

No. 780,622.

PATENTED JAN. 24, 1905.

G. SCHREIBER.
ELECTRIC SIGNALING DEVICE FOR RAILWAYS.

APPLICATION FILED APR. 25, 1902.

5 SHEETS—SHEET 1.

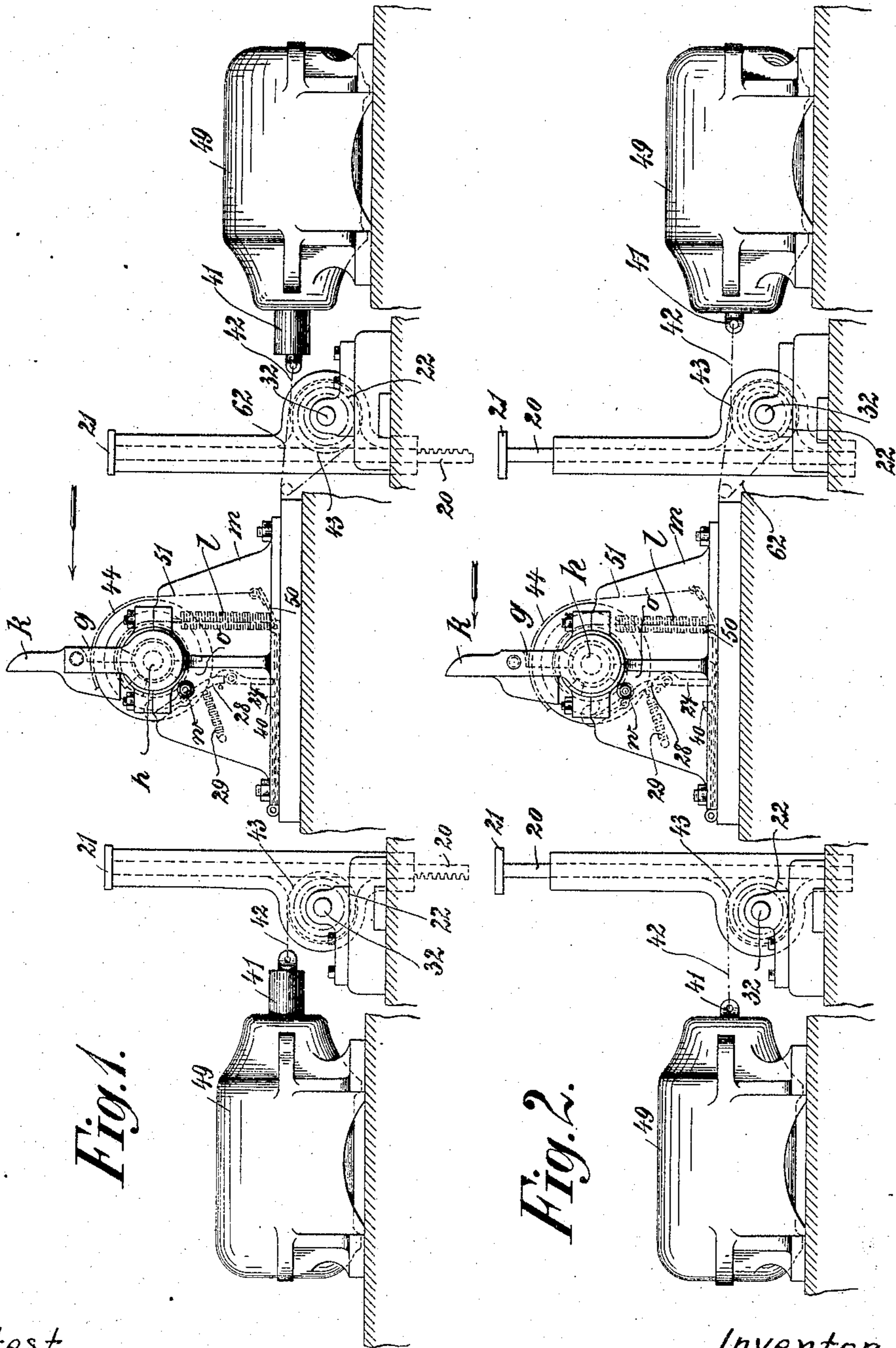


Fig. 1.

Fig. 2.

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Fig. 3.

