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C. W. S. TURNER.

SAFETY ATTACHMENT FOR LOCOMOTIVES.

APPLICATION FILED DEC. 22, 1903.

NO MODEL.

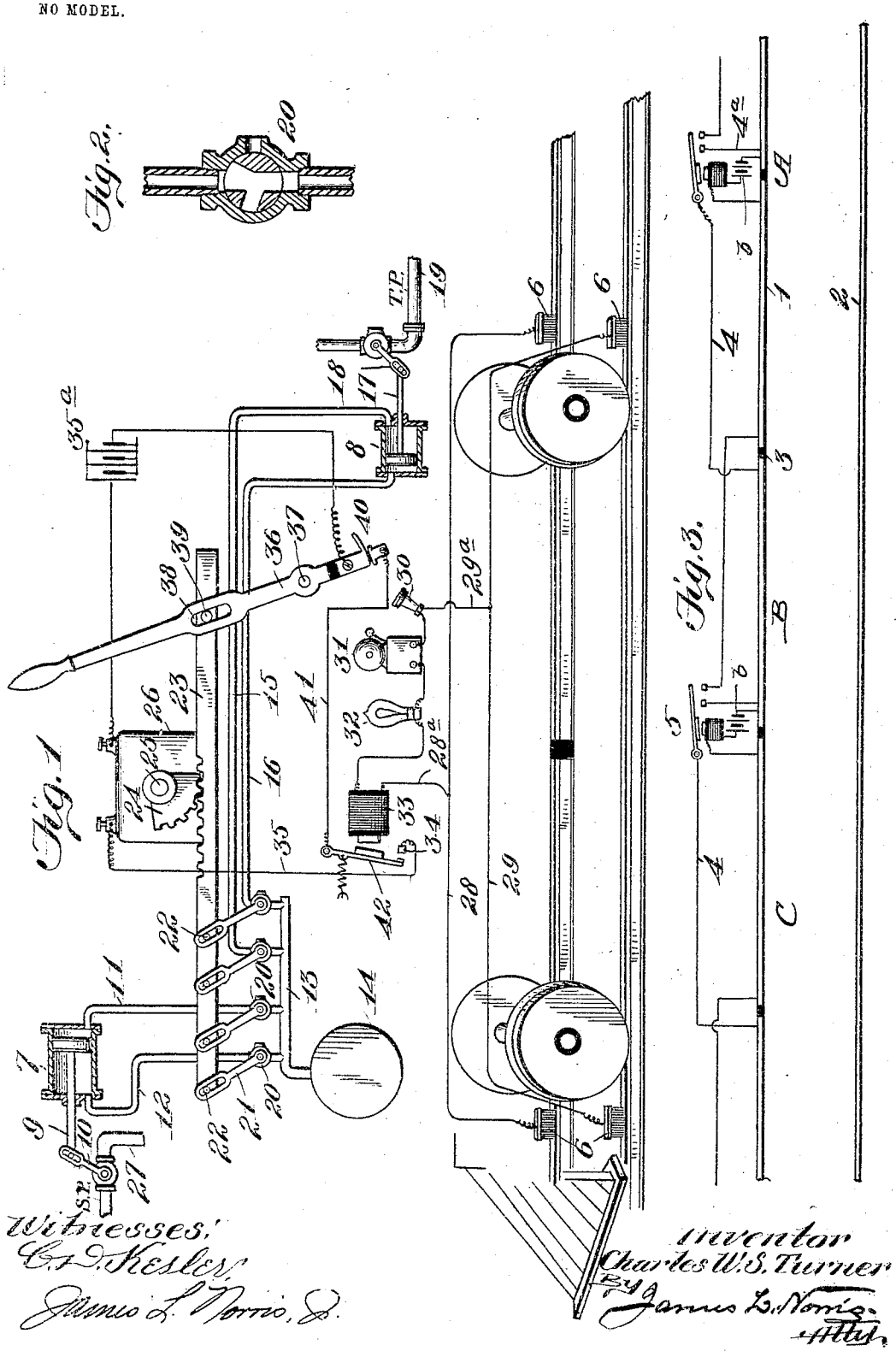


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No. 774,619. Patented November 8, 1904.

UNITED STATES PATENT OFFICE.

CHARLES W. S. TURNER, OF MOUNTVILLE, VIRGINIA.

SAFETY ATTACHMENT FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 774,619, dated November 8, 1904.

Application filed December 22, 1903. Serial No. 186,230. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. S. TURNER, a citizen of the United States, residing at Mountville, in the county of Loudoun and State of Virginia, have invented new and useful Improvements in Safety Attachments for Locomotives, of which the following is a specification.

This invention relates to safety attachments for locomotives.

