

(No Model.)

2 Sheets—Sheet 1.

J. D. HOLMES & W. L. HEATH.
AUTOMATIC RESETTING FUSIBLE CUT-OUT.

No. 604,616.

Patented May 24, 1898.

Fig. 1.

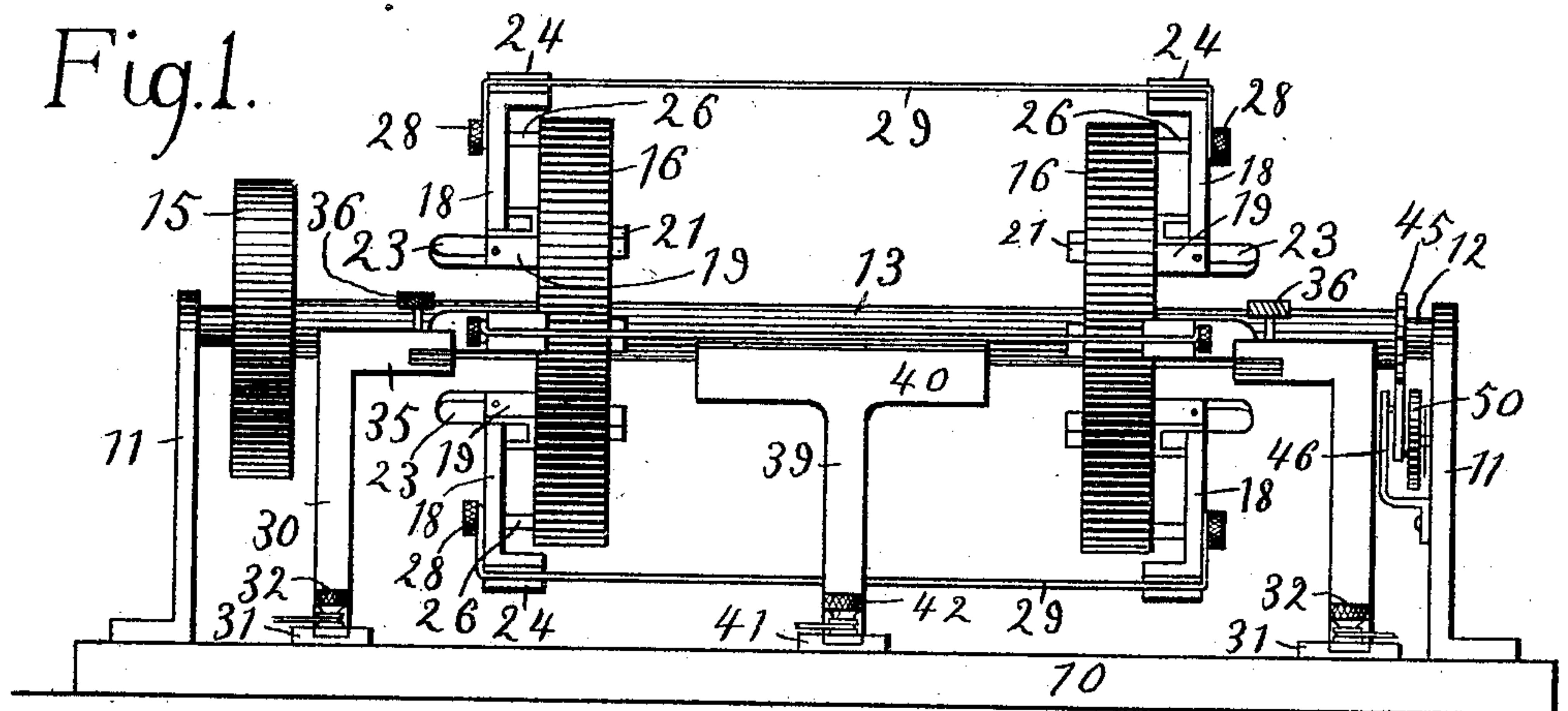


Fig. 2.

