No. 648,822. Patented May 1, 1900.

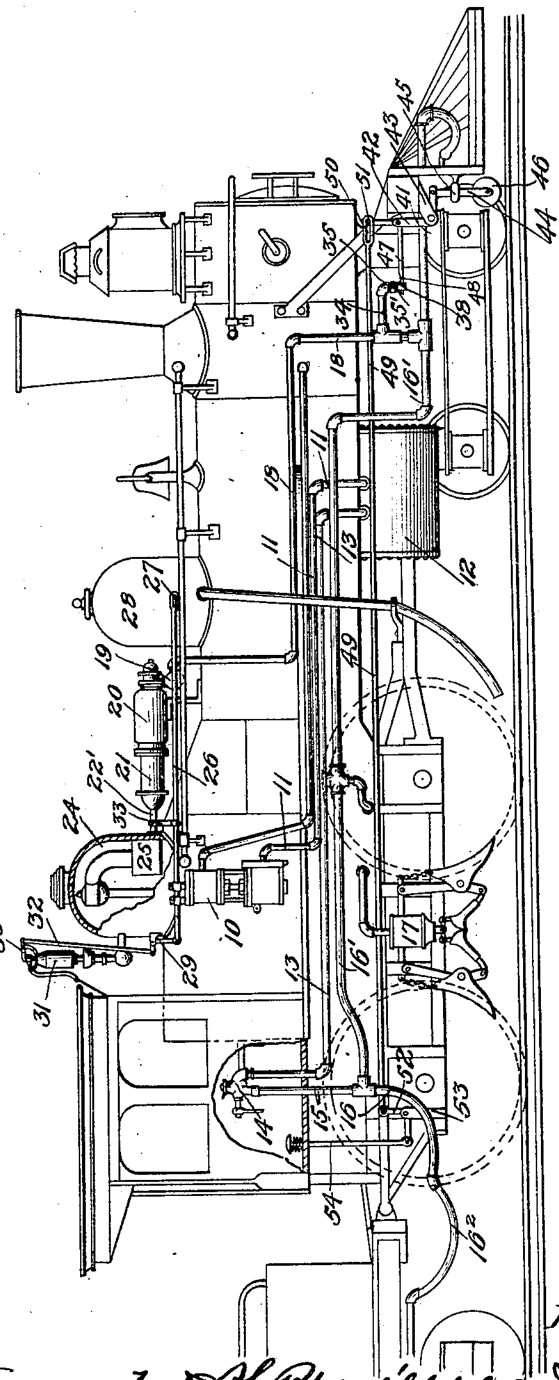
H. E. WILSON.

MEANS FOR AUTOMATICALLY STOPPING RAILWAY TRAINS.

(Application filed Jan. 11, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Inventor

