

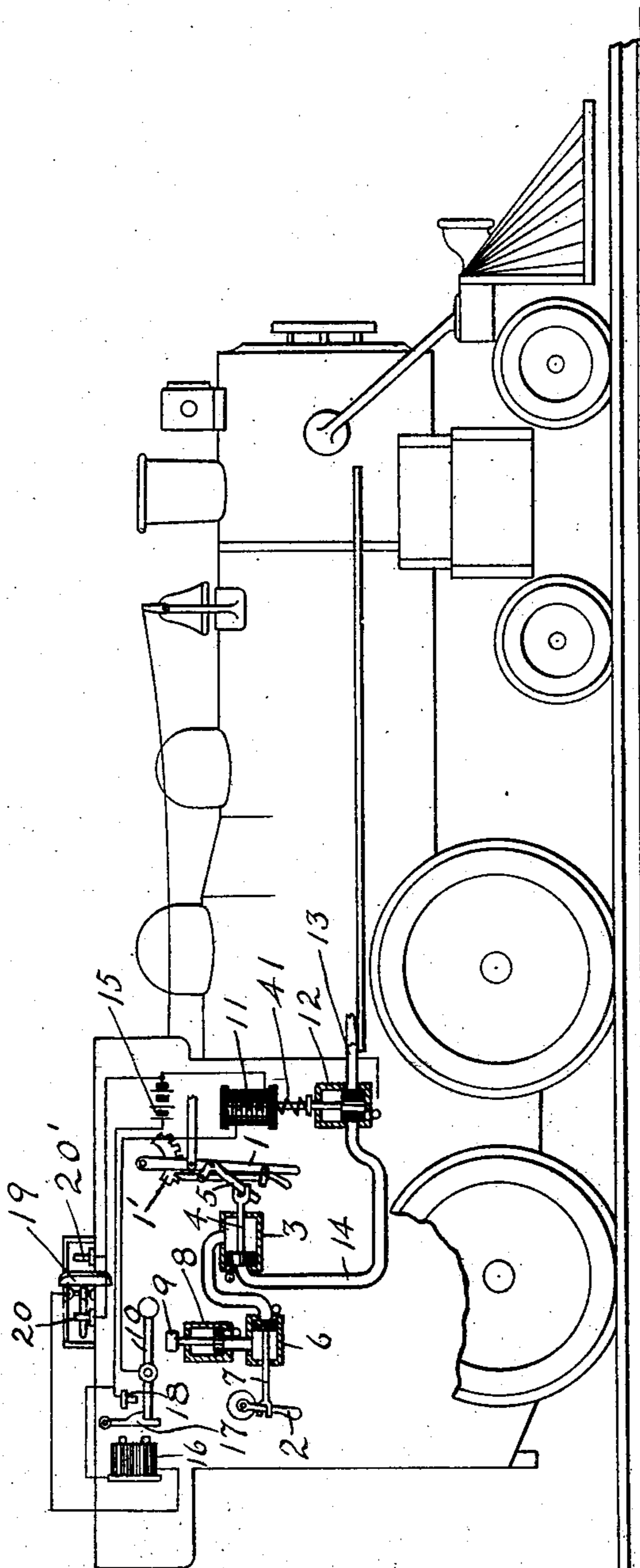
No. 891,556.

PATENTED JUNE 23, 1908.

