(No Model.) 2 Sheets—Sheet 1.

C. M. HAVEY, R. BLACK & T. G. PALMER.

RAILWAY SIGNAL.

No. 345,782. Patented July 20, 1886.

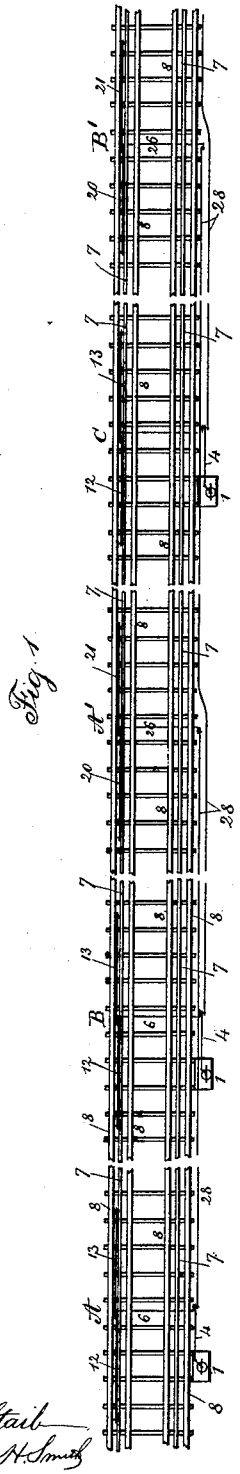

Fig. 1.

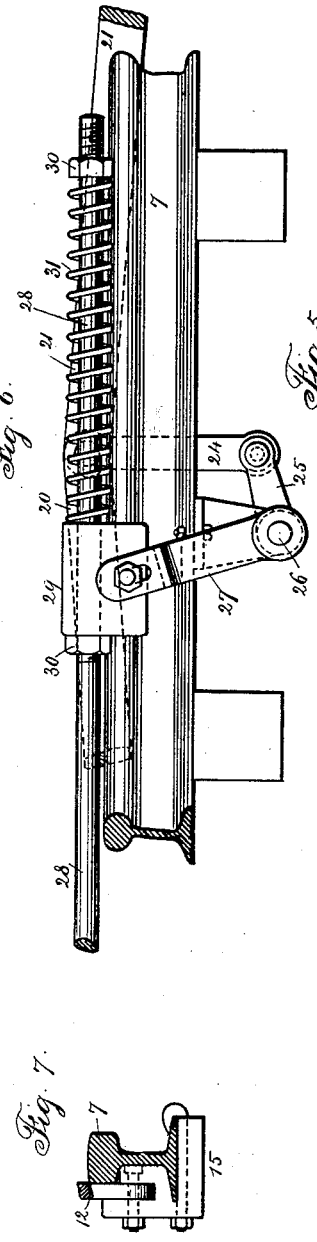

Fig. 6.

Fig. 7.

