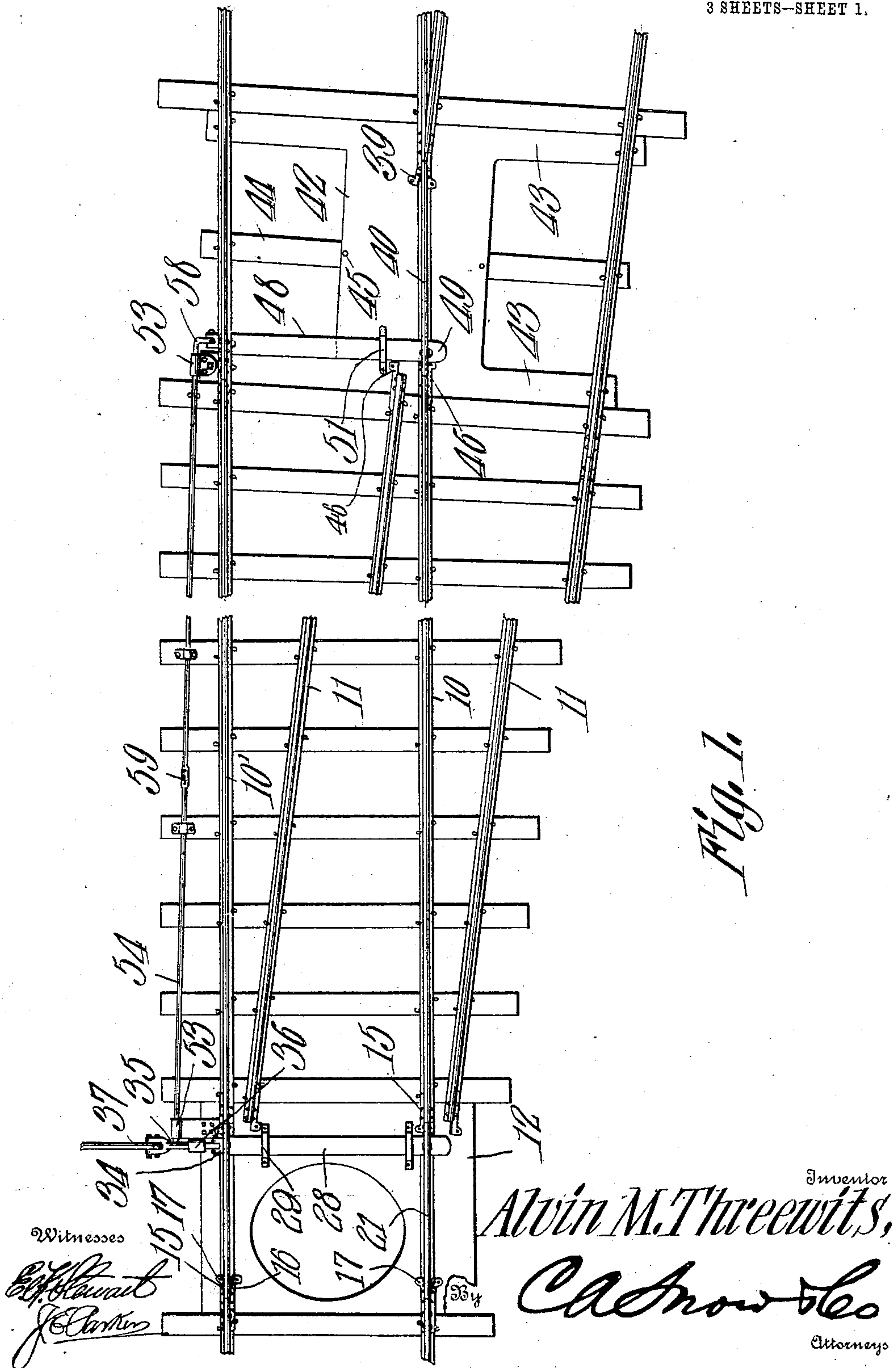


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3 SHEETS—SHEET 1.

