

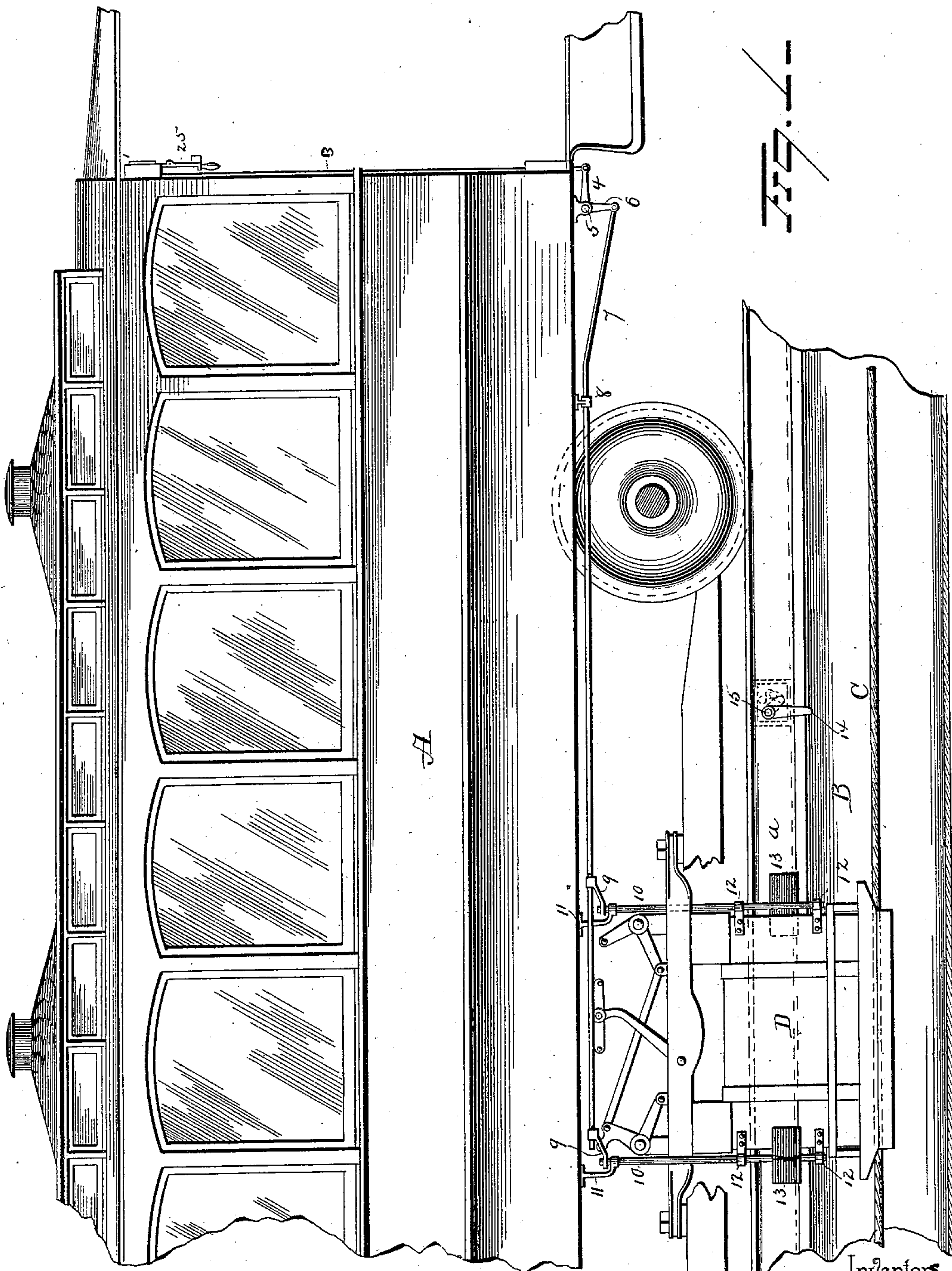
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5 Sheets—Sheet 1.

W. M. WOOD & J. C. MILLER.  
CABLE RAILROAD.

No. 557,320.

Patented Mar. 31, 1896.



Witnesses  
*E. J. Nottingham*  
*C. J. Downing*

Inventors  
*W. M. Wood*  
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By *H. A. Seymour*  
Attorney

(No Model.)

