

W. W. BROWN.
SEMAPHORE SIGNAL.

APPLICATION FILED MAR. 21, 1907.

1,038,278.

Patented Sept. 10, 1912.

2 SHEETS—SHEET 1.

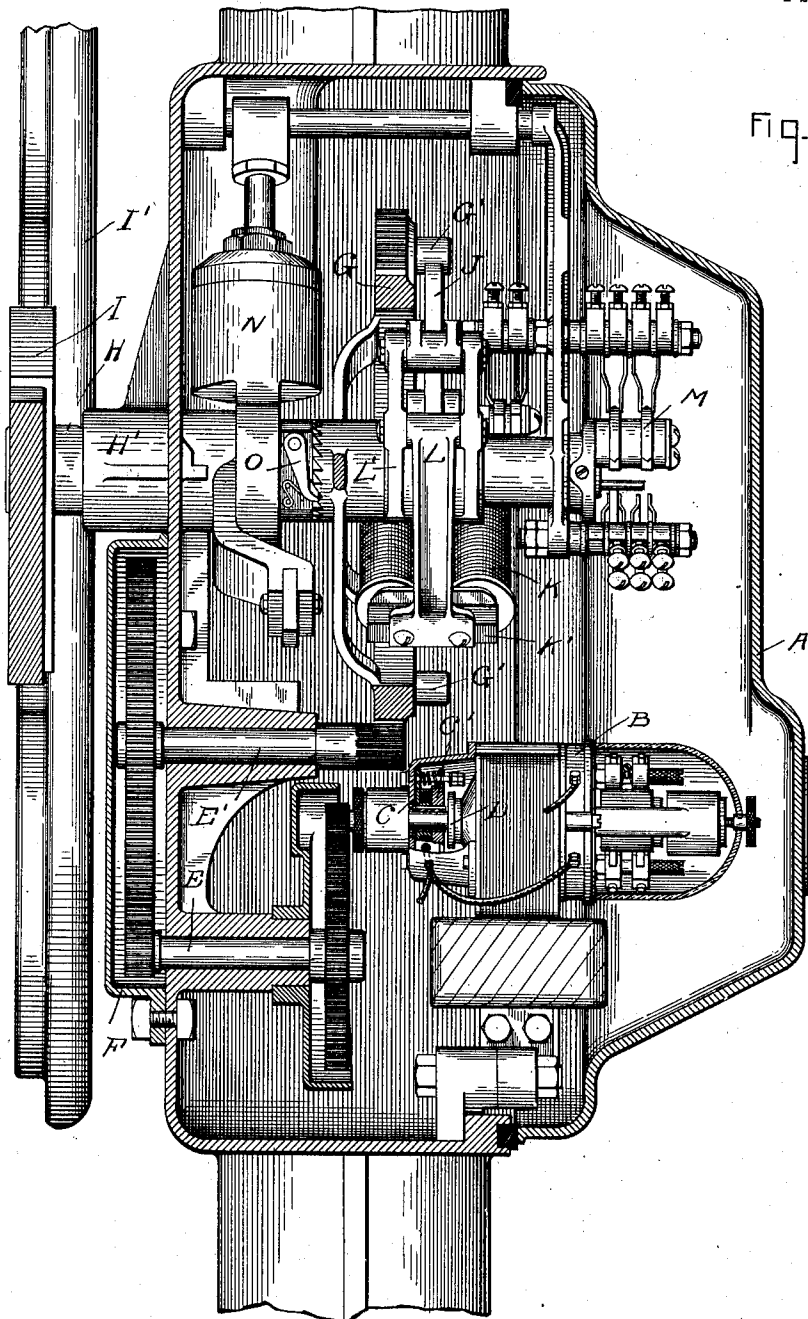


Fig. 1.

