

(No Model.)

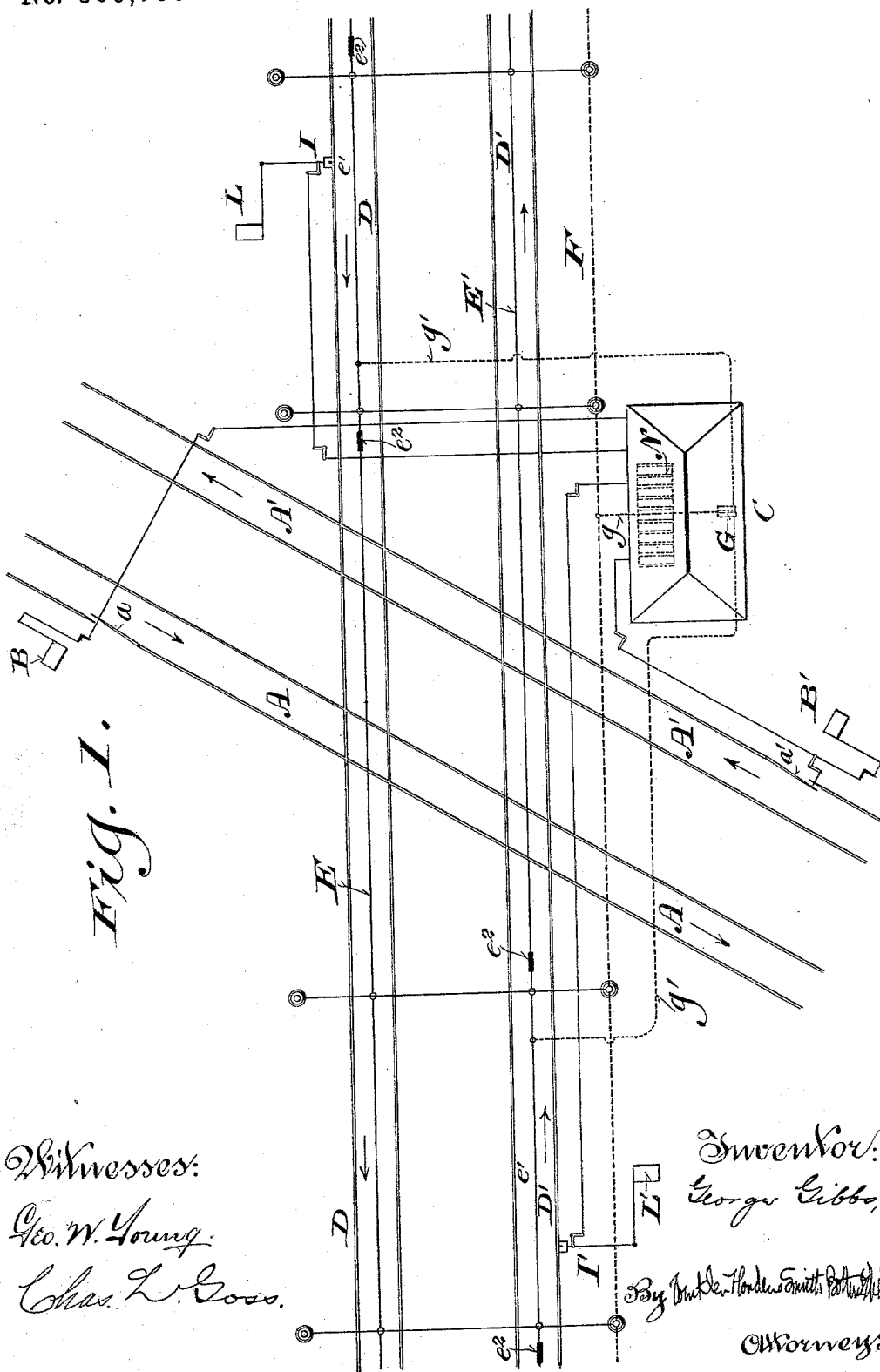
2 Sheets--Sheet 1.

