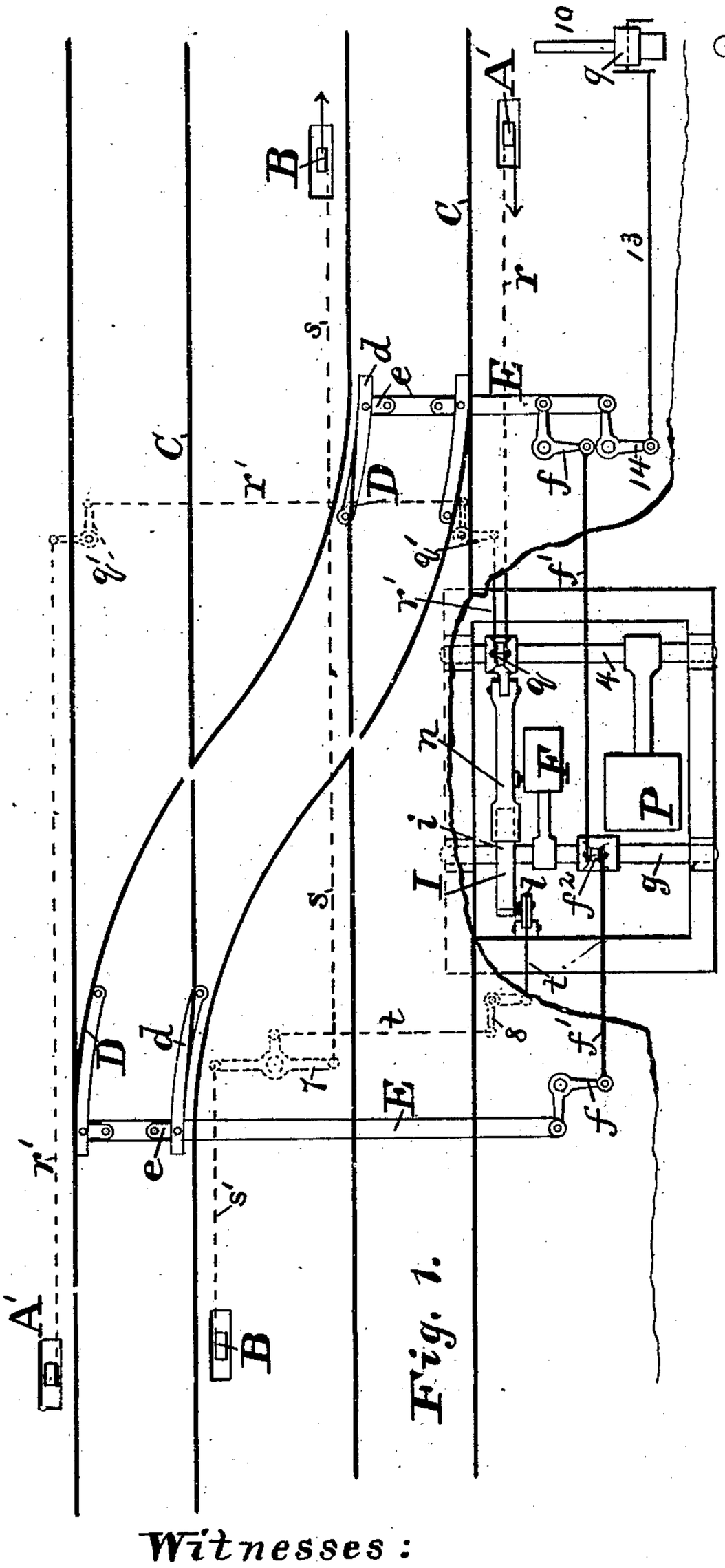
(No Model.) 2 Sheets—Sheet 1

R. F. CROWTHER.

RAILROAD SWITCH.

No. 246,087. Patented Aug. 23, 1881.