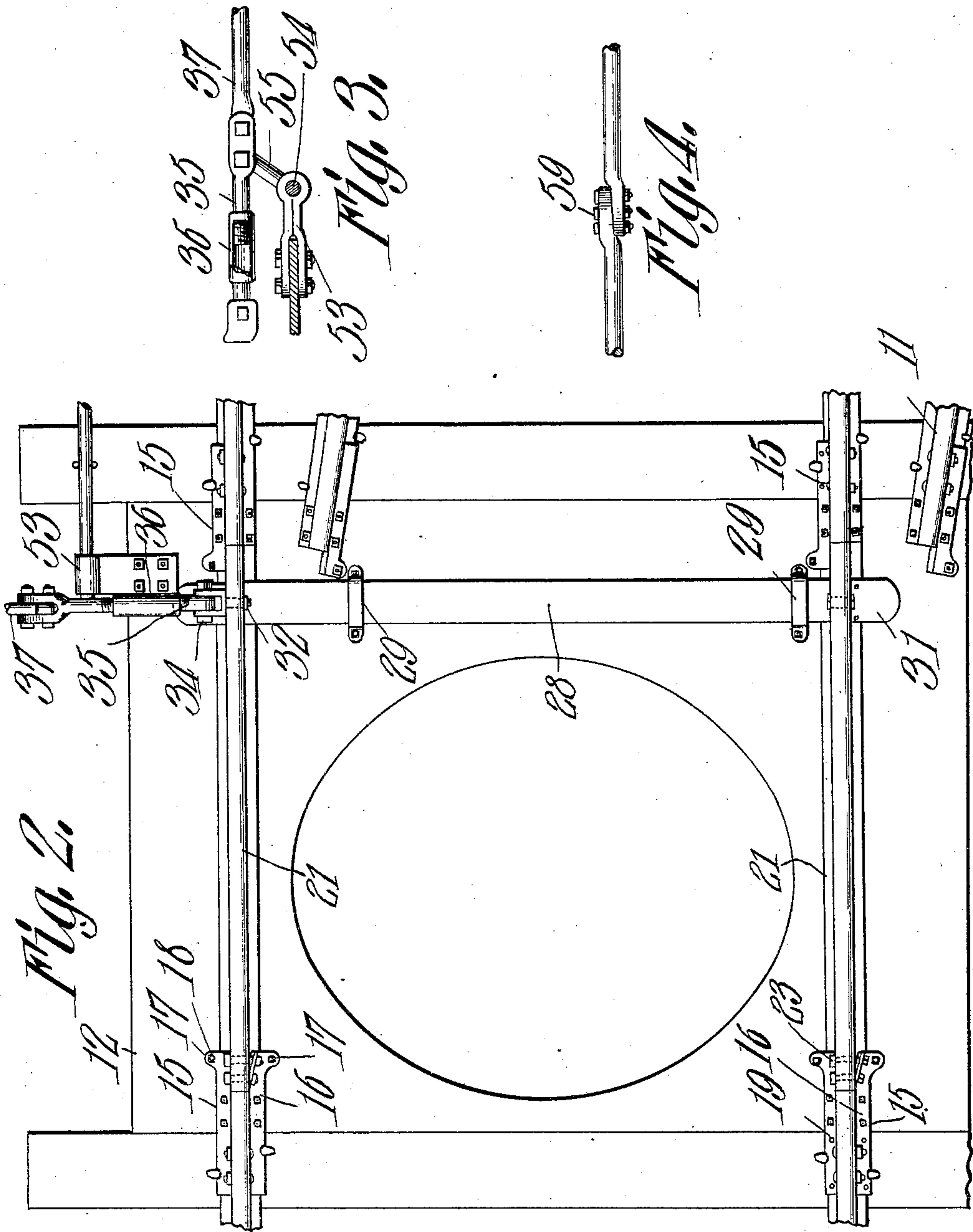


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Witnesses
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John E. Carter

