

No. 736,382.

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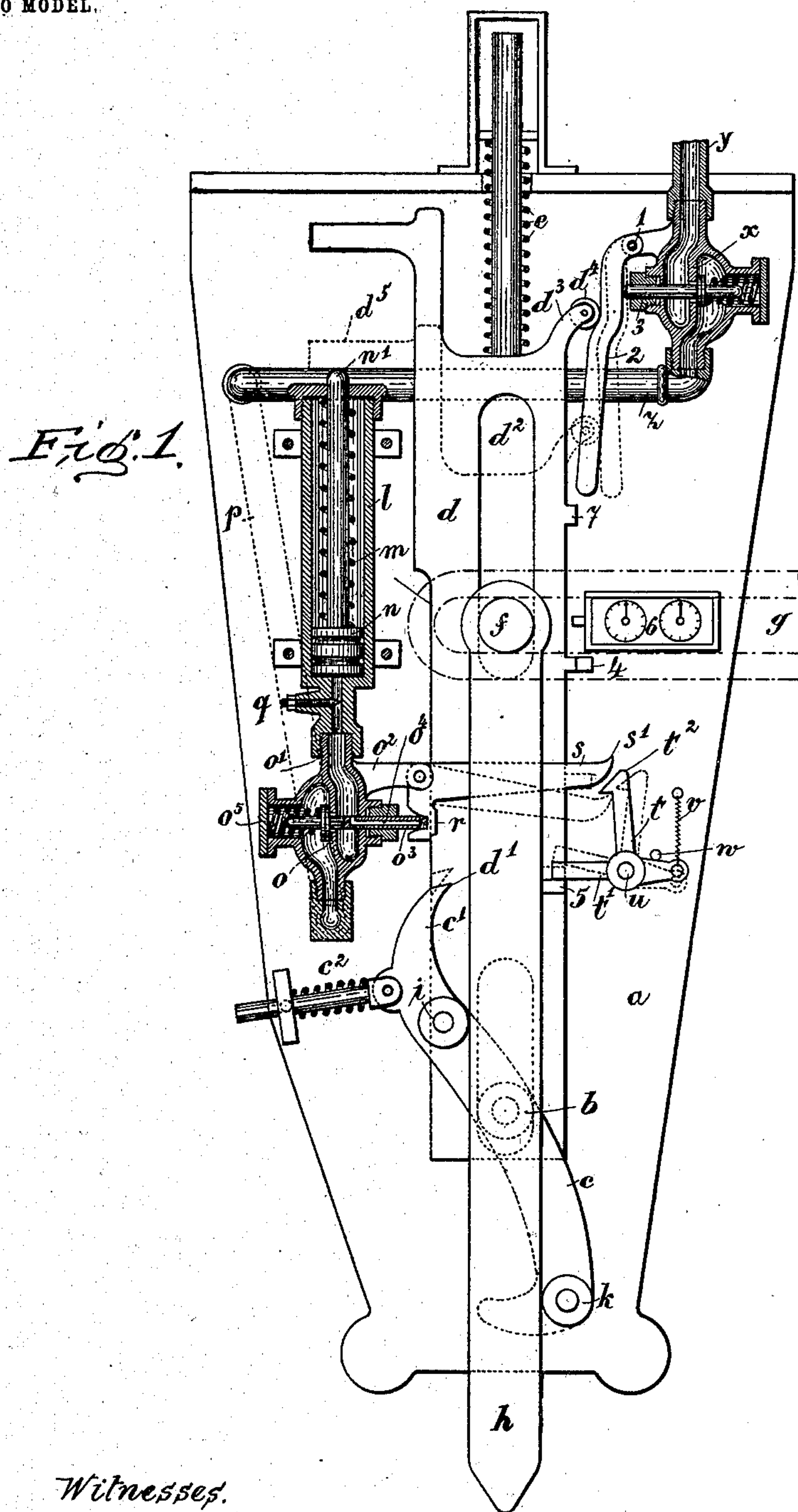
J. GRABER.

