2 Sheets—Sheet 1.

J. A. TALPEY.

TIME-SIGNALS FOR RAILROADS.

No. 169,741. Patented Nov. 9, 1875.

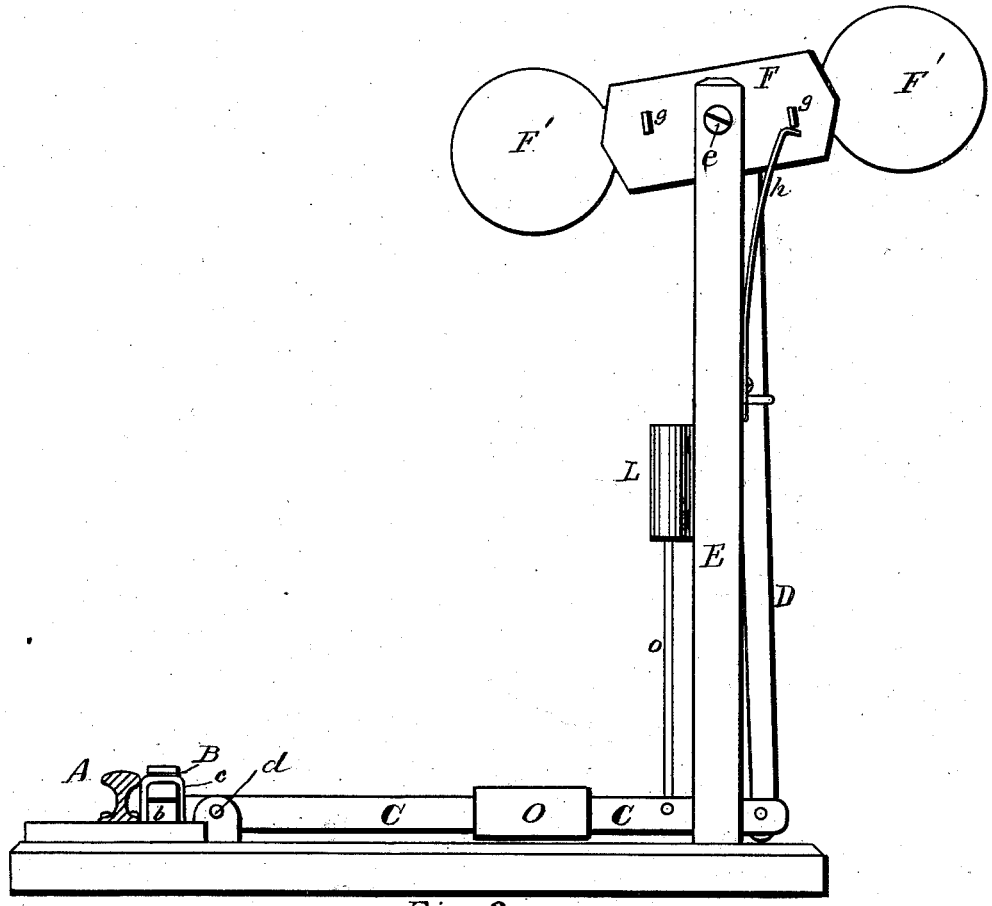

Fig. 2.

