

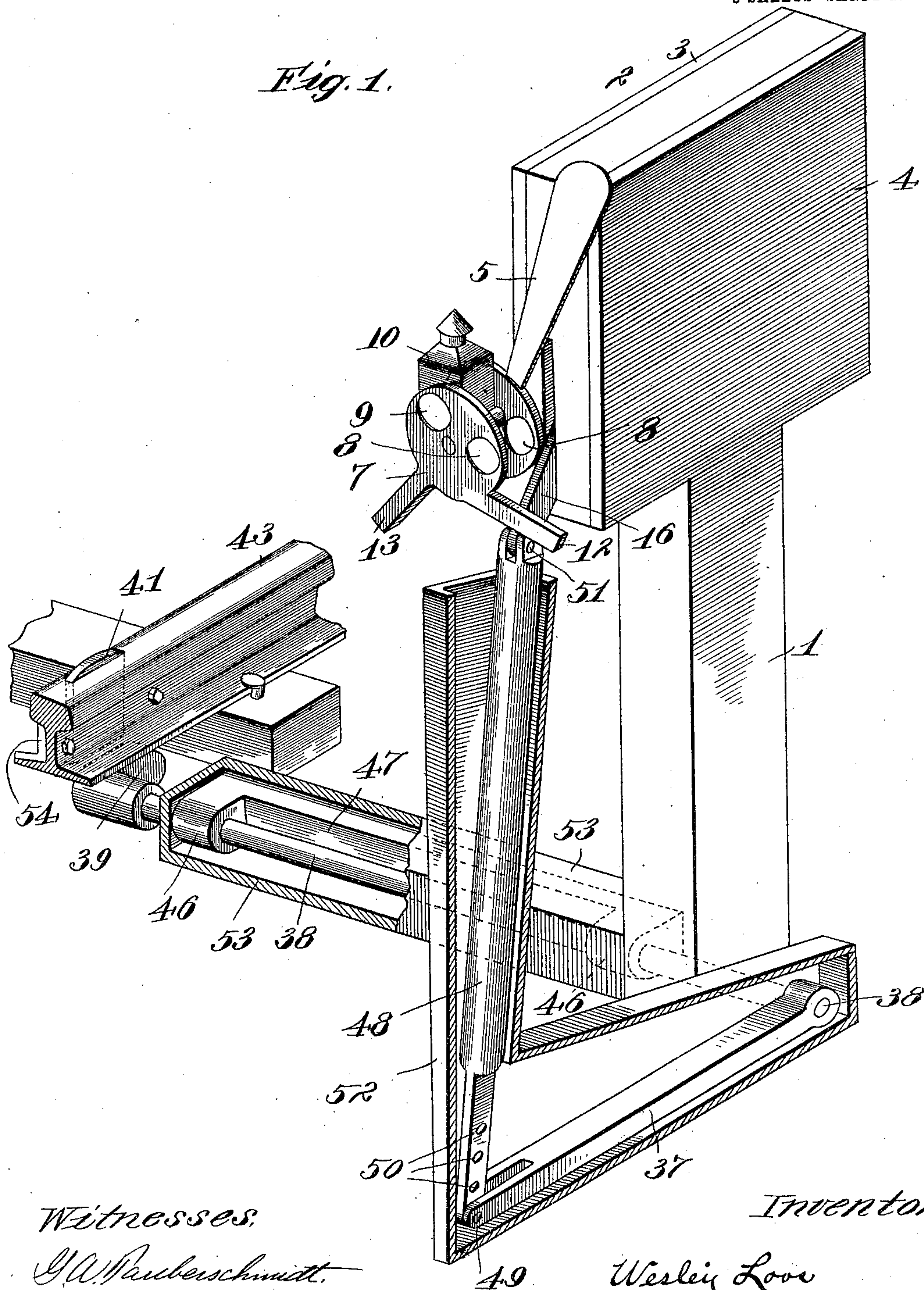
No. 812,941.

PATENTED FEB. 20, 1906.

W. LOOS.
RAILWAY SIGNAL.
APPLICATION FILED APR. 7, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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George L. Chirndahl

Inventor:

