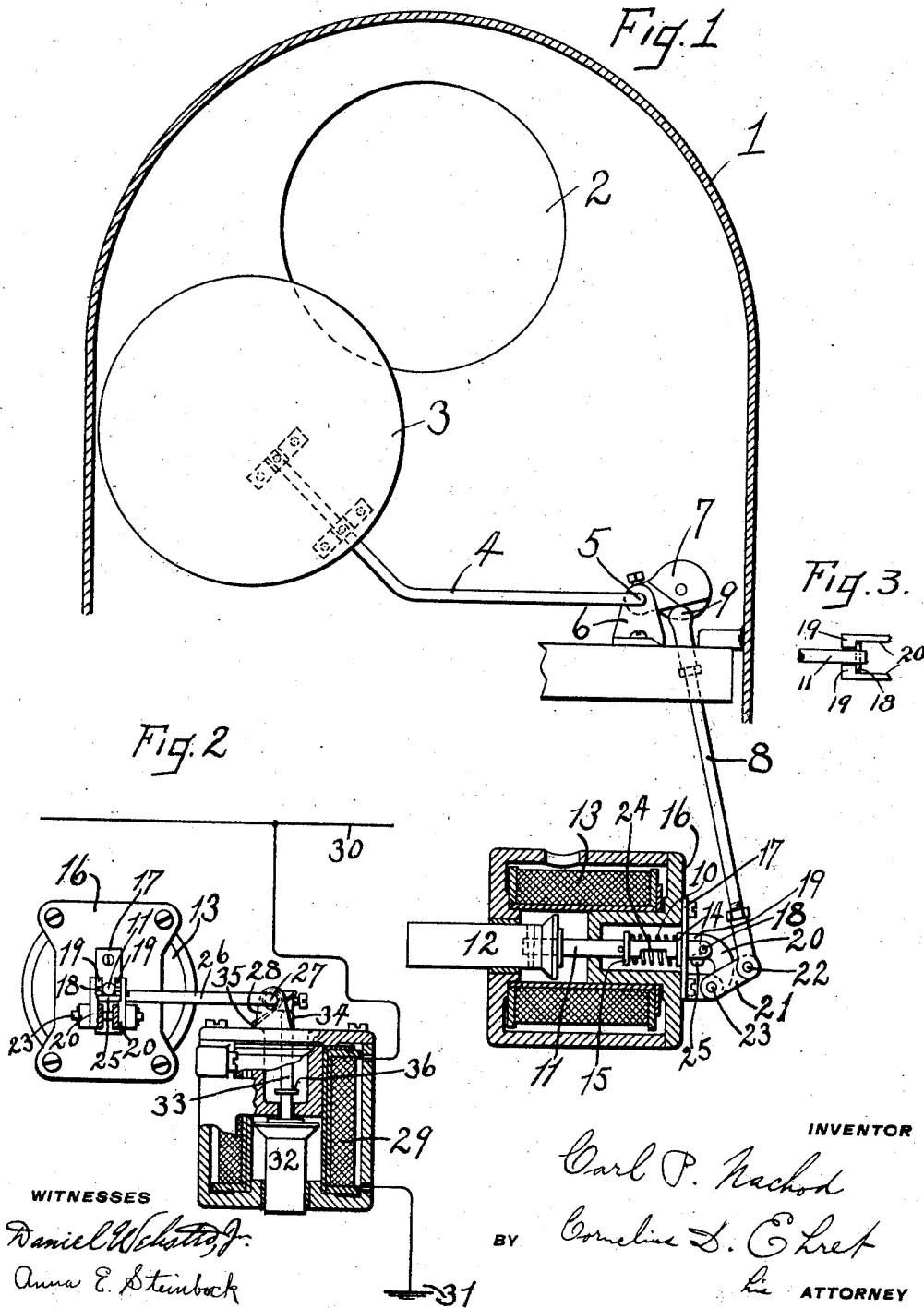


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 SIGNALING APPARATUS.
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UNITED STATES PATENT OFFICE.

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SIGNALING APPARATUS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARL P. NACHOD, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Signaling Apparatus, of which the following is a specification.

My invention relates to a signaling apparatus, and particularly to electric signaling apparatus for displaying a signal or signals for indicating the condition of a block or track of railway or kindred system.

More particularly my invention relates to means for controlling a disk or semaphore signal; and it relates further to the combination with a disk or semaphore controlling means, employed in connection with an electric railway system, of means for maintaining the signal in a desired condition upon the failure of voltage or power upon the electric railway system.