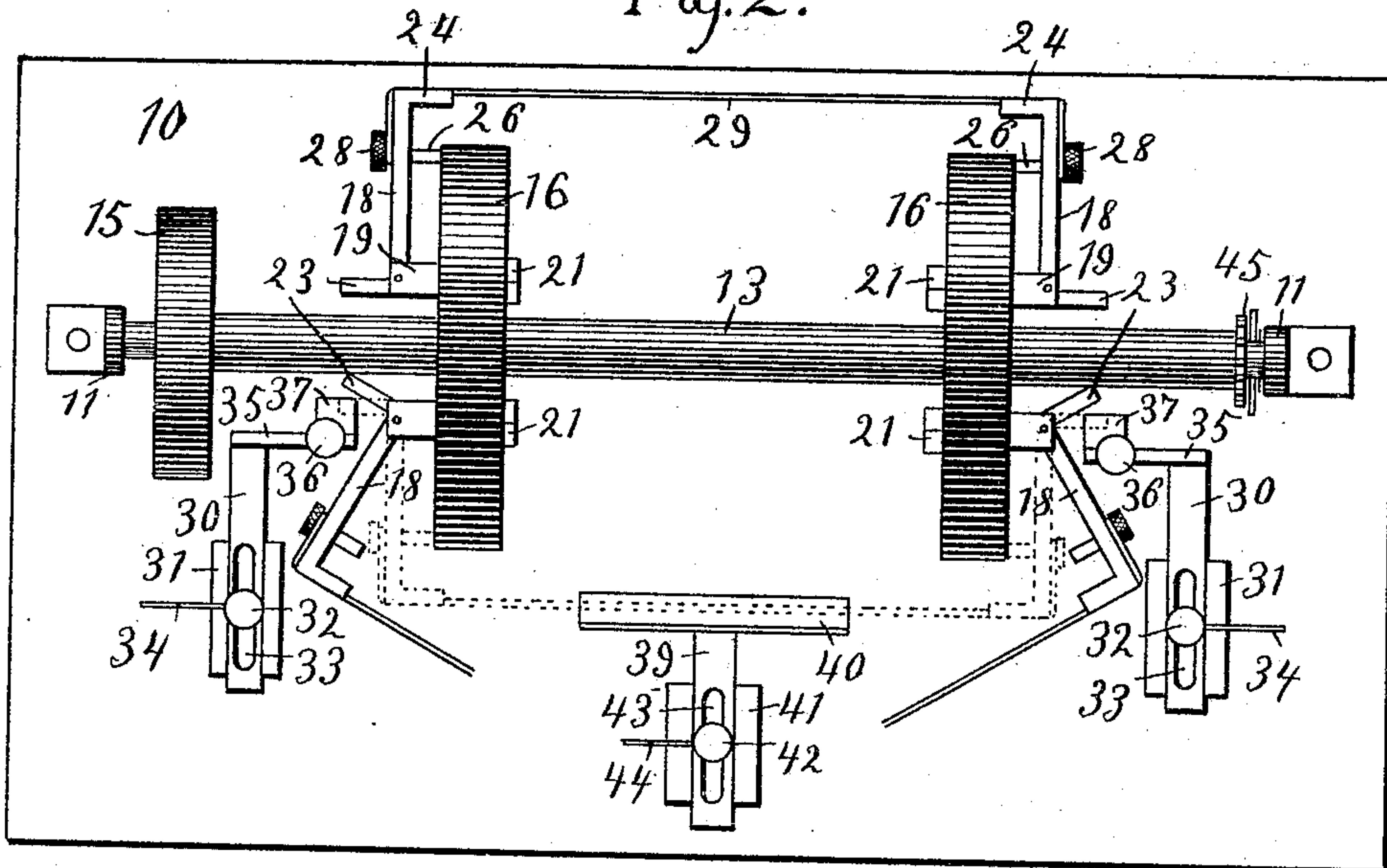
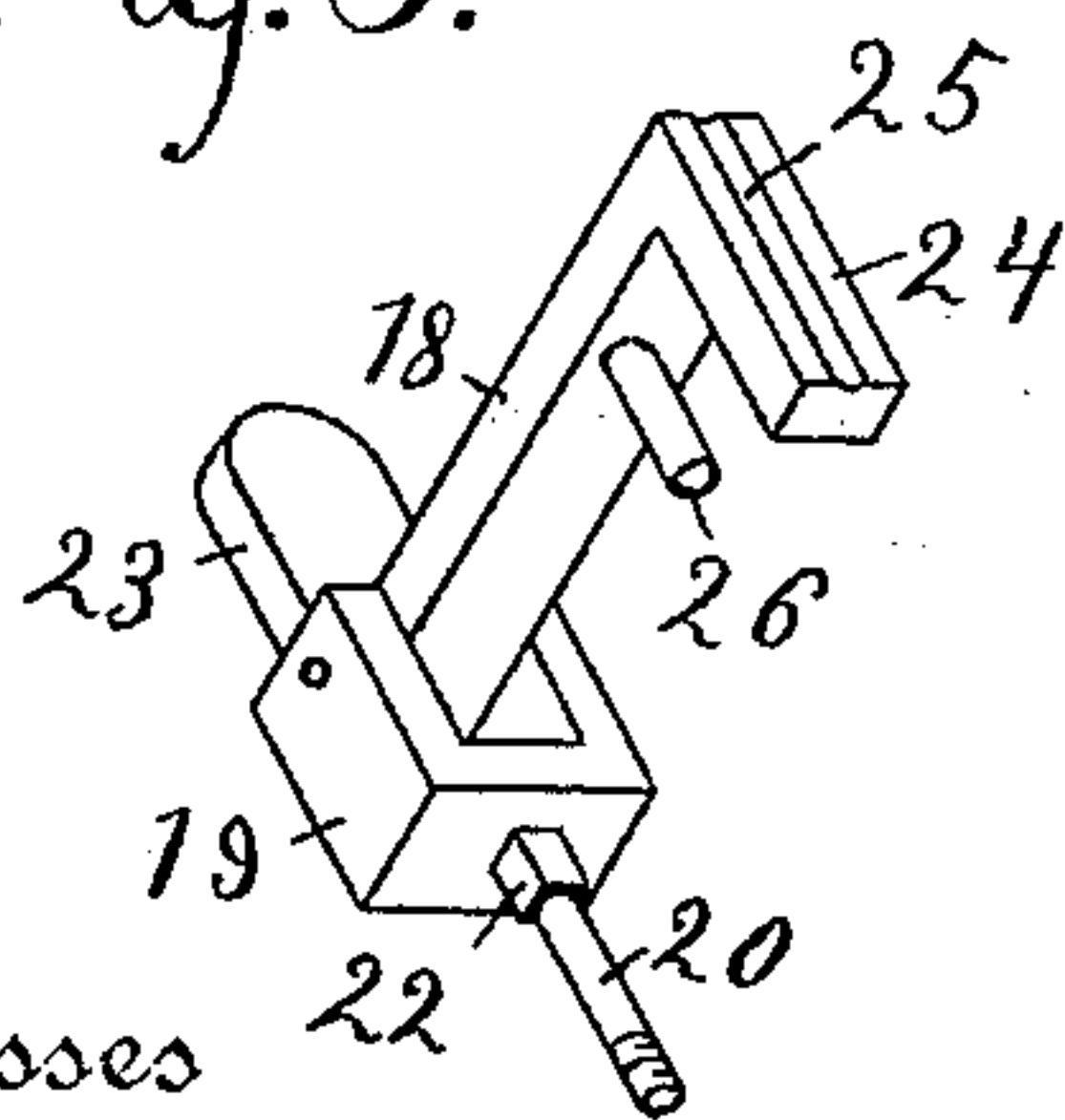