Wesley Loos

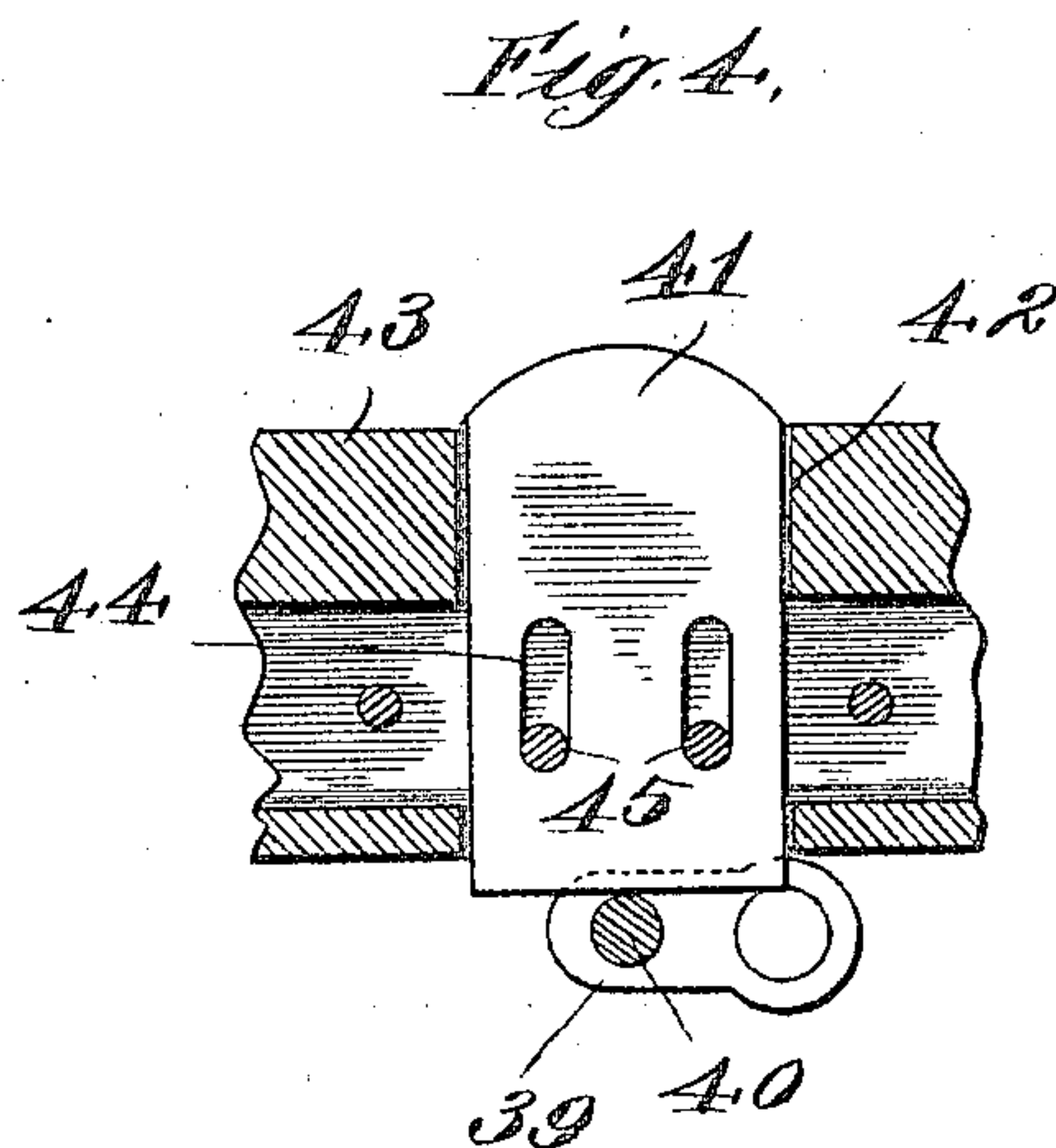
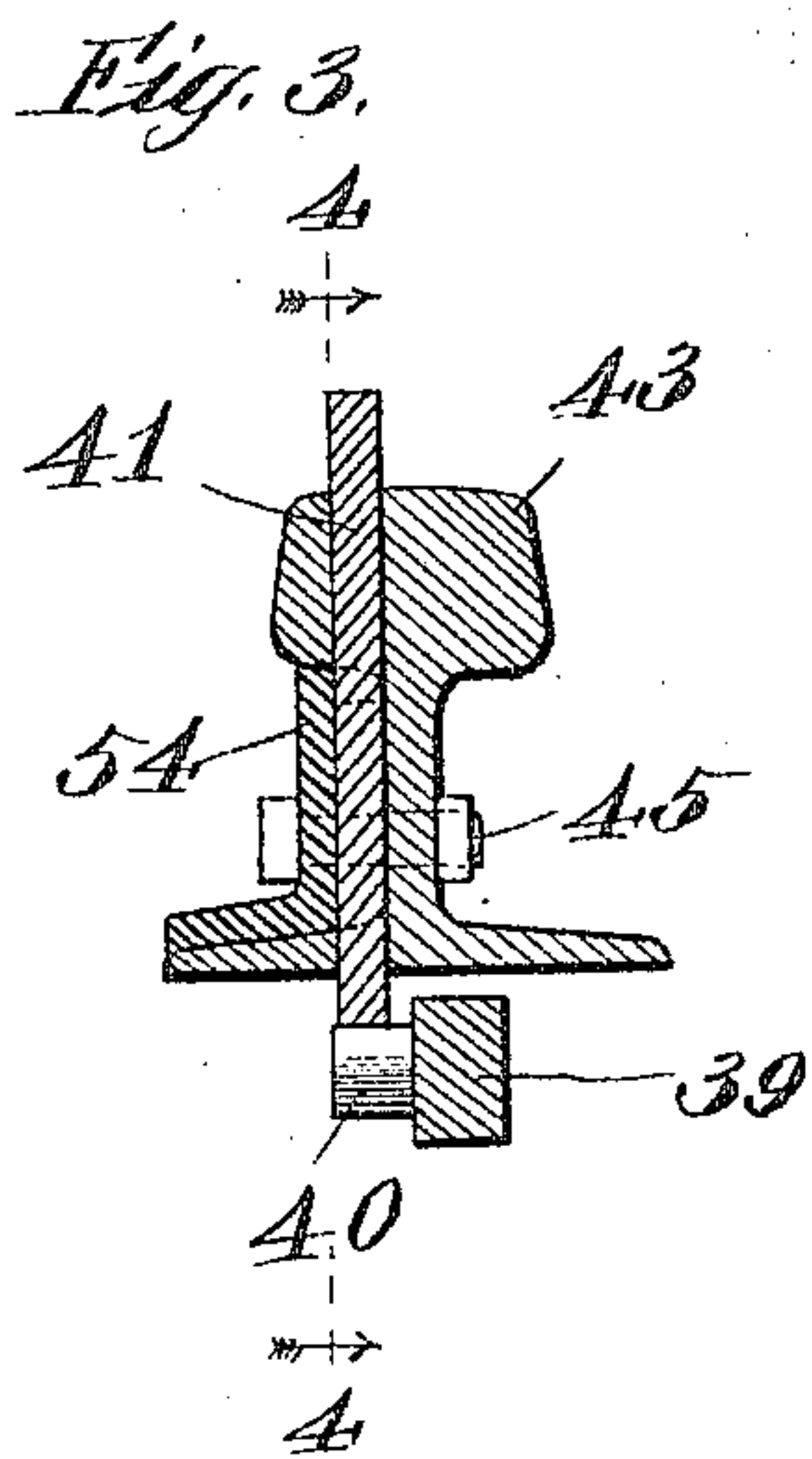