My invention resides in the features hereinafter described and claimed.

For an illustration of one of the forms my invention may take, reference is to be had to the accompanying drawing, in which:

Figure 1 is a vertical sectional view, some parts in elevation, of a disk or semaphore signal with its controlling means. Fig. 2 is a view illustrating the controlling means of Fig. 1 in combination with means for maintaining the parts in a desired position upon failure of power or voltage in an electric railway or other system. Fig. 3 is a fragmentary top plan view of a part of the signal controlling means.

In Fig. 1, a casing or box 1 is provided with an opening 2 at which a disk or other suitable signal 3 is adapted to be displayed. The disk or semaphore 3 is supported upon a rod 4 pivoted at 5 in a bracket 6, the rod 4 having attached thereto the weight 7 which is sufficient to move the disk or semaphore 3 in a clockwise direction about its pivot 5 to bring the same opposite the opening 2. The rod 8 engages with its upper end 9 upon the under side of the weight member 7 or in any suitable way with the weighted signal to hold it in the position shown, due to the force exerted by a spring as 10, such spring surrounding the rod 11 secured to the movable armature or core 12 of the electro-magnet having the winding 13. The spring 10 engages at its right hand end against the

stop 14 and at its left hand end against the disk 15 carried by the rod 11. The spring 10, therefore, normally pushes the rod 11 and the attached armature or core 12 toward the unattracted position, as shown in Fig. 1.

Upon the head 16 of the electro-magnet whose winding is 13, is a plate 17 through a perforation in which extends the rod 11 carrying at its outer end the transversely extending pin 18 disposed between the ears or lugs 19, 19 upon the levers 20, 20, said levers 20, 20 and their attached lever arms 21, 21 constituting a bell crank lever pivoted at 23. The arms 21, 21 are pivoted at 22 to the rod 8. The pin 18 is disposed in the path of travel of the ears or lugs 19, 19 and engages them, but is not secured thereto. The rod 11 is notched at 24 and in this notch is adapted to engage the outer end 25 of a rod 26, see Fig. 2, pivoted at 27 in a bracket 28 upon the top of the no-voltage magnet whose winding is 29. The winding 29 may be permanently connected between the trolley or other contact or feeder conductor 30 of an electric railway system and the ground or other return conductor 31, so that while power or voltage remains upon the system the magnet continues energized keeping its core or armature member 32 in the upper or attracted position, as shown in Fig. 2. Attached to the armature or core member 32 is an upwardly extending rod 33 which engages with its upper end 34 upon the under side of an extension of the rod 26 beyond or to the right of the pivot 27, a spring 35 engaging the rod 26 or its attachments in such manner as to keep its left hand end 25, as viewed in Fig. 2, raised. But when the magnet 29 is energized its core or armature member 32 is in the attracted position shown and, consequently, the rod 33 holds the end 25 of the rod 26 depressed against the opposition of spring 35. A pin or collar 36 upon the rod 33 limits the movement of the core or armature member 32 when the magnet 29 is deenergized, due to failure of power or voltage upon the system.

The operation is as follows: Normally the parts are in the position shown in the drawings. When, however, the magnet 13 is energized, in response to suitable control exercised by a moving car or train, its armature or core member 12 is attracted toward the right, as viewed in Fig. 1, against the opposition of spring 10. In consequence, the

pin 18 carried by the rod 11 is moved to the right away from the wings or branches 19 of the bell crank lever, in consequence, allowing the bell crank lever to rotate in a clockwise direction about its pivot 23, as viewed in Fig. 1, with consequent lowering or removal of the rod 8 from under the weight 7. Immediately the weight 7 acts upon the rod 4 and attached disk or semaphore 3 to rotate the disk 3 in a clockwise direction about its pivot 5, as viewed in Fig. 1, bringing the same in front of the opening 2 to give a signal display. If while in this position the voltage or power on the system should fail, the magnet 29 is deenergized with the result that its core or armature member 32 falls until limited by the pin 36. This action removes the rod 33 from engagement with the rod 26, whereupon the spring 35 raises the left hand end 25 of the rod 26, as viewed in Fig. 2, bringing such end into the notch 24 of the rod 11 of the magnet whose winding is 13, such notch 24 being, when the parts are in indicating position, outside of and to the right of the plate 17. The engagement of the end 25 in the notch 24 prevents the spring 10 moving the parts back to the position shown in Fig. 1, thereby preventing the raising of the rod 8 to move the disk 3 to the non-indicating position shown in Fig. 1.

