(No Model.) 2 Sheets—Sheet 1.

W. H. FISHER.

AUTOMATIC RAILROAD SWITCH.

No. 466,977. Patented Jan. 12, 1892.

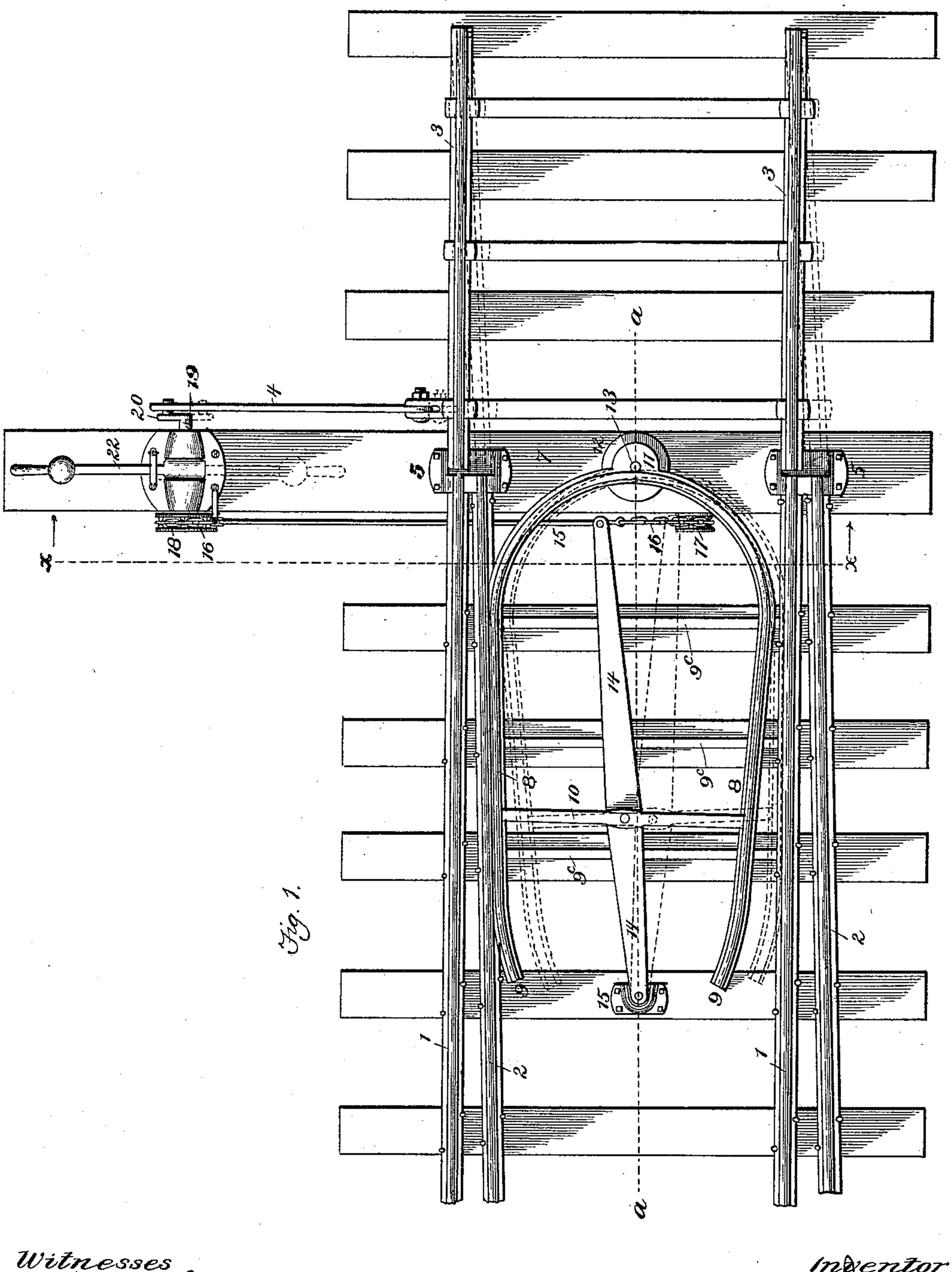

Fig. 1.

Witnesses
Geo. H. Johnson.
Howell Battle.

Inventor
William Henry Fisher
By Johnson & Johnson
His Attorneys

(No Model.) 2 Sheets—Sheet 2.

