

(No Model.)

2 Sheets—Sheet 1.

T. H. ROBERTS & R. SEIBERT.
AUTOMATIC SWITCH FOR CABLE ROADS.

No. 415,471.

Patented Nov. 19, 1889.

Fig. 1.

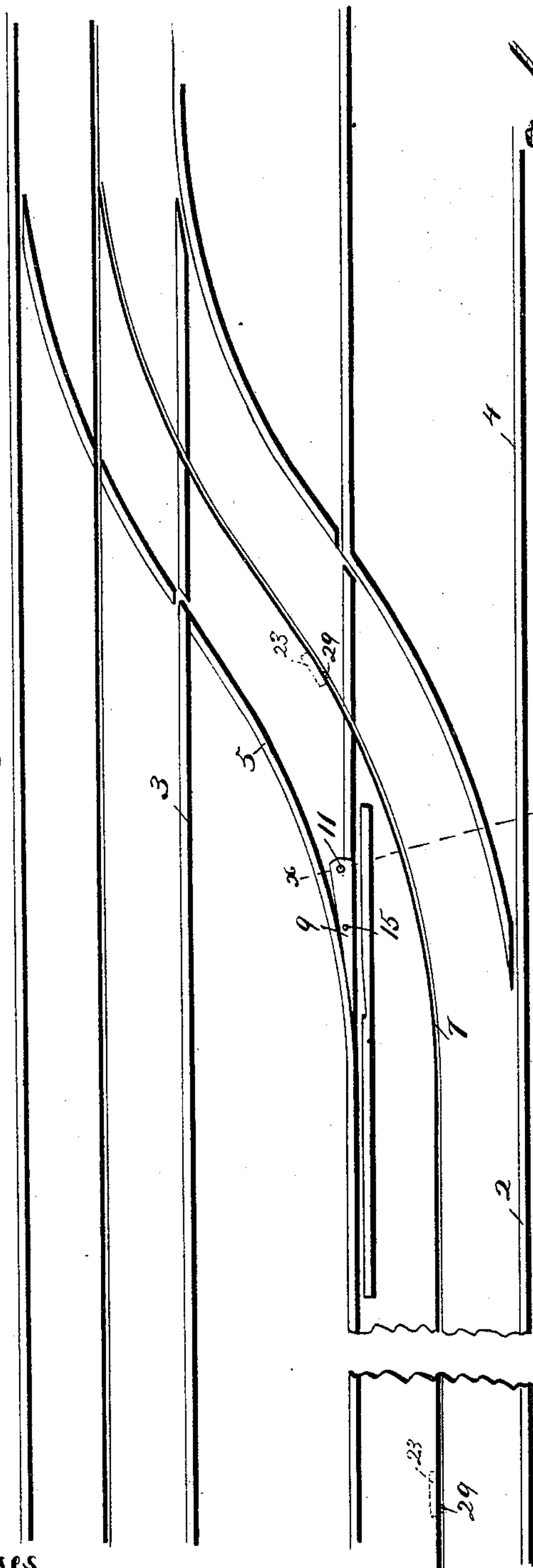
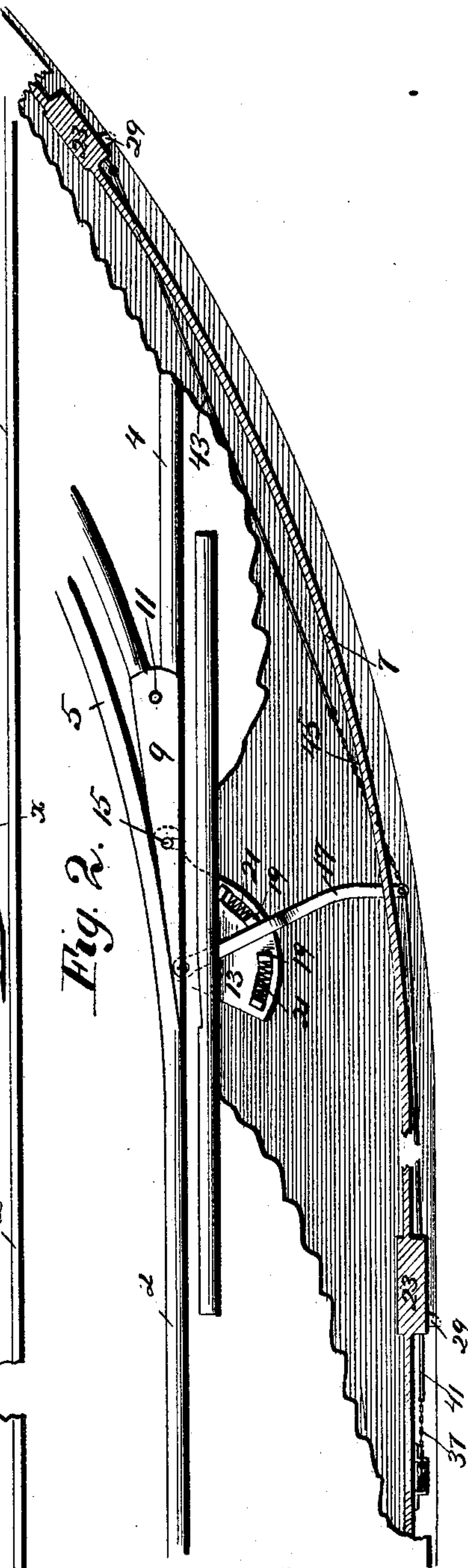


