(No Model.) 3 Sheets—Sheet 1.

F. S. WASHBURN.

THREE THROW SWITCH FOR RAILROADS.

No. 383,382. Patented May 22, 1888.

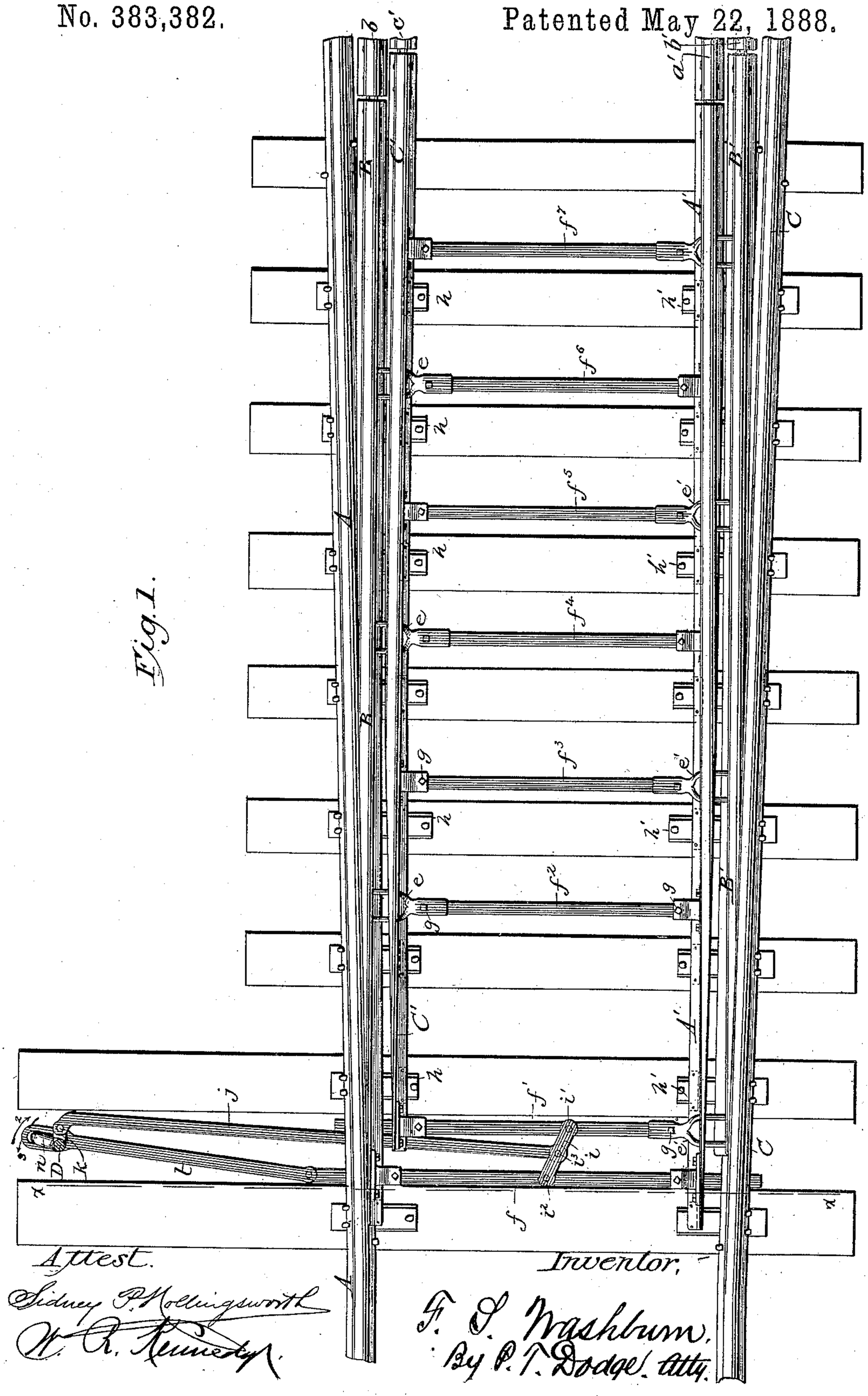

Fig. 1.

Attest.
Sidney P. Hollingsworth
W. R. Kennedy.

Inventor.
F. S. Washburn.
By P. T. Dodge, Atty.