W. H. FISHER.

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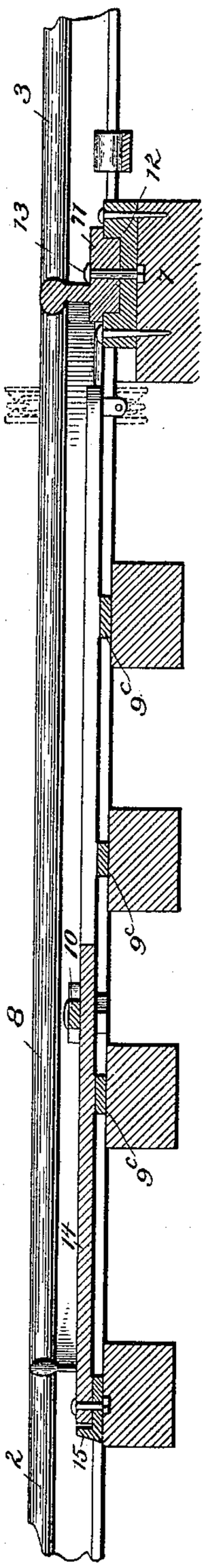

Fig. 2.

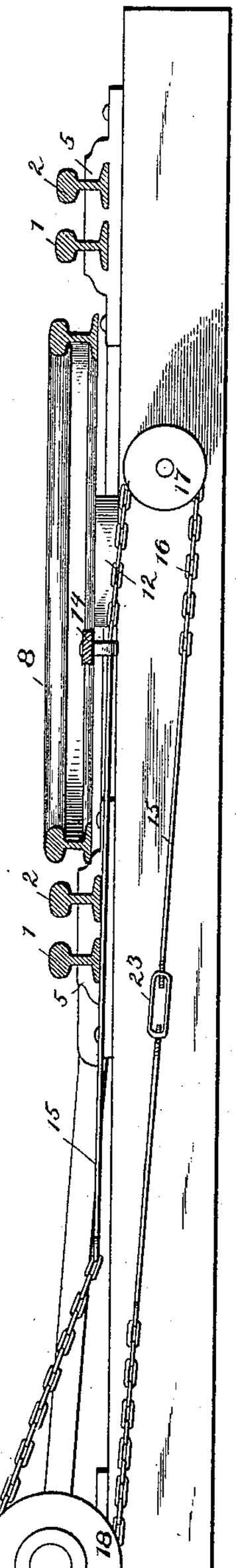

Fig. 3.

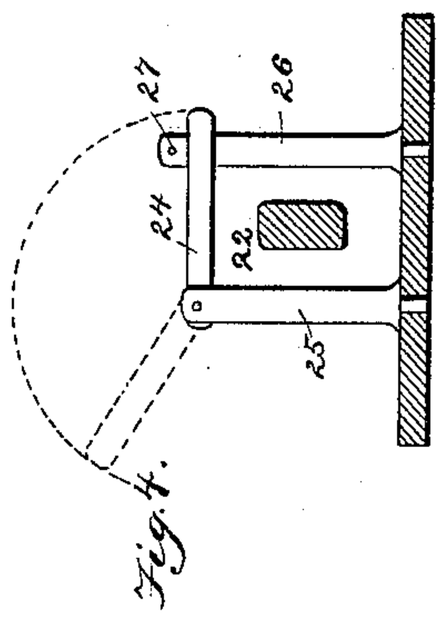

Fig. 4.

Witnesses
Guy A. Johnson.
Lowell Battle.

Inventor
William Henry Fisher
By his Attorneys
Johnson & Johnson

UNITED STATES PATENT OFFICE.

WILLIAM HENRY FISHER, OF DULUTH, MINNESOTA, ASSIGNOR OF ONE-HALF TO BYRON GEORGE SEGOG, OF SAME PLACE.

AUTOMATIC RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 466,977, dated January 12, 1892.

Application filed July 27, 1891. Serial No. 400,865. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY FISHER, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented a new and useful Improvement in Automatic Railroad-Switches, of which the following is a specification.

The invention herein relates to improvements in switches for railroads, which are operated by the flanges of the wheels of the locomotive to shift the switch-rails, so as to bring them in line with the main track and form a continuous straight track, or to shift the switch-rails from the main track, so as to bring them in line with the siding and thus form a continuous rail with the main track; and the objects of my improvements are to render the switch more easily operated—that is, to provide a construction, arrangement, and combination of lever devices forming the switch connecting and operating mechanism whereby such lever mechanism will be caused to act with an easy and certain movement by the gradual pushing action thereon of the flange of one of the wheels of the locomotive or cars. In this provision a novel, simple, and very compact and effective arrangement of levers is made to transmit with a very short gradual movement of the switch-actuating mechanism, given by the blow of the wheel-flange, the power of a compound leverage having a long but comparatively quick movement for shifting the switch, and it is this compound leverage obtained in the way which I will state that constitutes, in its connections with the switch and the switch-lock, the improvement herein claimed, as I shall now describe, in connection with the accompanying drawings, in which—

Figure 1 gives the relation of the rails of the main and of the side tracks, the switch-rails thereof, and my improved automatic switch-shifting device in the position it occupies when the switch-rails are set for the main line. Fig. 2 is a vertical longitudinal section taken through the switch-actuating device on the line *a* of Fig. 1. Fig. 3 is a vertical transverse section taken on the line *x* of Fig. 1. Fig. 4 shows in detail the locking device for the switch.

