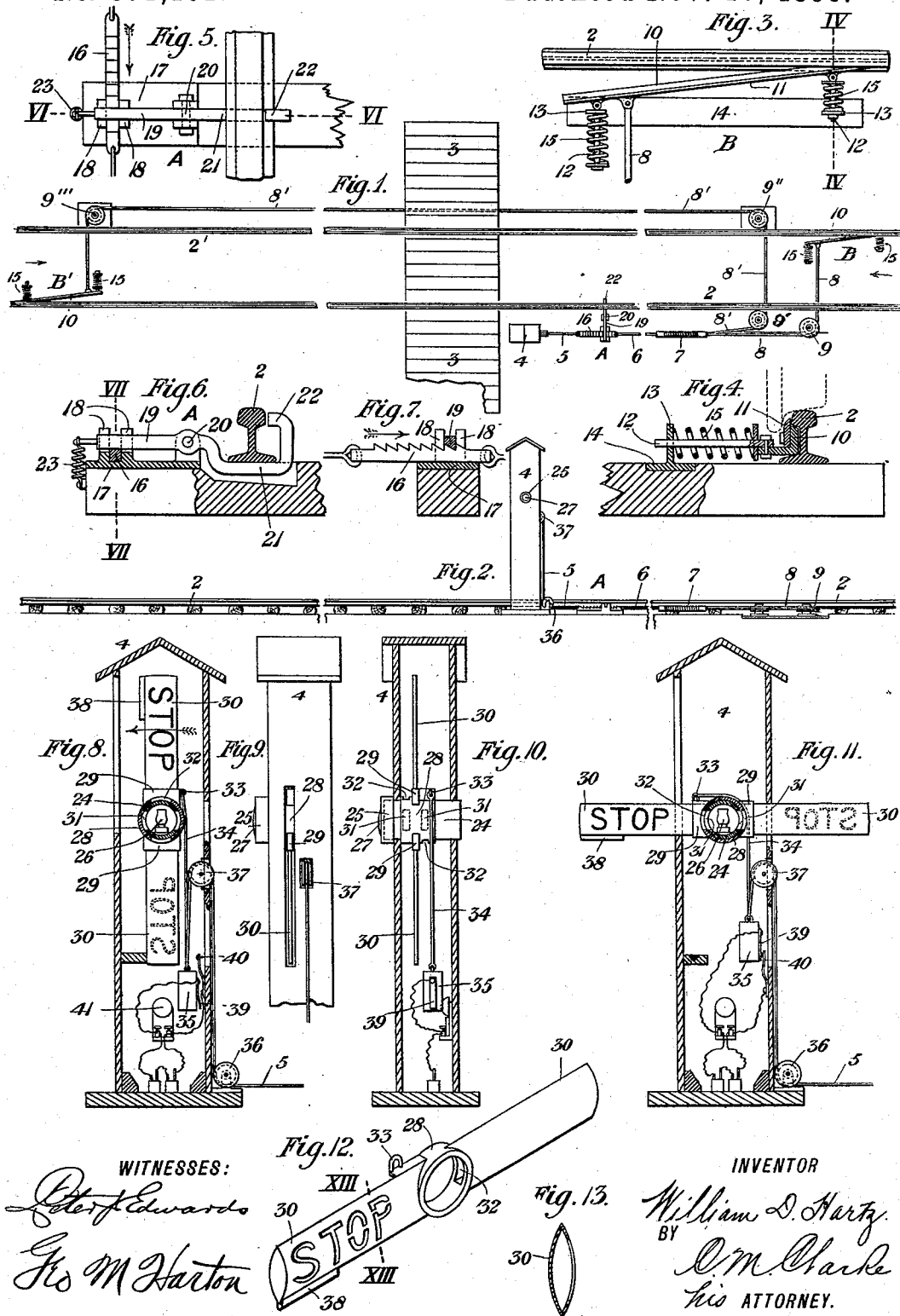


(No Model.)

W. D. HARTZ.
RAILWAY SIGNAL.

No. 571,191.

Patented Nov. 10, 1896.



UNITED STATES PATENT OFFICE.