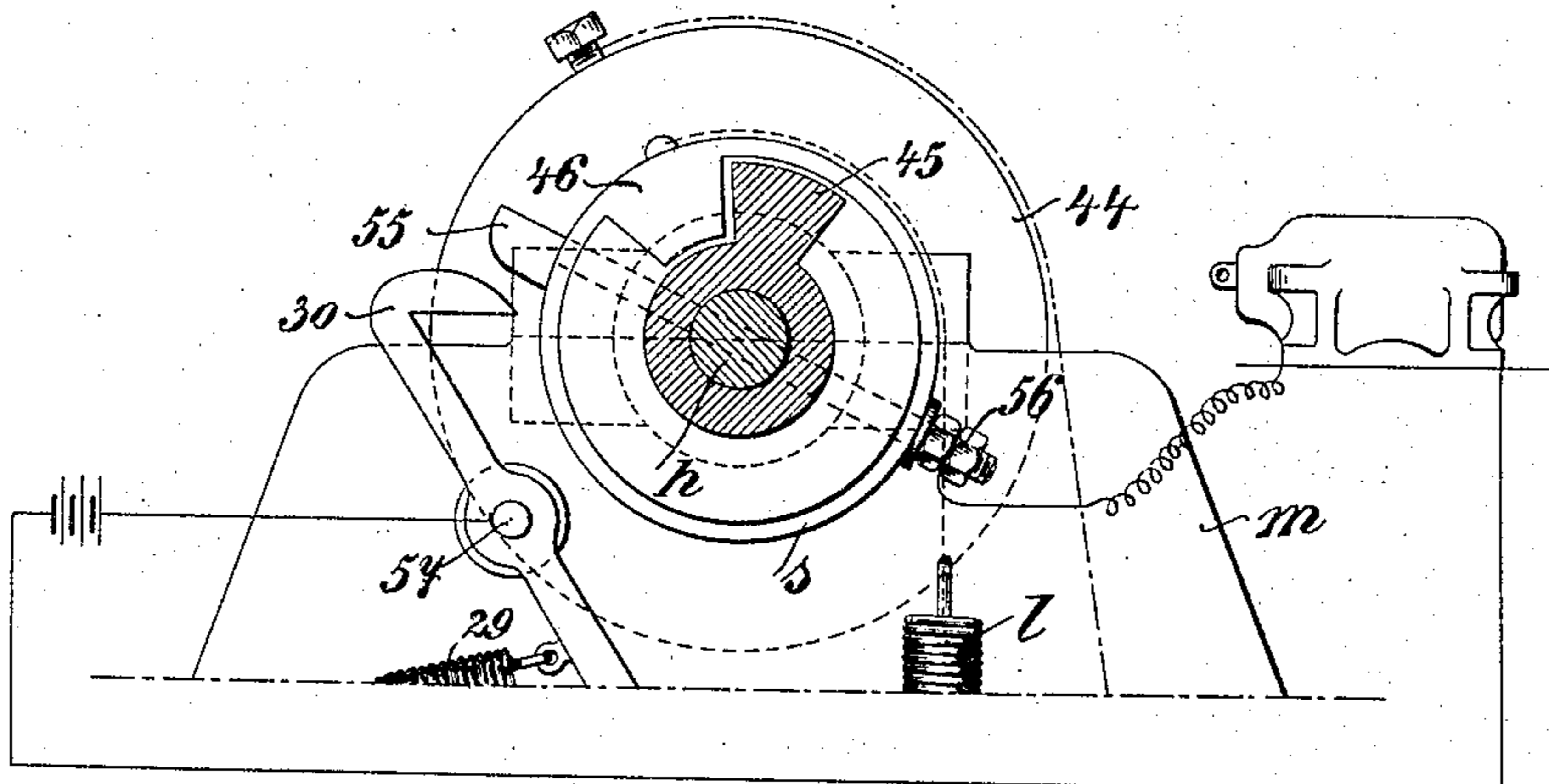
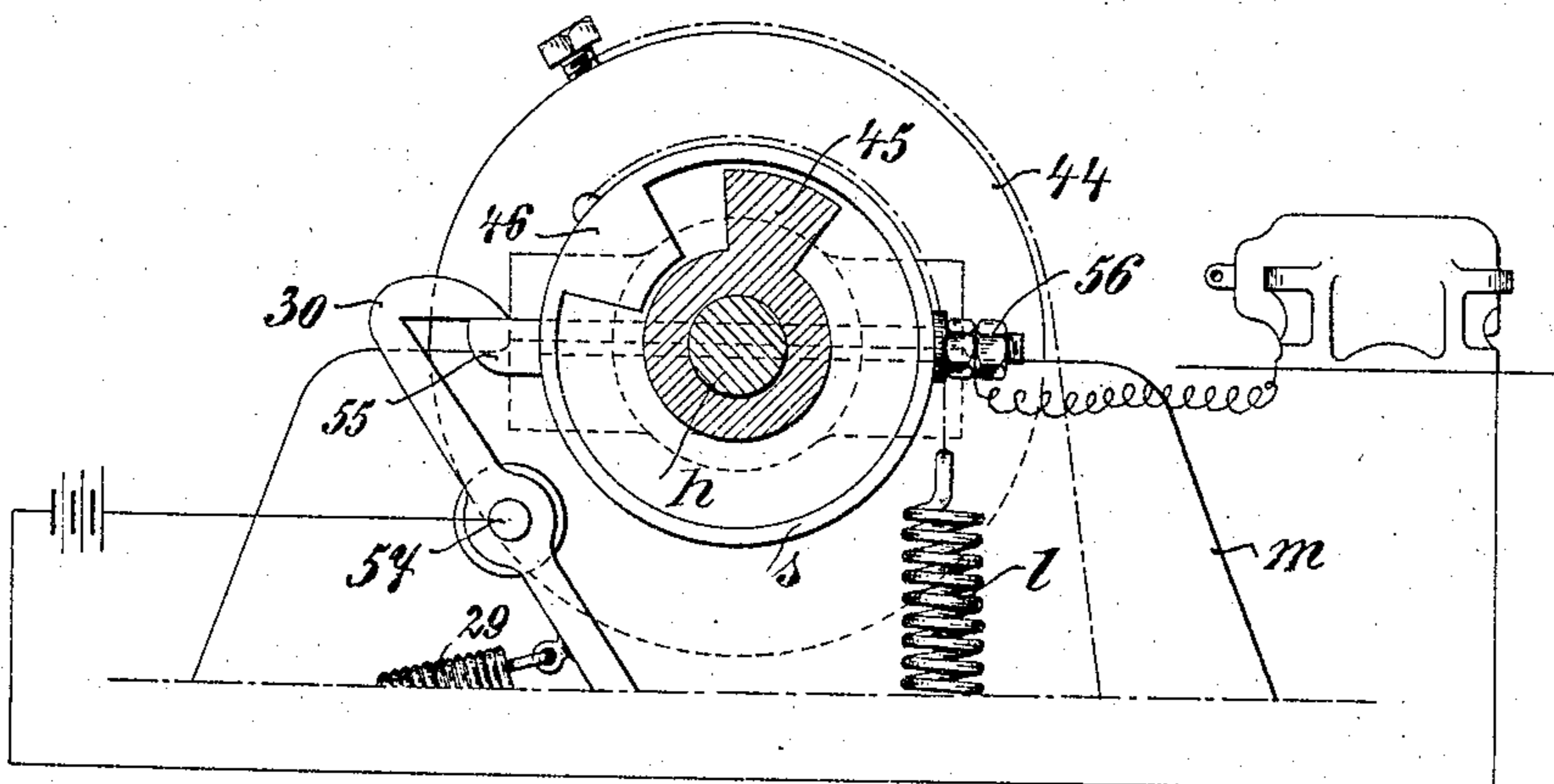


Fig. 4.



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Fig. 5.