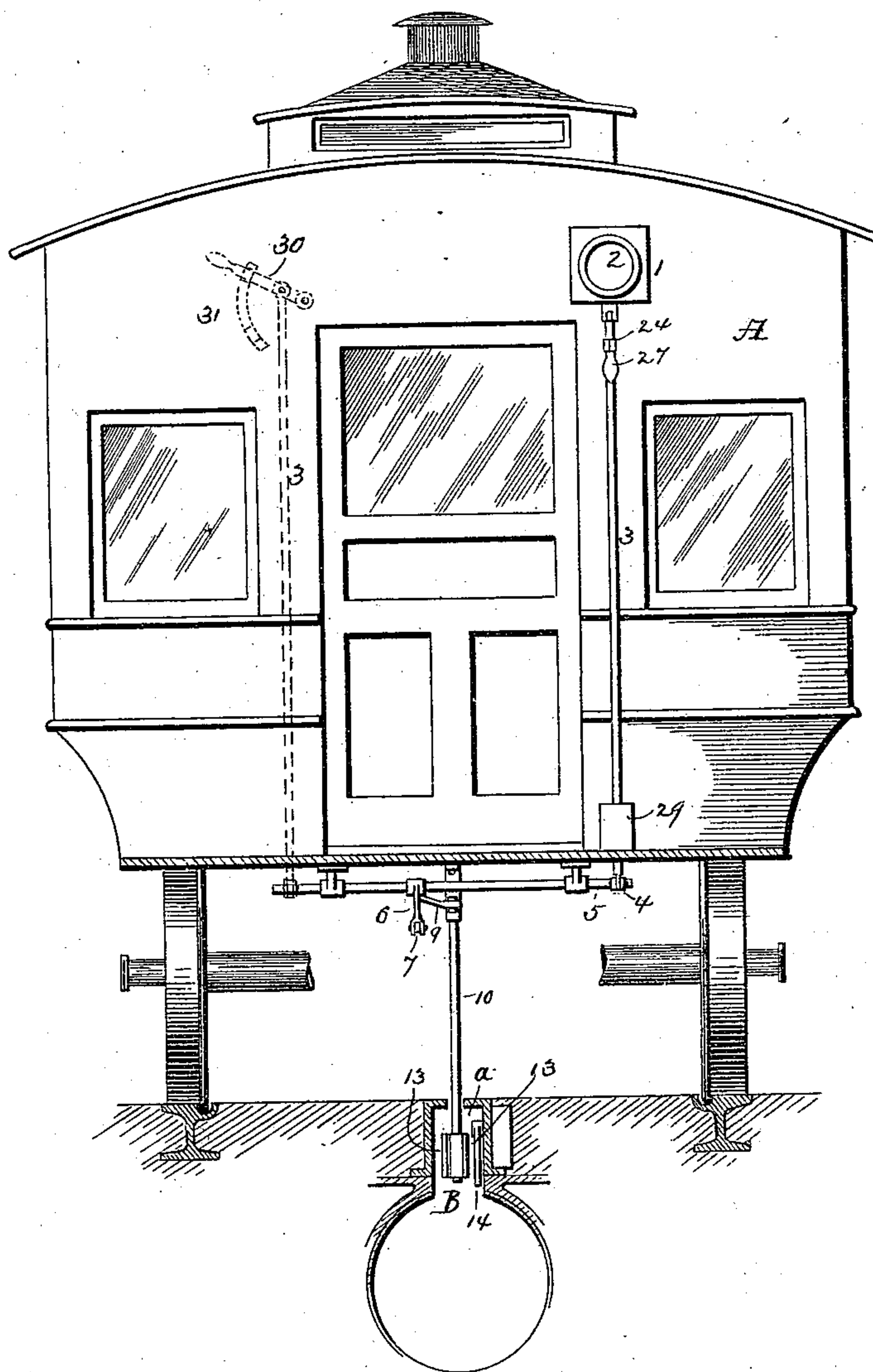
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Fig. 2.