(No Model.)

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F. S. WASHBURN.

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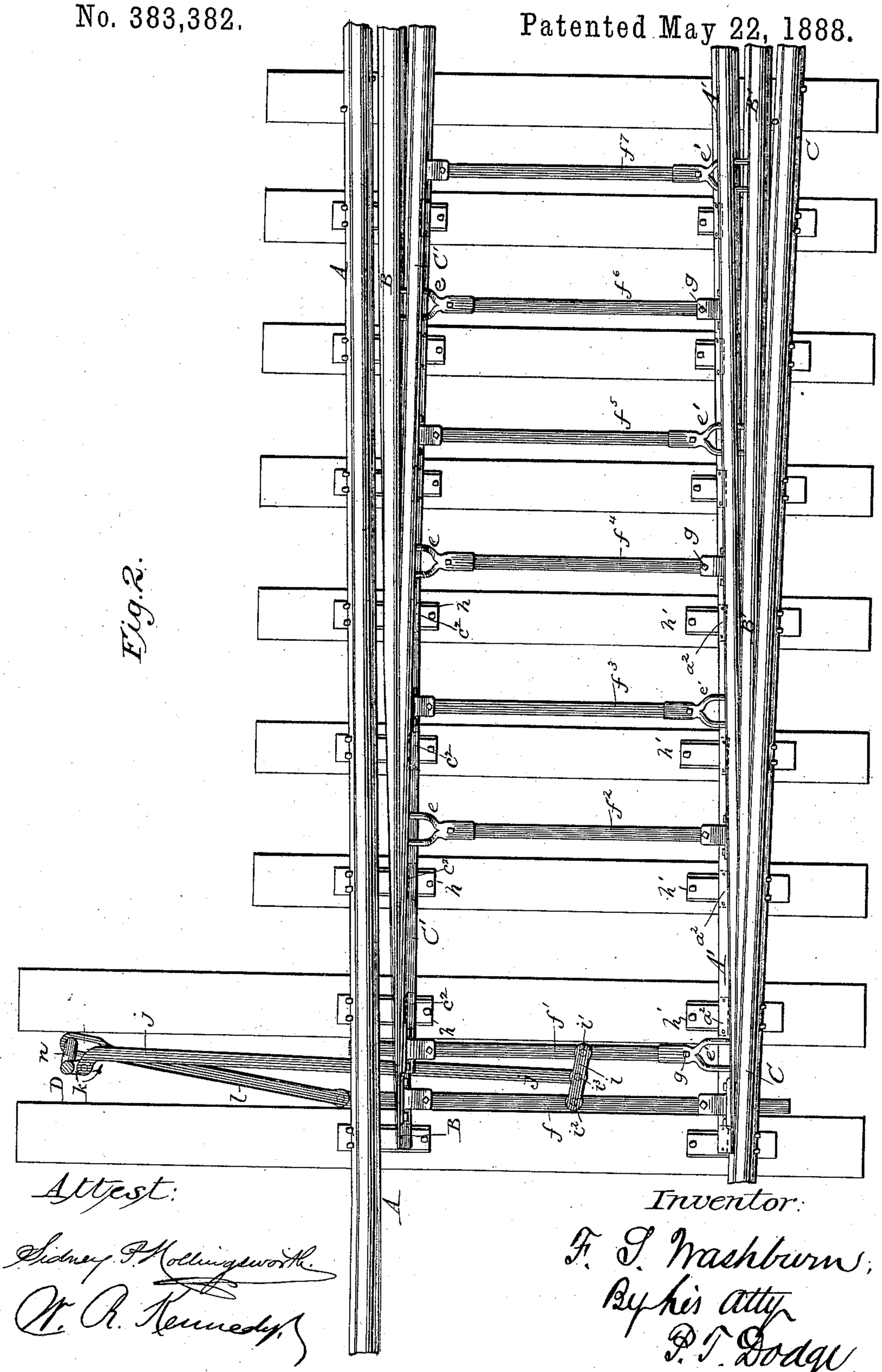

Fig. 2.

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Sidney P. Hollingsworth.

W. R. Kennedy.

Inventor:

F. S. Washburn;

By his atty

P. T. Dodge.

(No Model.)

3 Sheets—Sheet 3.

F. S. WASHBURN.

THREE THROW SWITCH FOR RAILROADS.