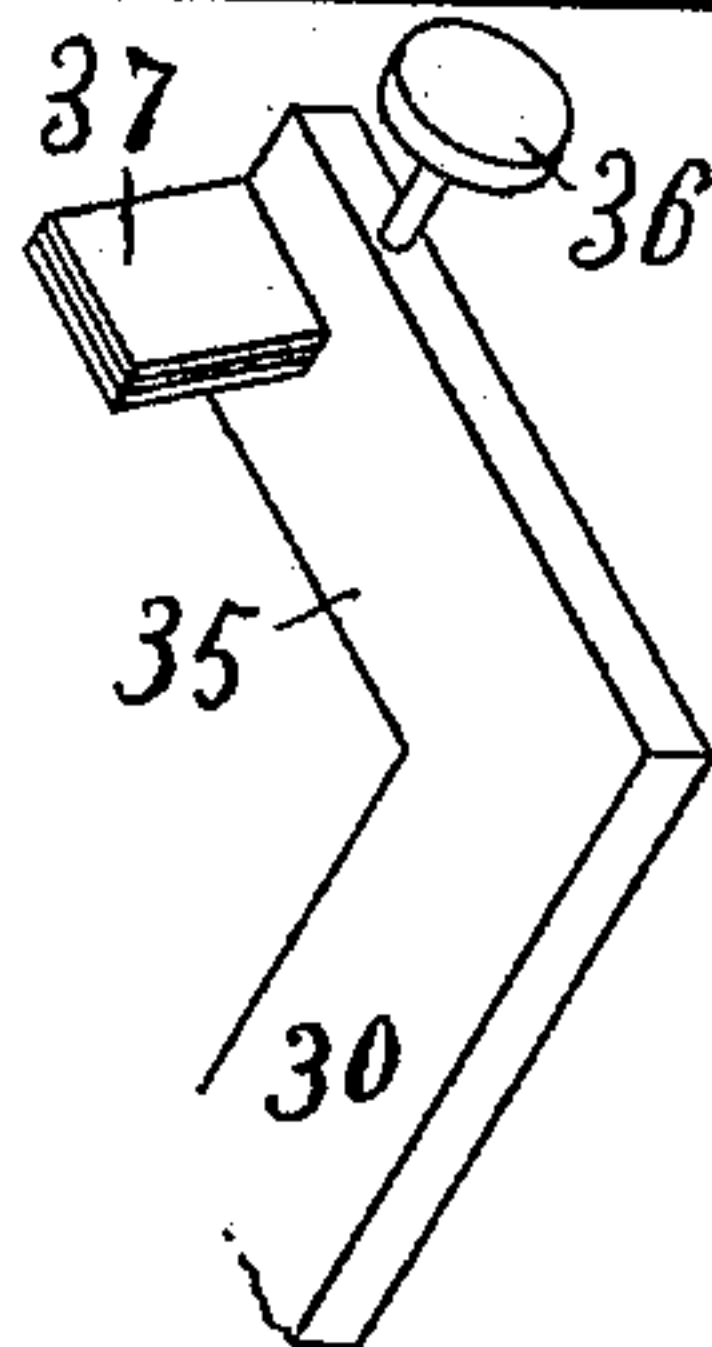