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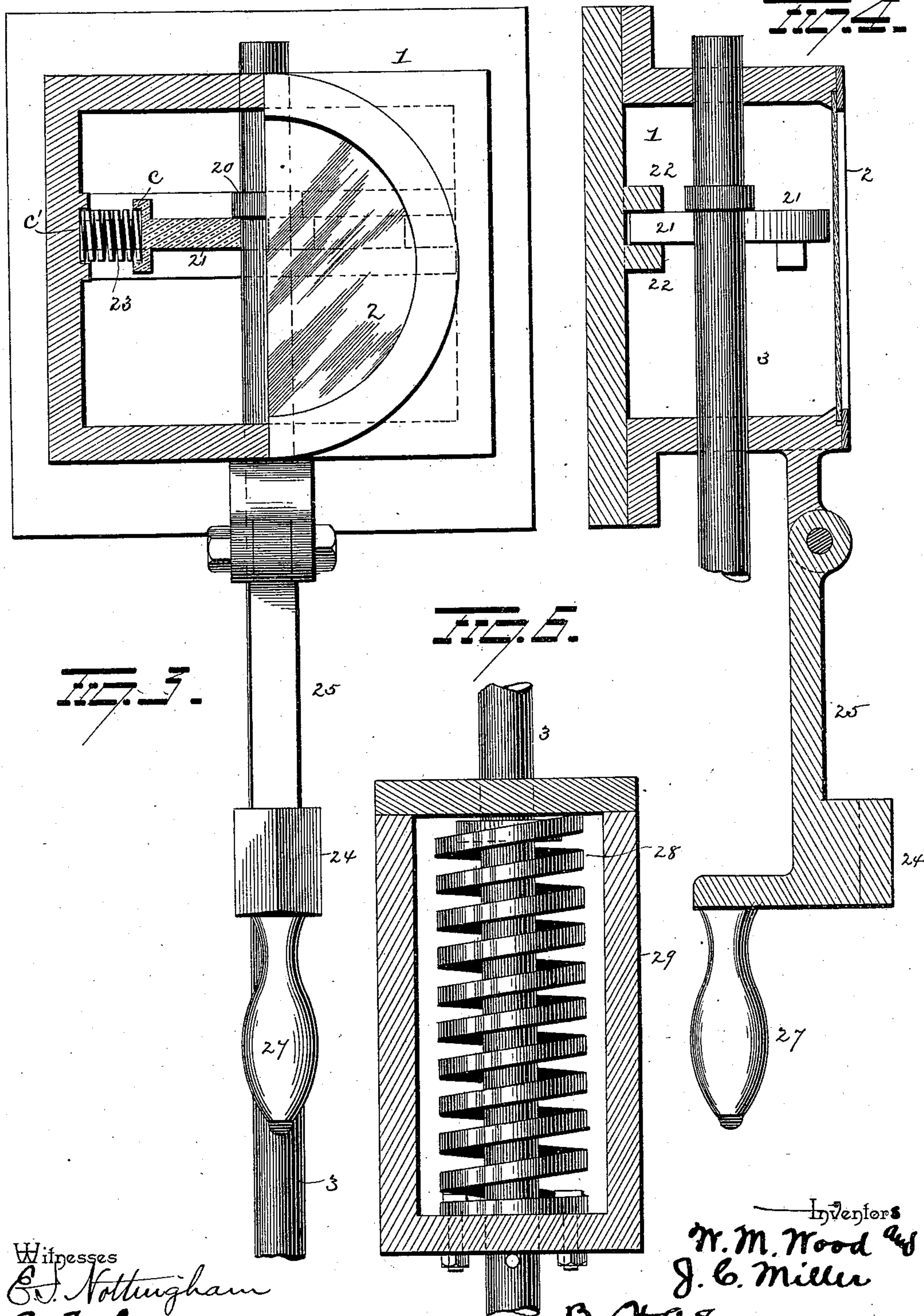
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