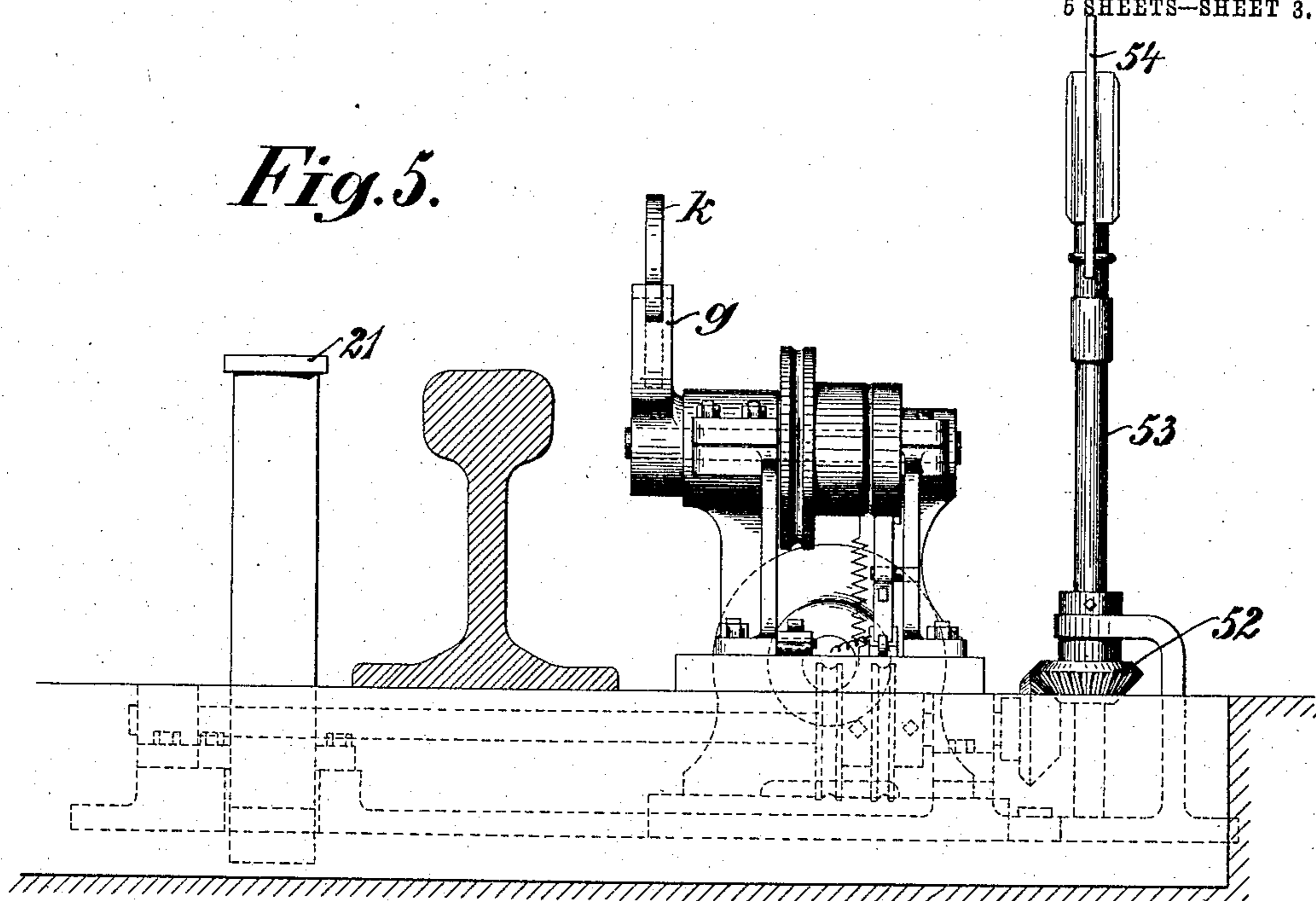
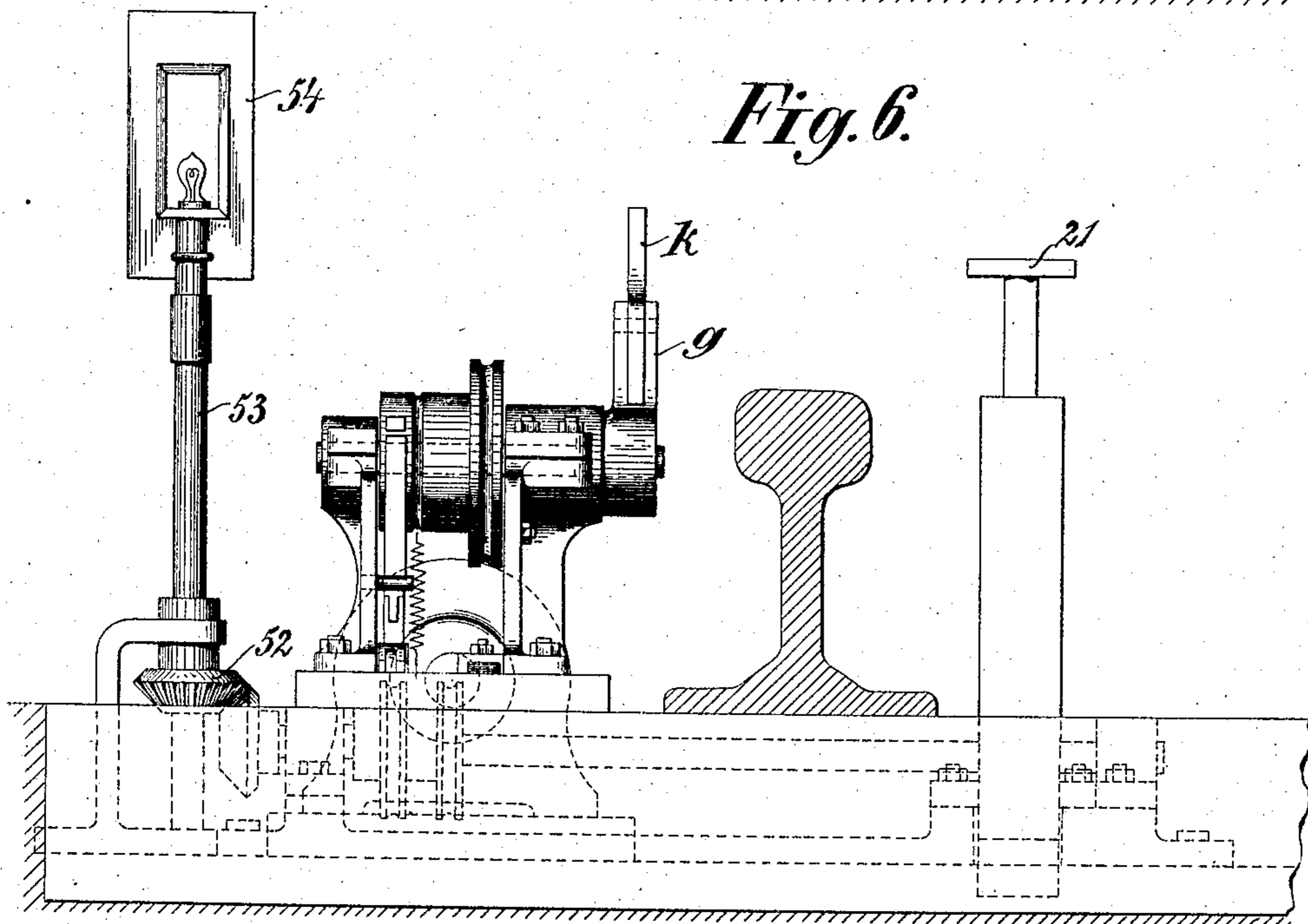


