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C. S. DEAN.

PNEUMATIC AUTOMATICALLY ACTING DANGER SIGNAL FOR RAILWAY CROSSINGS.

(Application filed Nov. 4, 1899.)

(No Model.)

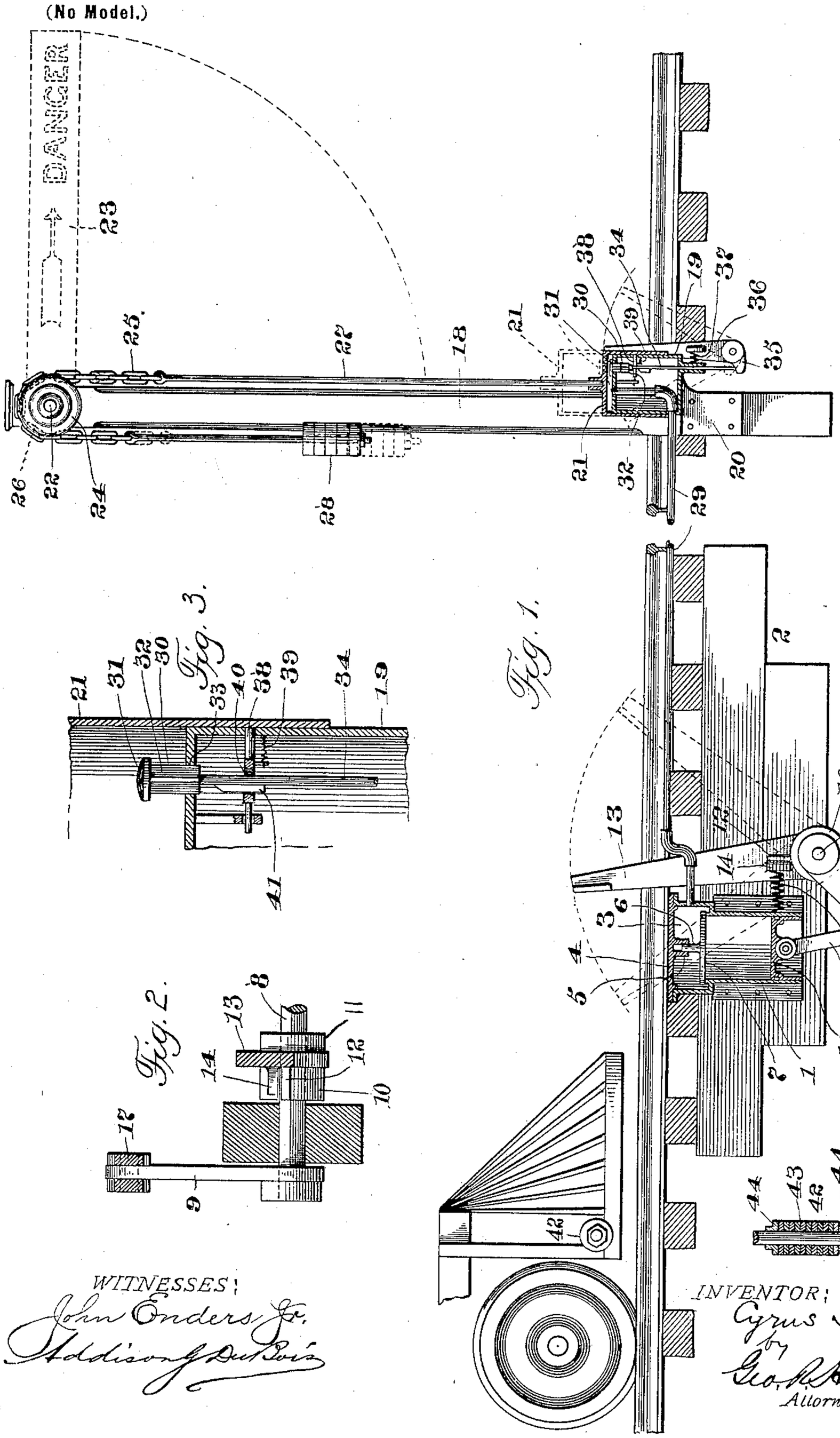

Fig. 1.

Fig. 3.

Fig. 2.

Fig. 4.

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PNEUMATIC AUTOMATICALLY-ACTING DANGER-SIGNAL FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 652,351, dated June 26, 1900.

Application filed November 4, 1899. Serial No. 735,799. (No model.)

To all whom it may concern:

Be it known that I, CYRUS S. DEAN, a subject of the Queen of Great Britain, residing at Fort Erie, county of Welland, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Pneumatic Automatically-Acting Danger-Signals for Railway-Crossings, of which the following is a specification.

This invention relates to pneumatic automatically-acting danger-signals for railway-crossings.

The object of the invention is the provision of improved pneumatic mechanisms for displaying a danger-signal at a railway-crossing or other dangerous position on the approach of a train and for hiding the signal when the train has passed, both operations being accomplished by the movement of the train itself without assistance from any other agency, thereby rendering the action entirely automatic and at all times reliable.

