No Model.)

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J. WAYLAND.

RAILWAY APPLIANCE.

No. 492,598. Patented Feb. 28, 1893.

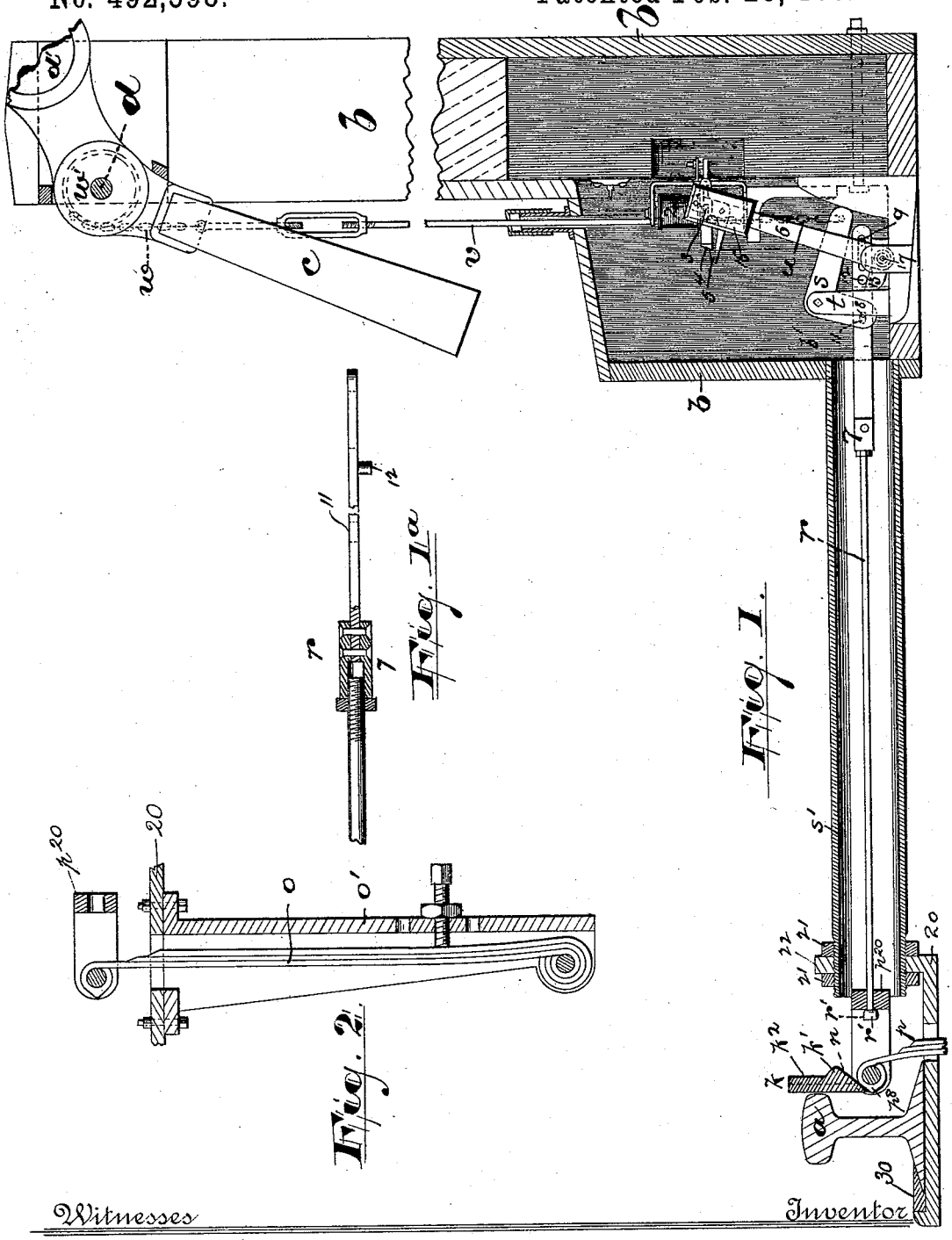

Fig. 1.

Fig. 1a.

Fig. 2.