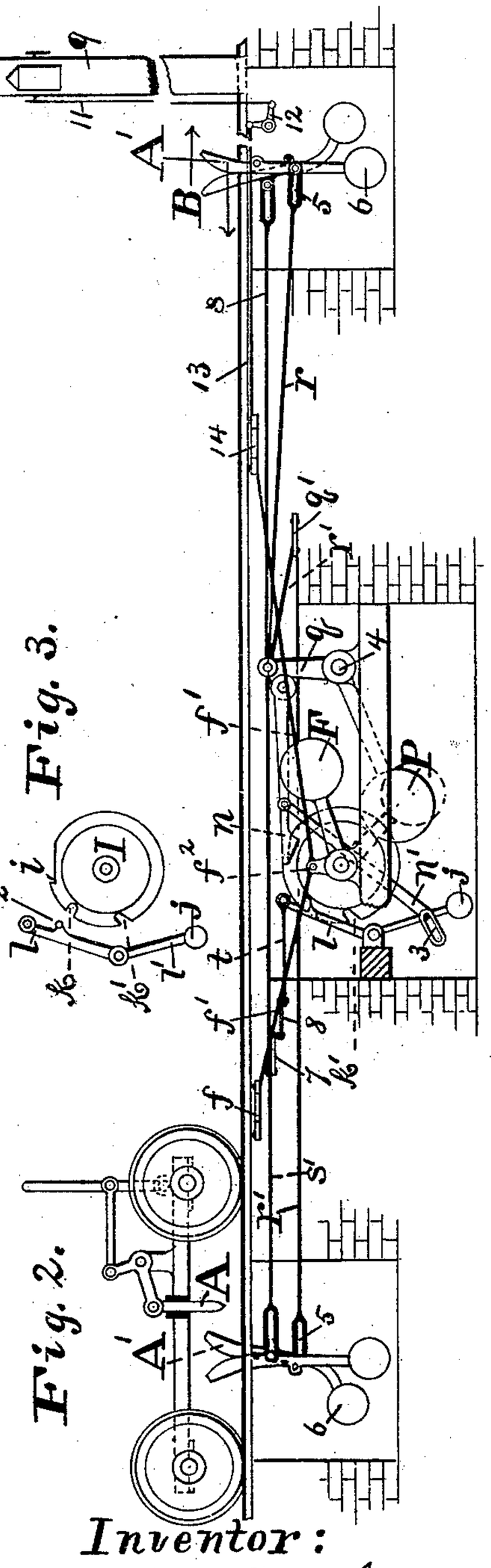


Fig. 3.

