

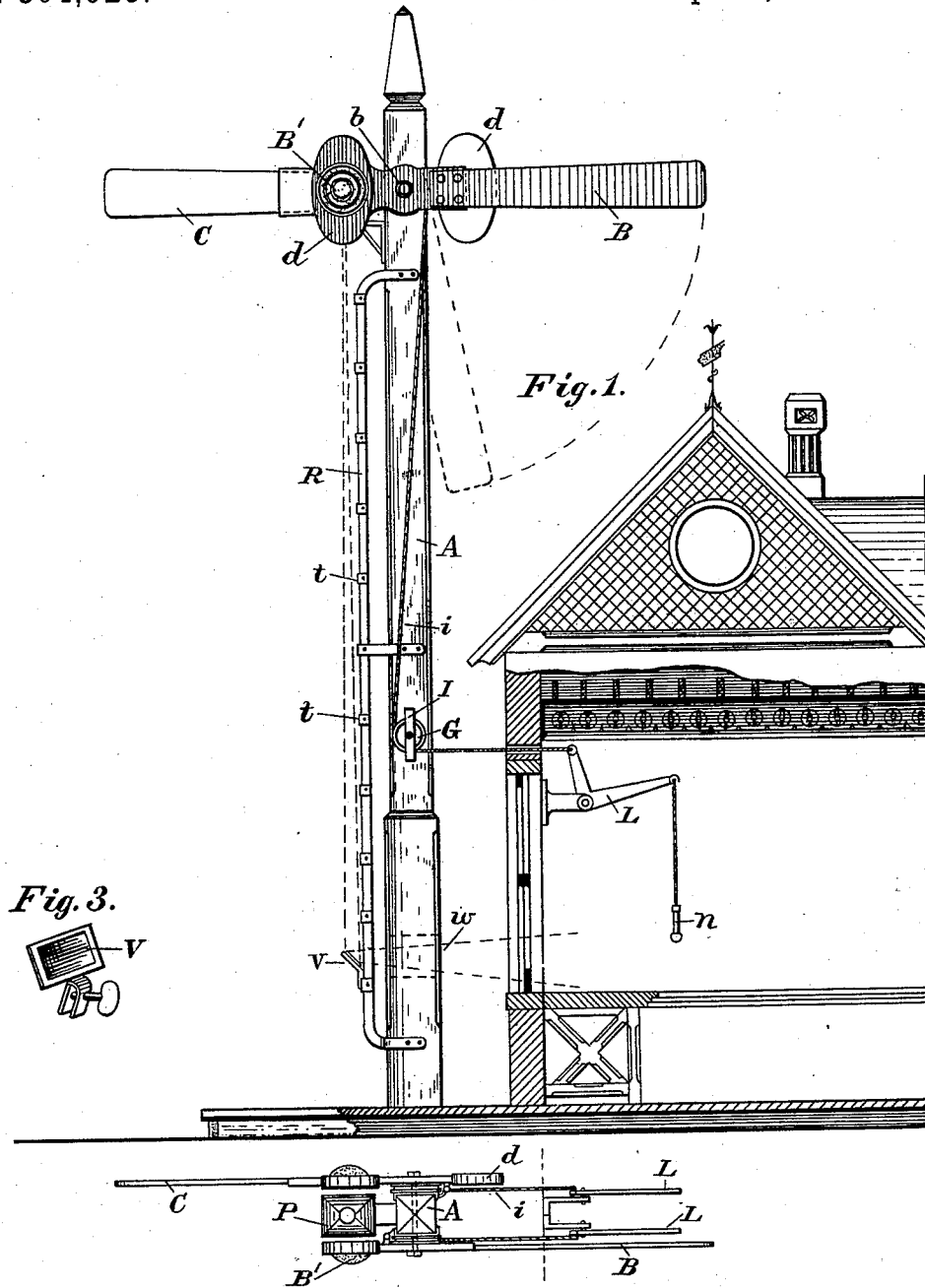
(No Model.)

2 Sheets—Sheet 1.

S. H. HARRINGTON.
SEMAPHORE.

No. 304,928.

Patented Sept. 9, 1884.



