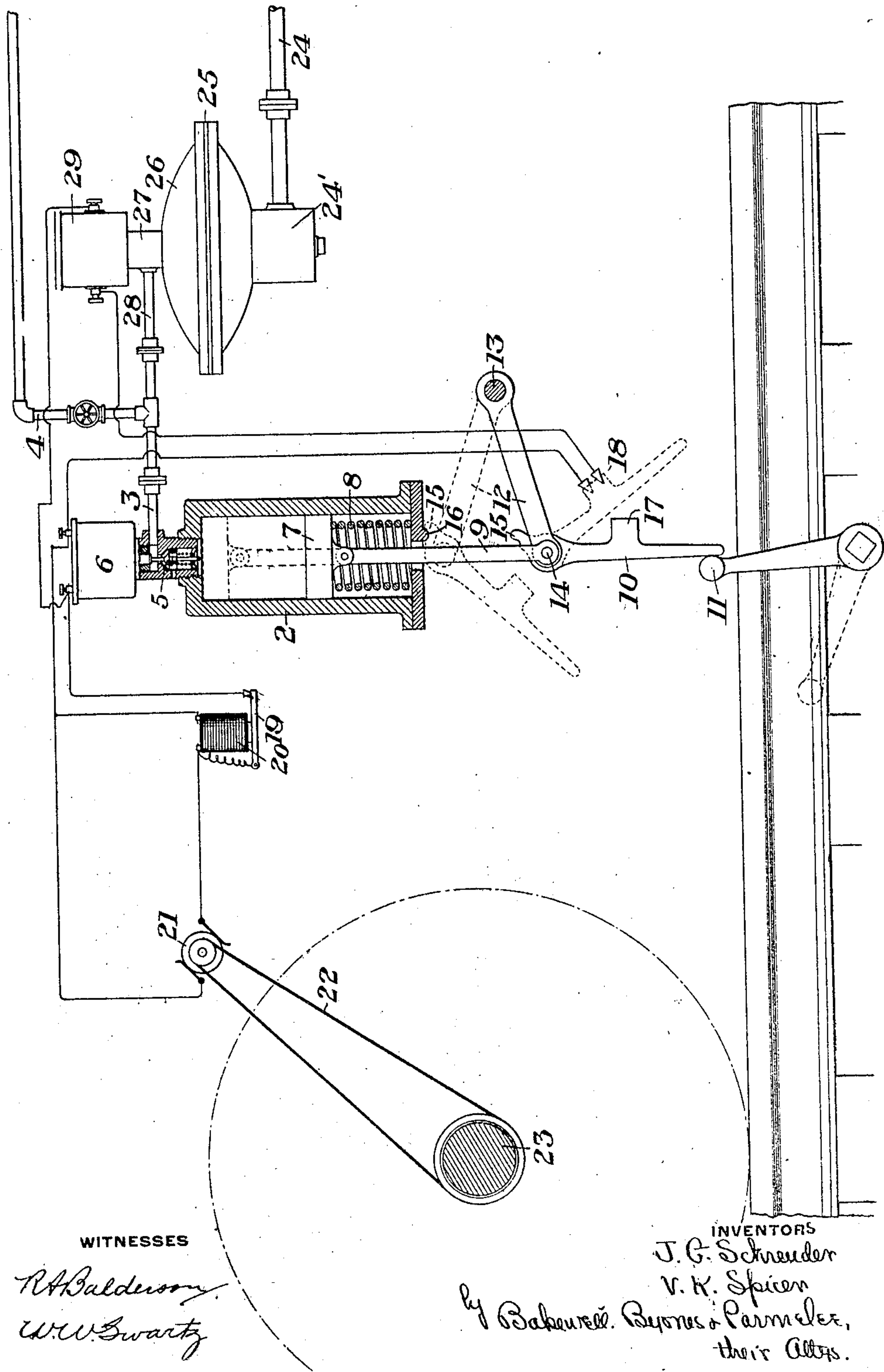


J. G. SCHREUDER & V. K. SPICER.  
 APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED OF TRAINS.  
 APPLICATION FILED AUG. 3, 1907.