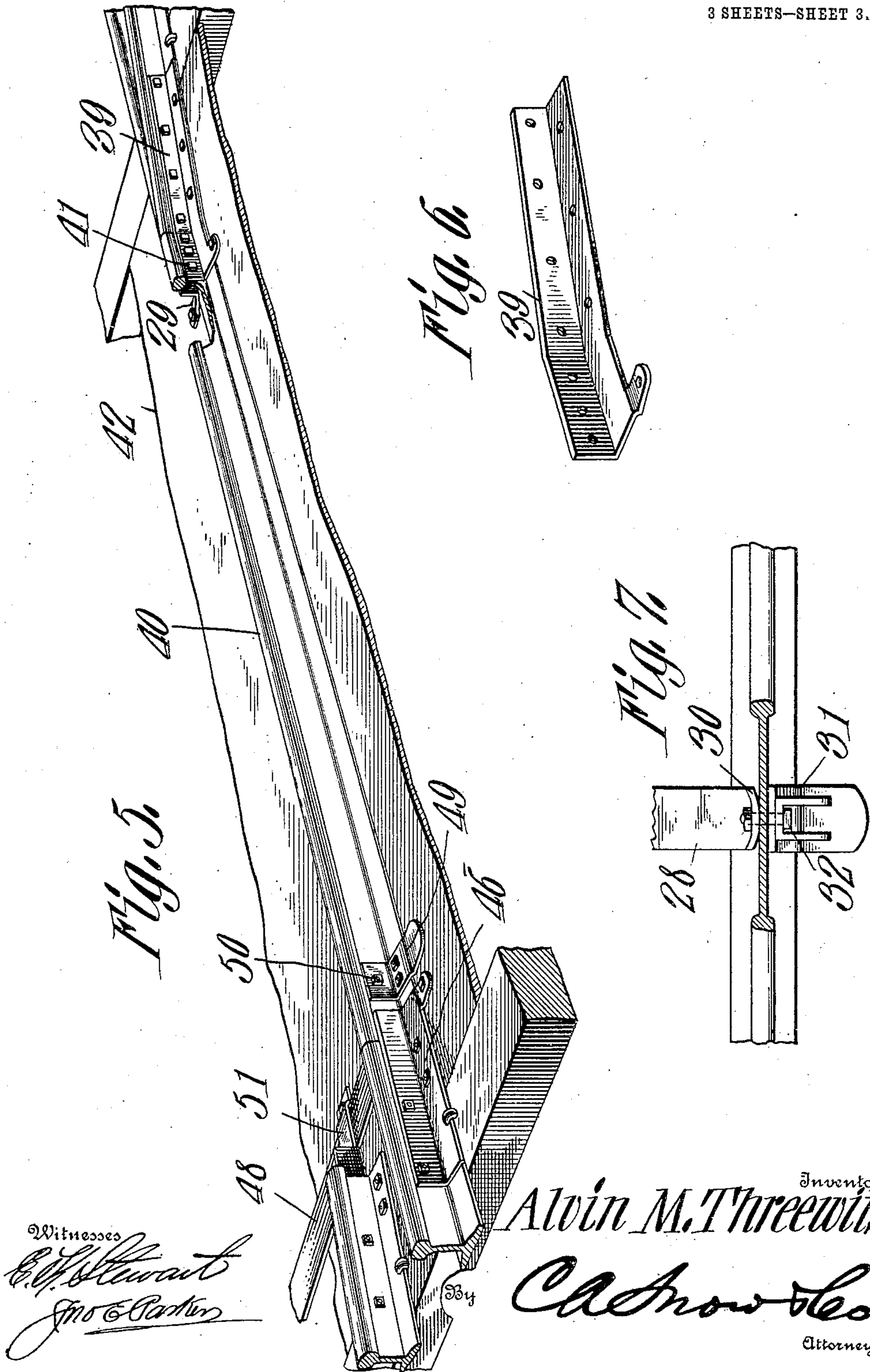
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UNITED STATES PATENT OFFICE.

ALVIN M. THREEWITS, OF CENTERVILLE, INDIANA.

RAILWAY SWITCH FROG.

No. 898,804.

Specification of Letters Patent.

Patented Sept. 15, 1908.

Application filed October 3, 1907. Serial No. 395,706.

To all whom it may concern:

Be it known that I, ALVIN M. THREEWITS, a citizen of the United States, residing at Centerville, in the county of Wayne and State of Indiana, have invented a new and useful Railway Switch and Frog, of which the following is a specification.

This invention relates to railway switches and frogs, and has for its principal object to provide an arrangement of switching and frog mechanism whereby needle and other switch points will be entirely eliminated and a solid, unbroken track will be provided for the passage of a train on both the main line and between the main line and siding.

A still further object of the invention is to eliminate the frog point at switches and sidings, thus removing one of the principal causes of derailment of trains.

A still further object of the invention is to provide a switch mechanism of very simple construction in which parts are so arranged and mounted as to render accidental displacement practically impossible, and at the same time to guard against malicious misplacing of the switch.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a plan view of a switch and frog mechanism constructed and arranged in accordance with the invention. Fig. 2 is a plan view of the main switch. Fig. 3 is an elevation, partly in section, showing the connections between the operating rod and the main switch. Fig. 4 is a detail view of the preferred form of coupling for the rod. Fig. 5 is a detail perspective view of the frog switch, parts being broken away in order to more clearly illustrate the construction. Fig. 6 is a perspective view of one of the fish plates detached. Fig. 7 is a sectional plan view through one of the rails, showing the means of attaching the coupling rod or bar.

Similar numerals of reference are employed to indicate corresponding parts

throughout the several figures of the drawings.