WILLIAM D. HARTZ, OF TALLEY CAVEY, PENNSYLVANIA.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 571,191, dated November 10, 1896.

Application filed April 24, 1896. Serial No. 588,888. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. HARTZ, a citizen of the United States, residing at Talley Cavey, in the county of Allegheny and State of Pennsylvania, have invented or discovered a new and useful Improvement in Railway-Signals, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this application, in which—

Figure 1 is a plan view of a crossing provided with my improved signal. Fig. 2 is a side elevation of the tower and operating mechanism. Fig. 3 is a detail plan view of the operating device actuated by the flange of the wheel. Fig. 4 is a cross-section on the line IV IV of Fig. 3. Fig. 5 is a detail plan view of the automatic locking and releasing mechanism. Fig. 6 is a cross-section there-through, taken on the line VI VI of Fig. 5. Fig. 7 is a cross-section on the line VII VII of Fig. 6. Fig. 8 is an enlarged vertical section through the tower. Fig. 9 is a side view of the upper part thereof. Fig. 10 is a vertical sectional view through the tower at right angles to Fig. 8. Fig. 11 is a view similar to Fig. 8, but showing the signal set to "danger." Fig. 12 is a detail perspective view of a modified form of signal-arm. Fig. 13 is a cross-sectional view on the line XIII XIII of Fig. 12.

Similar numerals and letters of reference refer to like parts wherever used throughout this specification.

My invention relates to the class of signals for use at railway crossings which are automatically operated by an approaching train, and it refers more particularly to the mechanism employed to operate and release the signal and to the mechanism within the tower by which a double-armed signal is set to "danger" and a bell set to ringing on the approach of a train.

Referring to the drawings, 2 2 are the rails of a single-track road, across which passes a roadway 3 at grade, which, for the purpose of illustration, I have indicated as a plank-road, although it is obvious that another line of railway may cross and be protected equally well.

4 is a tower, within which the signal is located, and 5 is a cable or other suitable connection by which it is operated, connected

to a locking and releasing device A, to the other end of which a cable 6 is attached connecting it with a compensator 7 of any preferred form.

At the end of the compensator two cables 8 8' are attached, the branch 8 leading around a grooved pulley-wheel 9 to the shifting device B, while the branch 8' is carried a short distance in the same direction as 8, around a grooved pulley-wheel 9', across the track, around a second grooved wheel 9'', backward along the track, passing under the crossing 3 to a point opposite a second shifting device B', to which it is attached after passing around a third wheel 9'''. It will be understood that these shifting devices B and B' are located a considerable distance away from the tower on each side of the crossing, so as to operate the signal a sufficient length of time before the approach of the train.

The device B consists of a bar 10, having a renewable shoe 11, to each end of which are attached bolts 12, passing through upwardly-extending lugs 13 of a plate 14, against which bear the coiled compression-springs 15, surrounding the bolts. These springs are located on the inner and outer sides of the lugs 13 in such a manner as to hold one end of the bar 10 against the rail, so that the flange of the wheel will engage it and in its passage draw the bar for its full length up against the rail, while the other spring tends to hold the other end of the bar away from the rail, as clearly shown in Fig. 4. The cable 8 is secured to the bar 10 near its moving end, so that when the bar is drawn against the rail, as described, it will exert a tension on the cable 8 and set the signal.

I desire that the signal shall remain set after the train has passed the shifting device until it has reached the crossing, and for that purpose have provided the locking and releasing device shown at A. This consists of a ratchet-toothed bar 16, inserted in the line of cable sliding upon a plate 17 between upwardly-extending guides 18 and a locking-bar 19, pivoted at 20, having an extension 21 passing under the rail, provided with an up-turned end 22 in close proximity to the head of the rail, so as to be depressed by the flange of the wheel.

When the bar 16 is operated by the tension

of the cable in the direction of the arrow, it will ride under the bar 19, which will fall back of each tooth in succession until the bar is out to its limit of movement, when it will engage one of the teeth under action of the spring 23 and hold it, thereby keeping the signal raised until the train has reached the crossing, when the flange of the first wheel will ride over the end 22, depressing it and raising the other end out of engagement with the toothed bar 16, releasing it and allowing the signal to drop.