J. H. LYNCH.
AUTOMATIC TRAIN STOP.
APPLICATION FILED MAY 1, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 3.

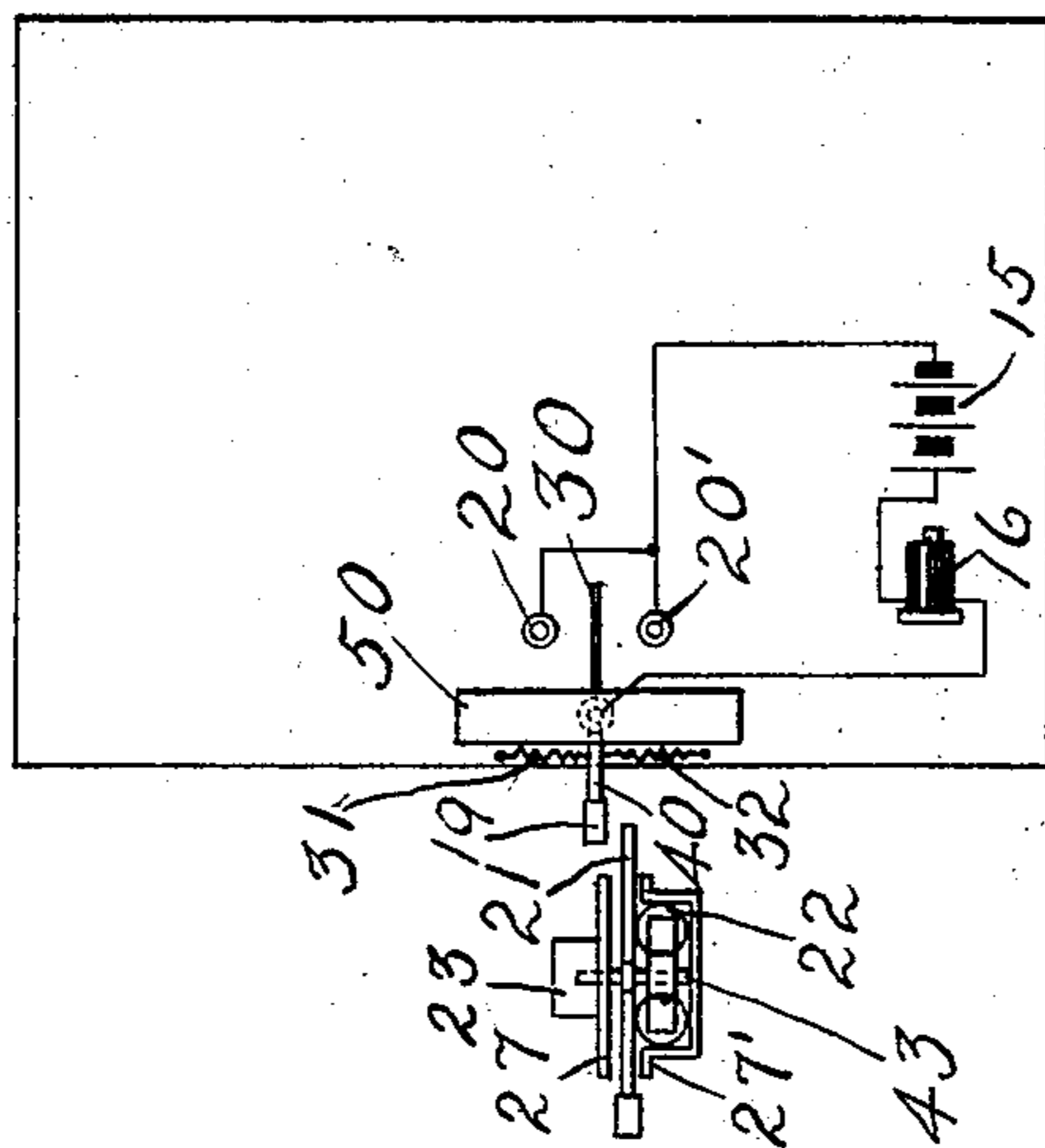
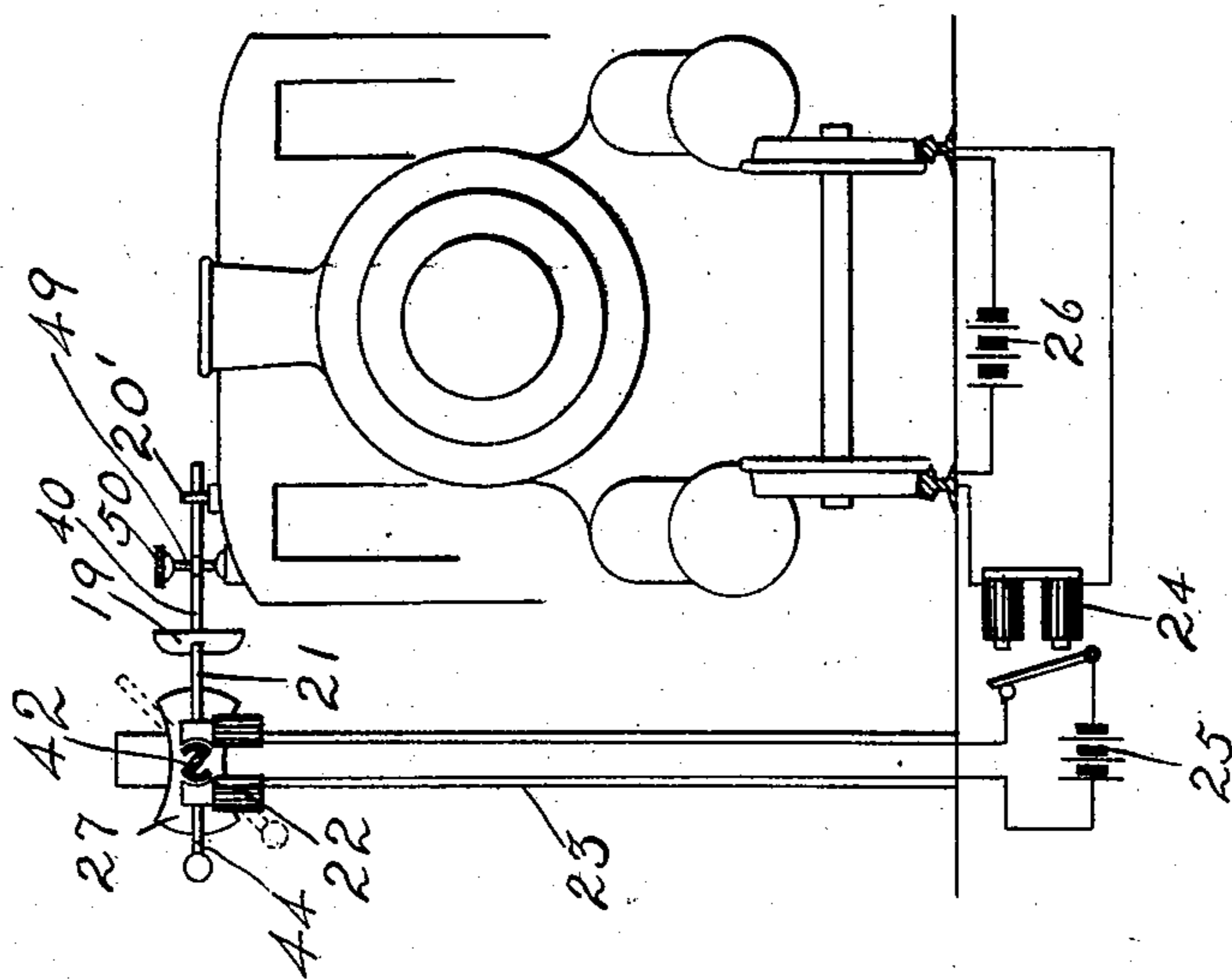


