

J. H. CATERSON & R. BROTZ.

RAILROAD-SIGNAL.

No. 175,420.

Patented March 28, 1876.

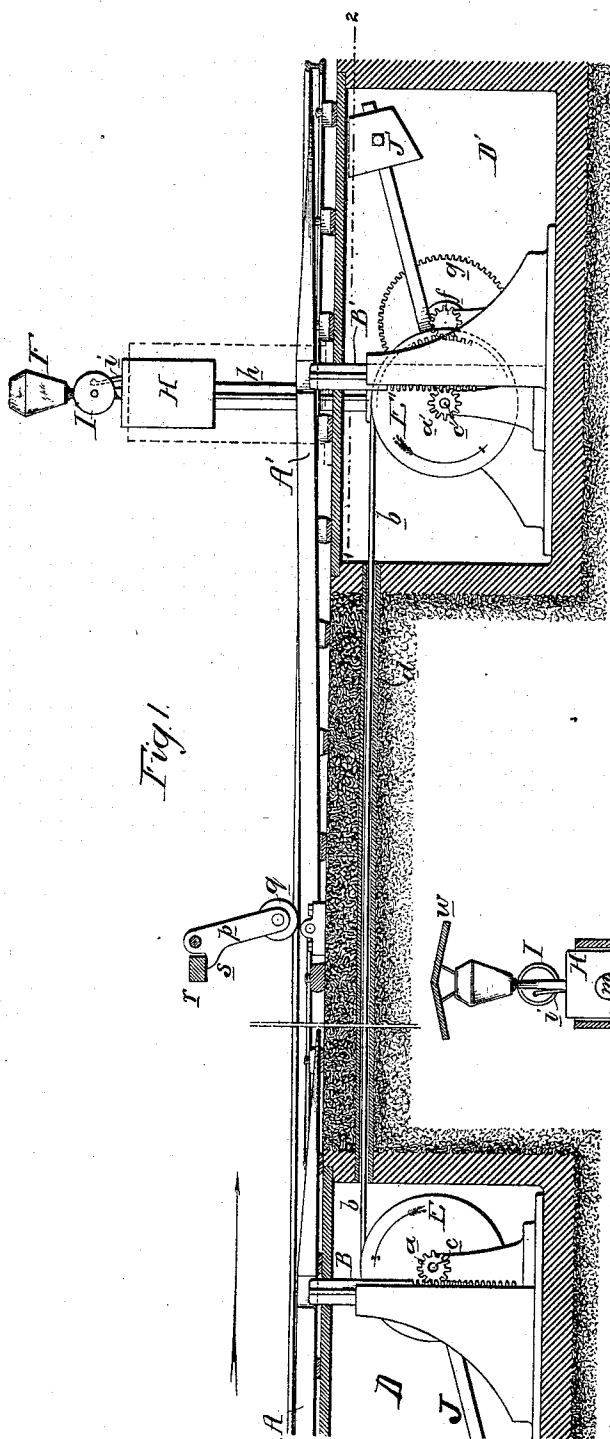


Fig. 1.

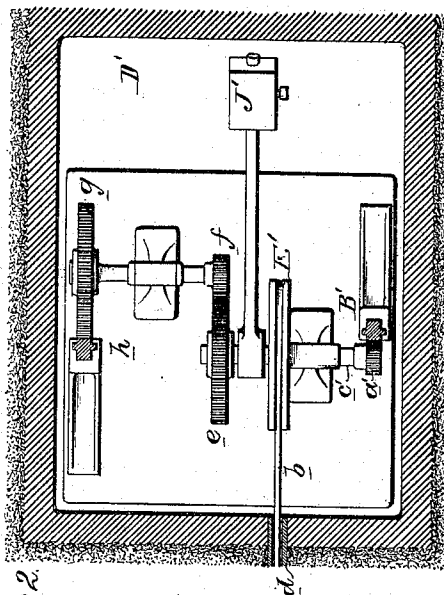


Fig. 2.

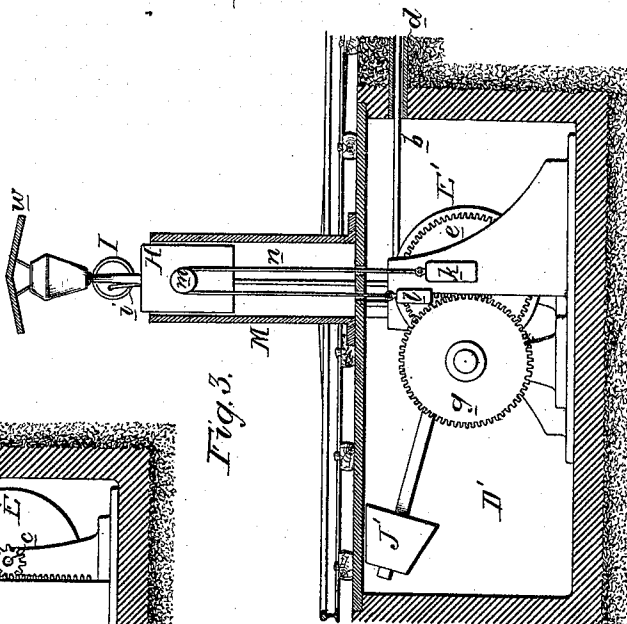


Fig. 3.

Witnesses
Harry Lawson Jr
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by their Attorneys
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UNITED STATES PATENT OFFICE.

JAMES H. CATERSON AND ROBERT BROTZ, OF PHILADELPHIA, PA.

IMPROVEMENT IN RAILROAD-SIGNALS.

Specification forming part of Letters Patent No. **175,420**, dated March 28, 1876; application filed January 17, 1876.

