

W. K. HOWE.
ELECTRIC SEMAPHORE SIGNAL FOR RAILWAYS.
APPLICATION FILED MAY 26, 1910.

1,019,046.

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Fig. 1.

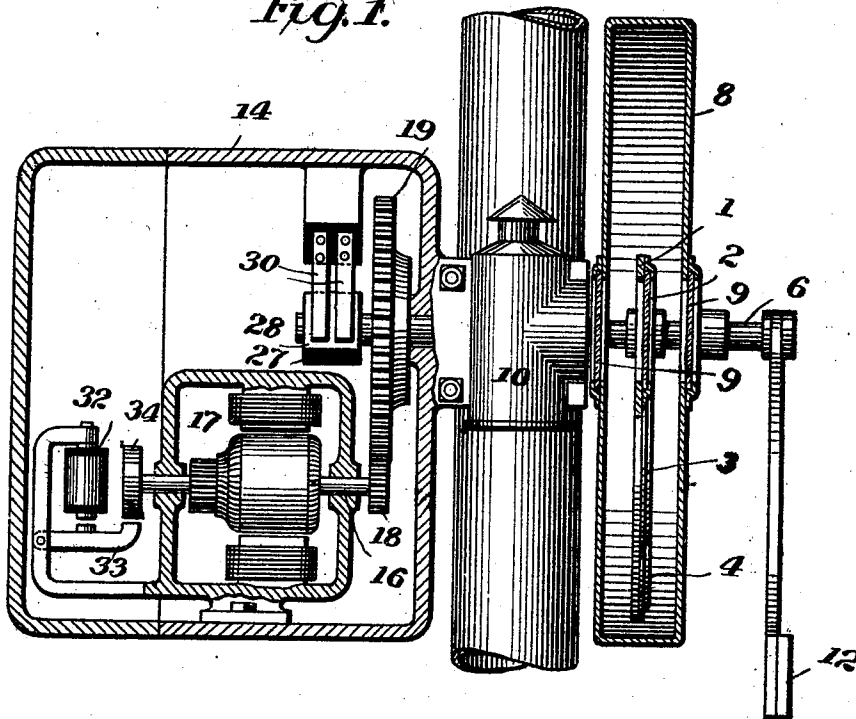


Fig. 2.

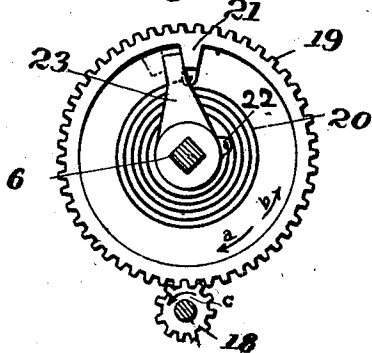
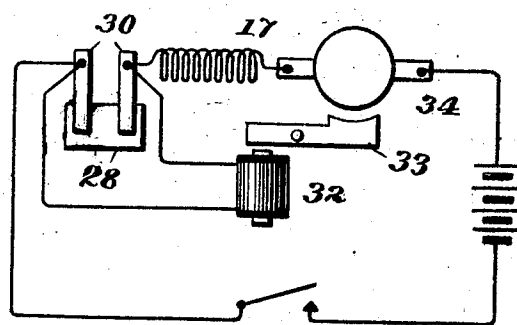


Fig. 3.



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Witnesses

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UNITED STATES PATENT OFFICE.

WINTHROP KEITH HOWE, OF ROCHESTER, NEW YORK, ASSIGNOR TO GENERAL RAILWAY SIGNAL COMPANY, OF GATES, NEW YORK, A CORPORATION OF NEW YORK.

ELECTRIC SEMAPHORE-SIGNAL FOR RAILWAYS.

1,019,046.

Specification of Letters Patent.

Patented Mar. 5, 1912.

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To all whom it may concern:

Be it known that I, WINTHROP K. HOWE, a citizen of the United States, residing at Rochester, county of Monroe, and State of New York, have invented certain new and useful Improvements in Electric Semaphore-Signals for Railways, of which the following is a specification.

This invention relates to electric semaphore signals for railways.

One object of my invention is to provide a mechanism which will insure the return of the semaphore arm from the "proceed" position to the "stop" position when the electric energy is withdrawn.

Much trouble has been experienced in the operation of semaphore signals by the occasional failure of the semaphore blade and spectacle to return by gravity to the stop or danger-indicating position after the power employed to move it to the "proceed" position has been removed. This is sometimes occasioned by the binding of the operating shaft in its bearings, but is more frequently due to the collection of sleet or ice upon the exposed parts.

It is the purpose of my invention to insure the proper return movement of the semaphore parts under all circumstances whenever the operating power carrying it to "proceed" position has been withdrawn.

For the purpose of lessening the opportunity for the collection of sleet or ice, I preferably inclose the spectacle portion in a casing and secure the semaphore blade to the end of a shaft projecting through the casing. To overcome any binding of the operating shaft or any locking of the blade due to sleet or ice, I provide means for delivering a strong torsional hammer blow upon the shaft carrying the spectacle and blade which will be sufficient to free the operating parts and start them under the action of gravity.

My invention will be more clearly understood from the following description, taken in connection with the accompanying drawings, in which,—

Figure 1 is a vertical section through the casings, showing the operating parts of a semaphore signal mechanism embodying my invention; Fig. 2 is a detail view of the parts designed to produce the hammer blow to the shaft carrying the spectacle and blade; and

Fig. 3 is a diagram showing the manner of connecting the electrical circuits.

