J. H. UPTON.

TRAIN STOPPING APPARATUS.

APPLICATION FILED JUNE 3, 1914.

1,132,408.

Patented Mar. 16, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

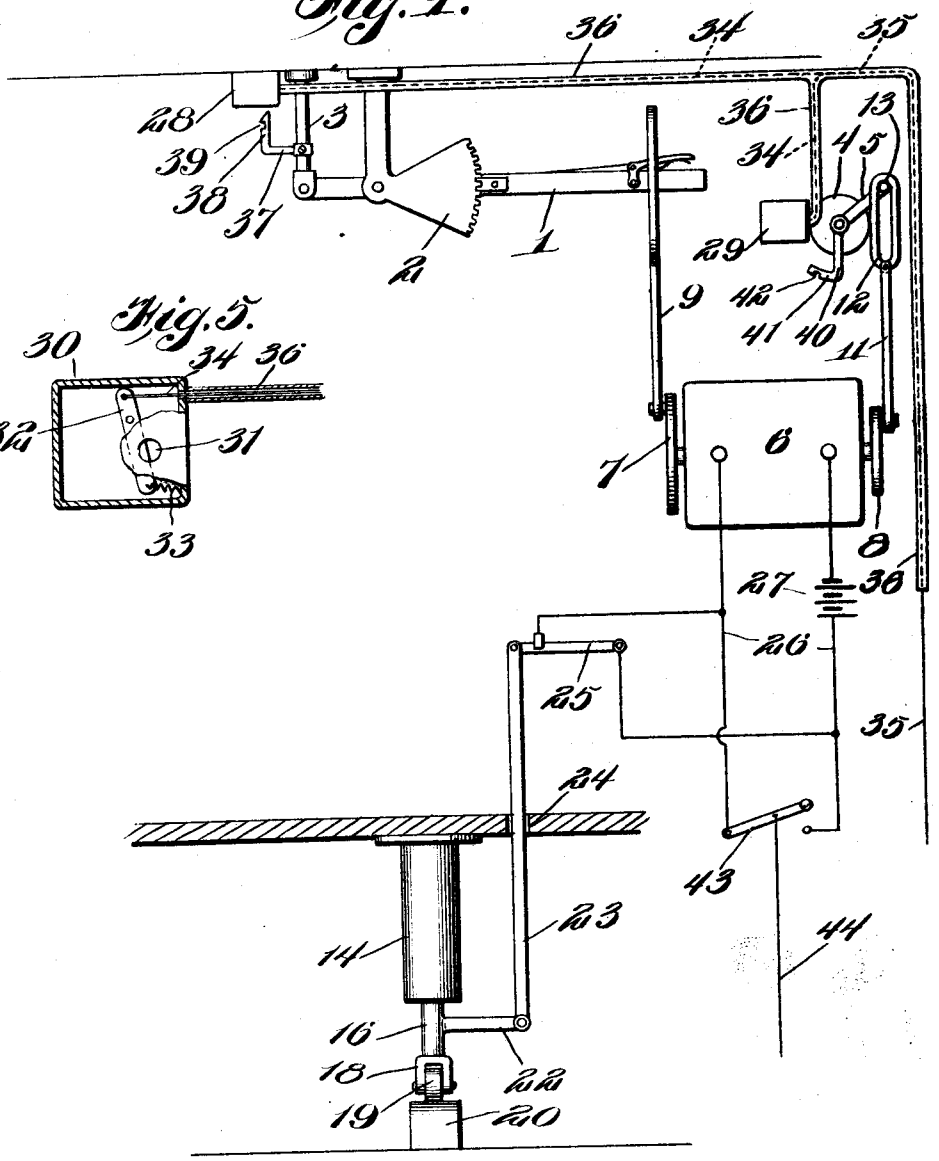


Fig. 5.

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2 SHEETS-SHEET 2.

Fig. 2.

