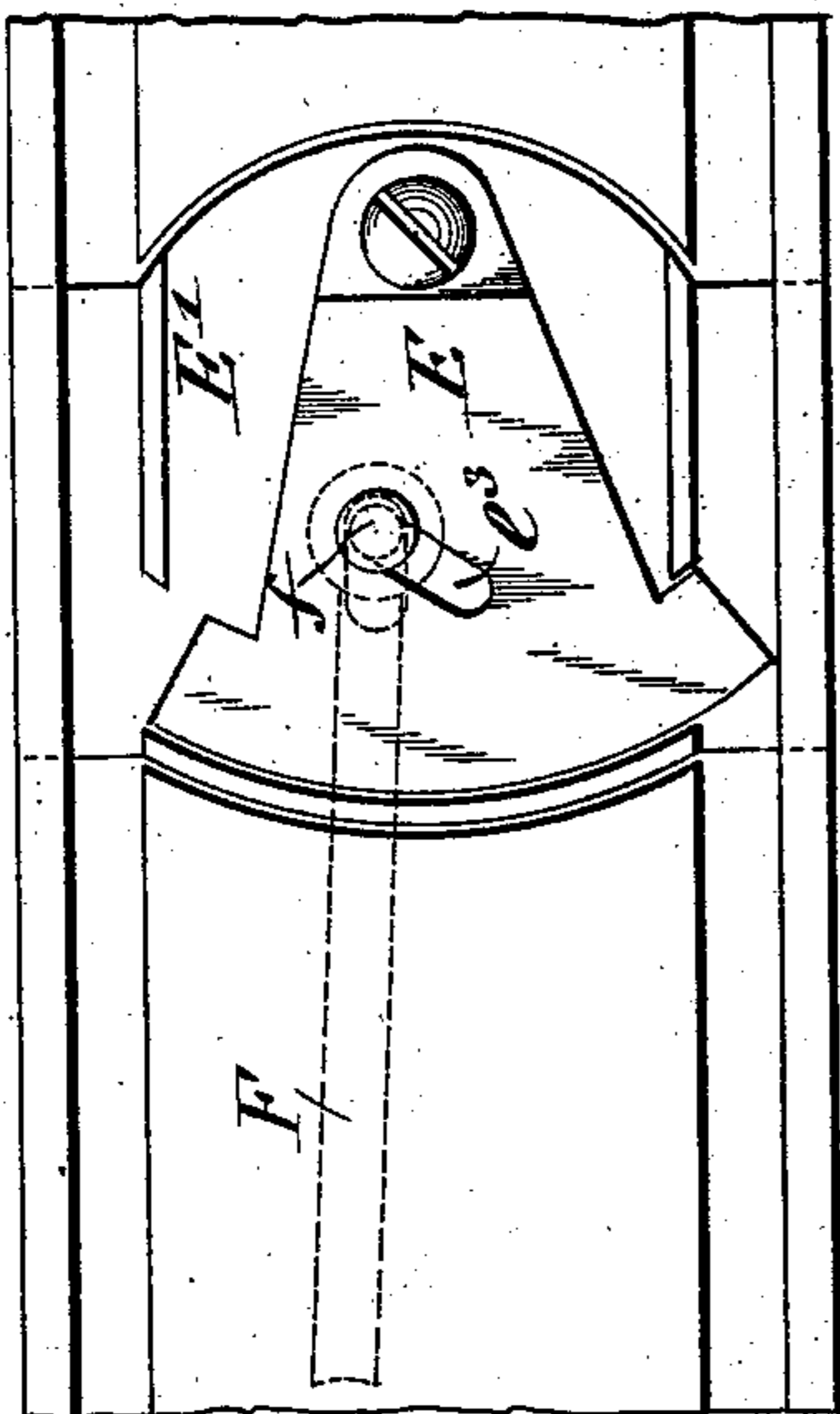


FIG. 12.