Fig. 2.



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JOSEPH H. LYNCH, OF RED BANK, NEW JERSEY.

AUTOMATIC TRAIN-STOP.

No. 891,556.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed May 1, 1907. Serial No. 371,288.

To all whom it may concern:

Be it known that I, JOSEPH H. LYNCH, a citizen of the United States, and a resident of Red Bank, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Automatic Train-Stops, of which the following is a specification.

My invention relates to that class of apparatus for controlling the movements of vehicles upon railways wherein means are provided for automatically cutting off the motive power which drives the vehicle, and for applying the brakes, in case the engineer or motorman fails to obey a signal or in case of any other emergency requiring a quick automatic stop of the vehicle or train of cars.

Primarily the purpose of my invention is to provide a simple and efficient mechanism or apparatus capable of use in connection with the ordinary manual motive power controller and manual brake controller, without interfering with the normal manual use of the same by the engineer or motorman.

My invention, however, might be used with motive power controllers and brake controllers other than those which are employed by the engineer or motorman in controlling the movement of the vehicle.

When my invention is applied to the throttle lever of a steam locomotive, it has the advantage that it is completely disconnected from the throttle lever and throttle connecting mechanism, and will, therefore, not impose upon the engineer any labor additional to that required in operating the ordinary throttle valve manually in controlling the movement of the train. When, however, an automatic stop is required, the actuating motor which I employ moves a motive device forward to position to impinge against the controller and just before engaging the lever operates upon the unlocking mechanism so as to free it from the usual locking quadrant.