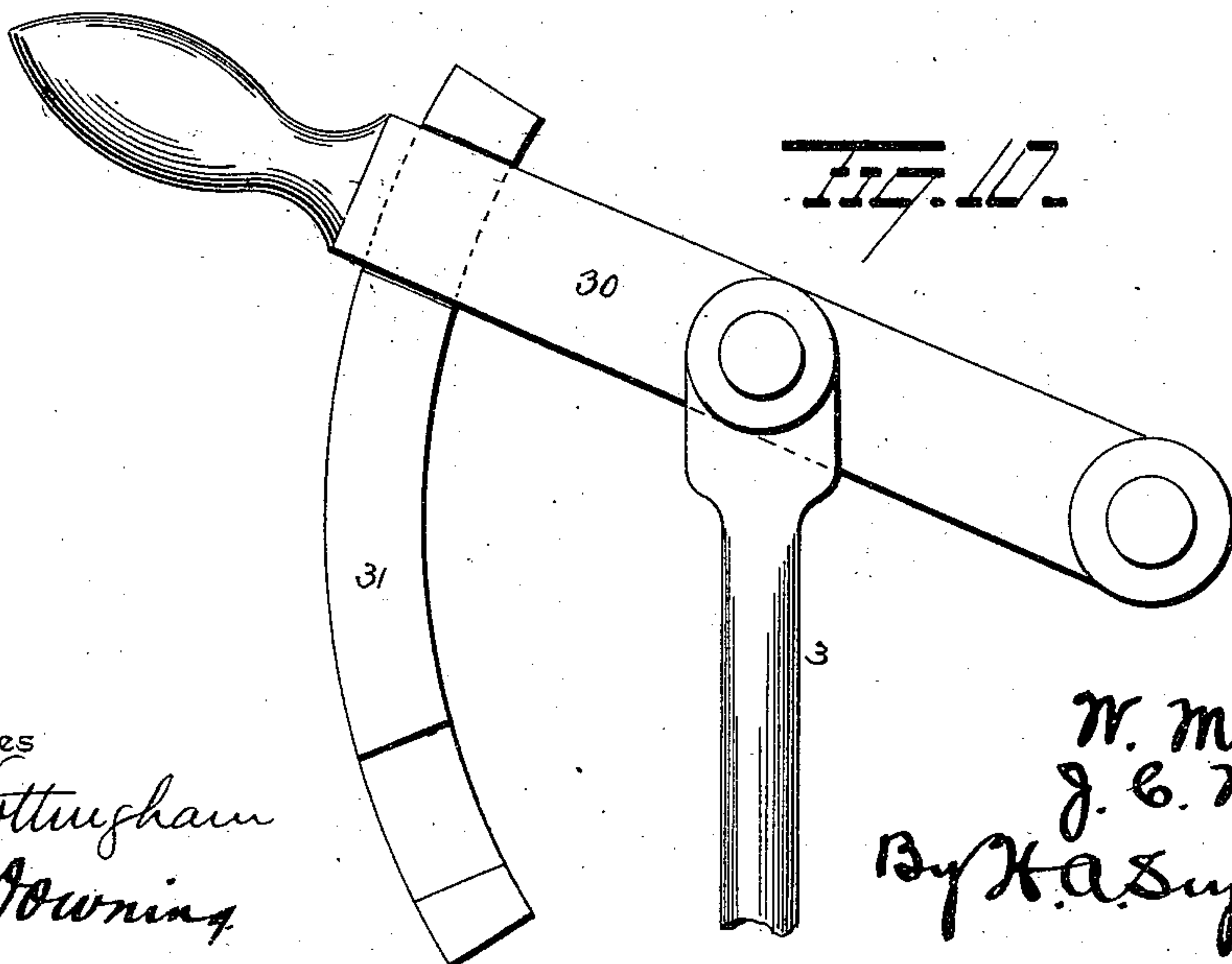
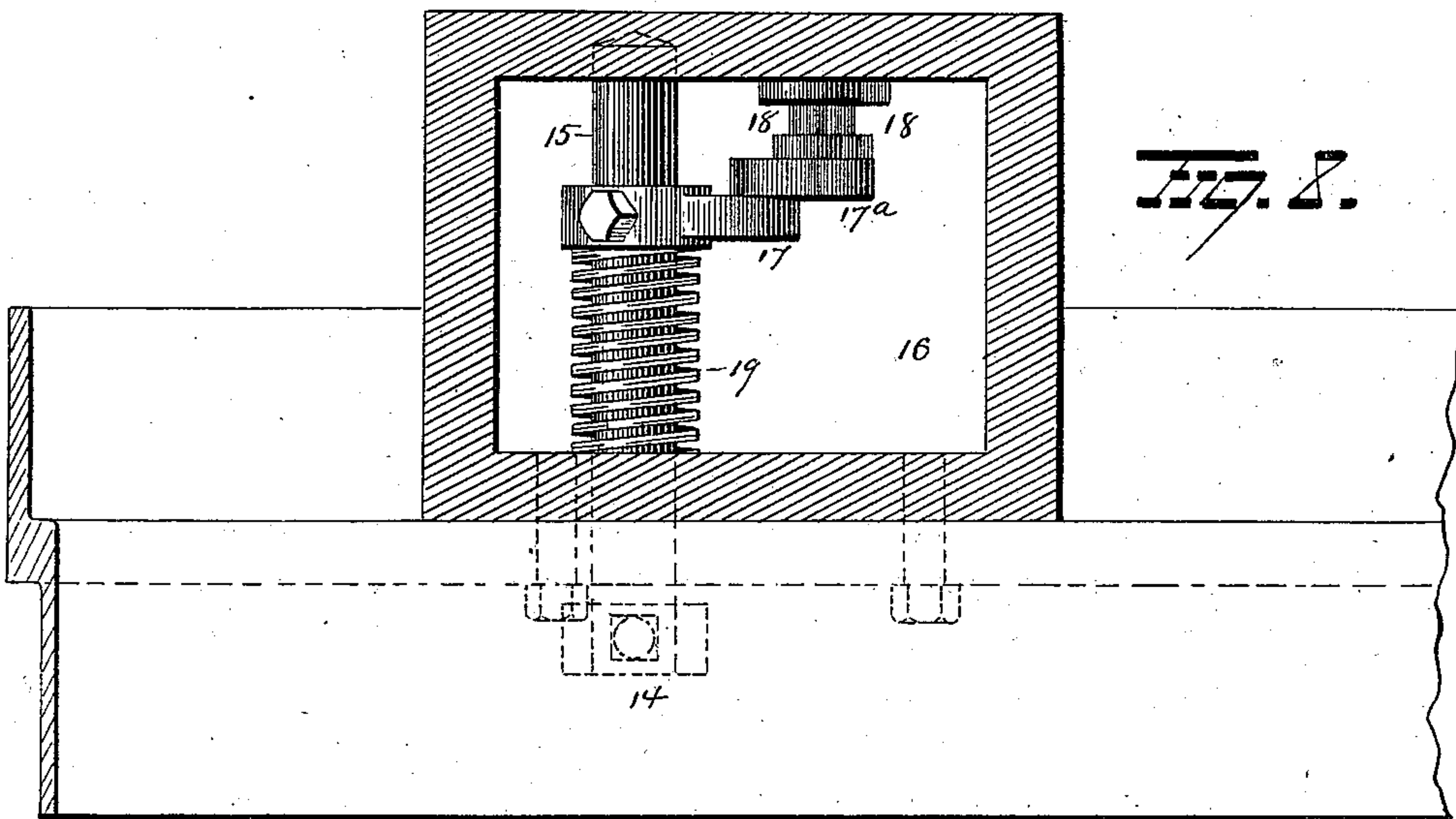