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Fig. 3.

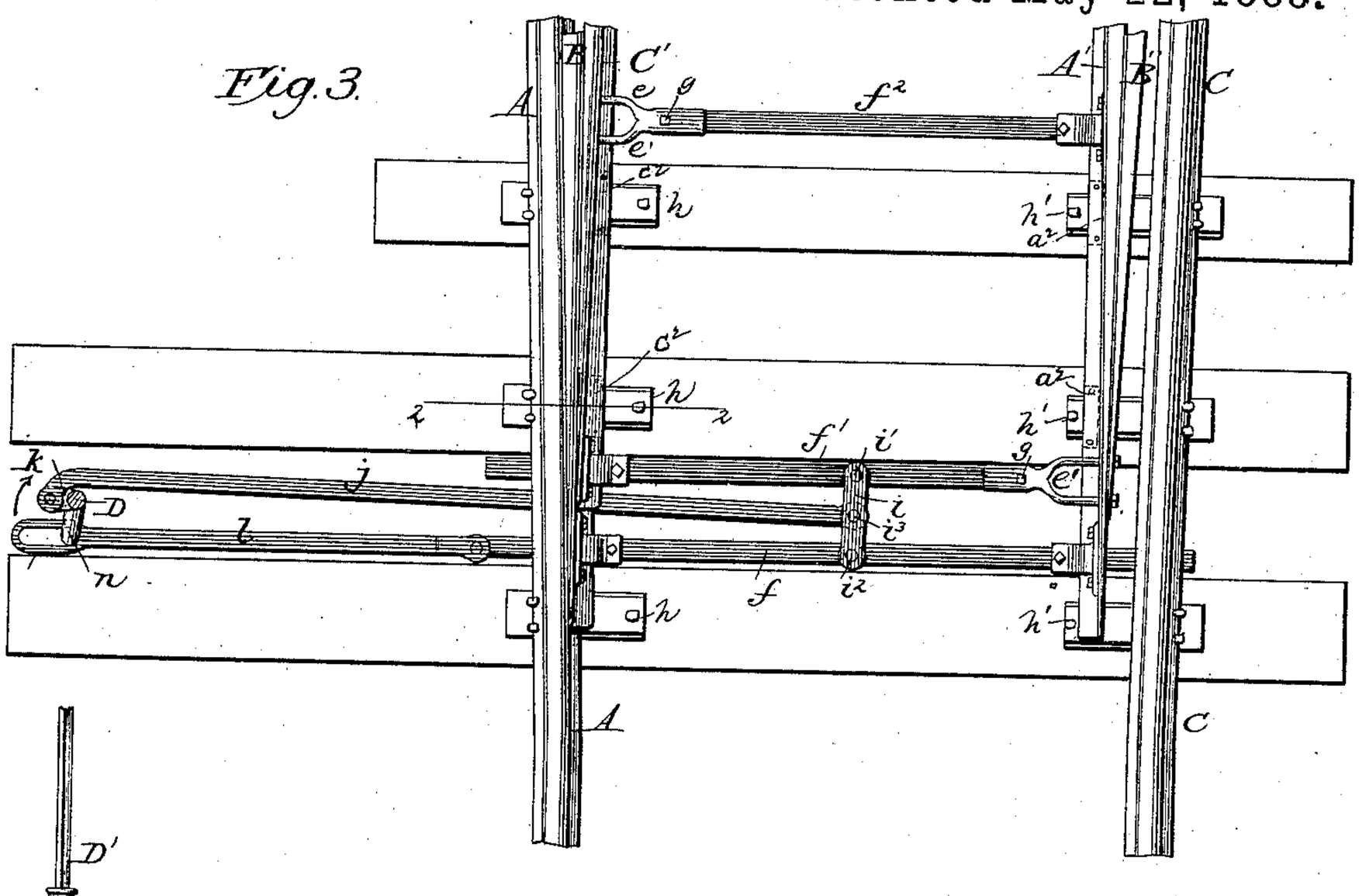


Fig. 4

on line 1–1

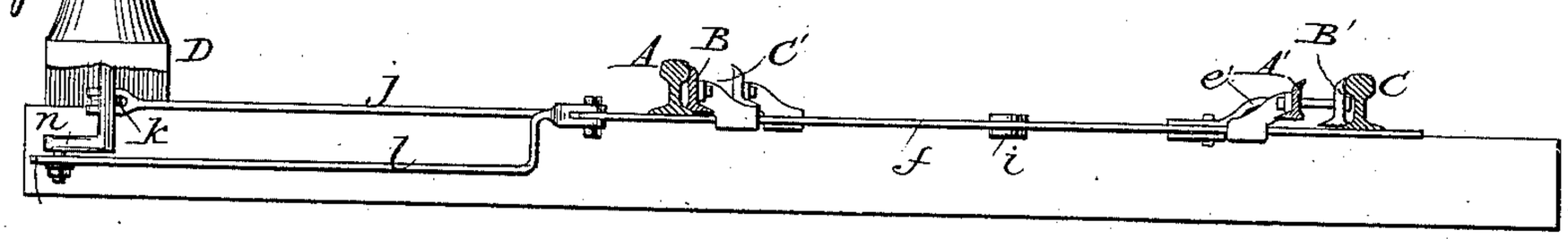


Fig. 8

on line 2–2

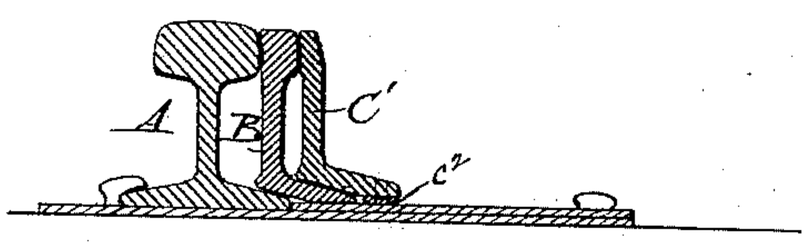


Fig. 6

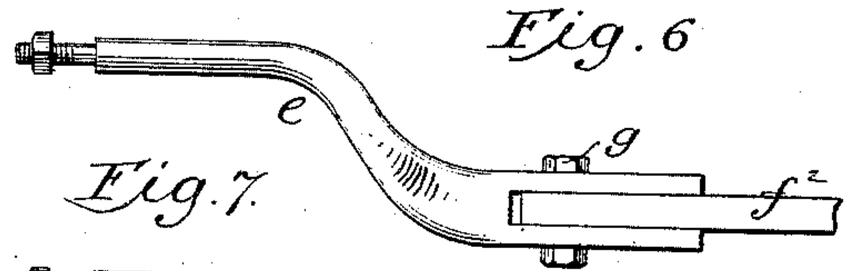


Fig. 7.

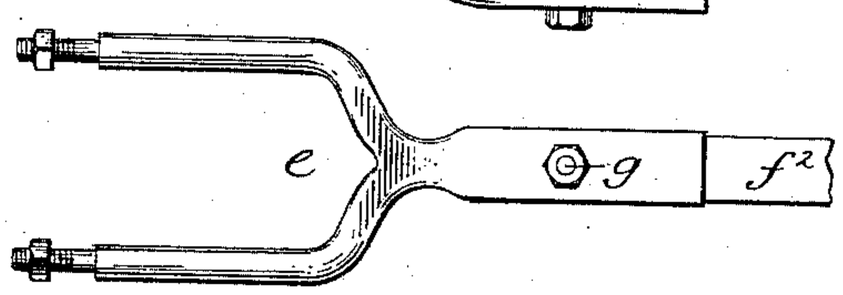
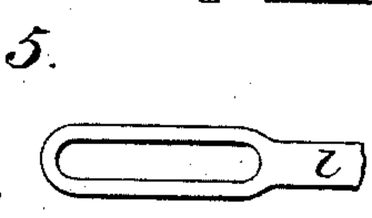


Fig. 5.



Attest.

Sidney P. Hollingsworth

N. R. Kennedy

Inventor.

F. S. Washburn.

By his Atty.

Phil. T. Dodge

UNITED STATES PATENT OFFICE.

FRANK S. WASHBURN, OF CHICAGO, ILLINOIS.

THREE-THROW SWITCH FOR RAILROADS.

SPECIFICATION forming part of Letters Patent No. 383,382, dated May 22, 1888.

Application filed October 27, 1886. Serial No. 217,362. (No model.)