The spectacle casting 1, carrying the red, green, and white disks or roundels, 2, 3, 4, is mounted upon the operating shaft 6, and is completely inclosed in the casing 8, which is provided with opposite transparent disks 9, which are illuminated by the lamp 10. One end of the shaft 6 carries the semaphore blade 12, while the other end is operatively connected to the motor mechanism, which is inclosed in a suitable casing 14.

The armature shaft 16 of the operating electric motor 17, carries a pinion 18 which meshes with a gear 19, loosely mounted upon the shaft 6, and connected therewith by means of a coiled spring 20, one end of the spring being secured to a lug 21 on the gear, and the other end to a lug 22, projecting from an arm 23, rigidly mounted upon the shaft. It will be apparent that the rotation of the motor in the direction of the arrow *c* will first cause the gear to rotate in the direction of the arrow *a* until the lug 21 moves from the position shown in full lines to the dotted line position, thereby winding up the coiled spring 20, and finally engaging the end of the arm 23. Further rotation of the motor armature causes the operating shaft 6 to rotate and carry the spectacle and the semaphore blade to the position indicating "clear" or to the "proceed" position.

The inner end of the shaft 6 carries an insulating disk 27, having a contact strip 28 thereon, which engages the switch contacts or fingers 30, except when the parts have been moved to the "proceed" position, at which time the contacts rest upon the insulation of the disk.

By referring to Fig. 3, showing the diagram of circuits, it will be observed that when the contacts 30 bear upon the strip 28, the brake magnet 32 is short-circuited and the brake shoe 33 is free from the brake disk 34. When, however, the contacts pass from the strip 28 and rest upon the insulating disk 27, the magnet 32 is energized and causes the brake shoe 33 to engage the disk 34. This occurs when the semaphore blade and spectacle have been moved to the "proceed" position by the motor 17, at which time the brake holds the parts in position and the current through the motor circuit

is decreased by the resistance of the magnet 32 inserted in series therewith. When the current is cut off, as by the short-circuiting of the signaling current by means of the wheels and axles of a car or train entering the block-section, both the brake magnet 32 and the motor 17 will be deenergized, and the parts, *i. e.*, the spectacle casting 4, semaphore blade 12, and arm 23 on shaft 6, being entirely unrestrained, will move under the action of gravity and in the direction indicated by the arrow *b* to "danger" position, the gear 19, with the lug 21 thereon, making a corresponding movement in the same direction. If, however, the parts are held by ice or sleet, as previously explained, the rotation of the gear under action of the spring 20 in the direction indicated by the arrow *b* will cause the lug 21 to impart a hammer blow to the arm 23, the shock of the impact breaking up the ice and sleet connection. From the above it will be seen that the hammer blow is only imparted in case the freedom of movement of the parts on shaft 6 is restrained.

From the foregoing description it will be apparent that I have reduced to a minimum the danger of any failure of the semaphore to return to "danger" position from the "proceed" position, the several features of my invention contributing to this result. By separating the blade from the spectacle and inclosing the latter in a casing, the surface exposed to sleet and ice is very materially reduced, and providing for the delivery of a sudden blow to the operating shaft in the event of any restraint, the chances of failure in the operation of the signal are practically eliminated.

I have described somewhat in detail the particular construction illustrated in the drawings, but it will be evident to engineers that various changes may be made therein without departing from the spirit of my invention.

I therefore claim:

1. In a semaphore signal, a shaft carrying a semaphore blade, means for actuating said shaft and blade against the action of gravity and means for imparting a hammer blow to said shaft in the direction of the action of gravity when said first named means is not acting.

2. In a semaphore signal, operating parts, means for storing energy during the normal movement of the operating parts thereof,

and means for causing said stored energy to deliver a sudden blow to the parts when restrained by extraneous means.

3. In a semaphore signal, a shaft carrying a semaphore blade, operating mechanism therefor, means for storing energy during the normal movement of said mechanism and means for causing said stored energy to deliver a sudden blow to the shaft when the same is restrained by extraneous means.

4. In a semaphore signal, a shaft carrying a semaphore blade, operating mechanism therefor, means intermediate said mechanism and said shaft for storing energy during the normal movement of said mechanism, and means for causing said stored energy to deliver a sudden blow to the shaft when the same is restrained by extraneous means.

5. In a semaphore signal, a shaft carrying a semaphore blade, a motor for moving said blade to "clear" position, a brake device to hold the parts in said position, means for storing energy, and means for causing said stored energy to deliver a hammer blow to the operating parts upon the release of the brake, when said shaft is restrained from free movement.

6. In combination with a semaphore signal, means for moving the signal against the action of gravity and means for imparting a blow in the direction of the action of gravity when said signal is free to move under the action of gravity.

7. In combination with a semaphore signal blade, means for moving said signal against the action of gravity, means for holding said blade in a defined position and means for imparting to said signal a blow in the direction of the action of gravity when said holding means is released.

8. In combination with a semaphore signal, a shaft therefor, a lug on said shaft, means for rotating the shaft and for moving the signal against the action of gravity and means for imparting a hammer blow to said lug to thereby assist gravity to move the signal to its normal position.

In testimony whereof, I affix my signature, in the presence of two witnesses.

WINTHROP KEITH HOWE.

Witnesses:

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