Within the tower 4 is a hollow circular barrel 24, extending across from front to back and provided with a cap 25, so that a lamp 26 may be placed therein, a bull's-eye 27 being located in the center of the cap. Journaled on the circular barrel 24 is a ring 28, from the sides of which extend the sockets 29, into which are inserted the signal-blades 30, bearing on one face a legend or warning such as the word "stop," each blade facing in opposite directions. This word is painted or otherwise affixed to the blade so as to be plainly legible during the day, and in order that the light from the lamp 26 may shine along the front surface of the blade openings 31 are left in the barrel 24 and similar openings 32 in the ring 28, so that when in the position for "danger" (shown in Fig. 11) the openings will be in register, allowing the light to shine on the front of each blade, the holes being located in front of and behind the center line of the blades, respectively.

Secured to the ring 28 at 33 is a wire cable 34, sustaining a weight 35, which normally holds the signal in a vertical position within the tower, as shown in Fig. 8, while the cable 5 is passed around the grooved pulleys 36 37 and attached to the weight. A counterweight 38 is secured to the end of one of the blades 30, and when tension is applied to the cable 5 and the weight 35 is lifted such weight 38 will cause the signal to assume the "danger" position, (shown in Fig. 11,) where it will remain until tension is released from the cable 5 by the device A, when, by reason of the weight 35, it will return to the normal position. The weight 35 is provided with a contact 39, which, when raised, closes a circuit through a contact 40, secured to the inside of the tower, thus establishing a circuit through the bell 41, which will continue to ring as long as the signal is in a raised position.

In Fig. 12 I have illustrated in detail a modified form of signal, made hollow so as to allow the light from the lamp to illuminate the interior, while the letters "stop" are cut through one side, permitting the light to shine through, thus making a very distinct night-signal, while for day use the inside and outside may be painted in strongly-contrasting colors, as, for instance, black and white.

Changes and modifications may be made in my invention without departing therefrom, since I do not wish to be limited to the exact construction, arrangement, and proportion

shown in the drawings, but to include any equivalent therefor.

Having described my invention and in what manner it is constructed and operates, what I claim, and desire to secure by Letters Patent, is—

1. A signal composed of outwardly-extending signal-blades secured to a revolving ring, journaled on a hollow trunnion provided with a removable cap furnished with a bull's-eye, substantially as set forth.

2. A signal composed of outwardly-extending signal-blades secured to a revolving ring, journaled on a hollow trunnion, with openings in the hollow trunnion and in the ring designed to come into register when the signal is set at "danger" substantially as set forth.

3. A signal composed of outwardly-extending hollow signal-blades secured to a revolving ring, journaled on a hollow trunnion, with openings in the hollow trunnion and in the ring in line with the hollow blades, designed to come into register when the signal is set at "danger," substantially as set forth.

4. A signal composed of outwardly-extending signal-blades, secured to a revolving ring journaled on a hollow trunnion, and a lamp within the trunnion, substantially as set forth.

5. In combination with a signal-tower, a signal-shifting device actuated by the flange of a wheel, and a cable connecting the shifting device with the signal: a locking and releasing device consisting of a toothed ratchet-bar inserted in the line of the cable and a locking-bar engaging the teeth of such ratchet-bar and provided with one end projecting into the path of a car-wheel flange whereby such end of the bar may be depressed, substantially as set forth.

6. In combination with a signal composed of outwardly-extending signal-blades secured to a revolving ring journaled on a hollow trunnion, a counterweight attached to one of the blades to turn it to "danger," a weight 35 attached to the revolving ring to turn it to "safety," and an electric contact secured to such weight designed to close a circuit and ring a bell when the signal is set to "danger;" the signal-shifting device comprising a bar having one end set against the rail and the other end diverging laterally therefrom, a cable attached to such divergent end and to the weight 35, springs to normally hold one end of the bar against the rail and the other end away from the rail, whereby the bar may be moved toward the rail to actuate the signal, by means of the flange of a car-wheel, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand this 16th day of March, 1896.

WILLIAM D. HARTZ.

Witnesses:

PETER J. EDWARDS,
C. M. CLARKE.