Another feature of my invention relates to the manner of operating the brake controller by means of a motor to which the motive agent is admitted directly by the movement forward of the actuating motor which operates on the vehicle motive agent controller.

Another part of my invention relates to means for automatically resetting or restoring the controlling device which brings the actuating motors of the vehicle motive power controller and of the brake controller into

operation, said resetting mechanism being actuated or controlled by the motor which operates on the brake controller so as to reset the devices only after the brake has been fully applied.

My invention relates also to the construction of a circuit closer adapted to be carried by the vehicle and to be operated by engaging an arm or obstruction on the permanent way when said arm is swung down into operating position which is done automatically or otherwise when conditions require that the vehicle should come to a stop. Said circuit closer may be used for bringing into operation the automatic train stop mechanism through the intervention of suitable circuits and controlling devices or may be used for closing a circuit on the vehicle for any other purpose.

The features of construction and the novel combinations of apparatus constituting my invention will be first described and then stated both broadly and specifically in the claims at the end of this description.

For the purpose of making clear the nature and scope of my invention, I will describe the same as applied to a steam locomotive and to the usual motive power controller thereof, although, as will be obvious, the invention may be applied to any other motive power controller wherever located on a vehicle and whether controlling steam or any other motive power.

I have also shown and described my invention as used in connection with the ordinary engineer's valve of a system of air-brake control, but, as will be obvious to those skilled in the art, the invention may be used with any vehicle brake system.

I have also described the use on the vehicle of compressed air as the motive agent for operating certain motors which actuate the vehicle motive power controller and brake controller, but any other motive agent and suitable governing devices for controlling its application to said motor may obviously be employed without departing from my invention.

In the accompanying drawings; Figure 1 shows in side elevation a steam locomotive as the vehicle of my invention and represents a diagrammatic arrangement of the apparatus constituting the invention as arranged in and on the locomotive cab. Fig. 2 shows the circuit closer on the vehicle as it appears when the vehicle is viewed end on, and also

illustrates the device on the permanent way with which the circuit closer arm engages as the vehicle passes. Fig. 3 is a plan view showing the circuit closer on the vehicle and its relation to the operating arm on the permanent way.

1 indicates a motive power controller for the locomotive or other vehicle which controller may be the usual steam throttle lever and which is provided also with a proper lock quadrant 1' by which it may be locked in any position of adjustment. The usual unlocking rod operated from the handle end of the controller is also shown.

4 is the plunger rod of a suitable plunger which works in plunger cylinder 3 and being actuated by compressed air or other fluid under pressure as the motive agent constitutes one form of motor which may be employed in carrying out my invention. The plunger and plunger rod 4 are not attached in any manner to the motive power controller 1, but are simply provided with suitable attachments whereby said rod when it moves forward, will impinge upon the motive power controller and move it to position for cutting off the motive power of the vehicle. As shown, the attachment for this purpose is indicated as a fork on the exterior end of the plunger. Said fork is also adapted, before it engages the motive power controller 1, to impinge upon the long arm of an elbow lever 5 which is connected to the lock rod for the quadrant, so as to free or unlock the controller first and then to move the same over to shut off the power. Normally, the plunger and its attachments occupy such position that the controller 1 may be moved through its usual range of adjustment without being interfered with in any manner.

2 is the air brake controller handle or operating arm of any other brake controlling apparatus and 7 is the operating plunger rod whose plunger works in the cylinder 6 so as to constitute a proper motor operating by compressed air or other fluid serving as the motive agent. The end of the rod 7 which is preferably forked normally occupies the position shown in which it is normally disconnected from the brake controller arm 2, but is adapted to impinge upon and actuate the arm when the piston is operated. Hence the plunger does not require to be moved when the brake controller is operated manually in ordinary service and does not, therefore, interfere with the free operation or adjustment of the controller manually. The position of the controller 2 shown in the drawings with relation to the motive device is that which it should have when the brakes are off. The plunger for the brake controller is operated by a motive agent supplied through a pipe or connection running, as shown, from the end of cylinder 6 to the side of cylinder 3, so that as the plunger in 3 moves forward, under the

pressure of air supplied through pipe 14, the said plunger will, after it has moved forward sufficiently to cut off the motive power, open up a passage for the air which will then pass from the space behind the piston and through the side of the cylinder to the cylinder 6 and there operate the motor which puts on the brakes. Obviously, the plunger in 3 acts simply as a means for controlling the application of the motive agent to the motor which operates the brake controller and in such manner that the brake will not be applied until the motive power has been cut off.