By the construction shown, the signal is saved from any shock or jar incident to cases where the signal is moved by the energy of an electro-magnet. In this case the electro-magnet, when energized, simply removes a part which allows a weight to quickly and without jar move the disk or semaphore to indicating position.

This application is a division from my prior application Serial No. 457,520, filed October 13, 1908.

What I claim is:

1. The combination with a disk or semaphore, of a weight attached thereto for moving the same to one position, a member for holding said disk or semaphore in another position, a spring actuating said member to overcome said weight, and electro-magnetic means for overcoming said spring, whereby said weight moves said disk or semaphore.

2. The combination with a disk or semaphore, of a weight attached thereto for moving the same to one position, a member disconnected from said disk or semaphore and from said weight for holding said disk or semaphore in another position in opposition to said weight, a spring for actuating said member to overcome said weight, and electro-magnetic means for overcoming said spring, whereby said weight moves said disk or semaphore.

3. The combination with a disk or semaphore, of a weight attached thereto for moving the same to one position, said disk or

semaphore and said weight constituting a moving system, a member disconnected from but engaging said moving system to hold the same in opposition to said weight in another position, a spring for moving said member to overcome said weight, and electro-magnetic means for overcoming said spring, whereby said weight may move said moving system.

4. The combination with a circuit subjected to voltage fluctuations, of a disk or semaphore, a weight attached thereto for moving the same to one position, said disk or semaphore and said weight constituting a moving system, a rod engaging but disconnected from said moving system, an electro-magnet subjected to the voltage fluctuations of said circuit having an armature or core, and means movable with said armature or core for actuating said rod in one direction only.

5. The combination with a circuit subjected to voltage fluctuations, of a disk or semaphore, a weight attached thereto for moving the same to one position, said disk or semaphore and said weight constituting a moving system, a member engaging but disconnected from said moving system for moving the same, a second member actuating said member but disconnected therefrom, and electro-magnetic means subjected to the voltage fluctuations of said circuit for actuating said second member.

6. In an electric railway signaling system, the combination with a disk or semaphore, of a weight for moving the same to one position, said disk or semaphore and said weight constituting a moving system, a spring actuated member engaging but disconnected from said moving system to hold the same in another position, electro-magnetic means for controlling said member, and means responsive to failure of energy in said railway system for locking said member.

7. In a signaling system, the combination with a disk or semaphore, of means for moving the same to one position, said disk or semaphore and said means constituting a moving system, a member engaging but disconnected from said moving system to hold said disk or semaphore in another position, electro-magnetic means for causing disengagement of said member from said moving system, a lock for holding said member in disengaging position, and a normally energized electro-magnet for maintaining said locks inoperative.

8. The combination with a disk or semaphore, of means for moving the same to one position, said disk or semaphore and said means constituting a moving system, a member engaging but disconnected from said moving system to hold said disk or semaphore in another position, electro-responsive means for causing disengagement of said member from said moving system,

a lock biased toward position for locking said electro-responsive means, and further electro-responsive means engaging but disconnected from said lock to hold said lock normally inoperative.

9. The combination with a disk or semaphore, of a weight for moving said disk or semaphore, said disk or semaphore and said weight constituting a moving system, a member adapted to engage but disconnected from said moving system, a spring actuated member engaging said member in one direction only to overcome said weight, and electro-magnetic means for actuating said spring actuated member in the opposite direction.

10. The combination with a disk or semaphore biased toward a predetermined position, of a motive device operating with constant force and in one direction only upon said disk or semaphore to hold the same in another position, and means operating with varying forces in opposition to and overcoming said motive device, whereby said disk or semaphore moves to said predetermined position.

11. The combination with a disk or semaphore biased toward a predetermined position, of a motive device operating with constant force and in one direction only upon said disk or semaphore to hold same in another position, and an electro-magnet operating with varying forces in opposition to and overcoming said motive device, whereby said disk or semaphore moves to said predetermined position.

12. The combination with a circuit subjected to voltage fluctuations, of a disk or semaphore, means biasing the same toward one position, a member disconnected from said disk or semaphore normally overcoming said means to hold said disk or semaphore in another position, and electro-magnetic means subjected to the voltage fluctuations of said circuit for overcoming said member.