REVERSING APPARATUS FOR USE ON RAILWAY VEHICLES.

APPLICATION FILED DEC. 2, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.

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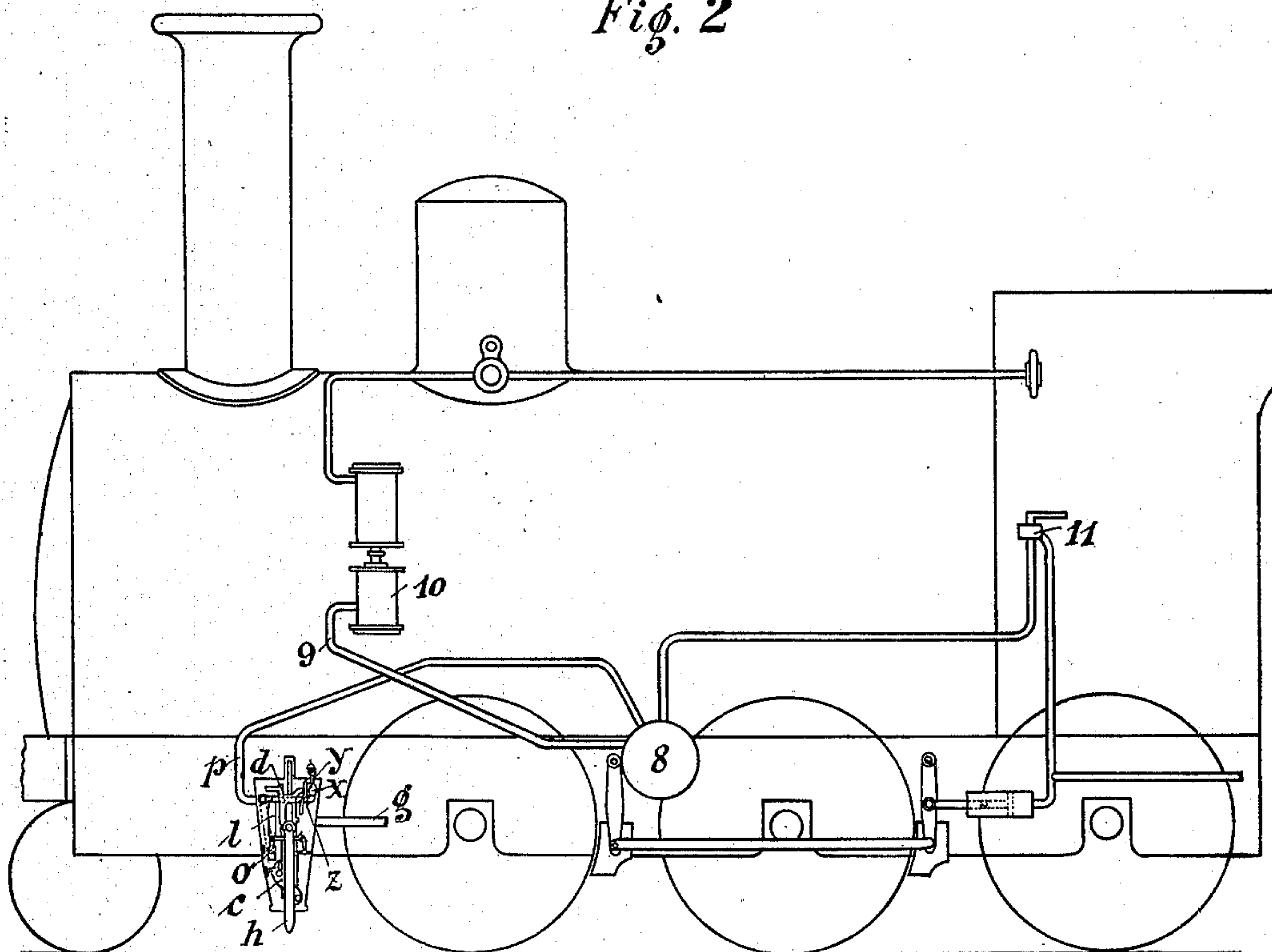
REVERSING APPARATUS FOR USE ON RAILWAY VEHICLES.

