

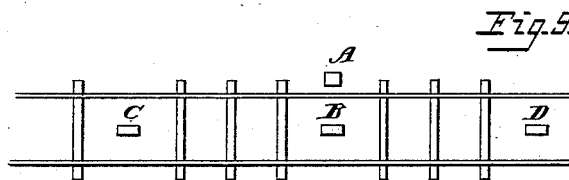
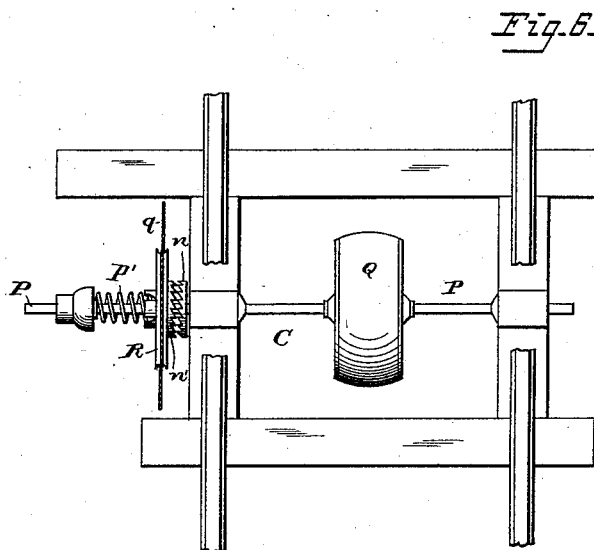
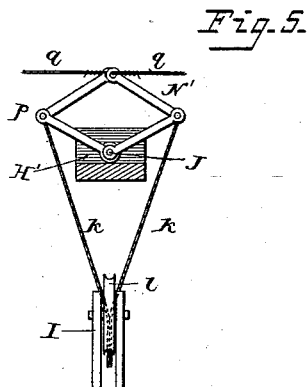
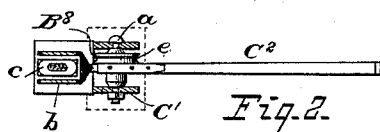
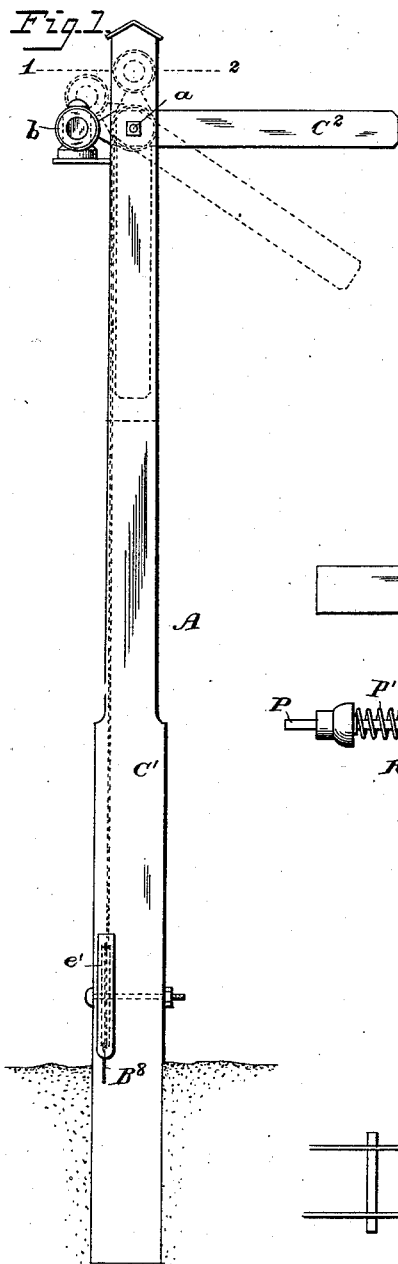
(No Model.)

2 Sheets—Sheet 1.

T. H. A. TREGEA.  
AUTOMATIC RAILWAY SIGNAL.

No. 307,242.

Patented Oct. 28, 1884.