Witnesses

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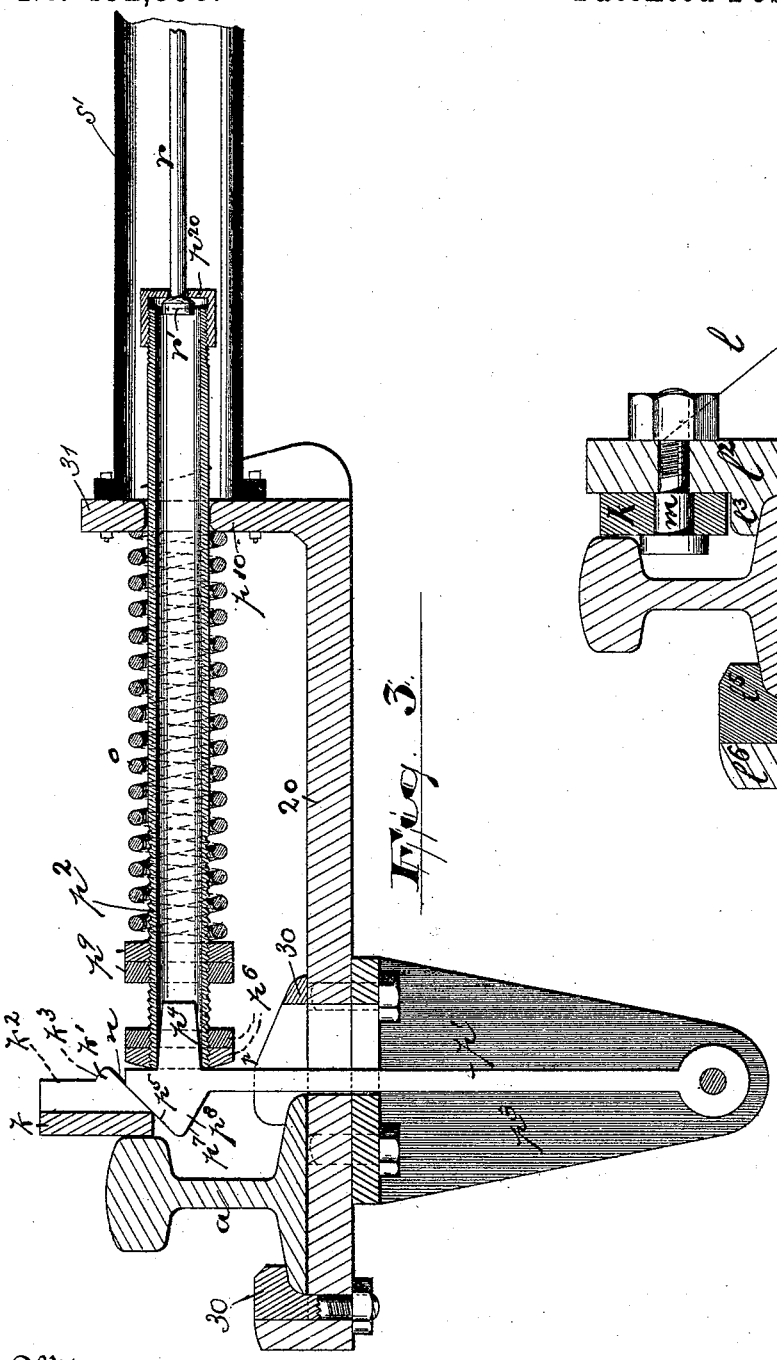

Fig. 3.

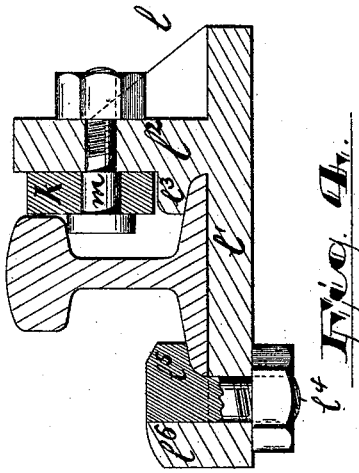

Fig. 4.

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(No Model.) 5 Sheets—Sheet 3.

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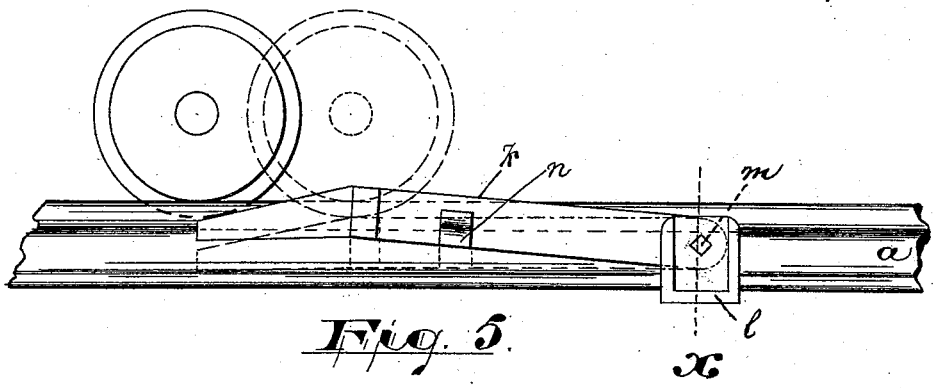

Fig. 5.