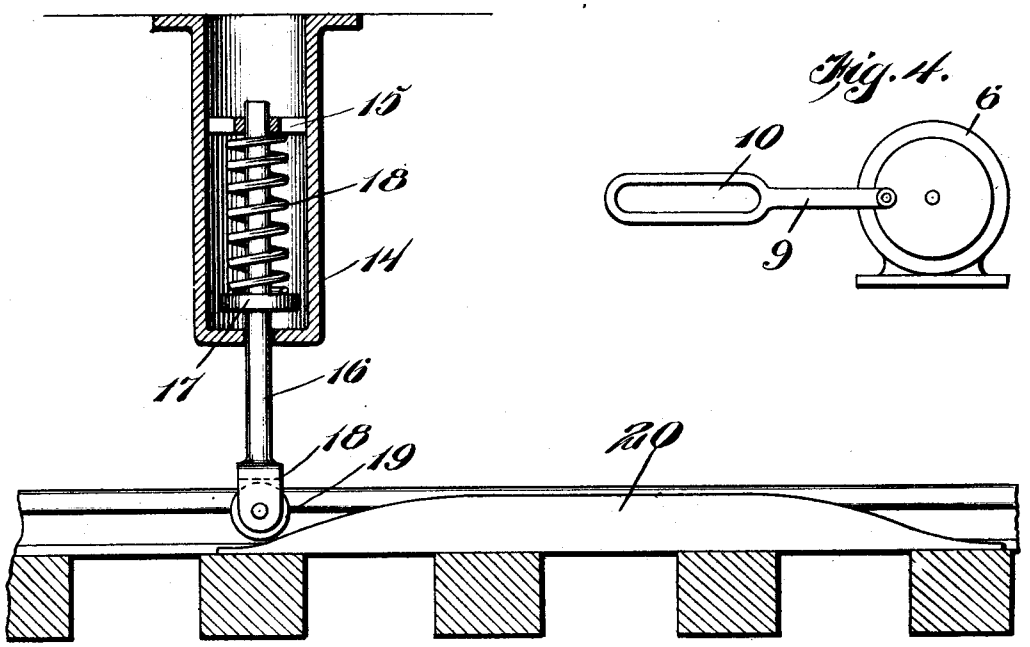
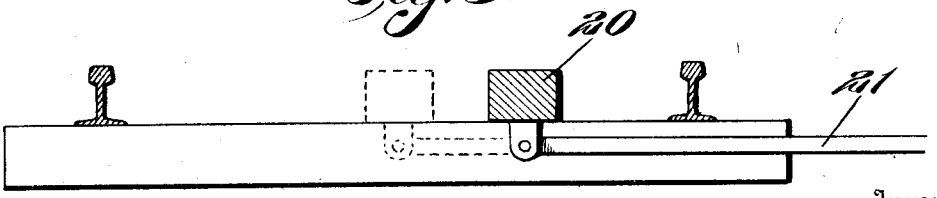


Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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TRAIN-STOPPING APPARATUS.

1,132,408. Specification of Letters Patent. Patented Mar. 16, 1915.

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To all whom it may concern:

Be it known that I, JESSE H. UPTON, a citizen of the United States, residing at Bryson City, in the county of Swain and State of North Carolina, have invented new and useful Improvements in Train-Stopping Apparatus, of which the following is a specification.

This invention relates to improvements in train stopping apparatus and has particular application to an automatic train stop whereby the propelling power of a motor car will be cut off and the air brakes applied in the event of the train entering the danger zone.

In carrying out the present invention, it is my purpose to provide train stopping apparatus which will operate automatically, in the event of the train passing a danger signal, to cut off the propelling power of the locomotive or motor car and apply the brakes and whereby the throttle valve and engineer's brake valve will be locked, succeeding the automatic operation thereof, so that the engineer will be unable to regain control of the train, means being provided whereby the conductor of the train may release the locking devices so that the engineer may regain control of the throttle and brake valves.

It is also my purpose to provide apparatus of the type set forth which may be installed and maintained at a minimum expense and which will operate effectively and efficiently under all conditions and which will embody few parts and these so correlated and arranged as to reduce the possibility of derangement to a minimum.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter set forth in and falling within the scope of the claims.

In the accompanying drawings; Figure 1 is a diagrammatic view of train stopping apparatus constructed in accordance with the present invention. Fig. 2 is a fragmentary side elevation of the same, parts being shown in section. Fig. 3 is a cross sectional view through the trackway. Fig. 4 is a view in side elevation of the motor and the connection between the latter and throttle valve of the locomotive. Fig. 5 is a cross sectional view through one of the latching devices.

In the present instance, I have shown my invention as applied to the steam driven locomotive and in this connection I wish it to be understood that the invention, in its useful application, is not limited to use with steam locomotives, as the same may be applied to electrically operated motor cars.

