

No. 854,970.

PATENTED MAY 28, 1907.

E. S. STOTTS & L. O. DICKEY.  
ELECTRICAL BLOCK SIGNAL.

APPLICATION FILED AUG. 13, 1906.

2 SHEETS—SHEET 1.

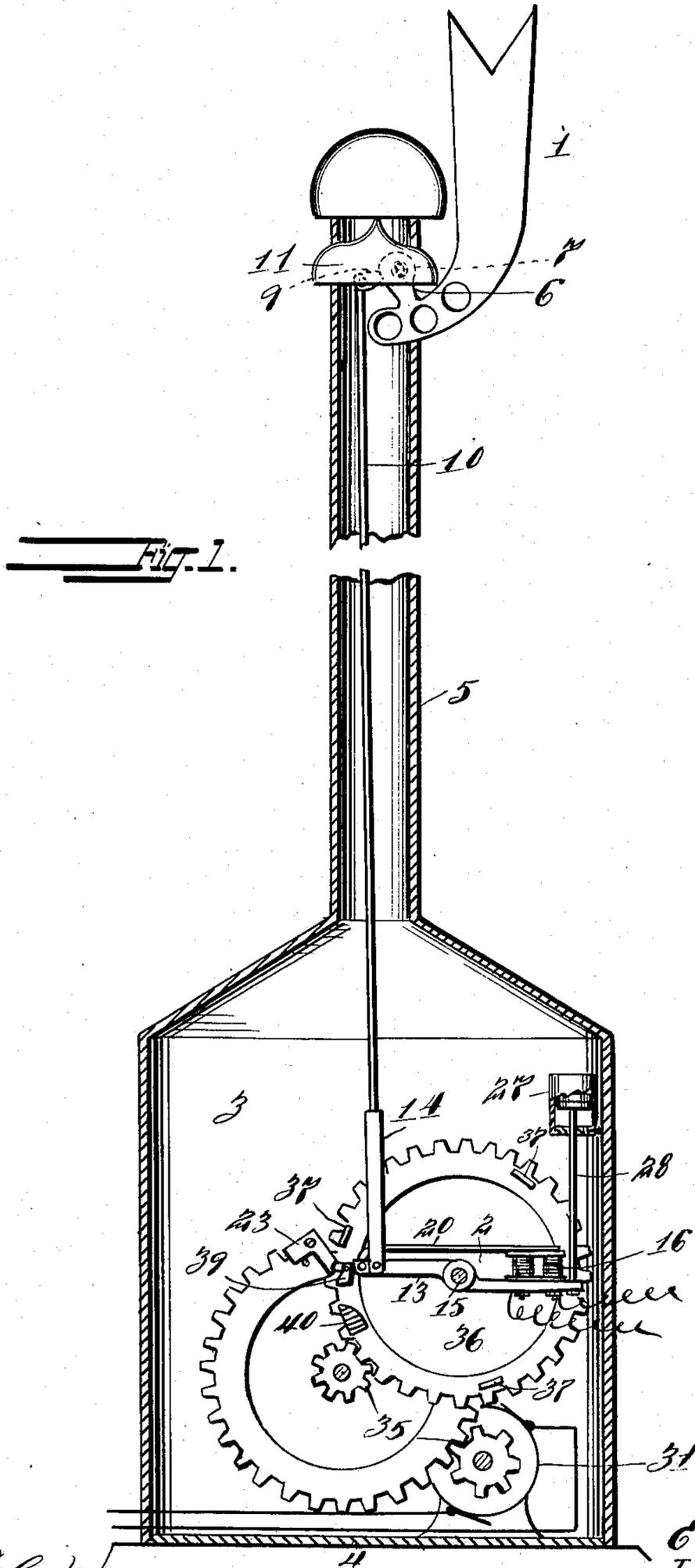


FIG. 1.