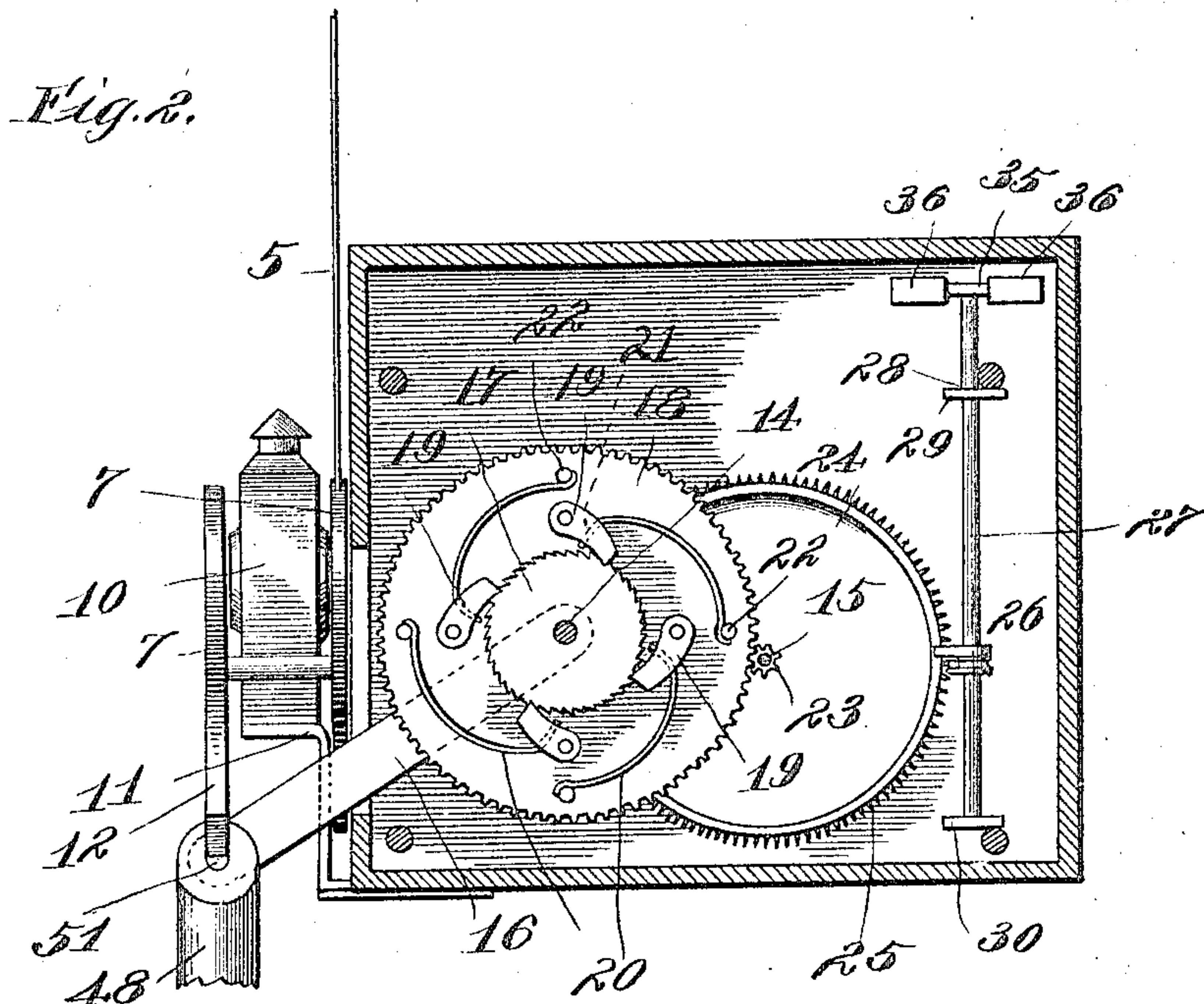
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 7.

