

W. KNORN.
SAFETY DEVICE FOR TRAINS.
APPLICATION FILED DEC. 5, 1904.

2 SHEETS—SHEET 1.

Fig. 1

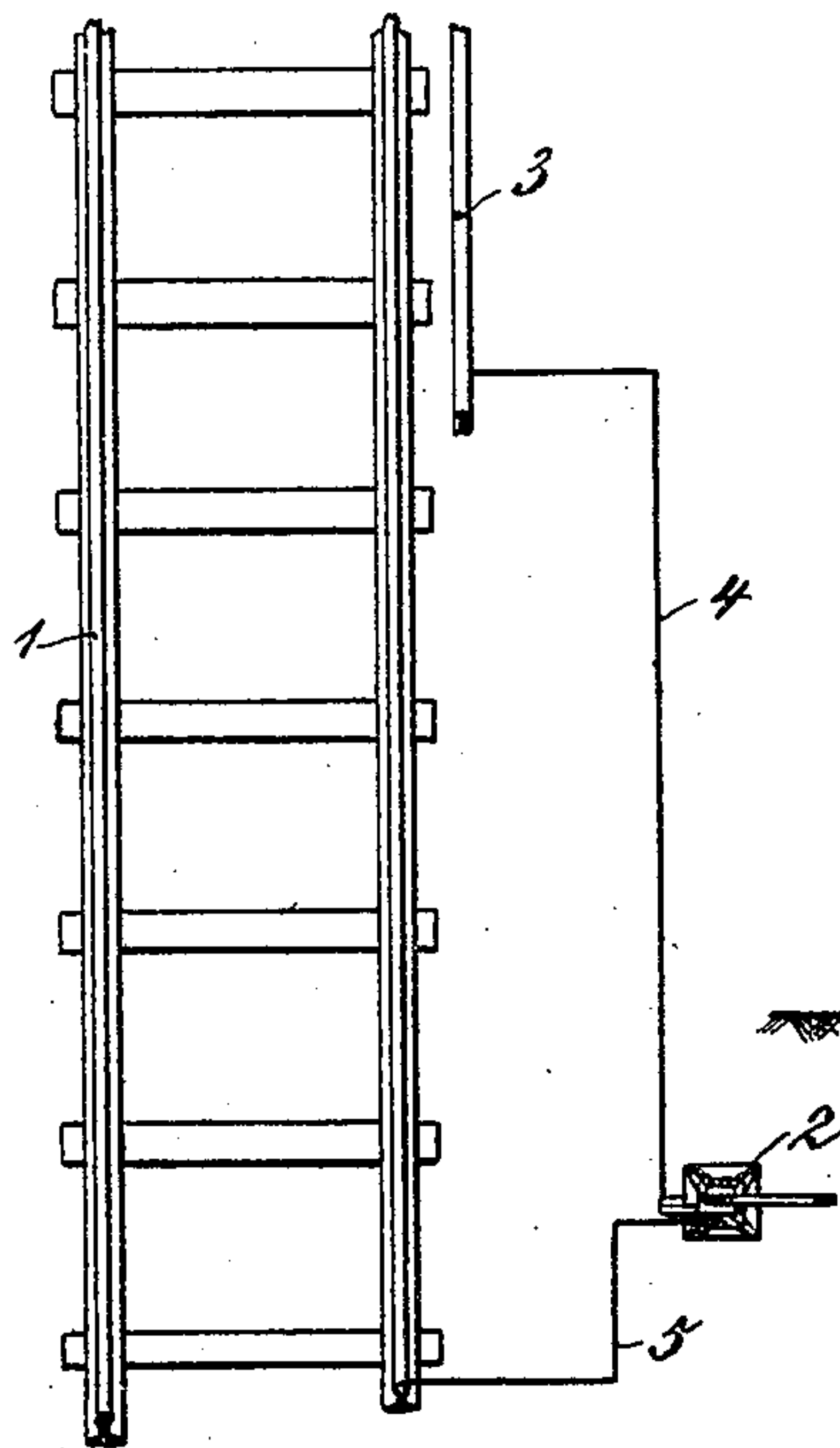


Fig. 2

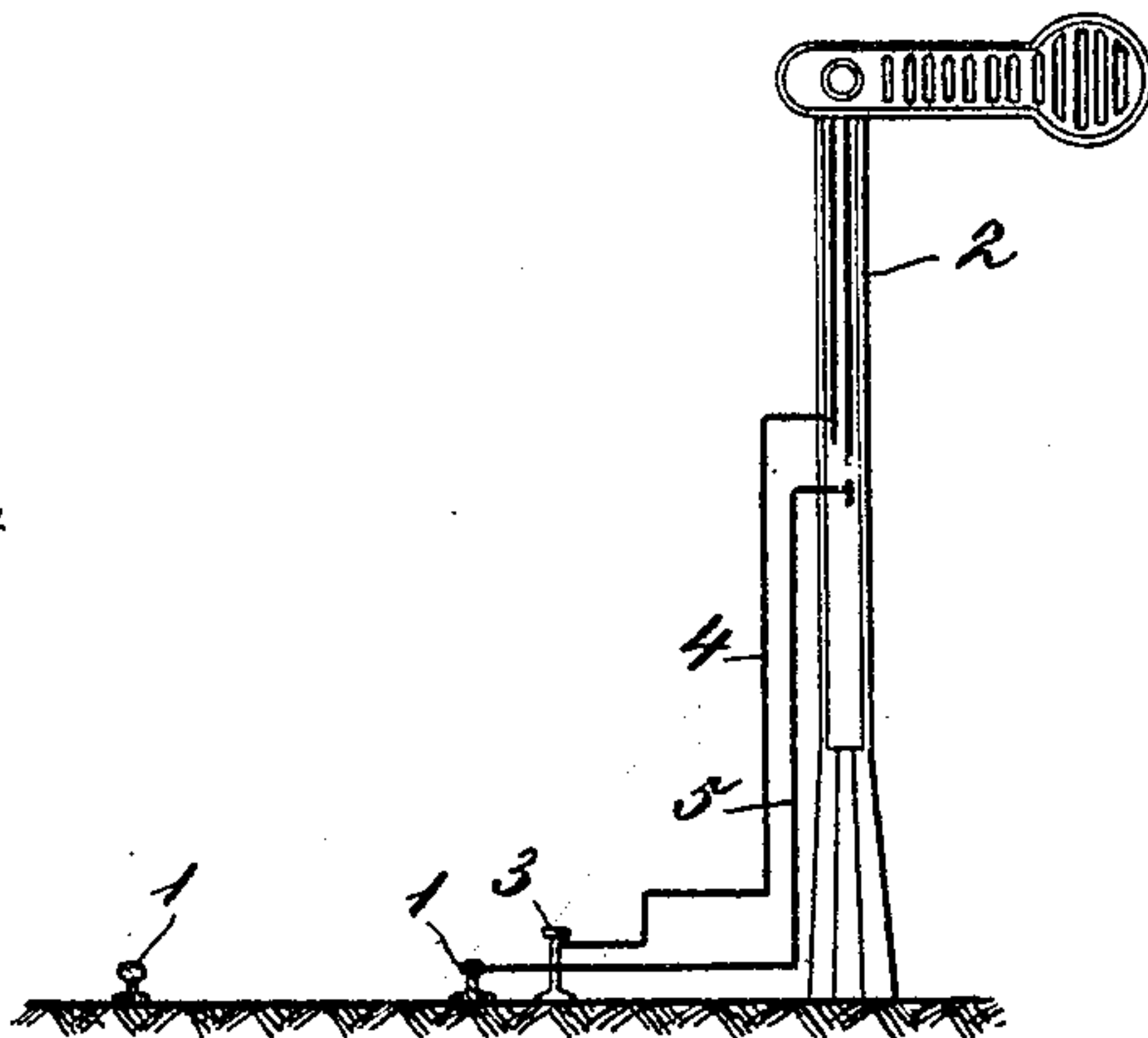
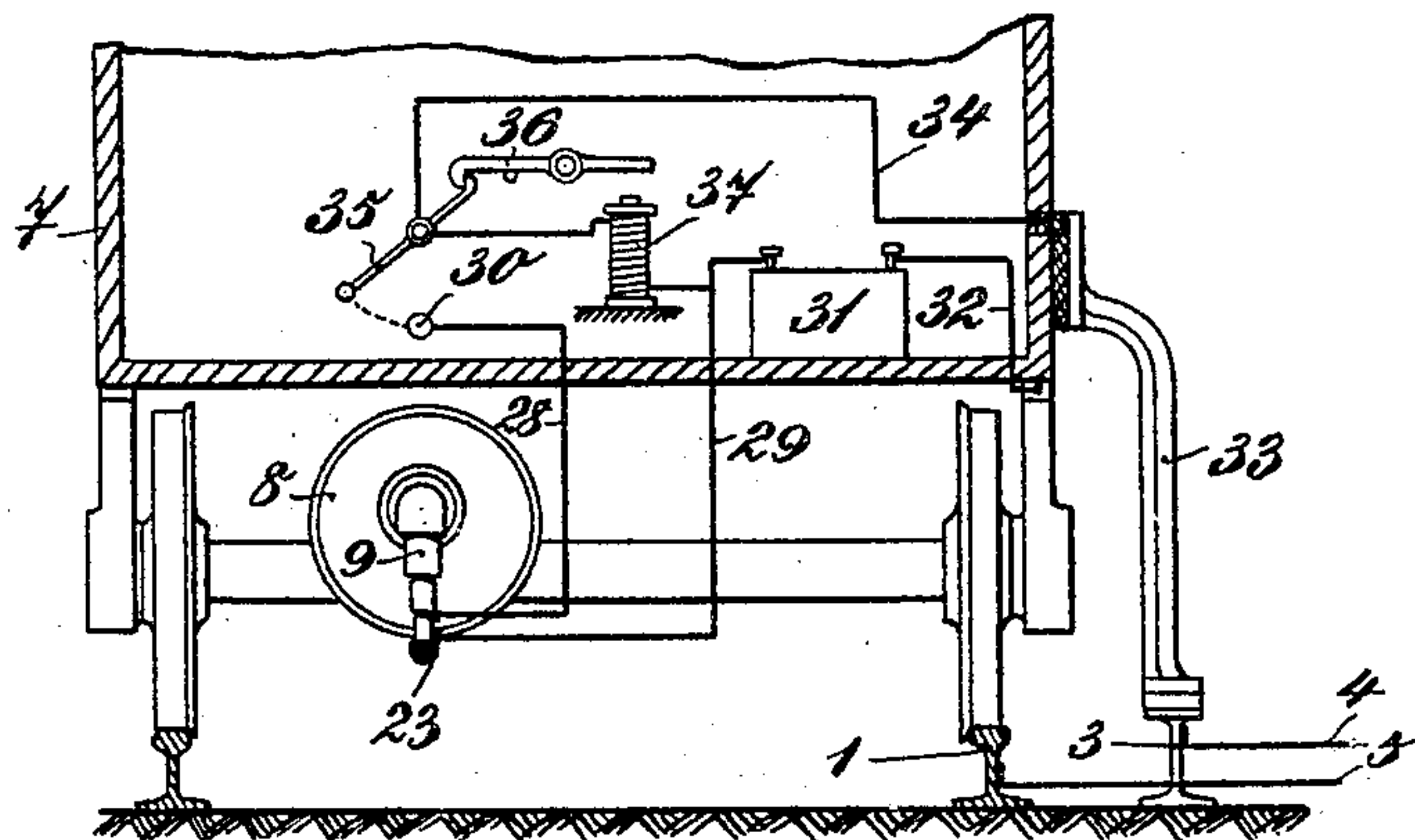


Fig. 3



WITNESSES:

Eugene M. Slincy
C. H. Griesbauer

INVENTOR

Willy Knorn.
By *A. B. Wilson*
Attorney.