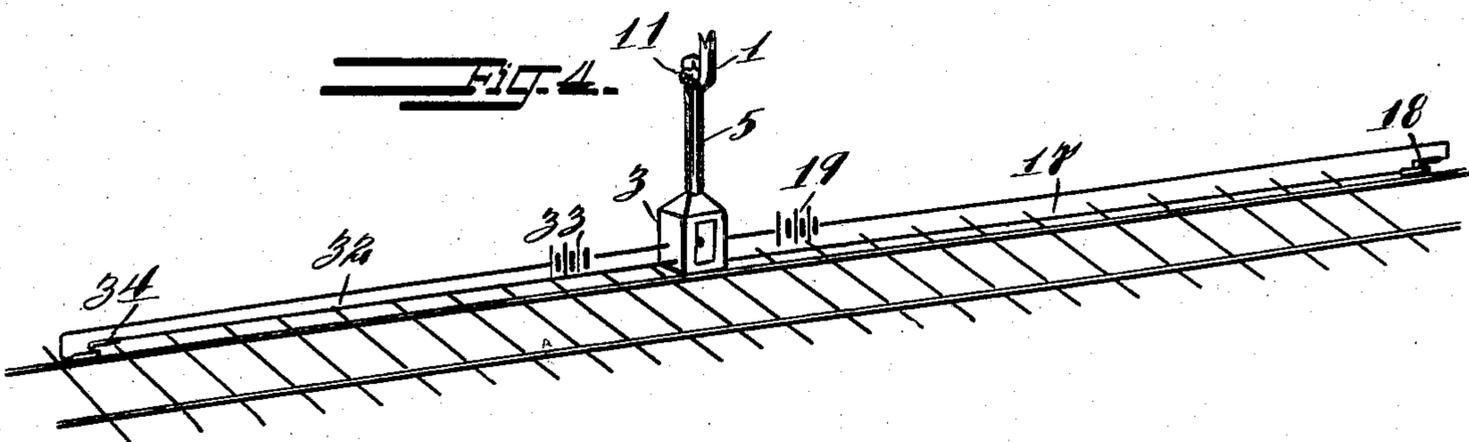
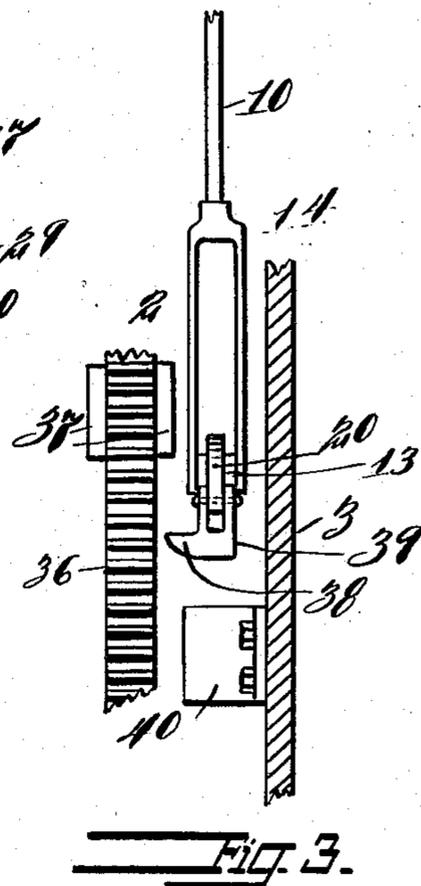
