H. S. L. BRYAN.

Improvement in Electro-Magnetic Railway Signal and Switch Tender.

No. 123,449. Patented Feb. 6, 1872.

Fig. 1.

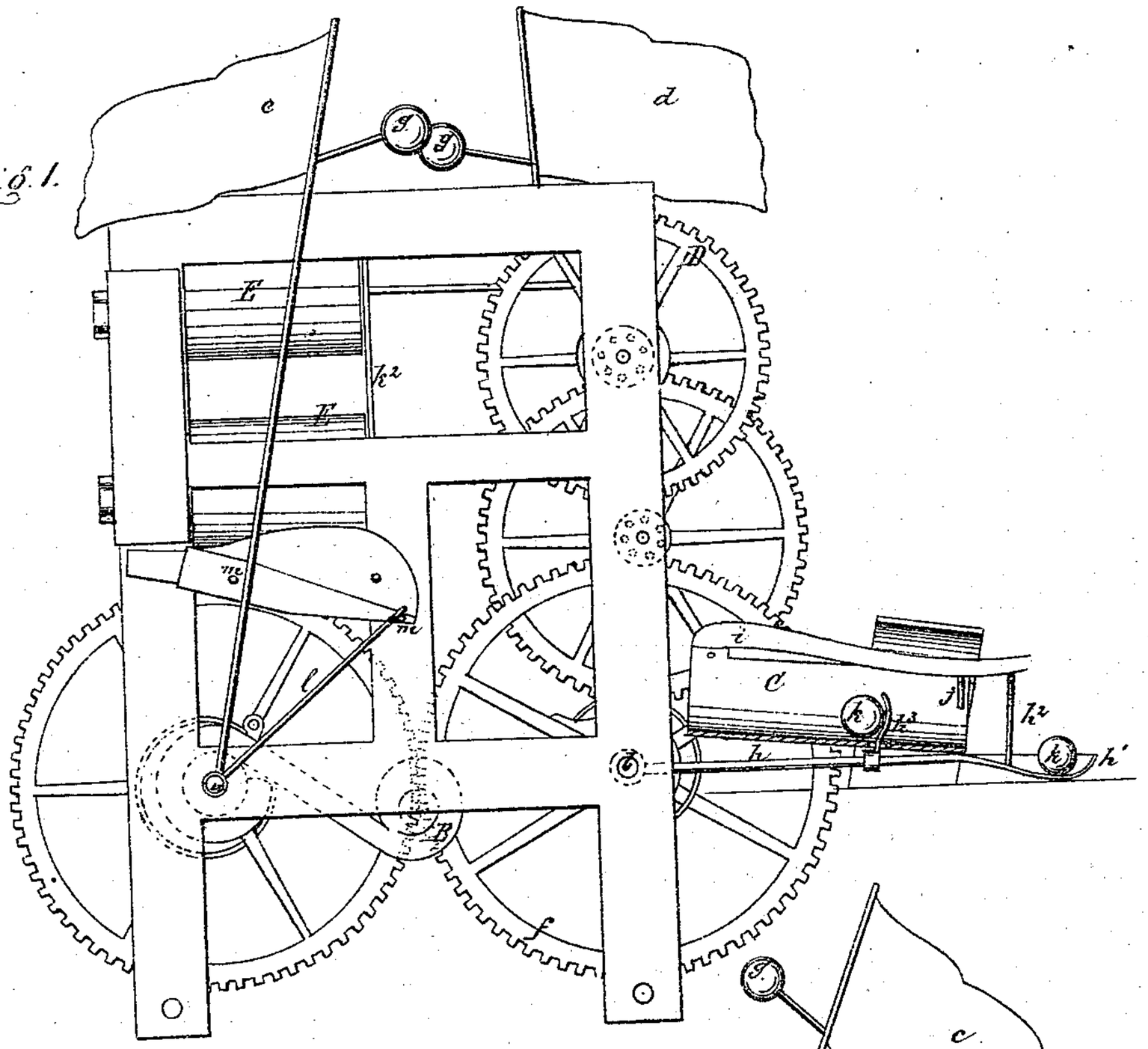
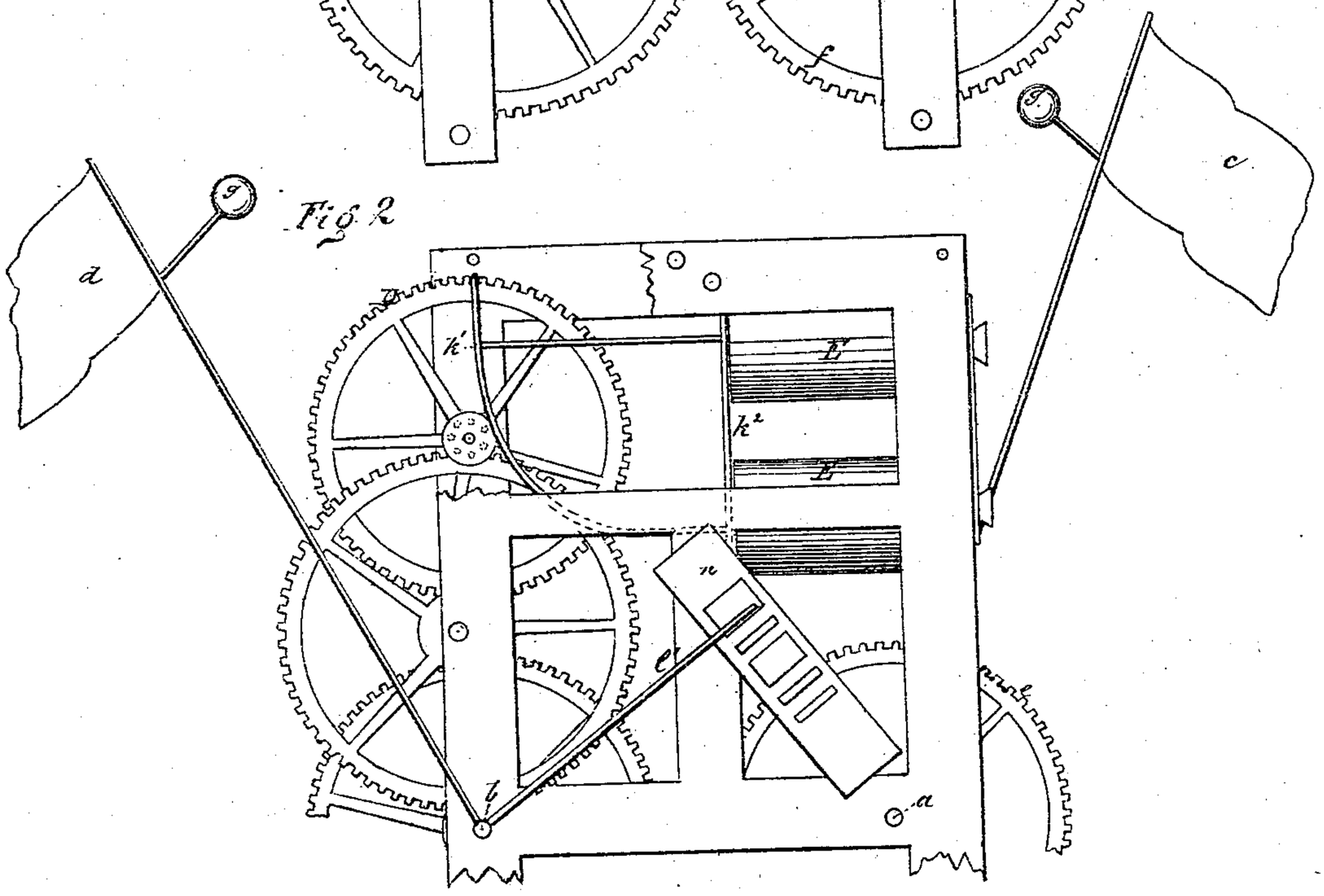


