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D. H. COKER & W. A. SCARBROUGH.

RAILWAY BLOCK SIGNAL.

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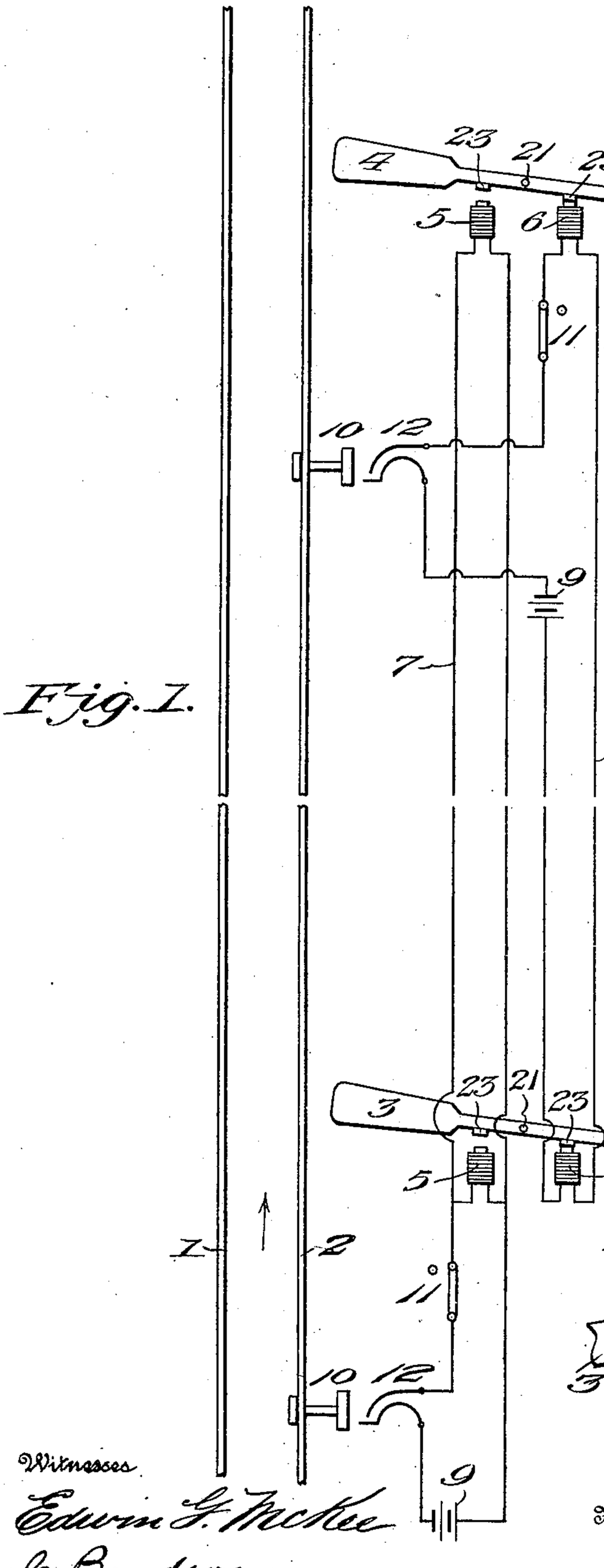


Fig. 1.

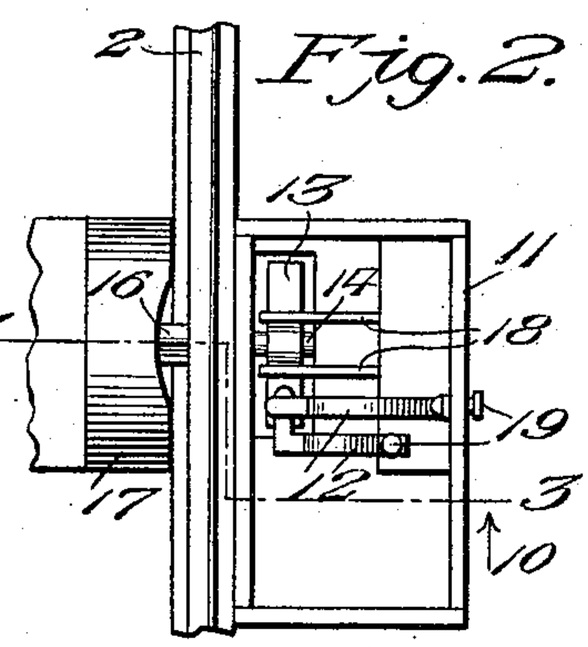


Fig. 2.