Attest:-

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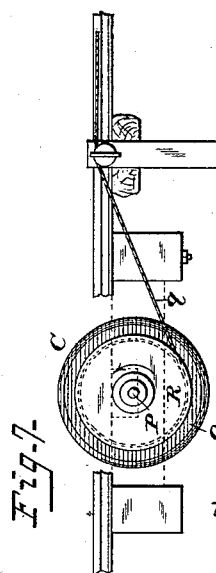
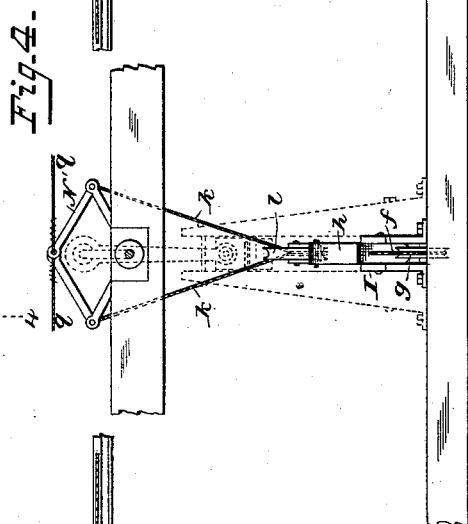
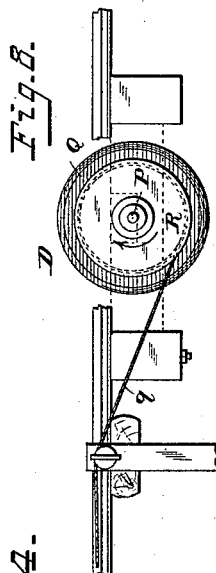
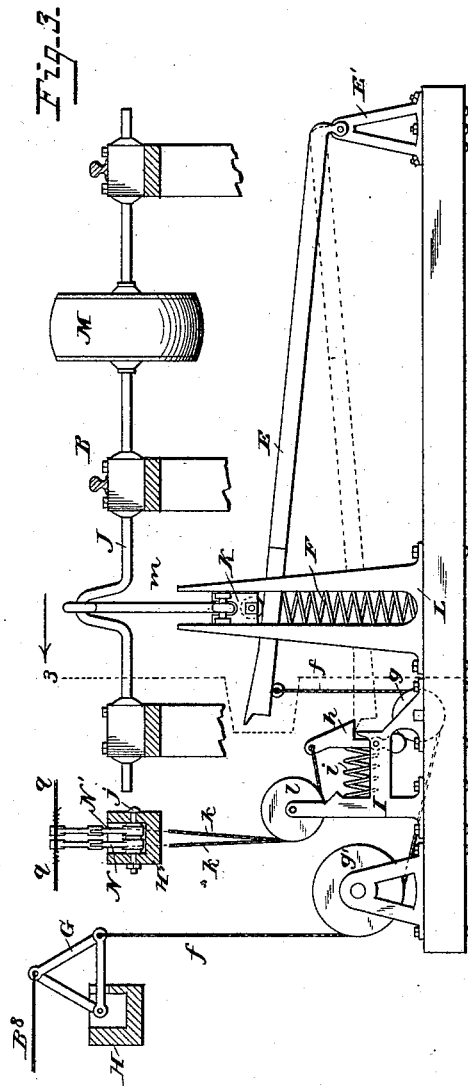
(No Model.)

2 Sheets—Sheet 2.

T. H. A. TREGEA.  
AUTOMATIC RAILWAY SIGNAL.

No. 307,242.

Patented Oct. 28, 1884.



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# UNITED STATES PATENT OFFICE.

THEODORE H. A. TREGEA, OF SOUTH LYON, MICHIGAN.

## AUTOMATIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 307,242, dated October 28, 1884.

Application filed July 19, 1884. (No model.) Patented in Canada August 13, 1884, No. 19,956.

*To all whom it may concern:*

Be it known that I, THEODORE H. A. TREGEA, a subject of the Queen of Great Britain, now residing at South Lyon, Oakland county, and State of Michigan, United States of America, have invented certain new and useful Improvements in Automatic Railway-Signals, of which the following is a specification.

My invention relates to that class of signals in which a semaphore is moved mechanically by the operation of passing trains; and my invention consists of certain simple, effective, and positively-operating devices, fully described hereinafter, whereby the signal is caused to be displayed by trains approaching the signal-post and is altered in its position as the train passes the said post.

In the drawings, Figure 1 is a side elevation of the signal-post and signal. Fig. 2 is a section on the line 1 2, Fig. 1. Fig. 3 is a transverse section of the track and side elevation of parts beneath the same adjacent to the signal. Fig. 4 is a sectional elevation on the line 3 4, Fig. 3, looking in the direction of the arrow. Fig. 5 is a side elevation of another portion of Fig. 3. Fig. 6 is a plan of one of the signal-setting devices. Fig. 7 is a side elevation of Fig. 6. Fig. 8 is a side elevation of the other signal-setting device. Fig. 9 is a diagram showing the relative positions of the parts of the signal.

