

(No Model.)

2 Sheets—Sheet 1.

J. WAYLAND.
RAILWAY SIGNAL.

No. 532,122.

Patented Jan. 8, 1895.

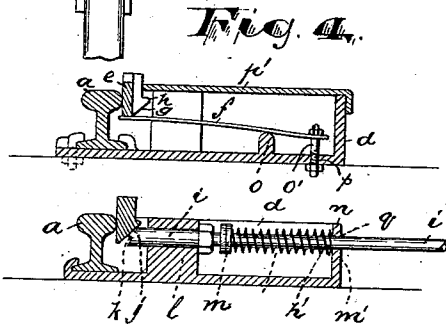
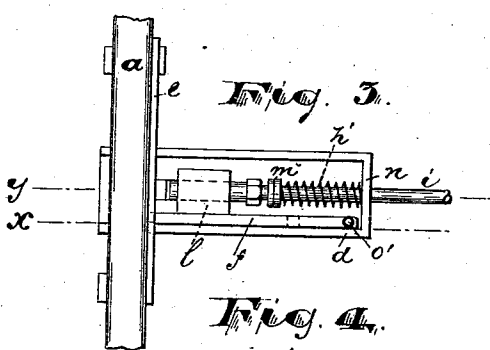
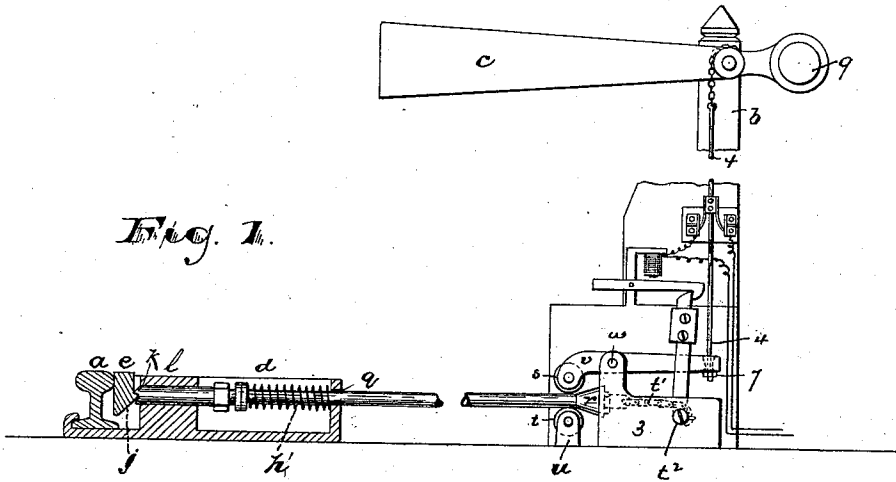
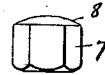
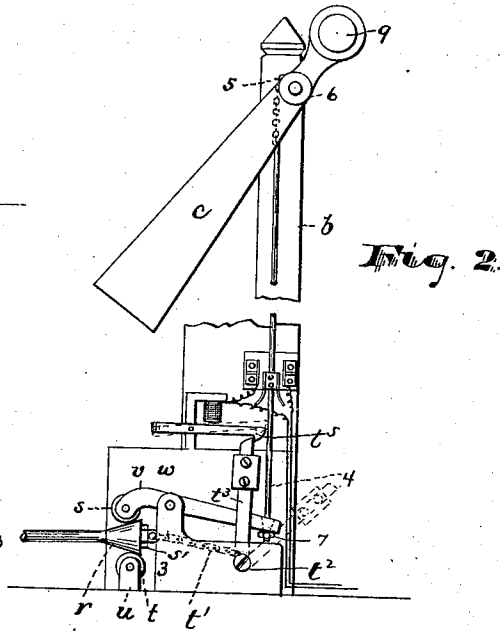


Fig. 5.



Witnesses

Robert Southerger
Louisa Browne

Fig. 6. Inventor,

James Wayland,

By *Drake & Co.* Attys

(No Model.)