The foregoing object is accomplished by the provision of an improved air-compressor operated by the train when approaching the crossing, together with a signal and novel means actuated by the compressed air for displaying the signal, and also an improved device adapted to restore the signal-operating mechanism to normal position as the train is passing out of the crossing.

In the accompanying drawings, Figure 1 is a side elevation, with certain parts in section and represented by dotted lines, illustrating the application of the invention; Fig. 2, a detail view of the mechanism for operating the air-compressor; Fig. 3, a detail view of the exhaust-valve for the signal-operating mechanism, and Fig. 4 a detail view of the trip or tappet on the locomotive-pilot.

The air-compressor cylinder 1 is fastened to a suitable foundation of beams 2 and has an enlarged valve-chamber 3 in its upper part, which is closed by a cover 4, removably bolted on, having a boss 5, constituting a guide for the stem 6 of a valve 7, which remains normally seated on the upper end of the cylinder by its own weight. A suitably-journaled rock-shaft 8 has a crank 9 securely connected to one end thereof, while on its inner end, adjacent the track-rail, two collars 10 and 11 are secured, the former being provided with an ear 12. A lever 13, whose upper end extends up beside the track-rail and above the same, has its lower end loosely journaled on the rock-shaft 8 between the collars 10 and 11. This lever is provided with an ear 14, corresponding to ear 12 and adapted to positively engage said ear 12 when the lever is rocked toward the crossing; but this lever being loose on the rock-shaft is free to swing idly in the opposite direction when struck by a train moving in the opposite direction. A spring 15 keeps the lever normally in upright position and restores it to that position after it has been rocked idly. A piston 16 is located in the cylinder 1 and, being connected to crank 9 by a link 17, is adapted to be forced upwardly to compress the air when the lever is struck by a train passing toward the crossing. A signal-post 18 is provided in a suitable position beside the track, and the signal-operating mechanism is preferably connected to the post. A hollow cylinder 19, fastened to the post by a bracket 20, constitutes the stationary part of this mechanism. An air-bell 21 telescopes over the cylinder and is adapted to move up and down thereon. A shaft 22, extending through the top of the post and journaled therein, carries a semaphore 23 on one end and a grooved pulley 24 on the other end. A chain 25, running over this pulley, has alternate links received in pockets 26, provided in the pulley to insure its turning with the movement of the chain, and one end of the chain is connected to bell 21 by a rod 27, while the other end is provided with a counterweight 28, which is slightly less in weight than the semaphore. My object in providing such a weight is to minimize the actual weight to be lifted—the excess weight of the semaphore over the counterweight—so that only a slight air-pressure will be required to raise the semaphore. At the same time the semaphore is self-restoring, as its superior weight will cause it to drop immediately upon the air being exhausted from the bell by the mechanism hereinafter described. The counterweight 28 will be made in sections, so that it can be increased or diminished according to requirements, for it may be found desirable in practice to have the track-walker add

to the weight should the semaphore become loaded with snow or sleet in bad weather. A pipe 29, extending from the valve-chamber of the air-compressor to the space underneath the air-bell, supplies the necessary pressure to the latter when the lever is actuated by an approaching train.

Referring now more particularly to Figs. 1 and 3 for a disclosure of the mechanism for resetting the signal, 30 represents an exhaust-valve having head 31 and grooved body 32, which extends through a seat 33 in the top of the cylinder 19. The stem 34 of the valve extends through a guide in the bottom of said cylinder in position for engagement with a finger 35 on the same rock-shaft with a lever 36, which extends above the track-rail in position to be tripped by the movement of the locomotive. A spring 37 restores this lever to normal upright position when rocked idly by a train moving toward the air-compressor and its lever; but ordinarily the lever is restored by the gravitation of the air bell and valve.

To insure against dropping of the semaphore before the train reaches the crossing, I provide a catch 38, actuated by a spring 39, sliding through the side of the cylinder 19 in position to engage the lower edge of the air-bell when it has been raised. The catch has a slot 40, through which the valve-stem passes, which is here provided with a cam 41, which retracts the catch when the valve is raised, thereby allowing the bell to drop simultaneously with the exhaustion of the air therein.

On the locomotive-pilot there is a tappet 42, composed of rubber rings 43, held by collars 44, Fig. 4, said tappet being in proper position to strike the levers 13 and 36. The force of the blow is cushioned by employing the rings 43, and in this connection I may state that the ears 12 and 14 are also preferably faced with cushioning material for the same purpose.