WITNESSES:

Jno. E. Morris.
A. C. Eader.

INVENTOR:

Saml. H. Harrington

By Chas B. Mann

Attorney.

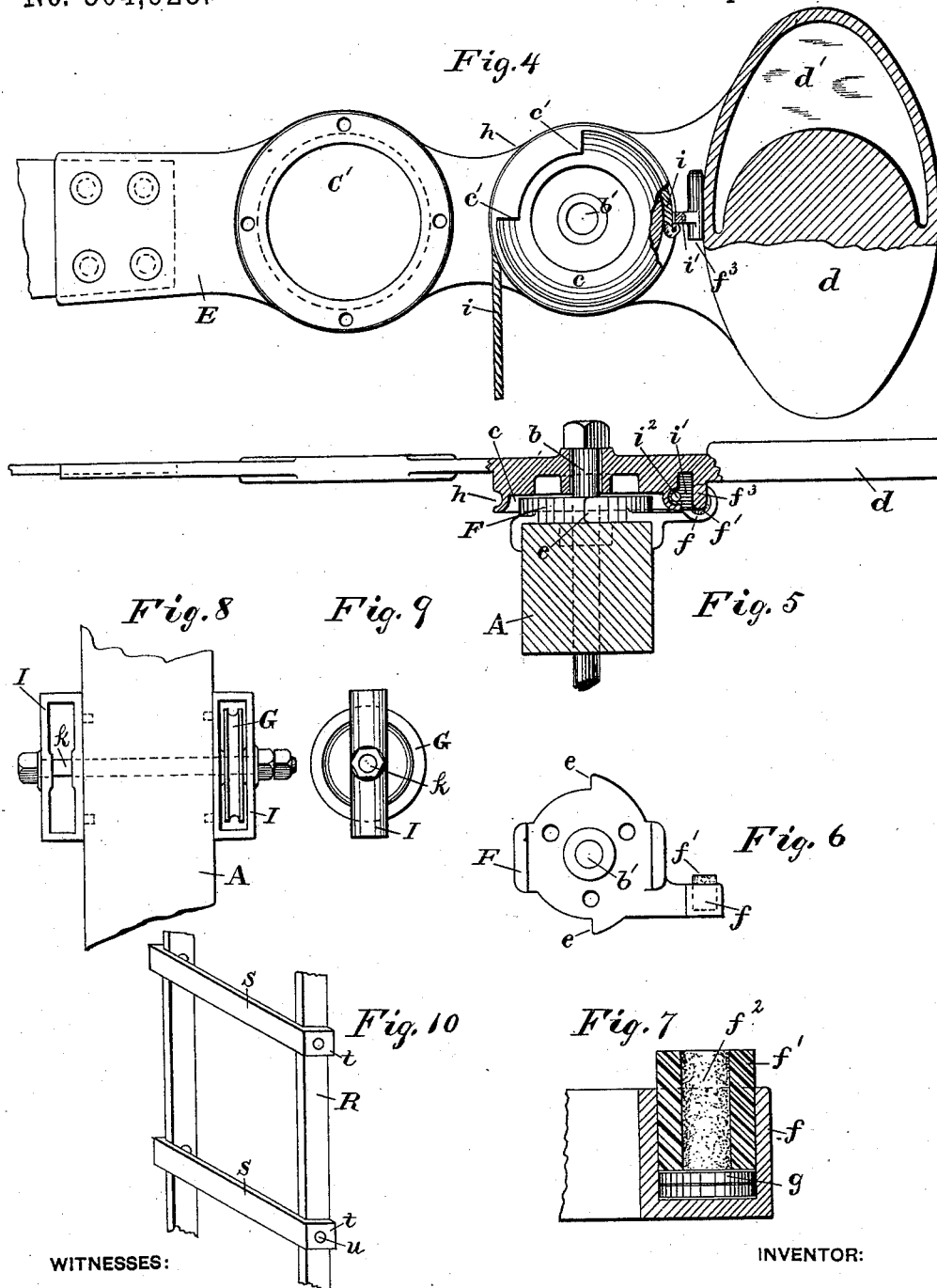
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UNITED STATES PATENT OFFICE.

