

(No Model.)

O. GASSETT.

RAILWAY SIGNAL LOCKING APPARATUS.

No. 283,232.

Patented Aug. 14, 1883.

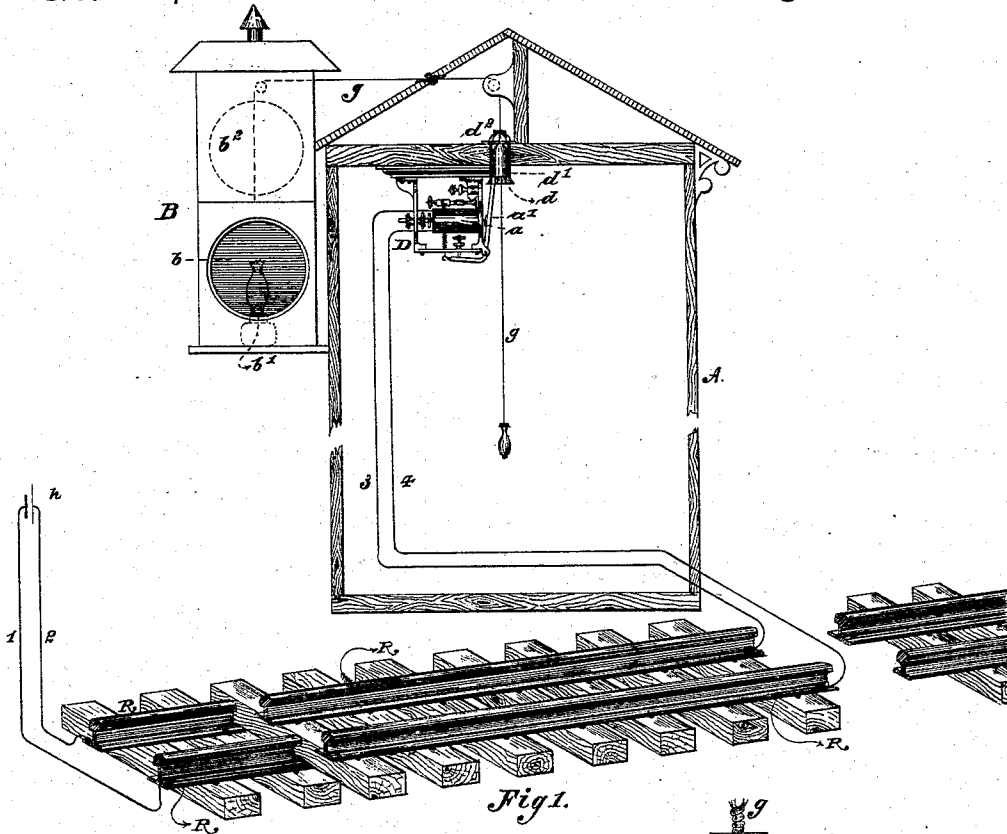


Fig. 1.

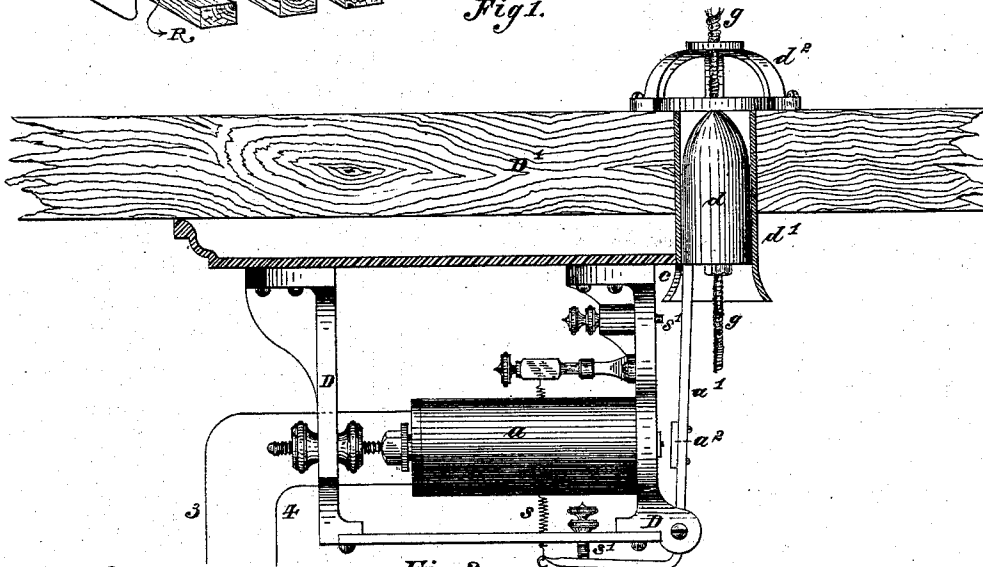


Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

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RAILWAY SIGNAL LOCKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 283,232, dated August 14, 1883.

