J. S. BROOME & C. S. ARCHER.

Railroad-Switch.

No. 206,220. Patented July 23, 1878.

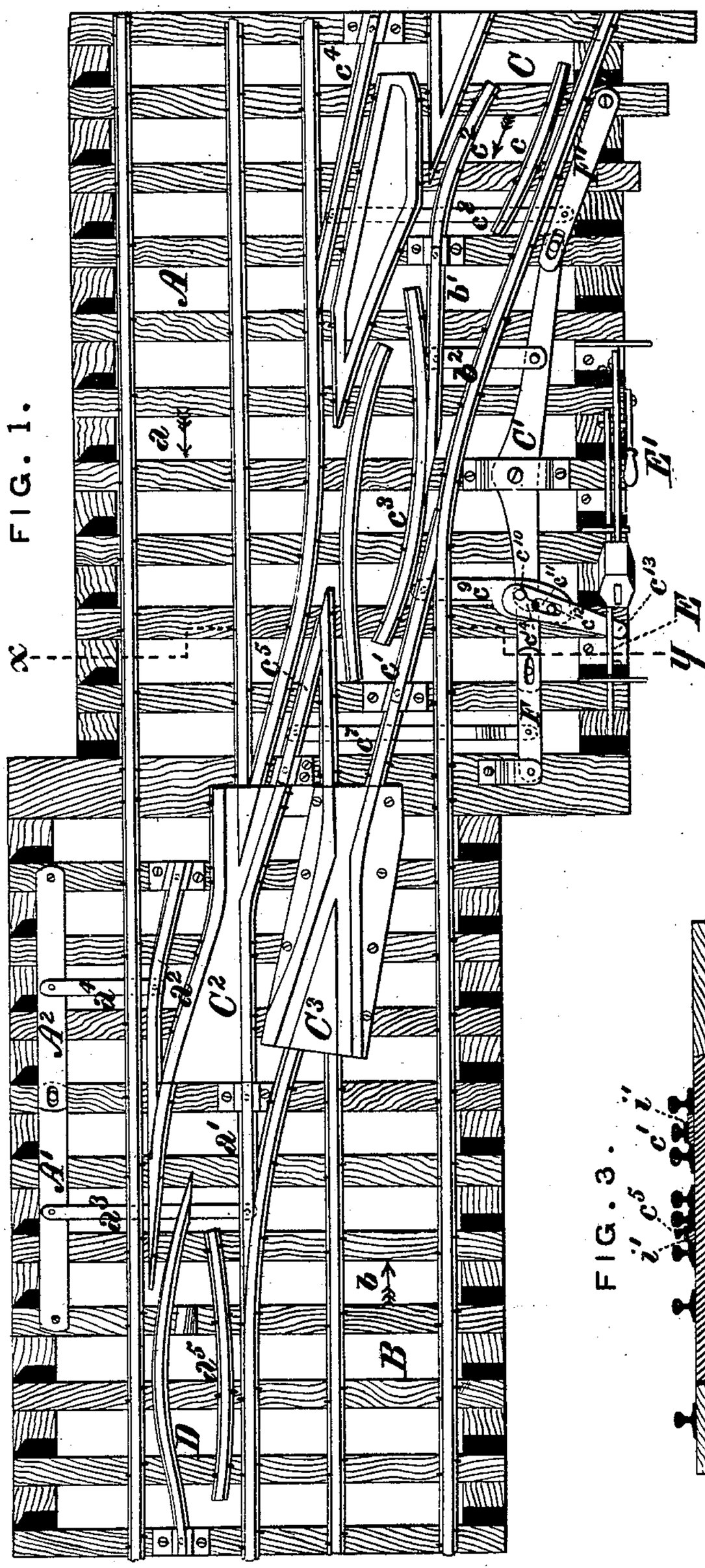

FIG. 1.