To all whom it may concern:

Be it known that we, JAMES H. CATERSON and ROBERT BROTZ, of Philadelphia, Pennsylvania, have invented an Improvement in Railroad-Signaling Apparatus, of which the following is a specification:

The object of our invention is to construct a simple and effective device for causing trains to operate signals at railway-crossings or other points; and this object we attain in the manner which we will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of a portion of a railway adjacent to a crossing or other signaling-point, illustrating the application of our improved signaling apparatus thereto; Fig. 2, a sectional plan on the line 1 2; and Fig. 3, a sectional view of part of Fig. 1, showing the reverse side of the mechanism.

Between or adjacent to the tracks of the road are two levers, A A', the latter of which is arranged near a crossing or other signal-station, while the former is at a considerable distance from the same in the direction from which the trains approach. The levers are hinged at one end, and are connected at or near the opposite ends to bars B B', which extend down into pits D D', containing the operating mechanism. The bars B B' have toothed edges, forming racks, which gear into pinions *a a'* on shafts *c c'*, carrying grooved wheels E E', which are connected together, so as to be incapable of moving independently of each other, by means of a band, *b*, preferably of wire-rope, which passes from the pit D to the pit D' through a tube, *d*. Owing to this connection the lever A' must always be elevated when the lever A is depressed, and vice versa. The shaft *c'*, carrying the wheel E', also has at one end a cog-wheel, *e*, which gears into a pinion, *f*, on an adjacent shaft, having at its opposite end a wheel, *g*, the latter gearing into a rack formed on the lower end of a post, *h*, carrying at its upper end the signal board or light F. The post *h*, as well as the bars B B', are suitably guided at their lower ends, so as to prevent lateral vibration, and to insure the keeping of the racks in gear with their respective pinions. The post *h* carries, in the present instance, in addition to

the signal F, a box, H, containing clock-work and a gong, I, which, when the said clock-work is in motion, is struck and sounded by a hammer on an escapement-lever, *i*, or other device operated by the same. The main spindle of the clock-work carries, in the present instance, a grooved pulley, *m*, Fig. 3, around which passes a cord or wire, *n*, carrying at the ends two weights, *k* and *l*, the former of which is heavier than the latter. When the signal is depressed, the weight *k* rests upon a suitable base or support, and the weight *l* is suspended, the clock-work in consequence remaining quiescent; but as soon as the signal is elevated, the tendency of the heavy weight to descend causes a revolution of the pulley *m*, and a consequent operation of the clock-work and sounding of the gong. Surrounding the signal is a box or casing, M, of such a height as to conceal the said signal when the post *h* is lowered, and expose the same when the post is raised. We prefer to attach to the top of the signal-lamp a cover, *w*, which moves with the lamp, but, when the latter is depressed, covers the top of the casing M, and serves to protect the lamp and clock-work from the weather. The operation of the lever A and A' is effected, preferably, by an arm, *p*, carried by the locomotive or car, and carrying at its lower end a roller, *q*, this arm being so hung in relation to a bar, *r*, that when a train is approaching in the direction of the arrow, Fig. 1, a lip, *s*, will be in contact with the bar *r*, and the arm will be rigidly held, and will depress the levers A A', but when moving in the opposite direction, as in backing, will be at liberty, and will consequently fail to exert the necessary pressure. Arms and weights J and J' are attached to the shafts of the wheels E and E', the weight J being slightly heavier than the weight J', in order to counterbalance the weight of the signal-post and signal, and to keep the rope *b* constantly tight.

When a train approaching a crossing or other signaling-point in the direction of the arrow, Fig. 1, arrives at the lever A, it depresses the same, as shown, causing a movement of the wheels E E' in the directions of the respective arrows, and thus raising the lever A', and elevating the signal at the cross-

ing or other station. As the signal is elevated the clock-work carried in the box H is set in operation, and the gong I is sounded, thus acting as an additional warning to those about to cross the tracks. When the train reaches the crossing, the signal and lever A' are depressed, and the lever A raised, so that the mechanism is in condition for being operated by the next train. As the signal is depressed, the motion of the clock-work is stopped and the gong ceases to sound, the weights assuming the position shown in Fig. 3, ready to cause the operation of the clock-work when the signal is again raised. Owing to the length of the levers A and A', they present such gradual inclinations for the action of the operating-arm *p* that the depression of the levers, and consequently the raising and lowering of the signal, will be easy and without sudden shock or jar.

It will be evident that different systems of gearing may be employed for imparting the motion of the shaft *c* to the signal, and that various forms of signals may be used—a hinged arm moving in the arc of a circle, for instance, being substituted for the post having a vertical movement.

We claim as our invention—

1. The combination of signal-operating mechanism with the levers A A', their bars

B B', the wheels E E', operated by the said arms, and the connecting-rope *b*, all as and for the purpose set forth.

2. The combination of the levers A A' and their toothed bars B B' with the shafts *c c'*, their pinions *a a'*, and wheels E E', connected together by a rope, *b*, and with devices by which the motion of the shaft *c'* is transmitted to the post *h* of the signal, all substantially as set forth.

3. The combination of the signal F, capable of being raised and lowered, with the gong I and clock-work H, and with devices, substantially as described, whereby the clock-work is set in motion on the raising of the signal, and stopped on the lowering of the same, all as set forth.

4. The combination of the operating-levers A A' with the arm *p*, pivoted to the locomotive or car, and having a projection, *s*, adapted to the bar *r*, as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JAS. H. CATERSON.
ROBT. BROTZ.

Witnesses :

HARRY HOWSON, Jr.,
HARRY SMITH.