To all whom it may concern:

Be it known that I, FRANK S. WASHBURN, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Three-Throw Switches for Railroads, of which the following is a specification.

My invention relates to that class of switches used where it is required to have one track arranged to connect with three diverging tracks, by which cars and trains may be conducted from a single track onto either one of the three diverging tracks, the whole forming what is commonly called a "three-throw turn-out." The common practice in constructing such three-throw turn-outs is to bring the ends of the three pairs of rails forming the three diverging tracks as close together as the space necessary for the passage of the flanges of the wheels will allow, and arrange for shifting the free ends of the rails of the single track and for placing them opposite to the ends of the rails of that one of the diverging tracks which it is desired to connect with the single track, a space of one inch or so being left between the free ends of the single-track rails and the ends of the rails of the diverging track, the whole forming what is known as a "three-throw stub-switch." Whenever the wheels pass over the gap between the rails, there is a jar and shock which, when the locomotive is heavy and the traffic of the railroad is large, render it difficult to keep the switch in order; and the effect of such shocks and jars on the locomotives and cars is very injurious, and gives rise to injuries not always traced to the actual cause. The constant hammering on the ends of the rails soon flattens them out, thus increasing the shock. The timber under the ends is constantly sinking into the ballast and requires frequent tamping up. The rod to the lever and bars connecting the switch-rails frequently wears loose and fails to keep the ends of the rails exactly even, and, being subject to much shock and concussion, sometimes breaks, in either case causing accidents.

On all railroads there is more or less of a longitudinal movement of the whole line of rails in one direction or another, commonly described as "creeping of the track;" and this frequently has the effect to vary the distance between the ends of the rails sometimes of itself enough to lock the ends together, and at other times sufficient to enable the expansion of the rails by heat to lock them together, in either case preventing the use of the switch, frequently causing accidents, and giving rise to serious delays to have the ends cut off. To overcome these difficulties in ordinary turn-outs, it is common to use switches of the construction known as "split switches," in which a pair of movable tapering-point rails are arranged between a pair of diverging fixed rails and arranged to be shifted a certain distance, to place one or the other of the points against one of the fixed rails and cause the wheels of the cars to be conducted by the point-rail in the desired direction; but for the purpose of three-throw turn-outs it has been necessary to have two point-switches, one placed a considerable distance back of the other, requiring two switch-stands to operate them, and affording chances for errors as to the relative positions of the respective switches; also from the distance apart of the switches, requiring more space for such three-throw turn-outs than when stub-switches are used.

The object of my invention is to overcome these difficulties and to provide for three-throw turn-outs an improved arrangement, in which two pairs of tapering-point rails form the termination of four of the rails of the diverging tracks arranged to work between two fixed rails which are the outermost rails of the three-throw turn-out; and my invention consists in certain improvements in the fitting of the tapering-point rails, in connecting them together, and in appliances for giving them operation, by which I am able to have the termination of both pairs of point-rails practically at the same point, so that the point of curve for each of the diverging tracks may be located at one place; also, both pairs of point-rails can be placed and secured in either of the three positions requisite to guide trains on either of the three diverging tracks by only one switch stand and lever.

In the accompanying drawings, which form part of this specification, Figure 1 is a plan view of a switch embodying my improvements set for the main track, the several parts being in the positions requisite to conduct a train to the center track. Fig. 2 is a plan view of my

switch set to conduct a train to the left-hand track. Fig. 3 is a plan view of my switch to conduct a train to the right-hand track. Fig. 4 is a sectional view on line *x x* of Fig. 1. Figs. 5, 6, 7, and 8 are views of details.

As shown in Fig. 1, A and C are full-sized ordinary rails, forming the outermost of the six rails of a three-throw turn-out.

B and B′ are tapering-point rails connected to the rails *b* and *b′* of the main-line track or middle track of the three-throw turn out.

A′ is a tapering-point rail connected to the one rail *a′* of the turn-out which gages with the left-hand outer rail, A; and C′ is a tapering-point rail connected to the one rail *c′* of the turn-out which gages with the right-hand outer rail, C. The tapering-point rails are coupled and connected by connecting-bars *f f′* f^2 f^3 f^4 f^5 f^6 f^7, and are moved to their respective positions by means of a connecting-rod, *j*, and cross-bar *i*.

