(No Model.)

R. T. BOWNE.

SIGNALING DEVICE.

No. 479,396. Patented July 26, 1892.

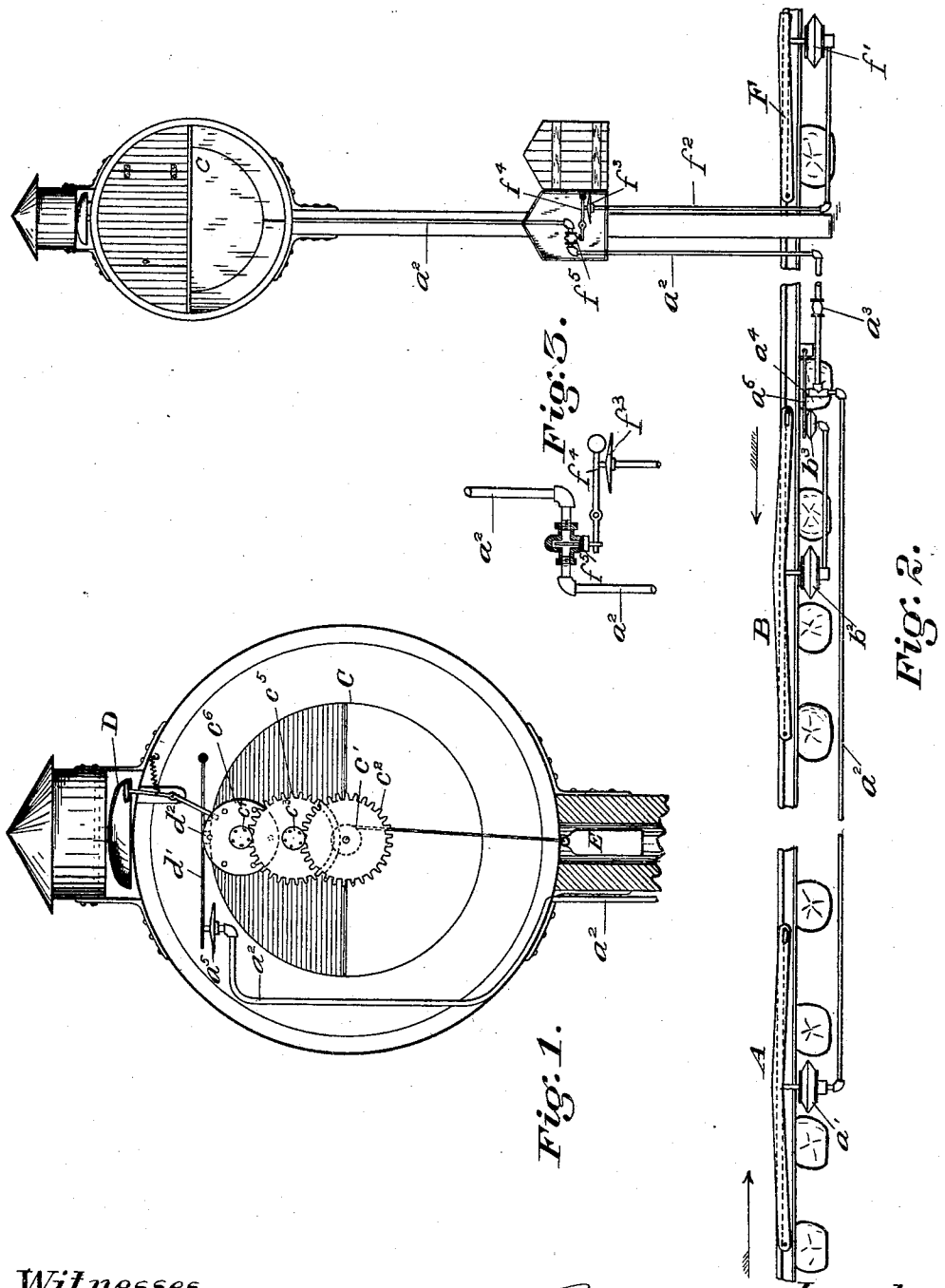

Fig: 1.