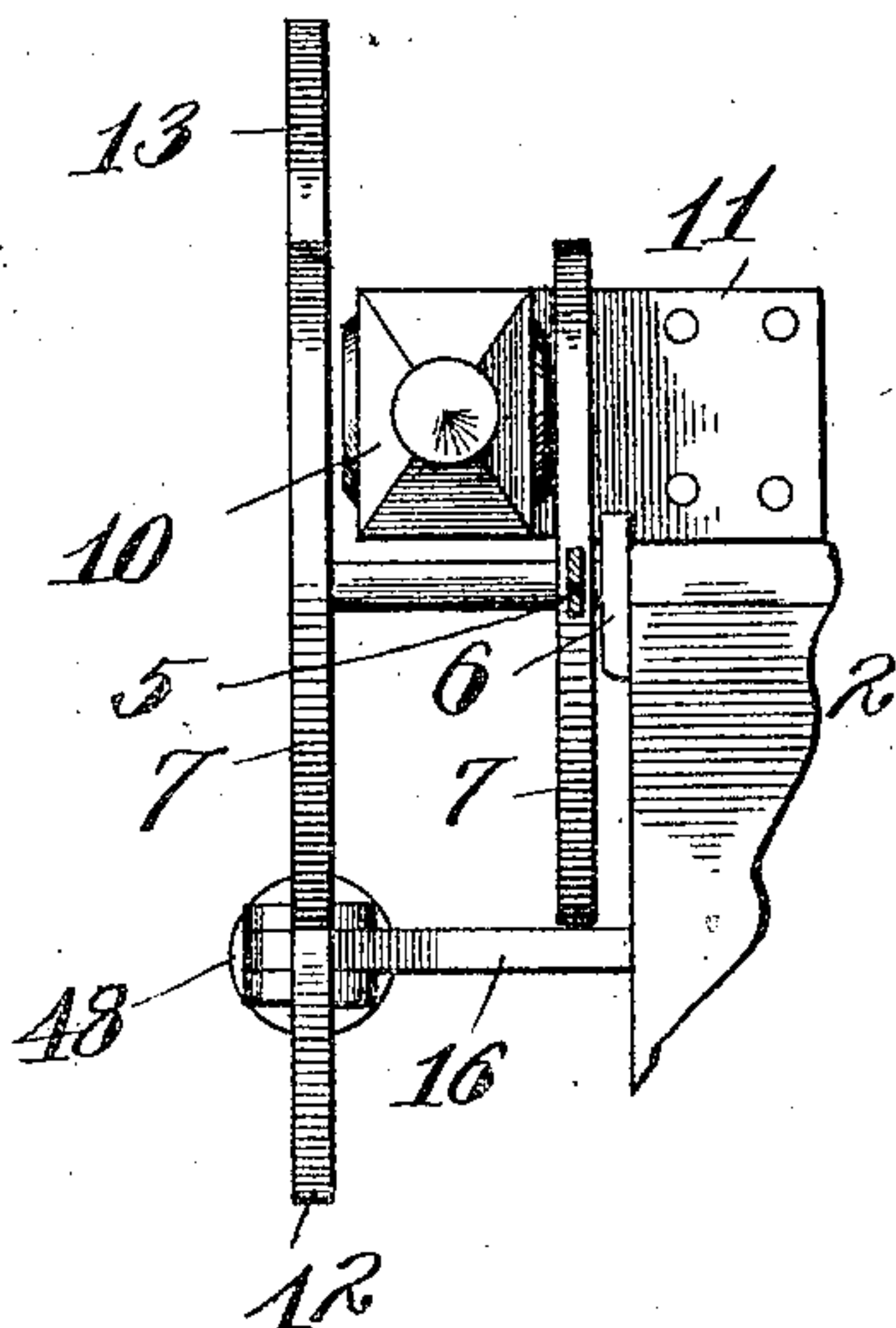


Fig. 5.

