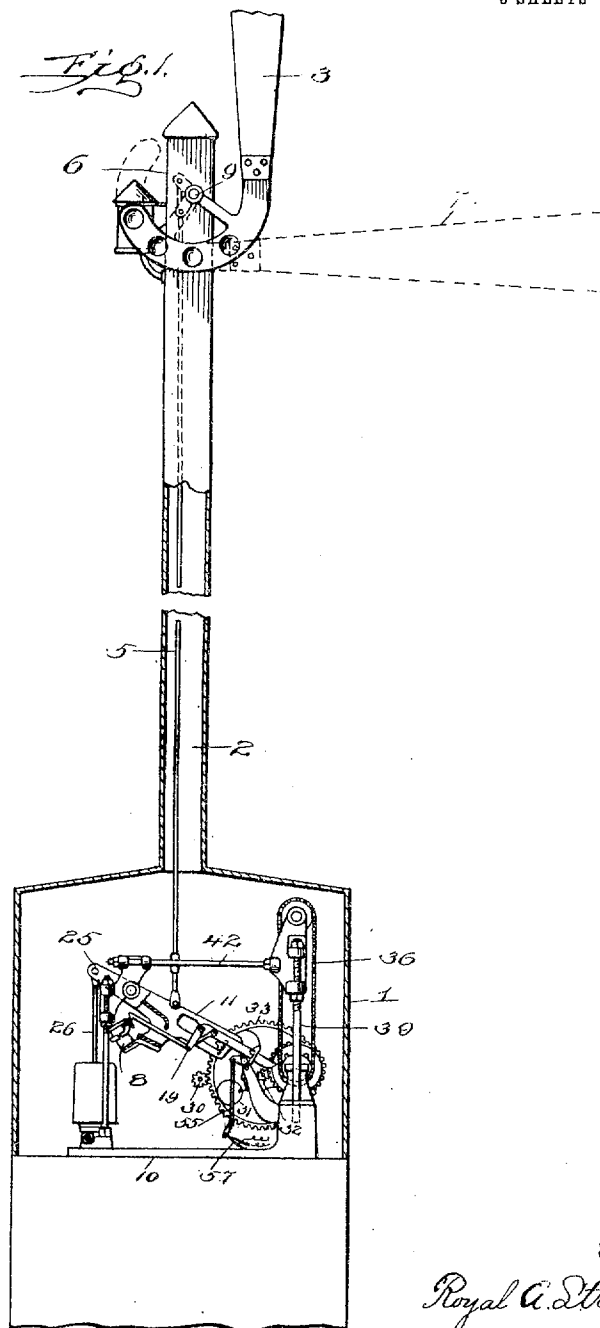


R. A. STREETER.
ELECTRICALLY OPERATED BLOCK SIGNAL MECHANISM.
APPLICATION FILED JUNE 24, 1908.

972,660.

Patented Oct. 11, 1910.

3 SHEETS-SHEET 1.



Witnesses
J. M. Fowler Jr.
Charles W. Roberts

Inventor
Royal A. Streeter.
By *Mason Fenwick & Lawrence*
his Attorneys.

972,660.