The tapering-point rails B and B′ are planed and shaped in the usual manner to fit against the outer rails, A and C, and to rest upon the flanges of the outer rails, A and C, when respectively placed against said rails. The tapering-point rails A′ and C′ are similarly fitted, except that they are fitted and arranged to rest on the flanges of the point-rails B and B′ when respectively placed against said point-rails B and B′. The usual iron surface-plates or slide-plates, *h h′*, &c., are placed on the timbers or cross-ties under the switch, the upper surfaces of which, for those portions of them under the point-rails B, B′, A′, and C′, are on a higher plane than the portions under the outer rails, so that when the point-rails are to be placed against the outer rails, A and C, the bearing of the remaining portions of the slide-plates *h h′*, &c., will support the point-rails and allow them to slide freely into proper contact with the outer rails, A and C. As the point-rails A′ and C′ are to rest, respectively, on the point-rails B and B′, raising-pieces a^2 and c^2 are riveted to the under side of the remaining flanges of the point-rails A′ and C′, in order to give said point-rails a proper bearing on the slide-plates and support them in the plane requisite for them to be moved freely into position.

For the proper operation of my switch the point-rail A′ must be connected or coupled to point-rail B, which requires the connecting-bar to pass through the point-rail C′ to reach the point-rail B. Likewise to couple point-rail B′ to point-rail C′ the connecting-bar must pass through point-rail A′. To avoid making large openings through the vertical webs of the point-rails A′ and C′, I prefer to provide forked connections *e e′*, &c., which pass through holes in the webs of the point-rails A′ and C′ and attach to the point-rails B and B′. The forked connections I prefer to attach by pivots *g* to the connecting-bars *f′* f^2, &c.; but the connecting-bars *f′* f^2, &c., may be forged solid without pivot, or in any other manner be provided with forks at one end of them. The other end may be of any form suitable for attaching to point-rails.

In Figs. 6 and 7 I show a preferable form of the forked connection *e*, the ends of the fork being fitted with shoulders to bear against one side of the web of the point-rail, and when nuts are screwed up tightly the point-rail and the forked connection will be securely connected.

To properly operate a three-throw split switch it has heretofore been necessary to employ two stands, or duplex stands, with two levers, as the changes in the positions of the point-rails to conduct cars into the several tracks are changes or variations of "combinations" affecting but one pair of points at one time, instead of complete changes of position of all the moving parts, as in a three-throw stub-switch; but in my improvement I am able to effect all the changes by one stand, with only one spindle and only one hand-lever, by which the convenience of operation, as well as safety, is greatly enhanced, rendering it practicable to indicate by one revolving target the condition of the switch. This important result is obtained by providing the spindle of the stand with two cranks, *k* and *n*, of different throws, and by rods attached thereto and to different parts of the switch, as shown in Figs. 1 and 4. The crank *k* has a throw equal to about one-half the throw of each pair of point-rails, and is connected by connecting-rod *j* to a cross bar, *i*, which is journaled at one end to the connecting-bar *f*, which connects the point-rails A′ and B, and at the other end is journaled to the connecting-bar *f′*, which connects the point-rails B′ and C′. The crank *n* has a throw equal to the travel of the point-rails A′ and B, and is connected by slotted connecting-rod *l* to the end of connecting-bar *f*, which connects said point-rails A′ and B, and holds point-rail B solidly against outer rail A, the parts standing as shown in Figs. 1 and 4, the switch being set for the middle track, the hand-lever of the stand standing in the center position on the side of the stand opposite the track.

To change the switch from the above position to that shown in Fig. 2, to conduct cars to the left-hand track, the hand-lever of the stand is moved one quarter-turn toward the heel of the switch, in the direction indicated by the arrow in Fig. 1, which brings crank *k* toward the track and crank *n* around to the right toward the heel of the switch. As cranks *k* and *n* do not stand exactly at right angles to each other, crank *n*, passing off the center toward the right, allows the slotted connecting-rod *l* to move toward the track, and thus releases connecting-bar *f* and the point-rails A′ and B, attached thereto, so that the movement of crank *k* will, by the connecting-rod *j*, move the point-rail A′ up to point-rail B′ and outer rail C and move the point-rail B away from the outer rail A. Point-rail B′ having already been pressed up to outer rail C as far as it can go, the journal-pin *i′* becomes the axis

of movement of the cross-bar *i*, and therefore the movement communicated through the crank *k* and connecting-rod *j* actuates the point-rails A′ and B only, so that when the hand-lever has been moved around one quarter-turn the point-rails A′ and B will have been fully moved to the right hand, (opening the way to the left-hand track,) and will be retained in that position wholly by the connecting-rod *j*.