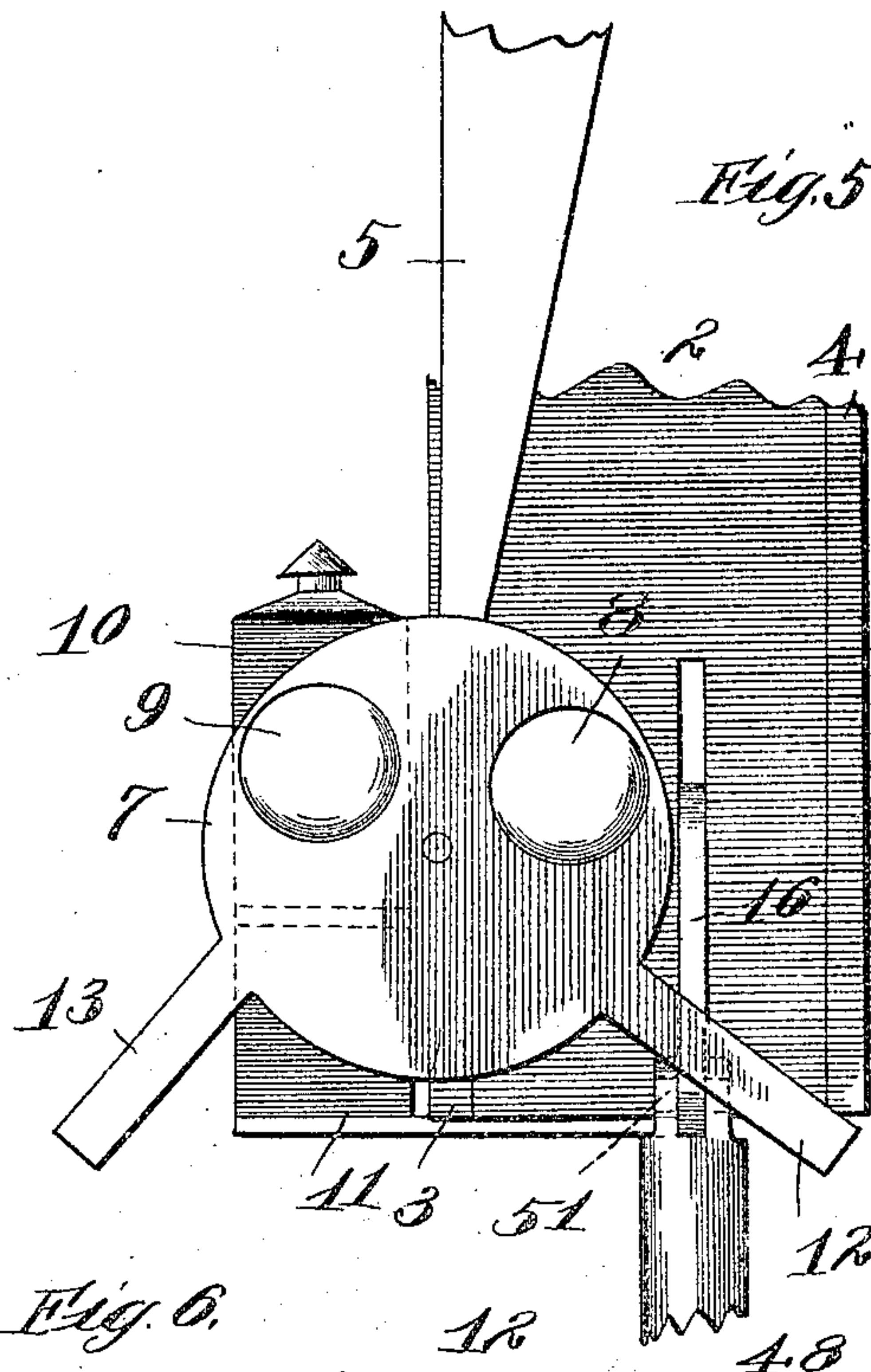


Fig. 6.

