

JOSEPH OLMSTED.

Improvement in Pneumatic Railway Signals.

No. 124,379.

Patented March 5, 1872.

Fig. 1.

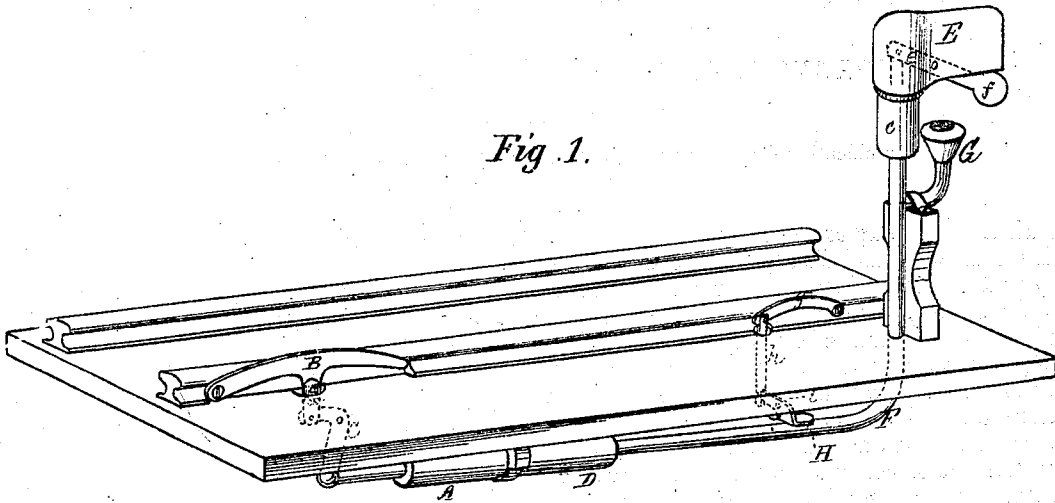


Fig. 2.

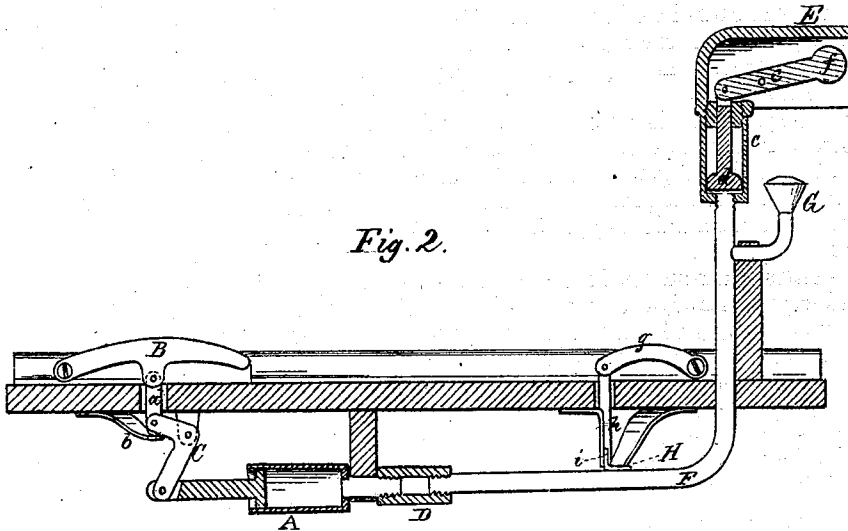
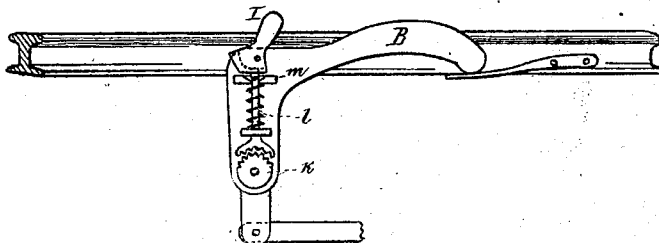


Fig. 3.



Witnesses
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JOSEPH OLMSTED, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN PNEUMATIC RAILWAY SIGNALS.

Specification forming part of Letters Patent No. 124,379, dated March 5, 1872.

To all whom it may concern:

Be it known that I, JOSEPH OLMSTED, of the city and county of Providence and State of Rhode Island, have invented a certain new and useful Pneumatic Railway Signal.

My invention consists in the novel combination of an air-pump arranged to be operated automatically by a passing railway carriage, a reserve-chamber, and a signal for the eye or ear, capable of being operated by an artificial current of air; and I do hereby declare that the following specification, taken in connection with the drawing furnished and forming a part of the same, is a true, clear, and exact description of an apparatus embodying the principles of my invention.

Figure 1 represents, in perspective, a model for illustrating my invention as applied to a double-track road. Fig. 2 represents the same in longitudinal vertical section. Fig. 3 represents operative mechanism applicable to a single track.