Fig. 3.

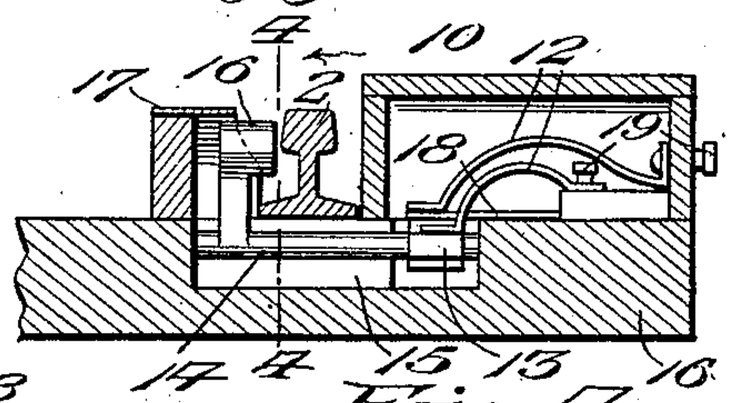


Fig. 4.

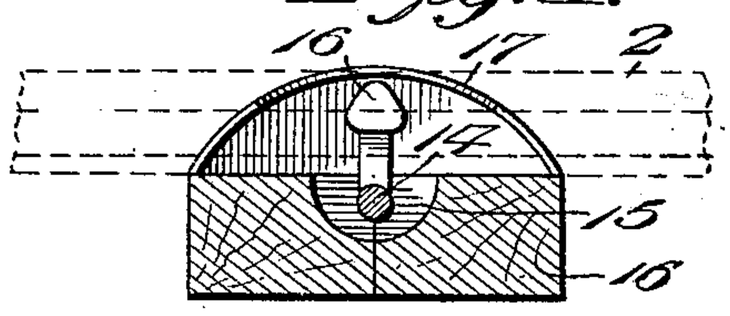


Fig. 5.

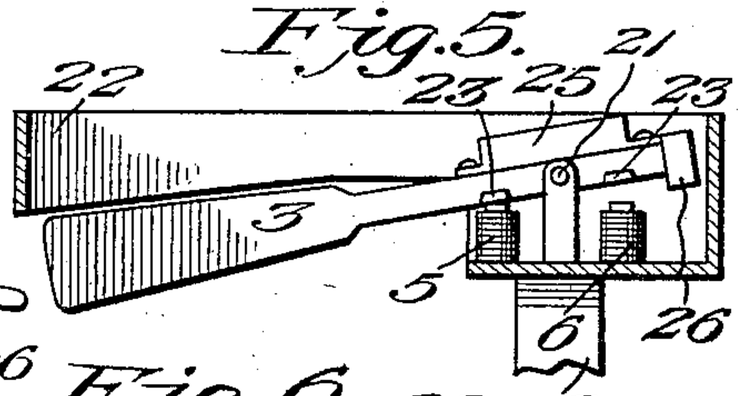
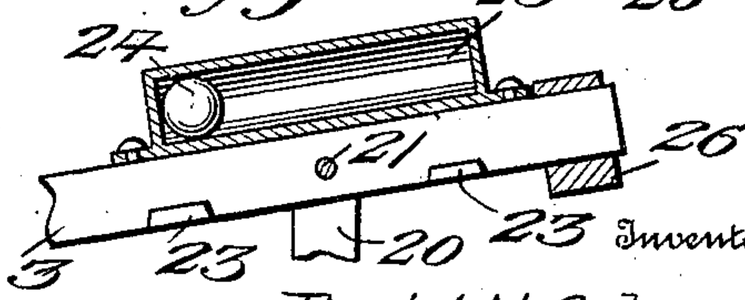


Fig. 6.



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RAILWAY BLOCK-SIGNAL.

No. 886,947. Specification of Letters Patent. Patented May 5, 1908.