Looking at Fig. 1, the main-track rails are indicated by the ordinal 1, the rails of the siding by 2, and the rails of the switch by 3, which, it will be understood, are adapted to be moved at one end to act with the main or with the siding rails, while at their other ends they are permanently pivoted to form a continuation of the main-track rails and are connected between their ends by tie-bars and at their movable ends to the locking device by the pivotally-connected rod 4. Suitable chairs 5 are provided at the junction of the fixed track-rails with the movable ends of the switch-rails.

The device for automatically operating the switch is placed between the fixed track-rails and consists of the following parts: A steel lever having the form of a horseshoe pivotally connected at its bend to the head-block or sill 7 at the junction of the fixed and the switch rails and extending between the rails, with their straight sides 8 adjacent thereto, terminate in inward-curved ends 9, so as to stand away from the fixed rails to receive the flanges of the wheels between them; and it will be understood that it is at these ends that the horseshoe-lever receives the blow of the wheels for an important advantage which I shall presently state. This horseshoe-lever has a length nearly twice the width between the rails and is supported by and has a firm and smooth sliding movement between the rails on steel bars 9^c, secured on the cross-ties, so as to raise the horseshoe-lever on a level that will allow it to move over the base-flanges and spike-heads of the rails. The form of this horseshoe-lever in cross-section is that of the rail to give it strength, and its ends are braced by one or more cross-bars 10. At its bend this lever has a circular base or disk 11, which is fitted into a socket-seat 12, secured to the head-block or sill, and a bolt 13, passing through the disk and its seat, holds them together in the circular seat and forms the bearing on which the lever is turned by the action of the wheel-flanges on its straight sides. One of these bearing parts, preferably the disk, can be made in two parts and be bolted to the flange of the lever and the head of the center bolt can be countersunk at the under side of the seat and its upper end riv-

eted on the disk. The bolts of the socket-seat may be secured in the same manner and thus avoid the use of nuts, which are liable to become loose, and provide a free and solid bearing, which affords a large surface and relieves the connecting-bolt from all strain and wear. A lever 14 is pivoted to one of the cross-bars of the horseshoe-lever and extends inward to near the pivot-bearing of the latter, its other end being pivoted on a track cross-tie at the ends of the horseshoe-lever by a casting 15, the pivot-pin of which, like the pivot-pin in the cross-bar, is riveted At its inner end this lever 14 is connected to one of a pair of rods 15, which extend transversely under the horseshoe-lever and the rails and are connected at their ends by chains 16, which at the lever-connected end pass over a sprocket-pulley 17, mounted on the vertical side of the head-block or sill, and at their other ends pass over a sprocket-pulley 18 on the crank-shaft 19 of a locking device at the side of the track. This locking device is mounted in a suitable housing, and its shaft has a crank 20, to which the switch-connecting rod 4 is attached, so that the chain-connected rods are on one side of the head-block or sill and the switch-operating rod is on the other-side of said head-block. A lever 22 on this shaft serves to shift the switch by hand and to lock it, as I will presently state.

Now, looking at Fig. 1, it will be seen that the horseshoe-lever has no direct connection with the switch, and this is important to effect one of the objects of my improvement, which is to obtain a connection by the lever and its chain and sprocket-wheel connections with a locking device, which not only locks the switch, but the horseshoe-lever, and this, so far as I know and can find, is a new combination in a switch operated by a horseshoe-lever. It is important, also, to observe that in this combination the horseshoe-lever is arranged to receive at its ends the action of the flanges of the wheels, which is to obtain the advantage of shifting the horseshoe-lever with a gradual movement, because the sides of said horseshoe-lever being straight and parallel with the rail against which it is set to be acted on it is caused to open from said rail like a pair of shears as the flange of the wheel runs between them, and thereby actuates the lever with a gradual easy and safe movement, as distinguished from a sudden movement of such horseshoe-lever if struck by the wheels of a train approaching the curved or pivoted end of the horseshoe-lever, which would cause the latter to have a sudden opening movement from the rails, and consequently giving a sudden jerking movement to the switch, which would be liable to break some of the connections either of the lever or of the switch. In the new arrangement and combination of the levers and their switch connections which I have set out the gradual movement of the horseshoe-lever is transmitted to the switch with certainty and safety through the long stroke of the lever revolving the switch-connected shaft through the chain and sprocket-wheels. This chain-and-rod connection with the lever is also important in the provision of turn-buckles 23 in one or both of the rods for adjusting them to take up any slack of the chain.