Application filed July 19, 1882. (No model.)

To all whom it may concern:

Be it known that I, OSCAR GASSETT, of Boston, Suffolk county, Massachusetts, temporarily residing at Sewickley, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Railway Signal Locking Apparatus; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a view in perspective of portions of a railway-track, and in sectional elevation of a signaling-station house, and in outside elevation of a signaling apparatus, illustrative of the present invention; and Fig. 2 is a detached sectional view, to an enlarged scale, of the electric locking apparatus of Fig. 1.

On many of the lines of railway in this country signaling-stations are erected at various points along the line, sometimes at the termini of "blocks," as they are called, and sometimes only at important stations, or at telegraph-stations. These signaling-stations, one of which is indicated by the cabin A, are provided with signaling-boxes B, having usually a glass plate or lens, *b*, in the lower part and on each side or face of the box—that is, on the faces looking up and down the track. About half-way between the glass plates is usually a white partition or diaphragm, but made with an opening large enough to receive a lamp, *b'*, at night. A red banner (indicated by the shade lines of *b* when down, and its position when up being indicated by the dotted lines *b''*) is arranged to be dropped down or raised up between the partition or lamp and the front lens, and a like one is commonly used next the other lens; but as a single one is sufficient to illustrate the present invention, I have shown but one. The other, if added, would be a duplicate of the one indicated. It will now be seen that when the banner is raised the white partition will give a signal for "line clear" by day, and a white lamp will give a like signal at night; but when the banner is down it will give a red or danger signal by day, and (being generally made of translucent material) the light of the lamp shining through it at night will give a red or danger signal. The banner

may be raised or lowered by a signaling-cord, *g*. Normally the banner should be down, or at "danger." Then when a train approaches the station, if the track is clear or supposed to be clear to the next station, or for a safe distance ahead, the operator in the cabin raises the banner, gives the signal of "line clear," and allows the train to proceed. If it be a passenger-train, the usual practice in block signaling is not to allow another following train of the same class to enter on that block until the previous train has passed onto the next block; but if the first train be a freight-train, with orders to take a siding at some point along the block, so as to let a closely-following passenger-train pass, then the above-described means of preventing accidents cannot be resorted to. In such case it is usual to display a green or other cautionary signal to the following train, (and this is done by another like banner similarly operated;) but this is not altogether safe, since the previous freight-train may break down or be delayed before reaching or getting onto the siding. Also, trains sometimes break in two between block-stations, the forward section passes, and if the operator at the second station happens to overlook the absence of "tail lights," he signals back "line clear," and the train following proceeds with a certainty of collision. Also, it is sometimes necessary to run freight-trains in two or more sections on the same schedule time and at a less distance apart than the distance between block-stations. If a forward one breaks down, the train next following is liable to run into it. And, still further, where the signaling-stations are far apart, so that the "block system" cannot be fully utilized, the station operator, as a general rule, can have no guide in allowing following trains to pass, except that one train must not pass until the previous train shall have gone by—say for ten or fifteen minutes, more or less. The track is then supposed to be clear for, say, six or eight miles ahead, whereas the fact may be, and sometimes is, that the previous train has broken down or been delayed at some point out of sight of the signaling-station, and where it has no adequate means of stopping a closely-following train.

My present invention is intended to provide

for these contingencies, and I do it by applying to the signal-operating cord an electric locking mechanism connected with a normally-closed track-circuit in such manner that after
 5 a train has passed a signaling-station and the signal has been restored (as it should be) to "danger," it will be locked at "danger" by the action of the train, and will remain so until that
 10 such track-circuit; and such track-circuit may extend as far as may be desired with reference to guarding against the occurrence of accidents of the kind referred to. Assume that the signal *b* faces or looks up the track, or
 15 to the right, and that the cabin *A* stands about opposite to or preferably a little to the right of the adjacent end of a track-circuit through the rails *R R*, which circuit, of any desired length to the left, is completed by battery *h*,
 20 battery-wires 1 and 2, and magnet-wires 3 4, leading to the opposite poles of an electro-magnet, *a*. The latter is mounted in any suitable frame-work, *D*, secured, say, to a cross-beam, *D'*, of the cabin, and in such a position that its armature-lever *a'* may be thrown into or out
 25 of the path of any suitable stop or catch on or connected with the signal-cord *g*. One suitable form of catch *I* have shown in the drawings at *d*. It consists of a solid block, somewhat of the shape of a Minié ball, secured onto or in the line of the signal-cord *g*, and at the proper point, so that when the banner is down the base or lower end of the catch-block *d* will be
 30 in a suitable position to be engaged by the armature-lever *a'*, so that while so engaged the cord *g* cannot be pulled down, and consequently the banner cannot be raised; but when the electro-magnet is excited, so as to attract its armature *a*, the armature-lever *a'* will be
 40 drawn over out of engagement with the catch-block *d*, and the banner may be raised.