The object of the invention is in a certain and positive manner to signal two approaching trains on the same section when they reach a dangerous proximity to each other and in the event of the engineer not heeding such signal to cause the steam to be cut off from the cylinders and the air-brakes to be applied.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a safety attachment for locomotives, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, there is illustrated one form of embodiment of the invention capable of carrying the same into effect, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of arrangement without departing from the spirit thereof, and in these drawings—

Figure 1 is a view in elevation, partly in section, exhibiting a system for carrying out the objects stated. Fig. 2 is a sectional detail view of one of the three-way valves employed in connection with the system. Fig. 3 is a view in plan, somewhat in the nature of a diagram, showing a manner of wiring of the tracks to effect the results designed.

Generally stated, the rails 1 and 2 are of the usual or any preferred construction; but the rail 1 is divided by blocks of insulating material 3 into sections of any preferred length. The rail 1 also has combined with it a normally open electrical circuit comprising line-wires 4, which are tapped into the rail on opposite sides of the insulating material, and a relay 5, which is normally open and is disposed adjacent the juncture of block-sections and at sufficient distance apart to insure proper operation of the device to obviate collisions.

In operation when two engines, cars, or trains the wheels of which are insulated, as shown, and which are equipped with electrical collectors—such, for example, as brushes 6 or the like—come upon adjacent or predetermined block-sections the circuits are completed and perform the functions of cutting off steam and applying the air-brakes in the manner hereinafter described. The circuits are shown in the drawings in an illustrative manner; but it will be understood that the invention is not restricted to such illustrated circuits, as other arrangements may be utilized without departing from my invention, which relates to the mechanism for cutting off the steam and applying the air-brakes automatically, as hereinafter described and claimed. Referring to the illustrative wiring shown in the drawings the circuits under the conditions supposed will be established as follows: Assuming a train to have arrived at the point A at the right of Fig. 3, the collectors 6, with which it is provided, will established the relay-circuit, including a battery *b*, at that point and attract the armature of the line-wire 4. If there be another train at point B, a danger-point, the circuit will be established along the line-wire to the collectors 6 and conductors 28 and 29 thereof, along the continuous rail 2 and through the collectors 6 and conductors 28 29 of the train at point A, and by conductor 4^a to the armature referred to. If a train come upon the block designated by C, the circuit will be established through its collectors 6 and conductors 28 29, through the relay connected to said block and through the collectors and conductors of the train at B, along the continuous rail 2 and back to the collectors and conductors of the train on block 2, and so on throughout the entire system.

It is stated at the outset of the specification that one of the objects of the invention is in a positive manner to cut off steam to the cylin-

ders and open the train-pipe to permit air to escape from one side of the operating-cylinders and to be admitted on the opposite side of the piston, so that the cutting off of the steam-supply to the cylinder and the operation of the air-brakes are instantaneous. In carrying out this part of the invention two cylinders 7 and 8 are employed, the cylinder 7 having its piston 9 operatively connected with a lever 10, which actuates a valve to cut off the supply of steam to the steam-chests. The cylinder 7 has two pipes 11 and 12 connected with the respective ends thereof, and the lower ends of these pipes are tapped into a pipe 13, entering the air-reservoir 14, of the usual or any preferred construction. The pipe 13 also has connected with it two other branch pipes 15 and 16, which connect with the respective ends of the cylinder 8, and to the piston-rod 17 of the latter cylinder is connected a lever 18, which controls the passage of air through the train-pipe 19. Each of the pipes 11, 12, 15, and 16 carries a three-way valve 20, properly disposed therein to carry out the sequence of operations hereinafter referred to, such valves being shown in detail in Fig. 2, and connected with the shank or valve stem of each of the valves is a lever 21, the upper ends of which are longitudinally slotted to receive pins 22, carried by a rack-bar 23. When the levers 10 and 18 are in the position shown in Fig. 1, the steam is permitted freely to pass to the cylinders, (not shown,) while the air through the train-pipe has free passage-way. The means for actuating the rack-bar 23 to cause it to throw the levers 21 to cut off the supply of steam to the cylinders and for opening the train-pipe to the atmosphere consists of a sector 24, which is carried by the shaft 25 of a motor 26, said sector when the motor is energized giving a short turn and swinging each of the levers 21 in unison. When this takes place, the air through the pipe 12 escapes to the atmosphere, while air from the reservoir 14, by way of the pipe 11, enters the cylinder 7 and forces out its piston-rod, thereby closing the valve in the pipe 27, which enters the boiler and operates in the usual manner for cutting off the supply of steam. While this operation of the air in the pipes 11 and 12 is taking place the air in the pipe 15 escapes through its appropriate three-way valve 20, while air is forced through the pipe 16 and enters the cylinder 8, projecting its piston and operating the valve in the train-pipe, which will cause the air to escape.