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

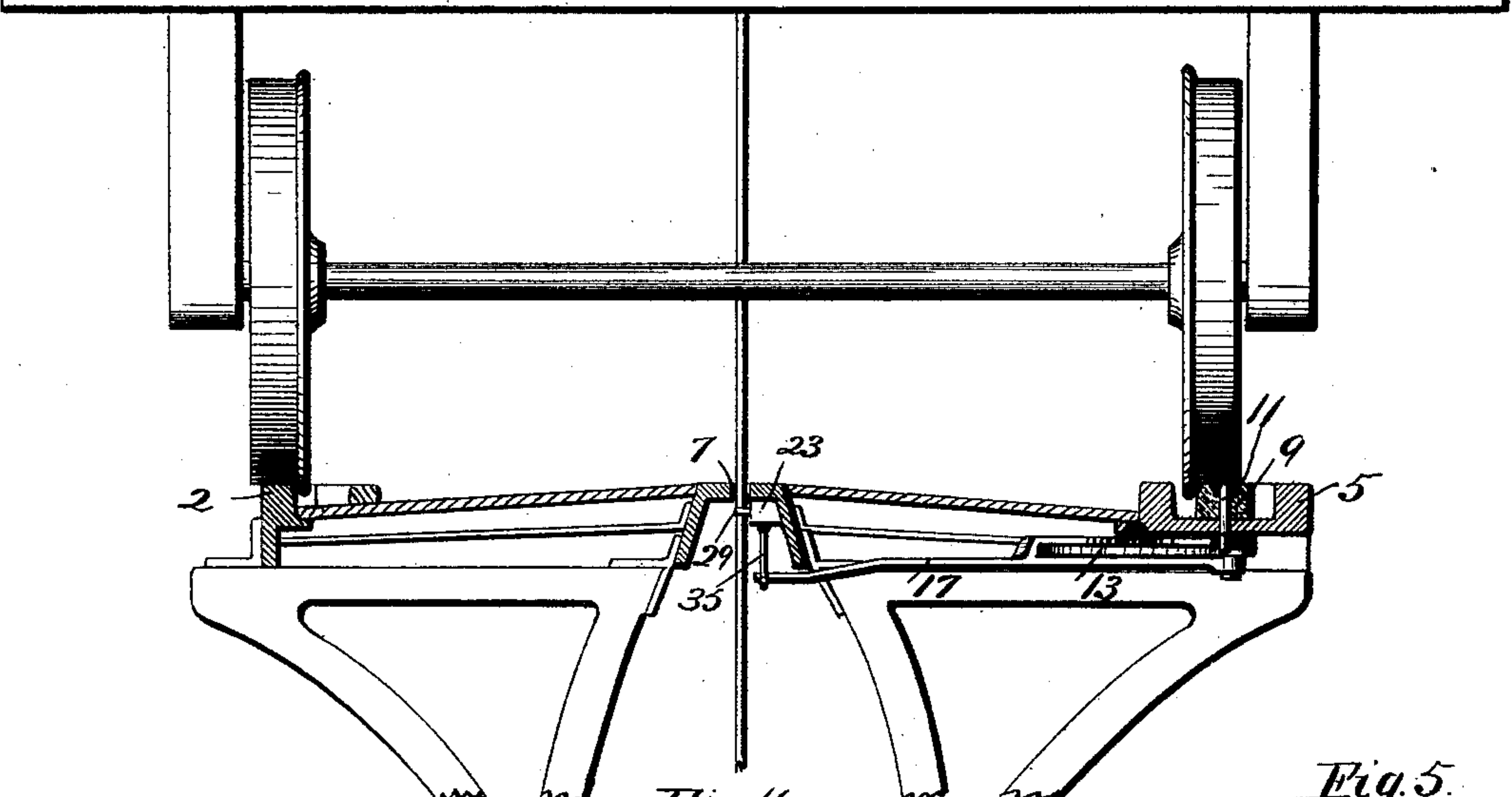