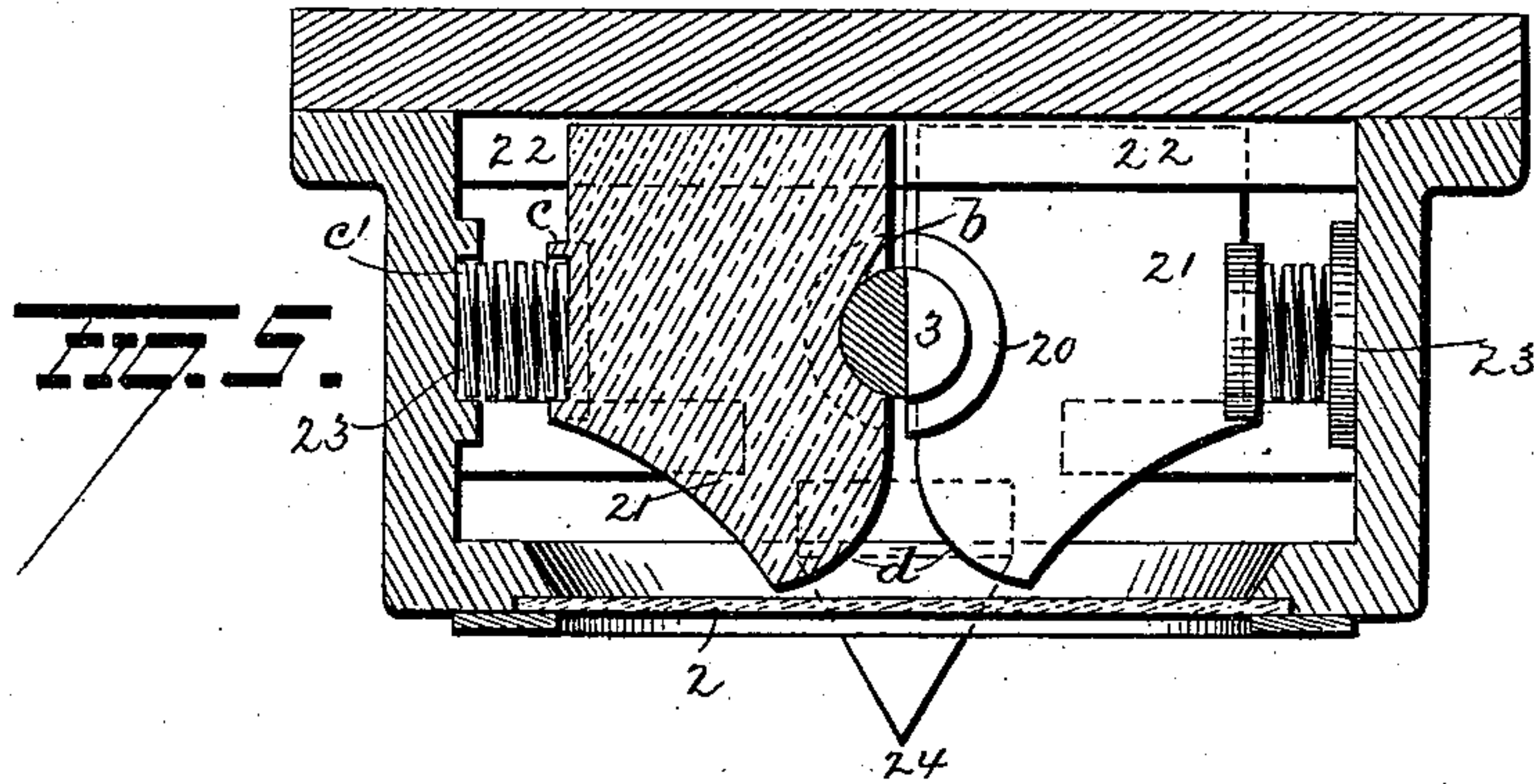
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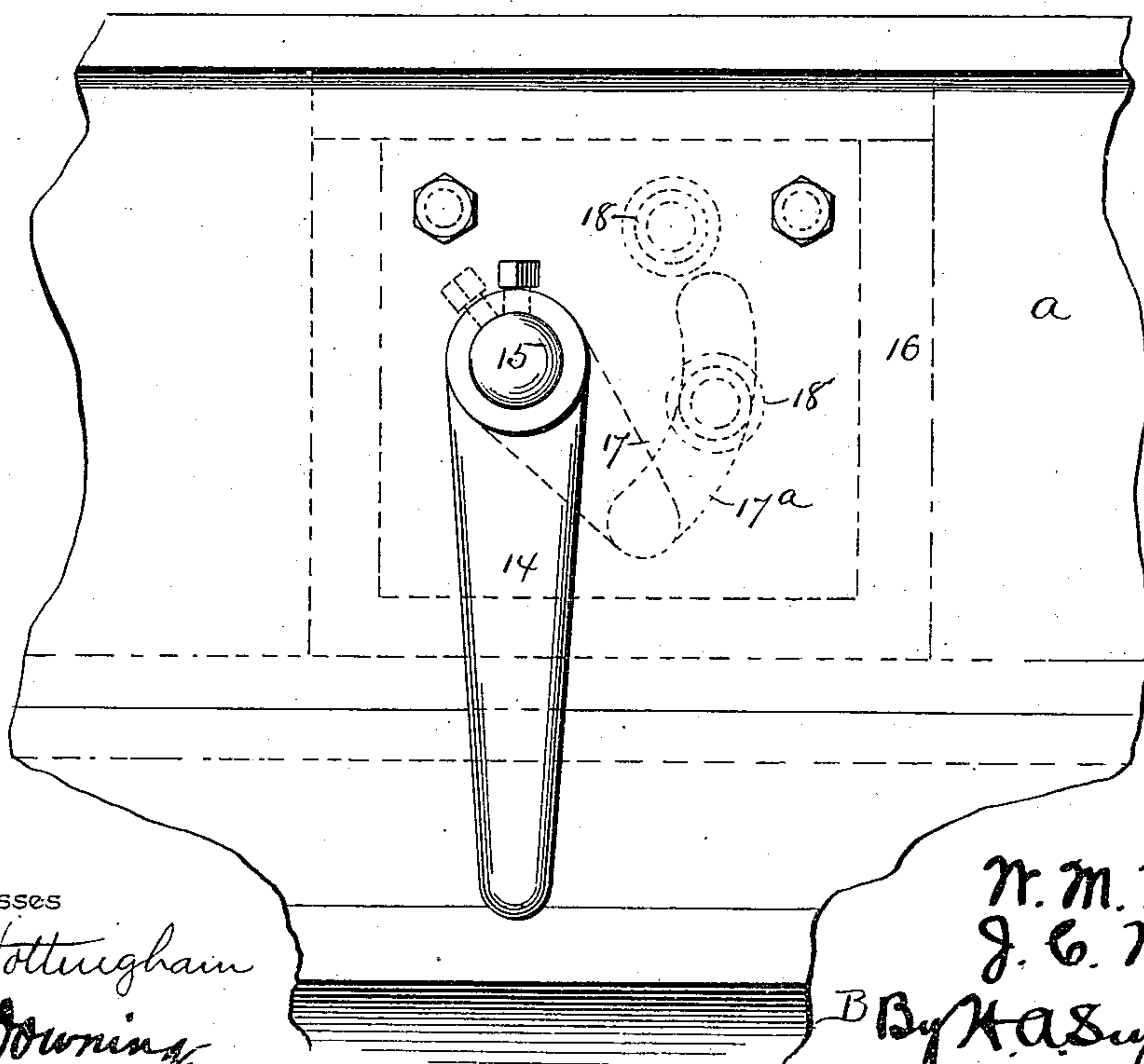