Fig. 6.



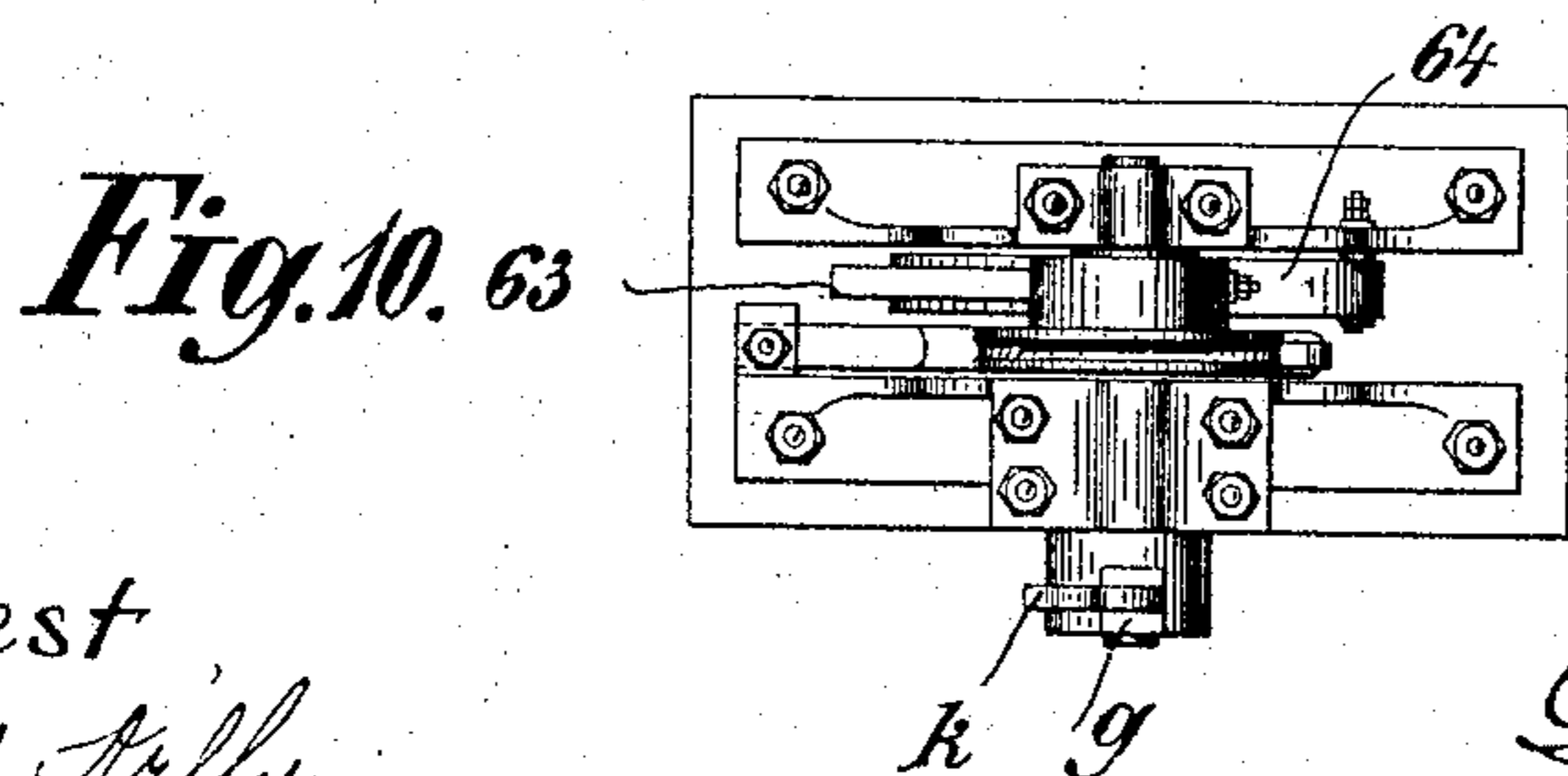
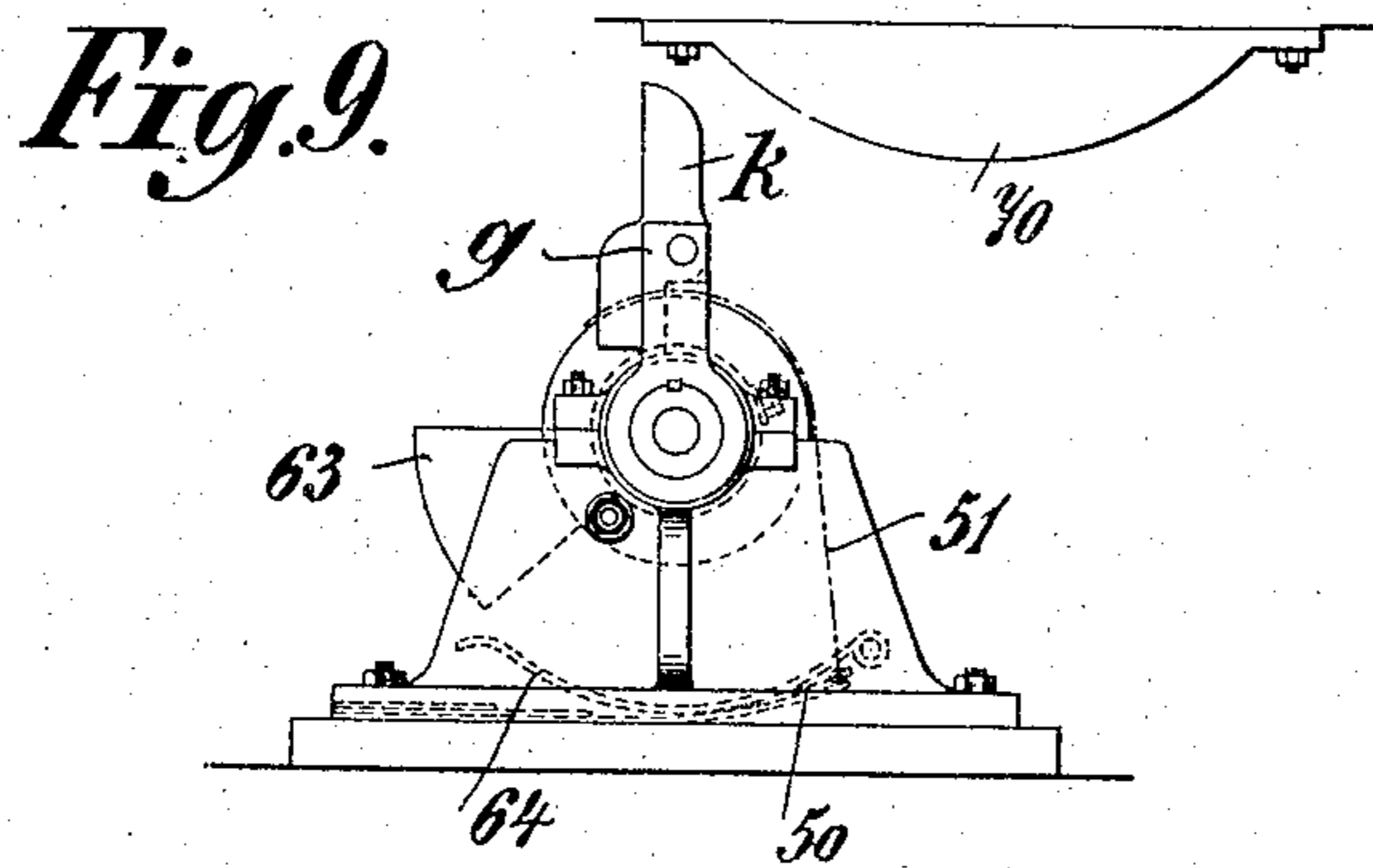
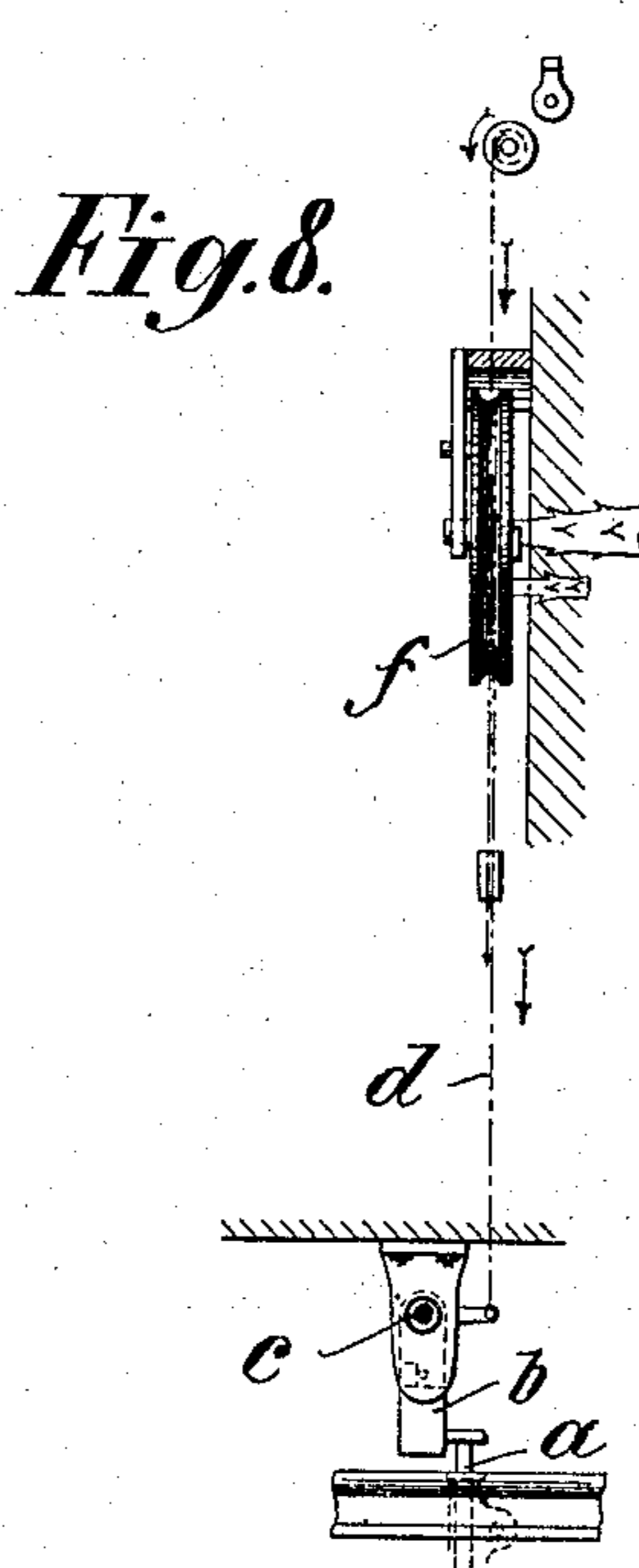
