(No Model.) 3 Sheets—Sheet 1.

E. S. PIPER.

SEMAPHORE AND OTHER ELEVATED SIGNAL LIGHTS.

No. 347,640. Patented Aug. 17, 1886.

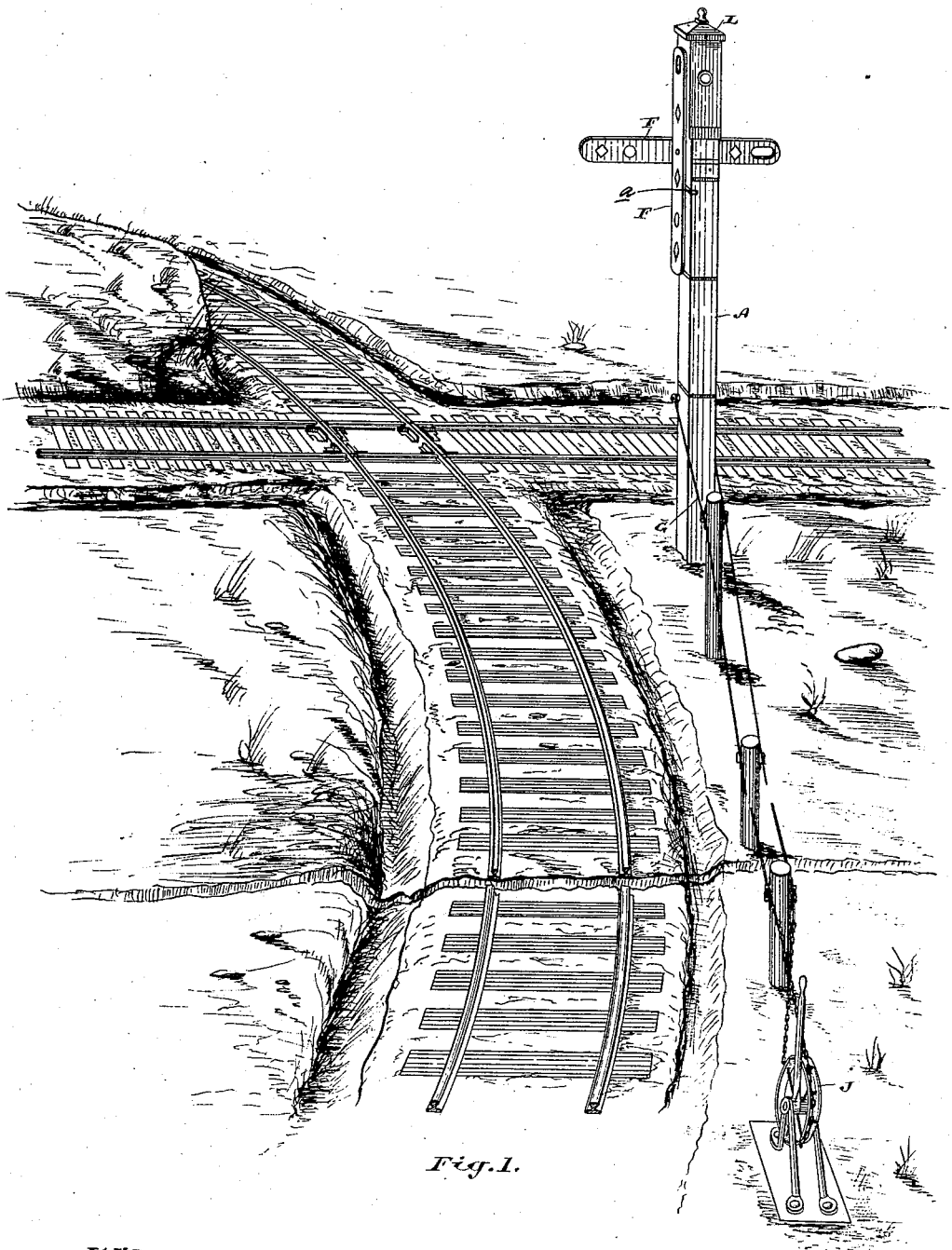

Fig. 1.

Witnesses.
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(No Model.) 3 Sheets—Sheet 2.