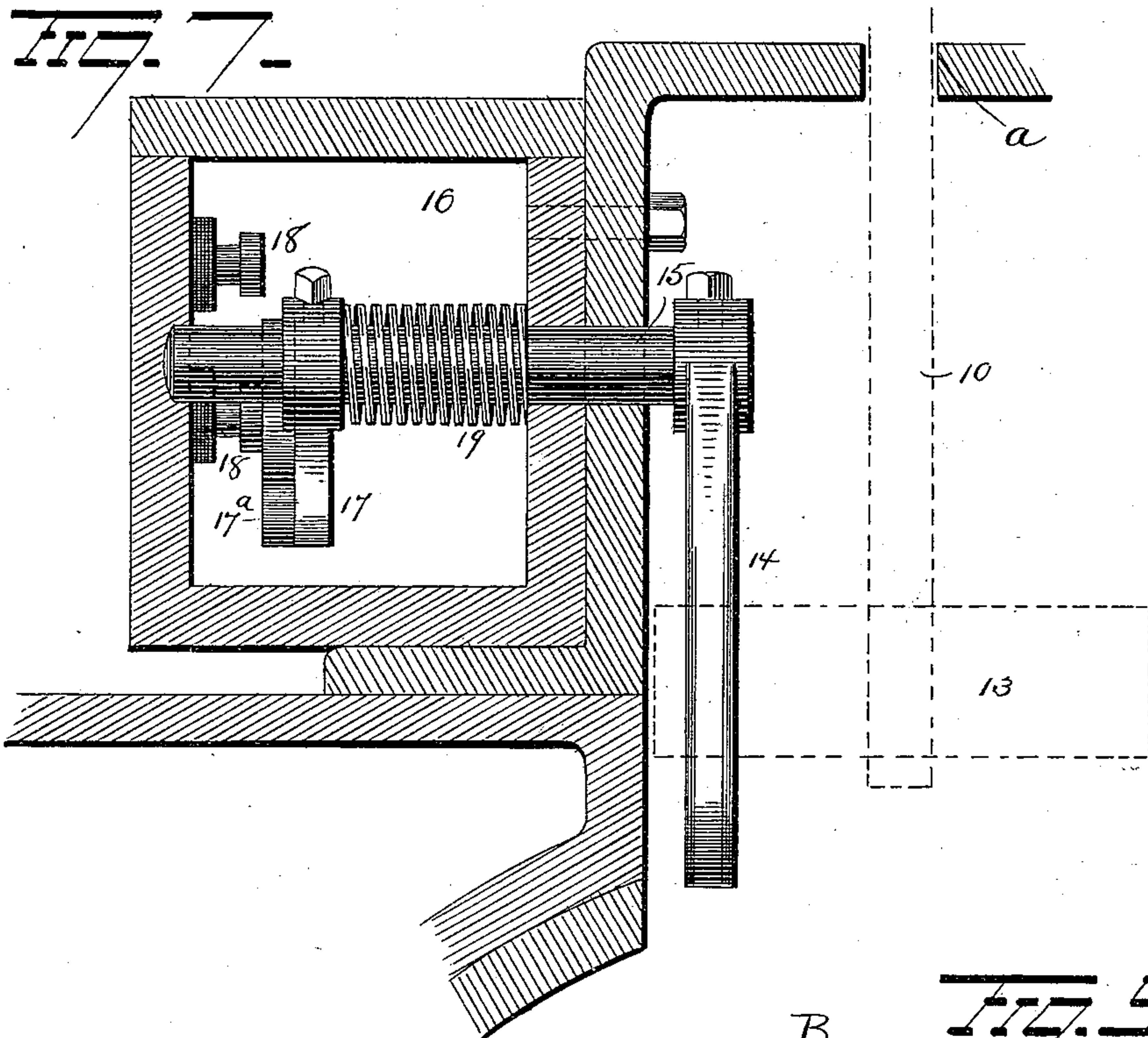
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# UNITED STATES PATENT OFFICE.

