J. EWART.

Railway-Signaling Apparatus.

No. 162,908. Patented May 4, 1875.

Fig. 1.

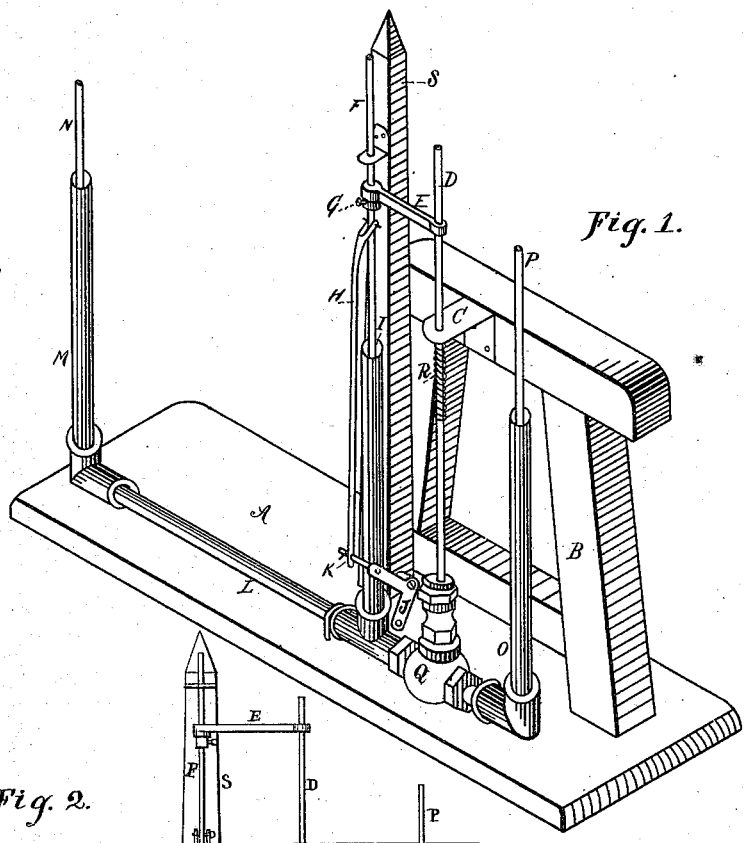
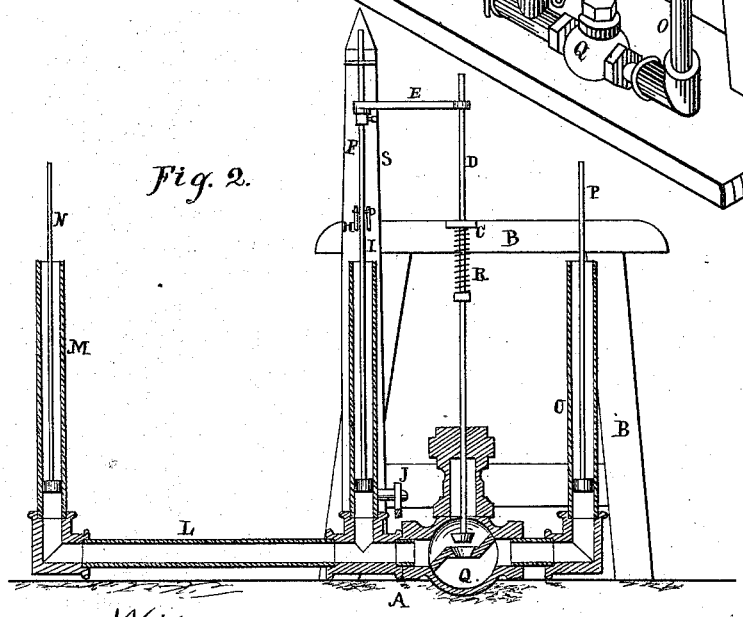


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN EWART, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR OF ONE-FOURTH HIS RIGHT TO JOHN BAILEY, OF SAME PLACE.

IMPROVEMENT IN RAILWAY-SIGNALING APPARATUS.

Specification forming part of Letters Patent No. **162,908**, dated May 4, 1875; application filed December 28, 1874.

To all whom it may concern:

Be it known that I, JOHN EWART, of Lawrence, in the county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Railway-Signals, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which my invention appertains to make and use the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is an isometrical perspective view.

My invention relates more especially to hydraulic railway-signals; and consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which very important results are attained, and a more effective device of this character produced, than is now in common use.

In signals of this description, as ordinarily constructed, much difficulty is experienced from the expansion and contraction of the fluid in the pipes, especially when they are of great length, producing a lack of uniformity in the movements of the target or flag, and greatly enhancing the danger of running trains.

My improvement is designed to obviate these objections and difficulties; and to that end I provide the apparatus with a counter-balance and cut-off, constructed and arranged to operate in a manner which I will now proceed to describe.

In the drawing, A represents the bed-piece or road-ties, to which the horizontal pipe L is attached, and S B a frame for supporting parts of the apparatus. A vertical pipe, M, fitted with a piston and rod, N, is connected to one end of the pipe L, a similar pipe, I, provided with the piston and rod F, being disposed at the other end. Pivoted to the standard S there is a bell-crank lever, J, having the arm K, to which one end of the pitman H is jointed, the opposite end of the pitman being jointed to the piston-rod F above the vertical pipe I. The crank J is designed to be connected with an ordinary switch or signal lever by a rod attached to its lower arm.

No novelty is claimed for these parts when in and of themselves considered, as they are found in all signals of this character.

In adapting my improvements to the signal I extend the pipe L on the side of the pipe I farthest from the pipe M, and connect it with the vertical pipe O, which is provided with a piston and rod, P. An ordinary gate-valve, Q, is disposed in the pipe L, between the vertical pipes O I, having the vertical rod D working in the guide or bracket C. Attached to the upper end of the rod D there is a horizontal arm, E, through a hole in one end of which the rod F works, and around the rod D is coiled a spiral spring, R, the lower end of the spring being attached to the rod and the upper end resting against the under side of the bracket C. An adjustable collet, G, is fastened to the rod F above the pitman H, and between the pitman and arm E.

The piston and rod P are designed to be properly weighted to act as a counter-balance to the rod N and the target to which it is connected.

By the foregoing it will be obvious to all conversant with such matters that when the valve Q is open any expansion or contraction of the fluid in the pipe L will be equalized by the counter-balance P. It will also be obvious that, in order to properly operate the target or flag connected with the rod N, it will be necessary to first close the valve Q, and to this end the collet G is so arranged on the rod F that when the rod is lowered by the crank J the arm E will be released and the rod D forced downward by the spring R, closing the valve Q, thus, as the rod F advances, causing the fluid in the pipe L to act upon the rod P. In reversing the signal the rod F will be retracted or raised, and will advance through a part of its course before the collet is brought into contact with the arm E, thus causing the rod N to be acted upon before communication is established between the pipes O M by opening the valve Q.

It will be understood that the pipe L is designed to be filled with water, or, what is preferable, a mixture of glycerine and alcohol, with which the pipes O M I are also partially filled; also, that the pistons (not shown) of the

rods P F N are to be properly packed, and that any proper mechanism for operating the signal target or flag may be attached to the lever J.

Having thus explained my improvement, what I claim is—

In a hydraulic railway signaling apparatus, the means, substantially as described, for equalizing the pressure and compensating for the expansion and contraction of the fluid and pipes, consisting of the pipe O, piston P, valve Q, and rod D with its arm E, in combination with the pipes I, L, and *m*, adapted to be operated by the piston-rod F, in the manner described.

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