3 SHEETS—SHEET 2.



Royal A. Streeter,

By Mason Fenwick & Lawrence,
his Attorneys

Witnesses

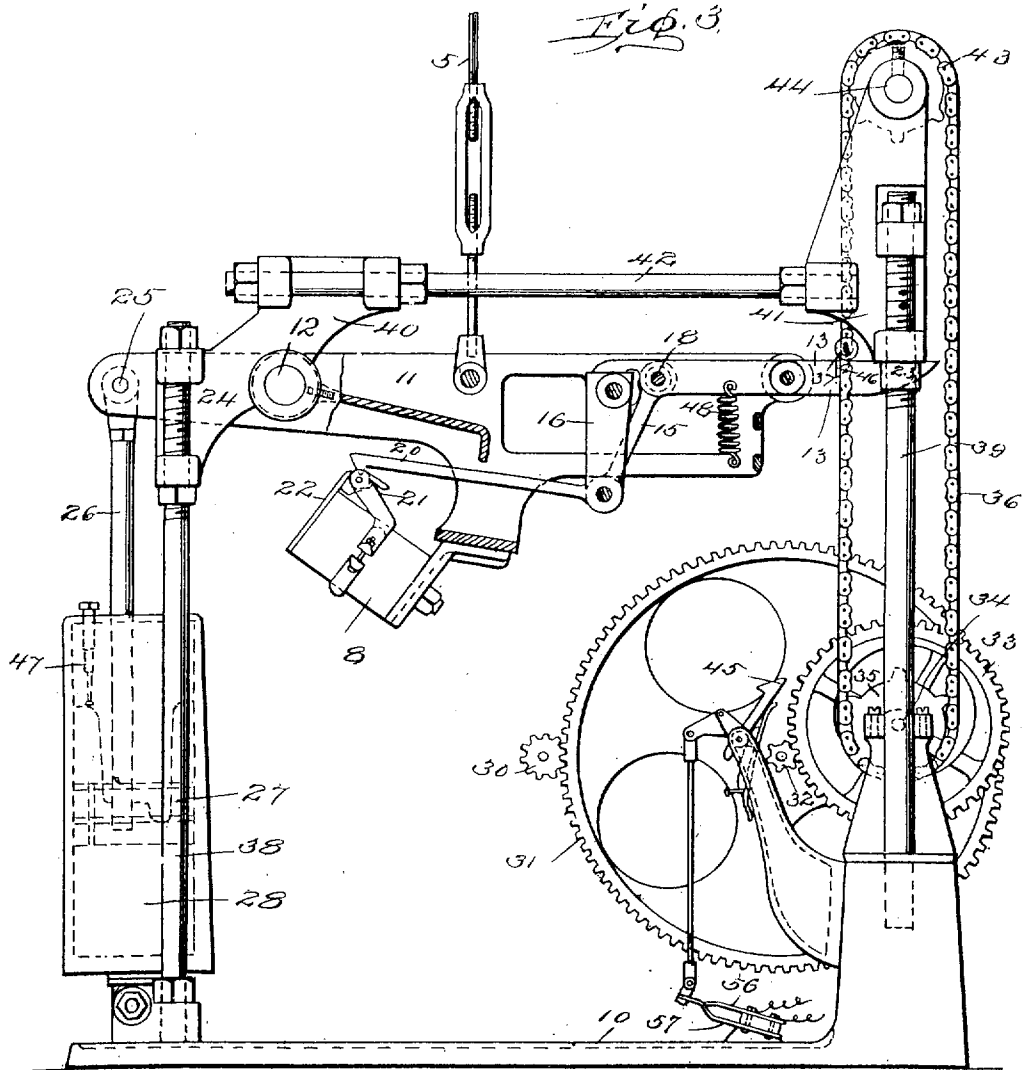
Witnesses
J. M. Fowler Jr
Charles W. Roberts.

R. A. STREETER.
ELECTRICALLY OPERATED BLOCK SIGNAL MECHANISM.
APPLICATION FILED JUNE 24, 1908.

972,660.

Patented Oct. 11, 1910.

3 SHEETS—SHEET 3.



Inventor

Royal A. Streeter,

By Mason Fenwick & Lawrence

his Attorneys

Witnesses

J. M. Fowler &
Charles W. Roberts.

UNITED STATES PATENT OFFICE.

ROYAL A. STREETER, OF MARION, IOWA, ASSIGNOR TO STOTTS SIGNAL COMPANY, OF MARION, IOWA, A CORPORATION OF ARIZONA TERRITORY.

ELECTRICALLY-OPERATED BLOCK-SIGNAL MECHANISM.

972,660.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed June 24, 1908. Serial No. 440,185.

To all whom it may concern:

Be it known that I, ROYAL A. STREETER, a citizen of the United States, residing at Marion, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Electrically-Operated Block-Signal Mechanisms; and I do hereby 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.

My invention relates to improvements in means for operating semaphores or signals, and particularly to semaphores or signals used in block signaling systems.

The object of my invention is to provide a mechanism of the most simple possible construction and operation, in which the parts are arranged and constructed in such a manner as to provide the least chance of their becoming deranged and in case any part or parts should become deranged or broken it would be practically impossible for the derangement to cause the mechanism to give a false clear signal.

Another object is the breaking of the motor circuit when the arm has cleared.

With these and other objects in view the invention comprises certain novel constructions, combinations and arrangement of parts as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings: Figure 1 is a general view in section of the mechanism case, pole and semaphore operated by the mechanism. Fig. 2 is a side elevation of the mechanism illustrating in detail the relative normal position of the assembled parts. Fig. 3 is an elevation partly in section showing the parts in a different position.