2 Sheets—Sheet 2.

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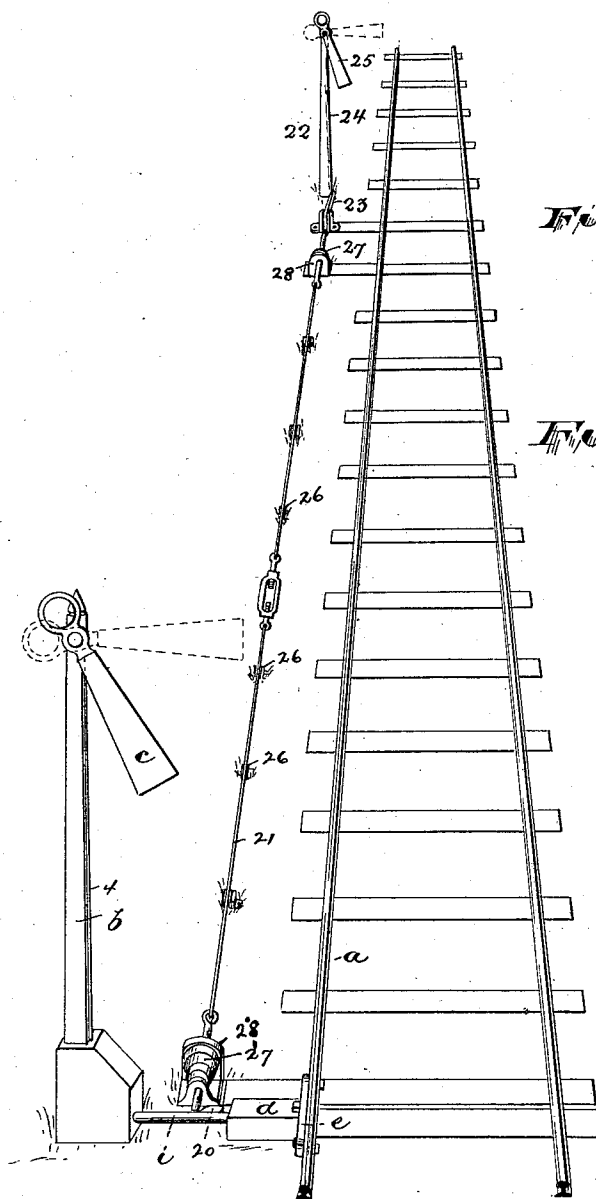


Fig. 7.

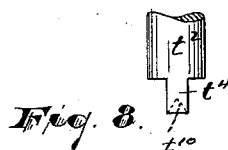


Fig. 8

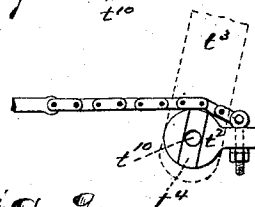


Fig. 9

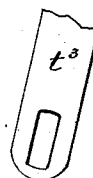


Fig. 10.

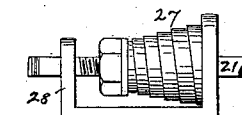


Fig. II

Witnesses:

Robert A. Fallberg &
Louisa Browne.

Inventor:

James Wayland,

By Drake & Co. Atty's.

UNITED STATES PATENT OFFICE.

JAMES WAYLAND, OF NEWARK, NEW JERSEY.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 532,122, dated January 8, 1895.

Application filed January 24, 1894. Serial No. 497,874. (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 Signaling Systems; 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.

15 This invention relates to certain improvements in that class of railway signaling systems and appliances represented by the one illustrated in my Patent No. 492,598, dated February 28, 1893.

20 The objects of the present improvements are to reduce the cost of and simplify the construction; to render the signaling mechanisms more reliable and certain in their operations; to more effectually prevent interference in the actions of certain parts; to enable the working parts to act more simply, and with reduced wear and strain; to enable a very limited movement of parts at the rail, to effect an increased movement at the signal or at the mechanism immediately beneath the semaphore; to enable the train acting on one instrument or device to operate two separate signals widely apart on the road and to secure said result by purely mechanical means, and to secure other advantages and results, some of which will be referred to hereinafter in connection with the working parts.

Referring to the accompanying drawings, in which like letters and numerals indicate corresponding parts in each of the views, Figure 1 is a sectional elevation showing the signal and its co-operating parts in their danger indicating positions. Fig. 2 is a similar view showing the same in their safety indicating positions. Fig. 3 is a detail plan showing the rail, a tread lever and a plunger, with certain catching or locking mechanisms arranged therewith. Fig. 4, is a sectional elevation of the same, taken at line *x*, and Fig. 5 is a section taken at line *y*. Fig. 6 is a detail of a nut for use in connecting a certain lever and a vertical rod in connection with the semaphore. Fig. 7 is a

perspective view of a section of the track showing the signaling posts and appliances, and illustrating certain means for transmitting power mechanically to another signaling post or station at a distance. Figs. 8, 9 and 10 are details showing the relations and construction of a weighted arm, chain connection and a drum, and Fig. 11 a detail of a counterbalancing spring and connecting rod.

