J. G. SCHREUDER & V. K. SPICER.

APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED OF TRAINS.

APPLICATION FILED AUG. 3, 1907.

903,413. Patented Nov. 10, 1908.

Fig. 2.

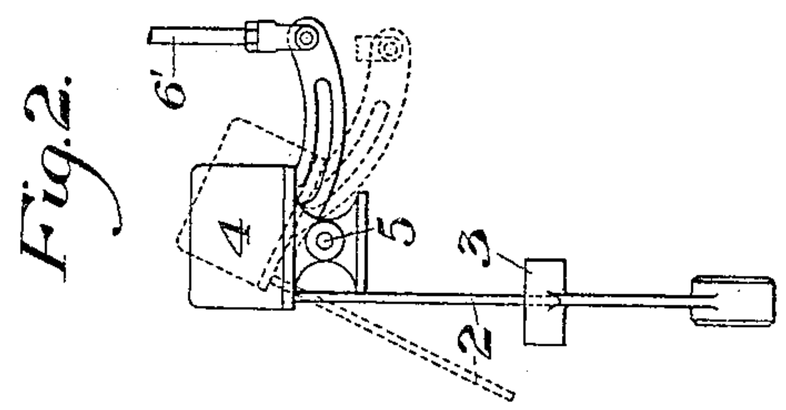
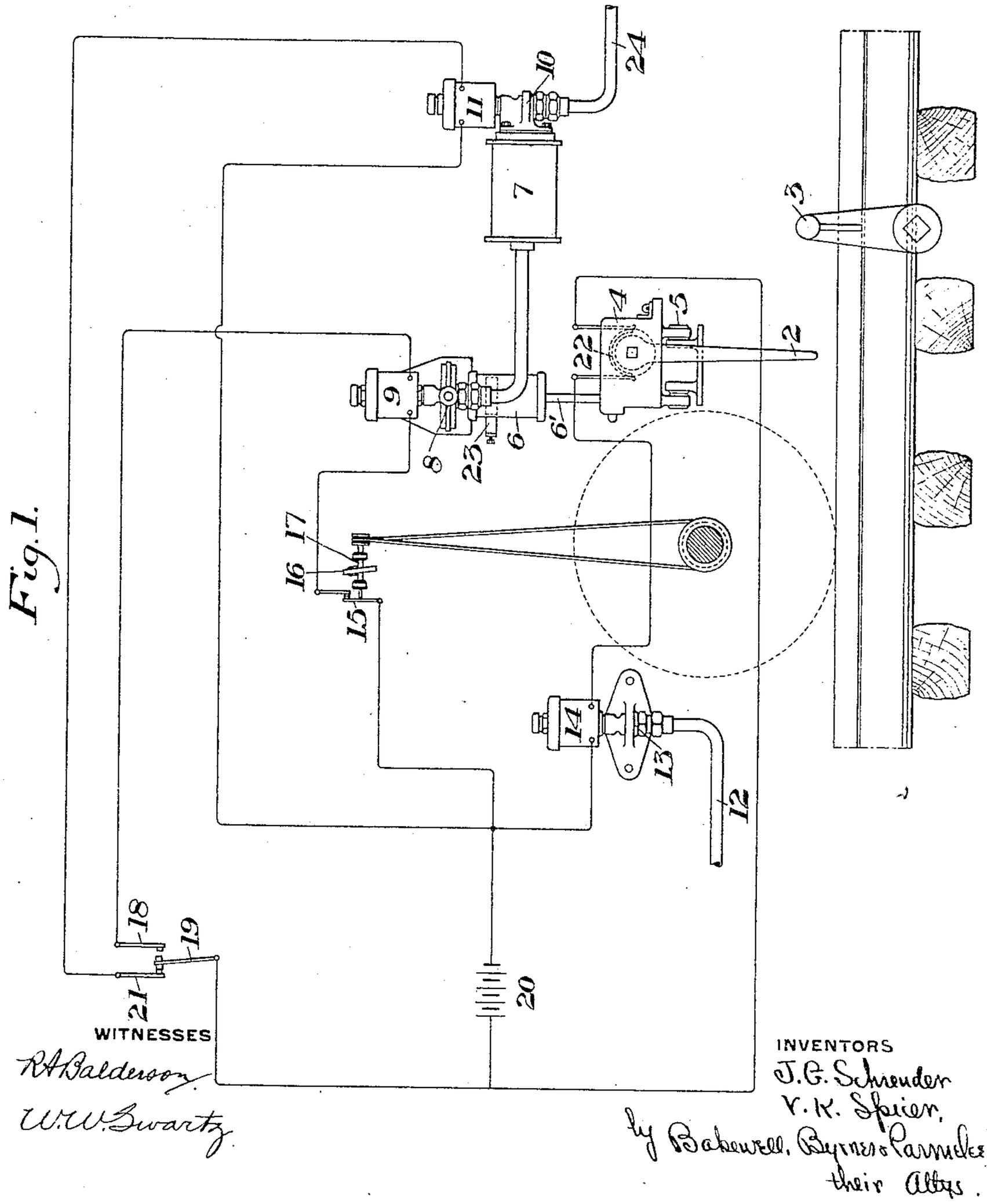