A represents an air-pump. It consists of a simple cylinder, piston, rod, and valves common to such pumps. It may be located at any convenient distance from the rail-track, and should be incased in a box or chamber to protect it from injury. B represents a lever, pivoted at one end to the side of the rail. It is pivoted midway to a connecting-rod, *a*, which extends downward at right angles to the lever. A spring, *b*, is so set as to bear upward against the lower end of the rod *a*, and serves to keep the lever raised to its highest elevation, except when the power of the spring is overcome by the application of weight to the top of the lever. C denotes a bell-crank lever, which is pivoted at its elbow in the usual manner. Its upper or short arm is pivoted to the lower end of the lever-rod *a*, and its lower or long arm is pivoted to the end of the piston-rod of the air-pump. It is readily observable that the action of the wheels of a passing railway carriage will depress the lever B, and thereby operate the air-pump, and that the spring *b* will elevate the lever and place it in position to be again depressed by the next succeeding wheel, and so on until all the wheels of a car or train have passed. D denotes a reserve-chamber. It is connected to the air-pump by a pipe provided with air-tight connections. Its entrance is guarded by a puppet-valve of ordinary construction. It is in this chamber that

a reserve force is maintained for a requisite period after the train has passed the pump. E denotes a sight-signal. It is, in practice, to be located at a railway crossing or other point from which signals should be observable, and at such distance from the pump as would insure security from the approaching train. In this instance the signal consists of a cylindrical chamber, *c*, a piston and rod, *d*, and a pivoted lever, *e*, to the end of which is attached a signal, *f*, of any desired form. The whole is embraced within a suitable casing, and so arranged that the signal *f* will be out of sight, except when required to give warning. In this instance the signal-lever *e* is, with the piston and rod, so balanced on its pivot that, when in its normal condition, it will retain the signal within the casing. The cylindrical chamber *c* is connected with the reserve-chamber D by a small pipe, F, provided with air-tight connections. It will be readily observed that a passing train will operate the air-pump and cause the piston and rod *d* to rise, and thereby depress and expose the signal. G denotes a sound-signal, which is connected to the pipe F below the sight-signal. In this instance it is represented as an ordinary air-whistle. A fan-wheel, spring-lever, and bell can be readily attached in an obvious manner, so that a current of air will turn the wheel and cause the bell to be sounded as rapidly and loudly as may be deemed desirable. H denotes a discharge-valve, which controls an orifice in the pipe F, and is located near the signal. It is provided with a rail-lever, *g*, a spring-rod, *h*, and valve-lever *i*, arranged substantially after the manner of the pump-lever. At the time the train reaches the signal-station there exists no further requirement for the signal; and, therefore, the valve H, upon being repeatedly opened by the passing train, will discharge the air from the pipes and reserve-chamber, and permit the signals to reassume their normal condition.

As presented and described, my apparatus is particularly applicable to a double-track railway, and is to be duplicated for the other track with the relative positions of the signal and pump reversed. When applied to a single track there will be two pumps, one on each side of the signal and equidistant therefrom. It will, therefore, be desirable that the levers

be so arranged that they will operate the pump only when actuated by such trains as may be going toward the signal, and not by the same trains after once passing it. A great variety of mechanical appliances can be arranged for accomplishing this purpose, from which I have selected a simple one for illustration.

In Fig. 3 the rail-lever B is represented as mounted on a shaft, but not secured to it. A collar, *k*, is keyed to the shaft. The side of the rail-lever and the inner face of the collar *k* are closely adjacent. A spring-bolt, *l*, with a toothed end, crescent-shaped, is mounted on the side of the lever above the collar in suitable bearings, and is fitted, when depressed, to enter its teeth into corresponding spaces in the upper edge of the collar. The spring is so set with relation to the bolt *l* that it will not permit the bolt to engage with the spaces in the collar *k*, unless the power of the spring be overcome; nor will the spring allow the bolt to remain engaged with the collar unless it is prevented from exercising its force. A cam-lever, *I*, is pivoted to the rail-lever B. The cam is so formed that, when the lever is turned toward the left hand, the bolt *l* is forced by the cam down into the slot in the collar *k*, and thereby forms an operative connection between the rail-lever, the collar, and the shaft. On the contrary, when the cam-lever *I* is turned toward the right hand, the bolt, by the action of the spring, is permitted to leave the slot in the collar, and the movement of the rail-lever causes no corresponding movement of the shaft. In order that the cam-lever *I* shall always, at its upper end, be elevated when at rest, and exposed to the action of the passing train, the cam is provided with two straight sides, which, by bearing upon the washer or plate *m*, hold the lever in either extreme position, but permits, without injury, its upper end to be temporarily depressed to a still greater degree by

the further yielding of the spring. The cam-lever *I* should extend sufficiently above the top of the rail to be exposed to contact with any suitable projection from the car-trucks provided for that purpose. Instead of having the return motion of the rail-levers actuated by springs, it can be accomplished by using a double rail-lever mounted on a rocker-shaft, the two ends of the lever being a little further apart than the usual distance from axle to axle in the car-trucks, so as to prevent pressure being applied to the two ends simultaneously. In its operation the compound lever would have but one complete movement during the passage of every four-wheel truck instead of two complete movements, as in the case of the simple rail-lever. On roads employing the six or eight-wheel trucks, the compound lever must, of course, be properly proportioned. With but little additional expense the double lever rocker-shaft could be mounted in spring pillow-blocks, which, while they could not be depressed by the alternate action of the ends of the lever, would be readily depressed when weight should be applied to both ends of the lever at the same time, and so prevent injury to any of the parts.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination of an automatic sight or sound railway signal, capable of being operated by an artificial current of air, with an air-pump operated by mechanism, which is actuated by a passing train, a reserve-chamber, and connecting-pipes, substantially as and for the purposes specified.

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Witnesses:

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