Application filed April 3, 1907. Serial No. 366,151.

To all whom it may concern:

Be it known that we, DAVID H. COKER and WHITFIELD A. SCARBROUGH, citizens of the United States, residing at Piedmont and Choccolocco, respectively, in the county of Calhoun and State of Alabama, have invented new and useful Improvements in Railway Block-Signals, of which the following is a specification.

This invention relates to a railway block signal system of that type in which semaphores or other signals at the ends of a block are dropped or actuated automatically as the train enters the block and are raised or thrown to inoperative position as the train leaves the block.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character so as to be comparatively easy and inexpensive to manufacture, operate and keep in repair, thoroughly and reliable and efficient in use and entirely automatic in operation.

A further object of the invention is the provision of a semaphore or other signal at each end of a block and the employment of electro magnets arranged to simultaneously actuate the semaphores to signaling position as the train enters the block and to simultaneously throw the semaphores to non-signaling position as the train leaves the block.

A further object of the invention is to provide a simple form of switch actuating mechanism adapted to be operated by the car wheels passing over the railroad track.

A still further object is the employment of means in connection with the semaphore for assisting the electro magnets in operating the latter and holding the semaphore in either extreme position.

With these objects in view and others as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawing which illustrates one of the embodiments of the invention, Figure 1 is a diagrammatical view of the block signal system. Fig. 2 is a plan view of one of the automatic switches at the ends of the block. Fig. 3 is a vertical section on line 3—3, Fig. 2. Fig. 4 is a vertical section on line 4—4, Fig. 3. Fig. 5 is a sectional view of one of the semaphores anh associated parts. Fig. 6 is a detail sectional view of a portion of a semaphore.

Similar reference characters are employed to designate similar parts throughout the several views.

In the present instance, I have elected to illustrate the block signaling system applied to a single track, as for instance, of a double track railroad with the semaphores or signals on one side of the track, but it is to be understood that the invention is not necessarily limited to this particular arrangement.

Referring to the drawing, 1 and 2 designate the rails of the track which are divided into sections of any desired length that are equipped with block signaling apparatus. At the ends of each section of blocks are arranged semaphores or other suitable signals 3 and 4 that are adapted to be simultaneously actuated to a signaling position as a train enters the block and to be actuated to a non-signaling position as the train passes out of the block. The semaphores are operated by separate electro magnets 5 and 6 included in independent circuits which are closed separately as a train enters and leaves the block. The electro magnets 5 and 6 are arranged in multiple relation in their respective circuits 7 and 8 and in each circuit is included a battery 9 and an automatically actuated switch 10 which opens and closes the circuit by the wheels of a train passing into and out of the block.

With a system constructed in this manner, the circuit 7 is closed by a train passing in the direction indicated by the arrow in Fig. 1, thus simultaneously energizing the electro magnets 5 to throw the semaphores 3 and 4 into signaling position, the latter in front of the train and at the leaving end of the block and the former at the rear of the train or entering end of the block. As the train passes out of the block, the switch 10 of the circuit 8 is closed so that the electro magnets 6 are energized and the semaphores returned to non-signaling position to indicate that the block is open. In each circuit is a manually controlled switch 11 whereby the circuits can be opened when a train is to be run into the block and backed out again without passing through, thus preventing the semaphore from being actuated.

Referring more particularly to Figs. 2 and 4, each automatic switch 10 comprises a cas-

ing 11 suitably supported on one of the cross ties of the track and inclosing spring contacts 12 that are normally held out of engagement by their own tension and brought into contact by a head 13 on a rock-shaft 14 journaled in the chamber 15 of the tie 16 and disposed under the rail 2, as shown clearly in Fig. 3, and on the shaft 14 and disposed at the side of the rail opposite from the switch casing is a shoe or arm 16 disposed in such proximity to the head of the rail as to be depressed by the flanges of the car wheels passing over the latter. Disposed over the shoe 16 is a shield 17 that serves to exclude dirt and other matter from the actuating mechanism. The shoe 16 is held in normal position by springs 18 suitably secured in the casing 11 and bearing on the head 13 at opposite sides of the shaft 14. The contacts 12 are suitably insulated and provided with binding posts 19 for connection in the semaphore circuits. As the shoe 16 of the automatic switch is depressed by the car wheels, the contacts 12 are brought into engagement by the rocking of the head 13 so that the electric circuit is completed. Each wheel of the cars actuates the shoe 16 so that there is a making and breaking of the circuit at rapid intervals since the springs 18 return the shoe to normal position as soon as a wheel passes over the same.