Fig. 1.



WITNESSES

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED OF TRAINS.

No. 903,413. Specification of Letters Patent. Patented Nov. 10, 1908.

Application filed August 3, 1907. Serial No. 386,936.

To all whom it may concern:

Be it known that we, JENS G. SCHREUDER, of Edgewood Park, Allegheny county, Pennsylvania, and VIBE K. SPICER, of Chicago, Cook county, Illinois, have invented a new and useful Apparatus for Automatically Controlling the Speed of Trains, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagram illustrating one form of our invention; and Fig. 2 is a detail view showing the laterally shiftable trip.

Our invention has relation to the automatic speed control of trains of the character described and claimed in our application for patent Serial No. 386,932 of even date herewith, in which the engine or train is provided with trip mechanism adapted to coöperate with trip or stop mechanism along the road, for the purpose of stopping the train or reducing its speed to a predetermined limit wherever necessary. The present application relates more particularly to the trip apparatus carried by the train for effecting a predetermined reduction in the train pipe pressure and a partial or service application of the brakes. The invention provides a movable trip device carried by the locomotive or train and normally in position to engage with the track trips or stops, means being provided, however, whereby the engineer provided the speed of his train is already below the predetermined limit, may move the trip device out of operative position.

Referring to the drawings, the numeral 2 designates a depending trip arm, which is attached to the engine or some other portion of the train, and which is normally in position to engage a track trip or stop 3. This trip arm 2 is attached to a tilting carrier 4 pivoted at 5. This carrier is arranged to be moved to the position shown in dotted lines to clear the trip arm 2 by means of a motor cylinder 6 whose piston rod 6′ is connected to the carrier. The motor cylinder 6 is connected to an air reservoir 7 through a valve 8 which is normally closed by an electro-magnet 9. The reservoir 7 has an admission valve 10, which is controlled by an electro-magnet 11.

12 designates a pipe, which is connected to the train brake pipe or to any suitable valve mechanism for effecting a service application of the brakes. This pipe has an escape valve 13 which is normally held closed by an electro-magnet 14. The circuit of the electro-magnet 9 is completed through a switch 15 which is controlled by a speed actuated device or governor which is driven by a belt or other connection with one of the axles or other moving part of the locomotive or train. This device has a centrifugally acting member 16, which, when the speed increases beyond a predetermined limit actuates the shaft or spindle 17 to open the switch 15, which is normally closed.

Any well known form of centrifugal governor, such as an ordinary ball governor, may be employed. The circuit of the magnet 9 is also carried through the back contact 18 of a switch 19, which is placed in the engineer's cab or at any other convenient point, and is designed to be operated manually.

20 indicates a battery or other source of power. The circuit of the magnet 11 is also arranged to be completed by means of the hand switch 19 through the front contact 21. The circuit of the magnet 14 is controlled by a circuit breaker 22 actuated by the depending trip arm 2, said breaker being closed when the arm is in its normal vertical position, but being broken when the arm is moved to either side by contact with the track trip or stop 3. The track trip or stop 3 is placed at any desired point along the road, where it is desired for purposes of safety that the speed of the train shall not exceed a certain maximum. It may be connected with the signal mechanism so as

to be thrown into and out of position, according to the position of the signal arms, as for instance, where used in connection with distant signals. In such cases, the trip 3 is designed to be connected with the distant signal movement in such a manner as to be held in operative position until the distant signal has cleared so that it will be impossible for the engineer to run his train past such signal without a reduction of speed. The trip 3 may, however, be permanently or temporarily secured to the track at any desired point. In our pending applications Serial Nos. 387,937 and 387,938, of even date herewith, we have shown and described two different arrangements for operating these trips. In our application Serial No. 386,932 above referred to, we have also shown means for this purpose.