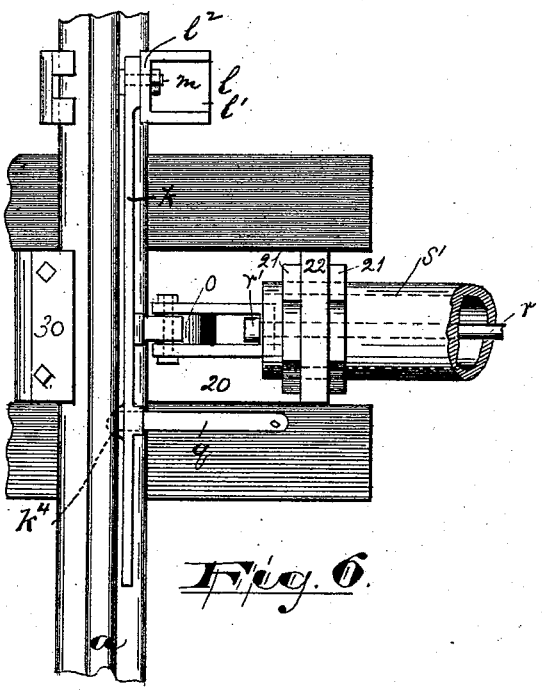

Fig. 6.

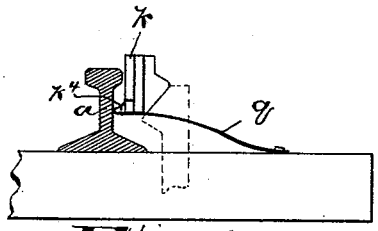

Fig. 7.

Witnesses

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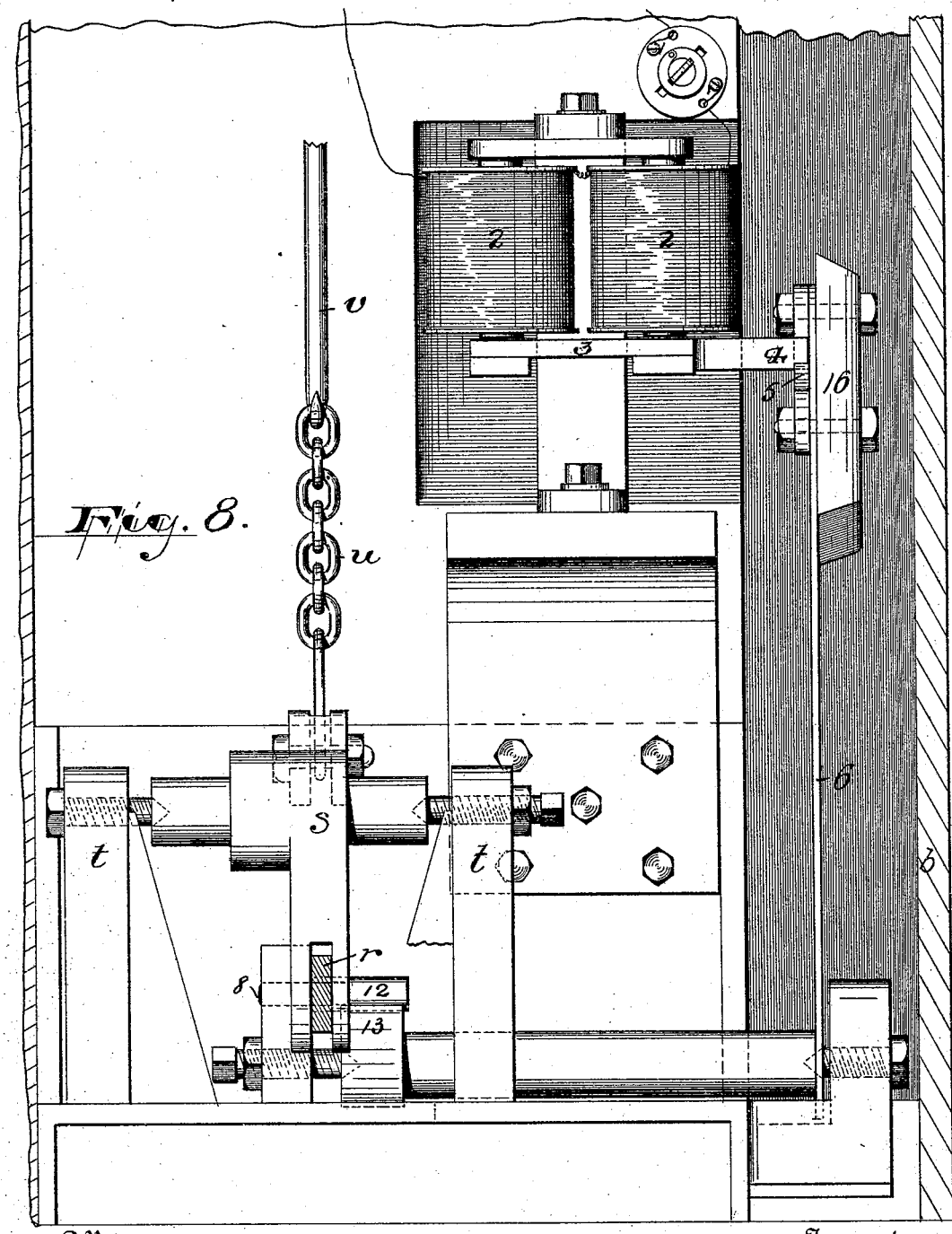

Fig. 8.

