W. GILBERT & J. GARRABRANT.
Signal for Railway Draw-Bridge.

No. 197,358. Patented Nov. 20, 1877.

Fig. 1

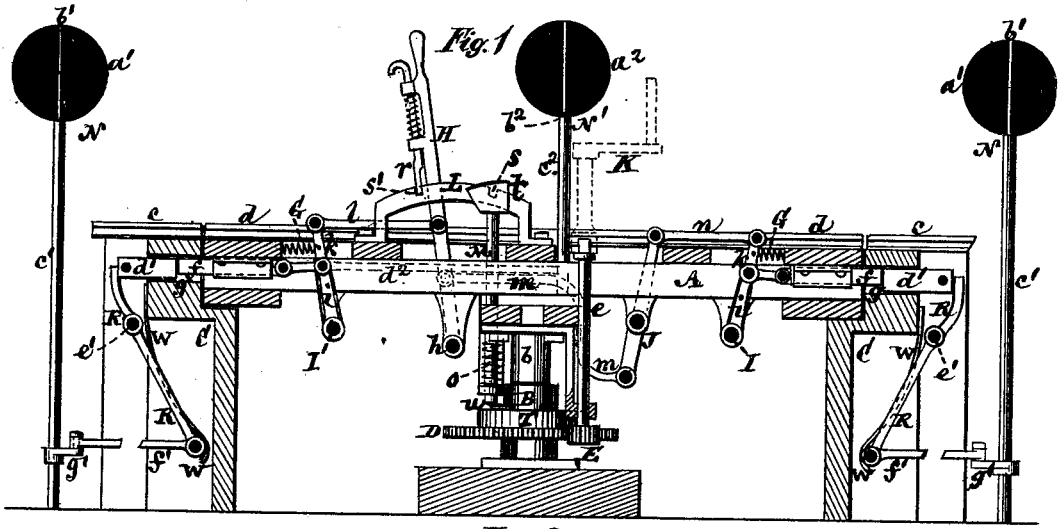


Fig. 2

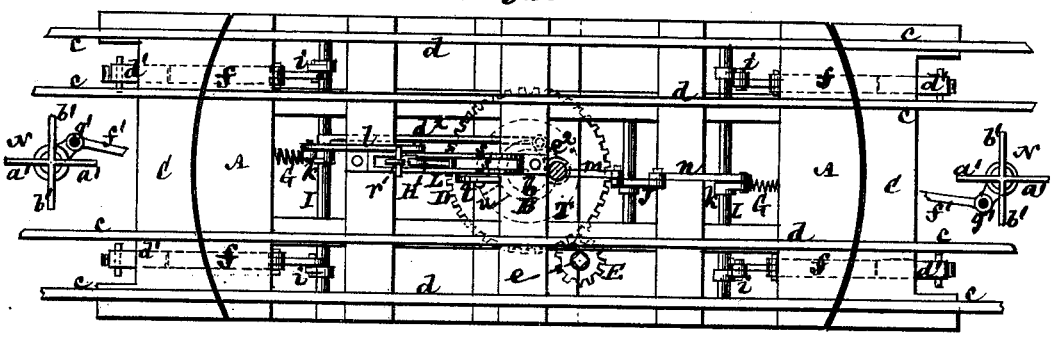
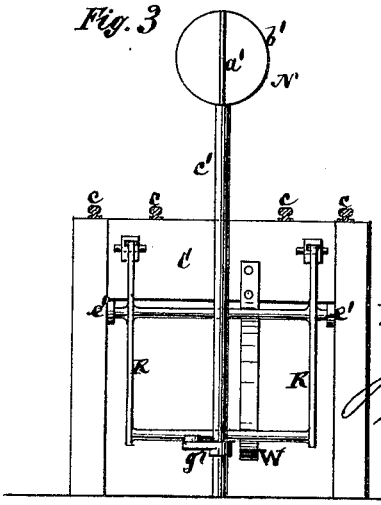


Fig. 3



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UNITED STATES PATENT OFFICE.