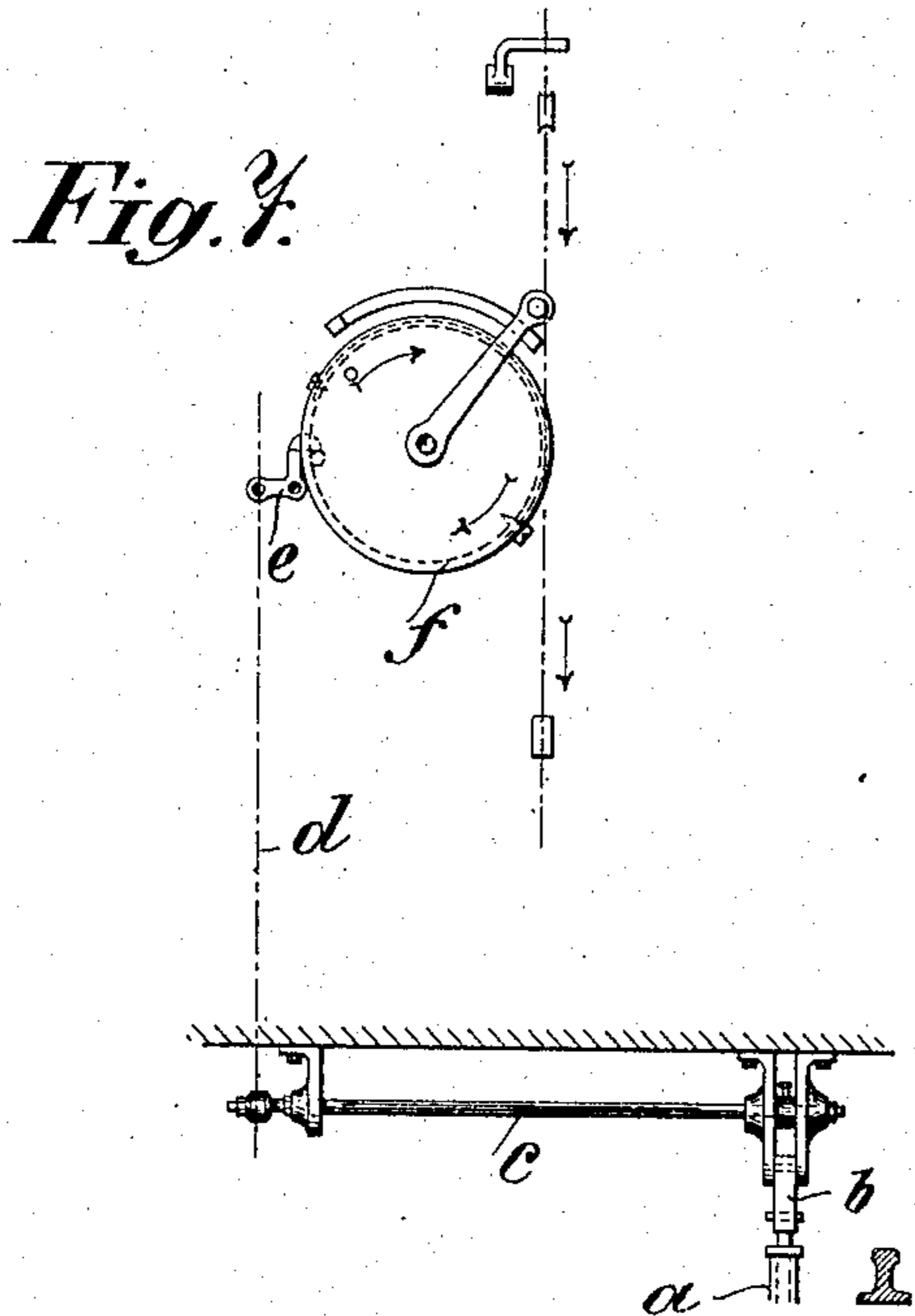
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5 SHEETS—SHEET 4.