G. GIBBS.

SAFETY APPARATUS FOR RAILWAY CROSSINGS.

No. 569,709.

Patented Oct. 20, 1896.



Witnesses:

Geo. W. Young.

Chas. L. Goss.

Inventor:

George Gibbs.

By *Franklin Smith* Attorney

Attorneys.

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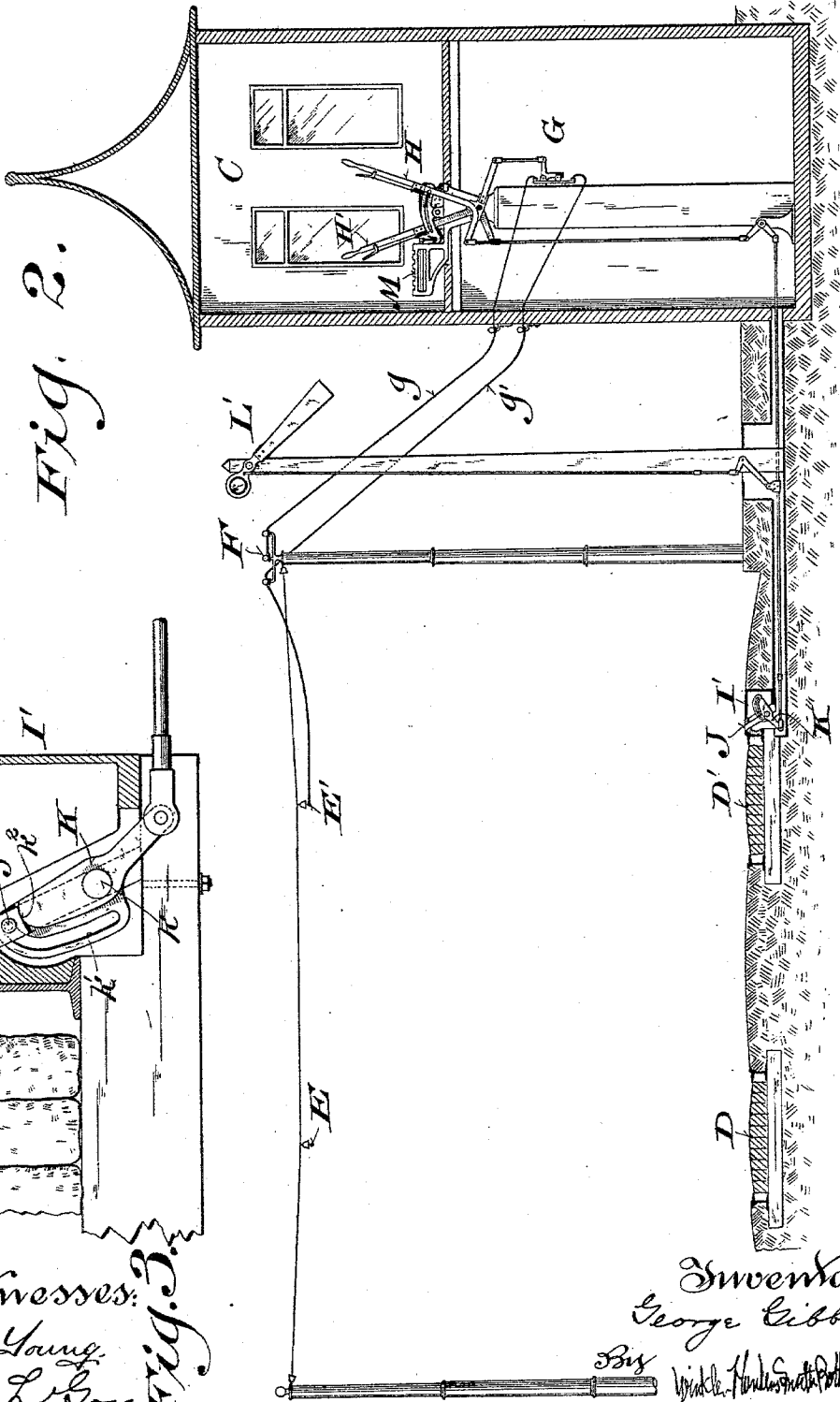
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Fig. 3.