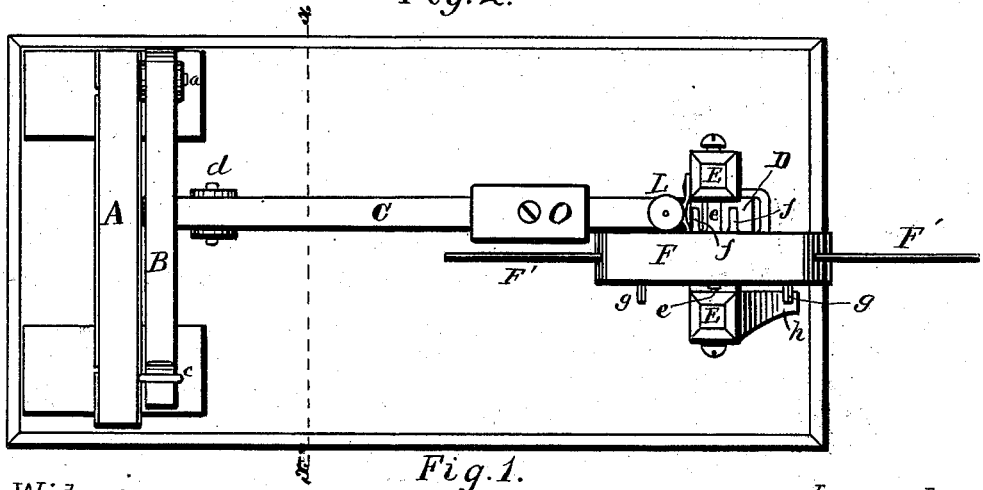

Fig. 1.

Witnesses.
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2 Sheets—Sheet 2.

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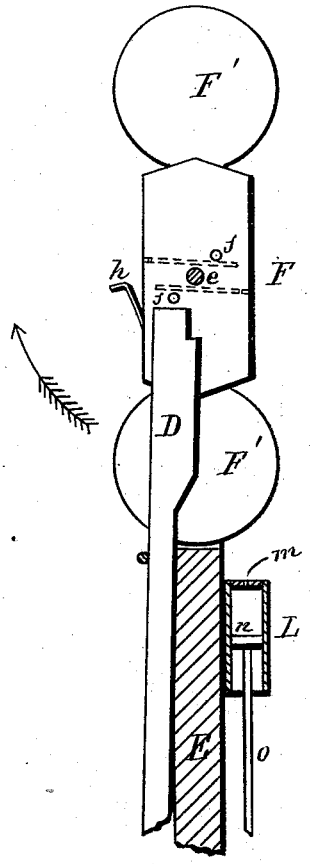

Fig. 3.

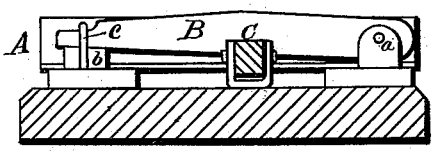

Fig. 4.

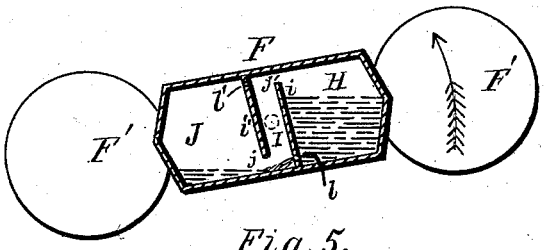

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOSEPH A. TALPEY, OF SOMERVILLE, ASSIGNOR OF ONE-HALF HIS RIGHT TO E. EMMONS GRAVES, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN TIME-SIGNALS FOR RAILROADS.

Specification forming part of Letters Patent No. **169,741**, dated November 9, 1875; application filed October 8, 1875.

To all whom it may concern:

Be it known that I, JOSEPH A. TALPEY, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Railway-Signals, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to a signal to be placed near a railway-track, to indicate to the engineer of an approaching train whether the track is clear ahead or not, and especially to that class of signals in which the signal is set by the passing train; and it consists, first, in the use of a signal-arm pivoted by its center to a suitable standard or post near the track, and having its central portion made hollow, and provided with two abutments or partitions, extending from opposite sides of the chamber toward and nearly to the opposite wall of the chamber, and provided at their other ends with small vent-holes, said chamber being partially filled with alcohol, quicksilver, or other non-freezing liquid, the flow of which through said small vent-holes determines the time which the signal-arm shall remain in a horizontal position, and the weight of which causes said arm to assume a perpendicular position.

My invention further consists in supplying the signal-arm with two projecting pins upon its exterior, arranged a short distance from and parallel to the axis of said arm, in combination with a vertical rod arranged to engage with one of said pins at each upward motion, and thus cause the signal-arm to assume a horizontal, or nearly horizontal, position, said vertical rod being adapted to be moved upward at each passage of a train.