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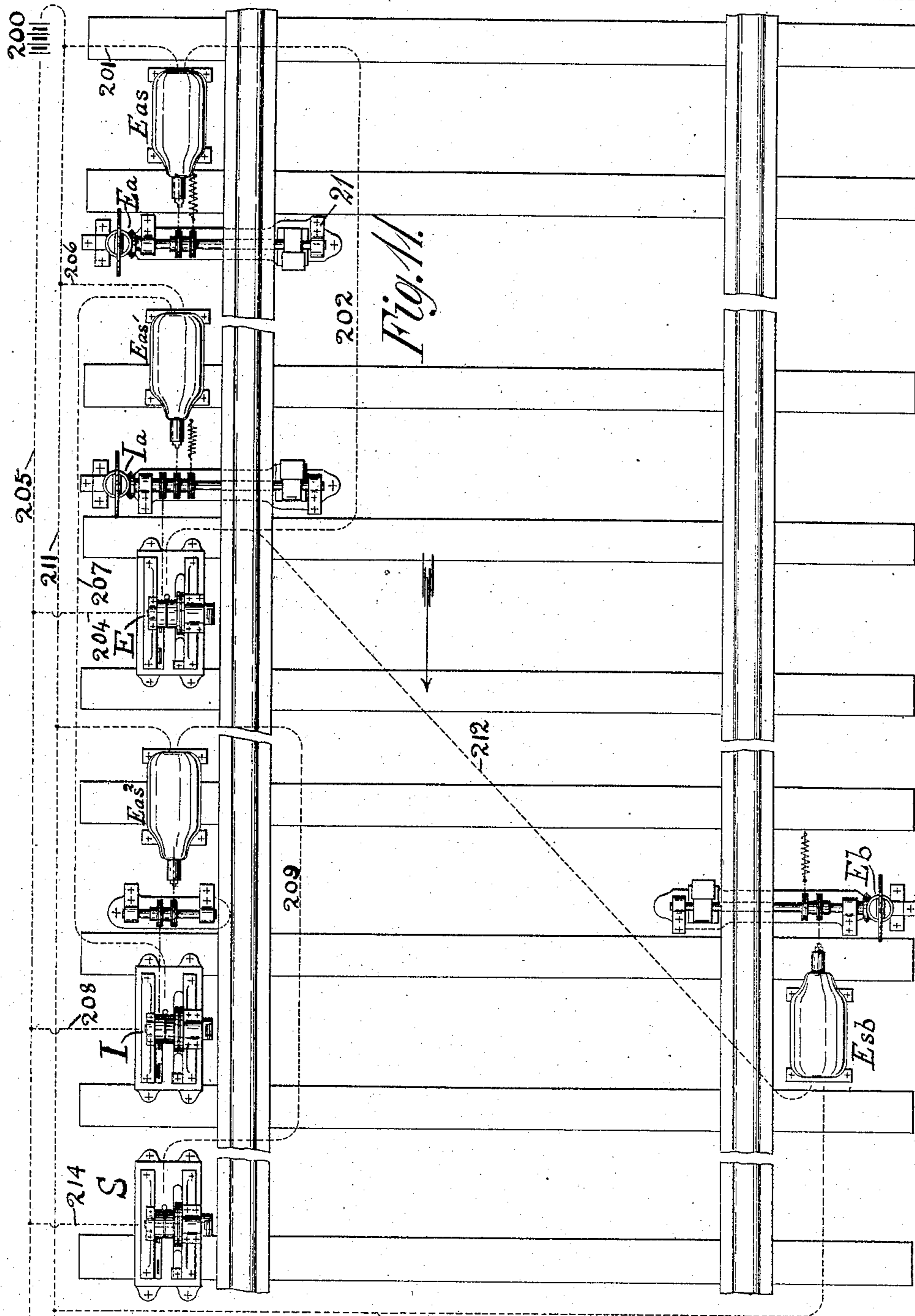
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

