

D. M. DALEY, A. H. LONG & H. L. MALTBIE.
SAFETY BRAKE APPARATUS FOR RAILWAY TRAINS.
APPLICATION FILED FEB. 19, 1908.

935,468.

Patented Sept. 28, 1909.
2 SHEETS—SHEET 1.

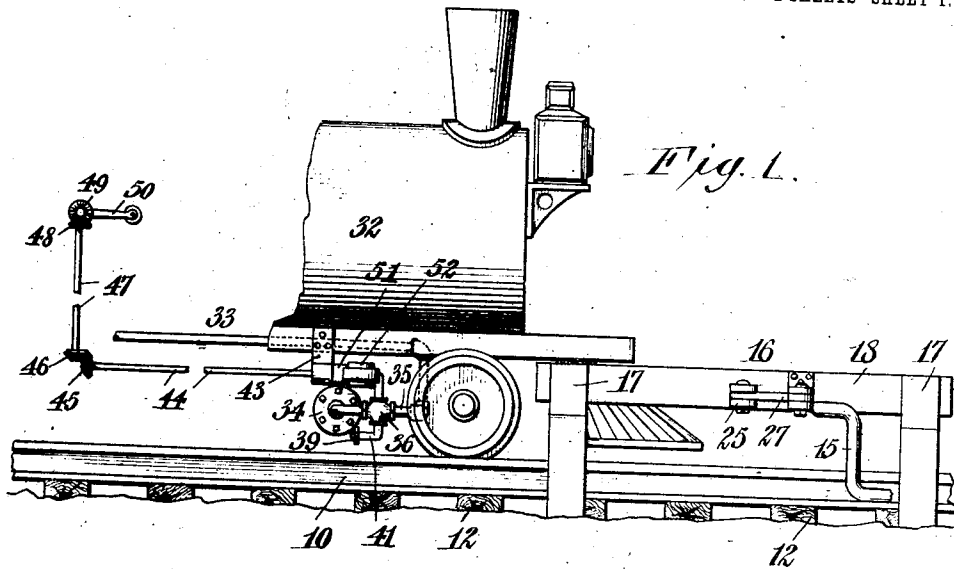


Fig. 1.

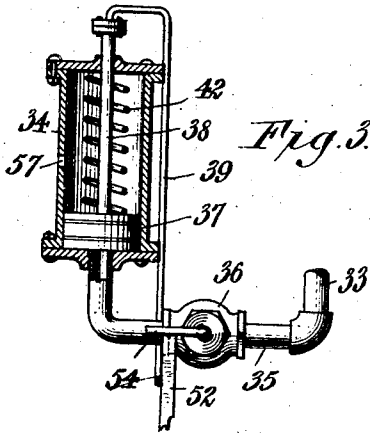


Fig. 3.

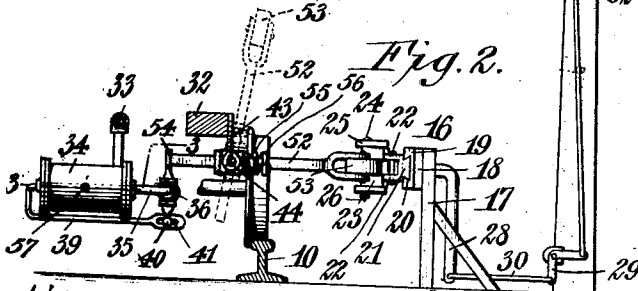
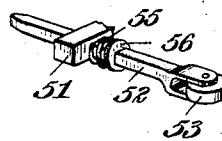


Fig. 2.

Fig. 4.



Witnesses:
Harry D. Rapp.
Christ Feinle Jr.

Daniel M. Daley,
Andrew H. Long,
Herbert L. Maltbie, } Inventors

By Emil Neuhauf, Attorney.