Fig. 4.

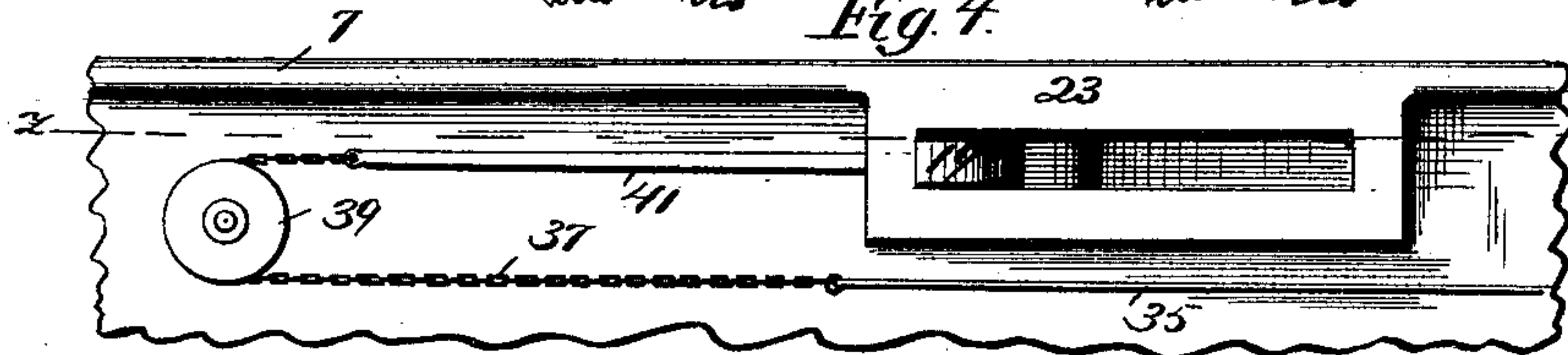


Fig. 5.