Inventor:
George Gibbs,
By
Windle, Hinds & Patten,
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE GIBBS, OF MILWAUKEE, WISCONSIN.

SAFETY APPARATUS FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 569,709, dated October 20, 1896.

Application filed December 13, 1893. Serial No. 493,609. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GIBBS, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Safety Apparatus for Railway-Crossings; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main object of my invention is to prevent collisions on grade crossings of railways, one of which at least is operated by electricity.

It consists, essentially, of an insulated section in the trolley-wire or conductor of the electric line at each approach to the crossing, a feeding connection with said insulated section through a switch under the control of an operator, by means of which current is supplied to or cut off from said section at the will of the operator, and of certain other novel features in the construction and arrangement of the component parts of the apparatus, as hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a plan view of a grade crossing of steam and electric railways to which my improvements are applied. Fig. 2 is a vertical cross-section of the electric line, showing my protecting apparatus as applied thereto; and Fig. 3 is a vertical section, on a greatly-enlarged scale, of one of the scotch-blocks constituting a part of the apparatus.

It is a common practice at grade crossings of steam-railways to employ an interlocking system of switches and signals to avoid collisions. Such a system consists, essentially, of signals and derailing or turn-out switches on each line, all worked from a central point in a tower and so interlocked in a machine at that point that opposing combinations cannot be set up simultaneously; that is, when the derailing-switches are closed to afford a "clear" line and the signals set at "clear" for one route over the crossing, the switches are locked open and the signals set at "danger" on the other route. By this means a

train ignoring the "danger" indication of a signal meets an open switch set about fifty feet ahead of such signal and is run off the rails, thus preventing a fouling of the crossing. These devices have been extensively introduced at grade crossings, and are required by law in most States where one road desires to cross another at grade without stopping for such crossing. Although used for crossings of steam-railways they have not been deemed necessary for crossings of steam and street railways when the latter employed animal-power for car-propulsion. The rapid introduction of electricity for the operation of street-railways, with the consequent increase in weight and speed of cars, has, however, demonstrated that the chances for accident have been enormously increased, and has demanded the introduction of adequate safety devices.

The arrangement of interlocking switches and signals above mentioned, as applied to steam-railways, is not practicable for street-railway crossings, and my invention relates to improvements in interlocking apparatus whereby it is adapted to the protection of grade crossings between railways, one of which, at least, is an electric or street line.

The principal change necessary for the adaptation of the apparatus heretofore employed on steam-railways for use in connection with electric railways is the substitution of some device other than a derailing-switch for stopping the electric cars on account of the general use of public streets and highways for electric lines. These streets are generally paved in some manner, and a derailing-switch must be so constructed as not to interfere with the pavement or offer an obstruction to ordinary vehicles. It is further necessary that the device be readily kept clear of mud, ice, and snow.

The main feature of my invention, as hereinbefore stated, is the insulated sections of the trolley-wire or conductor and of the switch by means of which the supply of current thereto is controlled, such switch being connected with the interlocking-machine controlling the switches, signals, or other safety devices of the intersecting lines.

Another feature of my invention constituting an additional safeguard against accidents

is the scotch-block, to be hereinafter described.

Referring to Fig. 1 of the drawings, A A' represent the tracks of a double-track steam-railway provided on the approaching sides of the crossing with the turnout or derailing switches *a a'*.

B B' designate signals of any suitable kind for indicating to approaching trains that said switches are closed and the tracks "clear," or that said switches are open and the tracks "blocked" or impassable. These switches and signals are connected in the usual or any suitable manner with levers of an interlocking machine M, as indicated by dotted lines, in a suitably-located tower C, from which they are operated.

D D' designate the tracks of an electric railway crossing the aforesaid tracks A A' of the steam-railway.