No. 795,397.

PATENTED JULY 25, 1905.

W. KNORN.
SAFETY DEVICE FOR TRAINS.

APPLICATION FILED DEC. 5, 1904.

2 SHEETS—SHEET 2.

Fig. 6

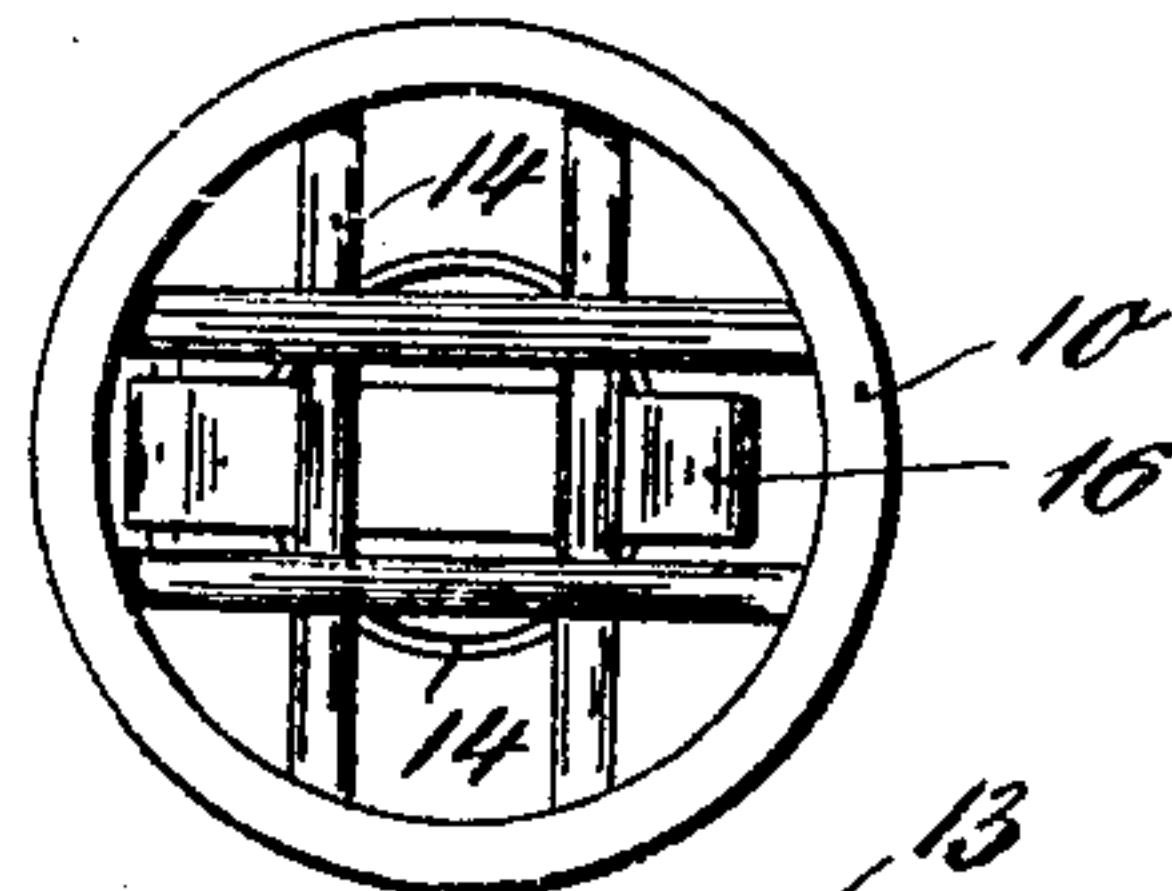


Fig. 4

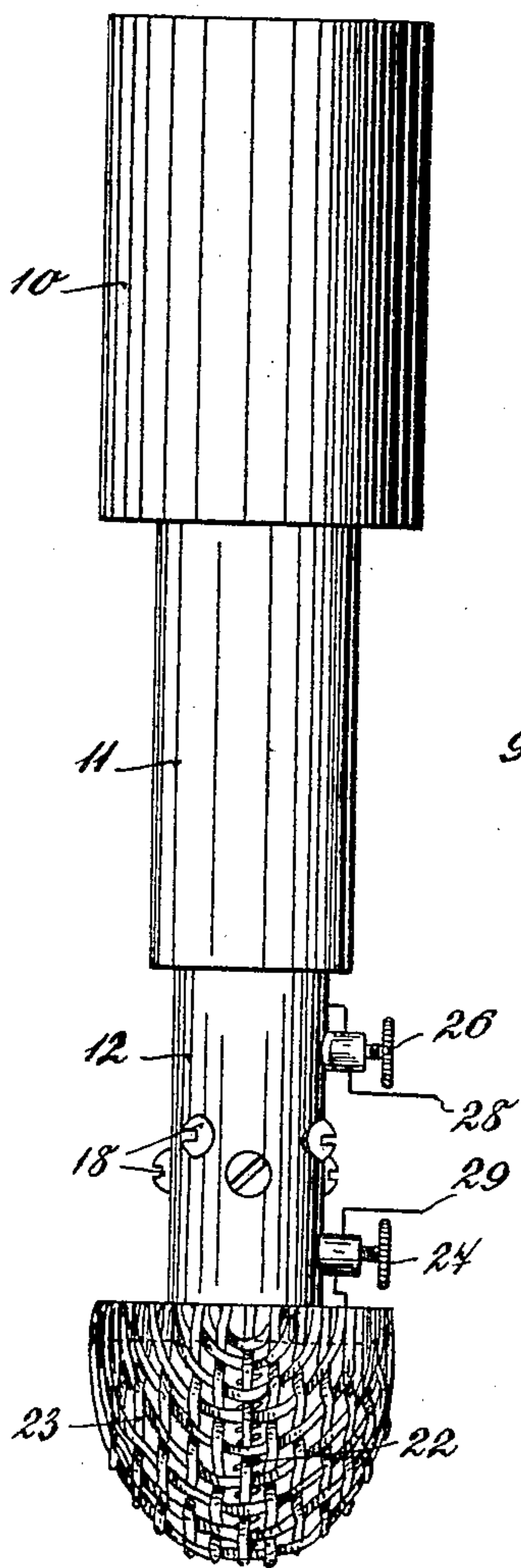
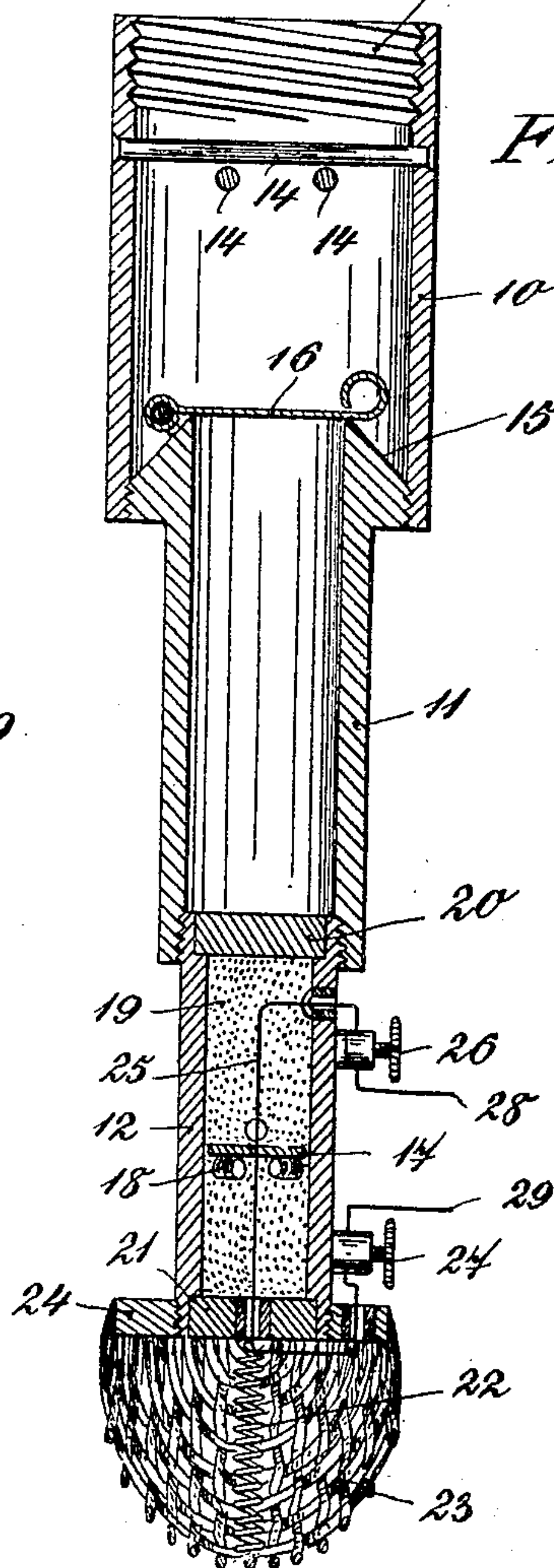