The operation is as follows:—The parts being in the position shown in Fig. 1, when the trip arm 2 engages a track trip 3, the circuit of the magnet 14 is opened at the circuit breaker 22. This deënergizes the magnet 14 and opens the valve 13, permitting air to escape from the pipe 12 to effect a service application of the brakes. This operation will occur at each track trip 3 provided the speed of the train is above the predetermined limit, and also provided the hand switch 19 is in the position shown in Fig. 1. If this switch 19 is moved to the right against the back contact 18, and if the speed of the train is not sufficient to open the switch 15, the magnet 9 will be energized, thereby opening the valve 8 and admitting air to the motor cylinder 6. This cylinder will then operate to throw the trip carrier 4 and trip 2 into the position shown in dotted lines in Fig. 2, or to clear position. If, however, the speed of the train is sufficient to have opened the switch 15 the operation of the hand switch 19 will be without effect. When the magnet 9 is energized to move the trip arm to clear position, as described, an exhaust port or passage 23 of the cylinder 6 will be uncovered by the piston and the air from the reservoir 7 will gradually leak out at this exhaust. This slow bleeding of the air from the motor cylinder gradually returns the trip arm to its engaging position after a short lapse of time, determined by the size of the reservoir 7 and the size of the exhaust opening 23. The reservoir 7 is supplied through the valve 10 by a pipe 24 leading to any suitable source. The valve 10 is normally held open by the magnet 11, but is closed as soon as the engineer breaks the circuit of the magnet by moving the switch 19 to the right, so that no more air can enter the reservoir until the magnet 11 is again energized by the reverse movement of the switch 19. Therefore, the trip arm 2 will remain in its operative position when returned thereto until the switch 19 is thrown back to the position shown in Fig. 1.

From the foregoing it will be apparent that the engineer cannot run past one of the track stops 3 without effecting a service application of the brakes unless the speed is already below the limit, in which case he may temporarily move the trip 2 to clear position.

It will be obvious that our invention is subject to various modifications and changes. Thus, instead of using air for the motor cylinder 6, any other suitable fluid pressure may be employed.

Various forms of motive devices for moving the trip to clear position may also be employed.

What we claim is:—

1. In apparatus for the automatic control of trains, a movable trip normally held in operative position, a motive device for shifting said trip to clear position, and means for holding the trip in clear position for a predetermined period; substantially as described.

2. In apparatus for the automatic control of trains, a shiftable trip device normally held in operative position, a motor for moving the device out of operative position, means governed by the speed of the train whereby said motive device cannot be operated unless the speed of the train is below a predetermined limit, and time release mechanism for automatically restoring the trip device to operative position; substantially as described.

3. In apparatus for the automatic control of trains, a control valve, a trip device for actuating the valve, normally held in operative position, a motor for shifting the trip device to inoperative position, means actuated by the speed of the train for controlling the operation of the motor, and means for automatically returning the trip device to operative position after a predetermined interval; substantially as described.

4. In apparatus for the automatic control of trains, a controlling valve, a trip device for controlling the operation of the valve normally held in operative position, a motor for moving the trip device to inoperative position, an electrically actuated valve for controlling the motor, a hand switch and a speed-actuated switch in the circuit of the electrically actuated valve, and a time-controlled release for the motor; substantially as described.

5. In train control apparatus of the character described, a movable train trip, a motor for shifting the trip to inoperative position, a reservoir for the motor, an electrically controlled valve for governing the

communication between the reservoir and the motor, and combined manual and automatic switch mechanism in the circuit of said valve whereby it can only be opened when the speed of the train is below a certain limit; substantially as described.

6. In apparatus of the character described, a movable train trip, a motor for moving the same to inoperative position, and a time-controlled release for said motor; substantially as described.

In testimony whereof, we have hereunto set our hands.

JENS G. SCHREUDER.
VIBE K. SPICER.

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