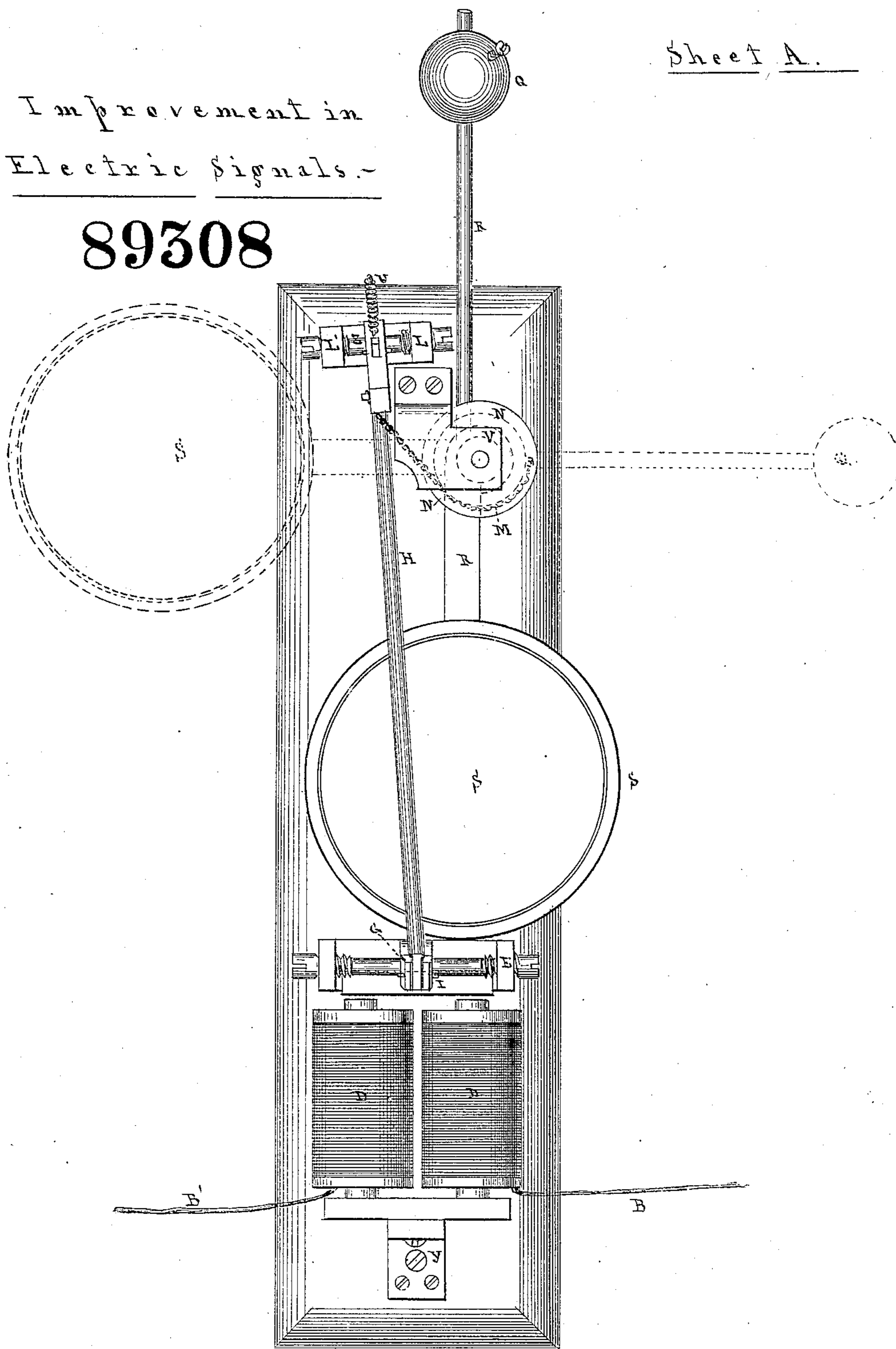


Sheet A.