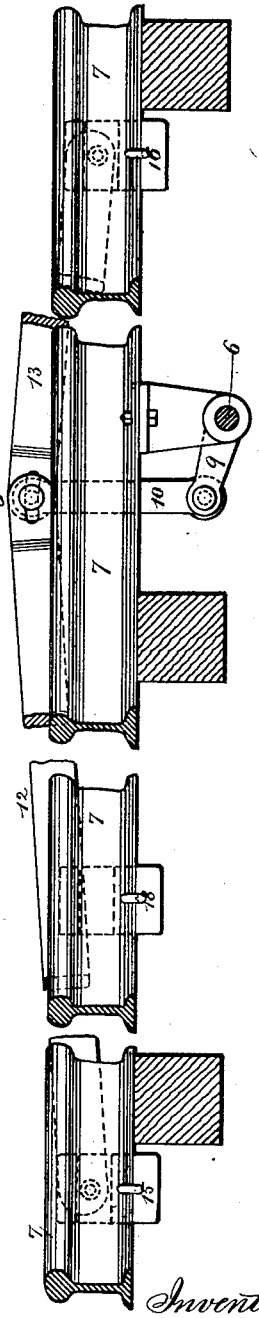

Fig. 5.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

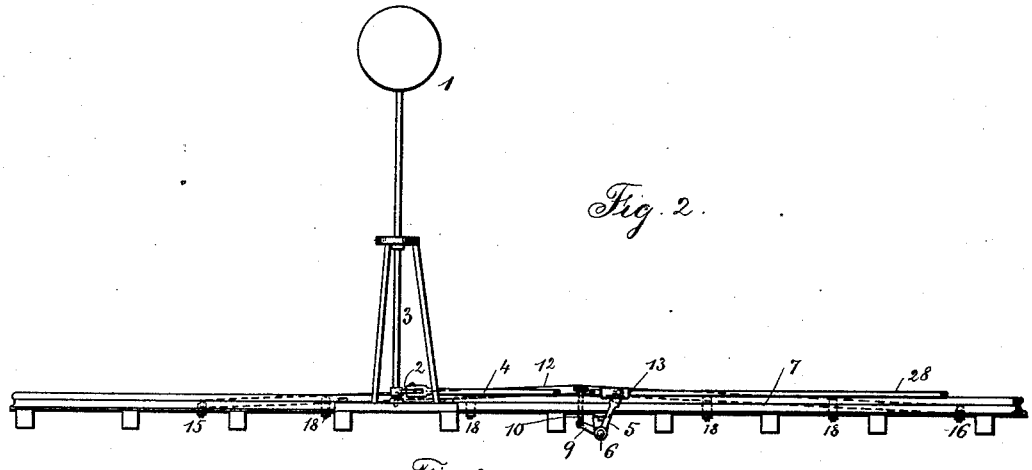


Fig. 3

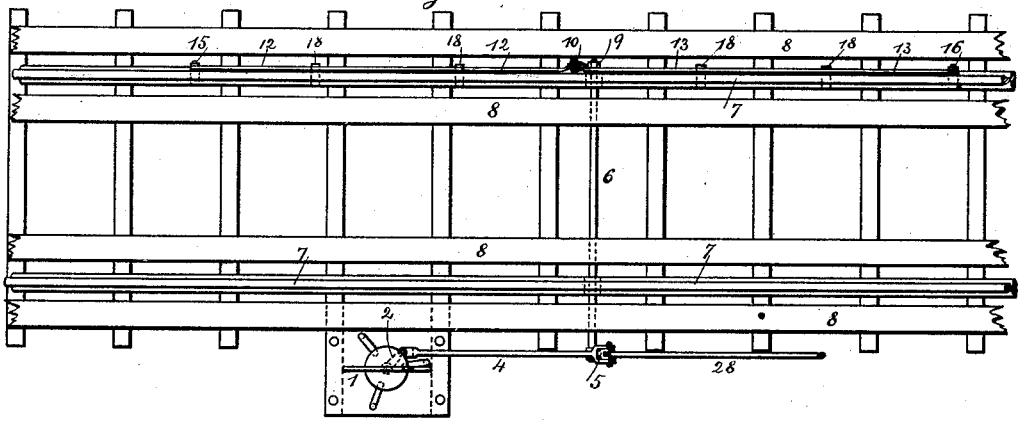
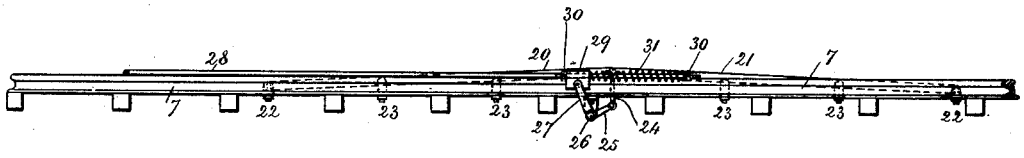


Fig. 4.



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UNITED STATES PATENT OFFICE.

CORNELIUS M. HAVEY AND ROBERT BLACK, OF NEW YORK, AND TIMOTHY G. PALMER, OF SCHULTZVILLE, N. Y.; SAID HAVEY ASSIGNOR TO SAID BLACK AND PALMER.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 345,782, dated July 20, 1886.

Application filed March 8, 1886. Serial No. 194,373. (No model.)

To all whom it may concern:

Be it known that we, CORNELIUS M. HAVEY and ROBERT BLACK, of the city and State of New York, and TIMOTHY G. PALMER, of Schultzville, in the county of Dutchess and State of New York, have invented an Improvement in Railway-Signals, of which the following is a specification.

The object of this invention is to prevent trains approaching too near each other, and it is especially adapted to elevated railways, so that in case of fogs the engineer can keep his train at a safe distance behind the preceding train. There are signals placed at suitable distances apart—say at least twice the length of a train or the length of a train, and ample distance for stopping added—and mechanism is connected with the signal and to inclined rails, over which or in contact with which the train passes, to depress the same and set the signal at "danger," and this danger-signal remains in view until the train passes a second danger-signal, and has set the same, and is moving along at the required distance beyond the second signal, when it acts upon mechanism for turning the first signal from "danger" to "safety," and so on along the entire track that is thus guarded, the signals being entirely automatic and reliable.

