





## UNITED STATES PATENT OFFICE.

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## SEMAPHORE-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 790,011, dated May 16, 1905.

Application filed March 6, 1905. Serial No. 248,470.

*To all whom it may concern:*

Be it known that I, AXEL A. STROM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Semaphore-Signals, of which the following is a specification.

My invention relates to an improvement in the class of semaphore-signals in which an axially-rotatable vertical shaft or spindle is employed to be turned when a switch is thrown to actuate a semaphore-arm connected with the shaft to be raised to a horizontal position or lowered therefrom, according to the direction of turning the spindle.

My primary object is to provide a construction or connection between the shaft and signal-arm which shall dispense with any form or arrangement of gears for effecting the connection and with the top-heavy casing commonly used for inclosing them and which shall be very simple and inexpensive to manufacture and durable without liability to get out of order.

My improved construction is not necessarily confined to a so-called "high" semaphore nor to a switch-stand from which to operate the spindle which actuates the semaphore-arm, although such embodiment of my invention is illustrated in the accompanying drawings, in which—

Figure 1 shows by a broken view in elevation a high semaphore embodying my improvement. Fig. 2 is an enlarged broken view of the upper portion of the apparatus, presenting the side thereof opposite that presented by Fig. 1; and Fig. 3 is an enlarged perspective view of a preferred form of the hinging connection between the semaphore-arm and its vertical actuating-shaft.

At A is represented a switch-stand of ordinary construction involving a suitable frame having journaled in it a vertical shaft B to be connected at its lower crank end in the usual way with a railway-switch (not shown) adapted to be thrown through the medium of a lever-handle A', fulcrumed on the stand and engaging the vertical shaft for turning it. The shaft B reaches to any desired height and car-

ries on its upper end the usual support C for a signal-lamp. (Not shown.) On the shaft B near its upper end is provided a sleeve *a*, in which the shaft turns, the sleeve having an arm *a'* projecting laterally from it and terminating in a depending socket *a*<sup>2</sup> or head and in an upwardly-projecting bearing *a*<sup>3</sup>, in which is journaled a shaft *b*. On one end of the shaft or journal *b* are secured the semaphore-arm D and the weighted arm D' for balancing it, and on the opposite end thereof a collar *c* is secured by a pin *d* passing through the journal and collar, the latter terminating in a socket *c'*. A ladder E rises inclinedly from a socket-bearing E' on the head-blocks, one of which is represented at F, upon which the switch-stand is supported and which cross a tie F', from which stay-rods rise (one such stay-rod being shown at F<sup>2</sup>) and are connected with the ladder to brace it, and the upper end of the ladder enters the socket *a*<sup>2</sup> to support it and the parts carried by it. In the socket *c'* is journaled a stem *e'*, terminating at its lower projecting end in a horizontally-perforated head *e*. On the shaft B, below the sleeve *a*, is fastened to turn with the shaft a collar *f*, having an arm *f'* extending laterally from it, and into the end of this arm is screwed the stem *g'* of a vertically-perforated head *g*.

The semaphore-arm and shaft B are connected at the heads *e* and *g* by a hinge connection to cause turning of the shaft to raise and lower the arm. The device shown for hinging the heads together is represented most clearly in Fig. 3 and comprises two connected yokes *h* and *i*, the arms of the former terminating in horizontally and coincidently perforated eyes *h'* *h'* and those of the latter terminating in vertically and coincidently perforated eyes *i'* *i'*. The yoke *h* embraces the head *e* and is pivotally connected therewith by a pin *h*<sup>2</sup> passing through the head and eyes *h'*, and the yoke *i* embraces the head *g* and is pivotally connected therewith by a pin *i*<sup>2</sup> passing through it and the eyes *i'*. By the hinge construction thus described when the shaft B is rotated to turn the arm *f'* in the direction away from the socket-head *a*<sup>2</sup> the yoke device will pull upon the head *e*, with the effect of turning



the journal *b* in its bearing to lower the semaphore-arm, and the latter will be raised in turning the shaft *B* in the opposite direction by causing the head *g* to press the yoke device against the head *e* and turn the journal *b* accordingly in its bearing *a*<sup>3</sup>.

While the yoke device shown and described affords the best means known to me for producing a positive and direct hinge connection between the semaphore-arm and its operating shaft, it may be modified in matters of detail and in character without departure from my invention.

An important feature of my improvement consists in the adjustability of the bearing *g*, whereby it may by screwing its stem *g'* in and out of the arm *f'* be shortened and lengthened to vary its leverage on the yoke device and accordingly vary the throw of the semaphore-arm, which is required to extend horizontally in its danger position, but may in its lowered position extend vertically or at any angle to the vertical, according to difference in preference among users. By rendering the hinge connection thus adjustable it enables in installing the signal device setting the arm to occupy a horizontal position when raised and to extend to any desired angle when lowered.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a semaphore-signal, the combination of a vertical rotary shaft, a horizontal journal carrying a semaphore-arm, arms extending laterally respectively from said shaft and journal, and a link connecting said arms.

2. In a semaphore-signal, the combination of a vertical rotary shaft, a horizontal rotary shaft, a semaphore-arm secured on said horizontal shaft, an arm extending laterally from each of said shafts, and a link connecting said arms.

3. In a semaphore-signal, the combination of a vertical rotary shaft, a horizontal rotary shaft carrying a semaphore-arm, an arm extending laterally from each of said shafts, and a link connected by a horizontal pivot with one shaft-arm and by a vertical pivot with the other shaft-arm.

4. In a semaphore-signal, the combination of a vertical rotary shaft, a semaphore-arm, and a hinge connection between them operating to raise and lower the arm by turning the shaft and adjustable to vary the throw of said arm.

5. In a semaphore-signal, the combination of a vertical rotary shaft, a horizontal journal

carrying a semaphore-arm, arms extending laterally respectively from said shaft and journal, and a link connecting said arms and having an adjustable screw connection with one thereof.

6. In a semaphore-signal, the combination of a vertical rotary shaft, a ladder, a semaphore-arm, a sleeve on said shaft provided with a bearing on which said arm is journaled and a head to which said ladder is fastened, and a hinge connection between said shaft and the journal of said arm operating to turn said journal to raise and lower the semaphore-arm by turning said shaft.

7. In a semaphore-signal, the combination of a vertical rotary shaft, a ladder, a semaphore-arm, a sleeve on said shaft provided with a bearing on which said arm is journaled and a socket-head to which said ladder is fastened, a head connected with the journal-shaft of the semaphore-arm, a collar secured on said vertical shaft and provided with a head, and a connection extending between and pivotally fastened to said heads, operating to raise and lower said arm by turning said vertical shaft.

8. In a semaphore-signal, the combination of a vertical rotary shaft, a ladder, a sleeve on said shaft provided with a journal-bearing and a socket-head to which said ladder is fastened, a semaphore-arm having a journal supported in said bearing, a collar fastened on said journal and terminating in a socket, a stem in said socket terminating in a head, a collar on said shaft provided with a head, and a yoke device terminating at each end in eyes pivotally connected, respectively, with said heads, for the purpose set forth.

9. In combination, a switch-stand having a vertical rotary shaft surrounded by a sleeve provided with a journal-bearing and a socket and carrying a collar provided with a head, a weight-balanced semaphore-arm on a journal working in said bearing, a ladder with which said socket is connected, a collar secured on said journal and provided with a socket, a stem in said last-named socket terminating in a head, and a yoke device terminating at each end in eyes pivotally connected, respectively, with said heads, for the purpose set forth.

AXEL A. STROM.

In presence of—

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