13. The combination with a circuit subjected to voltage fluctuations, of a disk or semaphore, means biasing the same toward one position, a member disconnected from said disk or semaphore normally overcoming said means to hold said disk or semaphore in another position, a second member actuating but disconnected from said member, and electro-magnetic means subjected to the voltage fluctuations of said circuit for actuating said second member.

14. The combination with a disk or semaphore, of means for biasing the same toward one position, a member disconnected from but engaging said means, and a second member disconnected from but adapted to actuate said member in such direction as to move said disk or semaphore to another position in opposition to said biasing means.

15. The combination with a circuit sub-

jected to voltage fluctuations, of a disk or semaphore, means for biasing the same toward one position, a member disconnected from but engaging said means, a second member disconnected from but adapted to actuate said member to move said disk or semaphore to another position, and electro-magnetic means subjected to the voltage fluctuations of said circuit for overcoming said second member.

16. The combination with a disk or semaphore biased toward a predetermined position, of a spring disconnected from but acting in one direction only upon said disk or semaphore to hold the same in another position, and an electro-magnet operating with varying forces in opposition to and overcoming said spring, whereby said disk or semaphore moves to said predetermined position.

17. The combination with a circuit subjected to voltage fluctuations, of a disk or semaphore, a motive device for moving the same to one position, a second motive device disconnected from said first named motive device, said second motive device overcoming said first named motive device by movement in one direction only, and electro-magnetic means subjected to the voltage fluctuations of said circuit for overcoming said second motive device.

18. The combination with a circuit subjected to voltage fluctuations, of a disk or semaphore, a motive device for moving the same to one position, a second motive device disconnected from said first named motive device, said second motive device overcoming said first named motive device by movement in one direction only, and electro-magnetic means subjected to the voltage fluctuations of said circuit for overcoming said second motive device, the movement of said second motive device when overcome by said electro-magnetic means being in direction to free said first named motive device.

19. The combination with a disk or semaphore, of a motive device acting thereon with constant force, a second motive device disconnected from said disk or semaphore and said motive device and acting with constant force in opposition to said first motive device to hold said disk or semaphore in a predetermined position, and means subjected to varying forces actuating said second motive device to free said first motive device, whereby said first motive device moves said disk or semaphore to another position.

20. The combination with a disk or semaphore, of a motive device acting thereon with constant force, a second motive device disconnected from said disk or semaphore and acting with constant force in opposition to said first motive device and normally overcoming the same, and means exerting varying forces overcoming said second mo-

tive device to free said first motive device, whereby said disk or semaphore is thereafter actuated by said first motive device.

21. In an electrical railway signaling system the combination with a disk or semaphore biased toward a predetermined position, of a motive device disconnected from said disk or semaphore and acting thereon with constant force independent of the current conditions in said system for holding said disk or semaphore in another position, and means exerting varying forces dependent upon the current conditions in said system overcoming said motive device, whereby said disk or semaphore is free to move to said predetermined position.

22. The combination with a disk or semaphore biased toward a predetermined position, of an energy storing device disconnected from and adapted to act with constant force in one direction only upon said disk or semaphore to move the same to another position, and an electro-magnet exerting varying forces upon and storing energy in said device.

23. The combination with a disk or semaphore biased toward a predetermined position, of an electro-magnet exerting varying forces when energized, and an energy storing member receiving energy from said electro-magnet and adapted to act with constant force upon said disk or semaphore to move the same to another position when said electro-magnet is deenergized.

24. The combination with a disk or semaphore, of a weight attached thereto for mov-

ing the same to one position, a member disconnected from said weight and semaphore but adapted to move the same in one direction only, a lever pivoted to said member, and a second member disconnected from but adapted to engage and actuate said lever in one direction only.

25. The combination with a disk or semaphore, of a weight attached thereto for moving the same to one position, a member disconnected from said weight and semaphore but adapted to move the same in one direction, a lever pivoted to said member, a second member disconnected from but adapted to engage and actuate said lever in one direction only, and a spring for actuating said second member.

26. The combination with a disk or semaphore, of a weight attached thereto for moving the same to one position, a member disconnected from said weight and semaphore but adapted to move the same in one direction, a lever pivoted to said member, a second member disconnected from but adapted to engage and actuate said lever in one direction only, a spring for actuating said second member, and electro-magnetic means for overcoming said spring.

In testimony whereof I have hereunto affixed my signature in the presence of the two subscribing witnesses.

CARL P. NACHOD.

Witnesses:

ELEANOR T. McCALL,
ANNA E. STEINBOCK.