Witnesses

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(No Model.) 5 Sheets—Sheet 5.

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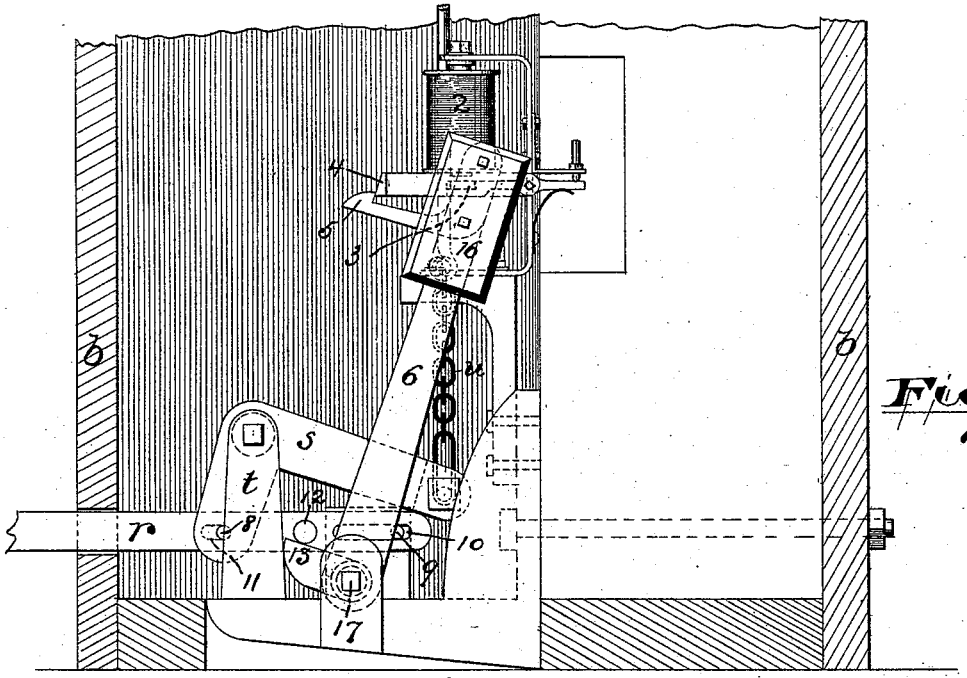

Fig. 9.

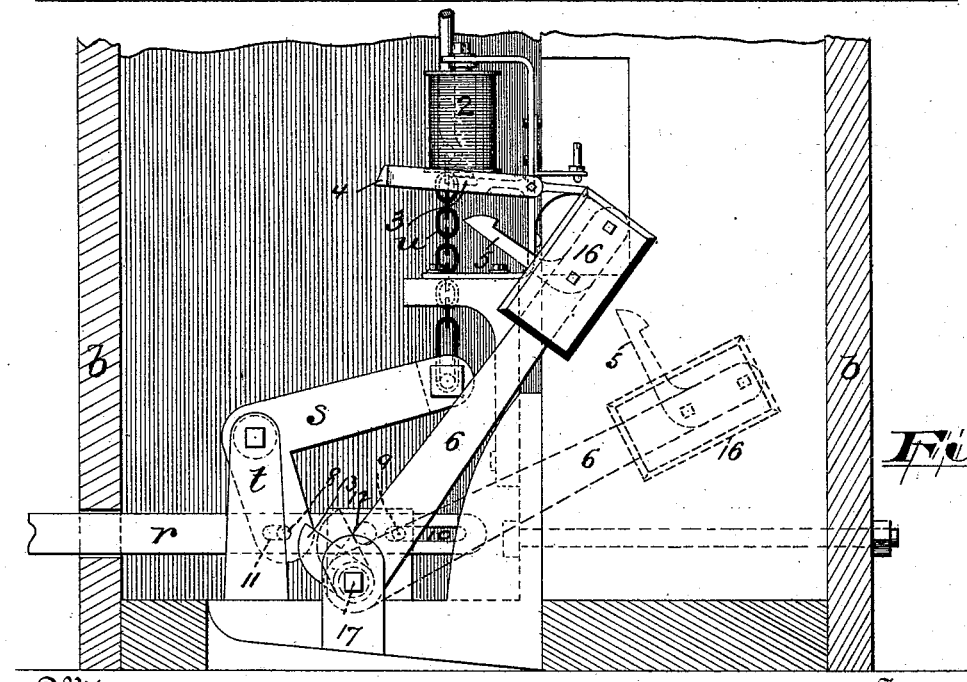

Fig. 10.