H. E. Wilson

Witnesses

by A. B. Willson & Co

Attorneys

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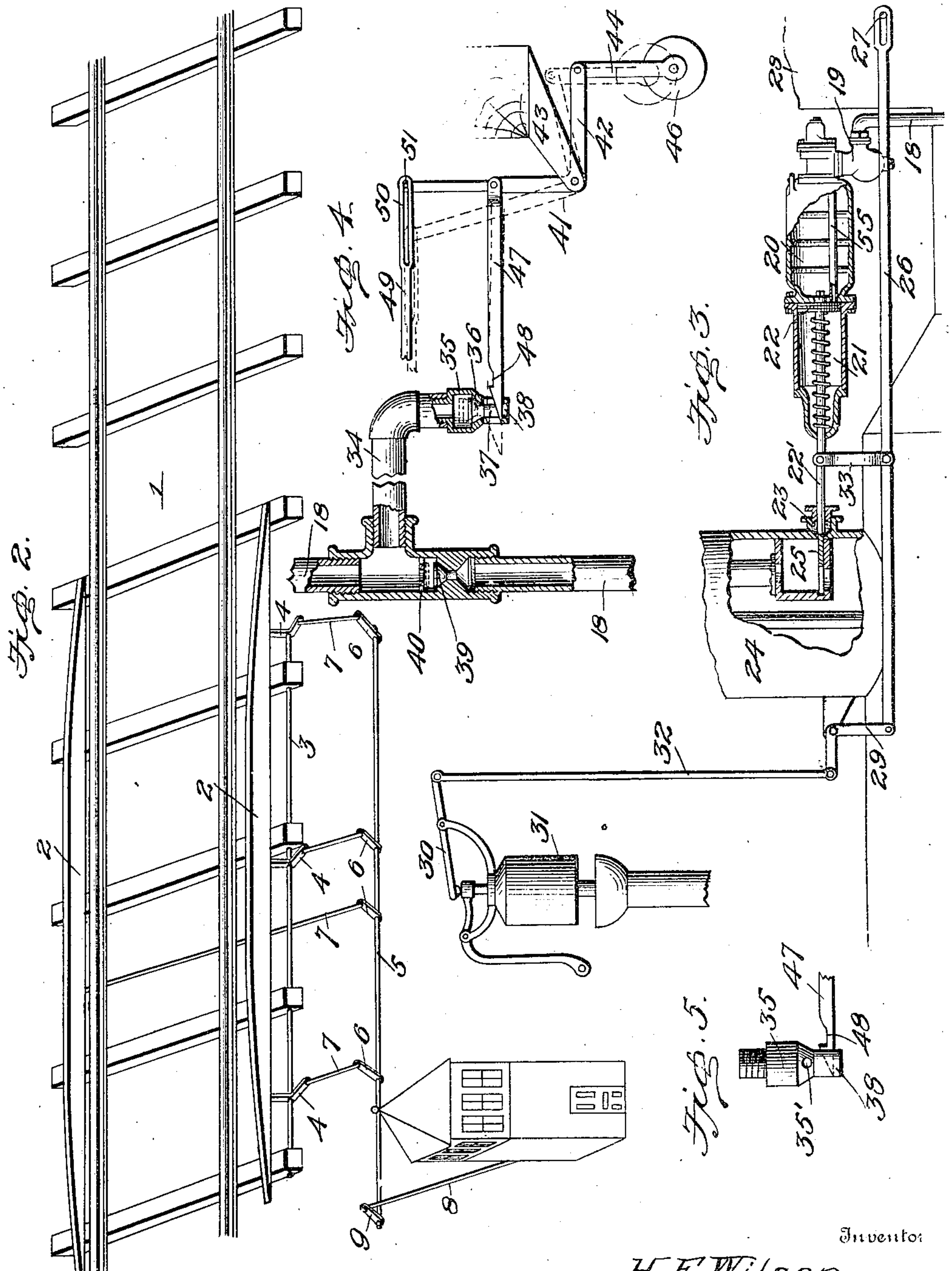

Witnesses

C. E. Hunter

J. A. Willson

Inventor

H. E. Wilson.

by H. B. Willson & Co

Attorneys

UNITED STATES PATENT OFFICE.

HENRY E. WILSON, OF POTTSVILLE, PENNSYLVANIA.

MEANS FOR AUTOMATICALLY STOPPING RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 648,822, dated May 1, 1900.

Application filed January 11, 1900. Serial No. 1,131. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. WILSON, a citizen of the United States, residing at Pottsville, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Means for Automatically Stopping Railway-Trains; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates, broadly, to means for automatically stopping a railway-train.

One object of the invention is to provide mechanism actuated by a trip-bar arranged along the track, contiguous to the rail thereof, and under the control of a towerman or switchman, whereby the track is automatically sanded, the brakes applied, the whistle sounded, and the steam cut off.

A further object of the invention is to provide mechanism for producing these results which shall be of such construction and arrangement that the engine-driver from his cab may actuate the mechanism to effect the results independently of the trip-bar, while at the same time he will be prevented from setting the mechanism so that it will not be actuated by the trip-bar.

With these and other objects in view the invention consists in certain features of construction and combination of parts, which will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of an engine equipped with my improvements. Fig. 2 is a conventional perspective view of a section of track, tower-house, trip-bars, and the mechanism for operating the trip-bars. Fig. 3 is a side elevation, partly in section, of the whistle, steam-dome, auxiliary air-reservoir, triple valve, and a portion of the sand-box. Fig. 4 is a similar view of the exhaust-valve-actuating mechanism and the train-pipe branch and its valve. Fig. 5 is a detail view of the exhaust-valve casing, showing the exhaust-port.

In the drawings the same reference characters indicate the same parts of the invention.