Referring now to the drawings in detail, 1 designates the throttle valve lever of a steam driven locomotive fulcrumed at the center of the arc of the quadrant 2 and movable over the latter and having the end beyond the fulcrum pivotally connected with the rod 3 of the throttle valve. The engineer's brake valve is indicated at 4 and is provided with the usual handle 5 capable of swinging movement whereby the valve may be manipulated to its various positions. 6 indicates an electric motor and fixed to the opposite ends of the armature shaft of the motor are crank disks 7, 8. Pivotally connected to the crank pin of the disk 7 is one end of a connecting rod 9 having the opposite extremity thereof formed with an elongated slot 10 through which the handle end of the throttle valve lever 1 projects, while pivotally connected to the crank pin on the disk 8 is one extremity of a connecting rod 11 having the opposite end thereof pivotally connected with a slotted link 12, a pin 13 projecting upwardly from the handle 5 of the engineer's brake valve and working within the slot in the link 12.

Depending from the locomotive is a tubular casing 14 formed interiorly with a spider 15 and having the lower end thereof closed. Formed in the spider 15 centrally thereof and the lower end of the tubular casing are alining openings and within these openings is slidably mounted a plunger rod 16 equipped, within the tubular casing, with a collar 17 disposed below the spider 15 and encircling the plunger rod between the collar 17 and the spider is a coiled expansion spring 18 having one end abutting the collar and the opposite extremity in engagement with the spider, such spring acting to hold the plunger rod 16 normally at its limit of downward movement, the collar 17 serving to check the outward movement of the plunger rod under the action of the spring and so prevent accidental disconnection of the parts. The lower extremity of the plunger rod 16 is formed with a yoke 18 and journaled in the yoke 18 is a roller 19.

If desired, my improved train stopping apparatus may be employed in conjunction with a block signaling system and located between the lines of rails of the trackway and at the entrance to each block is a shoe or obstacle 20 capable of sliding movement transversely of the trackway to active and inactive positions and connected through the medium of a rod 21 with the adjacent signal blade so that when the signal blade moves to danger position the obstacle will be rendered active, as illustrated by the dotted lines in Fig. 3, while when the signal is at clear the obstacle will be inactive, as shown by the full lines in Fig. 3.

Extending laterally from the plunger rod 16 adjacent to the yoke 18 on the lower end thereof is a horizontal arm 22 and connected with the outer end of the arm 22 and projecting upwardly therefrom is a vertical rod 23 working within an opening 24 formed in the bottom wall of the cab or other part of the locomotive. The upper end of the rod 23 is pivotally connected with the blade of a switch 25 controlling an electric circuit 26 including a suitable source of energy as a battery 27 and the motor 6.

In practice, when the signal blade moves to danger position, the obstacle or shoe 20 is slid to active position as shown by the dotted lines in Fig. 3 and in the event of a train passing the signal the roller 19 will ride upon the shoe 20 and so elevate the plunger rod 16 against the action of the spring 18. In the upward movement of the plunger rod, the rod 23 is elevated thereby closing the switch 25 and energizing the motor 6. In the initial operation of the motor 6 the end wall of the slot 10 and the connecting rod 9 engages the thumb lever of the latching dog and the throttle lever and actuates such dog to released position, while in the continued operation of the motor the connecting rod swings the throttle lever to close the valve. Simultaneously with the movement of the connecting rod 9 motion is imparted to the rod 11 and slotted link 12 and the latter swings the engineer's brake valve to emergency position.

In order to lock the throttle valve lever and engineer's brake valve in actuated positions and hold the same out of the control of the engineer, I employ locking devices 28 and 29 located adjacent to the throttle rod 3 and engineer's brake valve respectively. Each locking device comprises a substantially rectangular casing 30 having the front wall thereof formed with an aperture 31. Pivoted to the inner surface of the front wall of the casing is a latching lever 32 having the lower end thereof connected with a spring 33 and normally held across the opening 31, and the upper extremity thereof connected with one end of a cord or cable 34. The free extremities of the cords or cables 34 are connected with a common actuating cable 35 and the latter extends throughout the length of the train and is suspended in the manner of the bell cord and under the control of the conductor of the train. The cords 34, 34 and that portion of the common actuating cord 35 within the cab of the locomotive are inclosed in conduits or pipes 36 so that the cords are concealed from the engineer and out of his influence. Fast to the throttle rod 3 and projecting laterally therefrom is a latching arm 37 having the outer end thereof bent at right angles to itself and projected toward the front wall of the casing of the latching device 28 and alining with the opening 31 in the front wall of such device. The forwardly projecting portion of the latching arm 37 is formed with a notch 39 so that when the throttle valve rod is actuated to valve closing position and the portion 38 of the latching arm 37 moved into the casing 30 the latching lever 32 will engage the notch 39, under the action of the spring 33, and so hold the throttle valve lever against movement to open the valve. Secured to the stem of the engineer's brake valve and extending radially therefrom is a latching arm 40 having the outer end thereof bent at an angle to itself as at 41 and curved in an arc struck from the center of the valve stem. This curved portion of the latching arm is formed with a notch 42 and is designed to enter the casing 30 of the latching device 29 when the engineer's brake valve is swung to emergency position under the action of the motor 6 and as the arcuate portion of the latching arm enters the casing 30 of the latching device 29 by way of the opening 31, the latching lever 32 enters the notch 42 under the action of the spring 33 and so holds the valve locked in emergency position. When the conductor of the train receives orders to proceed, or desires to proceed, he pulls the cord 35 thereby swinging the latching levers 32 to inactive position so that the latching arms may be withdrawn from the casings of the latching devices and the engineer regain control of his engine.