My invention further consists in connecting said vertical rod, by means of a horizontal lever, with a second horizontal lever lying close by the side of the track-rail, pivoted at one end, and the other end resting upon a powerful spring, with its upper surface, or a portion of it, inclined to the top line of the rail, with its highest part raised a short distance above the rail, and in position to be acted upon by the outer portion of the tread of the locomotive driving-wheel.

My invention further consists in providing said signal-arm with two other pins or lugs, projecting therefrom parallel to its axis, and upon opposite sides thereof, in combination with a spring-catch arranged to engage therewith, to hold the signal-arm in a horizontal position.

My invention further consists in the use of an adjustable weight applied to the horizontal lever, to which the vertical rod which sets the signal is connected.

It further consists in the use, in combination with a system of levers to be acted upon by a passing train, for the purpose of mechanically setting a signal, of a piston connected therewith, and working in a cylinder, one end of which is open, and the other closed, except a small vent-hole, as will be further described.

Figure 1 of the drawings is a plan, and Fig. 2 a side elevation, of my improved signaling device, with the signal in position, as automatically set by a passing train. Fig. 3 is a partial vertical section of the signal-post, and showing the signal-arm in its normal position, or before being set by a passing train, or otherwise, to give information to an approaching engineer. Fig. 4 is a transverse section on line *x x* on Fig. 1, looking toward the track; and Fig. 5 is a vertical longitudinal section of the signal-arm, illustrating the arrangement of its interior chamber and the action of the fluid contained therein.

A is one of the rails of the main track of a railroad, close beside which, upon its outer side, is placed the lever B, pivoted at *a* to a suitably-constructed chair or other permanent part of the track, and resting at its other end upon a spring, *b*, and strapped down by the staple *c*.

The upper surface of the lever B is inclined from its center toward its ends, so that while at its two ends said upper surface is below the top surface of the rail A, at its center its top surface is raised some distance above the top of the rail, so that the passage of a locomotive along the track in either direction shall depress said lever till its highest portion is on a level with the top of the rail.

In cases where a double track is used, and

the trains all run in the same direction on a given track, the highest part of the lever B may be at or near its movable end, instead of in the center of its length, as shown. The under side of the lever B rests upon, or is otherwise connected with, the horizontal lever C, pivoted at *d*, and connected at its opposite end to the vertical rod D, fitted to suitable bearings upon the signal-post E. F is a signal-arm, the central portion of which is made hollow, and carrying at each end a colored signal-disk, F′, of any desired form; said signal-arm being pivoted or hung upon centers at *e*, in the center of its length, to the signal post or standard E. The arm F is provided with two pins, *f f*, which project from one of its vertical sides, one upon either side of, and equidistant from, its axis, and in such position that when the signal-arm is hanging in a vertical position, as shown in Fig. 3, one of said pins will be in the path of the upward movement of the vertical rod D, which, by said upward movement, engages with said pin and swings the arm F into a horizontal or slightly-inclined position, as shown in Fig. 2. Upon the opposite vertical side of the arm F are two other projecting pins or lugs, *g g*, also arranged upon opposite sides of, and equidistant from, the axis of said arm, and arranged to alternately engage with the upper end of the spring-support *h*, which serves the purpose of holding up the weighted end of the arm F when it is swung into a horizontal position by the vertical movement of the rod D. The interior chamber of the arm F has formed therein two abutments or partitions, *i i′*, placed one upon either side of the axis of said arm parallel to each other, and nearly dividing said chamber into three compartments, H, I, and J, as shown in Fig. 5, free communication being had from one compartment to another around the ends of the partitions *i* and *i′*, upon opposite sides of the arm F, as shown at *j* and *j′*, Fig. 5. The opposite ends of said partitions *i* and *i′* have formed therein small vent-holes *l* and *l′*, as shown. A quantity of alcohol, quicksilver, or other non-freezing liquid is placed in the chamber of the arm F, which is then hermetically sealed or otherwise made air-tight. The signal-arm F, when placed in position on the standard E, hangs in the position shown in Fig. 3, and all the liquid contained in the arm F is in its lower end compartment.