Fig. 3.



Witnesses
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Fig. 4.



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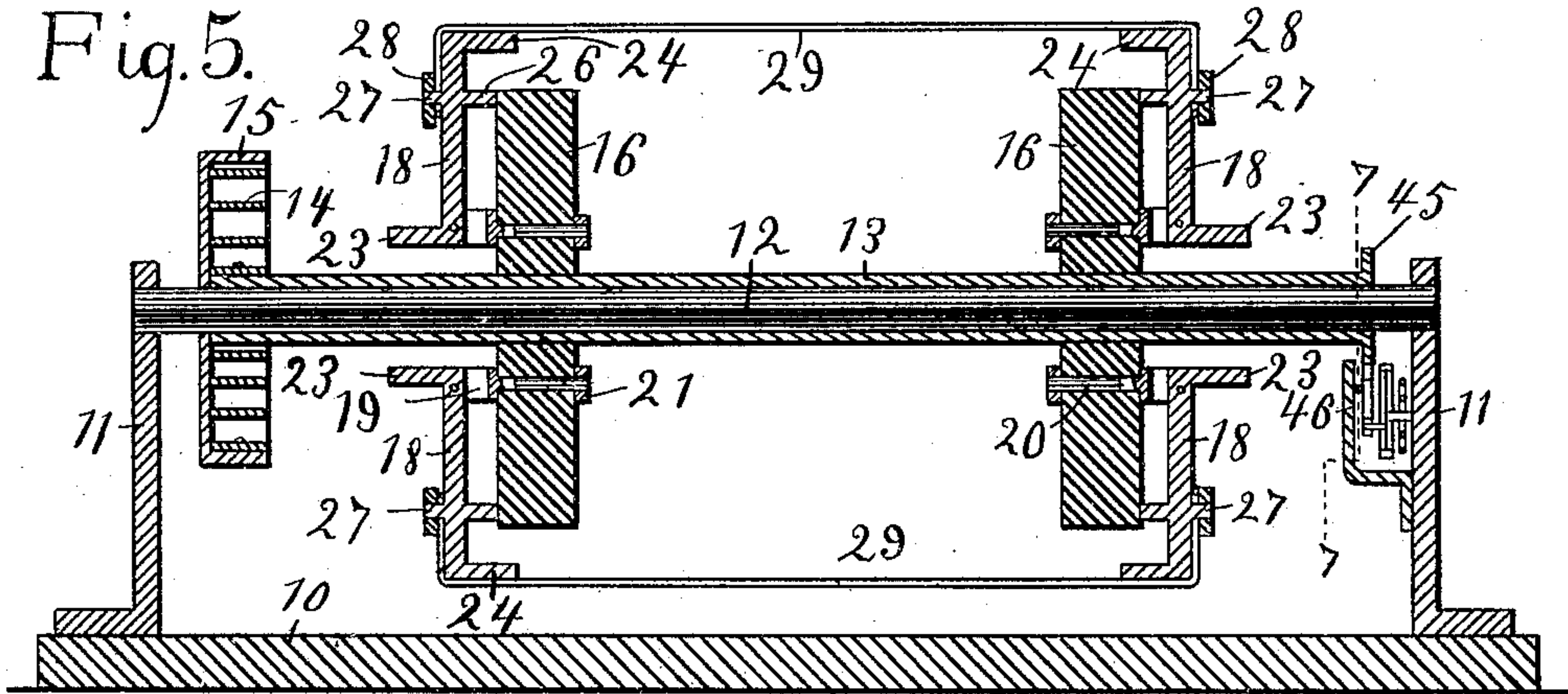


Fig. 6.