Fig. 5



WITNESSES:

Eugene A. Sliney
C. H. Griesbauer

INVENTOR

Willy Knorn

By

H. B. Wilson
Attorney.

UNITED STATES PATENT OFFICE.

WILLY KNORN, OF BERLIN, GERMANY.

SAFETY DEVICE FOR TRAINS.

No. 795,397.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed December 5, 1904. Serial No. 235,615.

To all whom it may concern:

Be it known that I, WILLY KNORN, engineer, residing at 16 Neustädtische Kirchstrasse, Berlin, Kingdom of Prussia, Germany, have invented new and useful Improvements in Safety Devices for Trains, of which the following is a specification.

This invention relates to a safety device for trains in which a partition which shuts off the compressed-air pipe of the brake device from the outer air is displaced by the ignition of a cartridge, the explosion of which is effected by means of the line-signal.

The essential feature of the invention consists in an arrangement for preventing the said partition from again assuming its original position, and thus securing the free passage of the air required to cause the brake to act. This is effected by the provision of a recoil device movable only in the direction in which the explosion throws the partition.

Figures 1 and 2 of the annexed drawings illustrate the connection between the track and the signal. Fig. 3 shows the device attached to a carriage, and Figs. 4 to 6 illustrate the construction of the cartridge.

There runs along the track 1 a contact-rail 3, which is connected by a wire 4 with a switch attached to the line-signal 2. A wire 5 connects the switch with the track. When the signal indicates "line blocked," wires 4 and 5 are connected. When it indicates "line clear," the connection between them is interrupted by the switch.

There is attached to the air-reservoir 8 of the compressed-air brake, which is fixed to the carriage 7, a cylindrical hollow body 9, which, as shown by Figs. 4, 5, and 6, is divided into three parts. The part 10 of the cylinder is provided at its upper end with a screw-thread 13, by means of which it can be fastened to the air-reservoir. It is provided, moreover, with cross-bars 14, which pass through it. The upper end 15 of the part 11, which is screwed into the part 10, is suitably tapered, while a flap 16, a cross-piece, a spring, or any similar device, which is movable in one direction only—namely, upward—and always automatically again returns to its first position, lies on the upper edge of the part 11.