Witnesses:
A. Cooper
A. E. Eader

Inventor:
Rodney F. Crowther
By his Atty
Chas B. Mann

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

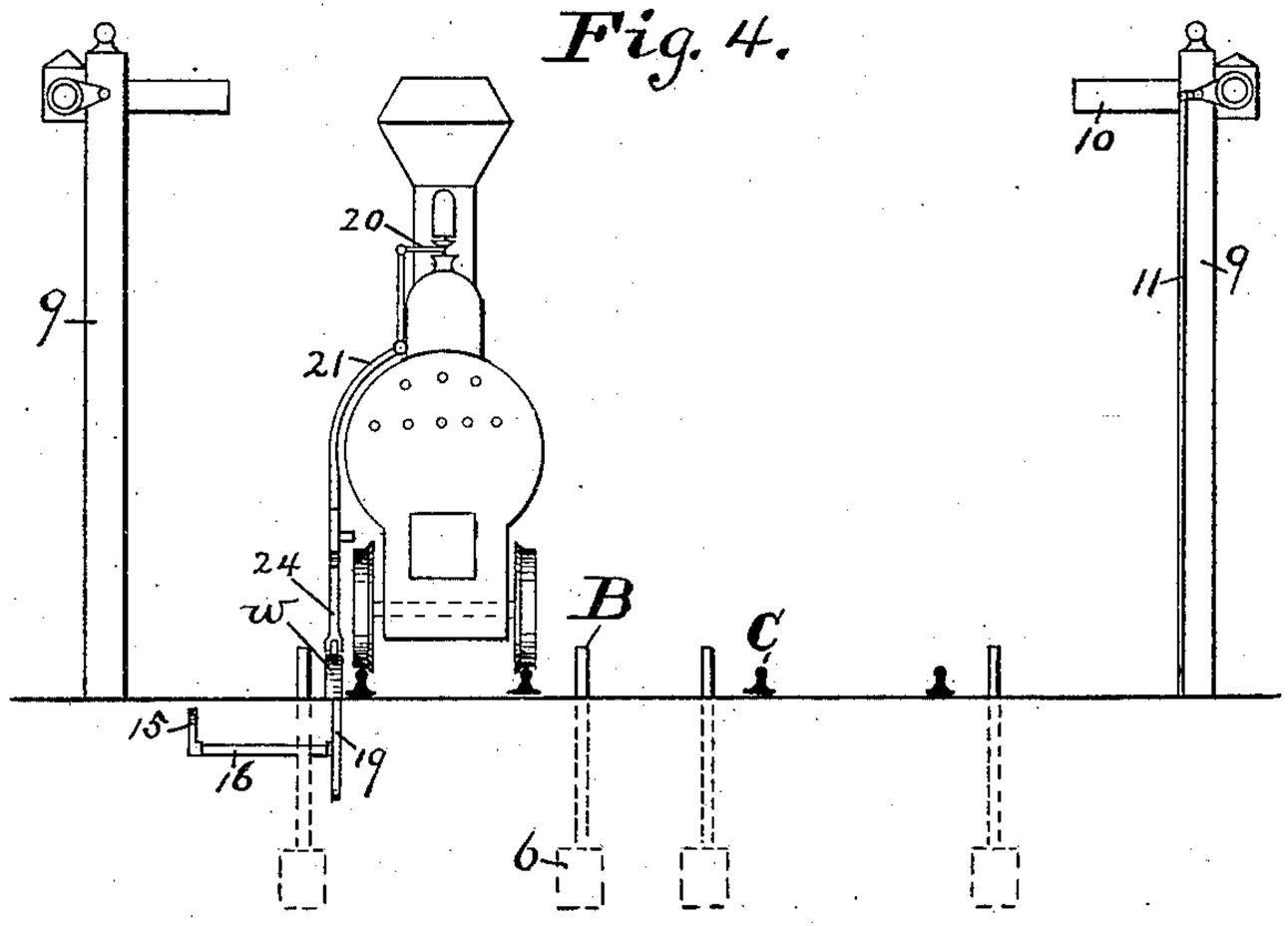


Fig. 5.