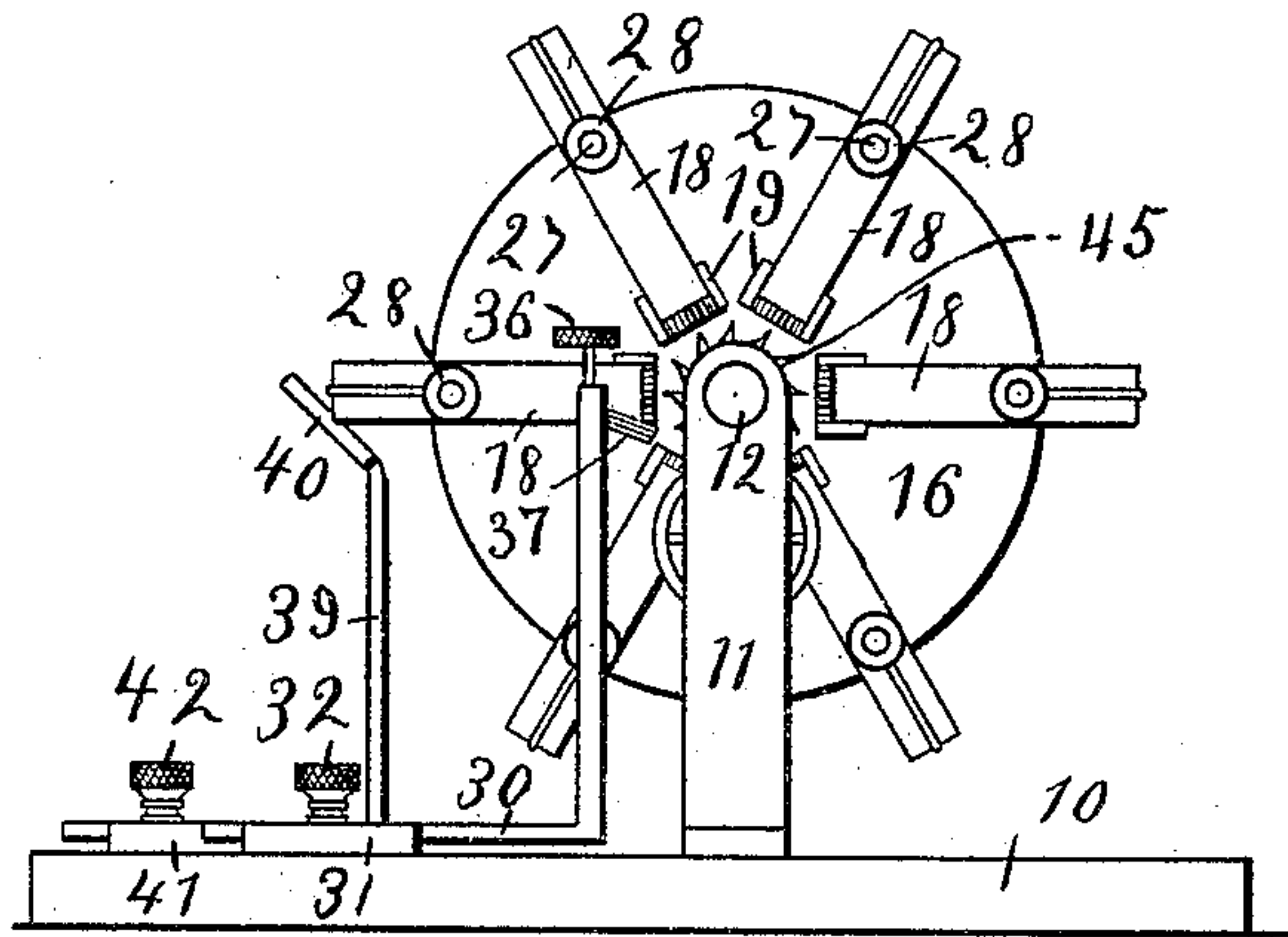


Fig. 7.