Witnesses

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UNITED STATES PATENT OFFICE.

JAMES WAYLAND, OF NEWARK, NEW JERSEY.

RAILWAY APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 492,598, dated February 28, 1893.

Application filed September 9, 1892. Serial No. 445,465. (No model.)

To all whom it may concern:

Be it known that I, JAMES WAYLAND, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Railway Appliances; 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 and figures of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in that class of railway appliances described in my contemporaneous application filed January 21, 1892, Serial No. 418,793, the object of the invention being to secure greater reliability of action under the heavy strain imposed by the passing trains, to secure greater durability in the construction of parts, and greater simplicity and cheapness, and to more perfectly avoid, in the operation of the semaphore, the shocks or jars by which the more delicate parts are broken or disarranged and the signal thus rendered less exact in its indications, and to secure other advantages and results some of which will be referred to in connection with the descriptions of the working parts.

The invention consists in the improved railway appliances and in the arrangements and combinations of parts, all substantially as will be hereinafter set forth and finally embodied in the clauses of the claim.

Referring to the accompanying drawings in which like letters and numerals indicate corresponding parts in each of the several figures, Figure 1 is a vertical section taken at right angles with a railway rail through certain of my improved signaling appliances and showing the general relation of the several parts. Fig. 1^a is a detail of a certain rod showing the adjustable relation of one part with the other. Fig. 2 illustrates one construction of a spring for returning the devices to an initial or normal position after the train has passed from the block. Fig. 3 is an enlarged view of a (at present) preferred construction of the returning spring and co-operating mechanisms. Fig. 4 is a sectional detail taken on line x, Fig. 5. Fig. 5 is a side elevation in detail of a tread-lever by means of which the power of the passing train is utilized in operating the signal or other appliances. Fig. 6 is a detail plan of said tread in connection with the spring, &c., shown in Figs. 1 and 2. Fig. 7 is a detail view of a spring arranged in connection with the tread-lever for raising the latter when released. Fig. 8 is an enlarged detail showing certain of the mechanisms at the base of the standard or support for the signal or other device to be operated, the view being taken from the direction of the track and Figs. 9 and 10 are views showing the mechanisms in the normal position or position to receive the train, and abnormal position assumed immediately after the passing of the train from the block respectively, the views being taken in directions parallel with the track.

In said drawings, a indicates a railway rail, b a semaphore post or standard upon which the signal or appliance to be operated is stationed, c indicates said semaphore.

Upon the outer side of the track a, and extending substantially parallel therewith is arranged a tread-lever k, Figs. 1 and 5, one end of which is formed on an incline and projects above the track so that, on the passing of the train, the wheel will press the lever down with an easy movement. The said lever is fulcrumed, as shown in Fig. 4, upon a bracket, l, of peculiar construction, the said lever being pivoted upon the bolt, m, of said bracket so as to work in a vertical plane. The said bracket consists of a horizontal plate, l', which extends beneath the bottom flange of the rail and bears up against the same, a vertical portion, l^2, which provides bearings for the pivotal bolt, m, and is provided with a stay projection, l^3, which overlaps one side or edge of the rail flange, and a bolt, l^4, having a head, l^5, which overlaps the opposite edge of the rail flange, the parts l^3, l^5, co-operating in holding the bracket to the rail. The bolt, l^4, is backed and braced by an upward projection, l^6, of the horizontal plate. At about the center of the lever, the same is provided with an

incline or wedge-shaped projection, n, Figs. 1 and 5, to engage a plunger p and give horizontal movement to the same in a direction away from the rail. The said plunger is suitably supported in bearings admitting of horizontal movement. In the construction shown in Figs. 1, 2, and 6, the plunger is carried at one end by the spring, o, which in this case is carried by a downwardly extending frame, o', secured to the rail, which said spring serves to return the plunger to its normal position, but in the preferred construction, shown in Fig. 3, the plunger consists of a vertical part, p', and horizontal part, p^2, of tubular form, the vertical part being pivoted upon a bracket or frame p^3, 20, at a point below the level of the rail and at its upper extremity being provided with a tongue, p^4, upon which the said tubular part, p^2, is arranged. The upper extremity of said vertical part is formed on an incline, p^5, to receive the inclined or wedged portion of the tread-lever. The end of the tubular portion of the plunger, where it engages the vertical portion, is strengthened by nuts, p^6, the face of one of which is curved to allow for the pivotal movement of the vertical portion. On the passing of the train, the tread lever is depressed, so that its upper edge is brought to the level of the rail-tread, and its inclined portion, n, slides on the incline, p^5, of the plunger, the latter being thereby forced outward or away from the rail. Upon the tread-lever is formed a catch, k', which, when the tread is forced to its lower limit of movement, is caught by a co-operating catch, p^8, of the plunger and thus held in its depressed position until released by the movement of the train from the block. To secure the catching of parts described, I employ the spring, o, which, in the construction of Fig. 3, is an ordinary helical spring arranged on the tubular part of the plunger between adjustable bearings, p^9, and a fixed bearing, p^{10}, in or on which the tubular portion slides. When the tread-lever is brought to its lower position as before stated and the catch projection, k', rides under the catch projection p^8, the spring, o, operates to force the plunger back toward the rail, but its movement in this direction is only sufficient to cause the two parts to remain in their abnormal positions, further movement in this direction being prevented by a stop, k^2, formed above the catch k', which stop serves to hold the plunger in position to regulate the co-operating parts more intimately connected with the semaphore or appliance to be operated.