Connected with the side of the cylinder 6 is a pipe leading to a cylinder 8 in which is a plunger and plunger rod having a head 9, the whole constituting a resetting mechanism, as will be hereinafter described. Said resetting mechanism operates by the power of the motive agent admitted to cylinder 8 when the plunger in cylinder 6 has completed its movement in applying the brakes. Obviously, the plunger in 6 operates as a piston valve whose port is the inlet to the pipe running to cylinder 8.

I do not limit myself to this particular expedient for operating the resetting mechanism after the motor for the brake controller has done its work since other devices automatically controlled and operated and actuated by other motive agent might obviously be used in the same manner as will be apparent from the general description of the operation of my invention.

Pipe 14 derives the air or fluid under pressure from a pipe 13 which may be connected to the air cylinder on the locomotive in which the air is stored for the air-brake service. Or it may derive the fluid under pressure from any other source.

12 is a cylinder or casing of any suitable valve here shown as a piston valve, which serves to open and close the connection from 13 to 14. This valve or other controller of the motive agent operating on the motors for the controllers 1 and 2 may be controlled in its action in any desired way, but preferably by the arrangement now to be described and embodying an actuating electromagnet 11 drawing electric power from any source, as for instance, battery 15 when its circuit is closed at the contact 18 of any desired form or construction of circuit controller whose circuit closing member is shown as a lever 10. Electromagnet 11 actuates the rod of the piston valve in any usual or desired way, a spring as 41 being preferably employed to restore the valve rod and attached parts to position for shutting off the flow of air to pipe 14 whenever the circuit of the actuating electromagnet 11 is interrupted. The pivoted lever 10 is weighted at one end as shown, said weight serving to cause the circuit to be closed on point 18 when the opposite end of the lever is freed from a catch 17. Catch 17

is operated by any desired means when emergency or other conditions may require stoppage of the vehicle independently of any action on the part of the engineer or motor-man. Said catch is also so formed as to permit the lever 10 to be restored or reset to position shown by the action of the resetting mechanism already described, arranged as shown with the plunger head 9 beneath and in position to engage the weighted end of lever 10 when the plunger is called into operation by movement of the parts employed in bringing about an automatic stop, preferably as described by that part which operates upon the brake controller. As will be seen, this resetting mechanism remains out of action and leaves the circuit of magnet 11 closed at contact 18 until all of the motive devices and mechanism employed in cutting off the power for moving the vehicle and the brake for stopping the same have completed their operation. The catch 17 is shown as operated by an electromagnet 16 whose armature comprises or is carried by the catch 17, but other means may be used for the same purpose. The circuit of electromagnet 16 is controlled in any desired manner. One of the ways, shown in the accompanying drawings, comprises a circuit closer on the vehicle mechanically actuated by engaging an obstruction on the permanent way, the position of the latter, that is to say, for engagement or for permitting the circuit closer to pass without encountering the obstruction, being in turn governed by any of the usual guard or control circuits employed in the art. In the present instance, I have shown the usual closed track circuit containing an electromagnet 24 and battery 26, which latter is shunted from the magnet through the presence of a vehicle upon a track or section of track, thereby permitting the armature of the electromagnet 24 to fall back and close the circuit of a battery or generator 25. In the circuit of the latter, and mounted upon a post 23, is an electromagnet 22 between whose poles is arranged an armature 42 of a form usual in the art. Said armature is secured to a rock shaft 43, which shaft carries semaphore arm 44 on one side and operating arm 21 constituting an obstruction adapted to be engaged by the circuit closer on the moving vehicle.