In the drawings, Figure 1 is a diagrammatic plan view representing portions of a track with the successively-acting signals applied thereon. Fig. 2 is an elevation, in larger size, of the signal and its connections. Fig. 3 is a plan view of the same. Fig. 4 is a side view of the distant-signal-actuating devices. Fig. 5 is a side view, in larger size, of a separate portion of the track and of the rail-bars and connection to the cross-shaft. Fig. 6 is a partial elevation of the arm at the end of the cross-shaft, and the connections for the distant signal at the station marked A', Fig. 1; and Fig. 7 is a section of one of the rails, and an elevation of one of the rail-bars and of the clip pieces.

The signal 1 is of any desired character. Usually it is a vertical shaft, with a disk or vane upon the top, supported by a frame. When turned so that the flat side of the disk is visible, it indicates "danger." When standing parallel to the track, so as to be seen endwise or edgewise, it indicates "safety" or, "go ahead." A crank-arm, 2, upon the vertical shaft 3 serves to move the signal in one direction or the other. A rod, 4, passes to a crank-arm, 5, upon the cross-shaft 6, that is below the track 7 and guard-rails 8, and has an arm, 9, and a link, 10, to the jointed rail-bars 12 and 13. These rail-bars 12 and 13 are supported at their distant ends by the clip-pieces 15 and 16, that are bolted to the rails, and they are close against the outer edges of the track-rail, and move up and down, and are guided by the jaw-blocks 18, placed at suitable distances apart at the outer sides of the rail. The normal condition of the rail-bars 12 and 13 is elevated at the middle joint, so that, as a train passes along, such bars are depressed and the shaft 6 partially rotated by the link 10, arm 9, and by the arm 5 and rod 4 the signal 1 is turned to "danger." It is now to be understood that devices constructed as aforesaid are placed at suitable distances apart, having reference to stations and to the lengths of the trains. We have illustrated these devices, as at signals A B C, and when a train passes each point in succession the danger-signal 1 at that place is exposed, and so remains until turned back by the appliances hereinafter described.

In arranging a system of automatic signals along a railway it is important to turn on a danger-signal when the train passes signal A, and to allow that signal to remain visible until the train has passed signal B and turned the same onto "danger," and has proceeded sufficiently far beyond the signal B to allow a train that may be following to be stopped by the signal B; hence we locate the devices that turn back the danger-signal A beyond the signal B, between B and C, as at A', and the devices that turn back the danger-signal B are located at B', beyond the signal C, and so on. The devices that turn back the danger-signals are track-bars 20 and 21, joined together in the middle and hinged at the ends to the clip-pieces 22 upon the track-rails; and there are guide-jaws 23 for such bars, a link, 24, to the arm 25, upon the cross-shaft 26, and a crank-

arm, 27, to the rod 28, which is continued along from the signal A to the reversing-station A′. The blocks 29 are provided for the rod 28 to pass through, and to which rods the blocks are clamped by set-screws 30 or otherwise, and the crank-pins of the arms go through these blocks. At the station A the crank-arm 5 moves the rods 4 and 28 in one direction, to turn the danger-signal into view, and at the reversing-station A′ the crank-arm 27 moves the rod 28 and 4 the other way, to turn the danger-signal back to safety. Should a train reach the signal A and be upon the rail-bars 12 13 at the time the train passes the reversing-station A′, the signal 1 could not be turned back to "safety," and it should not be so turned, but should remain at "danger."

To prevent the apparatus being broken, the spring 31 is applied around the rod 28, so that the spring may yield as the parts move at the reversing-station A′ without reversing the signal at A, thus allowing said signal to remain at "danger" after the second train has passed along.

The guide and pivot blocks are adapted to set up against one side of the rail and formed with open jaws, and when used as a pivot-block the pivot-bolt passes through the same, but not through the rail; and when used as guide-blocks the rail-bars simply are supported and guided in them. In both cases the block is clipped to the rail by a hook-ended bolt passing through a perforation in the base of the block below the rail. This renders it unnecessary to perforate the rail, and the parts can be attached wherever desired.

We claim as our invention—

1. A range of visual signals adjacent to the railway-tracks, hinged rail-bars and connections for turning the visual signal to "danger" as the train passes such signal, and rail-bars and connections between the second and third signals to turn the first signal back to "safety," and a spring applied between the danger-signal and the mechanism that is employed to turn it back, substantially as specified.

2. The guide and pivot blocks fitting against the rail and extending below the same, in combination with the hook-ended bolts for attaching the same to the rail, said blocks being formed as jaws for receiving the rail-bars, substantially as set forth.

Signed by us this 1st day of March, A. D. 1886.

C. M. HAVEY.
ROBERT BLACK.
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Witnesses:
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