Upon the passing of the train out of the block, the pressure of the spring, o, is momentarily counterbalanced and the vertical portion is freed from the pressure of the tube, p^2, or the nuts, p^6, thereon. Immediately a tread spring, q, Figs. 6 and 7, acts to throw the tread-lever upward to its normal position, the inclines, k^3, p^7, serving to facilitate such operation. This upward movement of the tread-lever is limited and controlled by a limiting projection, k^4, Fig. 7, which extends from said lever toward the rail and engages the under side of its head, as will be understood. By means of this projection, the pressure of the incline, p^5, against the incline n, will not throw the tread to such an elevation as to prevent a constant engagement of inclines.

Loosely connected to the plunger, is a rod, r, which is arranged horizontally in a tube or casing, s', which extends to the semaphore post. Said rod has an independent movement with reference to the plunger, which movement is imparted, at the passing of the train, by the weight, d', of the semaphore or other appliance to be operated. At one end, said rod is provided with a head, r', to engage an abutment, p^{20}, of the plunger, and at the opposite end engages a crank, lever or pulley, s, Figs. 1, 8, 9, 10, working in bearings, t, at the base of the post or standard. Said rod is connected to the shorter arm of the lever, crank or pulley, while the longer arm is attached, by a flexible connection u, or otherwise, to a vertical rod, v, extending up the post to a chain or flexible connection, w, which in turn connects with the drum, w', of the weighted semaphore or appliance to be operated.

At the passing of the train over the tread, k, and the horizontal movement of the plunger away from the track, the weight, d', which overbalances the semaphore blade, or the appliance to be operated, and the connections, including the rod, r, draws the said blade, c, to the danger indicating position, and the said rod, r, and its connections, to their abnormal positions preparatory to being drawn to their normal position by the spring, o, after the passage of the train from the block. To disengage the catches k', p^8, and allow said spring to act as stated, I have provided catch-releasing devices, controlled by an electric circuit which extends to the farther limit of the block, the said farther limit having stationed thereat, a suitable circuit closer or changer adapted to be operated by the passing train. On this circuit, at the standard or post, b, is an electro-magnet, 2, which is adapted to attract an armature, 3, having a catch, 4, thereon. Said catch, 4, engages a co-operating catch, 5, on a weighted lever, 6, adapted by the force accumulated by the gravitation of the weight to release the catches k', p^8.

The method preferred of securing the release by the sudden or hammer like action of the falling weight is illustrated in Figs. 8, 9, 10, where the horizontal bar, r, which is preferably in sections adjustable in relation to one another, as shown at 7, Fig. 1, is shown to be arranged on pins or bearings, 8 and 9, the pin 8, connecting the crank or lever, s, to the said bar and the pin, 9, being a fixture and serving as a support or guide for the rod or bar, r, and to secure a regular and steady horizontal movement as desired. The pin, 9, works in the slot, 10, when the upward draft

of the chain operates the crank or lever *s*, and rod *r*. The pin, 8, works in a short slot, 11, and thus the rod, *r*, is allowed a limited movement independent of the crank or lever *s*. The rod, *r*, is provided with a bearing 12, preferably at a point between the two pins 8 and 9 and the lever, 6, at the end opposite the weight, 16, thereof is provided with a bearing, 13, to engage the bearing, 12, when the weight has arrived near its lower limit of gravitation.

When the train has passed into the block and the plunger, *p*, has released the rod, *r*, and the weight *d'*, acting through the connections *u*, and *s*, has drawn said rod so that said rod has slid to the position shown in Fig. 10, the lever, 6, being still in the position shown in Fig. 10, in caught relation to the armature catch and the bearing, 12, being in advance of the bearing, 13, of the lever 6, these relations are maintained until the train arrives at the end of the block, when said train closes the circuit changer, the electric circuit magnetizes the magnet, 2, and the last attracts its armature, 3, and at the same time releases the catch, 4, from the weight catch 5. The weight 16, immediately gravitates and turns the lever, 6, on its fulcrums 17, and, when it has accumulated considerable force, the bearing, 13, is brought into engagement with the rod-bearing, 12, and thus the rod, *r*, is moved longitudinally backward with sufficient force to overcome the power of the spring *o*. This movement releases the catch, p^8, of the plunger from the catch *k'* of the tread, *k*, and the latter is raised by the power of the spring, *q*, and the spring, *o*, immediately acts to draw the sliding rod forward toward the track at the same time drawing the semaphore down to its safety indicating position and the weighted lever and its catch, 5, up so that it enters automatically into a caught relation with the armature catch 4, which immediately assumed the position shown in Fig. 10, after the circuit closer referred to was passed by the train. Said circuit closer possesses no feature of novelty in itself or in its relation to the track and post or station *b* and consequently is not shown.

