T. S. HALL.

ELECTROMAGNETIC SIGNAL APPARATUS FOR RAILROADS.

No. 103,875. Patented June 7, 1870.

Fig. 1.

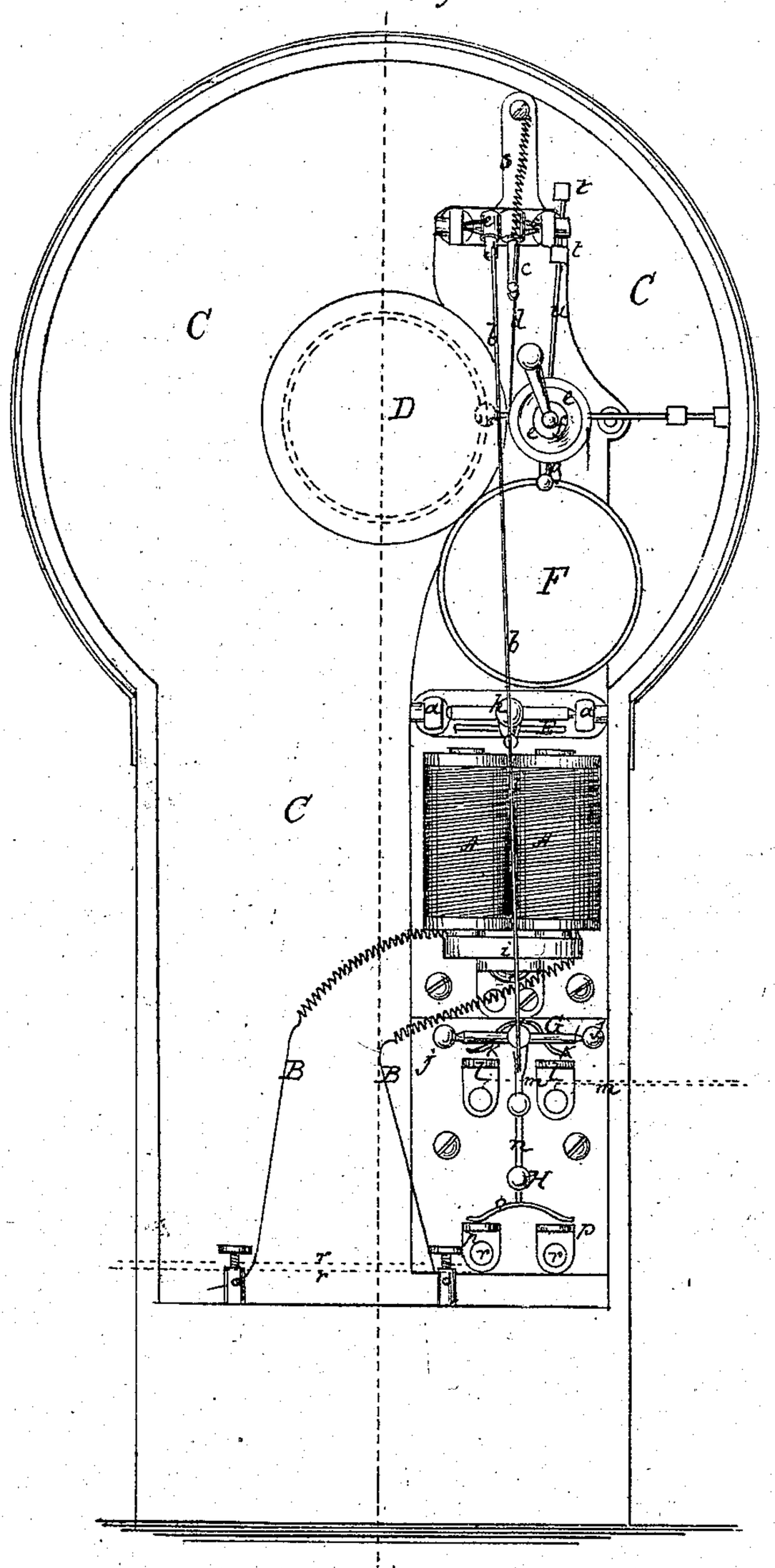
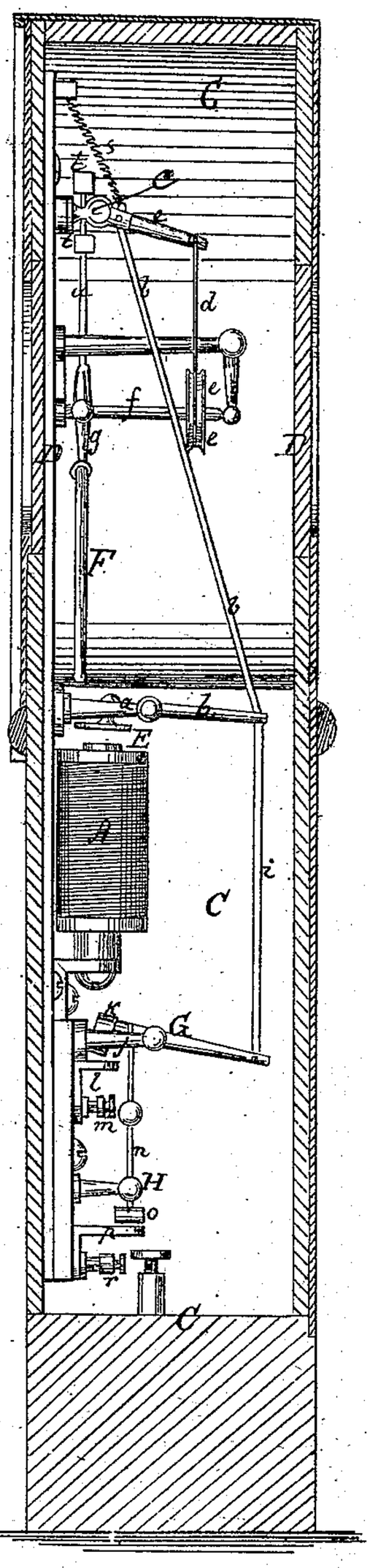