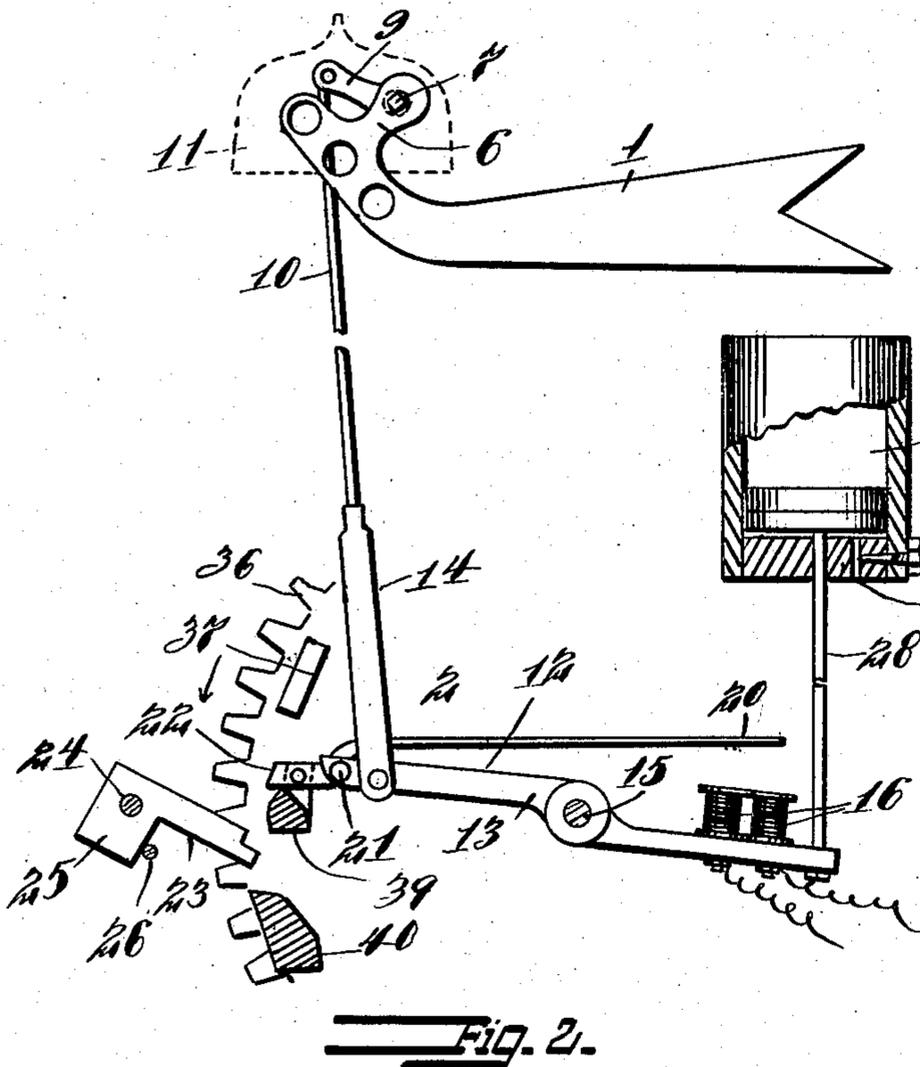
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