To set the switch to conduct cars to the right-hand track, as shown in Fig. 3, (being previously set for the middle track,) the hand-lever of the stand is moved one quarter-turn away fron the heel of the switch, which swings crank *n* in a direction away from the heel of the switch and swings crank *k* to the left away from the track. Point-rail B being already pressed closely against the outer rail A, the journal-pin i^2 becomes the axis of the movement of the cross-bar *i*, and the movement of the crank *k* results in moving point-rails B′ and C′ to the left hand, opening the way to the right-hand track, and retaining said point-rails in that position wholly by the connecting-rod *j*. When the switch is set for the middle track, as in Fig. 1, it is obvious that, except for the slotted connection *l* and the crank *n*, the point-rails could not be positively held in the proper positions, but could stand in various intermediate positions, the journal-pin i^3 becoming the axis of the movement of the cross-bar *i*, so that if a force be applied to the end of the point-rail B said point-rail could be forced away from the outer rail A, and the point-rail B′ would at the same time be brought away from the outer rail C, by the movement of the connecting-bars *f* and *f′* and cross-bar *i*, and thus the switch might be rendered unsafe; hence the value of the functions of the slotted connection *l* and the crank *n*, which draw on the connecting-bar *f* and hold the point-rail B firmly and rigidly against the outer rail A at the same time that the crank *k*, by the outer connecting-rod, *j*, holds the cross-bar *i* in the requisite position for pressing the point-rail B′ firmly against the outer rail C, the result of the combined operation being to maintain the safe position of the point-rails when the switch is set to conduct trains to the middle track.

To change the switch from the position shown in Fig. 2 to that shown in Fig. 1, it is only necessary to give the lever and shaft a quarter-turn in the direction indicated by the arrow in Fig. 2 from the position therein shown, whereupon the crank *n* and bar *l* move the rails B and A′. During this action the bar *f* moves the fulcrum i^2 of lever *i* in such manner that the lever can accommodate itself to the movement of bar *j* without affecting the bar *f′* or the rails C′ B′. In the same manner the rails are changed from the position of Fig. 3 to that of Fig. 1 by giving the crank-shaft a quarter-turn in the direction indicated by the arrow in Fig. 3 from the position therein shown, the crank *k* and bar *j* acting, through the lever *i* and bar *f′*, to move the rails C′ and B′, the action being controlled and modified by the crank *n* and bar *l*, which, through the bar *f*, hold the fulcrum i^2 of lever *i* in the required position. It will be perceived that the peculiar movements are secured by reason of the lever *i* moving at different times around different points and of the changing position of these points.

Having thus described my invention, what I claim is—

1. In a three-throw split switch, the combination of two movable points, and a connecting-bar having one end forked and passed through holes in an intermediate point, whereby an undue weakening of the middle point for the passage of the bar is avoided.

2. The coupling-bar for a split switch, having one end divided vertically into two parallel horizontal arms adapted to pass through separate holes in the switch-rail, substantially as described.

3. In a three-throw split switch, the combination of the two pairs of switch-points, a single operating-shaft provided with two cranks, and connecting devices, substantially as described, for operating both pairs of points therefrom.

4. The points B and A′ and their connecting-bar *f*, and the points C′ and B′ and their connecting-bar, in combination with the lever *i*, uniting said connecting-bars, the operating-shaft with two cranks, the pitman extending from one crank to said lever, and the rod extending from the connecting-bar *f* to the second crank, and having a limited independent motion whereby the one crank-shaft is enabled to control a three-throw split switch.

5. In a split switch, the two pairs of switch-points and their connecting-bars, in combination with the connecting-lever *i* and an operating-rod jointed to said lever.

In testimony whereof I hereunto set my hand, this 22d day of October, 1886, in the presence of two attesting witnesses.

FRANK S. WASHBURN.

Witnesses:

HOWARD HALLOCK,

ALBERT H. ADAMS.