The action of the horseshoe-lever transmits motion to its pivoted lever, and it is the connection of the latter at its long end with the chains that gives the pulley of the locking device a half-revolution, and thus shifts the switch into connection with the side-track rails or with the main-track rails, according as the train may be running on one or the other track.

Referring to Fig. 3, it will be seen that the shaft of the hand-operating lever is raised above the head-block to allow it and the crank to be depressed below a horizontal line, so that neither can be thrown over by any strain applied to the switch-rails.

The device for locking the hand-operating lever is shown in Fig. 4, and consists of a bar of cast-iron 24, pivoted to a stud 25 on one side of the said lever and engaged by a slot over the end of a stud 26 on the other side of said lever and locked thereto by a pin 27, so that in case the switch is thrown by a running train the lever will be violently thrown up against the cast-iron bar and break it, and thereby allow the switch to be moved the same as if the lever were not locked.

In the drawings the switch is shown set for the main track, and a train moving on the siding-track will, by the flanges of one of the wheels of the locomotive, shift the horseshoe-lever to the position seen in dotted lines, and by means of the lever and its chain and pulley connections with the crank-shaft simultaneously move the switch into connection with the side-track rails, as shown by dotted lines, and allow the train to pass in safety to the main track.

When the switch is set for the side track, the train moving on the main track will operate to shift the switch to the main track and allow the train to pass in safety.

When the switch is shifted as described, it is held secure by the position of its crank and hand-lever connection. The switch-stand is placed on the right-hand of the track and may have the usual target for indicating to the engineer that the switch is set for the side track.

It will be understood that a train passing to the switch on either track will cause the breaking of the cast-iron locking-bar in the event of its being placed over the locking-lever. For this purpose this locking-bar is placed a sufficient distance above the lever to cause the latter to strike the bar with a blow, and it will be understood that such blow will be caused by the lever, chain, and pulley connections with the hand-lever shaft and with the horseshoe-lever, whereby the shifting action of the latter through its connected lever

will revolve the pulley suddenly and with great force throw up the hand-lever and break the locking-bar and allow the switch to be moved, so that while this lock serves the usual purpose of locking the switch it also serves the important purpose of permitting the latter to be shifted when locked under circumstances that would otherwise endanger the safety of the train.

I have stated that a train passing to the switch on either track will cause the breaking of the cast-iron locking-bar in the event of its being placed over the locking-lever, and for this purpose I have shown in Fig. 1 such locking-bar on both sides of the crank-shaft, the inner bar being shown turned back out of the way of the lever. To give the proper throw to the lever and the force to break the bar, I make the studs about six inches high.

Without limiting myself to the precise construction of parts, I claim—

1. In an automatically-operated railroad-switch, the combination of the horseshoe-lever and its connected lever with the switch and means for connecting them, consisting of the crank-shaft, the connecting-rod, the sprocket-pulleys, and the chain and rods connecting said pulleys and crank-shaft with the said lever, for the purpose stated.

2. The combination, with the switch, of the horseshoe-lever, the lever pivoted thereto, the crank-shaft, the connecting-rod, the sprocket-pulleys, the rods and chains connecting them, and a locking device consisting of the lever and a cast-iron locking-bar, for the purpose stated.

3. In an automatically-operated railroad-switch, the horseshoe-lever pivotally connected in the line of junction of the switch and the fixed rails and arranged with its movable ends standing away from the switch, in combination with the intermediate lever and its connecting-rods and chains, the sprocket-pulleys for said rods and chains, and the switch-connecting crank-shaft and connecting-rod, arranged to operate as stated.

4. In a railroad-switch, the horseshoe-lever having a bearing-disk and socket-seat therefor bolted together, in combination with the intermediate lever, the chains, their adjustable connecting-rods, the sprocket-pulleys, and the crank-shaft and connecting-rod connecting the switch, for the purpose stated.

5. In an automatically-operated switch for railroads, the combination of the switch and devices for automatically shifting it by means of the moving train, consisting of a shaft having a crank connected to said switch and a pulley connection to its operating devices and having a hand-lever 22, with a cast-iron locking-bar for said hand-lever, crossing the path of movement of the latter a sufficient distance above it to give said bar a sudden forcible blow, for the purpose stated.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM HENRY FISHER.

Witnesses:
G. H. HOLDEN,
CLYDE W. STILSON.