When a locomotive passes over the lever B it depresses it, and through it the inner or short arm of the lever C, causing the outer or long arm of C to be raised, carrying with it the vertical rod D, the upper end of which engages with one of the pins *f*, set in the side of the signal-arm F, causing said arm to be oscillated about its axis, moving in the direction indicated by the arrow in Figs. 3 and 5, till the end which was downward is raised slightly above a horizontal line, as shown in Figs. 2 and 5, when, one of the pins or lugs *g* having passed above the upper end of the spring-support *h*, said support engages therewith to hold the arm F in the position shown in Fig. 2, the liquid remaining in the same compartment as it was in prior to the setting of the signal, but immediately commencing to flow therefrom through the vent-hole *l*, as shown in Fig. 5.

The arm F remains in the position shown in Figs. 2 and 5 till sufficient liquid has escaped into the opposite or lower end compartment to overbalance the higher compartment, when the arm F will continue its oscillation or rotation in the same direction till it again assumes the position shown in Fig. 3, except that it has changed ends, when whatever liquid may be left in the compartment which is now uppermost passes around the end of the partition *i*, and descends into the opposite end compartment. This operation is repeated at every passage of a train, the arm F remaining in the position shown in Fig. 2, after being set by the train, a certain and predetermined time, which may be varied to suit different circumstances in three different ways—viz., by increasing or diminishing the quantity of liquid contained in the chamber of the arm F, increasing or diminishing the size of the vent-holes *l* and *l′*, or varying the angle at which the arm F shall be set by the train and retained by the spring-support *h*. L is an air-cylinder, secured to the signal-post E or other suitable support, having its lower end open and its upper end closed, except a small vent-hole, *m*. The cylinder L is provided with a piston, *n*, fitted to work air-tight therein, and connected, by the rod *o*, to the lever C. The object of the cylinder L and piston *n* is to serve as an air-brake to retard the descent of the rod D and the outer end of the lever C, and the consequent rising of the lever B, after it has been depressed by the passage of a locomotive, until the whole train has passed over the lever B. The sudden blow of the locomotive-driver upon the lever B causes an abrupt upward movement of the piston *n*, which expels the air in the cylinder L above said piston, through orifice *m*, thus forming a partial vacuum in said cylinder, the pressure of the atmosphere upon the under side of the piston *n* serving to hold the outer end of the lever C up until an equilibrium of pressure is again obtained by air passing through the orifice *m* into the cylinder L. This signal-arm may be arranged to be set by hand or automatically by a passing train. O is an adjustable weight on lever C, to vary the descent of the rod D after setting the signal.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A pivoted railway signal-arm, having formed therein a chamber or chambers, and containing a quantity of alcohol, quicksilver, or other non-freezing liquid, and adapted to be set in a position slightly inclined from a horizontal line either by hand or automatically by a passing train, and to be automatically unset and tilted to a perpendicular position, at

a given and predetermined time after being set, by the flow of the contained liquid from one end of said chamber to the other, or from one chamber into another, substantially as described.

2. The chambered signal-arm F, provided with the abutments or partitions *i* and *i'*, extending from opposite sides of said arm, as shown, and having the vent-holes *l* and *l'*, all arranged to operate as and for the purpose described.

3. The pivoted signal-arm F, provided with the projecting pins *f f*, in combination with the rod D, adapted to be reciprocated vertically, and to engage with one of said pins at each upward movement thereof, to vibrate or oscillate the arm F, substantially as described.

4. The combination of the signal-arm F, pins *f f*, rod D, and levers B and C, all arranged and adapted to operate as and for the purposes described.

5. The hollow signal-arm F, containing a quantity of non-freezing liquid, and provided with the pins or lugs *g g*, in combination with the spring-support *h*, all arranged and adapted to operate as and for the purposes described.

6. In combination with the levers B and C, and rod D, adapted to set a pivoted signal-arm by the action of the drivers of a locomotive upon the lever B, the piston *n*, connected, by a suitable piston-rod, to one of said levers, and fitted to and adapted to be operated by said levers in the stationary or fixed cylinder L, provided with the orifice *m*, as and for the purpose described.

Executed at Boston this 5th day of October, 1875.

JOSEPH A. TALPEY.

Witnesses:
WM. P. EDWARDS,
E. A. HEMMENWAY.