APPLIOATION FILED DEC. 2, 1901.

NO MODEL.

2 SHEETS--SHEET 2

Fig. 2



Witnesses
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UNITED STATES PATENT OFFICE.

JAKOB GRABER, OF ZURICH, SWITZERLAND, ASSIGNOR TO GESELLSCHAFT FÜR PATENTVERWERTUNG DER DISTANZBREMSE FÜR EISENBAHNEN, OF BASEL, SWITZERLAND.

REVERSING APPARATUS FOR USE ON RAILWAY-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 736,382, dated August 18, 1903.

Application filed December 2, 1901. Serial No. 84,484. (No model.)

To all whom it may concern:

Be it known that I, JAKOB GRABER, a citizen of Switzerland, residing in Zurich, in the canton of Zurich, Republic of Switzerland, (whose post-office address is No. 454 Badenerstrasse, Zurich,) have invented certain new and useful improvements in reversing apparatus for use on railway-vehicles provided with brake or signal devices adapted to be operated from the track; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and numerals of reference marked thereon, which form a part of this specification.

The object of the present invention is a reversing apparatus for use on railway-vehicles provided with safety devices adapted to be operated from the track—such, for instance, as the devices set forth in my British Patent No. 2920 of 1901; and the present application describes an apparatus applicable for restoring the parts after operating by contact with a fixed obstacle on the track to their original position ready for the next actuation.

In the accompanying drawings is illustrated, by way of example, in Figure 1, a reversing apparatus of the aforesaid type, and in Fig. 2 the same apparatus is shown attached to a locomotive and connected to the air-chamber of the pneumatic brake. In Fig. 2 the compressed-air reservoir is represented at 8. The tube 9 conducts to the air-compressing pump 10, and 11 indicates the brake-tube.

On the casing *a*, which is preferably fixed on the underframe of a locomotive and the front of which is shown removed, there is pivoted on the pivot *b* a double-armed pawl *c*, the upper arm *c'* of which engages in a notch *d'* of a plate *d*, which plate is controlled by a spring *e* and moves on a pin *f* by means of the slot *d''*. The pin *f* is itself carried on a special arm *g*, placed, for instance, on an axle-box of the vehicle, bears a contact-lever *h*, which is guided below between two rollers *i* *k*, located on the pawl *c*. There is a cylinder *l*, arranged at the side of the plate *d*,

in which a piston *n* slides under the control of a spring *m*. At the under part of the piston is arranged a stop-valve *o*, which is in permanent communication by means of the tube *p* with the main air-chamber 8 of the locomotive-brake. A screw *q*, placed in the foot of the cylinder, allows the pressure of the compressed air passing to the piston to be regulated. To the valve-body *o'* there is linked, by means of the lugs *o''*, an elbow-lever *r* *s*, one arm, *r*, of which rests on the valve-spindle *o''*, the other arm having an edge *s'*, which in the depressed position (shown in dotted lines in the drawings) is caught and held by the projection *t''* of a pawl *t*. This pawl *t* is pivoted on a pin *u*, attached to the casing *a*, and is held in the position shown in full lines by means of a spring *v* and stop *w*. There is another stop-valve *x*, arranged in the upper part of the casing. This valve is connected, on the one hand, by means of a tube *y*, with a safety apparatus, (for instance, a whistle,) and, on the other hand, by means of tube *z* with the main air-reservoir. A lever 2, against which the valve-pin 3 rests, is likewise linked, by means of projections 1, to the valve-box.