To provide durable and effective means for holding the plunger, *p*, and rod, *r*, in proper relation to the tread *k* and track and one another, and to protect the rod and admit of expansion of the same when subjected to an increase of heat, I have constructed the frame, 20, with bearings, 30, by which it is firmly secured to the bottom flange of the rail and with bearings, 31, to receive the tube, *s'*, which incloses and protects the rod *r*. Said tube preferably extends through the vertical bearing portion 31, of the frame and is firmly held therein by nuts 21, 21, on opposite sides of said vertical portion. The opposite end of the tube, *s'*, is held in loose bearings in the box, *b'*, or other portion of the standard or post *b*, and is allowed a movement therein to admit of expansion of the metal. By means of these connections with the rail and standard, firmness and security for the working parts are obtained.

Having thus described the invention, what I claim as new is—

1. In a railway appliance, the combination with a catch, p^8, of a tread-lever having the anticlinal catch projection, *k'*, substantially as set forth.

2. In a railway appliance, the combination with a catch, p^8, of a wedge like tread-lever having a co-operating catch substantially as set forth.

3. In combination with the rail, a tread, *k*, having incline *n*, and catch, *k'*, a plunger for holding the parts to be affected on the passing of a train in normal position, said plunger having a co-operating catch, p^8, and incline p^5, substantially as set forth.

4. In a railway appliance, the combination with a spring controlled plunger having a catch for holding a tread in its depressed position, of said tread having an incline to engage said plunger and a co-operating catch, substantially as and for the purposes set forth.

5. In a railway appliance, the combination with a spring controlled, horizontally-movable plunger having an inclined bearing, of a tread engaging said bearing and adapted to force said plunger horizontally and hold it in its abnormal position substantially as set forth.

6. The combination with a tread and catch, *k'*, having incline, k^3, of a plunger for holding the appliances in normal position and having a co-operating catch substantially as set forth.

7. In combination with a tread having incline or wedge *n*, and catch *k'*, a plunger, *p*, having co-operating catch p^8 with incline p^7, substantiallly as and for the purposes set forth.

8. The combination with a tread-lever arranged parallel with the rail and having a wedge or lateral incline to throw a plunger laterally from the track, of said plunger having a spring for pressing the plunger against said incline and raising said tread, substantially as set forth.

9. In combination with the rail, a plunger for holding appliances in normal relation to the track or rail, a spring holding said plunger in such relation, a tread, *k*, and a wedge, pressing said plunger against the power of the spring to release said appliances, substantially as and for the purposes set forth.

10. In combination with the rail, a tread provided with a catch, a plunger having a co-operating catch, a spring holding said catches in engagement, an independently movable rod *r*, crank or lever *s*, and connections *u*, a weighted lever 6, having a catch 5, and a bearing 13, to engage a co-operating bearing on the rod *r*, a co-operating catch for holding the weight in its elevated position means for operating said co-operating catch upon the passage of the train from the block and allowing said weight to fall and throw the rod

r longitudinally against the power of the spring and release said catches on the tread and plunger, substantially as set forth.

11. In combination with the railway rail, a tread k, a spring actuated plunger movable laterally under the power of the tread and having a hollow bearing at its outer extremity and an independently movable rod connecting with parts or appliances to be operated and having a head, r', in said hollow bearing, substantially as set forth.

12. In combination with the rail and bracket, p^3, a plunger, consisting of a vertical portion, p', horizontal portion, p^2, having a helical spring, o, thereon and a hollow bearing at the outer end thereof, and a headed rod arranged in said hollow bearing and having a movement with said horizontal portion and another movement independent thereof, substantially as set forth.

13. In combination with the rail and tread k, a pivoted plunger portion adapted to be moved laterally by the tread, a horizontal plunger portion engaging said pivoted plunger portion at one end and engaging an independently movable rod, r, at the other and having a spring thereon, and said rod r, connecting with the appliances to be operated, substantially as set forth.

14. In combination, the tread k, having a catch k', a plunger having a catch p^8, a spring, o, an independently movable rod r, also movable with said plunger, an electro magnet controlled by the train, an armature catch a weight free to gravitate when released from said catch, the said weight controlling a hammer, the blow of which throws the rod, r, and plunger p, against the spring, o, to release the catches k', p^8, and means for throwing the tread upward when released, substantially as set forth.