A normally open switch 43 is preferably connected in parallel in the circuit 26 and is operable from a cord 44 extending throughout the length of the train and under the control of the conductor. By means of the switch 43 and the cord 44 the circuit 26 may be closed by the conductor and the motor 6 energized to bring the train to a stop when conditions warrant. If desired, this switch 43 and cord 44 may be eliminated.

From the foregoing description taken in connection with the accompanying drawings, the construction, mode of operation and manner of employing my invention will be readily apparent. It will be seen that I have provided automatic train stopping apparatus wherein the engineer's brake valve

and the throttle valve lever are automatically locked in actuated positions succeeding the operation of the motor so that it is impossible for the engineer to regain control of his train without the coöperation of the conductor.

While I have herein shown and described one preferred form of my invention by way of illustration, I wish it to be understood that I do not limit or confine myself to the precise details of construction herein described and delineated, as modification and variation may be made within the scope of the claims without departing from the spirit of the invention.

I claim:

1. In train stopping apparatus, the combination with a controlling element of the motor car, of a motor, a connection between said motor and controlling element whereby the latter will be operated to closed position in the operation of said motor, means for operating said motor, a latch for latching said element in actuated position, and means extending throughout the length of the train whereby the latch may be released.

2. In train stopping apparatus, the combination with a controlling element of the motor car, of a motor, a connection between said motor and controlling element whereby the latter will be operated to closed position in the operation of said motor, means for operating said motor, a latch for latching said element in actuated position, means extending throughout the length of the train whereby the latch may be released, and means concealing that portion of the releasing means within the engine cab.

3. In train stopping apparatus, the combination with a controlling element of the motor car, of an electroresponsive device, means under the control of said device for operating said controlling element to cut off the propelling power of the car, a source of energy for said electroresponsive device, a latch for latching said element in actuated position, and means extending throughout the length of the train whereby the latch may be released.

4. In train stopping apparatus, the combination with a controlling element of the motor car, of an electroresponsive device, means under the control of said device for operating said controlling element to cut off the propelling power of the car, a source of energy for said electroresponsive device, a latch for latching said element in actuated position, means extending throughout the length of the train whereby the latch may be released, and means concealing that portion of the releasing means within the motor car.

5. In train stopping apparatus, the combination with a controlling element of the motor car, of an electroresponsive device, means under the control of said device for operating said controlling element to cut off the propelling power of the car, a source of energy for said electroresponsive device, a latch for latching said element in actuated position, means extending throughout the length of the train whereby the latch may be released, means concealing that portion of the releasing means within the motor car, a switch controlling communication between said motor and source of energy, and means for operating said switch.

6. In train stopping apparatus, the combination with a controlling element of the motor car, and the engineer's brake valve, of a motor, connections between said motor and valve and between said motor and controlling element whereby the latter and the valve will operate to cut off the propelling power of the car and apply the brakes respectively in the operation of the motor, means for operating said motor, a latch for latching said valve and element in actuated positions, and means extending throughout the length of the train whereby the latches may be released.

7. In train stopping apparatus, the combination with a controlling element of the motor car, and the engineer's brake valve, of a motor, connections between said motor and valve and between said motor and controlling element whereby the latter and the valve will be operated to cut off the propelling power of the car and apply the brakes respectively in the operation of the motor, means for operating said motor, a latch for latching said valve and element in actuated positions, and a cord extending throughout the length of the train whereby said latches may be released.

8. In train stopping apparatus, the combination with a controlling element of the motor car, of a motor, a connection between said motor and controlling element whereby the latter will be operated to closed position in the operation of the motor, a source of energy for said motor, means controlling communication between said motor and source of energy, a latch for latching said element in actuated position, means extending throughout the length of the train whereby the latch may be released, and means for establishing communication between said motor and source independently of said second-named means.

In testimony whereof I affix my signature in presence of two witnesses.

JESSE H. UPTON.

Witnesses:
A. P. LEDFORD,
W. B. CANINGER.