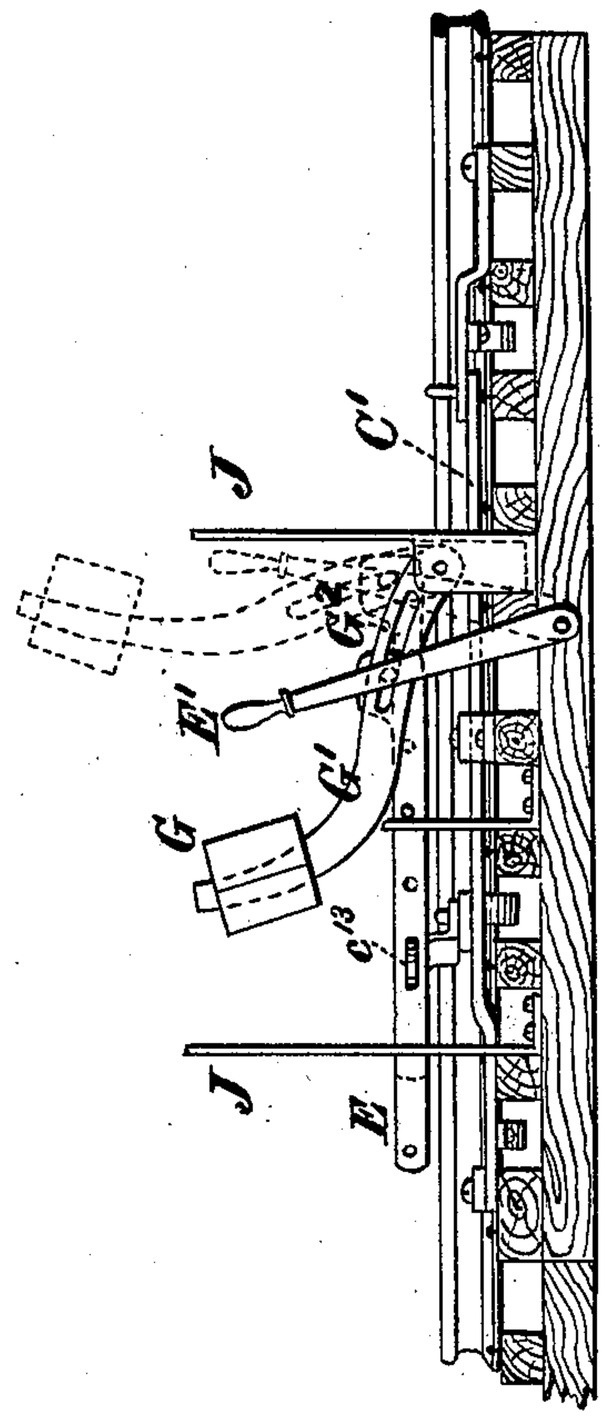

FIG. 2.

FIG. 3.

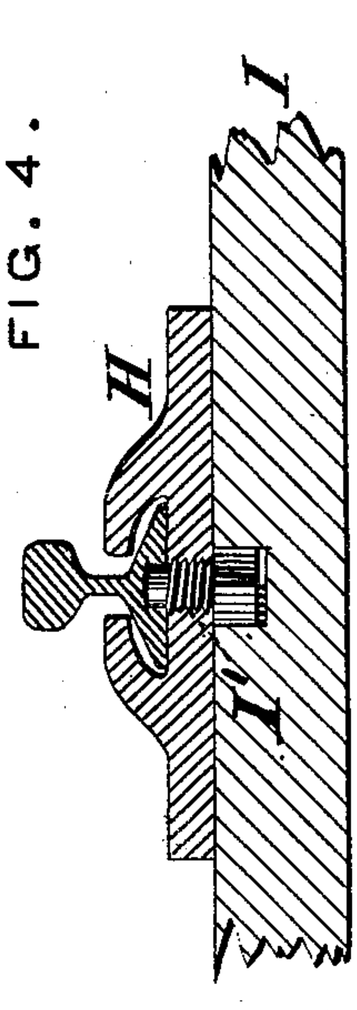

FIG. 4.

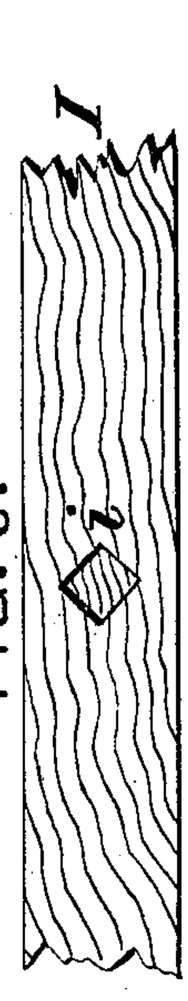

FIG. 5.