E E' are the trolley-wires or conductors provided at the approaches of the crossing with insulated sections *ee'*, the circuit-breakers or insulators by which they are separated from the main wires or conductors being indicated at *e² e'²*.

F represents a feed-wire from which the trolley-wires are supplied with current. It is connected by the wire *g*, as shown in Fig. 2, with a contact of a switch G, another contact of which is connected by wires *g'* with the insulated sections *e* and *e'*. The switch G is located in the tower C and connected with a lever H of the interlocking machine, so as to be controlled thereby in its operation.

As a further safeguard, in connection with the insulated sections of the trolley-wires, I may provide in the beds of the street-railway line scotch-blocks I I', as shown in detail in Fig. 3, and each consisting of a box or casing supported next to the outer side of one of the track-rails with its top flush or nearly so with the tread of the rail, a longitudinally-sliding bar J, adapted to be projected at its upper end through a closely-fitting opening in the top of said box next to the rail, and a lever K, fulcrumed on a pin *k* within said box and provided with a cam-slot *k'*, engaging a pin *j* on said bar J. Said lever is formed with an abutment *k²*, adapted to engage with a shoulder on the bar J and receive the end thrust thereon when it is projected, as shown, into the path of the wheels of a car on the adjacent track. The sliding bar J, being made to fit closely in the aperture through which it projects in the top of the casing, clears itself readily of mud, snow, and ice, a very important consideration in many localities where electric lines are installed and successfully operated. It will be observed that said bar is set at an inclination to a perpendicular, so that when it is projected upwardly from its inclosing casing at the side of a track-rail its upper end will overhang the tread of the rail. The main trolley-wires E E' extend entirely over the crossing, so as to supply current to a motor

which may happen to be on the crossing when the insulated sections *ee'* are deprived of current, and the scotch-blocks I I' are located at suitable points between the ends of the insulated sections, so that in case a motor-man fails to heed the warning afforded by the absence of current in an insulated section and fails to apply his brakes the motor will be derailed or stopped before it clears the insulated section and passes upon the crossing. Each of the scotch-blocks is connected with the lever H or other levers of the interlocking machine in tower C.

To afford still further protection against accident, I may provide semaphore or other visible or audible signals L L', and, as shown in Fig. 2, connect each with the same lever H of the interlocking machine by which the switch G and the scotch-blocks I and I' are operated, or they may be controlled by separate levers of the interlocking machine.

The operation of my improved apparatus may be explained as follows: Assuming that a train is approaching the crossing on track A in the direction indicated by the arrows in Fig. 1, (the direction of travel of trains and cars on each of the several tracks being indicated by arrows,) and that the switch *a* and signal B of that track are connected with the lever H' of the interlocking machine, as shown in Fig. 2, said switch being open and the signal B and lever H' located in their "danger" positions, and the lever H and the safety devices of the electric railway connected therewith, being in their "clear" or "safety" positions, the operator first throws the lever H to "danger," thereby shifting the switch G to cut out the insulated trolley-sections *ee'*, projecting the bars J of the scotch-blocks I I' into operative position, shifting the signals L L' to "danger," and unlocking the lever H'. The apparatus being now in condition to prevent the passage of cars on either of the electric-railway tracks over the crossing, the lever H' is thrown to "safety" position, thereby closing the switch *a*, clearing the signal B, and permitting the train to pass over the crossing on track A. Before the safety devices of the electric-railway line can be restored to their "clear" or "safety" positions it is necessary for the operator to return the lever H' to "danger." In this way it is made impossible for the operator to place the signals or safety devices of either of the intersecting lines in their "clear" or "safety" positions without first placing the signals or safety devices of the other line in their "danger" positions.

Although I have shown and described my improved apparatus in connection with a crossing between steam and electric railways, it is equally applicable to crossings between two or more electric railways, and it is obviously immaterial what system of electric railways is employed, the overhead-trolley-wire system being selected merely for convenience of illustration.

Various changes in the details of construc-

tion and arrangement of the component parts of the apparatus may be made within the intended scope of my invention.