912,897.

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# UNITED STATES PATENT OFFICE.

JENS G. SCHREUDER, OF EDGEWOOD PARK, PENNSYLVANIA, AND VIBE K. SPICER, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED OF TRAINS.

No. 912,897.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed August 3, 1907. Serial No. 386,934.

*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, in which the figure shows a diagrammatic view illustrating our invention.

The object of our invention is to provide means for automatically controlling the speed of railway trains, (and by the term "train" as used herein and in the claims, we desire to include all forms of engines and vehicles, whether single or attached), in passing distant signals, at curves, or at any other point along the right of way, or where it may be desired to limit the speed of, or automatically stop, the train.

In accordance with our invention, we provide a coöperating trip mechanism carried in part by the train, and located partly along the trackway, and which is arranged to effect the operation of a controlling valve or other device, which in turn effects the application of the brakes or other controlling device on the train or engine, means being provided whereby said trip mechanism is normally inoperative unless the speed of the train exceeds a certain predetermined limit.

Referring to the accompanying drawing, the numeral 2 designates a pneumatic cylinder which is connected by a pipe 3 with a pipe 4 which leads to the main air tank on the engine. Communication between the pipe 3 and the cylinder 2 is normally prevented by a valve 5, which is arranged to be unseated by means of an electro-magnet 6.

In the cylinder 2 is a piston 7, whose downward movement is resisted by means of a spring 8. Connected to said piston is a rod 9 to the lower end of which is pivotally connected a trip arm 10, designed when in the position shown in full lines in the figure to contact with a trip arm 11 on the track. 12 is a link, one end of which is pivoted on the fixed pin 13, and the other end of which is connected to the piston rod 9 on the same center 14 about which the trip arm or finger 10 is pivoted. Said trip arm or finger is provided with a curved tail portion 15, which is designed to engage with a projection 16 on the lower end of the cylinder 2 for the pur-

pose of holding said arm or finger in the upper dotted position shown. Said arm or finger also carries a contact 17, which is arranged to close the circuit between the two contacts 18 when the said arm or finger is moved by engagement with the trip 11 into the position shown by the lower dotted lines.

The circuit of the magnet 6 is carried through the armature 19 on an electro-magnet 20, which is included in the circuit of a generator 21 driven by a belt 22, or other suitable connection, with an axle 23 of the engine or train. When the electro-magnet 20 is energized to close the armature 19, the coil of the magnet 6 is connected in parallel with the coil of the magnet 20.

24 designates the air brake pipe of the train having an escape valve 24' which is normally held closed by the diaphragm 25 in a chamber 26 which is connected through a valve 27 with a pipe 28 leading to the pipe connection 4 to the main air tank. The valve 27 is normally closed and is arranged to be opened by an electro-magnet 29, whose circuit is completed through the contacts 17 and 18 before described.

The operation is as follows:—The resistance of the magnet coils 20, or of the line in which said coil is included, is so designed or proportioned that said coil will not be energized sufficiently to attract the armature 19 by voltage generated, except when the speed of the train reaches the predetermined limit. When this occurs, the armature at 19 is closed, thereby closing the circuit of the magnet 6, which opens the valve 5 to admit air from the pipes 3 and 4 to the cylinder 2. This forces the piston 7 downwardly and moves the trip 10 into the operative position shown in full lines, ready for engagement with the next trip 11 on the track. When this engagement is made, the arm or finger 10 is moved to close the circuit between the contacts 18, which thereby energizes the magnet 29, opens the valve 27, and also the valve 24' to exhaust air from the pipe 24 to slow the train or stop it. When the train has slowed down to the desired speed, the electro-motive force of the dynamo 21 drops to such an extent as to cause the magnet 20 to drop its armature 19. This breaks the circuit of the magnet 6 and closes the valve 5, which allows air to exhaust from the cylinder 2. The spring 8 now returns the piston 7 to



its normal position, and raises the arm or finger 10 into the position shown by the upper dotted lines, the tail-piece 15 of said finger engaging the projection 16 to hold said finger in this position. This operation, of course, breaks the circuit at 18, which de-energizes the magnet 29 and closes the valve 24' on the train line to release the brakes. It will be obvious that instead of the valve 24' being arranged to directly apply the brakes, it may be caused to actuate any other desired mechanism by which the speed of the train may be controlled.