The conductors 28 and 29, carried by the brushes 6, are in electrical contact with a circuit including a telephone 30, a bell 31, and an incandescent lamp 32. When two trains come upon adjacent or predetermined blocks, the relay-circuit is closed, as before described, energizing the battery included therein, whereupon an electromagnet 33 in the lamp and bell circuit is energized, the path of the current being from conductor 28, through wire 28^a, electromagnet 33, electric lamp 32, bell 31, and telephone 30, to conductor 29, through wire 29^a. As the armature of the electromagnet 33 is drawn to the core against the tension of spring 42^a it will engage a contact 34, constituting the lower end of one of the conductors 35 of the motor 26, the other branch of the circuit passing through a secondary battery 35^a and thence down and into electrical communication with a lever 36, fulcrumed at 37 upon a suitable support and having intermediate of its ends a slot 38, to receive a pin 39, projecting from the rack-bar 33. As will be observed by Fig. 1, the lower end of the lever 36 is insulated from the remaining portion of its length and bears upon a contact 40, forming the terminal of a conductor 41, which is in electrical communication with the armature 42 of the electromagnet 43. As soon as the motor 26 operates in the manner described the rack-bar is moved backward, and thereby throws the lower end of the lever 36 off from the contact 40 and breaks the circuit. After all danger has subsided the engineer will draw back upon the lever 36 and again bring it into engagement with the contact 40, so that the circuit is again in condition to be completed and all of the parts of the device are in proper position for operating again in the manner described.

It will be seen from the foregoing description that the apparatus of this invention is exceedingly simple in construction and it may, by reason of the arrangement and construction of its parts being thoroughly effective for the purposes designed, be relied upon for doing effective work.

Having thus described the invention, what is claimed is—

1. In an attachment of the class described, the combination with a steam-pipe, an air-brake train-pipe, and valves controlling said pipes, of an air-reservoir in communication with the valve-actuating mechanisms, valves controlling the passage of air from the reservoir to said valve-actuating mechanisms, a bar connected to said valves, an electric circuit including the track-rails, an electric motor in said circuit, and a connection between the shaft of said motor and the valve-operating bar.

2. In an attachment of the class described, the combination with a steam-pipe, an air-brake train-pipe, and valves controlling said pipes, of an air-reservoir in communication with the valve-actuating mechanisms, valves controlling the passage of air from the reservoir to said valve-actuating mechanisms, a bar connected to said valves, an electric circuit including the track-rails, an electric motor in said circuit, a connection between the shaft of said motor and the valve-operating bar, and a manually-operable handle connected with said

bar whereby the mechanism is adapted to be operated manually, and manually reset for operation.

3. An attachment of the class described, comprising a pair of cylinders, and means for supplying air under pressure thereto, a lever connected respectively with the stem of the steam-valve and with the train-pipe valve, means for automatically permitting passage of air to one end of the respective cylinders and for allowing escape from the opposite ends thereof, and a connection between the respective pistons of the cylinders and the said valves.

4. An attachment of the class described comprising a pair of cylinders one of which is operatively connected with a valve of the steam-pipe and the other with a valve on the train-pipe, valves for controlling passage through the pipes connecting the air-cylinder and the two first-named cylinders, and means for automatically opening the valves to permit supply of air to one end of the cylinders and for allowing escape from the opposite end thereof.

5. An attachment of the class described embodying a plurality of pipes communicating with the air-cylinder, a pair of cylinders one of which has its piston operatively connected with a valve for controlling the passage of steam to the cylinders, and the piston of the other cylinder being operatively connected with the valve controlling the passage of air to the train-pipes, a series of valves controlling the passage of air through said pipes, a rack-bar connected through interposed mechanism with the said valves, and an electric motor for automatically shifting the rack-bar to open passage through the various pipes.

6. An attachment of the class described embodying a rack-bar and a motor adapted to operate the same, means for operatively connecting the rack-bar with the air-pipes of the air-cylinder, a circuit including signaling mechanism and an electromagnet, and means for energizing the said magnet and therethrough the motor to cause the same to actuate the rack-bar.

7. An attachment of the class described including a pair of cylinders, one of which has its piston operatively connected with a valve controlling the passage of steam into the cylinders and the other having its piston connected with a valve for controlling the passage of air in the train-pipe, connections between the air-cylinder and the said valve-operating cylinders, and means operating automatically to permit entrance of air to the cylinders to operate the valve and to allow escape of air from the train-pipe.

8. The combination with an energized track, of a traveling connector, a circuit including signaling and lighting means in connection with the connector, a pair of cylinders, the piston-rod of one being operatively connected with the valve for controlling the passage of steam to the cylinders and the other with a valve controlling the passage of air to the train-pipe, a rack-bar operatively connected with the valves of the various pipes, an electrically-actuated sector for opening all of the valves in time of emergency, and means for resetting the device after having performed its function.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES W. S. TURNER.

Witnesses:
JAMES L. NORRIS,
GEO. W. REA.