I claim—

5 1. The combination with the insulated section of working conductor on an electrically-operated road, of a cut-out therefor and a train-stopping device such as a signal, derailing-switch, or the like, on the intersecting
10 road operatively connected with said cut-out to block traffic on the electric road when the right of way is given to the other road.

2. In safety apparatus for railway-crossings, the combination with an electric line, of
15 an interlocking machine controlling the operation of the safety devices of the several intersecting lines, a trolley-wire or conductor having an insulated section at the approach to the crossing, and a connection between
20 said insulated section and a source of electricity comprising a switch connected with and controlled in operation by said interlocking machine, substantially as and for the purposes set forth.

3. In safety apparatus for railway-crossings, the combination with intersecting tracks of an interlocking machine controlling the operation of the safety devices of the intersecting lines, a scotch-block located adjacent to
25 one of the intersecting tracks at the approach to the crossing and connected with and controlled in operation by said interlocking machine, a trolley-wire or electric conductor having an insulated section at the approach to the crossing, and a switch through which
30 said insulated section is connected and disconnected with a source of electricity, also controlled in operation by said interlocking machine, substantially as and for the purposes set forth.

4. In safety apparatus for railway-crossings, the combination with an interlocking machine controlling the operation of the safety devices of the several intersecting lines, of a scotch-block located at the approach of
35 an intersecting line to the crossing and connected with and controlled in operation by said interlocking machine, said scotch-block consisting of a casing, a longitudinally-sliding bar guided therein and adapted to be projected through an aperture in the upper side of said casing, and a cam-lever inclosed in said casing and engaging with said bar, substantially as and for the purposes set
40 forth.

5. In safety apparatus for railway-crossings, the combination with an interlocking machine controlling the operation of the safety devices of the several intersecting lines
45 of a scotch-block located at the approach of an intersecting line connected with said interlocking machine and composed of a casing, a sliding bar guided obliquely therein and adapted to be projected through an aperture
50 in its upper side, and a cam-lever fulcrumed in said casing in engagement with said bar and provided with an abutment adapted to

engage with a shoulder on said bar and receive the end thrust thereon, substantially as and for the purposes set forth.

6. In safety apparatus for railway-crossings, the combination with an interlocking machine controlling the operation of the safety devices of the several intersecting lines, of a trolley-wire or conductor having an insulated section at the approach to said crossing, a connection between said insulated section and a source of electricity, provided with a switch which is connected with and controlled in operation by said interlocking machine, and a scotch-block located at the approach of the electric line to the crossing and connected with said interlocking machine, substantially as and for the purposes set forth.

7. In safety apparatus for railway-crossings, the combination with an interlocking machine controlling the operation of the safety devices of the several intersecting lines, of a trolley-wire or conductor having an insulated section at the approach to said crossing, a connection with a source of electricity provided with a switch connected with said interlocking machine, a scotch-block, and a signal located at or near the approach of the same line to said crossing, and each connected with
85 said interlocking machine, substantially as and for the purposes set forth.

8. In safety apparatus for railway-crossings, a scotch-block consisting of a casing, a longitudinally-sliding bar guided therein and adapted to be projected through an aperture in the upper side of said casing, and a cam-lever fulcrumed within said casing and engaging with said bar, substantially as and for the purposes set forth.

9. In safety apparatus for railway-crossings, a scotch-block consisting of a casing having an aperture in its upper side guided obliquely therein, and a cam-lever inclosed in said casing in engagement with said bar and provided with an abutment adapted to engage with a shoulder on said bar and receive the end thrust thereon, substantially as and for the purposes set forth.

10. In safety apparatus for railway-crossings, the combination with an electric line, of a trolley-wire or conductor having an insulated section at the approach to the crossing terminating in advance of the crossing, and a connection with a source of electricity provided with a switch under the control of an operator, the main trolley-wire or conductor extending past the crossing so as to supply current to a motor thereon when the insulated section is deprived of current, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

GEORGE GIBBS.

Witnesses:

A. W. EMERY,
CHAS. L. GOSS.