In said drawings, *a*, indicates an ordinary railway rail; *b*, a signal post, and *c*, a semaphore pivotally arranged upon said post, and controlled by a train of mechanisms connecting with the railway rail.

In the former patent above referred to, a construction was shown in which the spring, controlling the lock or catch at the rail, extended vertically downward into a receptacle or pocket below the rail, in which position it was liable to be surrounded by water, which, when frozen, rendered the spring, and the parts depending thereon, inoperative. In the present construction, I avoid this disadvantage, and provide a more easy working and reliable construction, all the parts of which are at the level of the rail.

The improved catch or lock mechanism comprises a horizontal box, *d*, attached in any suitable manner to the rail, and extending at right angles to said rail, as shown in Fig. 3, a tread-lever, a catch for holding said tread-lever temporarily and suitable springs as will be now more particularly described. Upon said rail is pivoted or fulcrumed the tread lever, *e*, which is similar in construction to that shown heretofore. Said tread lever extends longitudinally with respect to the rail, through recesses or slots formed at the ends of said box, or between said box and the rail, the said recesses being sufficient in size to allow free play to said tread lever. Said tread lever, after having been depressed by the locomotive, caught, and, afterward released, is thrown upward from its depressed position, by a spring, *f*, which brings it into a position to be acted on by the spring-controlled plunger hereinafter described. The said lever is provided with an incline, *g*, and a catch projection, *h*, similar to those in the earlier patent, and which are engaged by a sliding plunger, *i*, having the co-operating incline, *j*, and projection *k*. The said sliding plunger is cy-

lindrical in form where it engages the bearing *l*, of the box, so as to have a pivotal movement in said bearing sufficient to enable the engaging inclines to maintain a broad and parallel contact of surfaces, as the tread lever turns on its fulcrum and which relations are conducive to an easy movement.

A spiral spring, *h'*, adjustably held on the plunger between the bearings *n*, and the nut, *m*, serves to throw the plunger normally toward the tread lever. The spring, *f*, which directly acts on the tread lever to raise the same from its lowest depression, bears upon a projection, *o*, formed within the box, and is adjustably held in place by a bolt, *o'*, and nut. The bolt is held rigidly within a threaded perforation, *p*, in the bottom of the box, and the spring, *f*, extends through an aperture or passage formed between the bearing *l*, and the sides of the box, and into engagement with the under side of the tread lever. It is thus held securely in place without danger of disarrangement when the wheels of the locomotive or train depress the tread lever. The catch parts are thus arranged so that there will be no danger of freezing.

The mechanisms described are protected from improper manipulation and from the deteriorating action of the weather, by a sheet metal cover, *p'*, of any suitable construction.

The plunger, *i*, extends away from the rail, or the catch thereat through a perforation, *q*, in the box, and at a point adjacent to the post, *b*, the said plunger is provided with a conical collar or sleeve, *r*, having preferably a sliding movement, whereby it may be adjusted on the rod by the nut *s'*. It may be fastened rigidly upon the plunger or integrally formed therewith. Said conical sleeve or collar, *r*, is prevented from moving longitudinally away from the roller bearing *s* beyond a desired limit, by a nut or collar, *s'*, of any suitable construction, preferably, however, allowing an adjustment of the collar upon the plunger. The said plunger at its extremity is provided with a flexible connection, preferably a chain, *t'* with a drum or shaft, *t*, around which the said chain is adapted to wind when turned. Said shaft is arranged in suitable bearings and at its extremity may be recessed, as at *t''*, Figs. 8 and 9 to receive the conical bearing on which the shaft turns. The said plunger, *i*, with the conical sleeve, extends through or between two roller bearings, *s*, *t*, one of which is upon a fixed stud, *u*, and the other upon a lever, *v*, fulcrumed at *w*, upon a stud or fixture 3. Said lever at its longer end, or the end opposite that having the roller *s*, connects with a vertical rod 4, joined by means of a flexible connection 5, with the drum or pulley 6 of the semaphore. Where the lever, *v*, connects with said rod, 4, the former is slotted as indicated in outline, to prevent binding of parts, and the nut, 7, at the extremity of the said rod, 4, is rounded as shown in detail Fig. 6, to prevent friction and binding.