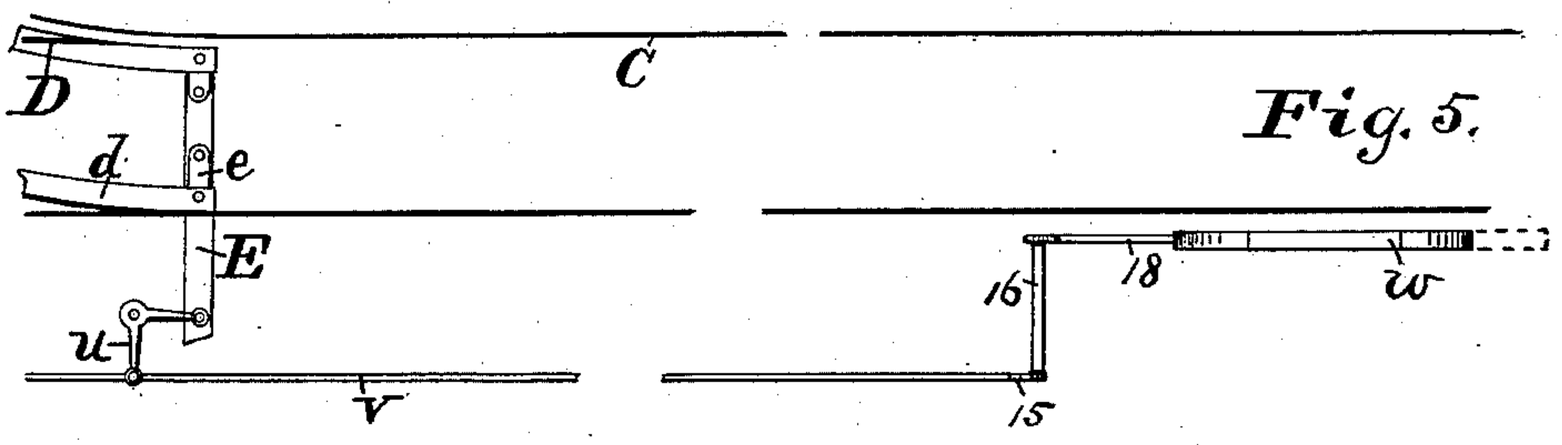
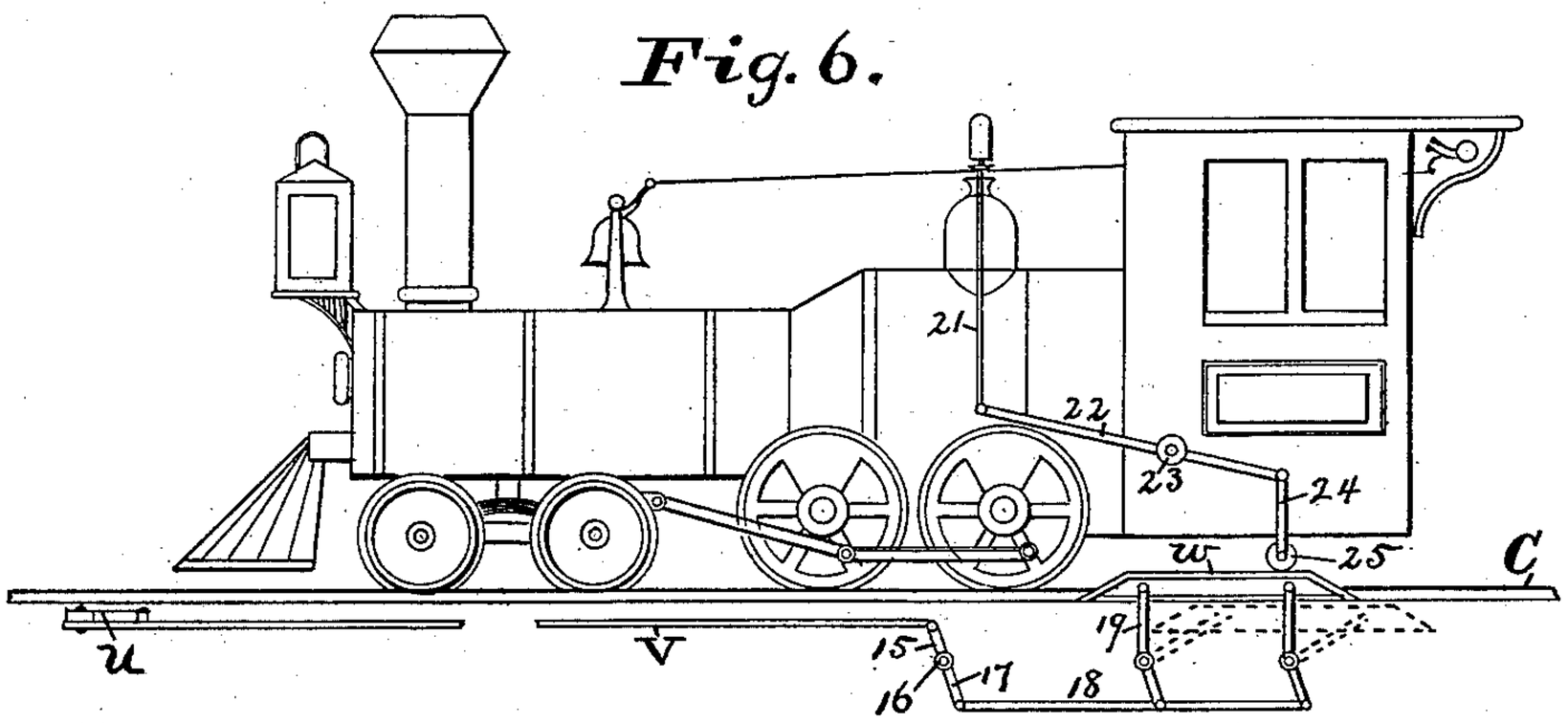


Fig. 6.