Improvement in Electric Signals.-

89308

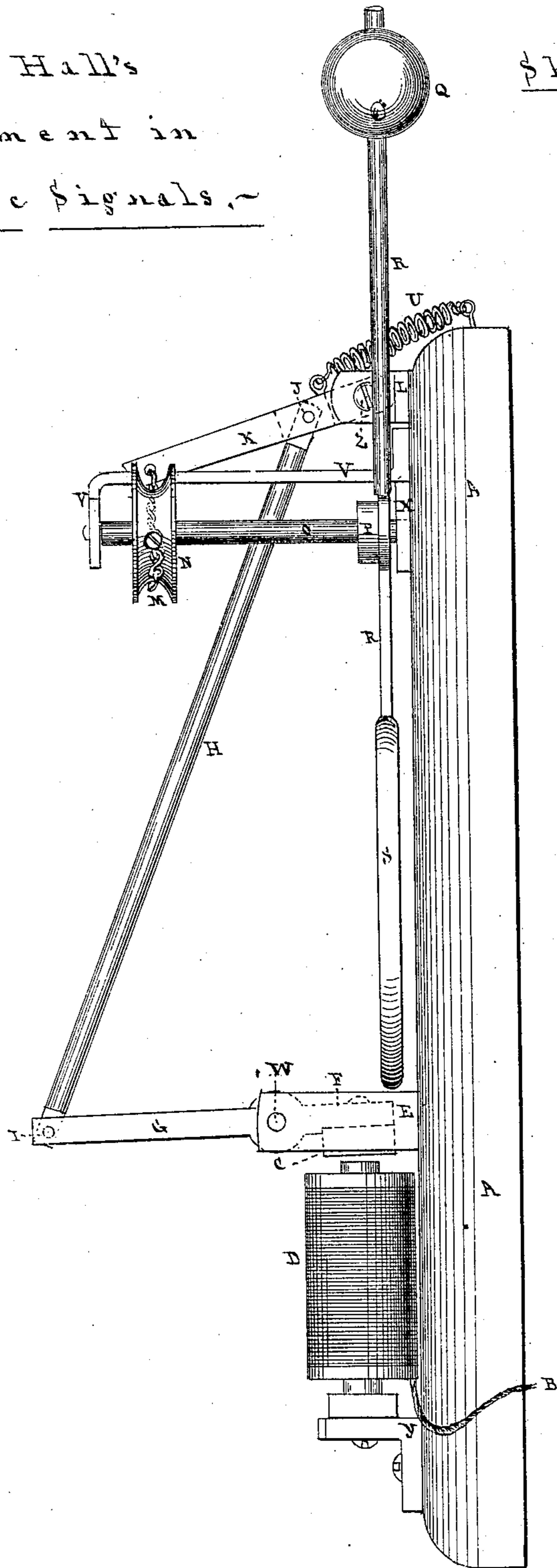


In presence of
John H. French
John M. Rathbald

Thomas Hall

Thomas Hall's
Improvement in
Electric Signals.

Sheet B.



In presence of
John French
John M. Butcher

Thomas Hall

UNITED STATES PATENT OFFICE.

THOMAS HALL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND
WILLIAM DILLON, OF STAMFORD, CONNECTICUT.

IMPROVEMENT IN ELECTRIC SIGNALS FOR RAILROADS.

Specification forming part of Letters Patent No. 89,308, dated April 27, 1869.

To all whom it may concern:

Be it known that I, THOMAS HALL, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Electric Signals for Railways and Draw-Bridges; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters and figures upon the same, making a part of this specification.

Sheet A is a side view, and Sheet B a front view, of the instrument.

The mode of signaling herein described is intended for use in connection with draw-bridges and the switches or points of railways, or to indicate the position of gates, doors, or other movable objects.

I am aware that various kinds of mechanism have been used for this purpose, and what I claim as new and of my own invention is the construction of the apparatus by which the slight motion of the armature of an electro-magnet placed at a distance from the switch or draw-bridge is made to move the signal several feet, so that it may be visible to the engine-driver of an approaching train.

The same letters of reference are used in both of the drawings.

The fixtures and movable parts are mounted upon the upright board or back A, the electro-magnet D being attached to it by the stand or bracket Y. The free ends or poles of the electro-magnet point upward, and just above them is the iron armature C, which is fastened to the short arm of the horizontal lever F G. This lever has its fulcrum at W, supported by the bracket E E' screwed to the back-board A.

From the joint I at the outer end of the long arm G a rod, H, extends upward, and is jointed at J to the lever K, the fulcrum of which is at Z in the stand or bracket L L', and has at its outer or free end a hole or pin, to which a chain, M, is fastened, and then wound partially around the grooved pulley N. This pulley is made fast to the horizontal shaft O, the ends of which turn in bearings at V and X. At the end of the shaft O nearest to the back-board a roller, P, is affixed,

which forms a bearing for the center of the vertical signal-arm R. This arm has at its upper end a counterpoise, Q, and at the lower end a signal-board, S. This should have a surface sufficiently large to be readily seen from a moving train, and in order that it may be light and readily moved it may be made in the form of a frame, having within it glass or other transparent material through which light may be transmitted.

One end of the spiral spring U is fastened to the top of the back-board and the other to the lever K, to prevent the signal-arm R S from falling too rapidly from a horizontal position.

The elevation of the signal S is effected as follows: When the electro-magnet D is charged by the passage of a current through the wires B B' the armature C is attracted and moves downward, the lever G rises, the arm H is thrust upward and raises the lever K. This pulls on the chain M and turns the pulley N, the shaft O, and its attached arm P R, raising the signal S from a vertical to a horizontal position.

The apparatus above described is to be inclosed in a suitable box or case, and, when used to indicate the position of the switch of a railway, is placed near the track at any required distance from the switch.

The wires B B' lead from the magnet D to the switch, the ordinary movement of which, either to the right or to the left, makes or breaks the current of electricity, and raises or lowers the signal S. The counterpoise Q is adjustable, and balances nearly the whole weight of the signal S.

What I claim, and desire to secure by Letters Patent, is—

The mechanism for the elevation of the signal, consisting of the armature-lever, the rod H, the lever K, and the chain and pulley, or their equivalents, connected with the counter-balanced signal-arm, substantially as described.

THOMAS HALL. [L. S.]

Witnesses:

JOHN F. FRENCH,

JOHN M. BATCHELDER.