SAMUEL H. HARRINGTON, OF COLUMBUS, OHIO.

SEMAPHORE.

SPECIFICATION forming part of Letters Patent No. 304,928, dated September 9, 1884.

Application filed May 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL H. HARRINGTON, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Semaphores, of which the following is a specification.

My invention relates to an improved semaphore for railroads; and it consists in certain features of construction and combination of parts hereinafter described and claimed.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a view of the semaphore and operator's house. Fig. 2 is a top view of the semaphore. Fig. 3 is a view of the mirror detached from the ladder. Figs. 4 and 5 are views of one of the arm-plates and its appendages. Fig. 6 is a view of the center plate. Fig. 7 is a view, enlarged scale, of the elastic cushion and its pocket. Figs. 8 and 9 are views of the pulley-pocket. Fig. 10 is a view of the ladder.

The letter A designates the post; B and C, the arms, and B' and C' the glass lens. One arm and one lens on each side of the post turn on the same pivot. It will be understood that the normal position of both arms and lenses is on a line projected horizontally from the post, and this position of the arm by day and the lens by night comprises the "danger" signal or the stop-signal. When the arm is turned down to a vertical or nearly vertical position, as indicated by broken lines in Fig. 1, it is designed as the signal to approaching trains that the road is open and that the train may proceed.

The arm-plates E have a hole, *b'*, for the pivot-bolt *b*, and on the inner side, or that side which sets next to the post, has a recess, *c*, about the pivot-hole, which receives the center plate attached to the post. The general shape of this recess is circular, to admit of its turning about the center plate. Two shoulders, *c'*, on the rim of the circular recess project inward. The space on the rim between its two shoulders comprises one-fourth of the circle. As the arm-plate turns, these come in contact with the stops *e* on the center plate. The arm-plate carries the counter-weight *d*, having an oval shape; but it may have any other given shape by forming a core

or hollow space, *d'*, at the top. (See Fig. 4.) The heaviest part of the weight comes at the bottom or below the pivot *b*. By this construction of counter-weight, while a uniform shape is preserved for all the weights, the center of gravity of each, instead of being in the center of the body, is located toward one of the long ends, whereby, when the signal-arm is brought down to a perpendicular, or nearly perpendicular, position, the heaviest part of the weight will stand off or be at one side of a straight line drawn lengthwise through the said arm and through the pivot, from which fact the weight will exert a greater influence or leverage, tending to restore the arm to the horizontal position. If, therefore, the rope or any of the rope connections from the handle *n* to the arm-plate should break, the signal-arms will be at once brought up to a horizontal position, thus assuring the presentation of the stop-signal, the heavy part of the weight at the same time reaching a position where it exerts less influence to rotate the arm, and consequently when stopped occasions less shock or concussion.

A center plate, F, (see Figs. 5 and 6,) is firmly attached on each side of the post A. It has a center hole, *b'*, for the passage of the pivot-bolt *b*, a vertical side against which the recess *c* of the arm-plate bears, and two stops, *e*, one projecting on the upper rim, and the other diametrically opposite on the lower rim. The two shoulders *c'* on the arm-plate move between the two stops *e* on the center plate, and, as before stated, the shoulders come in contact with the stops. By this means the arm-plate is limited to a one-quarter turn.

To prevent concussion or strain on the parts when the arm is brought to a horizontal position by the action of the counter-weight, an elastic or cushioned stop is provided. This consists of a pocket, *f*, projecting from the center plate with a tubular rubber cushion, *f'*, in the pocket. (See Fig. 7.) The height of the cushion or the extent to which it projects above is regulated by washers *g* set in the bottom of the pocket. By having a hole, *f''*, in the center of the cushion, or, as described, a tubular cushion, there is more elasticity, and the arm-plate is provided on the inner side with