Referring to the drawing by numerals, 1 indicates a casing or box arranged to inclose the operating means. From the top of the casing 1 projects a hollow post or support 2 which supports the semaphore or semaphores as 3 at any prescribed height, the blade of the semaphore 3 being shown in full lines in the "safety" position, and in dotted lines at 7 for indicating the "danger" position. When the mechanism inclosed by housing 1 is operated as hereinafter more fully described rod 5 which extends through post 2 pulls down upon crank 6 and moves the semaphore 3 to a raised or safe position.

Positioned in housing 1 is an arm 11 hereinafter more fully described which is normally held in the position shown in Fig. 1 by an electromagnet 8 which is adapted to be continuously energized except when a train approaching the semaphore has broken the circuit thereof. When the circuit of magnet 8 is broken arm 11 is released and rod 5 is permitted to move upward. Rod 5 is moved upward by the falling of semaphore 3 which falls to the danger position when arm 11 is released by magnet 8 and in falling acts through crank 6 in elevating rod 5. The weight of the blade of the semaphore 3 is such as to cause the same to take a danger position and to move the various parts above set forth when magnet 8 has been deenergized.

When the rod 5 is drawn downward by the operation of clearing the signal, the crank 6, turning the shaft 9 swings the semaphore 7 to its vertical or clear position as shown at 3. A base 10 is arranged to support the various mechanism in housing 1 as fully shown in Fig. 2 which forms both a support and foundation for the frame holding the operating elements. Positioned above base 10 is an operating arm 11 that is pivotally mounted at 12 upon a stationary bracket 40. This arm is arranged with means for locking the signal in its normal safe or clear position, and also with means for releasing the semaphore so as to permit the same to fall to danger.

Pivotally mounted upon arm 11 near the opposite end to pivot 12 is a slotted or bifurcated lever 13 held in place by a pivotal pin or journal 14. One end of the lever 13 is pivoted at 18 to a link 15 which in turn is pivotally secured to latch 20 by a pin or journal 19 and is guided in its radial movement by arm 16 which in turn is pivoted to arm 11 at 17. Pin 19 passes through link 15, arm 16, and latch 20 so that whenever link 15 is moved arm 16 and latch 20 will also be moved. Latch 20 is adapted to engage a catch 21 of an armature 22 which holds latch 20 against movement when magnet 8 is energized. As will be clearly seen from Fig. 2 not only latch 20 is held in position, but also the various elements connected therewith which eventually maintain the projecting ends 23 of lever 13 as an extension rigidly connected with arm 11. To the end 24 of the arm 11, is pivoted at 25, 110

the piston rod 26. The piston 27 slides in cylinder 28 which is pivoted at its lower end 29. The cylinder acts as a dash-pot or buffer to ease the fall of the semaphore when the same is released by the operation of the signal system.

A motor (not shown) set on the base 10, to one end of the shaft of which is attached the pinion 30, together with a train of gears and pinions, 31, 32 and 33, which turns the shaft 34, on which are mounted the sprockets 35, engaging the chains 36, carrying the rollers 37, forms the means by which the signal is cleared. These several parts described are supported by the mechanism frame as clearly shown in Fig. 2 by the rods 38 and 39 secured in the base 10, and on which are mounted the corner brackets 40 and 41. These in turn being connected by the rod 42. The upper end of the chain 36 is supported on a sprocket 43 mounted upon a shaft 44, set screwed to the frame bracket 41. It will be understood that the mechanism shown can be built to operate either one or two signals as desired.

A description of one complete operation of the mechanism will fully illustrate the functions of the various parts.

The mechanism is shown in Fig. 3 at the danger position. The rod 5 holds the semaphore at the vertical position shown in Fig. 1. The operation of the block signal system (not shown) having caused the magnet 8 to be energized, the armature 22 is retained against the magnet and the parts 20 and 15, and 13 maintained rigidly in the position shown. The upward pull on the rod 5, tending to raise the arm 11, is resisted by the double or bifurcated pawl, 45, which is hooked over the lugs 46, on the sides of the lever 13. When a train enters the block and the operation of the block signal system causes the magnet 8 to be deenergized, then the upward pull of the rod 5, raises the arm 11, causes the released lever 13, (released by the armature and levers 20 and 15) to draw from under the pawl 45, and the arm 11 raises to a height sufficient to allow the semaphore to fall to a horizontal or danger position, the blade of the semaphore being sufficiently heavy to cause such movement. The fall of the semaphore being retarded in violence by the piston 27, compressing the air into the cylinder 28; said compressed air being gradually released by the needle valve 47. The coil spring 48, causes the return of the lever 13 and its connected parts to their normal positions as a continuation of the arm 11, the slotted end 23 of the lever 13, straddling the chain 36. Should the roller 37 be in the way of the raising arm or lever 13, said lever would give way before it, as the magnet 8 remains deenergized until the motor is started in the operation of clearing the signal. When the railroad track or sec-

tion is again cleared by the passing train the block signal system causes the magnet 8 to become energized and the motor to be started for the clearing of the signal by raising it again to the vertical position.