E. S. PIPER.

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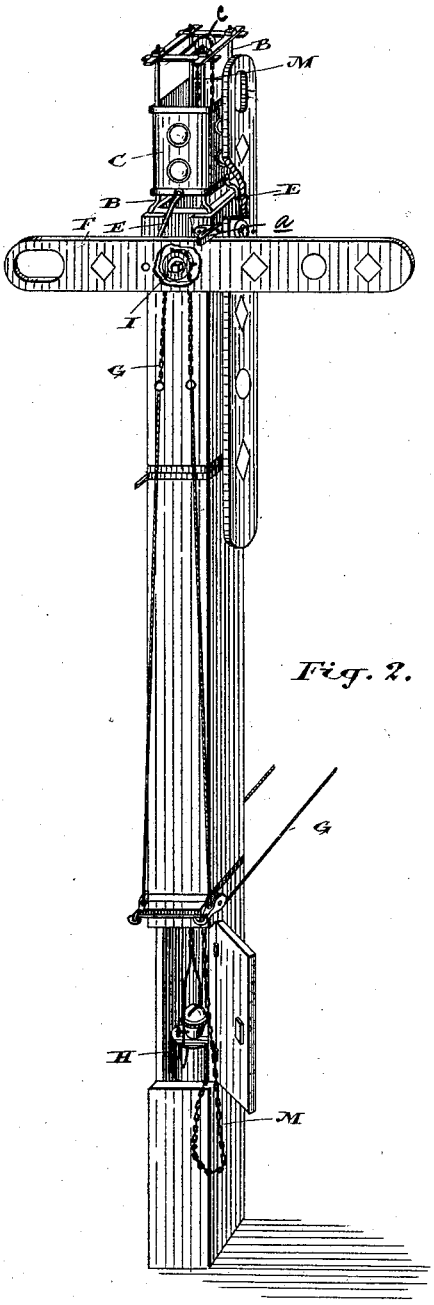

Fig. 2.

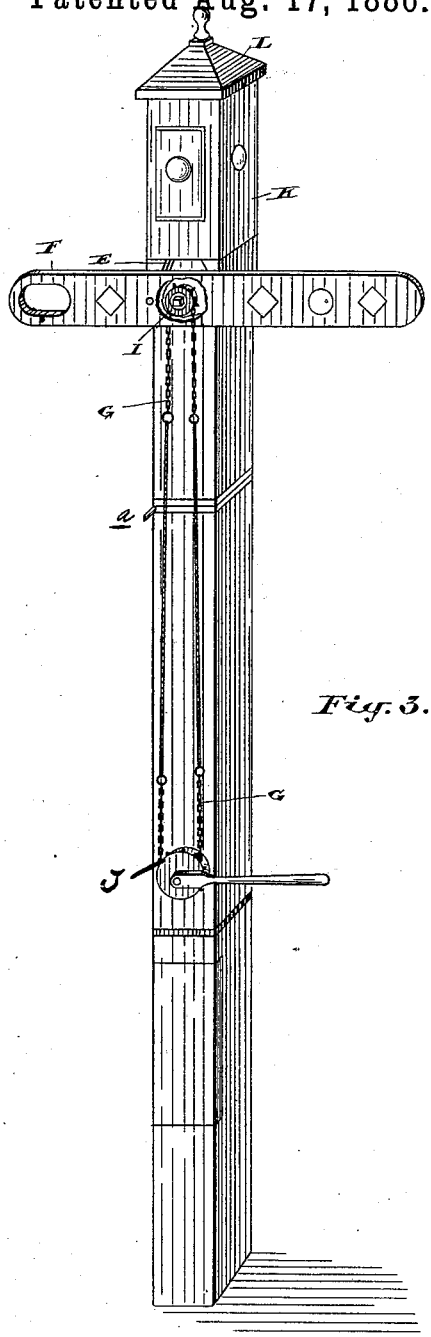

Fig. 3.

Witnesses.
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(No Model.) 3 Sheets—Sheet 3.

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SEMAPHORE AND OTHER ELEVATED SIGNAL LIGHTS.

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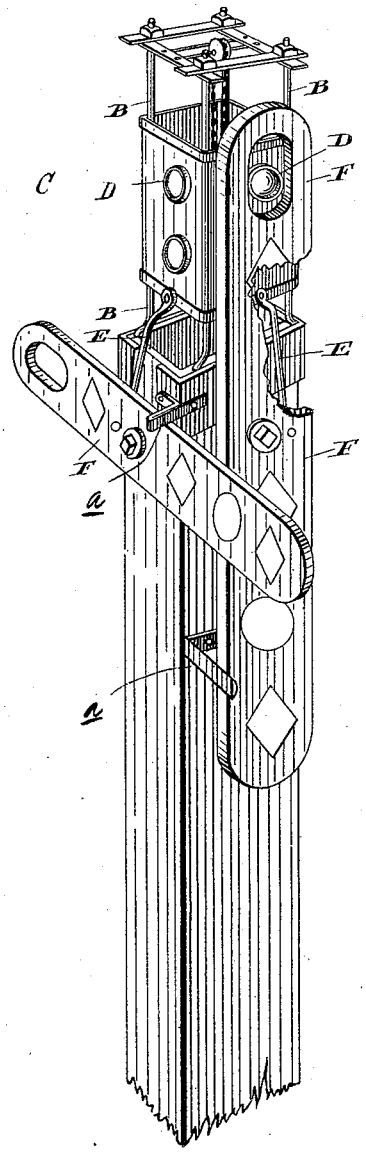

Fig. 4.