Fig. 2.



Witnesses:

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123,449

UNITED STATES PATENT OFFICE.

HUGH S. L. BRYAN, OF LIBERTY, MISSOURI.

IMPROVEMENT IN ELECTRO-MAGNETIC RAILWAY SIGNALS AND SWITCH-TENDERS.

Specification forming part of Letters Patent No. 123,449, dated February 6, 1872; antedated January 25, 1872.

To all whom it may concern:

Be it known that I, HUGH S. L. BRYAN, of Liberty, in the county of Clay and State of Missouri, have invented a new and Improved Electro-Magnetic Railroad Signal and Switch-Tender; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figures 1 and 2 are elevations of opposite sides of the apparatus.

This invention relates to an electro-magnetic apparatus, whereby the flags and lights of a signal-stand or a railroad switch can be operated from a point at any distance therefrom, and whereby the flag, light, or switch, in passing out automatically, transmits to the operator the signal O K, and, in passing in, the signal K O, by which signals the operator is informed that the flag, light, or switch is working properly.

Referring to the drawing, *a b* are shafts mounted crosswise of a frame, A, and bearing flags *c d*. A weight, B, is attached to the shaft *a* in such manner that the rotation which said weight imparts to said shaft is the proper one for drawing the flag *c* in. A spur-gear, *e*, fixed on the shaft *a*, gears with a spur-gear, *f*, fixed on the shaft *b*, so that at the same time the flag *c* is drawing in the flag *d* is doing the same. By the same means the flags are also moved outward simultaneously. When the flags are drawn in they are hidden behind a shield, not shown, and disks *g*, fixed to arms that project from the flag-staffs, hide the signal-light. To the shaft *b* is attached an arm, *h*, Fig. 1, bearing at its outer end a pan, h^1, and a bail, h^2. Nearer the shaft *b* the arm *h* also bears an upwardly-projecting finger, h^3. C is a trough, placed above the arm *h*, and having a hole in its bottom through which the finger h^3 can pass, and having an arm, *i*, hinged to its rear end, which arm bears, near its free extremity, a downwardly-projecting finger, *j*. The trough C is the receptacle of balls *k*, any one of which is of sufficient heaviness to overbalance the weight B. The shaft *b* is connected by a train of gear-wheels with a spur-gear, D, which engages a brake, k^1, attached to the armature k^2 of a pair of magnets, E E. When the connection between these magnets and the battery which furnishes them electricity is broken the armature is withdrawn by a spring from the magnets in the usual manner, and this movement raises the brake k^1 from the spur-gear D. The ball in the pan h^1 thereupon causes the arm *h* to sink, and this rotates the shafts *a b*, and moves the flags *c d* outward. The sinking of the arm *h* causes the arm *i*, which rests on the bail h^2, to sink also, so that the finger *j* comes in front of the balls in the trough C and prevents the escape of any of them. When the arm *h* is sufficiently inclined the ball rolls out of the pan h^1, and then the weight B causes the arm to rise and the flags to be drawn in. As the arm *h* rises the bail h^2 lifts the arm *i* and finger *j*, so that the front ball is left free to roll out out of the trough into the pan. At the same time the finger h^3 passes upward through the bottom of the trough C in front of the second ball, thus preventing its escape into the pan. The latter, having received another ball, sinks again and afterward rises, and thus the process goes on as long as there are any balls in the trough C. The moment the electric circuit is closed, however, the brake k^1 is applied to the gear D and the movement of the flags ceases. To the shaft *a* is attached a metal arm, *l*, which is connected by a wire with one of the binding-screws of the magnets E. The other binding-screw is connected by a wire with another metal arm, *l'*, that projects from the shafts *b* at the opposite side of the frame A, and this arm is also connected by a wire with the battery and with a pair of magnets at the station where the operator works, which magnets are connected by a wire with the office key and with platinum points *m m*, Fig. 1, on the frame A, between which the lever *l* vibrates. This last-mentioned wire passes through a binding-screw on the upper end of a metal plate, *n*, Fig. 2, attached to the side of the frame A, and having the Morse characters for K O raised on its outer side and insulated with wax or other non-conductor. These characters are so placed that as the lever *l'* vibrates it comes in contact with them successively.

When the operator at the station wishes to change the flags, lights, or switch, he first opens the office-key, thus breaking the circuit,

raising the brake k^1, and setting the shafts a b in motion, whereby the arm l is withdrawn from that one of the platinum points m with which it was in contact, thus making a second break in the circuit, which break is not closed until the arm l is again in contact with one of the points m, until which time, therefore, the wheels continue to revolve. The operator, after starting the clock-work, closes the office-key. As the arm l' passes the plate n a secondary circuit is alternately closed and broken, accordingly as the arm touches the Morse characters or the wax. Therefore the arm l' transmits to the operator the message O K or K O, according to the direction of its movement. As soon as the lever l' reaches the point m toward which it is moving the main circuit is closed and the brake k' applied. By this time the flags are either moved entirely out or in, and the work of the apparatus, for the time being, is consequently done.

The arm l, instead of being attached to the shaft a, might be pivoted at one end, at any convenient point, to the outside of the frame of the apparatus, and be passed though a tube having a female screw in its inside surface, which tube is placed on a screw that projects outside the frame, from the end of the shaft of the wheel D, so that the tube and the arm l with it is moved toward or away from the frame, according to the direction in which the wheel D revolves. The platinum nipple should be placed at the ends of the throw of the arm l, so as to close the main circuit or break it exactly in the manner hereinbefore described. The advantage of this arrangement would be that the brake would be applied exactly where it should be without being affected by the slack between the cogs in the reciprocating movements of the apparatus.

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

1. The combination of the shafts a b, arms l l', plate n, having insulated Morse characters raised on it, and platinum points m, in connection with the wires and battery of a galvanic circuit, as specified.

2. The combination of shafts a b, weight B, arm h, pan h^1, trough C, arm i, and balls k, as described.

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Witnesses:
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