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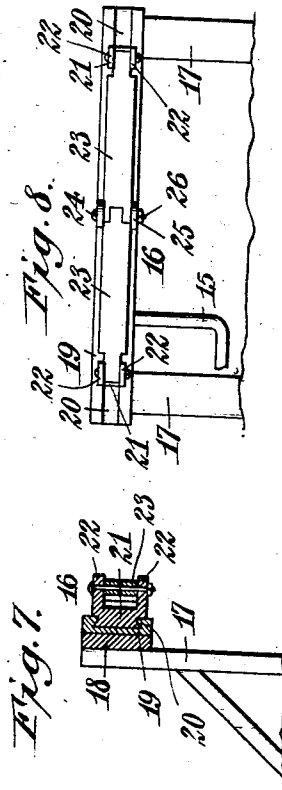
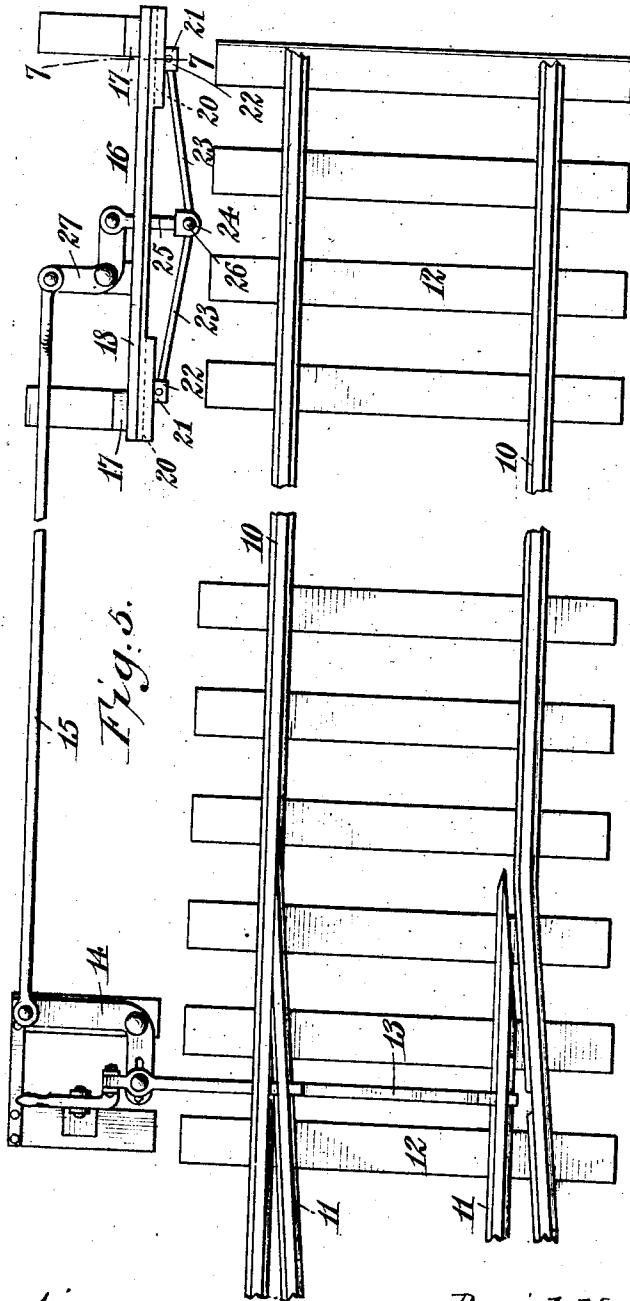


Fig. 6.

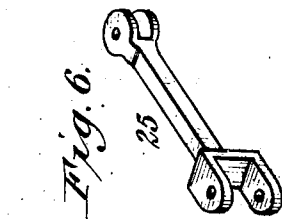


Fig. 7.

Fig. 8.

Witnesses:
Harry D. Rapp.
Christ Feinle, Jr.

Daniel M. Daley.
Andrew H. Long.
Herbert L. Maltbie. } Inventors.
By Emil Kuehner,
Attorney

UNITED STATES PATENT OFFICE.

DANIEL M. DALEY, OF WEST SENECA, AND ANDREW H. LONG AND HERBERT L. MALT-
BIE, OF ROLAND, NEW YORK.

SAFETY-BRAKE APPARATUS FOR RAILWAY-TRAINS.

935,468.

Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed February 19, 1908. Serial No. 416,673.

To all whom it may concern:

Be it known that we, DANIEL M. DALEY, residing at West Seneca, in the county of Erie and State of New York, and ANDREW H. LONG and HERBERT L. MALT-
BIE, residing at Roland, in the county of Erie and State of New York, all citizens of the United States, have invented certain new and useful Improvements in Safety-Brake Apparatus for Railway-Trains, of which the following is a specification.

This invention relates to safety brake-apparatus for railway-trains; it comprising essentially a contact-device arranged in operative relation to a track, a trip-device on a locomotive, and means actuated by said trip-device to cause a reduction in the air-pressure in the air-brake system of a train.

It also consists of a contact-device arranged in operative relation to the railway-track and in operative connection with a railway-switch, a signal apparatus or any other train-serving device, and a trip-device preferably controlled by the engineer of the train and in turn controlling the air-brake system.