Fig. 2.




Witnesses:

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# United States Patent Office.

THOMAS S. HALL, OF STAMFORD, ASSIGNOR TO HALL'S ELECTRIC RAILWAY-SWITCH AND DRAW-BRIDGE SIGNAL COMPANY, OF NEW HAVEN, CONNECTICUT.

*Letters Patent No.* 103,875, *dated June* 7, 1870.

## IMPROVEMENT IN ELECTRO-MAGNETIC SIGNAL APPARATUS FOR RAILROADS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, THOMAS S. HALL, of Stamford, Fairfield county, Connecticut, have invented a new and useful Improvement in Electric Signals for Railroads; and I do hereby declare that the following is a full, clear and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

Figure 1 represents a front elevation of my improved electric signal, the front plate of its casing having been removed.

Figure 2 is a vertical central section of the same, taken on the plane of the line *x x*, fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to certain improvements on the signal apparatus for which Letters Patent No. 62,414 were granted to me on the 26th day of February, 1867.

The invention has for its object to so arrange the apparatus within the signal-box that the motion of the signal will cause a series of wires to be connected, to produce electric currents, which will work some other signals on other parts of the road. Thus a whole chain of signals can be operated automatically, by the displacement of one single switch.

The invention consists in connecting the armature of the electro-magnet in the signal case, by rods or otherwise, with some swinging levers, which serve, when drawn down, to connect other wires, to close other circuits as aforesaid.

The invention also consists in the peculiar arrangement of parts, as hereinafter specified.

A in the drawing represents the electro-magnet to which the wire B, from a battery, is secured.

This electro-magnet is arranged within a signal-case or box, C, that is set upon the road and protects the machinery operating the signal.

The case or box C is made of sheet metal or other suitable material, and is provided with perforated sides, the apertures of which are closed by glass panes D D, through which the signal can be seen. The electro-magnet A is arranged stationary within the case.

E is its armature.

The same is pivoted to lugs *a* projecting from the case, and is, by a rod *b*, connected with a pivoted bar *c*, which is, by a cord *d*, connected with a pulley *e* on an arbor *f*.

On the arbor *f* is mounted a bar or arm *g*, which carries the signal-disk F.

Whenever the armature E is drawn upon the magnets A, by the charging of the same, the bar *c* is swung up, so that the signal will be swung opposite the openings of the case C.

When the current through the wire B is broken by the proper position of the switch, the disk F drops down again by its own weight.

A spring, *s*, or weight, may be used to aid in raising the signal when the current is established.

Balance weights *t t* are applied on an arm *u* projecting from the signal, to balance the same in either position.

The arm *h* which projects from the armature E to hold the rod *b*, is, by another rod *i*, connected with a lever G pivoted to lugs *j* that project from the case C.

This lever G carries a cross-head K, which, when swung down, connects two metal lugs *l l*, thereby establishing a current through a wire *m*, which has its ends fastened to said lugs *l*.

As long as the magnet A is not charged the cross-head *k* will be held away from the lugs *l*; when, however, the armature E is attracted, the cross-head will, by the motion of the armature, be carried against the lugs *l*, to establish a current through the wire *m* by which another signal may be operated.

The lever G may, by a rod, *n*, be connected with another lever, or directly with a cross-bar, *o*, which will connect lugs *p p*, as shown, thereby establishing a circuit through a third wire, *r*, and thus the armature E may, by its motion, connect with any suitable number of wires to establish circuits through the same whenever the switch is misplaced.

I claim as new and desire to secure by Letters Patent—

1. The combination of the electro-magnet A and its armature E with the rod *b*, swinging arm *c*, cord *d*, disk *e*, arbor *f*, and signal-disk F, all arranged and operating substantially as described, so that the signal is raised when the magnet is charged, as specified.

2. Connecting the swinging armature E with one or more movable bars *k o*, so that, when the armature is attracted by its magnet, it will serve to unite other wires to establish circuits through them, as set forth, whereby one signal will be caused to set others, as described.

Witnesses:

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