The permanent rails 10, 10' of the main track and the permanent rails 11 of the siding are secured as usual to the cross ties, chairs or other supports, and at the point where the switch is located is placed a plate 12 preferably formed of metal, and to which the ends of the rails 10 and 11 are rigidly secured.

In securing the ends of the rails 10 in place, a pair of fish plates 15 and 16 are used, for each rail end. These fish plates are in the form of angle bars in cross section, and each is provided at one end with a laterally extending ear 17 through which passes a securing bolt 18 that extends, also, through the base plate 12. The horizontal webs of the fish plates are further provided with openings for the passage of vertical securing bolts 19, and the ends of the plates which extend beyond the edge of the base 12 are spiked to the cross tie in the usual manner. The fish plate 15 is straight, while the inner end of the fish plate 16 is slightly off set in order to permit slight turning movement of the switch rail 21, the arrangement of the fish plates being such that an angular pocket is formed for the reception of the ends of the switch rail, and across this pocket extend two bolts 23 which pass through openings in the fish plates, and in the switch rail, the bolts forming loose pivots on which the switch rail may move in order that its free end may be adjusted into alinement with the main line rail 10' or the siding rail 11.

To one face of each of the rails 10' and 11 is secured a straight fish plate 15, the inner end of the fish plate projecting beyond the end of the rail, so that it forms a stop against which the free end of the switch rail abuts when moved to one or other of its two positions, and in this manner a continuous unbroken tread may be formed for the main line rail, or between the main line and the siding.

The free ends of the two switch rails are connected by a tie bar 28 preferably formed of a flat strip of metal which is guided and held in proper position by suitable straps, the ends of which are secured to the base 12. The opposite ends of the tie bar are turned up and are slightly curved to form concavo-convex flanges 30 that fit against the inner faces of the vertical webs of the rails, and fitting against the outer faces of such webs are

flanged shoes 31, each shoe and the adjacent flange 30 being connected by a bolt 32 that extends through an opening formed in the central web of the rail.

5 Secured to outer shoe 31 by its fastening bolt 32 is a bracket arranged to form a pair of pivot lugs 34 to which is pivotally connected the inner end of a rod 35, said rod being formed of two sections, one of which is
10 threaded and screws into a correspondingly threaded sleeve 36 carried by the other section for purposes of adjustment. To the outer end of the rod 35 is connected a second rod 37 that leads to the switch stand or
15 through suitable intervening mechanism to the switch tower, so that the two switch rails may be simultaneously moved to make the main track continuous, or to form a continuous tread between the main track and the
20 siding.

At the frog point, or at the point where the frog is usually located, the converging rails 10' and 11 are cut away and are bolted together, sufficient of the sides and tread of the
25 rail being removed to form at the end of the two rails a head of a width approximately equal to that of an ordinary single rail. To the sides of these rails are bolted fish plates 39, each of which has two faces at an obtuse
30 angle to each other, and which project beyond the ends of the rails 10' and 11 to form an angular pocket for the reception of one end of a secondary switch rail 40, which rail is held loosely in place by bolts 41 extending
35 through openings formed in the rail and in the fish plates 39. The fish plates are bolted to a base plate 42 which is formed of heavy metal which is provided with laterally extending arms 43 which pass under the outer-
40 most rails 10 and 11 and are bolted or otherwise secured thereto. In addition to this, the outer rails are connected by a tie bar 44 which passes under the base plate and is preferably secured to the latter by bolts 45.

45 The converging ends of the rails 10 and 11 are bolted to the plate 42 and are provided with fish plates 46 similar to the fish plate 15, there being one fish plate for each rail, and these fish plates form stops for the free
50 end of the secondary switch rail 40, said switch rail being movable to form a solid unbroken track for the main line, or between the main line and the siding. Secured to the switch rail 40 is a flat bar 48 having an up-
55 turned flange provided with a conical face that rests against the web of the rail, and outside the rail is a shoe 49, the flange and the shoe being secured together and to the rail by a bolt 50. The flat bar 48 is held in
60 proper position by a strap 51, the opposite ends of which are bolted to the base plate.

Secured to the ties and to the base plates 12 and 42 are bearing brackets 53, these being preferably in the form of strap iron bent
65 to encircle a rock shaft 54 and having super-

posed ends provided with openings through which a spike or securing bolt may be passed. The rock shaft 54 is provided at one end with an upturned rocker arm 55 that is connected to the rod 35, and at the opposite end has a
70 downturned rocker arm 58 that is connected to the bar 48, so that when the primary switch rails 21 are moved in one direction, the secondary switch rail 40 will be moved in the opposite direction. The extent of move-
75 ment of the switch rails may differ, and this is compensated for by altering the width of the rocker or crank arms. The rock shaft 54 may be made of a number of sections, and where it is necessary to splice the ends are
80 flattened and connected by bolts 59, as shown.