The primary object of our invention is the provision of means for automatically braking a train as it approaches an open switch, a block when a signal is set against entrance into the block, or any other train-serving device; it also has for its object the provision of means whereby the braking of the train is accomplished gradually; and to accomplish such objects by simple and reliable mechanical contrivances.

With these and other objects in view to appear hereinafter, the invention consists in the construction, arrangement and combination of parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the drawings,—Figure 1 is a side elevation of a railway-track, the contact-device at the side of the track and a portion of a locomotive equipped with the cooperating parts of our invention. Fig. 2 is an end elevation of the apparatus showing a semaphore operatively connected with the contact-device and the traveling portion of the apparatus carried on the frame of a locomotive. Fig. 3 is an enlarged section taken

on line 3—3, Fig. 2. Fig. 4 is a detached perspective view of the trip-device and its supporting-arm. Fig. 5 is a broken plan view of a railway-track having a switch, and of the contact-device operatively connected with the switch. Fig. 6 is a detached perspective view of the thrust-rod forming part of the contact-device. Fig. 7 is a section taken on line 7—7, Fig. 5. Fig. 8 is a front elevation of the contact-device.

Referring now to the drawings in detail, like numerals of reference refer to like parts in the several figures.

10 represents the main track-rails, and 11 the switch-points of a side or branch-track; said tracks being secured to cross-ties 12 in the usual manner. The switch-points are connected by an actuating-bar 13 which is pivotally connected at one end to one arm of a bell-crank lever 14 arranged at one side of the track, said lever having its other end connected to a rod 15 which extends parallel with the track to a contact-device 16 arranged at a distance from the switch-points and preferably at one side of the track. This contact-device comprises a frame having standards 17 which are braced and connected at their upper ends by a horizontally-disposed bar 18 to which is secured a slide-way 19 which faces the track. Said slide-way has dovetailed grooves 20 at opposite ends in which slide-blocks 21 are held, each of said slide-blocks having outwardly-projecting ears 22 to which the outer ends of a pair of oppositely-inclined contact-bars 23 are pivotally secured. Said bars have a hinge connection at their inner ends, as at 24, and are held in the bifurcated end of a thrust-rod 25 at such point by means of a bolt 26. Thrust-rod 25 passes through registering openings in the slide-way and the horizontally-disposed connecting-bar 18. The outer end of the thrust-rod 25 is pivotally connected to one arm of a bell-crank lever 27 which has its other arm pivotally attached to rod 15.

The parts thus far described are so related and connected that when the switch-points are in open position to cause an approaching train to move onto the side or branch track, the contact-bars 23 are moved into projected position; that is to say, their inner con-

nected ends are in the position in which they closest approach the tracks, and when the switch-points are in closed position, the contact-bars are drawn inward toward the slide-way 19.

As this invention is designed to set the brakes of a train automatically, the contact-device 16 may be used in connection with a railway-switch, as shown in Fig. 5, a semaphore as shown in Fig. 2, or any other train-serving device. When used in connection with a semaphore, the thrust-rod 25 may be bent downward, as at 28, Fig. 2, and its lower end connected to one arm of a bell-crank lever 29, by means of a link 30; the other arm of said bell-crank lever being connected with the signal-element 31, by means of a rod 32. Any other means of connection, however, may be established between the contact-device and the train-serving device, which may be a railway-switch, a signal-device, or any other appliance or apparatus to be actuated or used when it is desired to stop or cause a train to proceed slowly.

The contact-device and the train-serving device is adapted to cooperate with mechanism carried on a locomotive, whether traveling separately or in connection with a car or cars coupled thereto, and where herein a train is specified, it is to be understood as meaning a locomotive with or without cars coupled thereto. This train-mechanism we will now proceed to describe.

32 designates a portion of a locomotive or train, and 33 an air-pipe forming part of an air-brake system. Supported on the frame of the locomotive is an air-cylinder 34 which is connected with the air-pipe 33 by a pipe 35 having a valve 36 therein. Within the cylinder 34 is a piston 37 having a piston-rod 38 which extends out through one end of the cylinder and to which an actuating-rod 39 is secured. Said actuating-rod has connection with the stem of the valve 36; the means of connection being such as to allow a predetermined movement of said rod before actuating said valve. For this purpose the rod 39 is slotted, as at 40, and through said slot the bent end 41 of the valve-stem passes. The piston is normally held at one end of the cylinder by a spring 42 which surrounds the piston-rod 38 and is interposed between the piston and one end of the cylinder.