WITNESSES

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INVENTOR
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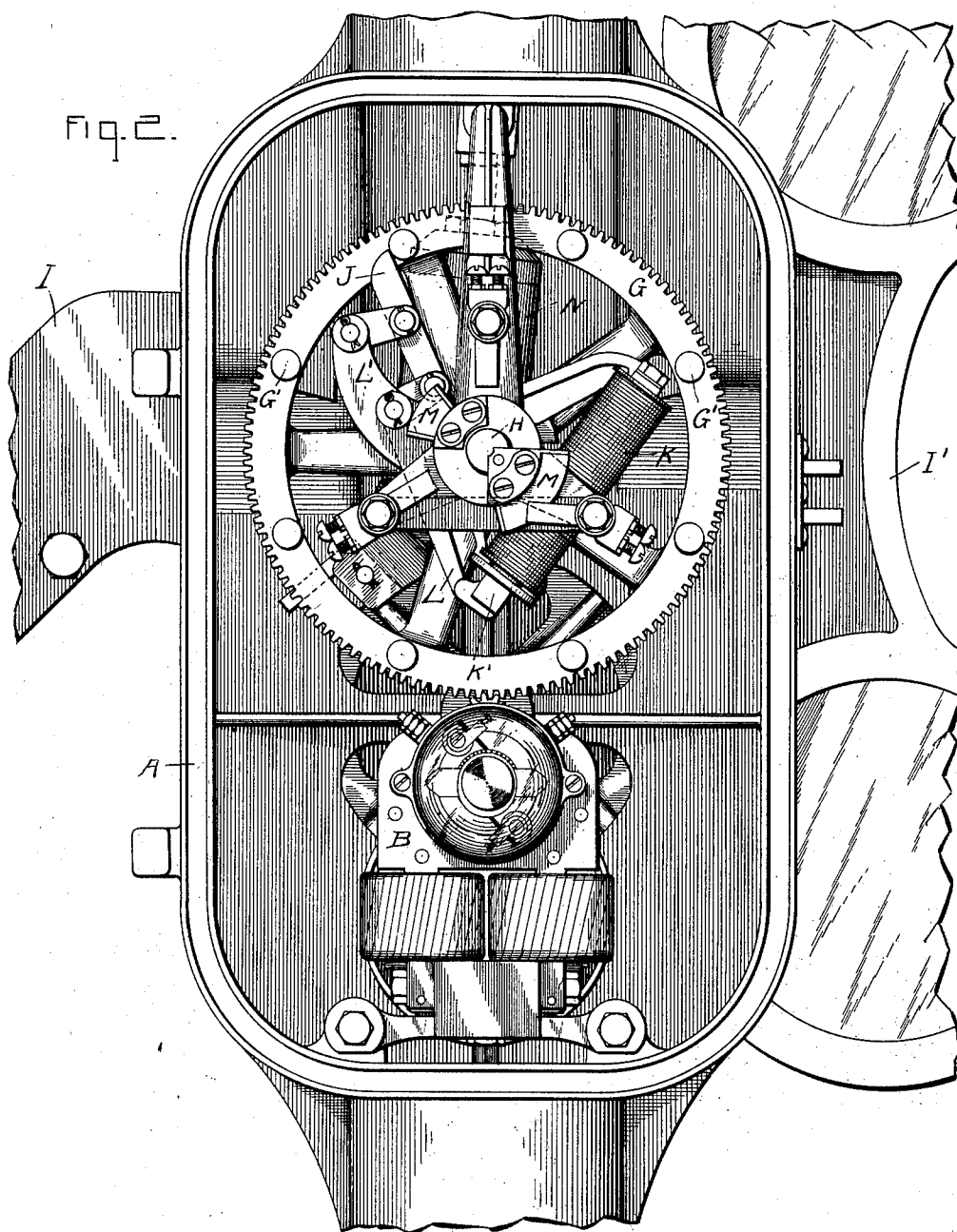
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

WALTER W. BROWN, OF SCHENECTADY, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNION SWITCH AND SIGNAL COMPANY, A CORPORATION OF PENNSYLVANIA.

SEMAPHORE-SIGNAL.

1,038,278.

Specification of Letters Patent.

Patented Sept. 10, 1912.

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To all whom it may concern:

Be it known that I, WALTER W. BROWN, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Semaphore-Signals, of which the following is a specification.

My invention relates to semaphore signals, and particularly to the type known as top-post signals, in which the operating mechanism is inclosed in a casing surrounding the semaphore shaft; though my invention is not necessarily limited to this type of signal.

The object of my invention is to provide an exceedingly compact and economical structure, which is reliable and efficient in operation.

It is frequently desirable to provide means for preventing the movement of a signal from danger to clear position, except when it is driven by the motor; since, if the counter-weight alone is relied upon for holding the signal at danger, it may be carried to clear position by tampering or by the accumulation of snow or ice on the semaphore-arm. I secure the desired result by providing means for permitting a relative movement of the semaphore-arm and driving mechanism in one direction only, with a brake for preventing all movement of the driving means except when the motor is operated. In order to permit the relative movement of semaphore-arm and driving mechanism in one direction only, I make use of a pawl and ratchet device connecting the two, which may be added to a standard mechanism without increasing the space required, and without materially increasing the cost.

In an electrically-operated signal it is ordinarily necessary to provide between the motor and signal-arm speed-reducing gearing comprising one or more intermediate shafts. For supporting these shafts, frames, standards, or brackets, within the casing have heretofore been employed. These occupy considerable space and increase the size and cost of the signal. One feature of my invention consists in journaling the intermediate gear-shafts in the wall of the casing itself, with one gear of each shaft inside and the other outside the casing. I further provide a gear-case for the gears

outside the casing, so as to protect them from the weather.

My invention will best be understood by reference to the accompanying drawings, in which—

Figure 1 shows a side elevation, with the casing in cross-section, of a signal mechanism arranged in accordance with my invention; and Fig. 2 shows a back elevation of the same.