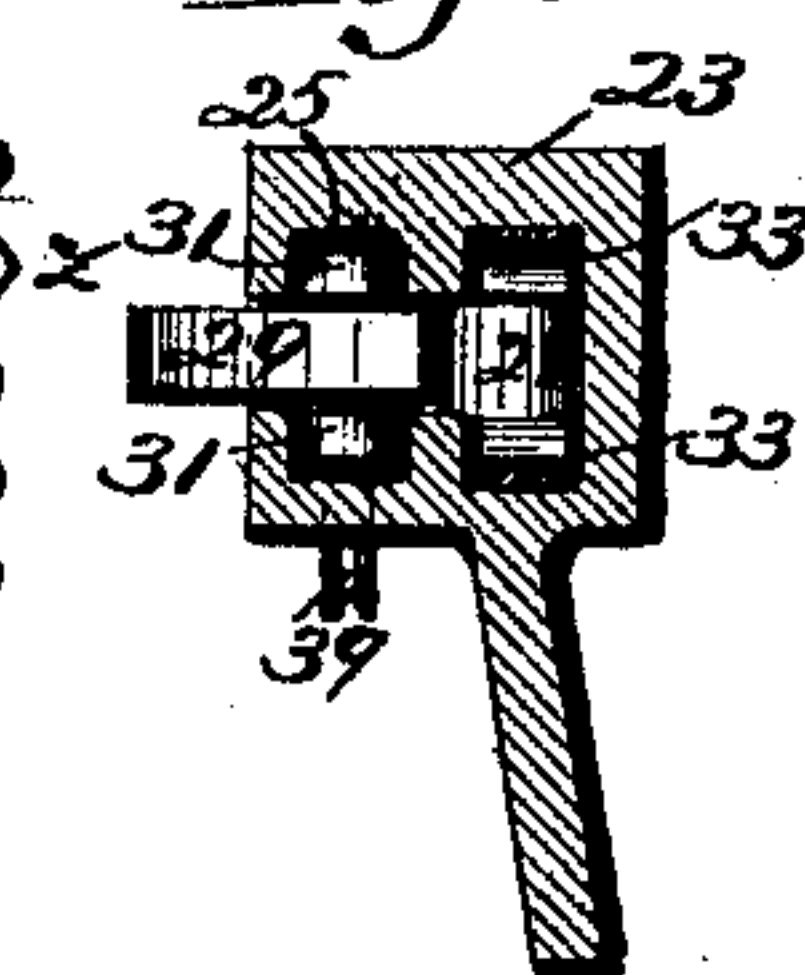


Fig. 6.

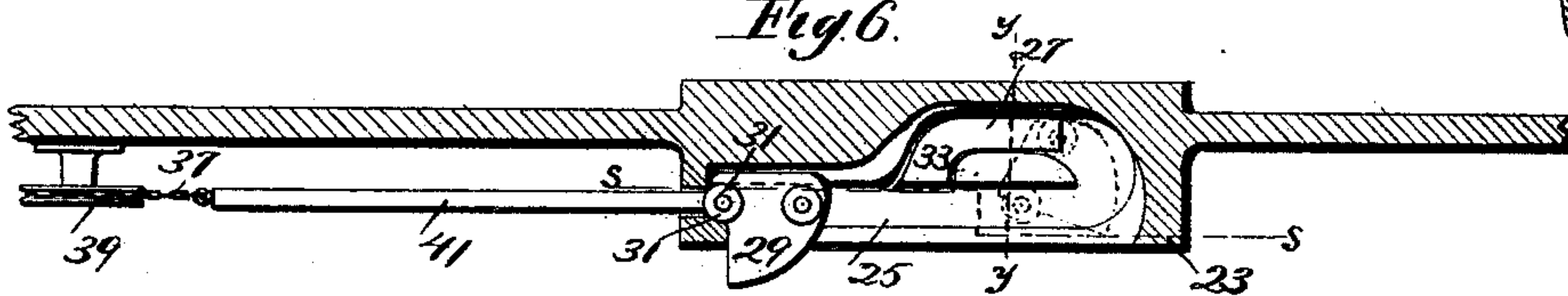


Fig. 7.