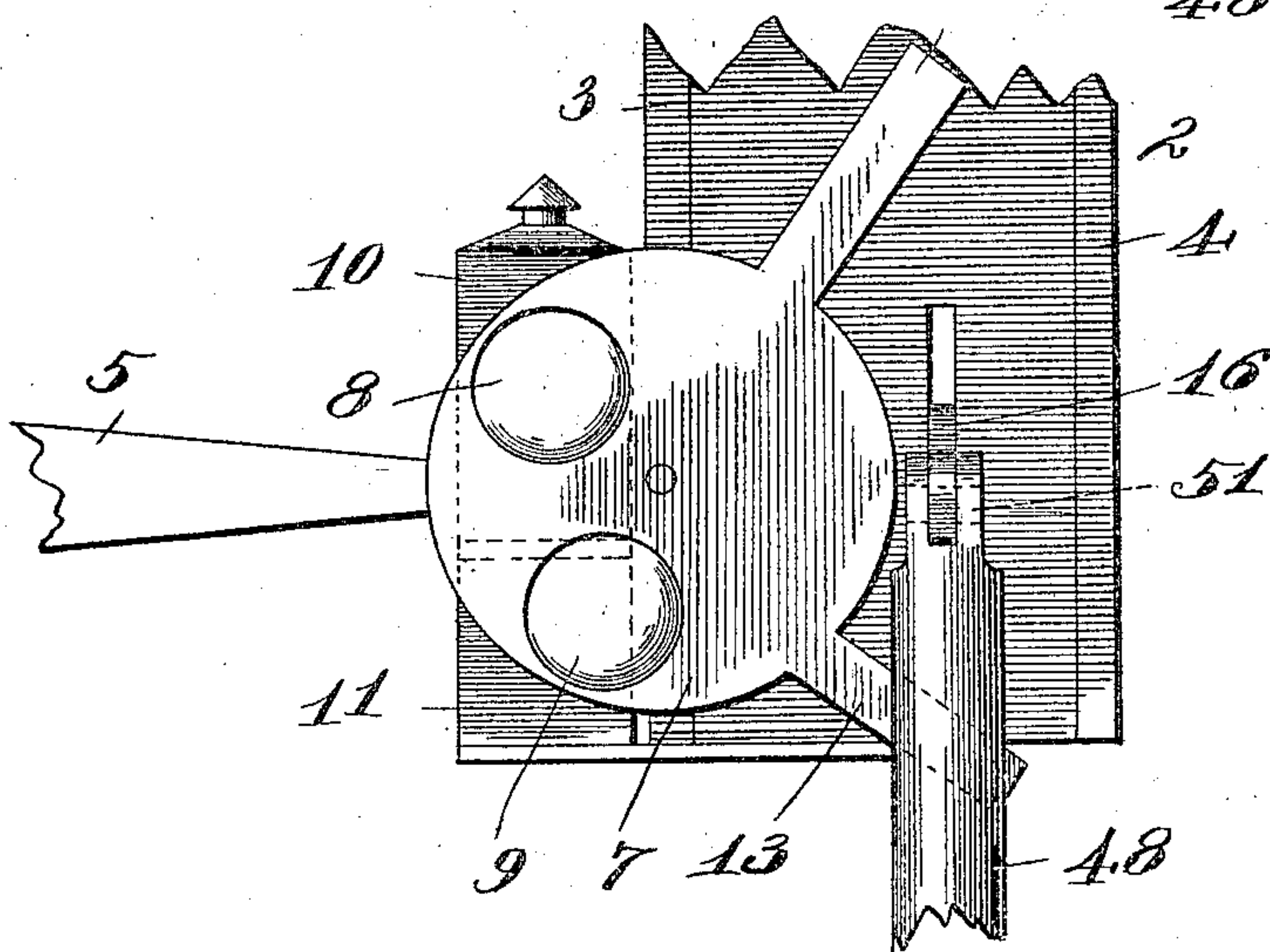
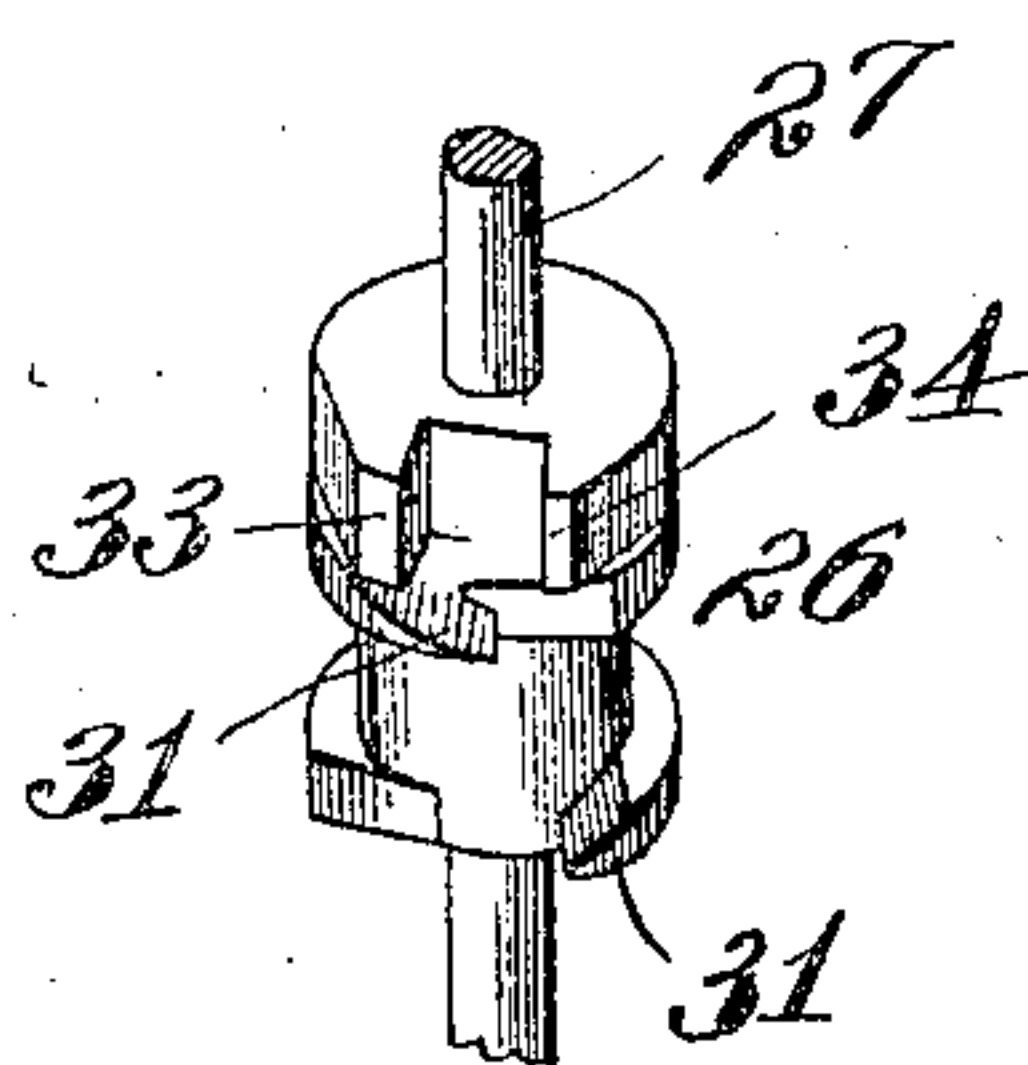


Fig. 8.



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UNITED STATES PATENT OFFICE.

WESLEY LOOS, OF SOUTH OMAHA, NEBRASKA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO EMANUEL V. LORIG AND ONE-FOURTH TO WILLIAM C. LAMBERT, ALL OF SOUTH OMAHA, NEBRASKA.

RAILWAY-SIGNAL.

No. 812,941.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed April 7, 1905. Serial No. 254,280.

To all whom it may concern:

Be it known that I, WESLEY LOOS, a citizen of the United States, residing at South Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Railway-Signals, of which the following is a specification.