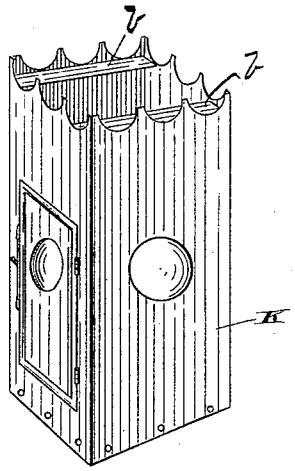

Fig. 5.

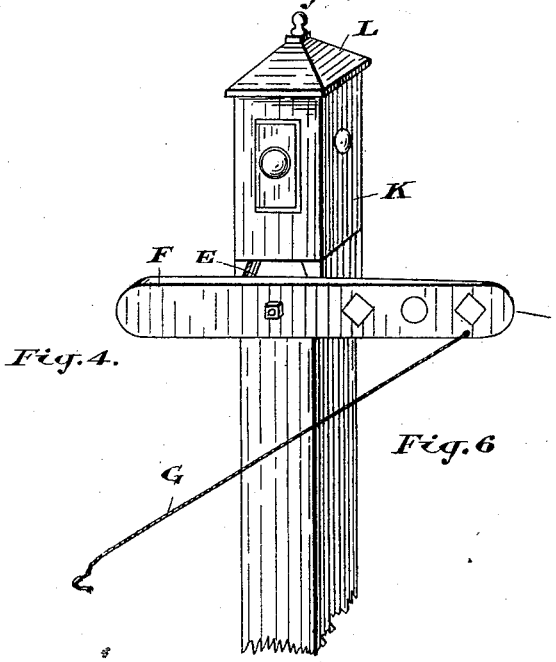

Fig. 6

Witnesses.

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by Donald C. Ridout & Co

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UNITED STATES PATENT OFFICE.

EDWARD S. PIPER, OF TORONTO, ONTARIO, CANADA.

SEMAPHORE AND OTHER ELEVATED SIGNAL-LIGHTS.

SPECIFICATION forming part of Letters Patent No. 347,640, dated August 17, 1886.

Application filed December 10, 1885. Serial No. 185,295. (No model.) Patented in England October 14, 1884, No. 13,595.

To all whom it may concern:

Be it known that I, EDWARD SPENCER PIPER, a subject of the Queen of Great Britain, residing at the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Semaphore and other Elevated Signal-Lights, of which the following is a specification.

The invention relates to certain new and useful improvements in semaphore and other elevated signal-lights; and it consists in the peculiar combinations and the construction and arrangements of parts, as will be hereinafter more fully described, and pointed out in the claims.

Figure 1 is a perspective view showing my semaphore arranged where two tracks cross each other. Fig. 2 is a view of my improved semaphore, showing the outer case removed and two semaphore-arms attached. Fig. 3 is a view of my improved semaphore, showing the semaphore-arms operated from the base of the post. Fig. 4 is an enlarged detail of the top of Fig. 2. Fig. 5 is a detail of the outer case. Fig. 6 is a detail of a station-signal.

In semaphores as now constructed the lamp is contained within a case supported on the end of a vertical rod or shaft, which is caused to revolve with the movement of the semaphore-arm, so that the lights exposed on the line shall correspond with the position of the arm of the semaphore. As these movements are effected very rapidly, particularly when the danger-signal is thrown into position, the jar to the lamp contained within, and which moves with the revolving case, soon injures the lamp, and in some cases the light within the lamp has in this way been put out. This objection is overcome by the adoption of my invention.

As the details of my invention can be considerably varied in their construction and application, I have shown two or three different forms, which suggest how changes may be made without altering the main principle of the invention.