Depending from the frame of the locomotive is a hanger 43 in which is mounted a shaft 44 extending rearward to a point beneath the cab of the locomotive, and at its rear end it has a bevel-gear 45 which meshes with a bevel-gear 46 at the lower end of a vertical shaft 47 extending upward into the cab. The upper end of said vertical shaft has a bevel-gear 48 which is in mesh with a bevel-gear 49 secured to a shaft suitably

journaled and having a crank-handle 50. To the forward end of the shaft 44 a rock-head 51 is secured which is slotted and has a trip-bar 52 passing therethrough at a right-angle to the shaft 44. At its outer end said trip-bar is equipped with a contact-roller 53 which is adapted to ride over the contact-bars 23 to cause said bars to move toward the slide-head 19 and during such movement of the contact-bars, the slide-blocks are forced toward opposite ends of the contact-device. Said contact-bars serve through the instrumentalities of the thrust-rod 25 and the actuating parts between the latter and the switch-points, to move said switch-points into closed position. When the contact-bars are forced into their depressed position, they retain their inclination with respect to each other, but in a less degree, and as the trip-device has forced the contact-bars inward to their full extent when the contact-roller reaches a point about midlength of the bar first in the path of its travel, said trip-bar is forced inward to actuate an arm 54 secured to the stem of the valve 36, causing air under pressure to enter the cylinder 34 from the main line of the air-brake system, which causes the setting of the brakes on the train. In order, however, that the trip-bar does not move inward before the contact-arms are actuated by it, a spring 55 of considerable power is provided which surrounds the trip-bar and is interposed between the rock-head 51 and a collar 56 on said bar; said spring offering sufficient resistance to assure the actuation of the contact-bars and their connected parts before the trip-bar can act upon the valve.

When the air enters the cylinder 34, it acts against the piston therein to force it forward, and after as it approaches the end of its stroke, the rod 39 acts to open the valve 36 to a greater extent than it was opened by the trip-bar 51, thus causing a second reduction of air-pressure in the air-line of the brake-system, which assures a positive braking of the wheels after the train has slowed down by reason of the first reduction of the air-pressure. By this means, therefore, the train is gradually stopped. As the piston reaches the end of the forward movement it opens an air-outlet 57 in the cylinder through which the air escapes, after which the spring 42 returns the piston to normal position.

This invention is particularly useful in foggy or stormy weather when it is difficult to see the signals, and at such times it is simply necessary for the engineer to turn the crank 50 which, through the instrumentality of the gears and shafts between it and the rock-head 51, cause the trip-bar 52 to be swung from normal position shown in dotted lines in Fig. 2 to that shown in full lines in said figure.

It is to be understood, that in lieu of the contact-device herein shown, any contact-device or obstruction in the path of the trip-bar 52 may be used, whether or not it is in connection with a train-serving device.

Having thus described our invention, what we claim is,—

1. In a safety-brake apparatus, the combination with a train-serving device, a contact-device in operative relation to the track and operative-connection between said train-serving device and said contact-device, of an air-brake system, an air releasing-device connected with said air-brake system, a trip-device, and means for moving said trip-device into or out of operative position with relation to said air releasing-device and said contact-device.

2. In a safety-brake apparatus, the combination with a train-serving device and a contact-device operatively connected with said train-serving device, of an air-brake system on a train, a cylinder having connection with an air-pipe of said system, a piston in said cylinder, a valve in the pipe leading to said cylinder, mechanism for opening said valve to a predetermined extent and adapted for co-action with said contact-device, and

means governed by said piston to open said valve to a greater extent.

3. In a safety-brake apparatus, the combination with a contact-device, of an air-brake system, a cylinder having an air-escape opening and connection at one end with an air-pipe in said system, a piston in said cylinder, a spring acting to retain the piston normally at one end of said cylinder, a valve in the air-pipe connected to said cylinder, means for opening said valve to a limited extent to admit air into said cylinder and cause a reduction of air in the air-brake system, said means being adapted for co-action with said contact-device and a connection to the piston adapted to open the valve to a greater extent after the piston reaches a certain point to cause a further reduction of air in the air-brake system.

In testimony whereof, we have affixed our signatures in the presence of two subscribing witnesses.

DANIEL M. DALEY.
ANDREW H. LONG.
HERBERT L. MALTBIE.

Witnesses:

WILLIAM CASEY,
EUGENE E. BLAIR.