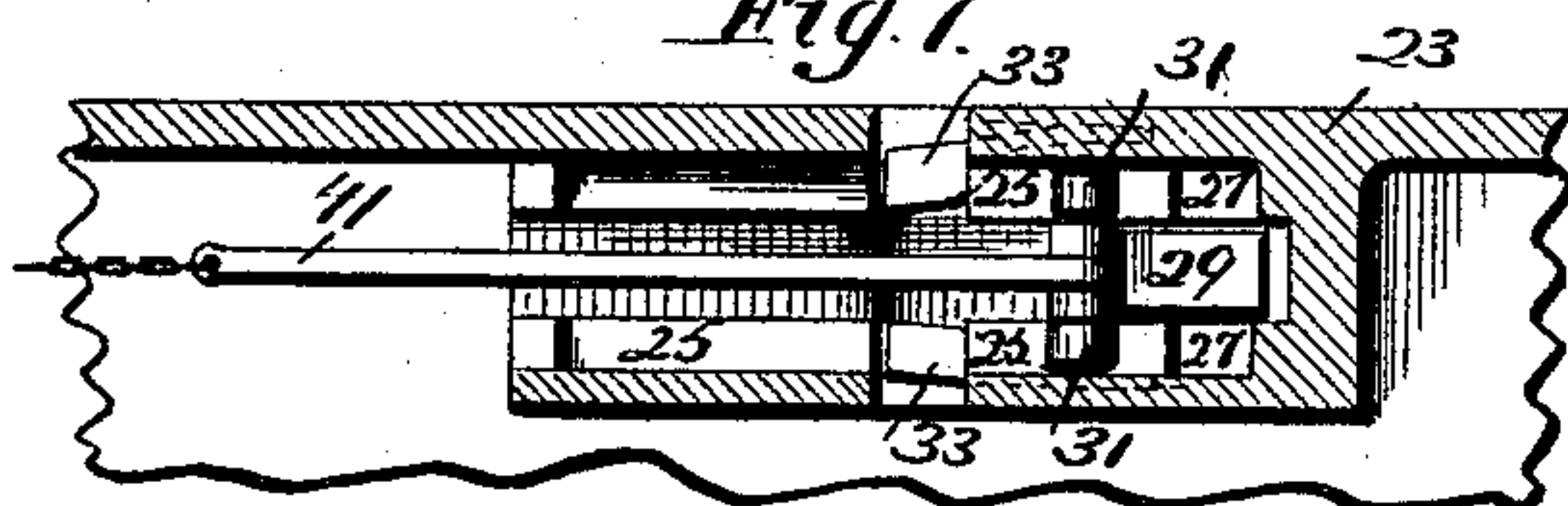


Fig. 8.