In the drawings A represents an inclosing casing in which is mounted an electric motor B. This motor is provided with an electric brake C, the coil of which is connected in series with the motor, as indicated in Fig. 1. All the parts in the drawing are shown in the positions which they occupy when the motor is in the act of driving the semaphore-arm from danger to clear, so that the brake-coil C is shown energized, attracting its armature C', and holding it away from the brake-disk D on the motor shaft. When the motor circuit is broken, the armature C' is released and is pressed by its springs into engagement with the brake-disk D. Consequently, whenever the motor is de-energized, all parts that are geared to it are held fast by the brake.

The motor shaft carries a pinion which engages a gear on an intermediate shaft E. This shaft is journaled in a stud or boss formed in the wall of the casing itself, and carries a pinion at its end outside the casing. This pinion engages a gear on a second intermediate shaft E', which is similarly journaled in the wall of the casing and carries a pinion inside the casing. A gear-case F covers the gear and pinion outside the casing, and protects them from the weather. By means of this construction the necessity for supporting-standards or brackets inside the casing is avoided, and the size and cost of the signal reduced.

The pinion on the intermediate shaft E' engages gear-teeth on the periphery of a drive-wheel G, which is loosely mounted on the shaft H which is journaled in a boss H' in the wall of the casing and carries the signal-arm I and its counter-weight or spectacle-casting I'. For driving the signal to clear position the drive-wheel G is clutched to the shaft H by a slot mechanism comprising a locking piece J, adapted to engage projecting studs G' at the periphery of the drive-wheel, controlled by the actuating

magnets K by means of a bell-crank lever L, which is pivoted on an arm L' fast to the shaft H, and which carries at the end of its long arm an armature K' for the magnets K, and at the end of its short arm is connected to the locking piece J. When armature K' is attracted by the magnets K, as shown in the drawings, the locking piece J is thrust outward into the path of the studs G', one of which is shown in engagement with the driving piece, so as to drive the shaft H. When the magnets are de-energized, the armature K' falls away, withdrawing the locking piece J, so as to disengage the shaft from the drive-wheel, and to allow the signal to go to danger.

M represents contacts carried at the inner end of shaft H, controlling the circuits of the motor and slot-magnets in a manner well understood in the art. The connections of these contacts are not shown in the drawings. N represents a dash-pot for retarding the movement of the signal when it is carried to danger by its counter-weight.

In order to prevent the signal-arm from being carried to clear position from any cause, except when the motor is operating, I provide a spring-pressed pawl O on the shaft H, and ratchet-teeth on the hub of the drive-wheel G adapted to be engaged by the pawl. When the motor is operating to drive the signal to clear, as shown in the drawings, the rotation of the drive-wheel G for this purpose being counter-clockwise, as viewed in Fig. 2, the ratchet and pawl are inoperative, since they are carried along together by the engagement between the locking piece J and a stud G' on the drive-wheel. When the slot-magnets K are de-energized to allow the signal to go to danger, the pawl and ratchet device still remains inoperative, since the rotation of the shaft, when the signal is moved toward danger position, is clockwise, as viewed in Fig. 2, so that the pawl O slips idly over the ratchet-teeth. But as soon as the signal reaches danger position it is locked there by the pawl O, which prevents any movement of the semaphore-arm relative to the drive-wheel in the opposite direction, while the drive-wheel is prevented from all movement whatever by the brake on the motor shaft,

which is now released by its coil. Consequently the semaphore-arm is locked at danger position, and cannot be moved to clear until the motor is energized to drive it; at which time the brake-coil C is energized and the drive-wheel G driven by the motor. It will be noted that the ratchet and pawl device employed adds nothing to the space required and very little to the cost of the apparatus.

I do not desire to limit myself to the particular construction and arrangement of parts here shown, but aim in the appended claims to cover all modifications which are within the scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In a semaphore signal, a semaphore-arm, a driving member, a slot mechanism for clutching said member to said arm, means for preventing relative movement of said arm and member in one direction only, a driving motor for said member, a brake for said member, and means for rendering said motor and said brake alternately operative.

2. In a semaphore signal, a drive-shaft, a semaphore-arm carried thereby, a driving member loose on said shaft, a slot mechanism for clutching said member to said shaft, means for preventing relative movement of said shaft and member in one direction only, a driving motor for said member, a brake for said member, and means for rendering said motor and said brake alternately operative.

3. In a semaphore signal, a drive-shaft, a semaphore-arm carried thereby, a driving member loose on said shaft, a slot mechanism for clutching said member to said shaft, a ratchet and pawl device connecting said member to said shaft, a driving motor for said member, and means for preventing the movement of said member except when the motor is operating.

In witness whereof, I have hereunto set my hand this 20th day of March, 1907.

WALTER W. BROWN.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.