The cylinder 12 is divided into two compartments by a disk 17, of pasteboard or the like, and is screwed into the lower end of the cylinder 11. This pasteboard disk 17 is held in its place by screws 18. The space above and beneath the disk 17 is filled with any suit-

able explosive substance 19, which is closed in at the top by the disk 20 and at the bottom by the disk 21. The disks 20 and 21 are so fitted into the cylinder 12 as to be secured against being accidentally displaced. Moreover, a spiral spring 22, the lower end of which rests against the inner surface of a basket 23, is attached to the disk 21. The basket 23 is fixed to a disk 24, which is screwed onto the cylindrical part 12.

A solid body 25 (a piece of iron wire or some other suitable material which can be easily rendered incandescent by the action of the electric current) runs through the explosive substance contained in the cylinder 12. It is joined up with the wires 28 and 29 by the binding-screws 26 and 27, Fig. 3. The wire 28 is joined to a contact-stud 30, while the wire 29 is connected with any suitable current-generator 31. The current-generator 31 is electrically connected with the track by means of the wire 32 and the metallic portions of the carriage.

An arm 33, made of conducting material, which is attached to and insulated from the carriage, is connected by the wire 34 with a switch 35, which is held in the position illustrated in Fig. 3 by a detent-lever 36 or some similar contrivance. The detent-lever 36 is acted upon by an electromagnet 37, which is joined up with a wire which runs from the switch 35 to the current-generator 31.

The device described above operates in the following manner: When the line-signal 2 indicates "line blocked," the wires 4 and 5 are connected. Consequently the contact-rail 3 is electrically connected, by means of the line-signal 2, with the track. If now a train passes the spot where the line-signal is situated, the circuit through the carriage will be closed by the arm 33 when the train passes over the contact-rail 3. When that occurs, the electromagnet 37 is excited and the detent-lever 36 attracted, and consequently the switch 35 will be released, with the result of closing the following circuit: current-generator 31, wire 32, rail 1, wire 5, wire 4, contact-rail 3, arm 33, switch 35, contact-stud 30, wire 28, incandescent body 25, wire 29, current-generator 31, and of exploding the explosive substance 19 by the heat given out by the incandescent body 25. The resulting explosion displaces the disks 20 and 21, and thereby allows the air to pass freely through the parts 10, 11, and 12 of the cylinder. The air-reservoir of the compressed-air brakes is consequently put in

communication with the outer air and the brakes caused to act.

Instead of the method described the circuit may be arranged in a different manner, if desired. For instance, the rail may be used solely for the purpose of exciting the electromagnet and the circuit may be closed within the locomotive itself.

The force of the explosion of the substance 19 hurls the disk 20 through the cylinder 11; but the cross-pieces 14 prevent it from passing into the air-reservoir. The flap 16 opens to allow the disk 20 to pass from the cylinder 11 into the cylinder 10, but closes again as soon as it has passed through. Consequently the disk 20 cannot fall back again into its first position.

To enable the safety device to be used again when the train passes on its journey, it is only necessary to insert a new cylinder 9.

Having now particularly described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A safety device for trains in which a partition which shuts off the compressed-air pipe of the brake device from the outer air is displaced by the ignition of a cartridge effected by means of the line-signal, the essential fea-

ture of the invention being the arrangement by means of which the said partition is prevented, after the explosion has taken place, from again assuming its original position with the result of insuring the passage of the air required to cause the brake to act, substantially as described and illustrated.

2. A form of constructing the safety device in which a recoil-piece 16, arranged behind the partition 20, catches the partition 20 after the explosion has been effected and prevents it from falling back into its original position, substantially as described and illustrated.

3. A form of constructing the safety device in which cross-pieces 14 are arranged in the path of the partition 20 with the object of preventing the partition from entering the air-pipe and throwing it back against the catching device 16, substantially as described and illustrated.

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

WILLY KNORN.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.