The operation is as follows: When the tappet on the locomotive-pilot strikes the lever 13, the piston is moved and the air suddenly compressed. The compressed air lifts the valve and flows through the pipe to the air-bell 21, which is raised by the pressure and locked by the catch 38, so that the semaphore is raised and displayed, as shown by dotted lines in Fig. 1. The semaphore remains in this position, warning persons at the crossing that a train is approaching, until the train reaches the lever 36 and depresses it. When this is done, the exhaust-valve 30 is raised, whereupon the air in the bell 21 exhausts. At the same time the cam 41 retracts the catch, allowing the air-bell and semaphore to fall to their normal positions. When the semaphore is down, it is parallel with the signal-post, and consequently not displayed.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a signaling device, the combination with a signal, of pneumatic mechanism for displaying the signal, an air pump or compressor for supplying air to the pneumatic mechanism, means for locking the signal when displayed, and means for unlocking it and exhausting the air from the pneumatic mechanism to restore the signal.

2. In a signaling device, the combination with a signal, of pneumatic mechanism for operating the signal, an air-compressor for supplying air to the pneumatic mechanism, a locking device for securing said pneumatic mechanism when the signal is displayed, a valve for exhausting the air from the pneumatic mechanism to restore the signal, and means for unseating the valve and unlocking the pneumatic mechanism.

3. In a signaling device, the combination with a signal, of an air-bell connected thereto, an air-compressor for supplying air to the bell to operate the signal, and means for exhausting the air from the bell to restore the signal.

4. In a signaling device, the combination with a normally-undisplayed, self-restoring signal, of an air-bell connected thereto, an air-compressor for supplying air to the bell to operate the signal, and means for exhausting the air from the bell to restore the signal.

5. In a signaling device, the combination with a signal, of an air-bell connected thereto, means for supplying air to the bell to operate the signal, a cylinder over which the bell telescopes, an exhaust-valve in the cylinder to allow the air from the bell to exhaust therethrough, and a device for unseating the valve.

6. In a signaling device, the combination with a signal, of an air-bell connected thereto, means for supplying air to the bell to operate the signal, a cylinder over which the bell telescopes, an exhaust-valve in the cylinder to allow the air from the bell to exhaust therethrough, a locking device for securing the bell when raised, and means for unseating the valve and unlocking the bell.

7. In a signaling device, the combination with a signal, of an air-bell connected thereto, means for supplying air to the bell to operate the signal, a cylinder over which the bell telescopes, an exhaust-valve in the cylinder to allow the air from the bell to exhaust therethrough, said valve having its stem provided with a cam, an automatic catch for locking the bell when raised, which is retracted by the cam when the valve is unseated, and means for unseating the valve to allow the bell to descend.

8. In a signaling device, the combination with a signal, of an air-bell connected thereto, means for supplying air to the bell to operate the signal, a cylinder over which the bell telescopes, an exhaust-valve in the cylinder to allow the air from the bell to exhaust therethrough, said valve having its stem provided with a cam, a spring-actuated sliding catch adapted to engage and support the bell

when unseated which is provided with a slot through which the cam passes when the valve is unseated, and means for unseating the valve to unlock the bell and exhaust the air therefrom.

9. In a signaling device for railway-crossings, the combination with a signal, of an air-bell for operating said signal, a cylinder over which the bell telescopes, an air pump or compressor having operating mechanism positioned for actuation by the train when approaching the crossing, which supplies air to the bell, an exhaust-valve for the air-bell, an automatic locking device for securing the bell when raised, a stem on the valve which accomplishes the retraction of said locking device, and a lever, positioned to be struck by the train, which operates the valve-stem.

10. In a signaling device, the combination with a pivotally-mounted, gravitating semaphore or signal, and a pulley for turning the same, of a chain running over said pulley, a counterweight on one end of the chain which is of slightly less weight than the semaphore, and air-operated mechanism connected to the other end of the chain, whereby said semaphore is rendered self-restoring by its own weight and requires but slight air-pressure to display it.

11. In a signaling device, the combination with a pivoted, gravitating semaphore or signal, and a pulley for turning the same, of a chain running over said pulley, a counterweight on one end of the chain which is of slightly-less weight than the semaphore, an air-bell connected to the other end of the chain, means for supplying air to the bell to display the signal, and an exhaust-valve for the bell to permit it to fall with the semaphore.

12. In a signaling device, the combination with an air-compressor cylinder, of a rock-shaft, a crank secured thereto, a piston in the cylinder, a link connecting the piston to the crank, a lever journaled loosely on the rock-shaft and extending up beside the track-rail in position for contact by the train, and ears on the shaft and lever, respectively, which are adapted to engage when the lever is rocked one way and disengage when it is rocked in the opposite direction.

13. In a signaling device, the combination with an air-compressor cylinder having an enlarged valve-chamber provided with a cover or head having a guide, of a valve in said chamber which normally rests on and closes the end of the cylinder, and has a stem received in the guide, an outlet-pipe leading from the valve-chamber, a rock-shaft, a crank secured thereto, a piston in the cylinder, a link connecting the piston to the crank, a lever journaled loosely on the rock-shaft and extending up beside the track-rail in position for contact by the train, and ears on the shaft and lever, respectively, which are adapted to engage when the lever is rocked one way and disengage when it is rocked in the opposite direction.

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

CYRUS S. DEAN.

Witnesses:
C. REINHARDT,
FRANK E. NEWTON.