Fig: 3.

Fig: 2.

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SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 479,396, dated July 26, 1892.

Application filed May 12, 1891. Serial No. 392,421. (No model.)

To all whom it may concern:

Be it known that I, ROBERT T. BOWNE, a citizen of the United States, and a resident of Benson, in the county of Harford and State of Maryland, have invented certain new and useful Improvements in Signaling Devices, of which the following is a specification.

Figure 1 is a view of a signal-box and gear for operating the signals, showing, also, the detent-lever for holding the gear and an air-chamber for releasing the lever. Fig. 2 is a view of track with levers, air-chambers, signal-box, and means for releasing the air from pipes and chambers. Fig. 3 is a detailed view showing means for releasing the air from the pipes.

My invention relates to that class of pneumatic signaling devices for railroads for which I have obtained a patent, No. 429,185, dated June 3, 1890, its object being to furnish a device to operate in conjunction with such a system to render the signaling apparatus inoperative when actuated by an engine, car, or train running on the track in a wrong direction.

If, for example, on a track in which the signals are set and operated by the action of a train passing over the operating-levers and running in a given direction—say from left to right—the signals would be set to be seen from other trains or from points on the road ahead or behind and would indicate of themselves the direction the train had taken which had operated or set the signals. If therefore a train running in the opposite direction would exhibit the same signals or perform the same work, the effect would be to deceive, and it could not be known whether the danger were ahead or behind. Again, in the case of a signal having been properly and regularly set by a passing train, which as soon as it had passed its track might be taken by another train entering from a switch and running the other way, there should in such case be some arrangement to prevent this train from undoing the work done by the first train, and to the accomplishment of these objects my invention is directed.

Viewing Fig. 2 of the drawings, it will be seen that I have placed upon the track, some distance apart, two operating spring-levers A and B, which compress the air in the chambers in the manner already explained in my other patent, No. 429,185. Let us suppose now a train running from left to right over the track. It first reaches lever A. Its action is to compress the diaphragm a'. From this diaphragm extends the tube or pipe a^2, which runs to the signal-box, lifts the catch-lever and its detent, and allows the weight E to operate in reversing the signal. In the pipe a^2 I have placed an aperture or hole a^4, which is closed by the lever a^6, of sufficient weight to seal the aperture and prevent the air from escaping when chamber a' is compressed, which lever is operated by the air-chamber b^3 at the proper time, as will be more fully explained, and beyond this aperture a^4 I have placed in the pipe a^2 the check-valve a^3. The compressed air after passing from the chamber a' through this valve cannot return backwardly, but is caught and held by the valve, and consequently exerts its pressure upon the air-chamber in the signal-box, whereby the detent is lifted and the signal mechanism started. The train continuing to proceed on its course runs over the lever B without altering the result obtained by operating lever A. Its operation here is to compress the air-chamber b^2, forcing the air into the chamber b^3, which expands, lifting the lever a^6, allowing the air to escape from the aperture a^4, behind the check-valve. Hence the action of the compressed air from the chamber a' is not affected. Now it will be seen that a train running in the opposite direction from right to left will have no effect upon the signals. Such a train would reach the lever B first and open the aperture a^4, allowing the air to escape from said aperture, and consequently from the pipe a^2. As the train proceeded it would reach the lever A before the aperture a^4 had closed, and consequently the air forced through the pipe a^2, by compressing the air-chamber a' would not pass through the check-valve a^3, and therefore would not work the signal mechanism in the box. Thus by this simple arrangement the signals are operative by a train passing in the proper direction and are not operative by one passing in the opposite path. It is easily seen that the same arrangement may be made for producing re-

sults in opposite directions by simply duplicating the arrangement for opposite trains. It has been said that the compressed air passing to the signal-box through the pipe a^2 will start the signal mechanism in the box, which is constructed as follows:

The compressed air which has passed the check-valve a^3 continues up through the tube a^2 into the signal-box. The upper part or half of this box is closed or boarded over and the lower half is provided with a glass, through which the signal may be seen. As shown in Fig. 1, the signal C may be circular in form, and in such case its upper lined portion is usually red or "danger," while the lower part is usually white or "safety." It may be changed as to form. For example, a pair of paddles would work equally well. Suitably journaled within the box is the shaft c', which carries the signal and is turned or revolved by the weight E, attached to a chain or cord wound upon the shaft. The shaft also carries the cog-wheel c^2. Other shafts, as c^3 c^4, are suitably journaled in the box. c^3 is provided with a pin-wheel or pinion meshing with the cog-wheel c^2, and also carries a cog-wheel c^5, which meshes with a pinion or pin-wheel on the shaft c^4, the whole forming a train operated by the weight E when released. The shaft c^4 carries a wheel c^6, provided on its plane or periphery with a series of pins, which as it revolves operates and rings a bell D in a manner well known, and need not be further described. A lever, as d', suitably pivoted, is provided with a notched detent, as d^2, which catches upon a projection on the periphery of the signal and holds the train fast until released. The other end of the lever rests upon the compressible air-chamber a^5. As shown in Fig. 1, the chamber is collapsed, the lever is down, and the detent is caught to hold the signal. When the car or train passes over the lever A, as before described, forcing the air through the pipe a^2, the lever d', with its detent, is lifted and is held up by the compressed air in the pipe, while the signal is released and revolved by the weight and gear, exhibiting a flash-signal alternating red and white until stopped. It is now necessary to stop the signal from turning and arrest it again at the proper time, and to effect this I have placed on the track the lever F, operated by the passing engine or train in the same manner as the levers A and B. This lever compresses the air in the chamber f', forcing the air into pipe f^2, from thence to an air-chamber, as f^3, lifting a lever, as f^4, which opens a valve, as f^5, located in the pipe a^2, allowing the air in that pipe to escape, the air-chamber a^5 to collapse, and the lever d' to drop in position to catch a projection on the signal and stop it in the position shown in Fig. 1, with the white or safety signal exposed and the red hidden.

It will be seen that a reciprocating movement of the signal or a movement up and down would have the same effect to show alternating or flash signals.

What I claim and desire to secure is—

1. In a pneumatic signaling system, a signaling mechanism located near a track or railway, a compressible air-chamber in which the air is compressed by a passing engine or train, and a tube for conveying the compressed air to the signaling mechanism when the air-chamber is compressed by an engine or train running in a given direction, in combination with means for allowing the compressed air in the tube to escape and prevent it from affecting the signaling mechanism when the air-chamber is compressed by a train running in the opposite direction.

2. In a pneumatic signaling system, a signaling mechanism located near a track or railway, a compressible air-chamber in which the air is compressed by a passing engine or train, a tube for conveying the compressed air to the signaling mechanism, and a check-valve in the air-conveying tube to prevent the air from returning when forced through the tube by an engine or train running in a given direction, in combination with an aperture in the tube behind the check-valve, opened by mechanism operated by a passing engine or train to allow the air in the tube behind the valve to escape and prevent it from affecting the signaling mechanism when the air-chamber is compressed by an engine or train running in the opposite direction.

3. In a pneumatic signaling system, a signal-box containing a train of gears revolved by a weight, and a lever and detent for checking and holding the train, in combination with an expansive air-chamber operated by an engine or train upon the railway to expand the chamber and lift the detent-lever to release the gear-train, and means also actuated by an engine or car on the track to allow the air to escape from the expanded chamber and permit the detent-lever to engage and stop the gear-train.

4. In a railway-signaling device, a flash-signal normally at rest and means for imparting to the same continuous revolution, in combination with means for releasing and arresting the signal operated by a passing train or car upon the railway, substantially as described.

Signed at Baltimore, in the State of Maryland, this 2d day of May, A. D. 1891.

ROBERT T. BOWNE.

Witnesses:
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