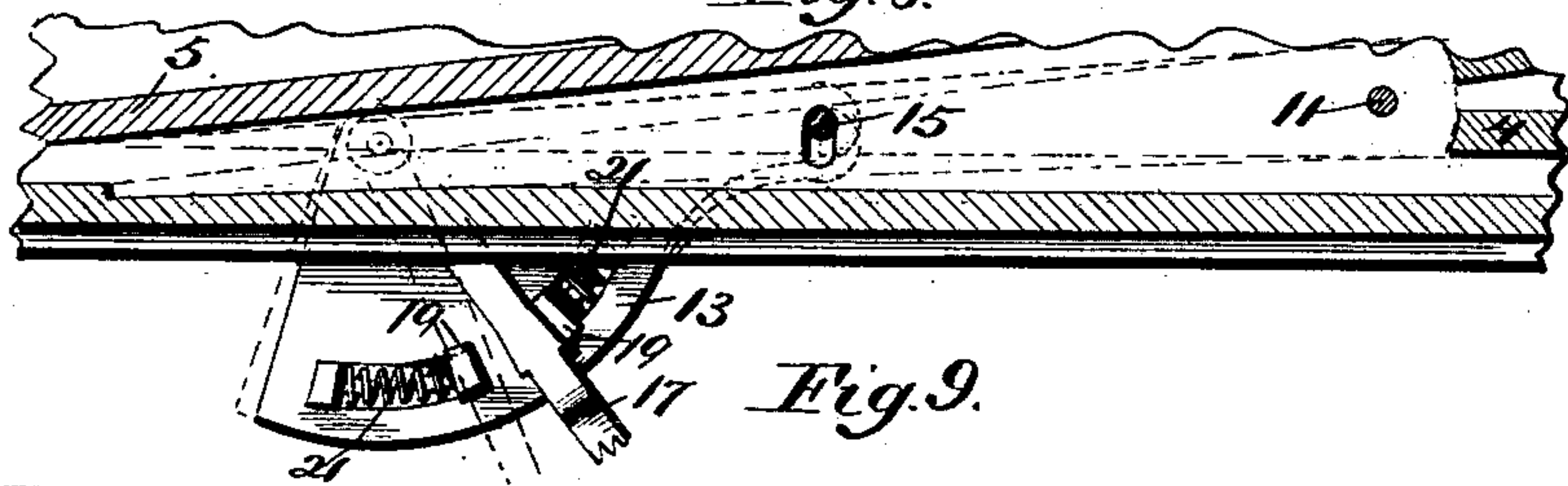
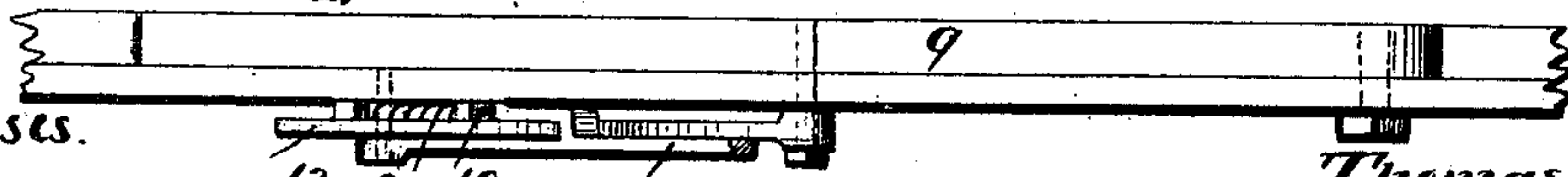


Fig. 9.



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UNITED STATES PATENT OFFICE.

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MINNESOTA.

AUTOMATIC SWITCH FOR CABLE ROADS.

SPECIFICATION forming part of Letters Patent No. 415,471, dated November 19, 1889.

Application filed July 23, 1889. Serial No. 318,381. (No model.)

To all whom it may concern:

Be it known that we, THOMAS H. ROBERTS, of St. Paul, in the county of Ramsey and State of Minnesota, and ROBERT SEIBERT, of Stillwater, in the county of Washington and State of Minnesota, have invented certain new and useful Improvements in Automatic Switches for Cable Roads, of which the following is a specification.

10 This invention relates to improvements in switches for cable roads; and the object of the invention is to provide an improved mechanism by which a switch may be automatically operated by the grip as it passes along in the cable-conduit. The switch is designed particularly for use at the end of a line of cable road where it is desired to change the grip-car from one end of the coach or coaches to the other. It is customary in such cases to provide a switch-track connecting the two tracks of the road. A switch is placed at the junction of the track over which the cars approach the switch-track with the switch-track, while the main track itself extends a short distance beyond such switch. As a train approaches the switch, the grip-car is usually uncoupled from the coaches and is run ahead, and the switch is moved so as to turn the grip-car onto the switch-track. The switch is then turned in the other position and the coaches run past the switch on the extension of the main track. The coaches will then run beyond the grip-car and, through a suitable connecting-track, will come onto the opposite track in position for the grip-car to be attached to their opposite end.

It has heretofore been necessary for the conductor or an attendant to move the switch by hand or by pushing it with the foot, and for this purpose it is necessary usually for the conductor to get off the train and run ahead of the coach, so as to turn the switch before the coach passes, and to turn it again after the coach passes, so as to leave it in position for the next grip-car to pass onto the switch-track.