The signal device consists, essentially, of the signal mechanism A, the signal-releasing mechanism B, and two signal-setting mechanisms, C D. The relative arrangement of these parts and their position in respect to the track is illustrated in the diagram Fig. 9, which shows the signal mechanism A arranged outside of the track, the releasing mechanism B arranged beneath the track and opposite the signal mechanism, and the signal-setting mechanisms C D as arranged beneath the track at some distance from the signal, the said distance being usually about forty rods from the central signal.

I will now describe the various mechanisms, which I have designated by the letters A B C D, and their connection and operation.

The signal A consists of a post, C', erected at a suitable distance from the track, and carrying a semaphore-arm, C<sup>2</sup>, pivoted to the post by a pivot, a, and having at the rear end a

bracket carrying a pair of disks, b b, arranged to cover and obscure the opposite lenses of a lamp, e, supported by the post C', so that the different positions of the arms C<sup>2</sup> (indicated in Fig. 1) will serve to signal to persons using the crossing both during the day and night. The weight of the arm C<sup>2</sup> tends to maintain it in the vertical position shown in dotted lines, Fig. 1, and a chain, B<sup>2</sup>, secured to and passing over a grooved pulley, e, secured to the arm C<sup>2</sup>, and around a pulley, e', at the foot of the post C', serves as a means of elevating the arm C<sup>2</sup> to its various positions.

The signal-releasing mechanism consists of a lever, E, pivoted at one end to a bracket, E', in a space or chamber below the track, a spring, F, arranged to lift the opposite end of the said lever, a cord or cable, f, connected to the lever passing around guide-pulleys g g', and a crank-lever, G, pivoted to a support, H, above the track, and connected at its upper arm to the cable B<sup>2</sup> and at the end of its lower arm to the cable f.

To a frame, I, is pivoted a pawl, h, thrown forward by a spring, i, and arranged so as to be thrown back by the contact with the end of the lever E, and to engage the end of the said lever with its shoulder and retain the same in the position shown in dotted lines, Fig. 3.

Transversely across the track extends a shaft, J, having a crank connected by a rod, m, to a guided block, K, sliding between the arms of a bracket, L, which supports the spring F, and a drum or wheel, M, is secured to the shaft J in a position between the rails of the track.

To a pin, j, passing through a support, H', near the level of the ground, are hung two bell-crank levers, N N', each of which is connected at one of its corners to a cable, k, passing around a pulley, l, supported by the bracket I, and connected to the trigger h.

Each setting mechanism consists of a shaft, P, turning in suitable bearings, and supporting a drum or pulley, Q, in position between the rails, and carrying at one end a clutch-wheel, n, which is opposite a corresponding clutch-wheel, n', at the side of a loose grooved pulley, R, supported upon the shaft P, and thrown toward the latter by means of a spring, P'.

To the upper end of each of the crank-levers

N N' is connected a cable, *g*, which extends round and is secured to one of the pulleys R of one of the setting mechanisms, and the bevels of the clutch-wheels *n n'* of each mechanism are such that the shaft P of the setting mechanism D may be turned in the direction of its arrow, Fig. 8, without turning the pulley R, and the shaft P of the setting mechanism C may also be turned in the direction of its arrow without turning the adjacent pulley R. The drums or wheels M Q Q have peripheral coverings of rubber or other suitable material, and the said wheels are of such size and so arranged as each to be struck by the cow-catcher or a tappet of a passing train, so as to be thereby turned. As a train passes in either direction over the signal-releasing mechanism B it will turn the drum M and its crank-shaft in one direction or the other, in either case imparting a reciprocating motion to the block K and throwing down the lever E until it is caught by the trigger *h*, the series of movements imparted to the block K insuring the catching of the lever in case the trigger should slip or fail to make contact therewith upon the first movement of the lever. As the lever E is depressed it slackens the cables *f B* and the signal-arm assumes its lowest position. As the train continues its movement it passes the signal and travels over the farther pulley, Q. The latter is turned without any effect upon the signaling apparatus; but upon another train passing over the said pulley Q and turning it in the opposite direction it will carry with it the wheel R, and thus draw upon the cable *g*, whereby the trigger *h* is drawn back and the lever E released. As soon as the lever E is released it is carried upward by the spring F, and the cables *f B* are drawn, caught, and moved so as to lift the signal-arm to the position shown in full lines, Fig. 1. As the said second train continues its movement it will be brought over the pulley M of the releasing device B, when the lever E will be thrown down and caught by the trigger, and the signal-arm C' will be allowed to descend. The further movement of the train over the other drum Q will turn the latter without any effect upon the signaling device. It will thus be seen that each train, as it approaches the signal coming from either direction, draws back the trigger *h* and leaves the lever E under the influence of the spring F, and insures the display of the signal as soon as the train is within forty rods thereof, the signal retaining its displayed position until the train passes the signal-post, when the lever E will be depressed and the signal is brought to its vertical position.