In Figs. 1, 2, 3, and 4, A is a hollow post, on top of which is fixed a metal frame, B, open on its four sides, but provided with a vertical movable jacket, each side of which is provided with a glass, D, all of which may be the same color, or made of glass of contrasting colors. This vertical sliding jacket C is connected by the bar E to the pivoted semaphore-arm F, which arm is operated by a chain, G, or in any other suitable manner. H is an ordinary hand-lamp suspended within the post A and frame B, and when in position for signaling is immediately in front of the openings in the said frame. As the glass surrounding the lamp H is white, a clear signal is exhibited. Assuming the glasses D to be red, a danger-signal is exhibited the moment that the semaphore-arm F is thrown out in a horizontal position, as it will be seen from its connection through the bar E to the jacket C the said jacket will be drawn down over the openings in front of the lamp H by the outward action of the arm.

Although the semaphore-arm F may be operated in various ways, it is not necessary for the object of understanding my invention to exhibit more than one plan.

As stated in the commencement of this specification, the sliding jacket C is connected by a bar, E, to the pivoted semaphore-arm F. When two semaphore-arms F are used, as shown in Figs. 1, 2, and 4, I simply provide two bars, E and place and connect these bars to their respective semaphore-arms on opposite sides of the pivots, so that when the jacket C moves one arm or target is thrown out to "danger," while the other arm or target F is lowered. Thus, when the semaphore is located as shown in Fig. 1, one line or track will be closed, while the other line is indicated as being free for the passage of the train. On the spindle of one of the arms or targets F, I fix a sprocket-wheel, I, around which is carried a chain, G, which is made endless, and is carried round another sprocket-wheel, J, either located as shown in Fig. 1, when the semaphore is to be operated from a distance, or located, as shown in Fig. 3, when the semaphore is to be operated from the base of its post.

It will be noticed on reference to Figs. 1 and 2 that the chain G is carried over suitable pulleys to the sprocket-wheel J, which is located at the proper point and provided with a lever, as indicated. It will be seen by this connection that the simple turning of the sprocket-wheel J by its lever will impart a correspond-

ing motion to the sprocket-wheel I, and through it the desired motion is conveyed to the semaphore arm or target F.

Fig. 5 shows an outer case, (marked K in Fig. 3.) This case fits round the jacket C, sufficient space between the outer case, K, and the inner metal frame, B, being left to allow of the free vertical movement of the jacket C.

Fig. 5 shows a detail of the case B. It will be noticed that an internal flange, *b*, is formed on the top edge of the outer case, K. This flange is intended to rest upon the top of the case B, when the outer case, K, is slipped over it. The width of this flange holds the case K sufficiently far from the frame B to leave enough space between the two to permit the free movement of the jacket C, which, as before stated, surrounds the case B.

Fig. 3 exhibits the outer case, K, in position, a suitable top, L, being provided, and the cases are properly ventilated.

In Fig. 2 I show a lamp, H, lowered near the ground. In this figure it willl be seen that the lamp H is suspended on a chain or rope, M, which chain or rope M is preferably made endless by having its other end connected to the bottom of the lamp, after passing over a pulley, *c*, located at or on the top of the frame B. From this it will be seen that the lamp H may be elevated into or lowered from the frame without the party operating it being required to ascend to the elevated frame B, from which the signals are given. This plan, it will be seen, affords an opportunity of cleaning and lighting the lamp without the necessity of ascending into the elevated position in which the signal-case B is located. I may also draw attention to the fact that the jacket C, which contains the signal-glass, is adjusted entirely independent of the lamp; consequently the signals may be changed without jarring or in any way affecting the burning of the lamp.

a are stops secured to the post A, for the purpose of preventing the arms F going beyond their vertical or horizontal positions.

The jacket C is preferably made with two rows of glasses, the lower row of glasses being arranged to indicate one set of signals, while the second set of glasses will be exhibited by lowering the case C till the upper row of glasses come opposite to the lamp H.

What I claim as my invention is—

1. The post A, provided with the hollow case B, in combination with the jacket C, semaphore-arm F, connected directly to said jacket by the arm E, the rope G, and sprocket-wheels I and J, substantially as and for the purpose specified.

2. The post A, having the hollow case B secured to the top thereof, the jacket C, sliding on said case B, and the pivoted semaphore-arm F, connected directly to said jacket by the bar E, in combination with the rope G, connected at one end to the arm F, and at the other to the sprocket-wheel J, and the stop *a*, secured to said post, substantially as and for the purpose specified.

3. The combination, with the post A, of the sliding jacket C, the semaphore-arms F F, and the bars E, connecting said arms with the sliding jacket on opposite sides of the pivots, whereby said arms are moved simultaneously, but in opposite directions, as set forth.

Toronto, November 20, 1885.

E. S. PIPER.

In presence of—

CHARLES C. BALDWIN,

F. BARNARD FETHERSTONHAUGH.