15. In combination with a tread and plunger, each having catches co-operating to hold the tread down after the passage of the train, a spring for elevating the tread upon the release of the catches and means for releasing the catches from engagement, substantially as set forth.

16. In a railway appliance, the combination with a rail, a bracket, l, having vertical part, l^2, and bolt, m, and a tread lever fulcrumed on said bolt and having a wedge like or inclined bearing and catch, of a spring actuated plunger adapted to be engaged by the inclined bearing of the lever and forced horizontally to an abnormal position substantially as set forth.

17. In combination with the rail and tread lever, a bracket consisting of a plate, l', extending under the flange of the rail, a vertical portion, l^2, at one side of said flange, having a projection l^3, bearing on the top of said flange and having bearings for the fulcrumal bolt m, said bolt, m, and a headed bolt, l^5, cooperating with the projection, l^3, in holding the plate l', up to the bottom of the flange, substantially as set forth.

18. In combination with the rail, a, and tread lever k, a bracket consisting of the horizontal part l', vertical part l^2, having bearing m, for the lever and projection l^3, for the top of the rail flange and a brace or backing, l^6, for a headed bolt, l^5, and said bolt, substantially as set forth.

19. In combination with the pivoted plunger portion, p', having a tread bearing, and bearing for a horizontal plunger portion, said horizontal plunger portion, of tubular form and an independently movable rod r, and a spring o, substantially as set forth.

20. In combination with the rail and tread, a vertical plunger portion having a bearing tongue p^4, a tubular horizontal portion having a spring, o, and nuts, p^6, thereon and receiving said tongue at one end and a rod, r, at the other and said rod connecting with the appliances to be operated and movable independent of the said horizontal plunger portion, substantially as set forth.

21. In combination with the rail, tread, and spring actuated plunger, a rod, r, movable horizontally independent of the plunger and made in sections adjustable one in relation to the other, substantially as and for the purposes set forth.

22. The combination with the rail, plunger, tread and independently movable rod, r, extending to the base of standard or post b, and connecting with devices or appliances to be operated on the passing of a train, of a tube inclosing and protecting said rod and extending to said post, substantially as set forth.

23. The combination with the rail, bracket, 20, secured to said rail, a tread, plunger and rod r, connecting with the appliances to be operated, of a tube having bearings on said bracket and inclosing and protecting said rod, substantially as set forth.

24. In combination with the rail and bracket 20, a tread and spring actuated plunger, a rod movable independent of said plunger and also having a movement with said plunger, and a threaded tube supported at one end by said bracket and held thereto by nuts 21, inclosing said rod and extending to and supported at its opposite end by the standard, b said standard and appliances operated by said rod, substantially as set forth.

25. In combination with a tread and plunger, a rod, r, movable with and independent of the plunger, a pulley or crank connected with said rod the connection between said rod and crank or pulley admitting of an independent movement, and a hammer or weight for producing a movement of said rod, substantially as set forth.

26. In combination with the rail, tread k, plunger, spring o, crank s, and appliances operated thereby, a rod r, having slot 11, and pin 8, connecting with the crank, and also

having a bearing 12, a lever 6, having weight 16, and bearing 13, to engage the bearing 12, a catch for said weight and means for releasing the catch when the train passes from the block substantially as set forth.

27. In a railway appliance, the combination with a treadle having an inclined bearing and a catch, of a plunger controlled by a spring and adapted to be caught by said catch and held in caught engagement by said spring and a releasing apparatus adapted to disengage the said catches and an electro-magnet and armature and connections adapted to be controlled by the passing train and actuate said releasing apparatus to cause the same to overcome the action of the spring and release said catches, substantially as set forth.

28. In a railway appliance, the combination with catching means for holding the appliance parts in abnormal positions, of a hammer like releasing device controlled by electro-magnetical devices adapted to be operated upon by the passing train, the catching means being released by the impact or blow of said hammer like part or device when acted on by the passing of the train into connection with the electro-magnetical devices substantially as set forth.

29. In a railway appliance, the combination with a circuit closing device operable by a passing vehicle, an electro-magnet embraced in the electric circuit common to said circuit-closing device, of a weight or hammer adapted to receive, store up and deliver force for releasing a catch or detent and said catch or detent adapted to be brought to its caught or detaining position by the wheel of the vehicle substantially as set forth.

30. In a railway signaling apparatus, the combination with two distinct recipients of power *o*, 16, and means for transmitting power thereto from a passing train, means connecting said recipients whereby when one of said recipients is released the power stored therein will be transmitted to the second recipient to release the latter and admit the application of the power stored therein to effect a signaling and catches or holding means for holding said recipients in abnormal positions temporarily, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 31st day of August, 1892.

JAMES WAYLAND.

Witnesses:
CHARLES H. PELL,
OSCAR A. MICHEL.