The semaphores 3 and 4 are in practice mounted at the sides of the track in any suitable manner as for instance in posts, one of which is designated by 20 in Fig. 5. On the post, the semaphore is fulcrumed at 21 in a housing 22, and arranged in the housing under the semaphore and at opposite sides of the fulcrum of the latter are the electro magnets 5 and 6 and on the semaphore are armatures 23 coöperating with the cores of the electro magnets.

In order to assist the electro magnets in operating the semaphore, a ball or other suitable means 24 is arranged in a casing or holder 25 carried on the semaphore and extending in equal distance on opposite sides of the fulcrum 21. The long arm of the semaphore is counterbalanced by a weight 26 and the ball 24 serves to insure the tilting of the semaphore by rolling from one end of the casing 25 to the other after the electro magnets have initially moved the semaphore to such an extent as to disturb the equilibrium of the ball or weight 24. In other words, after either electro magnet has moved the semaphore slightly past a horizontal position, the ball 24 rolls to the opposite end of the casing at an accelerated rate of speed and causes the semaphore to suddenly move to its final position. It will thus be seen that the semaphores are extremely sensitive and reliable in operation.

I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, but I desire to have it understood that the apparatus shown is merely illustrative and that changes can be made when desired as are within the scope of the claims.

Having thus described the inventiom, what I claim is:—

1. In a block signaling system, the combination of a semaphore fulcrumed for swinging movement, electro magnets disposed under the semaphore and arranged at opposite sides of the fulcrum of the semaphore, armatures carried by the semaphore and disposed above the electro magnets, said electro magnets forming stops for limiting the movement of the semaphore in either direction, and a movable body carried by the semaphore and movable to one side or the other of the fulcrum point for holding the semaphore into either signaling or non-signaling position.

2. In a block signaling system, the combination of a track, automatically closed switches disposed at suitable points along the track, separate normally open circuits controlled by the switches, a source of current provided in each circuit a manually controlled switch in each circuit adjacent the automatic switch thereof, a semaphore adjacent each automatic switch, a weight supported on the semaphore for free movement to one side or the other of the fulcrum of the semaphore, and means carried by the semaphore and movable therewith for holding the weight in place electro magnets disposed on opposite sides of the fulcrum points of the semaphores and having their armatures mounted directly on the latter, and means for connecting the corresponding electro magnets in the separate circuits to simultaneously throw the semaphores into signaling position when one circuit is closed and into non-signaling position when the other circuit is closed.

3. In a block signaling system, the combination of a semaphore fulcrumed for a swinging movement, alternately actuated electro magnets disposed on opposite sides of the fulcrum point to swing the semaphore in opposite directions, separately controlled circuits connected with the electro magnets, a weight movable on the semaphore from one side of its fulcrum to the other, and means for holding the weight on the semaphore.

4. In a block signaling system, the combination of a semaphore fulcrumed for a swinging movement, separate means for tilting the semaphore in opposite directions, and a device carried entirely by and movable with the semaphore to assist the said means.

5. In a block signaling system, the combination of a semaphore fulcrumed for a swinging movement, electro magnets having armatures disposed on opposite sides of the fulcrum point, a casing fixed on the semaphore

extending to opposite sides of the fulcrum points, and a movable body in the casing for assisting in the tilting of the semaphore.

6. In a block signaling system, the combination of a support, a housing thereon, a semaphore fulcrumed in the housing, electro magnets having their armatures attached to the semaphore on opposite sides of the fulcrum point, a counterbalance weight on the semaphore, a holder secured to the semaphore and extending to opposite sides of the fulcrum point, and a movable body in the holder for assisting the electro magnets in tilting the semaphore.

In testimony whereof, we affix our signatures in presence of two witnesses.

DAVID H. COKER.
WHITFIELD A. SCARBROUGH.

Witnesses:
H. F. MONTGOMERY,
A. SHARPE STEWART.