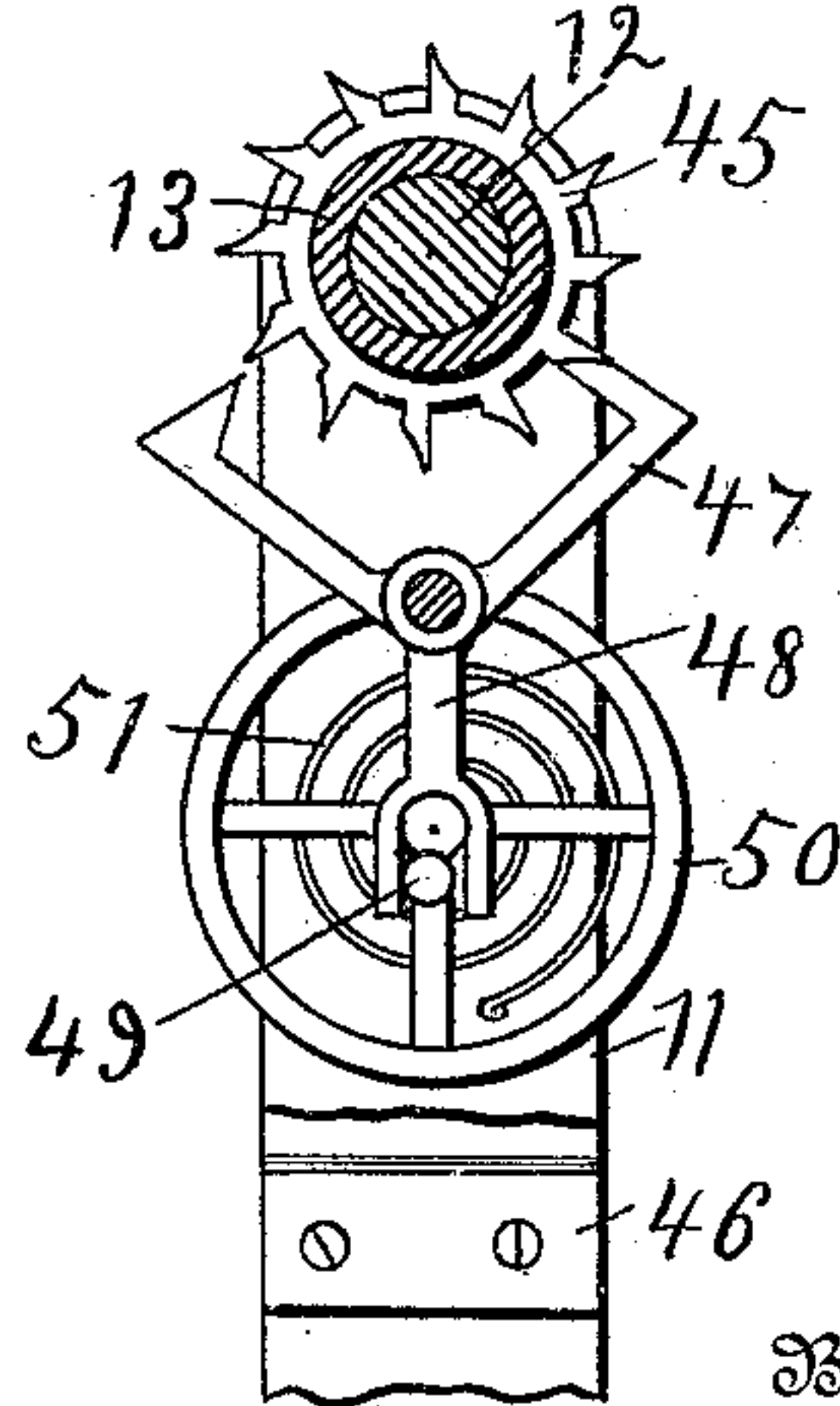
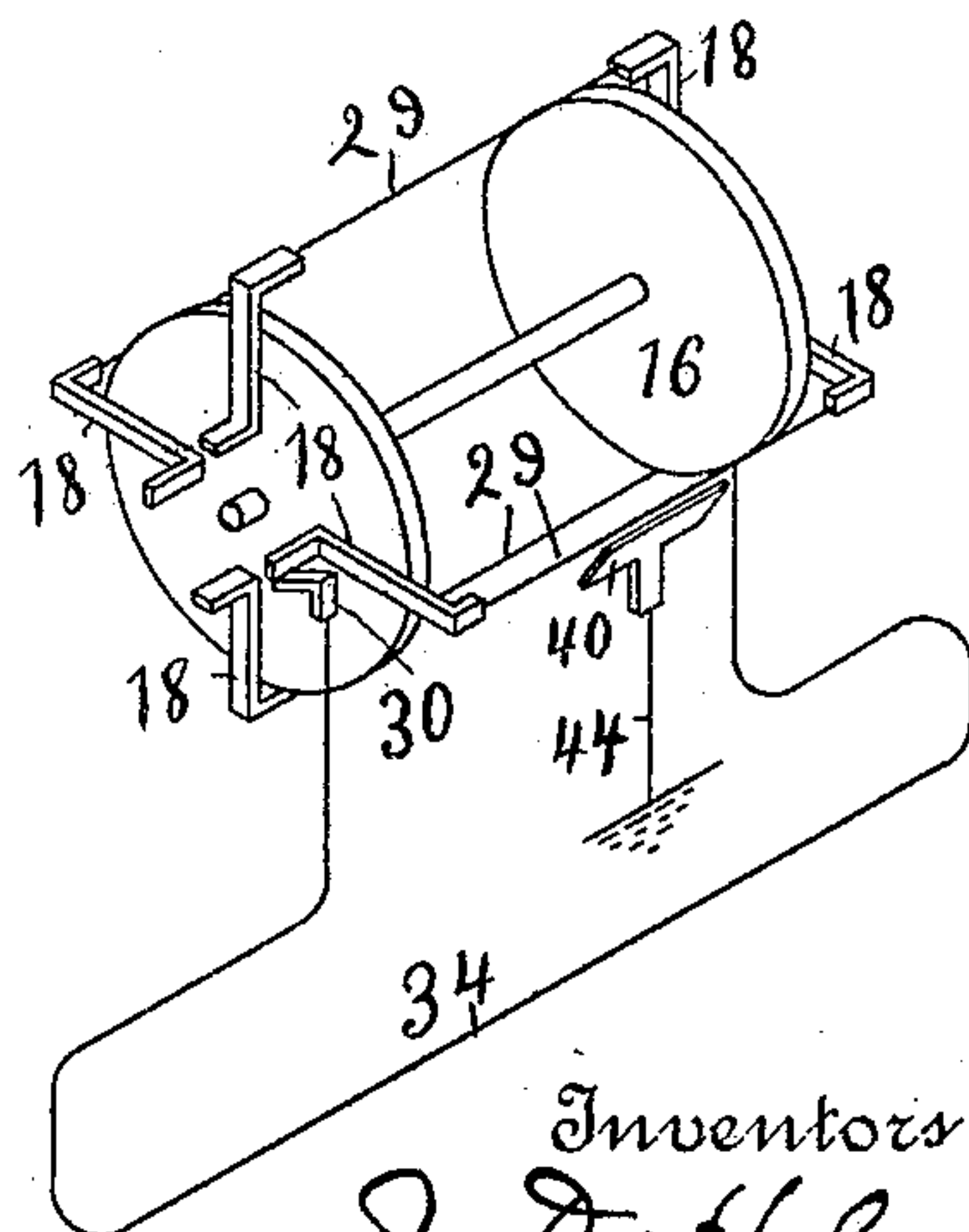