GEORGES SCHREIBER, OF ROUBAIX, FRANCE.

ELECTRIC SIGNALING DEVICE FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 780,622, dated January 24, 1905.

Application filed April 25, 1902. Serial No. 104,657.

To all whom it may concern:

Be it known that I, GEORGES SCHREIBER, a citizen of the French Republic, residing at 37 Rue du Nouveau Monde, Roubaix, France, have invented certain new and useful Improvements in Electric Signaling Devices for Railways, of which the following is a specification.

It is the object of this invention to automatically actuate a signal either in advance or in the rear or simultaneously both in advance and in the rear of a passing railway-train.

The signal may be either visual or one which will act by contact to give an alarm to another train reaching the actuated signal or to automatically actuate devices on such train to bring it to rest.

A part of my invention relates to devices whereby one signal is lowered or thrown out when the next one in advance is operated, so that there may be at all times but one signal displayed in advance or in the rear, all the other signals being automatically thrown out by the train.

These objects are accomplished by the devices shown in the accompanying drawings, in which—

Figure 1 is a side elevation of part of the signaling apparatus, showing two of the solenoids and the signals operated thereby. Fig. 2 is a similar view showing the signals after they have been operated. Fig. 3 is a vertical section of the circuit-closing devices of the apparatus shown in Figs. 1 and 2. Fig. 4 is a similar view showing the same parts of the circuit-closing devices after they have been operated to close the circuit. Fig. 5 is a side elevation of the signaling apparatus, illustrating its connection with a visual signal. Fig. 6 is a similar view looking from the opposite side and after the signals have been actuated. Figs. 7 and 8 are respectively a front and a side elevation of a safety apparatus on the locomotive adapted to be operated by the signals. Figs. 9 and 10 are respectively a side elevation and a plan view of the circuit-closing devices at the end of the line, and Fig. 11 is a diagram of a railway provided with the signaling apparatus.

The signaling apparatus, which is arranged at suitable intervals along the railway, consists

of a circuit-closing device, a signaling device, and an electrically-operated signal-actuating device.

The circuit-closing device is constructed as follows: Mounted on an axis *h* adjacent to and outside of the rail is a lever *g*, carrying a projection *k*, adapted to be struck by a projection 70 on the locomotive or car body. (See Fig. 9.) Mounted on the axis *h* and carried with the lever *h g* is a lug or projection 45, which is arranged adjacent to and adapted to strike a lug or projection 46 on a drum *s*, mounted on the axis *h* and with freedom to turn thereon. Carried by the drum *s* is a lug 55, adapted to engage a dog 30, pivoted on a pin 57 and thrown forward by a spring 29. The drum *s* is connected by a chain with a spring *l*, which acts to normally retract the lug 55 from engagement with the dog 30, as shown in Fig. 3. The lug or projection 45 and lever *h g* are secured to a disk 44, which is connected by a chain 51 with a leaf-spring 50, which thus acts to normally retract the lug 45 and lever *h g* into the position shown in Figs. 1 and 3. The electrically-operated signal-actuating device is a solenoid 49, in circuit with a source of electric energy and also with the lug 55 of the drum *s*. (See Figs. 3 and 4.) The dog 30 is also in circuit with the source of electric energy, the circuit being closed when the lug 55 and dog 30 are in contact.

The signaling devices are constructed as follows: 20 is a signal-rod mounted in a suitable guide inside of the rail and carrying at its top a contact piece or head 21 and at its lower part a rack which engages a pinion 22, carried on a shaft 32. A wheel 43 on the shaft 32 is connected by a chain 42 with the core 41 of the solenoid.