WITNESSES.

Geo. A. Vaillant.

Wm. Leyniss.

INVENTORS.

Jno. S. Broome,
Chas. S. Archer,
by J. Thornden Bell, Atty.

UNITED STATES PATENT OFFICE.

JOHN S. BROOME AND CHARLES S. ARCHER, OF CAMDEN, NEW JERSEY.

IMPROVEMENT IN RAILROAD-SWITCHES.

Specification forming part of Letters Patent No. **206,220**, dated July 23, 1878; application filed January 12, 1878.

To all whom it may concern:

Be it known that we, JOHN S. BROOME and CHARLES S. ARCHER, both of the city and county of Camden, in the State of New Jersey, have jointly invented certain new and useful Improvements in Safety Switches and Crossings for Railroads, of which the following is a specification:

The object of our invention is to provide, in a railroad switch and crossing, simple and efficient means for preventing derailment of trains by accidental or willful misplacement of the movable parts, and to enable a train to pass or cross in safety irrespective of the position in which the switch may be set. To these ends our improvements consist in the combination, with the main side track and crossing rails, of pivoted switch-tongues, automatically operated by the forward wheel-flanges of the locomotive, a series of pivoted links and a lever connecting the switch-tongues, and a switch-lever, sliding bar, and counter-balance, operated by hand, to set the switch either for the main or side track, as desired, all as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a plan view, showing our improvements applied to the junction of a side track or lateral road with two main tracks; Fig. 2, a side view, in elevation, showing the mechanism for operating by hand; Fig. 3, a transverse section at the line *x y* of Fig. 1; Fig. 4, a section, on an enlarged scale, of the switch-tongue and its chair, showing the method of pivoting; and Fig. 5, a plan view of a tie, showing the socket for the head of the pivot-bolt.

Our improvements are here shown as applied to the junction of a side track or lateral road, C, with two main tracks, A B, in such manner that a train passing over the track C in the direction of the arrow *c* may be transferred either to the track A or the track B, the normal direction of passage of trains along which is in the direction of the arrows *a* and *b*, respectively, thus serving both as a switch and a crossing, or as a switch alone, as the case may be. In the position shown in the drawing, the parts are so set that a train will pass from the track C to the track A, the main rails of which are in proper position for trains moving in the direction of the arrow *a*, while a train moving along the track B will automatically adjust the position of the movable tongues c^1, b^1, and c^4, as presently to be described, so as to maintain the track B in proper position for the continued traverse of the train thereon.

The track C crosses the inner rails of the tracks A B by frogs C^2 C^3, of the ordinary form, and is placed in connection with either the track B or the track A, as the case may be, by the movement of a pivoted switch-tongue, c^1 or a^1, respectively, from the position shown in Fig. 1 into a position such that its toe or free end shall be entirely clear of the rail of the track C, and at a sufficient distance therefrom to admit of the free passage of the wheel-flanges.

The tongue c^1 is moved by a hand-lever, E′, pivoted to a suitable base or stand and to a horizontal sliding bar, E, which operates an arm, c^{13}, pivoted to an arm, c^9, which is in turn pivoted to the tongue c^1. The tongue a^1 is moved by the flange of the forward truck-wheel of the locomotive. A counter-balance, G, on an arm, G^1, pivoted to the switch-stand, and having a slot, G^2, within which the pin which connects the hand-lever E′ and sliding bar E slides, serves to return the tongue c^1 to its original position, and leave the pivoted tongues c^4, b^1, and c^1 free to be moved by a train passing in either direction along the track B.