The track tips 11 may be connected with the signal mechanism, so as to be moved into and out of engaging position, as indicated, by the position of the signals as described and claimed in our application, Serial No. 386,932, of even date herewith. This would be the case where it was desired to check the speed of a train in passing a distant signal set at caution. In such case the movement of the distant signal to its caution position would move the trip 11 to its set position. The trips 11 may, however, be permanently secured to the track at any place where it is desired to control the speed, or they may be temporarily clamped to the rail in the case of an emergency.

It will be obvious that various forms of mechanism may be devised which will be within the scope of our invention as defined by the claims, and that instead of using air in the cylinder 2 any other suitable fluid pressure may be employed.

What we claim is:—

1. In apparatus for controlling the speed of trains, a trip device, mechanism for moving the same into operative position, and an electro-magnetic device controlled by the speed of the train for controlling the operation of said mechanism; substantially as described.

2. In apparatus for controlling the speed of trains, a trip device, fluid pressure means for moving the same into and out of operating position, and an electro-magnetic device controlled by the speed of the train for controlling the operation of the fluid pressure means; substantially as described.

3. In apparatus for controlling the speed of trains, a normally closed control valve, electro-fluid-pressure means for opening said valve, a trip device controlling the operation of the electro-fluid-pressure means, and an electro-fluid-pressure control device for controlling the operative position of the trip mechanism; substantially as described.

4. In apparatus for controlling the speed of trains, a trip device, a pressure cylinder for moving the same into and out of operative position, an electro-magnet for controlling the admission of pressure to said cylinder, means dependent upon the speed of the train for controlling the energization of the

magnet, a controlling valve, and means operated by the trip for effecting the operation of said valve; substantially as described.

5. In apparatus for controlling the speed of trains, a control valve, a magnet for operating the same, a trip device for controlling the circuit of the magnet, and means controlled by the speed of the train for moving the trip device into and out of operative position; substantially as described.

6. In apparatus for controlling the speed of trains, a generator driven by the train, a trip device, electro-magnetic means included in the circuit of the generator for controlling the position of the trip device, and speed-controlling means operated by the trip device; substantially as described.

7. In apparatus for controlling the speed of trains, a generator driven by the train, a vertically movable trip device, electro-magnetic means included in the circuit of the generator for controlling the position of the trip device, and speed-controlling means operated by the trip device; substantially as described.

8. In an apparatus for controlling trains, the combination of an arm movably connected to a car, a trip arranged on the track, means operative by electrical effects produced by the rotation of a wheel of the train for controlling the movement of the arm.

9. In an apparatus for controlling trains, the combination of an arm movably connected to a car, a trip arranged on the track, means for shifting the arm, and means operative by a wheel of the train for generating electrical effects controlling the arm shifting means.

10. In an apparatus for controlling trains, the combination of an arm movably connected to a car, a trip arranged on the track, mechanism for moving the arm, electrically controlled means for controlling said mechanism, and means for varying the operative value of the current in such controlling means, in accordance with variations in the speed of the train.

11. In an apparatus for controlling trains, the combination of a trip arranged on the track, an arm movably connected to a car, electrically controlled means for moving the arm, and an electric generator operated by a wheel of the car and included in the controlling circuit of the arm moving means.

In testimony whereof, we have hereunto set our hands.

JENS G. SCHREUDER.  
VIBE K. SPICER.

Witnesses as to Jens G. Schreuder:

JAS. JOHNSON,  
C. C. WHITE.

Witnesses as to Vibe K. Spicer:

E. T. BARNES,  
W. M. VANDERSLUIS.