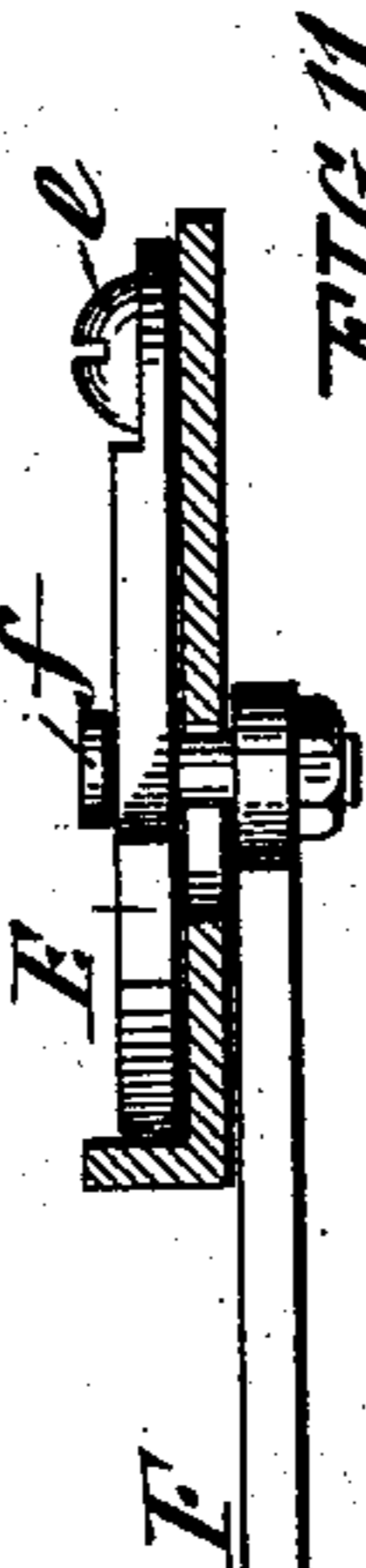


FIG. 11

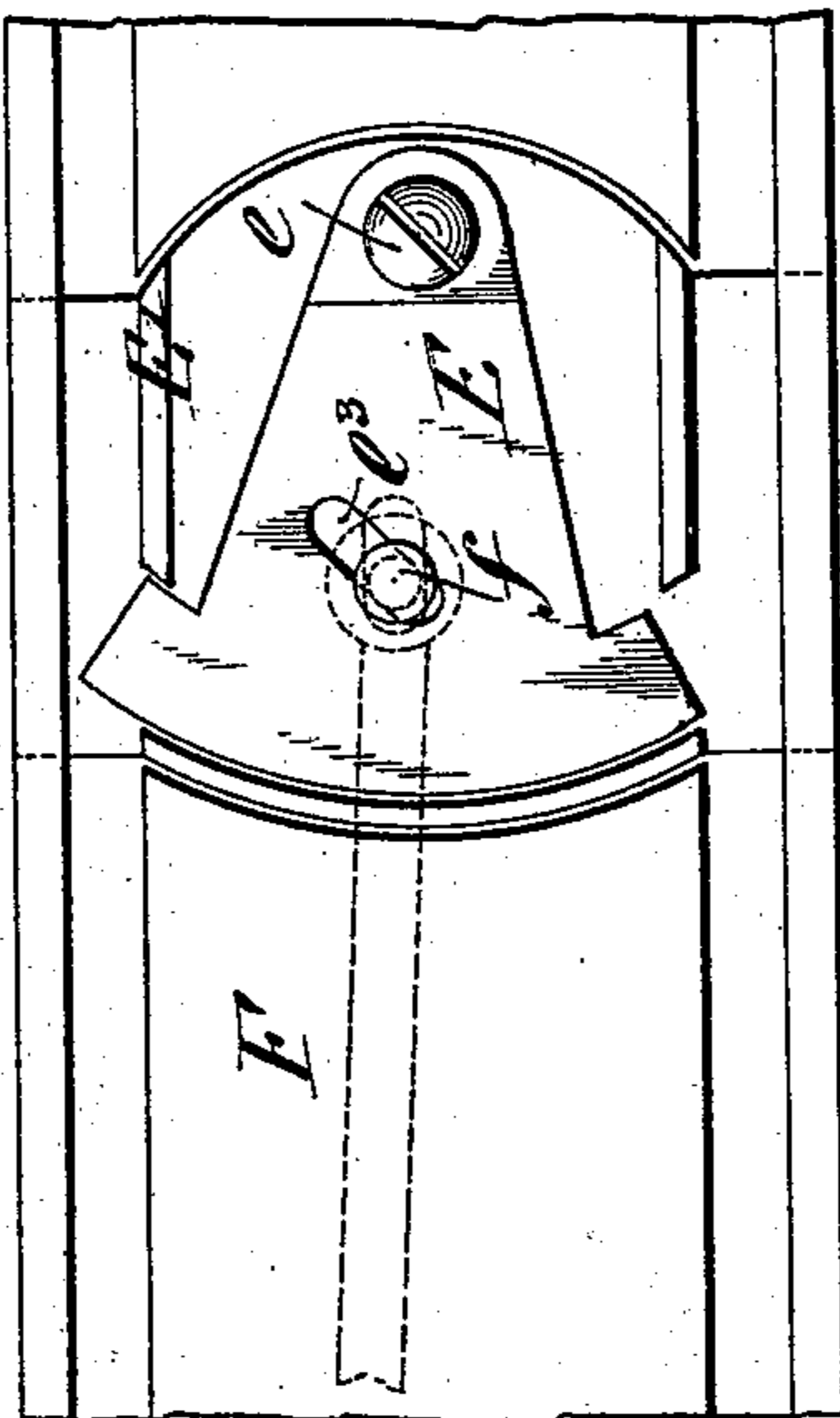


FIG. 8.