WILLIAM GILBERT AND JACOB GARRABRANT, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN SIGNALS FOR RAILWAY DRAW-BRIDGES.

Specification forming part of Letters Patent No. **197,358**, dated November 20, 1877; application filed October 10, 1877.

To all whom it may concern:

Be it known that we, WILLIAM GILBERT and JACOB GARRABRANT, of Jersey City, in the county of Hudson and State of New Jersey, have jointly invented certain new and useful Improvements in Signals for Railway Draw-Bridges, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

This invention consists in certain novel combinations of means for operating signals on a line of railroad automatically by a rotating draw-bridge, to indicate when the latter is open and closed.

Figure 1 represents a longitudinal sectional elevation of a draw-bridge and line of railroad in part, with our invention applied. Fig. 2 is a plan of the same, and Fig. 3 an end view thereof.

A is a horizontally-rotating draw-bridge, arranged to swing or turn by a central pivot, *b*, within an upright lower socket or base, B. C C are the abutments at the ends of the bridge, on which are the terminal portions of the rails *c c* of the main track. The rails on the bridge, which match with the rails *c c* of the main track when the bridge is closed, are represented by the letters *d d*.

D is the stationary wheel or circular rack on the socket or base B, by which, on turning a pinion, E, by crank or handle applied to an upright spindle, *e*, carried by the bridge A, the latter is turned to open and close the draw.

When the bridge A is closed, as represented in Figs. 1 and 2, it is locked, to keep its rails *d d* in line with the rails *c c* of the main track, by the engagement of sliding bolts *f f* at the ends of the bridge with fixed sockets or keepers *g g* in the abutments C C. These bolts *f f* are thrown into lock with the abutments by springs G G; or weights, chains, and pulleys, or weighted levers, may be substituted for said springs. Said bolts are thrown out of lock by a lever, H, which has its fulcrum *h* on the under side of the bridge. Said springs G G and the lever H are connected, for operation in reverse relation with each other on the bolts *f f*, by mechanism substantially as follows:

I I are transverse rock-shafts on the under side of the bridge, near its opposite ends. These rock-shafts have fast on them arms *i i*, to which the bolts *f f* are attached; and on each of said shafts is also secured an arm, *k*, to which the springs G, that control the shooting of the bolts *f* into lock with the sockets or keepers *g* in the abutments, are attached. One of these arms, *k*, is attached by a rod, *l*, to the lever H, and this lever is further connected by a rod, *m*, to the lower arm of a double-armed lever, J, the upper arm of which is attached by a rod, *n*, to the other arm *k*, so that on drawing the lever H to the right, against the tension of the springs G, the bolts *f f*, at opposite ends of the bridge, are withdrawn from lock with the abutments, and the bridge A is, or may be, turned to open it by rotating the spindle *e* through a crank or handle, K. When the lever H is thus adjusted, a spring bolt or catch, *r*, on it engages with a notch, *s*, in a frame, L, on the bridge, to hold back the bolts *f f*; but after the bridge has been closed, and the bolts *f f* are in line with the sockets or keepers *g g*, then the spring-bolt *r* is liberated from the notch *s*, and the lever H is thrown by the springs G G to the left, and the spring-bolt *r* engages with a further notch, *s'*, at the opposite end of the frame L, to hold the bolts *f f*, as thrown by the springs G G, in lock with their keepers *g*.

The liberation of the spring-bolt *r* from the notch *s'*, when it is required to draw back the bolts *f f* by the lever H, may be effected directly by hand, applied to said spring-bolt; but the liberation of it from the notch *s* when the bolts *f f* are required to shoot into lock with their keepers *g*, by the action of the springs G G, is effected automatically by the turning of the bridge A as the latter is brought into a closed position. This is done by means of an upright sliding rod, M, on the bridge, controlled by a spring, *o*, and mounted by a releasing-cap, *t*, rising up or on the raised portion *u* of a fixed cam, T, which causes the rod M, by its cap *t*, to release the spring-bolt *r* from the notch *s*, and so liberate the springs G G and bolts *f f*.