It will be seen that the devices described are positive in their action, and are so constructed and arranged as to work effectively when the parts are at considerable distances apart, and that they will not be liable to be effected by accumulations of snow or ice.

It is not necessary in all cases to use the precise construction and arrangement of parts

shown and described—for instance, the cable *f* might be secured to a block sliding in the guides L below the block K between the latter and the spring, in which case the trigger or catch device would be differently constructed.

Instead of crank-levers G N N', grooved pulleys might be employed, and any suitable construction of semaphore might be used.

Heretofore signals have been operated from each direction along the track by devices which are struck by the wheels of the train; also, drums have been employed as signal-operating devices, and a signal has been held in an obscured position by a catch, and liberated by a treadle so arranged as to be operated by the train moving in the proper direction only and to be reset by the train.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination, in a railway signaling apparatus, of a signal device, A, arranged adjacent to the track, shafts carrying drums Q Q M, devices connected to the signal and arranged to be mechanically operated from either drum Q to display the signal, and devices connected to the signal and arranged to be mechanically operated by the drum M to set the signal to its opposite position, substantially as specified.

2. The combination, with a signal apparatus provided with a movable semaphore, of a spring-actuated lever connected to said semaphore to display the latter under the action of the spring, a drum, M, and intermediate appliances whereby the lever is depressed by the turning of the drum, a catch for retaining the lever in its lowest position, and devices connected to the catch and arranged at opposite sides of the signal and distant therefrom, and constructed to be operated by passing trains to draw back the catch, for the purpose set forth.

3. The combination, with the signal device provided with a semaphore, and with a drum, M, adjacent to the signal, and connections whereby the movement of the drum by a passing train is made the means of unsetting the signal, of a catch for retaining the parts in one position, and devices arranged to be operated by the train at distant points to release the catch, substantially as set forth.

4. The combination, with the semaphore, of a cord connected thereto and to a lever, a spring for raising the latter to display the signal, a catch, and means for operating the same from distant points by the movement of passing trains, and a crank-shaft provided with a drum arranged to be struck by a train passing the signal, and a pitman connected to the crank and serving to compress the spring and unset the signal as the drum is rotated, substantially as set forth.

5. The combination, with the signal and spring for setting the same, and with mechanism for compressing the spring to unset the signal by the action of a passing train, and

with a catch for holding the parts in position, of shafts arranged upon opposite sides of the signal at distant points, carrying drums in position to be rotated by passing trains, and  
5 each having a clutch-connection with a pulley, around which a cord passes to a catch when the said clutches are constructed to permit the drum-shafts to rotate without moving the catch when the trains are passing from the  
10 signal, substantially as described.

6. The combination, with the signal and its operating cable, of a spring and connections, whereby the signal is set by the action of the spring; a catch for retaining the spring in its  
15 compressed condition, and a crank-shaft provided with a drum arranged to be operated by passing trains, and with a pitman, whereby the spring is compressed by the rotation of the shaft, substantially as set forth.

20 7. The combination, with the signal and crank-shaft carrying a drum and pitman connected to a block, of a lever connected to the operating-cord of the signal, and a spring arranged to elevate the lever, substantially as  
25 set forth.

8. The combination of the crank-shaft, drum, reciprocating block, lever connected to the operating-cord of the signal, spring and catch connected by cords to pulleys upon shafts arranged at distant points upon opposite sides  
30 of the signal, and drums and clutch-connections, constructed to operate substantially as set forth.

9. The combination, with the signal and catch for retaining the latter in its lowest position, of a shaft at a distant point on each  
35 side of the signal, provided with a drum arranged to be rotated by passing trains, a pulley connected by a cord with the catch, and clutch-connections between the pulley and the  
40 drum, whereby the pulley is turned to draw back the catch only by trains that approach the signal, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two sub-  
45 scribing witnesses.

THEODORE H. A. TREGEE.

Witnesses:

HERBERT YATES,  
E. W. H. TROOD.