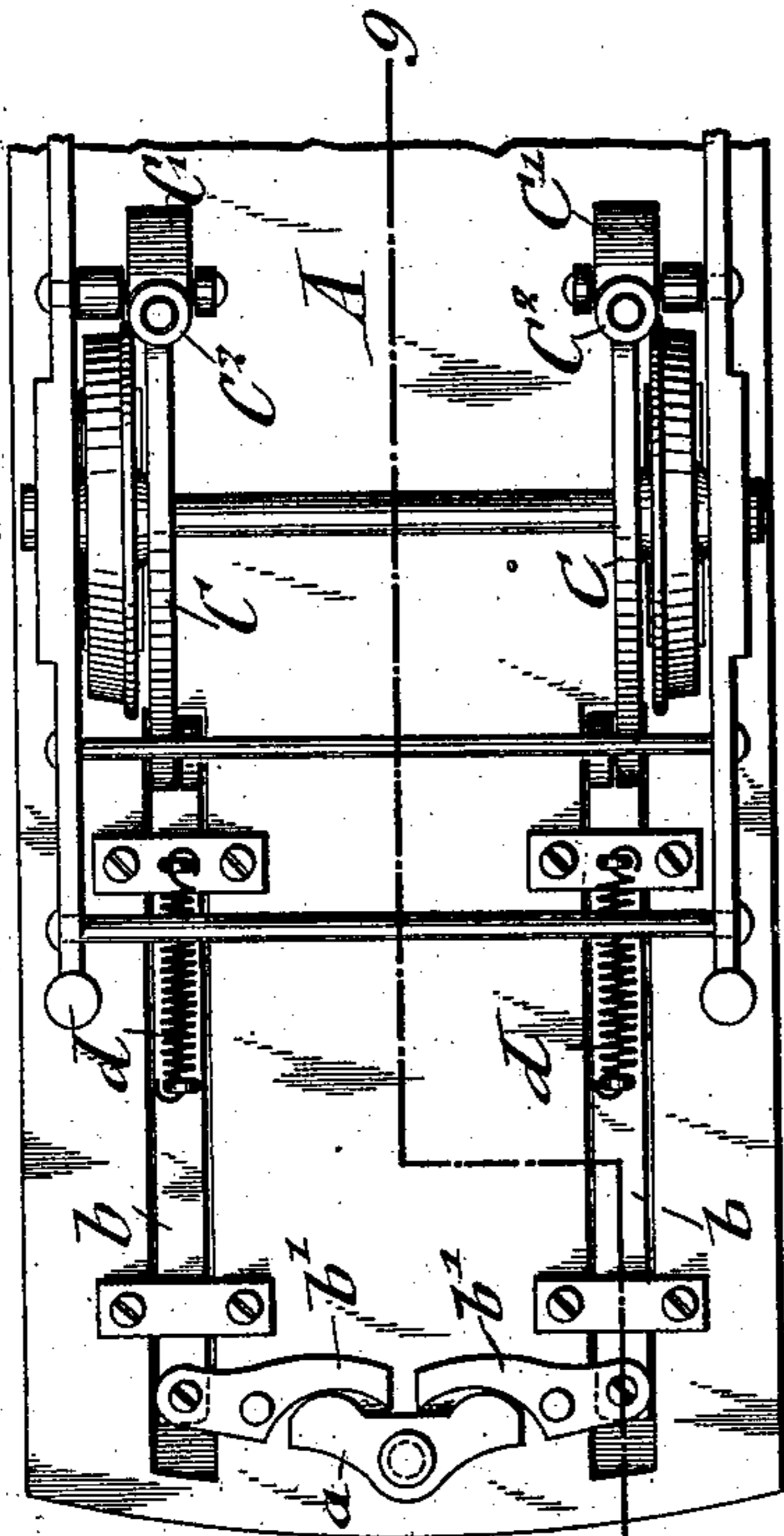
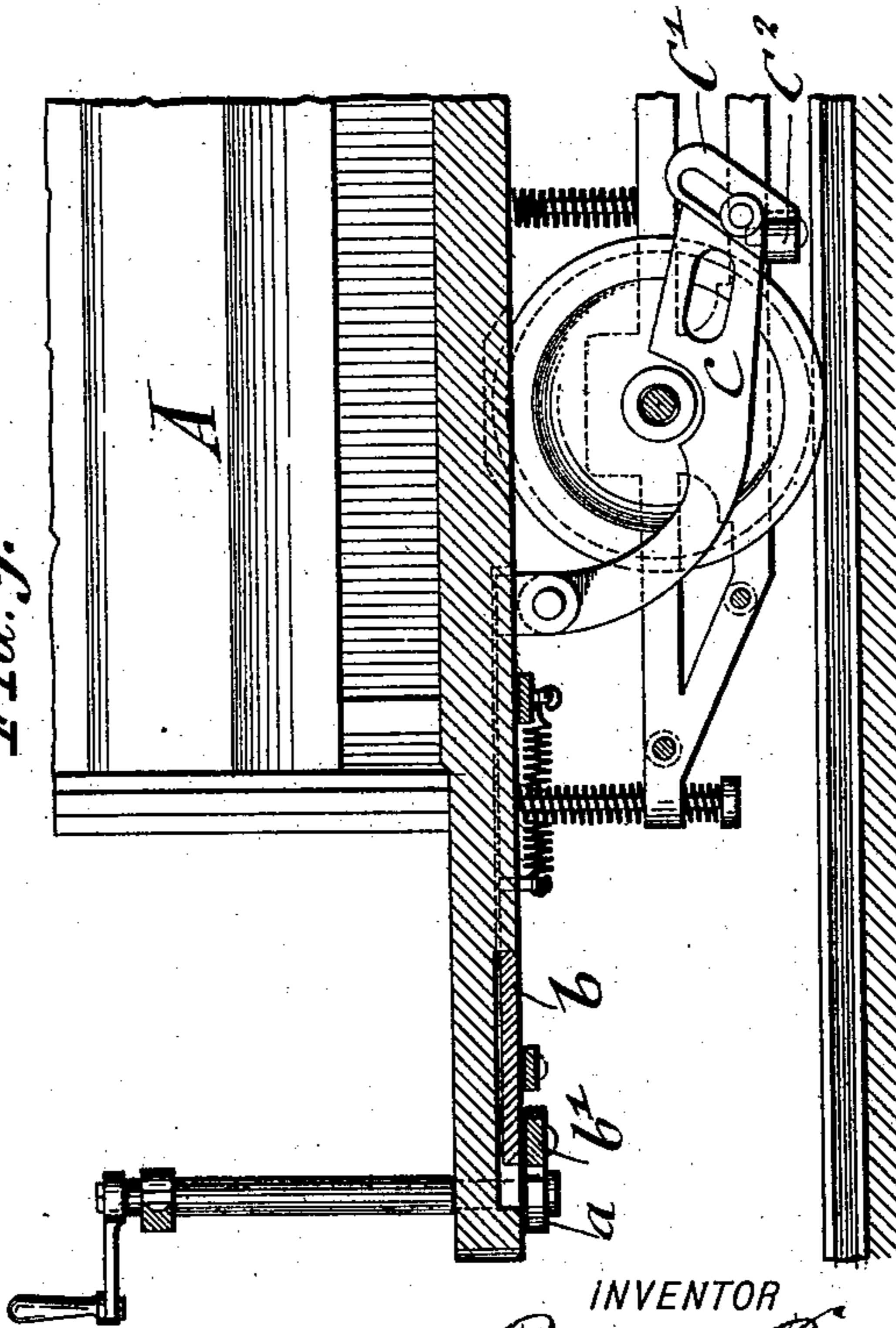


FIG. 9.



WITNESSES:

*Bruggen im Rhydingen*  
*Geo. H. Jaekel*

INVENTOR

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ATTORNEYS.