The operation of these parts is as follows: Supposing the parts to occupy the positions shown in Figs. 1 and 3, with the train moving in the direction of the arrow in Figs. 1 and 2, when the projection 70 on the locomotive or car strikes the lever *h g*, it will turn it to the left and move the lug 45 in contact with the lug 46. This will rotate the drum *s* against the action of the spring *l* until the lug 55 is engaged by the dog 30. The dog and lug will remain locked in this position, while the disk

44, with the lever *kg* and the lug 45, will return to normal position under the action of the spring 50. The contact of the dog 30 and lug 55 will complete the electric circuit through the solenoid 49, which will retract the core 41 and, through the chain 42, chain-wheel 43, shaft 32, and rack and pinion 22, project the signal-rod 20, as shown in Fig. 2. The raised signal-rod 20 is thus in position to give a danger-signal to any following train, either by visual indication or by the actuation of a danger-signal or other device on the train through contact of the head 21.

The electrical connections are shown in Fig. 11, in which a series of signals are shown arranged along a single track. E is one of the circuit-closing devices actuated by the train, having the contact-dog 30 connected by the wire 204 with one wire 205 from the battery 200 and the contact-nose 55 electrically connected by the wire 202 with the solenoid *Eas*, which is electrically connected by the wire 201 with the other line-wire 211 to the battery 200. The core of the solenoid *Eas* is connected in the manner described with the signaling devices *Ea*. When a train in passing actuates the circuit-closing device E in the manner described, the solenoid *Eas* is energized and the signal-rod of the signal apparatus *Ea* is elevated. In practice the signal device *Ea* and its associated solenoid *Eas* will be located at a considerable distance from the associated circuit-closing device E to enable the actuating-train to pass to a safe distance in advance of a following train before the latter will reach the elevated signal. As the train passes on to the next contact-closing device I it will energize the next associated solenoid *Eas'* with which it is connected to the conductor 207 and will actuate the signal-rod of its associated signal device *Ia*. The contact-closing device I is connected by the wire 208 with one line-wire, 205, and the solenoid *Eas'* is connected with the other line-wire by the conductor 206. The current will then flow from battery 200, through wire 201, solenoid *Eas*, wire 202, through circuit-closing device E and wire 204 to the line 205, and thence through wire 208, contact-closing device I, and wire 207 to solenoid *Eas'* and back through wire 206 to the battery. The raising of the signal-rod of the apparatus *Ia* will effect the lowering of the previously-raised signal-rod of apparatus *Ea* in the following manner: A spring-retracted trip 40 (see Figs. 1 and 2) is arranged in front of the lower end 27 of the pivoted dog 30 of each contact-closing device and is connected by a chain 62 with a disk 43 on the shaft 32 of the signaling device controlled by the next circuit-closing device in advance—i. e., the trip of the circuit-closing device E is operatively connected with the signaling device *Ia*, which is controlled by the circuit-closer I. As the shaft 32 is rotated to raise its signal-rod 20

the trip 40 is pulled forward and trips the dog 30 of the circuit-closer E. This breaks the circuit through the solenoid *Eas*, and consequently the signal-rod of the signal devices *Ea* will fall. In cases where trains are run in both directions on the same track two signals may be operated from each circuit-closer, one in front of the train and the other behind it.

The solenoid *Ebs* and the signaling device *Eb* in Fig. 11 are connected with the circuit-closer E and the line-wire 211 by the conductors 212 and 213, so as to be operated simultaneously with the devices *Ea* and *Eas* in like manner.

Besides the signal-rod 21 a semaphore or visual signal may be operated. This is illustrated in Figs. 5 and 6. The shaft 32 is connected by bevel-gears 52 with an upright shaft 53, which carries the signal disk or light 54.

The train may be automatically stopped by the signal-rod 21 by the apparatus shown in Figs. 7 and 8. On the bottom of the locomotive is a shaft *c*, carrying an arm *b*, adapted to strike a raised signal-rod 20. An arm on the shaft *c* is connected by a suitable link or connection *d* with a detent *e*, which engages a weighted disk *f*, which may have suitable connections with the locomotive-signals, throttle-valve, and air-brake. When the shaft *c* is rocked by contact of the arm *b* with a rod 20, the weighted disk *f* will be released by the detent *e* and will actuate the valves and devices which it controls to bring the train to a full stop.

At the end of the track, as indicated at S in Fig. 11, may be employed a device of the character shown in Figs. 9 and 10. In this case the circuit-closing device consists of a contact-piece 63, carried by the lever *kg* and the contact-spring 64, one of which is connected with the line-wire 205 by the wire 214 and the other by the conductor 209 with the solenoid *Eas'*, which in this case merely operates the trip device *s* for opening the circuit-closer I and releasing the last signal-rod of the series. The device S in this case is similar to the other signaling devices except that it has no signal-rod 20 or pinion to operate it.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In an electric signaling device for railways, the combination of a normally open electric circuit, a circuit-closer in said circuit adapted to be actuated by a passing train to close the circuit, consisting of a rocking lever *kg* carrying a lug 45, a rotary drum *s* actuated by said lug 45 and having a contact-nose 55 connected with one line of the circuit, a spring to return said drum and lug to normally retracted position, a spring contact-dog 30 connected with the other line of the circuit adapted to engage said nose 55, a solenoid in said circuit electrically connected with said dog and located at a distance from said circuit-closer, and a signal apparatus adjacent to

and mechanically connected with said solenoid to be actuated thereby when it is energized.

2. In an electric signaling device for railways, the combination of a normally open electric circuit, a circuit-closer in said circuit adapted to be actuated by a passing train to close the circuit, consisting of a rocking lever *k g* carrying a lug 45, a rotary drum *s* actuated by said lug 45 and having a contact-nose 55 connected with one line of the circuit, a spring to return said drum and lug to normally retracted position, a spring contact-dog 30 connected with the other line of the circuit adapted to engage said nose 55, a solenoid in said circuit electrically connected with said dog and located at a distance from said circuit-closer, a signal apparatus adjacent to and

mechanically connected with said solenoid to be actuated thereby when it is energized, a second circuit-closer similar to the first also in contact with another distant solenoid having an associated signaling device, and a trip device between the first-mentioned signaling device and the contact-dog of the second-mentioned circuit-closer to release said dog and open the circuit when the first-mentioned circuit-closer is closed.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

GEORGES SCHREIBER.

Witnesses:

ALFRED C. HARRISON,
B. OR. GOBLE.