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN D. HOLMES AND WEBSTER L. HEATH, OF ST. LOUIS, MISSOURI.

AUTOMATIC RESETTING FUSIBLE CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 604,616, dated May 24, 1898.

Application filed April 12, 1897. Serial No. 631,668. (No model.)

To all whom it may concern:

Be it known that we, JOHN D. HOLMES and WEBSTER L. HEATH, citizens of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Automatic Resetting Fusible Cut-Out, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The principal objection to fusible cut-outs as now made is that whenever a fuse is burned out the entire circuit in which it is contained is rendered inoperative and remains so until a new fuse is inserted in the cut-out. This is a source of great annoyance and delay, especially in telegraph-lines, signal systems, and the like, for which our cut-out is more especially designed, although it may be adapted for any kind of electrical work in which a fusible cut-out is desired. The object of our invention is to overcome this objection by constructing a fusible cut-out carrying two or more fuses which will automatically bring a new fuse into position after one has been burned out.

Our invention consists in a fusible cut-out having a movable part carrying two or more fuses and provided with means for automatically actuating said movable part to bring a new fuse into the circuit when one has been burned out and in other novel features and details of construction, all of which are fully described in the following specification and pointed out in the claims affixed hereto.

In the accompanying drawings, which illustrate one form of cut-out made in accordance with our invention, Figure 1 is a front elevation. Fig. 2 is a top plan view, part of the fuse-carrying arms being omitted to better show the remaining ones. Fig. 3 is an isometric projection of one of the fuse-carrying arms and the part in which it is pivoted. Fig. 4 is an isometric projection of one of the line-wire terminals. Fig. 5 is a vertical longitudinal section. Fig. 6 is an end view. Fig. 7 is an enlarged section on the line 7 7 of Fig. 5, and Fig. 8 is a diagrammatical view.

Like marks of reference refer to similar parts in the several views of the drawings.

10 is a base of any suitable insulating material. Secured to the base 10 in any suitable manner are two arms 11, in which is rigidly secured a rod or shaft 12. On the rod 12 is loosely mounted a sleeve 13. To one end of the sleeve 13 is secured one end of a spiral spring 14, Fig. 5, the other end of which is attached to a cylindrical box or case 15, rigidly secured in the shaft 12. To the sleeve 13 are rigidly secured two disks 16, of hard rubber, fiber, or other insulating material.

18 are fuse-carrying arms which are pivoted in U-shaped brackets 19, carried by the disks 16. The arms 18 are arranged in pairs opposite each other, one on each of the disks 16. In the drawings we have shown six pairs; but the number may be increased or diminished, as desired. The brackets 19 are secured to the disks 16 by threaded rods 20 and nuts 21. The rods 20 are formed with square portions 22, Fig. 3, or other means is provided to prevent the rotation of the brackets. On the inner end of each of the arms 18 is formed a projection 23 and on the outer end a projection 24, in which is formed a groove 25, Fig. 3.

26 is a pin formed on the arm 18 and which rests against the disk 16, and thus holds the two arms of a pair parallel when the fuse is in position. On the opposite side of the arm 18 is a threaded projection 27, Fig. 5, on which is a milled nut 28, which serves to secure the fuse 29 in position.

30 are two L-shaped line-wire terminals, which are secured in guide-plates 31 by screws 32, which pass through slots 33 in the said terminals. The screws 32 also act as binding-posts for the ends of the line-wire 34. On each of the terminals 30 is a lateral projection 35, terminating adjacent to the face of the disk 16. Secured in the projection 35 by a screw 36 and projecting in the path of projections 23 of the arms 18 is a brush 37.