The roller bearing, *s*, of the lever, *v*, is so

related to the sleeve, *r*, connected with the semaphore rod, 4, as that, when the plunger, *i*, is thrown longitudinally away from the track, the weight, 9, is allowed to act to draw the semaphore blade to the danger indicating position, and with it the rod, 4, and lever *v*, to abnormal positions where they remain while the plunger is in caught engagement with the tread-lever.

In connection with the oscillating drum or shaft, *t*, I have provided a weighted carrying arm, *t'*, which is rigidly fixed at one end of the drum. The manner of fixing said weighted arm is shown in Figs. 8, 9 and 10, where the said shaft or drum is provided with a head *t''*, on which the arm, slotted to receive said head, is closely fitted and fastened.

The weighted arm is held at an incline by a catch, *t'*, so that, when released, it will quickly gravitate and turn the drum or shaft, *t*, in its bearings. The catch, *t'*, is controlled by an electro-magnet and armature and circuit wires extending to the opposite end of the block, and thereat provided with a circuit changer of any suitable kind adapted to be operated by the passing train, affect the circuit and occasion an operation of the said catch, *t'*, in any manner common in this branch of signaling. The chain connection, *t'*, is slack so as to allow the weighted arm to acquire considerable momentum before it acts to draw the plunger backward. When it has acquired this momentum, it counteracts the power of the spring, *h*, within the box, *d*, draws the co-operating catching parts *e*, *i* from holding relation, and admits the return of the tread-lever to its raised position. The spring *h*, immediately regains its power and throws the plunger toward the track, forces the wedge-like sleeve or collar, *r*, between the rollers, *s*, *t*, thus turning the lever, *v*, on its fulcrum and drawing the semaphore to its safety indicating position and the arm, *t'*, into caught relation with the catch, *t'*, controlled by the circuit.

It may be observed that the wedge, working between the two rollers, one a fixed and the other a movable one, serves, with an easy draft, to give a multiplied movement to the said movable roller and the lever carrying the same. I thus secure an increased movement at the semaphore with a decreased movement of the plunger and tread-lever and yet the movement is more easy than if the longer arm of the lever *v*, were extended.

Where I desire to establish a cautionary signal or station and operate it mechanically from the signal above described, I employ an inclined, or wedge shaped, projection, 20, on the plunger, *i*, at a suitable point thereon, which engages a longitudinally movable connecting rod, 21, extending along the side of the track to a distant signal station, 22, where it connects by means such as a bell-crank, 23, and rod, 24, with the semaphore, 25.

The connecting rod, 21, where it engages the incline 20, is beveled to coincide there-

with and secure an easy movement. The rod, 21, may be supported and thus prevented from sagging by a series of rollers, 26, and at its ends is connected with oppositely bearing helical springs, 27, 27 arranged on fixtures 28, which springs are under tension and tend to counterbalance one another. They are each of sufficient strength to draw the rod toward itself, so that the rod will have a longitudinal movement without bending or buckling and consequent lost motion. The springs exert equal power to hold the rod in an initial or normal position, and when this normal condition is disturbed by the action of the train, after the disturbing force is withdrawn, said springs serve to return the rod to its said normal position.

When the train operates the plunger by the means hereinbefore described, the connecting rod, 21, is pressed longitudinally against the pressure of the nearest spring, 27, disturbing the balance and enabling the spring at the opposite end to draw the rod so that it will operate the signal. I am aware that various means may be employed to disturb the balance of the passage of a train, and that various forms and arrangements of springs may be used and that in lieu of springs other balancing means may be employed, without departing from the spirit or scope of this feature of the invention.

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

1. The combination with the home and distance signaling stations and means for operating the signals thereof on the passage of a train, of a connecting rod and springs arranged at the opposite ends of the same, each of which is normally under tension or compression and capable of drawing upon and operating said rod when the other has its normal tension or compression disturbed.

2. The combination with the signal post, its semaphore and connections, a tread-lever, and plunger having means for converting its longitudinal movement into movement at right angles with a counterbalanced connecting rod, said rod acted upon by said plunger and operating a distant signal, and said signal, substantially as set forth.

3. The combination with the home signal post, its semaphore and connecting means, a tread-lever, plunger operating said connecting means and operating, longitudinally, a connecting rod extending along the track, said connecting rod and counterbalances controlling the same, and mechanical appliances operable by said counterbalanced connecting rod, substantially as set forth.