WILLIAM M. WOOD AND JAMES C. MILLER, OF ELMIRA, NEW YORK, ASSIGNORS OF ONE-THIRD TO CHARLES F. WRIGHT, OF SUSQUEHANNA, PENNSYLVANIA.

## CABLE-RAILROAD.

SPECIFICATION forming part of Letters Patent No. 557,320, dated March 31, 1896.

Application filed August 26, 1895. Serial No. 560,617. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM M. WOOD and JAMES C. MILLER, residents of Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Cable-Railroads; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in cable-railways, and more particularly to electrical appliances adapted to be operated from the car for controlling the operation of the machinery which drives the cable, whereby the latter can be quickly stopped in case of accident.

One object of our invention is to provide a cable-car with devices which can be operated quickly and practically instantaneously to close or open an electric circuit through suitable stop mechanism, clutch devices, signals or other apparatus located at the powerhouse, whereby to stop the cable quickly in case of accident or for other reason.

Another object is to so construct and arrange the devices on the car that their weight will be supported wholly by the car-body and not by the grip; and a further object is to produce appliances for the purpose stated which shall be simple in construction, easy to manipulate, cheap to manufacture, sure in operation, ready of application to any cable-railroad system and which shall be effectual in all respects in the performance of their functions.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a car having our improvements applied thereto and also showing a section of the cable-conduit with our improvements therein. Fig. 2 is an end view of a car and a cross-section of a portion of the cable-conduit, showing our improvements. Figs. 3, 4, 5, 6, 7, 8, and 9 are views illustrating

details. Fig. 10 is a view of a modification of a portion of the mechanism.

A represents a car; B, the conduit; C, the cable, and D the grip carried by the car and adapted to grip the cable. To the end of the car a box or casing 1 is secured and provided with a glass front 2. The top and bottom of the box or casing 1 are perforated for the accommodation of a rod or bar 3, which is made of sufficient length to extend through the bottom of the car or the platform thereof, where it is pivotally connected with a crank-arm 4 projecting from a shaft 5. The shaft 5 is also provided with a crank-arm 6, to which one end of a rod 7 is pivotally connected. From this construction it will be seen that the shaft 5 and crank-arms 4 and 6 constitute a bell-crank lever between the rods 3 and 7. The rod 7 is mounted in a suitable bearing 8 secured to the car and is connected with crank-arms 9 9 at the upper ends of vertical shafts 10 10. The shafts 10 10 are mounted at or near their upper ends in brackets 11 11, secured to the car and the weight of said shafts and devices secured to them are supported by said brackets. The shafts 10 depend parallel with the ends of the grip D and are maintained in proper relation thereto by means of small brackets or guides 12 secured to and projecting from the ends of the grip. To that portion of the shafts 10 which passes through the throat *a* of the conduit arms or wings 13 13 are secured and normally disposed parallel with the side faces of the grip.

When the shafts 10 are caused to oscillate, (in a manner presently explained,) the arms or wings 13 will be turned at right angles to the grip and made to project laterally therefrom in both directions, so as to be in the path of a lever 14 mounted in the conduit, regardless of the direction in which the car is running. The lever 14 is carried at one end of a shaft 15 mounted in a box or casing 16 secured to the framework of the conduit, preferably in the throat thereof. An arm 17 is secured to the shaft 15 within the casing 16 and provided at its end with a contact-plate 17<sup>a</sup> adapted to move over contact-blocks 18 in the box or casing 16. These contact-



blocks are connected in circuit with an electric stop mechanism, electric clutch mechanism or electric signals at the power-house of a cable-road, so that when the contact-plate 17<sup>a</sup> is moved so as to make contact with both blocks 18 the electric circuit, through the electric mechanism at the power-house, will be closed and said mechanism caused to operate to stop the cable. The contact arm or plate 17<sup>a</sup> is maintained in its normal position out of contact with one of the blocks 18 by means of a spring 19 coiled on the shaft 15 and secured at its respective ends to said shaft and the box or casing containing it.

At a point within the box or casing 1 the rod 3 is provided with a fixed collar 20 adapted to rest on two yielding blocks 21 21, the latter being recessed, as at *b*, for the accommodation of the rod 3, and by these blocks the rod 3 is maintained in its normal elevated position. The blocks or slides 21 are adapted to slide between guides or flanges 22 on the box or casing 1 and are maintained snug against the rod 3 under the collar 20 by means of springs 23 disposed between the sides of the box or casing and the outer edges of the sliding blocks, suitable recesses or cups *c c'* preferably being provided for the reception of the respective ends of said springs. The front edges of the sliding blocks 21 are made with curved lips *d*, so that when a wedge-shaped block 24 is forced between them the blocks 21 will be moved laterally in opposite directions and thus made to release the rod 3. The wedge-shaped block 24 is carried by a comparatively heavy arm 25 hinged to a lug 26 projecting downwardly from the casing 1, and said arm is provided with a handle 27. The rod 3 will, when released by the blocks 21 as above described, be made to move quickly and with some force by means of a spring 28 which encircles said rod and is secured at its respective ends thereto and to a casing 29 which incloses it.