a stop-lug, f^3 , cast integral therewith. When the arm comes to a horizontal position, the stop-lug strikes the cushion f' just before the upper shoulder c' comes in contact with the upper stop e . A grooved pulley, h , is formed around the circular recess c on the arm-plate. The rope i occupies this groove and extends to the operator's house. This rope is fastened to the groove-pulley as follows: A web, i' , is cast across the pulley-groove, (see Figs. 4 and 5,) and a hole, i'' , is made in the web. The end of the rope i is passed through the hole and then knotted. The knot is then drawn up against the web, and the rope lies over the top of the pulley, from whence it hangs down and extends to the operator's house. The direction of the rope is changed from the vertical to the horizontal (see Figs. 1, 8, and 9) by a pulley, G , on the side of the post. A pulley-pocket consisting of a rectangular frame, I , is placed against the post A . A hole is made in two sides of the frame for the bolt k , and the pulley occupies the pocket-space between the four sides of the frame, and turns on the same bolt k that binds the pocket to the post.

In this description only one side of the semaphore and means to operate one arm are mentioned; but by reference to Fig. 8 it will be seen the one bolt, k , holds a pulley-pocket, I , on each or two opposite sides of the post. One pulley serves for the rope of one arm and the opposite one for the rope of the other arm. The rope passes into the operator's house, where it is attached to one arm of a bell-crank lever, L , over the desk or above the seat of the operator. A handle, n , depends from the other arm of the lever. By drawing on the handle the signal-arm may be brought down to a nearly vertical position, as indicated in Fig. 1 by broken lines.

The lantern P is placed on a bracket at one side of the post, and has position between the two lenses B' C' . One lens, B' , is fixed in the center of the counter-weight, as in Fig. 1, and the other lens, C' , is fixed in the arm-plate, as in Fig. 4. This difference in the position of the lenses is necessary to bring both of them alongside of the same lantern.

A ladder, R , is attached to the post. The ends of the upright bars are curved to a horizontal position, and are bolted to the post. The rungs s consist of bars whose ends t are bent at a right angle, (see Fig. 10,) and take on the outer side of the upright bars. Thus constructed a single bolt or rivet, u , will secure each end and make the rungs permanent. The ladder is cheap and strong and serves to approach the lantern.

In order to enable the operator to know while in his house whether or not the lantern is lighted, I provide a mirror, v , and attach it to the ladder or to the post, as may be most con-

venient. The mirror is pitched at an angle of forty-five degrees, and the rays of light coming down from the lantern through holes in its bottom provided for the purpose are reflected by the mirror and directed into the operator's house. A hole in the post (indicated at w by broken lines in Fig. 1,) allows the reflected rays to pass. The mirror may be detached and taken in during the day.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a semaphore, the combination of a fixed center plate, F , having two stops, e , one diametrically opposite the other, and the signal-arm plate having a pivot-hole and a recess on its side about the said hole which receives the center plate, and provided with two shoulders, c' , the space between which comprises one-fourth of a circle, as set forth.

2. In a semaphore, the combination of a fixed center plate, F , having a center hole, b' , and provided with a projecting pocket, f , containing an elastic cushion, f' , and a signal-arm plate having a pivot hole, and provided with a stop-lug, f^3 , adapted to strike the said elastic cushion, and a counter-weight, and a pivot-bolt, b , passed through both center plate and signal-arm plate, as set forth.

3. In a semaphore, the combination of a pivoted signal-arm, a plate fixed to the supporting-post, and provided with a pocket, and a tubular elastic cushion in the pocket which the said arm strikes when in operation, as set forth.

4. In a semaphore, the combination of a fixed center plate, F , having a center hole, b' , and a vertical side bearing, a signal-arm plate having a pivot-hole, a circular recess about the said hole, and a grooved pulley, h , around the recess, a pivot-bolt, b , passed through both center plate and arm-plate, and a rope fastened to the grooved pulley, as set forth.

5. The combination, in a semaphore having a pivoted signal-arm, of a counter-weight having an oval or other given symmetrical shape, cored or hollowed out, substantially as described, to bring its center of gravity below the pivot, as and for the purpose set forth.

6. In a semaphore, the combination of a post, a signal lens and lantern mounted on the post, handles for operating or shifting the lens, and a mirror placed at an angle to reflect the rays of light from the lantern to the position where the operating-handles are located, as set forth.

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

SAMUEL H. HARRINGTON.

Witnesses:

C. C. CORNER,

E. A. DAWSON.