Witnesses:
A. Cooper
A. C. Eader

Inventor:
Rodney F. Crowther
By his Atty
Chas B. Mann

UNITED STATES PATENT OFFICE.

RODNEY F. CROWTHER, OF BALTIMORE, MARYLAND.

RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 246,087, dated August 23, 1881.

Application filed May 31, 1881. (No model.)

To all whom it may concern:

Be it known that I, RODNEY F. CROWTHER, a citizen of the United States of America, residing at Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Railroad-Switches; and I do hereby 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to certain improvements in devices for operating railroad-switches by the moving locomotive, and to certain signaling devices operated in connection with the switch, as hereinafter described, and designated in the claims.

In the drawings hereto annexed, Figure 1 is a plan of the switch. Fig. 2 is a side view of same. Fig. 3 is a detail view of a certain part. Fig. 4 is a cross-section or end view of the road-bed, &c. Fig. 5 is a plan of the switch and whistle-blowing device. Fig. 6 is a side view of same and of a locomotive in position to be acted on by the whistle-blowing device.

The switch is operated by means of a vertical rod, A, one on each side of the locomotive. The rods are connected by a shaft extending across the locomotive, and each rod has an endwise movement and is controlled by the engineer. When the rods are down their lower ends are in position, as the locomotive moves along, to strike the treadles A′ and B, which project above the surface of the ground alongside of the track. In moving forward one of the rods A will strike the treadle A′, and by moving the latter cause the switch to open, as in the position shown in Fig. 1. Now, if it be desired to close the switch so as to restore the main track to its former condition, the locomotive must be moved back in the opposite direction, whereupon the other rod A, in passing, will strike one of the treadles, B, which projects up alongside of the opposite track. Attention is called to the fact that the switch is operated by the treadles when the latter are moved only in one direction, their movement in the other direction effecting no result, and thus there is an effective and a non-effective movement, as hereinafter explained.

The letter C designates the rails of the main track, of which the drawings show two, or a double track.

D is the switch leading from one track to the other. In the drawings, Fig. 1, the horizontal flange *d*, attached to each switch-rail, is shown of exaggerated size to more plainly illustrate its connection with the parts.

E designates the shifting-bars, to which the switch-rails are attached in any suitable manner. In the present instance the mode of attachment is by an intermediate link, *e*. The shifting-bars are moved by a bell-crank lever, *f*, to which one end of a rod, *f′*, connects, the other end of said rod being attached to a throw-arm, f^2, on a horizontal rock-shaft, *g*, suitably mounted in a pit just below the surface of the road-bed. A weight, F, is mounted on another arm attached to the rock-shaft, and the normal or down position of said weight is indicated in Fig. 2 in dotted lines, in which position of the said weight the switch is closed—that is, the main track is unbroken. This weight, then, by partly turning the rock-shaft, and thereby moving the throw-arm f^2, serves to close the switch.