In clearing the semaphore the magnet 8 being energized and the armature 22 in position against it, the lever 13 is held rigidly extended by means of the link 15, and the latch 20. The lever 13 being astride of the chain 36, will be engaged by the rollers 37, which are placed on both sides of the chain 36, when the motor by means of the chain of gears carries the chain 36 in the direction of the arrow 49. The movement of the chain 36 will draw the lever 13 and the arm 11 in a radial downward direction to its normal position. Just before the rollers 37 pass the end 23 of the lever 13, the double pawl 45 being astride the lever 13 engages the lugs 46, retaining the arm in its lowered position and the semaphore which has been raised by the rod 5, turning the crank 6, is held normally clear until the magnet is again deenergized by the entrance of a train upon the block.

A system of automatically breaking the motor circuit when the arm has cleared is also provided. When the lever 13 is about to reach its normal position, it strikes the lug 50 causing the point 51 to travel a fraction of an inch in the direction of the arrow 52 against the pressure of the spring 53. (The spring 54 is used to keep the pawl 45 in position.) This causes the connecting rod 55 to separate the two contact springs 56 and 57 through which electric current for the motor, passes and consequently deprives the motor of current. When the semaphore again goes to the danger position and the lug 50 is free to move under the pressure of the spring 53, the lug 50 travels in a direction opposite of the arrow 52, and raising the connecting rod 55, closes the contact between the springs 56 and 57 so that when a relay controlling the motor current is again operated, the motor current is completed through the contact springs 56 and 57.

Having thus described my invention what I claim and wish to secure by Letters Patent is:—

1. In an apparatus of the class described, a semaphore adapted to be moved to danger by gravity, a longitudinally movable member for moving the semaphore to safety, an electrical circuit adapted to be short-circuited by a train passing over the track to which the apparatus is connected, means for moving said longitudinal member for moving the semaphore to safety when that portion of said circuit included within said apparatus is supplied with current, said means comprising a pivotally mounted arm, a pivotally mounted extension arranged on said

arm, a link member pivotally connected with the inner end of said extension, a catch pivotally connected with the link member at the end opposite to that connected with said extension, a pivotally mounted guiding member pivotally mounted at one end on the same pivotal pin which connects said catch and said link, and pivotally mounted at the opposite end on said arm, and an armature for engaging and holding said catch, and a magnet mounted on said arm interposed in said circuit for holding said catch rigidly in position when that portion of said circuit supplied with current is included within said apparatus, and permitting a free movement of said catch when that portion of said circuit included within said apparatus is deprived of current, whereby said extension is held rigidly in position as long as that portion of said circuit included within said apparatus is supplied with current, means for moving said arm downward pivotally when that portion of said circuit included within said apparatus is supplied with current, and means for locking said arm in its lowered position.

2. In an apparatus of the class described, a semaphore adapted to move to danger by gravity, a longitudinally movable member for moving the semaphore to safety, an electrical circuit adapted to be short circuited by a train passing over the track to which the apparatus is connected, means for moving said longitudinally movable member when that portion of said circuit included within said apparatus is supplied with current, said means comprising a pivotally mounted arm,

a pivotally mounted extension connected with said arm, a link connected with one end of said extension, a pivotally mounted guiding member connected at one end with said arm and at the other end with said link for causing the end pivotally connected therewith to move in the arc of a circle around the pivotal mounting of said guiding member, a catch pivotally mounted to said link at the end opposite to that connected with said extension, a pivotally mounted armature for engaging and holding said catch, and a magnet mounted on said arm interposed in that portion of said circuit included within said apparatus for holding said catch rigidly in position when that portion of said circuit included within said apparatus is supplied with current, whereby said extension is held rigidly in position as long as that portion of said circuit included within said apparatus is supplied with current, but permitted a free pivotal movement when said catch has been released by depriving that portion of said circuit included within said apparatus of current, means for moving said arm downward pivotally when that portion of said circuit included within said apparatus is supplied with current, and means for locking said arm in its lowered position.

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

ROYAL A. STREETER.

Witnesses:

P. S. GRIFFIN,
GEO. W. TOURS.