By means of our improvement, hereinafter described, the switch will be turned by the grip before the grip-car reaches the switch, and will be moved in the opposite direction

by the grip after the grip-car passes the switch.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view of a portion of a cable road, showing the switch and showing in dotted lines the travelers by means of which the switch is operated. Fig. 2 is a similar view of a portion of a track, on a somewhat larger scale, showing in horizontal section a portion of a conduit with the travelers therein and the means connected with said travelers for operating the switch. Fig. 3 is a transverse section, on an enlarged scale, through the switch on line $x x$ of Fig. 1, and showing a portion of a car on the track. Figs. 4, 5, 6, and 7 are detail views of the traveler, Fig. 5 being a transverse section on line $y y$ of Fig. 6, Fig. 6 being a horizontal section on line $z z$ of Fig. 4, and Fig. 7 being a vertical section on line $s s$ of Fig. 6. Fig. 8 is a horizontal section of the track, showing the position in dotted lines, and Fig. 9 a side elevation of the switch and operating-lever.

In the drawings, 2 represents the track, of a cable road over which the cars arrive or approach the terminus of the line. 3 represents a portion of the opposite track. A switch-track 5 connects the two tracks 2 and 3, and the slotted conduit 7 extends from the track 2 through the track 5 to the track 3. A switch 9 is arranged at the junction of the tracks 5 and 2, and this switch may be set so as to connect the track 2 with the track 5, or to connect the track 2 with the continuation 4 thereof. From the extension 4 a suitable track will also extend and connect with the track 3. We have not shown this last-named track in the drawings, deeming it unnecessary to do so, as it forms no part of our invention. The switch 9 is preferably mounted or secured to the track by a suitable pivotal connection 11. A plate 13 is pivoted below the track and is connected by a pin or bolt 15 with the switch 9. This plate forms a lever for operating said switch. As the plate is turned upon its pivot the switch is moved in one direction or the other. An operating-arm 17 is mounted upon a suitable pivot and is preferably arranged directly over the plate

13, and is arranged to move freely thereon. The plate 13 is preferably provided with suitable blocks 19, arranged upon opposite sides of the operating-arm 17, and held in position by springs 21. There is preferably considerable play between the arm 17 and the blocks 19. The springs 21 hold the blocks 19 stationary under all ordinary strains, so that when the operating-arm is brought against one of these blocks the switch will be turned. Should, however, there be any obstruction to the movement of the switch, such as would be occasioned by stone lodging in the space between the switch and the rail, or by an accumulation of ice or snow, such as would prevent movement of the switch, the springs 21 will yield, permitting the full movement of the operating-arm without damage to the mechanism that moves it, hereinafter described.

Arranged in the cable conduit, preferably at each side of the operating-arm 17, is a suitable traveler that is adapted to be encountered by the cable-grip as it moves along in the conduit, and said traveler operates the switch through suitable connections. The traveler, which is encountered by the grip before it reaches the switch, preferably moves the switch into position to direct the grip-car onto the switch-track 5. After the grip-car passes the switch the grip encounters the other traveler which moves the switch in the opposite direction, and moves the first traveler to its former position, so that it is ready to be operated upon by the next approaching grip-car. We prefer to arrange a block 23 in the side of the cable-conduit and to provide this block with a suitable channel or groove 25 and a return loop or groove 27, connected with and forming a part of said channel, and to arrange the traveler 29 in said block and provide it with wheels or rolls 31, which move in the ways 25.

The traveler 29 consists, preferably, of a block arranged to project from the grooved block 23, and having one face that is straight and extends at right angles to the wall of the conduit and projects into the path of the grip. The opposite face of the block is preferably curved, as shown in Fig. 6. The grooves 25 extend, preferably, in straight lines parallel with the wall of the conduit or the face or front of the block 6. The end of the groove 25 is curved and extends into the return-groove 27, which connects with the groove 25, preferably at a point about midway of its length. A spring 33 is arranged in each of the grooves 27, and the ends of said springs are flush with the inner walls of the grooves 25 and across the ends of the return-grooves 27, where said grooves join the grooves 25, as shown clearly in Fig. 7. The ends of these springs, when in their normal position, make therefore a continuous wall across this end of the groove 27, so that as the traveler 29 is moved from its position shown by full lines in Fig. 6 to the opposite end of