An actuating and locking wheel, I, is mounted on the rock-shaft. This wheel has one ratchet-notch, *i*, with which the push-pawl *n* engages to partly turn the rock-shaft and raise the weight F, by which the switch is opened, and two locking-notches, *k* and *k′*, into which enters the lug 2 on the upright locking-lever *l*. The lower end, *l′*, of this lever has a weight, *j*, attached, which serves to press the upper end with its lug 2 toward the actuating and locking wheel. A draw-rod, *n′*, has its upper end pivoted to the push-pawl, and its lower end is provided with a slot, 3, which connects with a pin on the lower end of the locking-lever. The effect of this arrangement of parts, in connection with the actuating and locking wheel, is that when the switch is in such position that the main track is unbroken the lug 2 of the locking-lever is engaged with the notch *k′*, which serves to prevent the wheel from moving, whereby the switch is retained rigidly to its position, and its accidental displacement is

avoided. When the switch is open—that is, leading from the main track—the locking-lever engages with the notch *k* and prevents the switch from moving. The position of all the operative parts when the switch is open is shown in Figs. 1 and 2. The movements which are made upon shifting the switch from the open position, as last mentioned, to restore the unbroken condition of the main track are as follows: By moving one of the treadles B the upper end of the locking-lever *l* is drawn away from the wheel. The first effect of drawing on the locking-lever is to move the lower end toward the wheel, whereby the draw-rod *n'* is pushed up and raises the push-pawl *n*, which releases it from engagement with the notch *i* of the wheel. The second or further effect is to release the lug 2 from its engagement with the notch *k*, whereupon the weight F partly turns the wheel and closes the switch. The lug 2 now enters the notch *k'* and locks the switch to its position.

A second horizontal rock-shaft, 4, is mounted in the pit, and carries a throw-arm, *q*, to which the push-pawl is pivoted. The said throw-arm is connected to the lower end of the treadles A' by rods *r r'*, having at their ends slots 5, which connect with a pin fixed on the treadles. The same rock-shaft has an arm extending in the direction of the push-pawl, on which a weight, P, is mounted. When the switch is closed this weight is fully down, and the effective movement of the treadle A' draws on the rod *r*, which turns the throw-arm *q*, thereby raising the weight P, and at the same time drawing back the push-pawl until it engages with the notch *i* on the wheel; but before such engagement is effected the drawing back of the push-pawl has released the locking-lever from the notch *k'* by lifting the draw-rod *n'* until the extreme end of the slot 3 lifts up on the pin fixed to the lower end of the locking-lever. The treadle A' being freed from the rod A on the locomotive which gave it the effective movement, the gravity of the raised weight P causes the rock-shaft 4 to partly turn and moves the push-pawl against the notch *i*, the weight P lowering part way, whereby the switch is automatically opened to the position shown in Fig. 1. As long as the push-pawl, when the switch is open, remains engaged with the notch *i*, the weight P stands only partly lowered and the weight F is elevated. It will now be understood the effective movement of the operative treadles is in that direction which causes a draw on the rod. The non-effective movement is in that direction which permits the pin on the treadle to move freely in the slot 5 in the rod, thus producing no effect on the latter. The treadles A' are pivoted above the pin which works in the slot 5 of the rod, and the treadles B below the pin. Each of the treadles is provided with a weight, 6, to restore it to its normal upright position.

In order that both ends of the switch, or rather the two switches, may be operated at the same instant, a lever, 7, (denoted in dotted lines in Fig. 1,) is pivoted below the road-bed and between the two main tracks. This lever is pivoted midway between its extremities, and at one side of its center a short arm is attached. A rod, *s*, connects one of the treadles B with one end of the lever 7, and a rod, *s'*, connects the other treadle B with the other end of lever 7. A rod, *t*, connects (through the medium of a bell-crank lever, 8) the short arm at the center of lever 7 and the locking-lever *l*. Now, when the switch is open the effective movement of one of the treadles B first raises the push-pawl and then releases it from the notch *i* on the wheel, which allows the weight P to drop to its lowest position, and, second, withdraws the lug on the locking-lever from the notch *k*, whereupon the gravity of the raised weight F causes the rock-shaft *g* to partly turn, whereby, through the medium of the throw-arm f^2, rod *f'*, bell-crank lever *f*, and shifting-bar E, the switch is automatically closed, leaving the main track unbroken.