It is found, in practice, that by making the arm 58 of greater length than the arm 55, the frog switch will be first moved to po-
85 sition and, as the movement continues, the main switch will be moved to place. During the latter part of the movement, the rock shaft will be subjected to torsional strain, and, together with the arms, will act some-
90 what after the nature of a spring to positively hold the frog switch in adjusted position.

It will be noted that the angular pockets formed by the fish plates are arranged to re-
95 ceive only the web of the switch rail, and the head of the switch rail will extend over the fish plates and completely cover the small angular pocket in order to prevent the entrance of dirt and stone.

I claim:—

1. In railway switches, a base plate, permanent main line and siding rails having their ends secured to the base plate, fish plates secured to the main line rails on either
105 side and base plate and projecting beyond the ends of such rails to form pockets, switch rails having their ends loosely pivoted in said pockets, means for moving the free ends of such switch rails to form a continuous
110 main line or continuous tread between the main line and siding, and single fish plates secured to the sides of the main and siding rails and having integral projections project-
115 ing beyond the ends of said rails to form stops for limiting the movement of the free ends of said switch rails.

2. In switch mechanism, a base plate, permanent main line and siding rails having their ends secured to the plate, fish plates
120 secured to and projecting beyond the ends of the permanent rails, one of such fish plates being bent to form an angular pocket, switch rails having their ends within such
125 angular pockets, cross bolts extending through the fish plates, and the switch rails and forming loose pivots for the latter, single fish plates secured to the opposite permanent rails and forming stops against which the
130 free ends of the switch rails abut, a tie bar

connecting such switch rail and provided with upturned flanges presenting convex faces to the webs of said switch rails, shoes at the outer faces of the switch rail, connecting bolts extending through the flanges, the switch rails and shoes, and means for operating said switch rails.

3. In switching mechanism, permanent main line and siding rails, the converging ends of the adjacent main line and siding rails being cut away to form a tread approximately equal in width to that of a single rail tread, fish plates secured to said rails and projecting beyond the ends thereof to form a pocket, and a switch rail having one end mounted within the pocket and movable into alinement with either the permanent main or permanent siding rails to form continuous tread.

4. In railway switching devices, a base plate, main line and siding rails having their ends permanently secured thereto, the converging ends of the adjacent main and siding rails being cut away to form a tread of a width equal to that of a single rail, fish plates secured to the opposite sides of such converging rails and projecting beyond the end thereof, the fish plates being bent to form an angular pocket, a switch rail having one end pivotally mounted in said pocket, and single fish plates secured to the opposite ends of the main and siding rails and base plate and forming stops for limiting the movement of said switch rails.

5. In apparatus of the class described, a pair of switches, a rock shaft extending from switch to switch, and rocker arms extending from the shaft to the switches, the arms being of unequal length so that the rod will be subjected to torsional strain during the final portion of the switch operating movement.

6. A rail support of the class described comprising a plate having a central body

portion and provided with laterally directed pairs of spaced arms, means for connecting the outer portions of said arms to the rails, and an intermediate cross bar extending under the body portion and secured thereto, the opposite ends of said cross bar being provided with means for attachment to the rails.

7. In a railway switch, the combination with permanent rails, of a base plate, fish plates secured to both the permanent rails and the base plate and projecting beyond the ends of the permanent rails, and a movable rail arranged to abut against the projecting portion of the fish plate.

8. In railway switching devices, a pair of movable rails, a cross bar connecting them, the cross bar having upturned flanges at its outer ends for engagement with the vertical webs of the rails, shoes secured to the outer surfaces of the webs, bolts connecting said shoes and flanges to the rail, a yoke carried by the shoe, an operating bar pivoted to the yoke, said bar being formed of adjustably connected sections, an auxiliary switch rail, and a rock shaft having one end connected to the operating rod and the other to the auxiliary switch rail.

9. In a switch of the class described, a pair of fish plates having their ends flared to form an angular pocket for the reception of the vertical web of a switch rail, and a switch rail extending between said fish plates, the head of said rail extending completely over and protecting said angular pocket.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALVIN M. THREEWITS.

Witnesses:

JAS. M. WALKER,
JNO. E. PARKER.