In Fig. 2 of the drawings, the magnet 22, being energized, will swing and hold the arm 21 down in position shown, but when the magnet is deenergized by breaking its circuit, the arm 21 will fly up at an angle or to the angular position, indicated by the dotted line, under the influence of the weighted arm 44. In this position it will be out of the path of the head 19 of the circuit closing lever 40 on the locomotive or other vehicle. Said circuit closing lever 40 is secured to a shaft 49 mounted to turn in vertical bearings in

a frame 50. The lever 40 is held normally centered by springs 31 and 32 which cause it to normally stand projecting at right angles to the path of movement of the vehicle.

The head 19 extends vertically and in a direction transverse to the longitudinal axis of the lever, as shown, and so as to cause the lever to turn when it encounters the arm 21. By thus extending the head 19, provision is made for discrepancies or differences in the height of the mounting of said lever on the vehicle or locomotive and also for vertical oscillations or vibrations thus insuring an operation of the circuit closer by the obstructing arm 21 whenever the latter is swung down into operating position. To support the lever or arm 21 against damage from the impact of the head 19 and to prevent breakage of the shaft bearings for the armature 42, the lever 21 is caused to work in a narrow vertical slot between two stay or support plates 27 and 27', the latter, if desired, serving also as a casing for the parts but having its edges extended to cooperate with the arm 21 and supports the same laterally against the impact of 19 when moved from the position shown against the arm.

The circuit closing lever 40 is extended at its rear end into a circuit closing blade spring 30 adapted to engage with either one of two contact posts or stops 20, 20' according to the direction of movement of the vehicles. When the head engages the arm 21, the spring 30 will engage the stop 20 and will yield still preserving contact but permitting the head 19 to escape by the obstruction 20. Both contacts 20, 20' are in the circuit of the arm and magnet 16 so that obviously the latter will be energized when the locomotive is backing up.

The general operation of the apparatus is as follows: Assuming that a section of the rails have been occupied by another train so as to deenergize magnet 24, the arm 21 will be swung down to position shown in Fig. 2 and the arm 19 of the following train will engage the same and thereby close the circuit of magnet 16 if the engineer has not obeyed the signal and brought his train to a stop before reaching the guard point at which the post 23 is located. Upon closure of the circuit of magnet 16, the magnet 11 will operate and the motors of controllers 1 and 2 will be operated as already described, thus cutting off the motive power for the vehicle and also putting on the brakes. During this operation, the arm 10 of the circuit controller for magnet 11 will be depressed, but as soon as the brakes have been put on, the resetting mechanism will come into play as already described and reset the circuit controller 10, thus cutting off the flow of current in magnet 11. Spring 41 will thereby close the connection from pipe 13 to pipe 14 and the plungers 7 and 4 may be readily forced to their initial

position by operating the motive power and brake controllers 1 and 2 where they will be out of the way of the free operation of said devices. It will be readily understood that
 5 as usual in the art the cylinders 6 and 3 are provided with the usual exhaust or bleed ports which will permit the gradual exhaust of the fluid from the operating spaces after the supply has been cut off by the restoration
 10 of the controller valve between 13 and 14 to normal position.

What I claim as my invention is:

1. The combination of a vehicle motive power controller and its locking devices, a
 15 plunger normally disconnected from said controller and actuated by fluid pressure and adapted to first free the said locking devices and then to impinge upon said controller, a brake controller, an actuating plunger there-
 20 for having a plunger rod normally disconnected from said brake controller but adapted to impinge upon and actuate the same, and a connection between the plunger cylinders through which fluid may pass to actuate
 25 the brake controller plunger when the motive power controller has moved to a predetermined extent.

2. The combination of a manual motive power controller for a vehicle, a lock rod carried thereby, an elbow lever connected to the
 30 lock rod and an actuating plunger having a plunger rod provided with a forked end adapted to impinge upon an arm of said elbow lever to unlock the manual controller and then to operate the manual controller
 35 itself to cut off the motive power.

3. The combination of a vehicle motive power controller, an actuating motor operating on the same to throw off the power, con-
 40 trolling devices controlling the application of the motive agent to said actuating motor, and resetting mechanism adapted to reset the controlling devices and cut off the flow of the motive agent; said resetting mechanism be-
 45 ing controlled by said actuating motor after it has operated to throw the motive power controller.