1 denotes a section of track. 2 denotes trip-bars arranged on either side of the track in close proximity to the outer sides of the rails. 3 denotes the rod fixed to the ends of the ties. 4 denotes bell-crank levers journaled upon said rod and having their inner ends fixed to the trip-bars 2. 5 denotes a suitably-journaled rock-shaft provided with the cranks 6, connected to the free members of the bell-crank levers by a link 7, and 8 denotes an operating-rod leading to the tower-house and connected to a crank 9, secured to the free end of the rock-shaft 5. This is a simple form of mechanism for throwing the trip rod or rods into position to be engaged by the valve-actuating mechanism carried by the engine; but it is of course understood that any form of mechanism desired may be employed for moving the trip bar or bars into and out of operative position without departing from the spirit of my invention, which resides mainly in the mechanism for either stopping the train or signaling the engineer, or both.

Referring to Fig. 1 of the drawings, 10 denotes the air-pump, from which leads a pipe 11 to the storage-reservoir 12 for the compressed air. A pipe 13 leads from the storage-reservoir to an air-brake valve 14, located in the engine-cab under the control of the engine-driver. A pipe 15 leads from this valve to the train-pipe 16, a branch 16′ of which runs along the side of the engine and is connected in the usual manner to the engine-brake cylinder 17, while the other branch 16^2 runs along under the passenger-coaches and is connected to the air-brake cylinders in the usual manner. This arrangement of air-pipes for applying the brakes to the engine and coaches is well known and in itself forms no part of my invention, and therefore a detail description of the parts just described is thought not to be necessary.

18 denotes a branch pipe leading from the section 16′ of the train-pipe up to an ordinary triple valve 19, communicating with an auxiliary reservoir 20. The triple valve 19 and the auxiliary reservoir 20 are of the usual construction and are now generally employed in the Westinghouse air-brake systems, and a further detail description of the same is therefore unnecessary.

21 denotes a cylinder having a spring-controlled piston 22, the rod 22′ of which extends through a suitable stuffing-box 23 in the steam-dome 24 and is connected to a cut-off valve 25.

26 denotes a rod the forward end of which is connected to a pin 27, projecting from a valve in the sand-box 28. The rear end of this rod 26 is connected to one member of a bell-crank lever 29, which has its other member connected to a whistle-lever 30 of a steam-whistle 31 by a link 32.

33 denotes a link or strap connecting the rods 22′ and 26.

34 denotes an exhaust-pipe which is connected to the pipe 18 and is provided at its discharge end with a valve-casing 35, in which is seated a valve 36, the stem 37 of which projects below the valve-seat. This valve-casing 35 is provided with the exhaust-port 35′ and with a guide-bracket 38 for a purpose hereinafter to appear.

Located within the branch pipe 18, below the exhaust-pipe 34, is a conical valve 39, the upward movement of which is limited by a cross bar or grating 40.

41 denotes the valve-actuating mechanism. In the drawings I have shown the preferred mechanism employed for actuating the valve and will now proceed to describe the same, but would have it distinctly understood that I reserve to myself the right to provide any means or mechanism I may hereafter desire to use for actuating the valve. The mechanism shown consists of a bell-crank lever 42, pivoted to a bracket 43, secured to one of the engine-timbers. To one member of the lever is pivoted an arm 44, which moves in a vertical guide 45 and has its lower end provided with a friction roller or wheel 46, adapted to engage the trip-bar 2. The other member of the bell-crank lever extends upwardly and has pivoted to it a valve-shifting bar 47, having a wedge end which rides in the bracket 38 and engages the stem 37 of the valve 36 to elevate said valve free of its seat. This bar 47 is provided with a notch 48, into which the stem of the valve 36 drops and is seated after the valve has been raised from its seat, so that it will be impossible to return the valve to its normal position unless the driver leaves his cab and withdraws the bar 47, with its notch, from engagement with the valve-stem 37.

To the extreme upper end of the bell-crank lever 42 is attached a rod 49, the forward end of the rod having an elongated aperture 50, through which projects a pin 51 at the upper end of the bell-crank lever. The rear end of the rod 49 is connected to one member of a bell-crank lever 52, pivoted in a bracket 53 under the engine-cab. A spring-actuated push-bar 54, projecting through the running-board of the engine within the cab, has its lower end pivoted to the other member of the bell-crank lever.