The operation of the apparatus is as follows: Supposing the contact-lever *h* be pushed (in either direction) out of the position of rest shown during the journey by an obstacle on the line, the upper arm *c'* of the pawl *c* is thereby turned to the left and the plate *d* released, when the latter falls by its own weight and the action of the spring *e*. Thereby the lever 2, with the valve-pin 3, is moved to the right by a roller *d''* on an arm *d'''*, so that the compressed air can pass through the tube *z* to the tube *y* and actuate the safety apparatus and warn the train-staff. As soon as the plate *d* has nearly reached its lowest position, a stop 4 on the plate strikes against the arm *s* of the angle-lever *r* *s* and brings it into the position shown in dotted lines, when it is caught with the edge *s'* by the projection *t''* of the pawl *t*, and thereby the valve *o* opened. In this position of the valve compressed air passes from the main air-chamber through the passage *p* into the cylinder *l* and raises the piston *n*, where-

by the piston-rod n' presses against a lug d^5 on the plate d and lifts it. As soon as the plate has reached its original position the upper arm c' (which is controlled by a spring c^3) of the pawl c catches once more into the notch d' and prevents the plate going back. The upward movement of the piston n or plate d continues until a lug 5 on the plate strikes against the horizontal arm t' of the pawl t and brings the vertical arm t^2 out of engagement with the piece s' , (dotted lines,) whereupon the current of air coming out of the passage p and passing to the cylinder l aids the spring o^5 to close the valve o . At the same time by the displacement of the valve-pin o^3 the lever s moves back into the original position. As the lever s is now free and the supplying of air to the cylinder l has ceased the air compressed therein, driven out by the weight of the piston n and the pressure of the spring m and slightly blowing against the arm r of the angle-lever $r s$, is enabled to escape through a passage o^4 , arranged in the valve-pin o^3 , so that the piston can return automatically to its original lowest position, while the plate is held up after a short downward movement of the pawl-arm c' . The movement upward of the plate d , however, also admits of a lateral displacement of the valve-pin 3, which is controlled by a spring, so that the supply of air to the safety apparatus (whistle) is also interrupted.

On the casing of the apparatus there is provided a registering device 6, which is operated by a special projection 7 on the plate and records each time that the apparatus has been operated during a certain time.

The lower supports of the cut-off valve x could also be in communication with another safety device—i. e., the brake-tube of the train (when the tube z would be omitted)—in which case every operation of the apparatus would cause the brake of the train to be put on. Also instead of compressed air steam could be employed.

What I claim is—

1. In railway-vehicles provided with a safety device adapted to be operated from the track an apparatus for automatically reversing the actuating part of the safety device

into the normal position and having a valve in permanent communication with a source of fluid-pressure, having a passage for the escape of the fluid, and adapted to be operated by the actuating part of the safety device and to be periodically maintained in open position by means of a pawl, of a piston placed in a cylinder, adapted to be set in controllable communication with the said valve and to reverse the said actuating part of the safety device into its initial position and to stop the safety action substantially as described.

2. In railway-vehicles provided with a safety device adapted to be operated from the track, an apparatus for automatically reversing the actuating part of the safety device into the normal position and having the swing-lever h , the actuating-plate d , the fluid-pressure tube z , the signal-valve x , mechanism for operating said valve on the descent of d , the reversing-valve o , the cylinder l , the spring-controlled piston n , the piston-rod n' , the supply-pipe p , the escape o^3 , the lever s , the stop r , the pawl t , and mechanism for retaining the plate d in its raised position until released by the lever h , substantially as described.

3. In railway-vehicles provided with a safety device adapted to be operated from the track, an apparatus for automatically reversing the actuating part of the safety device into the normal position and having the swing-lever h , the actuating-plate d , the valve x in communication with the brake-tube of the train, mechanism for operating said valve on the descent of d , the reversing-valve v , the cylinder l , the spring-controlled piston n , the piston-rod n' , the supply-tube p , the escape o^3 , the lever s , the stop r , the pawl t , and mechanism for retaining the plate d in its raised position until released by the lever h substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of November, 1901.

JAKOB GRABER.

Witnesses:

A. LIEBERKNECHT,
HERMANN HUBER.