# UNITED STATES PATENT OFFICE.

PHILIPP BOCH, OF LONG ISLAND CITY, NEW YORK, ASSIGNOR OF TWO-THIRDS TO JOHN D. STRAHMANN AND CHARLES HERRMANN, OF NEW YORK, N. Y.

## RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 601,050, dated March 22, 1898.

Application filed October 22, 1897. Serial No. 656,070. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIPP BOCH, a citizen of the United States, residing at Long Island City, in the county of Queens and State of New York, have invented certain new and useful Improvements in Railway-Switches, of which the following is a specification.

My invention relates to automatic switches especially adapted to the use of street-railroads; and its object is to provide an automatic switch which will be certain in its action and which can be operated from the car while traveling in either direction.

The invention consists of a switch-plate, a switch-bar connected thereto, a link working in a slot in the end of the switch-bar, a switch-tongue connected by said link with the switch-bar, and a striking-arm pivoted to the under side of the car and adapted to be thrown into and out of engagement with the switch-plate, so as to rotate the same.

The invention consists, further, of details of construction hereinafter described, and defined in the claims.

Referring to the drawings, Figure 1 is a view in elevation of the under side of a car provided with my improved mechanism for operating the switch-plate. Fig. 2 is a section thereof on the line 2 2. Fig. 3 is a top view of the automatic switch mechanism applied to an ordinary street-railroad and showing in dotted lines the operating mechanism of the car. Fig. 4 is a section thereof on the line 4 4. Fig. 5 is a view, partly in section, of the switch-tongue and its connection with the switch-bar. Figs. 6 and 7 are views in elevation of the switch-tongue and its connections with the switch-bar, showing the relative position of the parts when the switch-tongue is in its open and closed positions. Fig. 8 is a view in elevation of the bottom of one end of the car, showing a modified form of the operating mechanism of the car. Fig. 9 is a section thereof on the line 9 9. Figs. 10 and 11 are views in elevation of the switch-plate and its connections with the switch-bar, showing the positions assumed when the switch is open and closed. Fig. 12 is a central longitudinal section of Fig. 10.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents a car of any ordinary or preferred form provided with my improved switch-operating mechanism. To the front and rear of the car is arranged a suitable hand-operated lever *a*, which are adapted to operate the rods *b*, two of which are provided at each end of the car and which are guided in ways upon each side of the bottom of the car. In the form shown in Fig. 1 the rods *b* are provided with an arm or extension which is adapted to be engaged by a pin at each side of the hand-levers *a a*. Each of the rods *b* is pivotally connected to a curved arm *c*, which extends downwardly below the axle of the car and carries at its extremity a slotted lug *c'*, through which slot passes a pin *c<sup>2</sup>*, secured to the frame of the car-truck and by which the lug is guided. The lugs *c'* are forwardly inclined with respect to the curved arms *C*, and the slot *c<sup>3</sup>* in the lugs *c'* is similarly inclined, which causes the lug to descend when forced against the pin *c<sup>2</sup>* by the forward movement of the rods *b*.

A suitable retracting-spring *d* is attached to the end of the lug *c'* and is secured to some portion of the car or truck, or, if preferred, the spring may connect with the end of the lug operated from the other end of the car. The curved arms *c* are so shaped that when the hand-levers are in their normal position the lugs *c'*, carried by the arms *c*, are raised above the trucks by the resilience of the springs *d*; but when the levers are operated the curved arms *c* are forced forward, carrying the lugs *c'* with them, against the resistance of the springs *d* and causing the lugs to descend by reason of the pin *c<sup>2</sup>* working in the inclined slot *c<sup>3</sup>* until it is in position to strike the switch-plate *E* and thus operate the switch.

The mechanism above described is shown as secured to the under side of the car and at the outer edges thereof; but it is obvious that these striking-lugs could be located more or less toward the center of the car, thus rendering unnecessary the use of so large a switch-plate as that shown.

In the form shown in Figs. 8 and 9 the rods *b* are pivotally connected to a lever *b'*, which is pivoted to the bottom of the car and pro-

jects transversely thereto into the path of the hand-lever  $a$ , by which it is adapted to be struck and operated. Instead of attaching the retracting-springs  $d$  to the striking-lug  $c'$  they may be connected with the rod  $b$  and the bottom of the car. The striking-lug  $c'$  may be provided with a friction-roller  $C^2$ , as shown in Figs. 8 and 9, instead of terminating in a solid angular point, as shown in Fig. 2.