The operation is as follows: Assuming the storage-reservoir 12 to contain air under ninety (90) pounds pressure and the train-pipe to contain air under seventy (70) pounds pressure, the triple valve will prevent the discharge of air through the pipe 55 into the cylinder 21, and the pressure of air in the pipe 18 above the valve acting upon a greater surface of the valve than the pressure from the section 16′ of the train-pipe will hold said valve 39 to its seat. In other words, the valve 39, presenting a greater area to the air-pressure above it than it presents to the air-pressure below it, will be held firmly to its seat. The valve 36 in the exhaust-pipe 34 being acted upon by the air-pressure in the branch pipe 18 of the train-pipe will also be held securely to its seat. Now assuming the train to be moving along and the trip-bar to be thrown into the position to be engaged by the valve-actuating mechanism, the instant the roller or wheel 46 strikes the trip-bar the bell-crank lever 42 will be rocked, thus moving the beveled or wedge-shaped end of the valve-shifting bar 47 under the stem of the valve 36, which will raise it from its seat, in which raised position said valve will be locked by its stem dropping into the notch 48 in the bar. The instant the valve is raised from its seat the air is exhausted through the exhaust-pipe and exhaust-port 35′, thus relieving the pressure upon the upper surface of the valve 39 and permitting it to rise from its seat and exhaust the air from the train-pipe 16, and thereby apply the brakes to the engine and the entire train. The unseating of the valve 36 also releases the pressure in the pipe 18, which causes the triple valve to establish communication between the auxiliary reservoir and the cylinder 21 through the pipe 55 to force the piston 22 rearward, which movement actuates the valve 25 to cut off the steam from the dry pipe and also actuates the rod 26 to cause the blowing of the whistle 31 and the discharge of sand from the sand-box 28. The train will soon come to a stop, and to restore the parts the driver will leave his cab and reset the bell-crank lever 42 and bar 47.

Should for any reason it be desired to simultaneously sand the track, apply the brakes, and sound the alarm, the engineer may do so by pressing upon the push-bar 54, which will operate the valve-actuating mechanism the same as if the roller had been engaged by the trip-bar. The driver, however, cannot shift the parts so as to prevent the operation of the device should the trip-bar be set to be engaged by the roller.

From the foregoing description, taken in connection with the accompanying drawings, the construction, operation, and advantages of my improvements will be readily apparent without requiring an extended explanation.

It will be seen that my improved means is simple of construction, that said construction permits of the manufacture of the device at a comparatively-small cost, and that it is exceedingly well adapted for the purpose for which it is designed.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In automatically-operated train-stopping mechanism, the combination with the locomotive-engine, of the air-pump 10 connected with the storage-reservoir 12 for compressed air by a pipe 11; the air-brake valve 14 located in the engine-cab under the control of the engine-driver; and connected by a pipe 15 with the train-pipe 16; the branch pipes 16′ and 16^2, connecting the engine-brake cylinder and the air-brake cylinders; the branch pipe 18 leading from the branch or section 16′ to the triple valve 19; the auxiliary reservoir 20; the exhaust-pipe 34 connected to said branch pipe 18 and provided at its discharge end with a valve-casing provided with an exhaust-port 35′ and a guide-bracket 38; the valve 36 seated therein and having its stem projecting below said valve-seat; the bell-crank lever 42 pivoted to a bracket 43 secured to the front timber of the engine; the arm 44 pivoted to the lower member of said bell-crank lever, provided with a friction-roller and adapted to move vertically in a guide 45 secured to said front timber; the apertured rod 49 loosely connected with the upper end of said bell-crank lever; the valve-shifting bar 47 pivoted on said bell-crank lever and provided with a notch 48 for engaging the valve-stem and seating the valve 36 and maintaining it in its seated or raised position until the engine-driver leaves his cab and withdraws said bar 47 from engagement with said valve-stem; substantially as and for the purpose set forth.

2. In automatically-operated train-stopping mechanism, the combination with the locomotive-engine; of a storage-reservoir for compressed air; of a train-pipe communicating therewith; an auxiliary reservoir for compressed air; a cylinder provided with a piston connected to piston-controlling mechanism; a triple valve adapted to establish communication between said auxiliary reservoir and said cylinder; the train-pipe; a branch pipe establishing communication between said train-pipe and said triple valve; an exhaust-pipe connected to said branch pipe; a valve located in said exhaust-pipe provided with the bracket 38; the valve 36 loosely seating in said exhaust-pipe and provided with the valve-stem 37; the valve-shifting bar 47 pivoted to said bell-crank lever and provided with a notch 48 near its wedge-shape end for engaging said valve-stem and seating said valve until such time as the engine-driver shall descend from the engine-cab and withdraw said bar 47 from engagement with said valve-stem; substantially as specified.

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

HENRY E. WILSON.

Witnesses:
CHAS. GRAEFF,
JOS. C. HEIKEN.