Erected on the main line, at any suitable distance from the opposite ends of the bridge, are signals N N, which, as the bridge is unlocked prior to opening it, are automatically turned or operated to indicate "danger," and remain

so during the opening and closing of the bridge, and until the latter is again locked by the bolts *f f*, but which, when the bridge is closed and locked, are automatically turned or operated to indicate "safety."

These signals N N may be variously constructed, but are here represented as consisting of different-colored transverse disks a^1 b^1, mounted on an upright spindle, c^1, arranged to fit or turn in suitable bearings, so as to expose either disk, a^1 or b^1, to the view of the engineer of a train moving toward the bridge, the one colored disk, a^1, indicating "danger," and the other differently-colored disk, b^1, signifying "safety." Different-colored lights may be substituted for the disks when the signals are required to be operated at night.

To automatically adjust these signals to their proper positions in relation with the bridge, as described, the bolts *f f*, when shooting into lock as the bridge is closed, are caused to act, either directly or through followers d^1 d^1, on a swinging frame or levers, R, the axis of motion of which is at e^1. This frame, which is the same or duplicated at both ends of the bridge, is connected, by a rod, *f'*, and crank or arm *g'*, with the spindle c^1 of either signal, and is operated in one direction of its motion by a spring, W, or a weight may be substituted for a spring, and is operated in a reverse direction by the bolts *f f*.

Thus, when the bridge is closed, and as the bolts *f f* shoot into lock to secure it, said bolts operate on the followers d^1, and through the latter on the swinging frames R, against the action of the springs T, to turn the signals N so as to indicate "safety." On the other hand, when, or as, the bolts *f f* are withdrawn from lock, prior to turning the bridge to open the latter, the springs act upon the swinging frames R to turn the signals N N so as to indicate "danger," and said signals remain in such position not only till the bridge is closed, but till it is locked again.

In addition to these signals N N, there is another and like signal, N', on the bridge itself. This additional signal is or may be of the same construction as the signals N N, being formed of transverse differently-colored disks a^2 b^2, erected on an upright spindle, c^2, and arranged to operate in the same relation with the opening and closing or locking and unlocking of the bridge A as the signals N N, by the connection of one of the arms *k*, through a rod, d^2, and crank c^2, with the spindle c^2 of the signal N'.

This bridge-signal N' is not only an additional precaution in case of the other signals N N being overlooked, but it indicates to craft passing up or down the stream over which the bridge is thrown the open or closed and locked or unlocked condition of the bridge.

We claim—

1. The combination, with the horizontally-swinging or rotating draw-bridge A, of the locking-bolts *f f*, controlled by weights or springs G G, the abutments C C, the lever H, with its connections for withdrawing said bolts, and the signals N N, arranged in advance of either end of the bridge, and controlled by the adjustment of the lever H, substantially as specified.

2. The combination, with the swinging or rotating draw-bridge A, of the locking-bolts *f f*, the sockets or keepers *g g*, the springs G G, the lever H, the rock-shafts I I, the arms *i i k*, the rods *l m n*, the double arm or lever J, and the signals N N, with means, substantially as described, for controlling said signals by the locking and unlocking action of the bolts *f f*, essentially as described.

3. The lever H, provided with a spring bolt or catch, *r*, in combination with the frame L, having opposite end notches *s s'*, the sliding rod M, having a releasing-cap, *t*, the rotating bridge A, the cam T, having a raised portion, *u*, the rod *l*, the arms or levers *k*, the levers *i i*, the rod *m*, the lever J, the rod *u*, the springs G G, the bolts *f f*, controlled by said springs and lever H, and the signals N N, with means for controlling said signals by the locking and unlocking action of the bolts *f f*, substantially as specified.

4. The combination of the swinging frames or levers R with the bolts *f f*, the followers d^1, the rod *f'*, the crank *g'*, the spindle c^1 of the signals N N, and the cam T, or its equivalent, substantially as specified.

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