Should an accident or some other cause necessitate the prompt stopping of the cable, it will simply be necessary for the motorman to throw the arm 25 upwardly so as to cause the wedge-shaped block 24 to break the glass front of the casing 1 and enter between the sliding blocks or plates 21, thus separating the latter and releasing the rod 3. When the rod 3 is thus released, it will move quickly and forcibly and transmit motion, through the medium of the crank arms and shafts above described, to the vertical shafts 10 at the ends of the grip and cause the arms or wings 13 to assume positions at right angles to the grip. The arms or wings 13 will now be in position to strike the lever 14 of one of the circuit-closers located in the conduit, said circuit-closers being placed at regular intervals throughout the length of the road. The electrical stop apparatus included in circuit with said circuit-closers can thus be operated from the car and the cable stopped quickly.

It is not essential that two shafts 10 and

wings or arms 13 be provided, but it is preferable in order to insure the proper operation of the circuit-closers.

Instead of the devices above described for maintaining the rod 3 in its normally-elevated position and releasing it the said rod may be pivotally connected to a pivoted operating-lever 30 and said lever provided with a dog or tooth to engage a ratchet-bar 31, as shown in Fig. 10 and in dotted lines in Fig. 2.

Numerous slight changes might be made in the details of construction of our invention without departing from the spirit thereof or limiting its scope, and hence we do not wish to limit ourselves to the precise details of construction herein set forth; but,

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a cable-railroad, the combination with a conduit and a car, of circuit-closers located in said conduit, an oscillatory shaft carried by the car and depending into the conduit, an arm or wing on said shaft adapted to be made to operate said circuit-closer, a crank-arm at the upper end of said shaft, a horizontal rod connected with said crank-arm, a vertical rod, a bell-crank lever between said rods and means for releasing and moving said vertical rod, substantially as set forth.

2. In a cable-railroad, the combination with a conduit and a car, of circuit-closers in the conduit, a shaft carried by the car and having an arm to engage said circuit-closer, a vertically-movable rod on the car, means for maintaining said rod normally elevated, connections between said rod and shaft, and means for releasing said rod, substantially as set forth.

3. In a cable-railroad, the combination with a conduit and a car, of circuit-closers in the conduit, a shaft on the car having an arm adapted to be made to engage said circuit-closers, a vertically-movable rod, connections between said rod and shaft, means for maintaining said rod normally elevated, means for releasing the rod and a spring for causing said rod to forcibly descend, substantially as set forth.

4. In a cable-railroad, the combination with a conduit and a car, of a shaft carried by the car and depending into the conduit, circuit-closers in the conduit, an arm on the shaft adapted to be made to operate the circuit-closers, a crank-arm on the shaft, a horizontal rod connected with said crank-arm, a vertical rod, a bell-crank lever between said rods, means for normally retaining said vertical rod in its elevated position, a lever for operating said retaining devices whereby to release the vertical rod, and means for causing said rod to descend, substantially as set forth.

5. In a cable-railroad, the combination with a conduit and a car, of circuit-closers in the conduit, an oscillatory shaft carried by the car and depending into the conduit, an arm on said shaft to engage the circuit-closers, a



vertically-movable rod on the car, a casing through which said rod passes, a collar on the rod, yielding blocks in the casing adapted to be disposed under said collar, connections  
5 between said vertical rod and oscillatory shaft, and a lever having a block adapted to enter between said yielding blocks and force them apart to release the vertical rod, substantially as and for the purpose set forth.

10 6. The combination with a cable-conduit and a car, of circuit-closers in the conduit, a device carried by the car for operating said circuit-closers, a movable rod carried by the car and connected with said device, means  
15 for maintaining said rod normally elevated and means for lowering said movable rod, whereby to transmit motion to the device for operating the circuit-closers, substantially as set forth.

20 7. The combination with a cable-conduit and a car, of circuit-closers in the conduit, a device carried by the car for operating said circuit-closers, a movable rod connected with said device, a collar on said rod, spring-pressed  
25 plates normally disposed under said collar and means for separating said plates, whereby to release the rod, substantially as and for the purpose set forth.

30 8. The combination with a cable-conduit and a car, of circuit-closers in the conduit, a device carried by the car for operating said circuit-closers, a casing on the car, a vertically-movable rod passing through said casing and connected with the device which op-

erates the circuit-closers, a collar on said rod, 35 spring-pressed plates or blocks in the casing normally disposed under said collar, said plates or blocks having curved or beveled lips, a pivoted arm, a wedge-shaped block on the arm adapted to be made to enter between 40 said curved or beveled lips and separate the spring-pressed plates or blocks to release the vertically-movable rod, substantially as set forth.

9. The combination with a cable-conduit 45 and a car, of circuit-closers in the conduit, a device carried by the car for operating said circuit-closers, a vertically-movable rod on the car connected with said device, a casing through which said rod passes, said casing 50 having a breakable front, a collar on the rod, spring-pressed plates normally disposed under said collar, a spring for forcing the rod downwardly, a pivoted arm and a block carried by said arm and adapted to pass through 55 the breakable front of the casing and separate the spring-pressed plates, whereby to release the vertically-movable rod, substantially as set forth.

In testimony whereof we have signed this 60 specification in the presence of two subscribing witnesses.

WILLIAM M. WOOD.  
JAMES C. MILLER.

Witnesses:

JOHN WOOD,  
JOSEPH P. BRIGGS.