the groove 25 its wheels 31 are prevented by the ends of the springs 33 from entering the groove 27. When the traveler reaches the end of the groove 25, the wheel which is then the forward wheel follows around into the end of the groove 27, and the traveler is thrown into the position shown by dotted lines in Fig. 6, and its outer end is now substantially flush with the face of the block 23. If a reverse movement is now given to the traveler, one wheel will pass back in the groove 25, while the other wheel will pass back in the groove 27, separating the springs 33 and coming into the groove 25 through this end of the groove 27, when it will assume its original position, such as shown by full lines in Fig. 6. A rod 35 is connected to the operating-arm 17 and extends along the conduit, and is connected to the traveler 29 by means of a chain 37, which extends, preferably, over a sheave 39 and a rod 41, that is pivotally connected to the block 29. The traveler that is arranged at the other side of the arm 17 is preferably constructed and arranged similar to that hereinbefore described, and it is connected, by means of a rod 43 and chain 45, with the arm 17. These two travelers are so arranged that when the block forming one of the travelers is at the forward end of the slot in which it travels and is turned inward, so as to permit the grip to pass it, the block forming the other traveler will be at the rear of its slot and in position to be encountered by the grip. When the grip strikes one of the travelers and moves it forward, it draws the other one back to its original position, setting it in position to be operated upon by the next grip that reaches it. We also prefer to so construct and arrange the parts that the first movement of the traveler will move the arm 17 only the distance between the side of the arm and the block 19 without moving the plate 13. This first movement of the traveler will also return the other traveler to its original position, or, in other words, set it preparatory to the next operation thereon by the grip.

The traveler 29 will pass the ends of the springs 33 and the ends of the grooves 27 before or by the time that the switch begins to move, so that while the switch is being moved the wheels of the traveler will be upon the solid portions of the block between the ends of the grooves 27.

It will be understood that we do not confine ourselves to the use of our device alone upon the arrangement of track shown in the accompanying drawings, nor do we confine ourselves to the details of construction of the mechanism for operating the switch, as many equivalent devices will probably suggest themselves readily to any skilled mechanic, which are capable of being used in place of the devices we have shown and described for accomplishing the same result.

We claim as our invention—

1. The combination, with the track of a

cable road, of a movable switch connected with said track, a sliding traveler arranged in the cable-conduit in position to be encountered by the grip and adapted to slide longitudinally in said conduit, and connecting mechanism connecting said traveler and said switch, whereby as the traveler is moved longitudinally in the conduit the switch will be operated.

10 2. The combination, with the track of a cable road, of a movable switch connected therewith, a traveler projecting into the cable-conduit and adapted to be encountered by a grip moving in said conduit and to be withdrawn and permit said grip to pass after having moved a predetermined distance with said grip, and connecting mechanism connecting said traveler with said switch, for the purpose set forth.

20 3. The combination, with a switch of a cable road, of a traveler arranged in the cable-conduit and adapted to be encountered by a grip moving in said conduit, and to be withdrawn to permit said grip to pass after having moved a predetermined distance, mechanism connecting said traveler with said switch, and an independent traveler arranged in the conduit in the switch-track and also connected with said switch, for the purpose set forth.

30 4. The combination, with the track and

movable switch, of the traveler 29, arranged in the cable-conduit and connected with said switch, and a groove or guideway supporting said traveler and arranged to withdraw the traveler as it is moved along in said groove, substantially as described. 35

5. The combination, with the movable switch of a cable road, of the block 23, arranged in the cable-conduit and provided with the groove 25, and the return-groove 27, connected with said groove 25 and provided with the springs 33, and the traveler 29, provided with the wheels 31, arranged to move in said grooves, and connecting mechanism between said traveler and said switch, substantially as described. 40 45

6. The combination, with the switch 9, of the pivoted plate 13, connected with said switch, the spring-supported blocks 19, arranged upon said plate, the operating-arm 17, arranged between said blocks, and the traveler arranged in the cable-conduit and connected with said operating-arm, substantially as described. 50

July 17, 1889.

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Witnesses:

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