If the train is moving in the direction of the arrow *b*, (the normal direction of movement upon this track,) the forward wheel-flange moves the tongue c^1 away from the main rail; and this tongue, by its connection, through the double-armed lever C^1, pivoted to a bearing on one of the ties, and the links c^9, b^2, F′, and c^8, with the tongues c^1 and c^4, moves the tongue b^1 into line with and so as to form part of the main rails of the track B, and moves the tongue c^4 away from said rails. The links c^9, c^{13}, and lever C^1 are connected by pins c^{10} c^{12}, moving, respectively, in a curved slot, c^{14}, and a straight slot, c^{11}, so that the tongue c^1 may be moved either by the lever C^1 or the hand-lever E′, as may be required.

If the train is moving in the opposite direction, the same effect is produced by the action of the forward wheel-flange upon the tongue c^4. After a train has passed along the track

B, the tongues c^1 b^1 will be moved into proper position, when required, to admit of the passage of a train from the track A along the track C in a direction opposite to that of the arrow *c* by the action of the forward wheel-flange upon the pivoted tongue c^5, which is connected by the pivoted links c^7 and F to one arm of the lever G^1.

If the switch of the track A remains in this position, and a train should pass along the track A in the direction of the arrow *a*, the forward wheel-flange will move the tongue a^2 away from the main rail, and the tongue a^1 will be correspondingly moved into line with the main rail by reason of being connected with the tongue a^2 by the pivoted links a^4, A^2, A^1, and a^3.

To provide for the passage of trains along the main track A in a direction opposite to that of the arrow *a*, it is only necessary to apply an additional pivoted tongue, having its point in opposite direction to the arrow *a*, and connected by a double-armed lever to the link a^3, and hand-lever gearing, similar to that shown in connection with the switch from B to C.

It will thus be observed that, irrespective of the position in which the switches may be set or the switch-tongues rest, each main track is practically unbroken and the ordinary derailment from maladjustment will not occur.

It is further obvious from the positions of the switch-tongues, which act as automatic adjusters relatively to the approaching train, that in no instance is the weight of the train or any part of it borne by the adjusting-tongue, nor by any other movable tongue, until after it has been moved into its proper position, thus enabling the adjustment to be effected with certainty and safety, not attainable in any device in which weight or pressure is brought upon the moving members.

Any number of main tracks may be crossed, and at any desired angle; and, if desired, the hand-lever E′ may be arranged to be operated from a distance; and, further, by attaching an operating-lever to the locomotive, to be governed by the engineer, for the purpose of moving the tongue c^1, a switch-tender may be entirely dispensed with.

Figs. 4 and 5 show a method of pivoting the movable tongues. The lower flange of the tongue rests in a recess in a chair, H, secured on one of the ties I. The pivot-bolt I′ is screwed into the chair H from below its point, projecting into the recess thereof, and forming the fulcrum on which the tongue vibrates, and the head of the bolt rests in a recess, *i*, of the tie. The upper and lower flanges of the switch-tongues are cut away adjacent to the main rails, in connection with which they operate, and the tongues, which are of less depth than the main rails, slide over bearing-plates *i′*, secured upon the ties.

The object of the arrangement last stated is to facilitate the sliding motion of the tongues and to strengthen them, as in clearing the lower portion of the main rail they have the benefit of its lateral resistance. In order to protect the points of the tongues, they are made slightly lower than the main rails.

We have shown at D, Fig. 1, a pivoted tongue, which is curved inwardly from its pivot or fulcrum toward the main rail, and thence outwardly toward its toe or point, by which construction it is susceptible of operation by the wheel-flange of a locomotive passing in any one of three directions—to wit, in that of the arrow *c* on the track C, or in either direction on the track A. In the relation shown in the drawing, the tongue D does not perform any function, being illustrated only for the purpose of exhibiting its form and manner of operation.

The counter-balance G serves as a signal to the engineer of a train approaching on the track B that the switch of the track C is open by being displayed when elevated above the screens J J, which conceal it from view when the parts are in position to admit of the passage of trains along the track B.

We claim as our invention—

The combination, in a railroad switch and crossing, of a series of pivoted switch-tongues connected by links with a vibrating double-armed lever, and a hand-lever and counter-balance for operating one of the pivoted tongues independently of the others, substantially as set forth.

JOHN S. BROOME.
CHARLES S. ARCHER.

Witnesses:
J. SNOWDEN BELL,
GEO. A. VAILLANT.