This invention relates to safety-signals, and refers particularly to an automatic mechanically-operated signal for railways and other similar service. When trains are being run over a line at comparatively short intervals, it is necessary to employ some means to guard against rear-end collisions. The means for this purpose hereinafter more fully described comprises a signal device adapted to be set automatically by a passing train in a position indicating "danger" to a following train, and further comprises automatic means for restoring said signal to a safety position after the lapse of a predetermined time, which time is alterable at the will of the operator. In practice this signal is placed beside the railway-track at any desirable point—for instance, adjacent to curves or at other points in the track where the view of the engineer for a distance along the track is interfered with. A train passing the signal sets it at "danger," in which position the signal remains for a certain predetermined time. Should a train be stopped after passing a signal or be obliged to proceed so slowly that the signal would be restored before said train had traveled a safe distance beyond said signal, a flagman is sent back along the track to hold any following train until the several trains are again properly spaced upon the system.

In the accompanying drawings, Figure 1 is a perspective view of a railway-signal embodying the features of this invention. Fig. 2 is a side elevation of the escapement mechanism, one side of the supporting-casing being removed. Fig. 3 is a transverse sectional view through one of the running-rails, showing the plunger adapted to be engaged by the wheels of a passing locomotive. Fig. 4 is a longitudinal sectional view on dotted line 4-4 of Fig. 3, showing the plunger in elevation. Fig. 5 is a fragmental elevation showing the signal-arm in its safety position. Fig. 6 is a similar view showing the signal-arm in its danger position. Fig. 7 is a top plan view

of the mechanism illustrated in Fig. 5. Fig. 8 is a perspective view of a portion of the escapement mechanism.

In the construction of a signal embodying the features of this invention I provide a supporting-post 1, set in the earth or secured upon the ties beside a railway-track. At the upper end of the post 1 is secured a casing 2, comprising side plates 3 and 4, within which casing is mounted the escapement mechanism to be hereinafter described. A signal-arm 5 is pivotally supported upon a bracket 6, fixed to the casing 2, and is adapted to have an oscillatory movement in a plane at right angles with the length of the track. This arm 5 is provided with a two-part hub 7, the two parts being secured rigidly together and having in their walls plates 8 and 9 of colored glass, the plates 8 being red and the plates 9 green in the present instance. A signal-lamp 10 of common construction is supported between the parts of the hub 7 by means of a bracket 11, secured to the casing 2. When the signal-arm 5 is in its danger position, as shown in Fig. 6, the red-glass plates 8 are in coincidence with the signal-lamp 10, and when the arm 5 is in the position indicated in Fig. 5 the green-glass plates 9 are opposite the signal-lamp. The hub 7 is provided with two rearwardly-extending fingers 12 and 13, by means of which the signal-arm 5 is operated.

Within the casing 2 in suitable bearing-openings in the plates 3 and 4 are journaled a winding-shaft 14 and an escapement-shaft 15. The winding-shaft 14 has fixed thereon an operating-arm 16 and a ratchet-wheel 17. A spur gear-wheel 18 is loosely mounted upon said winding-shaft between the arm 16 and the ratchet-wheel 17, said gear-wheel 18 having pawls 19 pivotally mounted upon one side thereof in position to engage the teeth of the ratchet-wheel 18. The pawls 19 are held in engagement with the teeth of said ratchet-wheel by means of curved springs 20, one end of each of which springs passes through an opening 21 in its pawl, the other end lying in contact with a stud 22, set in the side of said spur gear-wheel 18. The escapement-shaft 15 has a pinion 23, adapted to mesh with the teeth of the spur-gear 18, said escapement-shaft also carrying an escapement-wheel 24, both the wheel and the pinion being fixed

upon said shaft. The escapement-wheel 23 is provided with a peripheral series of teeth 25, adapted to be engaged by the escapement-dog to be next described.

5 The escapement-dog 26 is fixed upon an oscillatory shaft 27, said shaft extending through a bearing-opening 28 in a bracket 29, fixed in the casing 2, and its pointed lower end resting in a cupped bearing-bracket 10 30, also rigidly secured with relation to said casing. The dog 26 is provided with two opposite inclined escapement-teeth 31 and 32 and two stop-shoulders 33 and 34. The teeth of the escapement-wheel 24 are intended to pass between the two shoulders 33 and 15 34 and to engage the beveled faces of the escapement-teeth 31 and 32. The upper or outer end of the shaft 27 carries an arm 35, upon the ends of which arm are secured 20 weights 36.

The operating-arm 16 is in position to engage the setting-fingers 12 and 13 of the signal-arm when said operating-arm is moved. Movement is imparted to the operating-arm 25 by means of an oscillatory crank-arm 37, fixed to one end of a shaft 38, the opposite end of which shaft carries a crank 39, having a pin 40 extending from its face, said pin lying underneath a plunger 41, supported in 30 an opening 42, formed in the side of one of the running-rails 43 of the railway. The plunger 41 at its upper end is rounded and projects slightly above the surface of the rail 43. Said plunger is adapted to have a vertical 35 movement, which movement is limited and the plate guided by elongated openings 44, extending in said plate, and pins 45, extending through said openings and through the rail 43. The oscillatory shaft 38 is mounted 40 in suitable bearings 46 in the base-block 47, secured in any suitable manner between the post 1 and the ties of the railway. The free end of the crank-arm 37 and the operating-arm 16 are connected by means of a weighted 45 connecting-rod 48, the outer end of the arm 37 being bifurcated to receive the lower flattened end of said connecting-rod and perforated to receive a pin 49, adapted to extend through any one of a series of perforations 50 50 in the lower end of said connecting-rod. The upper end of the connecting-rod is bifurcated and likewise perforated to receive a pin 51, adapted to extend through a corresponding perforation in the outer end of the operating-arm 16. The crank-arm 37 and the connecting-rod 48 are inclosed in a casing 52 and the 55 shaft 38 in a casing 53.