4. The connecting rod and fixtures for supporting the same at its ends, in combination with springs normally under tension, bearing on said fixtures and said rod and tending to draw the said rod, each toward itself, substantially as set forth.

5. The combination with the signaling post and its appliances, the track, a plunger en-

gaged by a tread lever, a box having a bearing *o* and a lateral bearing, *l*, of said tread-lever, a horizontally disposed spring bearing *70* at one end on the under side of the tread-lever, adjustably secured at its outer end to a suitable fixture and between said fixture and its inner, or tread-lever-engaging end, engaging said bearings *o* and *l*, substantially as set forth.

6. The combination with the track, and tread-lever having an inclined bearing, a plunger engaged by said bearing and having a lateral oscillation or movement to secure parallelism at the bearings.

7. In a railway signaling system, the combination with the track and tread-lever, a box having a bearing *l*, a horizontally movable plunger arranged in said bearing and being of a cylindrical shape thereat whereby it is allowed a lateral oscillation as well as the horizontal sliding movement, and signaling means connected therewith.

8. In a railway signal, the combination with the track, and tread, *e*, of a plunger, *i*, having opposite inclines to enter between rollers on fixed and movable bearings, said rollers and bearings and means connecting the movable bearings with the signal, substantially as set forth.

9. In a railway signal, the combination with the track and tread-lever, of the plunger with opposite inclines arranged between fixed and movable parts, said fixed and movable parts being in connection with the signal, and said signal, substantially as set forth.

10. In combination with the track, tread, *e*, and plunger, *i*, a collar or sleeve arranged on said plunger, rollers, *s*, *t*, one on a fixed bearing, *u*, and the other on a lever, *v*, said bearing, *u*, and lever, *v*, the rod, *4*, and semaphore, all arranged and operating substantially as and for the purposes set forth.

11. The improved signaling apparatus, in which is combined with the track, a tread, *e*, a plunger, *i*, engaged by said tread at one end and at its opposite end carrying an inclined bearing, *r*, a lever, *v*, acted upon by said inclined bearing, a rod connected with the semaphore and said semaphore, substantially as and for the purposes set forth.

12. The improved signaling apparatus, in which is combined with the track, a tread, *e*, plunger *i*, carrying an inclined bearing, *r*, at its end away from the track, a lever *v*, having a roller *s*, a rod connected with the semaphore and said semaphore.

13. The improved signaling apparatus, in which is combined with the track, tread lever and plunger engaged by said tread lever and extending horizontally away therefrom toward the signal, an adjustable cone arranged on said plunger and held thereon by a nut and a lever connecting with the signal and engaged by said cone, all substantially as and for the purposes set forth.

14. In a signaling apparatus, the combination with the tread and plunger, a chain or

flexible connection t' , a drum or shaft on which said flexible connection may wind, a weighted arm and a catch for holding said arm and shaft or drum from turning.

- 5 15. In combination, in a railway signal, with a catch and spring for holding the parts in caught engagement, a chain or flexible connection, a drum adapted to wind said flexible connection, a falling weight arranged in connection with said drum to turn the same and
10 a catch for holding said weight in its elevated position, substantially as set forth.

16. The combination with the track, depressible tread for the car wheel having a catch
15 projection, and a spring actuated plunger adapted to engage said projection and hold the tread in its lowered position, of a winding drum and flexible connection of the same with the plunger, a weight adapted to gravitate
20 when released and impart momentum to the drum whereby it may overcome momentarily the power of the plunger spring and release the tread, substantially as set forth.

- 25 17. In a railway signaling system, the combination with the track, tread, and catch for

holding the tread, a plunger, z , which is normally held in catching position, is provided with opposite inclines and has a flexible connection with a weight adapted to fall and draw said flexible connection and plunger, z , from
30 catching relation with the tread, said weight, a catch and an electric circuit controlling the same, said circuit extending a distance and being provided with circuit controlling means,
35 and a signal, c , connected with movable means v , adapted to be operated upon by the opposite inclines of the catch part z , substantially as set forth.

18. In a railway signal, the combination with rolls s , t , arranged on bearings, u , v , the latter
40 of which is movable and operates a signal, of opposite inclines of the plunger, z , movable between said rolls, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of
45 January, 1894.

JAMES WAYLAND.

Witnesses:

CHARLES H. PELL,
LOUISA BROWNE.