The apparatus is to be provided with the usual retractile spring, *s*, and adjustable stops *s' s'*.

45 It will now be seen that normally the circuit through rails *R R*, from battery to electro-magnet, will be closed, the latter excited so as to draw over the armature-lever out of engagement with the catch-block. Assume,
 50 now, that a train approaches from the right and has a clear track ahead with the right of way. The operator gives the signal of "line clear" by raising the banner, and the train proceeds. As soon as it passes he drops his banner to "danger," and as soon as the forward end
 55 of the train enters on, the rail-circuit it short-circuits the battery *h*, so as to cut out the electro-magnet *a* from its influence; and the armature-lever *a'* then, under the control of the retractile spring *s*, swings out so that its free end shall engage the catch-block *d*, as illustrated more clearly in Fig. 2, and so lock it
 60 and the signal-cord *g* as to prevent the banner being raised to give a signal "line clear" to a following train so long as the forward train or any part thereof is on any part of the rail-cir-

cuit *R*; but if the forward or first-supposed train enters on the rail-circuit *R* before the operator lowers the banner the result will be the same, since the free end of the armature-lever will merely fall against the side of the catch-block *d*, and will not impede or interfere with the upward movement of the catch-block as the signal goes to "danger," and when the signal gets to "danger" locking will take place, as before. As soon as the last car of the forward train leaves the track-circuit rails *R R*, electrical action through the electro-magnet *a* will be restored and the signal-cord will be unlocked.

80 Preferably the catch-block *d* is made tapering at its upper end, and it is provided (when up) with a bush, *d'*, bell-mouthed at its lower end, so that it may be properly guided into its locking position, and a cage, *d''*, may be added to prevent it from getting out of place by going too high. A slot, *c*, should be made in the lower end of the bell-mouth for the free end of the armature-lever.

85 The structure of the apparatus described, as also the arrangement of its several parts, may be varied at pleasure as regards all matters not material to the invention, and particularly the catch employed may be changed in form, so far as it is an element in the general combination, provided it be so combined with the signal-cord and armature-lever as to embody substantially the operation described. And a rigid rod may take the place of the signal-cord, except through so much of the length of the latter as, in the working of the signal, passes over the pulleys or sheaves, where such are used. The approach may be duplicated for the signal-cord and signal of another line of tracks. Also, by describing the banner as going to "danger" by a downward motion, I do not mean to limit myself to an apparatus in which such motion is essential, as by reversing the arrangement of the interlocking parts and counterweighting the signal the same work can be done in the same way with a banner working reversely. Any suitable form of signal may be used. Also, a normally-open rail-circuit closed by the wheels and axle of the train, so as, by exciting the magnet, to lock the signal-cord, may be employed as the mechanical equivalent in the combinations hereinafter claimed of the corresponding parts herein described.

120 I am aware that it is not new at this date to electrically lock a switch-lever by the action of an approaching train for the purpose of preventing the shifting of the switch until the train has passed such switch, as described in Patent No. 256,797, granted to me April 18, 1882. Such apparatus involves the use of a track-circuit which extends from the point to be protected—say the switch—outward along the track in the direction from which the train is expected. The present invention involves
 125 the arrangement and use of a track-circuit which extends from the point at which pro-

tection is desired forward in the direction of the movement of the train when departing, so as to protect it as against a following train, so that so long as the departing train or any part thereof is on the outgoing block or the track-circuit thereof it will be impossible for the operator to let a following train onto such block.

I claim herein as my invention—

1. In a railway block system, the combination of a hand-actuated signal at the entrance end of the block, a signal-cord, *g*, for operating the same, a catch thereon or connected therewith, an armature-lever for engaging such catch, an electro-magnet for actuating such armature-lever, and a track-circuit extending

from at or about the block entrance any desired distance along the track in the direction of the movement of the departing train, substantially as set forth.

2. As a locking device in signaling operations, a catch-block, *d*, arranged on or in the line of a flexible signal-cord, in combination with bush *d'* and armature-levers *a'*, substantially as described.

In testimony whereof I have hereunto set my hand.

OSCAR GASSETT.

Witnesses:

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GEORGE H. CHRISTY.