In operation a train passing the signal depresses the plunger 41, oscillates the shaft 38, 60 and raises the free end of the crank-arm 37. This movement of the crank-arm raises the connecting-rod 48 and the operating-arm 16, said operating-arm in its upward movement raising the finger 12 and throwing the signal- 65 arm 5 to the position shown in Fig. 6. In

this position the arm acts as a danger-signal and the plates of red glass 8 in the hub 7 are opposite the lamp 10. The ratchet-wheel 17 on the winding-shaft 14 also is rotated by the arm 16, the pawls 19 clicking over the teeth 70 of the ratchet-wheel 17 upon the upward movement of the arm 16. Upon the downward movement of said lever the pawls 19 engagesaid ratchet-teeth, locking the ratchet-wheel and the operating-lever with relation 75 to the spur-gear 18. The weight of the connecting-rod 48 tends to rotate the spur-gear 18 and the escapement-wheel 24. The teeth 25 of the escapement-wheel being engaged by the escapement-dog 26, the rotation of said wheel is prevented, save as the teeth of said wheel are permitted to pass said escapement-dog. The escapement-dog oscillates the weighted arm 35 at the upper end 80 of its shaft 27, a rapid rotation of the escapement-wheel being thereby prevented. By means of this escapement mechanism the operating-lever 16 is permitted to descend slowly, the time of its downward movement being changed by altering the weights upon 85 the outer ends of the weight-arm 35. As the operating-arm 16 is permitted to descend by the escapement mechanism near the lower point of its travel it engages the finger 13, moving said finger downward and raising 90 the signal-arm into its upper or safety position—to wit, the position shown in Fig. 5. In the safety position of the signal-arm the plates of green glass 9 in the two-part hub 7 of said arm are opposite the lamp 10, giving 100 to the engineer of an approaching train a green or safety signal at night, when the position of the arm cannot be seen.

The time of the operation of the escapement mechanism between the setting of said 105 mechanism by the passing of a train and the return of the signal-arm from the danger to the safety position is regulated not only by changing the weights upon the arm 35, but also by altering the amount of throw imparted to the operating-arm 16 by the crank-arm 37. The adjustment last mentioned is obtained by changing the position of the connection between the crank-arm 37 and the 110 connecting-rod 48, several openings being provided for said connection. The various parts of the mechanism are closed for protection both from weather and trespassers. The shaft 38 and its bearings are covered with the box 53, and the connecting-rod 48 is protected 115 by means of the casing 52. The opening 42 in the rail for receiving the plunger 41 may be provided by notching the tread of the rail and cutting through the foot thereof. The rail thus cut away at its upper portion 120 may be strengthened by securing a fish-plate 54 to its web portion.

It is clear that many changes may be made in the construction of this signal device without departing from the spirit and scope of 130

my invention, wherefore I desire to have it understood that I do not limit myself to the details of construction herein set forth, but desire to claim said invention broadly.

5 I claim as my invention—

1. In a signal-operating mechanism, in combination, a pivotally-mounted signal-arm; and means for pivotally moving said signal-arm comprising a pivoted operating-arm, a pivoted arm adapted to be moved upon the passage of a car, and a weighted connecting-rod extending between said last-mentioned arm and said operating-arm.

2. In a signal-operating mechanism, in combination, a pivotally-mounted signal-arm; two fingers fixed with relation to said signal-arm; a pivoted lever adapted to engage said fingers for moving said arm; a car-operated device for moving said lever in one direction; and a weight adapted to move said lever in the opposite direction.

3. In a signal-operating mechanism, in combination, a pivotally-mounted signal-arm; two fingers fixed with relation to said signal-arm and spaced apart; a pivoted lever extending between said fingers for moving said arm; means for moving said lever in one direction; and means for moving said lever in the opposite direction.

4. In a signal-operating mechanism, in combination, a pivotally-mounted signal-arm; means for pivotally moving said signal-

arm comprising a pivoted operating-arm, a pivoted arm adapted to be moved upon the passage of a car, and a weighted connecting-rod extending between said last-mentioned arm and said operating-arm; and an escapement for controlling the gravity movement of said weighted rod.

5. In a signal-operating mechanism, in combination, a pivotally-mounted signal-arm; two fingers fixed with relation to said signal-arm; a pivoted lever adapted to engage said fingers for moving said arm; a car-operated device for moving said lever in one direction; a weight adapted to move said lever in the opposite direction; and an escapement for controlling the gravity movement of said weight.

6. In a signal-operating mechanism, in combination, a pivotally-mounted signal-arm; two fingers fixed with relation to said signal-arm and spaced apart; a pivoted lever extending between said fingers for moving said arm; car-operated means for moving said lever in one direction; a weight for moving said lever in the opposite direction; and an escapement for controlling the gravity movement of said weight.

WESLEY LOOS.

Witnesses:

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ROBT. H. JUDD.