A signal device to be displayed when the switch is open is provided. It consists of a post, 9, at one side of the track, and at a suitable distance from the switch, which has at its top a pivoted arm, 10, which, when exposed, is in a horizontal position, as shown in Figs. 1 and 4, and when not exposed is in a vertical position. The pivoted signal-arm is actuated by a vertical rod, 11, whose upper end is attached to a crank on the shaft to which the signal-arm is secured. The lower end of the rod connects with the bell-crank lever 12, which is connected by the rod 13 (shown in Fig. 2 as broken) and bell-crank lever 14 with the shifting-bar E. Thus a movement of the shifting-bar which opens the switch will also raise the pivoted signal-arm.

A device is also provided by means of which, when the switch is open, the whistle of an approaching locomotive will be blown, thereby to certainly attract the attention of the engineer if anything be wrong with the signal, or if the condition of the weather be such (as in case of a dense fog prevailing) as to prevent the engineer from seeing the signal. This automatic whistle-blowing device is illustrated in Figs. 4, 5, and 6.

From a bell-crank lever, *u*, attached to the switch-shifting bar, a rod, *v*, extends along the track to a suitable distance from the switch. This rod connects with an upright throw-arm, 15, attached to one end of a horizontal rock-shaft, 16, having at its other end a downward throw-arm, 17, the latter swinging in a vertical plane alongside of and below the track C. The lower end of arm 17 is pivoted to a horizontal bar, 18, to which latter the lower ends of two upright levers, 19, are pivoted. The upper ends of levers 19 carry a horizontal treadle, *w*, which occupies a position close alongside the track-rail. It will be seen that when the switch D is open the horizontal treadle *w* is up, as shown in Figs. 5 and 6, the position

of the said treadle when down—that is, when the switch is closed—being indicated by the dotted lines.

To avail of this device suitable mechanism must be provided on the locomotive, which shall, when in contact with the raised horizontal treadle, open the valve of the steam-whistle. As an instance of such mechanism reference is made to Figs. 4 and 6. The whistle-lever 20 is depressed by the rod 21, which extends part way down the side of the boiler, and is pivoted to the horizontal rod 22, which latter, midway of its ends, is pivoted at 23. From the opposite end of lever 22 is a depending arm, 24, which carries at its extremity a roller, 25. This roller is in position to strike or pass up on the horizontal treadle *w*, as shown in Figs. 4 and 6, if the latter be elevated, and the effect is to depress the whistle-lever 20, thereby opening the valve and giving a blast.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of a treadle, A′, projecting up alongside of the track, a horizontal rock-shaft, 4, having an upward-projecting throw-arm, *q*, and also a sidewise-projecting arm, on which is mounted a weight, P, means to connect the treadle and throw-arm, a horizontal rock-shaft, *g*, having an upward-projecting arm, f^2, a wheel, I, mounted on the rock-shaft and provided with a notch, *i*, a push-pawl, *n*, attached to the throw-arm *q* and adapted to engage with the notch *i* on the wheel, a switch-shifting bar, E, and means to connect the latter with the upward-projecting arm f^2, whereby the switch may be opened, as set forth.

2. The combination of the switch-shifting bar E, a horizontal rock-shaft, *g*, having an upward-projecting throw-arm, f^2, and also having a sidewise-projecting arm, on which is mounted a weight, F, means to connect the shifting-bar and throw-arm, a wheel, I, mounted on the rock-shaft and having a notch, *k*, an upright locking-lever, *l*, provided with a lug, 2, to engage with the notch, a treadle, B, projecting up alongside of the track, and means to connect the treadle and locking-lever, whereby the switch is locked or held to its position when open, and by the movement of the treadle is unlocked and closed, as set forth.

3. In combination with the shifting-bar of a switch, a treadle connected to the shifting-bar and designed to operate the whistle-valve on an approaching locomotive, as set forth.

4. The combination, with the shifting-bar of a switch, of a treadle, *w*, connected to the shifting-bar, and a locomotive provided with a whistle-valve-operating device, substantially as described, and adapted to be moved by the treadle when the switch is open, as set forth.

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

RODNEY F. CROWTHER.

Witnesses:
CHAS. B. MANN,
JNO. T. MADDOX.