ELZA S. STOTTS AND LESTER O. DICKEY, OF OMAHA, NEBRASKA.

## ELECTRICAL BLOCK-SIGNAL.

No. 854,970.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed August 13, 1906. Serial No. 330,503.

*To all whom it may concern:*

Be it known that we, ELZA S. STOTTS and LESTER O. DICKEY, citizens of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Electrical Block-Signals for Railways; and we do 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.

This invention relates to improvements in electrical block signals for railways, and consists of the novel construction, combination and arrangement of parts hereinafter described and claimed.

The object of the invention is to provide a mechanism of this character which will be of simple, compact and comparatively inexpensive construction and automatic and reliable in operation.

The above and other objects which will appear as the nature of the invention is better understood, are accomplished by means of the construction illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical sectional view through the improved signal mechanism, showing the parts in their normal position; Fig. 2 is a side elevation, on an enlarged scale, of the signal operating mechanism, showing the position that the parts assume when the semaphore or signal is at danger; Fig. 3 is a detail edge view of the parts shown in Fig. 2; and Fig. 4 is a diagrammatic view, showing the circuits for controlling the mechanism.

Referring to the drawings, 1 denotes a signal preferably of the semaphore type so constructed that its blade swings by gravity to a horizontal position to indicate danger and is operated and held in a vertical position to indicate safety, by means of an operating and controlling mechanism 2 located in a housing or casing 3. The latter is provided upon a suitable base 4 of concrete or the like located adjacent to a railway track and has projecting from its top a tubular upright or post 5, from which the semaphore is suspended. This semaphore has its blade projecting from a spectacle provided with an arm 6 secured upon the outer end of a shaft 7 journaled in a suitable bearing upon the upright or post 5. Upon the inner end of the shaft 7 is a crank arm 9, which is connected by a rod or link 10 to the mechanism 2 within the housing or casing 3. The rod 10 extends through the

tubular post 5, which latter has its upper end closed by a cap, so that the mechanism and the inner end of the shaft 7 is protected from the weather. The outer end of this shaft and its bearing are protected by a hood 11 through the open bottom of which extends the arm 6 of the semaphore.

The weight of the blade of the semaphore 1 is adapted to cause it to swing to a horizontal position and it is held normally in its vertical position, to indicate that the track is clear, by means of a holding device 12, consisting of a lever 13, to which the rod 10 is connected by a yoke 14, as clearly shown in Fig. 3. The lever 13 is pivoted intermediate its ends upon a pivot 15 suitably mounted within the casing 3 and has upon one of its ends an electro-magnet 16, which is included in an electric circuit 17 adapted to be opened by a train as it enters the block which the signal 1 is adapted to guard. The circuit 17 includes a suitable circuit breaker 18 and a battery or other generator 19, as shown in Fig. 4. The armature 20 of the magnet 16 is in the form of a lever pivoted intermediate its ends at 21 in the lever 13. Its long arm extends through the yoke 14 and is normally held in contact with the cores of the magnet 16, since the latter is normally energized. The short end 22 of the armature lever 20 is normally engaged with the notched end of a dog 23, which is suitably pivoted at 24 in the casing 3. A counterweight 25 on the dog swings its notched end normally into the path of the end 22 of the armature lever, and its swinging movement is limited by a stop 26. When the armature lever is attracted by the magnet 16, it will be seen that it is rigidly held upon the lever 13, so that it forms a part thereof, and when its end 22 is engaged with the dog 23 the connecting rod 10 will be held down so that the semaphore is retained in its safety position. As soon as the magnet 16 is deenergized the pull upon the rod 10 owing to the weight of the semaphore blade will cause the armature lever 20 to swing upon its pivot 21, thereby releasing the holding lever 13 and permitting the latter to swing upwardly as the semaphore blade swings to its horizontal position to indicate danger, as shown in Fig. 2 of the drawings. In order to check and cushion the drop of the semaphore, a dash pot 27 is connected to the lever 13 by a rod 28. The dash pot may be of any suitable form and construction, but as shown the movement of its piston to which

the rod 28 is connected, is controlled by a screw 29, which regulates the escape of air through the vent 30 in the cylinder of the dash pot.

5 In order to return the semaphore to its safety position when the train passes out of the block a motor 31 is provided within the casing 3 and included in an electric circuit 32, which also includes a battery or generator 33 and a circuit closure 34 adapted to be  
10 actuated by the train as it leaves the block. The motor 31 is connected by a train of gears 35 to a gear wheel 36 mounted upon the pivot 15 and having upon one or both sides of its  
15 rim one or more projections or tappets 37. The latter are adapted to engage the laterally-projecting hook 38 of a detent 39 pivoted upon the end 22 of the armature lever, so that it will swing inwardly but not outwardly.  
20 This detent 39 is formed with a curved portion, in the path of which is disposed a releasing device 40. The latter is fixedly mounted within the casing 2 and is in the form of a projection or arm having a beveled  
25 surface which engages the detent 39 and forces it inwardly as the end 22 of the armature lever passes said releasing device 40.