4. The combination of a vehicle brake controller, a plunger for actuating the brake
 50 controller to apply the brakes, controlling mechanism governing the application of power to said plunger, an actuating plunger for resetting said controlling mechanism, and means governed by the brake controller
 55 plunger for applying power to the resetting plunger upon the completion of the operation of throwing the brake controller to apply the brakes, as and for the purpose described.

5. The combination of a vehicle motive power controller, an actuating piston there-
 60 for, a magnetically controlled valve, circuit controlling devices governing the action of said valve, resetting mechanism for restoring said circuit controlling devices to position for

causing the valve to shut, and means governed by said piston for operating the resetting mechanism.

6. The combination of a vehicle brake controller, an actuating motor therefor, circuit
 70 controlling devices governing the operation of said motor, resetting mechanism for restoring the circuit controlling devices to normal position, and means controlled by the actuating motor for operating the resetting
 75 mechanism at the completion of the operation of throwing the brake controller to apply the brakes.

7. The combination of a brake controller, an actuating plunger, a circuit controller and
 80 a resetting plunger connected for operation with the fluid pressure space in the plunger cylinder of said actuating plunger as and for the purpose described.

8. The combination of a vehicle motive
 85 power controller and brake controller, actuating plungers therefor, a circuit controller, a magnet in the circuit thereof, and means operated by said magnet for applying the motive agent to the plungers, a catch normally
 90 holding the circuit controller out of action, an operating magnet for said catch, a circuit closer for the latter carried on the vehicle and adapted to be automatically operated
 95 when the vehicle passes a guard point on the permanent way, and means controlled by the plunger of the brake controller for resetting said circuit controller to position for engagement by the catch.

9. The combination of a vehicle brake controller, a vehicle motive power controller, a
 100 governing electromagnet and circuit controller for said magnet, mechanism responsive to the action of said magnet for operating the power controller and brake con-
 105 troller to cut off the power and apply the brakes a latch for normally holding the circuit controller in inoperative position, and mechanism for resetting said circuit controller as soon as the brakes have been fully
 110 applied.

10. The combination of a vehicle brake controller, actuating mechanism therefor, a
 controller governing the operation of said mechanism, and resetting devices for restoring
 115 the latter controller to normal position, and means for automatically operating the resetting devices as soon as the brake has been fully applied.

11. The combination of a circuit closing
 120 lever mounted on a vehicle, and extending therefrom at right angles to the path of movement of the vehicle, a swinging obstruction on the permanent way adapted to be swung into and out of position for engagement by
 125 the lever, and a head on the end of said lever extended transversely to the longitudinal axis thereof, as and for the purpose described.

12. The combination of a circuit closing 130

lever on a vehicle provided with a head extending vertically therefrom on its end projecting laterally from the vehicle, and an arm mounted on a post on the permanent way and adapted to be swung into and out of position for engagement by said head.

13. The combination of the swinging arm or obstruction on the permanent way, a swinging arm or lever on the vehicle adapted to engage the same, and a stay plate or support for supporting the former arm against damage from the impact of the arm or lever on the vehicle.

14. In an apparatus for closing a circuit on a vehicle from the permanent way, the combination of an electromagnet, an armature mounted on a shaft substantially parallel to the path of movement of the vehicle and adapted to turn between the poles of said magnet, a projecting arm or lever on said shaft, and an arm or lever on the vehicle projecting laterally therefrom and adapted to engage the former arm when swung down into operating position by the action of the magnet.

15. The combination, substantially as described, of a circuit closing lever projecting

laterally from a moving vehicle, centering springs adapted to hold the lever projected at right angles to the path of movement and a rearward extension of said lever comprising a circuit closing blade spring adapted to engage a circuit closing contact when the lever is swung by impact with an obstruction on the permanent way.

16. In an apparatus for closing a circuit on a moving vehicle from a permanent way, an operating obstruction on the permanent way consisting of an arm mounted on a pivotal support and adapted to turn into and out of operating position in a plane transverse to the line of movement of the vehicle, an electromagnet, and an armature therefor turning in the space between the poles of said magnet and secured to the pivotal support of the arm.

Signed at New York in the county of New York and State of New York this 30th day of April A. D. 1907.

JOSEPH H. LYNCH.

Witnesses:

C. F. TISCHNER, Jr.,
LILLIAN BLOND.