The switch-plate  $E$  is constructed substantially in the form of a disk and is pivoted at  $c$  to a supporting-plate  $E'$ , set into the road-bed between the rails of the track. A suitable cover may be provided for the supporting-plate  $E'$ . A shouldered projecting portion  $e'$  is provided upon diametrically opposite sides of the switch-plate  $E$ , one of which is adapted to overlap the flange of the rail at one side of the track in position to be struck by one of the striking-lugs  $c'$ , carried by the car. The projecting portion  $e'$  is so arranged that when it lies in the path of the striking-lug  $c'$  on one side of the track the other side of the track is clear, as shown in Fig. 3. The switch-plate  $E$  may be substantially in the form of a circular disk, as shown in Fig. 3, or it may be substantially in the form of a segment, as shown in Figs. 10 and 11. The switch-plate  $E$  is provided near its central point with a perforation which is engaged by a pin  $f$  of a switch-bar  $F$ , located beneath the road-bed. A short curved slot  $e^2$  is provided in the supporting-plate  $E'$  to allow play for the pin  $f$  as the rod is moved by the rotation of the switch-plate  $E$ . When the switch-plate  $E$  is made in the form shown in Figs. 10 and 11, it is provided with an inclined slot, in which the pin  $f$  of the switch-rod  $F$  engages. When the switch-plate is struck by the lug  $c'$ , it is swung from one side to the other, and the edges of the inclined slot  $e^3$  working against the pin  $f$  causes the forward- and backward movement of the switch-bar  $F$ . The opposite end of the switch-bar  $F$  is offset or curved at  $f'$  and is provided near its extremity with two slots  $f^2 f^3$ , which incline nearly at right angles toward each other. A guide-pin  $f^4$  extends downwardly from a supporting-plate set in the road-bed and bears against the curved side of the switch-bar  $F$ . A link  $G$ , having at one end a lug  $g$ , which projects into the slot  $f^2$ , works on the under side of the switch-bar  $F$ . At the opposite end of the link  $G$  is provided a squared recess  $g'$ , into which is secured the squared end of a shaft  $h$  of the switch-tongue  $H$ . This shaft  $h$  projects up through the slot  $f^3$  of the switch-bar  $F$ . By this construction when the switch-plate  $E$  is struck by one of the lugs  $c'$  it is partially rotated, thus advancing or retracting the switch-bar  $F$ . This movement of the switch-bar  $F$  causes the

turning of the link  $G$  by means of the lug  $g$ , working in the slot  $f^2$ , and the switch-tongue  $H$  is thus thrown into its open or closed position, as shown in Figs. 6 and 7.

Having thus described my invention, what I claim is—

1. In an automatic switch, the combination with a car provided with a switch-actuating mechanism of a switch-plate mounted in a slotted supporting-plate and adapted to be rotated by the switch-actuating mechanism of the car, a switch-bar pivoted to the switch-plate by a pin passing through the slot of the supporting-plate and secured to the said switch-plate, and a switch-tongue operated by said switch-bar, substantially as set forth.
2. In an automatic switch, the combination with a car provided with a switch-actuating mechanism of a switch-plate provided with an inclined slot and mounted in a slotted supporting-plate, projections on said switch-plate adapted to be struck by the switch-actuating mechanism of the car, a switch-bar provided with a pin adapted to pass through the slot of the supporting-plate and to engage the inclined slot of the switch-plate, and a switch-tongue operated by said switch-bar, substantially as set forth.
3. In an automatic switch, the combination with a switch-plate of a car provided with hand-levers, a bar connected thereto and located on either side of the car and adapted to be moved longitudinally by said hand-levers, curved arms pivoted to said bars and forwardly-inclined striking-lugs attached thereto and provided with a forwardly-inclined slot, a retracting-spring, and a pin passing through said slot and secured to the car-frame, whereby the forward movement of the said curved arms causes the striking-lug to descend so as to engage with and operate the switch-plate, substantially as set forth.
4. In an automatic switch, the combination with a switch-plate, of a car provided with suitable hand-levers, a bar guided in ways on either side of the car, a lever pivoted to the car and pivotally connected to the end of said bar and adapted to be operated by said hand-lever, curved arms pivotally connected with the said bars, a forwardly-inclined lug attached to said arms and provided with an inclined slot, a retracting-spring and a pin secured to the car and engaging the said slot, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PHILIPP BOCH.

Witnesses:

PAUL GOEPEL,  
S. E. SMITH.