The operation of the invention is as follows: When the parts of the apparatus are in their  
30 normal position, the circuit 17 is closed and the circuit 32 open and the signal operating and holding mechanism 2 is in the position shown in Fig. 1, so that the semaphore blade is held vertically. When a train enters a  
35 block guarded by the signal 1, the circuit 17 is broken by the train operating the device 18 or in any other suitable manner, whereupon the armature lever 20 is released, so that the signal 1 will drop to its danger position  
40 shown in Fig. 2 of the drawings, as previously explained. As the train passes out of the block it closes the circuit 32 by operating the device 34 or in any other suitable manner, so that the motor 31 will be operated to turn  
45 the wheel 36 in the direction indicated by the arrow in Fig. 2. As this wheel rotates, one of its tappets 37 engages the hook 38 of the detent 39 and swings the armature lever together with the holding lever 13 on which it  
50 is rigidly held by the magnet 16, which is again energized by the closing of the circuit 17. As the detent 39 engages the releaser 40, it is swung inwardly to disengage its hook 38 from the tappet 37 and at the same time  
55 permit the notched end of the dog 23 to engage the end 22 of the lever 20, thereby holding the device 12 in its normal position shown in Fig. 1.

It will be seen that the device is of simple,  
60 compact durable and comparatively inexpensive construction and at the same time safe and reliable in operation. The blade of the semaphore being held vertically or perpendicularly when at safety has a tendency  
65 to swing to its danger position when any for-

eign weight is placed thereon, and if a second train should enter the block after one has just left or before the signal has returned to safety and should release the magnets, or if  
70 for any other cause the magnets would release at any time during or after the return of the signal, then the blade will be released and will fall to indicate danger. By providing the tappets 37 upon both sides of the wheel  
75 36, two or more semaphores may be operated by the device.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of  
80 this invention, as defined by the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters-Patent, is:—

1. In combination with a signal tending to move to its danger position, of means for holding it normally in its safety position comprising a holding lever, an electro-magnet thereon, an armature for said magnet  
90 pivoted upon said lever, and a keeper for engaging said armature lever.

2. In combination with a signal tending to move to its danger position, of means for holding it normally in its safety position comprising a holding lever, an electro-magnet thereon, an armature for said magnet  
95 pivoted upon said lever, a keeper to engage said armature lever, and means for moving said lever into engagement with said keeper.

3. In combination with a signal tending to move to its danger position, of means for holding it normally in its safety position comprising a holding lever, an electro-magnet thereon, an armature for said magnet  
100 pivoted upon said lever, and a swinging dog to engage said armature lever, a rotary element, a tappet upon said element, a detent carried by said armature lever and disposed in the path of said tappet, and a releasing device to engage said detent and disengage it from said tappet.

4. In combination with a signal tending to move to its danger position, of means for holding it normally in its safety position comprising a holding lever, an electro-magnet thereon, an armature for said magnet pivoted upon said lever, a swinging dog to engage said armature, a rotary element, a tappet upon said element, a detent carried by  
105 said armature and disposed in the path of said tappet, a releasing device to engage said detent and disengage it from said tappet, a circuit breaker, an electric circuit including said magnet and said circuit breaker, a motor for operating said rotary element, a circuit-closer, and an electric circuit including  
110 said motor and said circuit closer, substantially as described.

5. In combination with a signal, tending

to move to its danger position, of means for holding it normally in its safety position, comprising a holding lever, a dash-pot coacting therewith, an electro-magnet carried by the lever, an armature for the magnet pivoted upon the lever, a swinging dog to engage the armature, a rotary element, a tappet upon the element, a detent carried by the armature and disposed in the path of the tappet, a releasing device to engage the detent and disengage it from the tappet, a circuit breaker, an electric circuit including the mag-

net and the circuit breaker, a motor for operating the rotary element, a circuit closer, and an electric circuit including the motor and the circuit closer. 15

In testimony whereof we have hereunto set our hand in presence of two subscribing witnesses.

ELZA S. STOTTS.  
LESTER O. DICKEY.

Witnesses:

R. A. STREETER,  
WM. R. LINDLEY.