Carried by an L-shaped arm 39 is a plate 40, which acts as a lightning-arrester. The arm 29 is secured in a guide-plate 41 by a screw 42, which passes through a slot 43 in the said arm 39, and also serves as a binding-post for a ground-wire 44.

In Fig. 7 is shown in detail the device for retarding the rotation of the sleeve 13 and attached parts. 45 is an escape-wheel, which

is rigidly mounted on the sleeve 13. Pivoted to a bracket 46, secured to the arm 11, is an anchor 47, which engages with the escape-wheel 45. On the anchor 47 is a forked arm 5 48, which engages with a pin 49 on a balance-wheel 50. The balance-wheel 50 is pivoted to the arm 11 and provided with a suitable spring 51.

While we prefer to use the device above 10 described, it is obvious that many other well-known devices may be used to retard the motion of the sleeve 13.

The operation of our cut-out is as follows: The fuse-wires 29 are stretched from one arm 15 18 of each pair to the other, passing along the grooves 25 and secured in place by the milled nuts 28. The projections 23 of the pair of arms 18 adjacent to the line-wire terminals 30 are forced against the brushes 37 by the 20 action of the spring 14, which has been previously wound by turning the rotary parts of the cut-out backward. The contact of the projections 23 with the brushes 37 locks the rotary parts of the cut-out against any further rotation in the direction in which they 25 are impelled by the spring and at the same time brings the fuse 29 into the circuit. The current enters by one end of the line-wire 34 and passes along the terminal 30, brush 37, and arm 18 to the fuse 29 and passes out 30 along the other arm 18, brush 37, terminal 30, and line-wire 34. Whenever an excessive current passes over the line and the fuse is burned out, the arms 18 swing on their pivots, as shown in Fig. 2, and release the sleeve 35 13 and attached parts, so that they can be rotated by the spring 14 to bring the fuse carried by the next succeeding pair of arms 18 into the circuit. The terminals 30 can be 40 adjusted by means of the screws 32 to insure the proper contact of the projections 23 with the brushes 37.

If the rotary part of the cut-out were allowed to move as fast as it could be driven by 45 the spring, it might happen that a new fuse would be brought into the circuit before the high tension on the line-wire was relieved, and consequently a second or even a third fuse burned out. We have overcome this ob- 50 jection by the use of the retarding device shown in detail in Fig. 7. The escape-wheel 45 can only rotate as fast as allowed by the motion of the balance-wheel 50, and being secured to the sleeve 13 retards the motion of 55 the entire rotary part. By varying the size of the escape-wheel 45 or, if necessary, interposing gearing between it and the sleeve 13 the cut-out can be arranged so that any desired length of time will elapse between the burn- 60 ing out of one fuse and the bringing of the next into the circuit.

The plate 40 being connected with the

ground insures the speedy burning out of the fuse in case of an excessive current by the formation of an arc between the fuse and the 65 said plate. This plate also tends to prevent the formation of an arc between the terminals in case of a high-tension current by conducting the current to ground.

The number of fuses carried by the cut-out 70 may be varied, so as to adapt it to the requirements of the use to which it is to be put with regard to the liability of the fuses to be burned out and the frequency with which it will be inspected. 75

We wish it understood that we do not limit ourselves to the construction shown and described, as many changes may be made in the form and construction without departing from the spirit of our invention. 80

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

1. In a fusible cut-out, a movable member, fuse-holding devices carried by said movable 85 member and normally locking the same, said fuse-holding devices being arranged in pairs and insulated from each other, means for releasing said movable member when a fuse is burned out, and line-wire terminals adapted 90 to be put in electrical communication with one pair only of said fuse-holding devices at a time.

2. In a fusible cut-out, a rotary member, radial fuse-holding arms pivotally mounted 95 thereon to swing in radial planes, said rotary member being normally locked against rotation, and means for releasing said rotary member when a fuse is burned out.

3. In a fusible cut-out, a rotary member, 100 fuse-holding arms pivotally mounted on said rotary member to swing in radial planes, each of said fuse-holding arms being insulated from the others, and stops at each end of said rotary member adapted to come in contact 105 with said fuse-holding arms when they are held in position by a fuse and thereby lock said rotary member.

4. In a fusible cut-out, a rotatable sleeve, disks of insulating material carried by said 110 sleeve, radial fuse-carrying arms pivotally mounted on said disks, projections on said radial arms, and line-wire terminals with which said projections come in contact when said arms are held in position by a fuse. 115

In testimony whereof we have hereunto set our hands and affixed our seals in the presence of the two subscribing witnesses.

JOHN D. HOLMES. [L. S.]
WEBSTER L. HEATH. [L. S.]

Witnesses:

JOHN F. GREEN,
W. A. ALEXANDER.