

(No Model.)

2 Sheets—Sheet 1.

J. C. LOURY, Jr.
AUTOMATIC SWITCH.

No. 363,075.

Patented May 17, 1887.

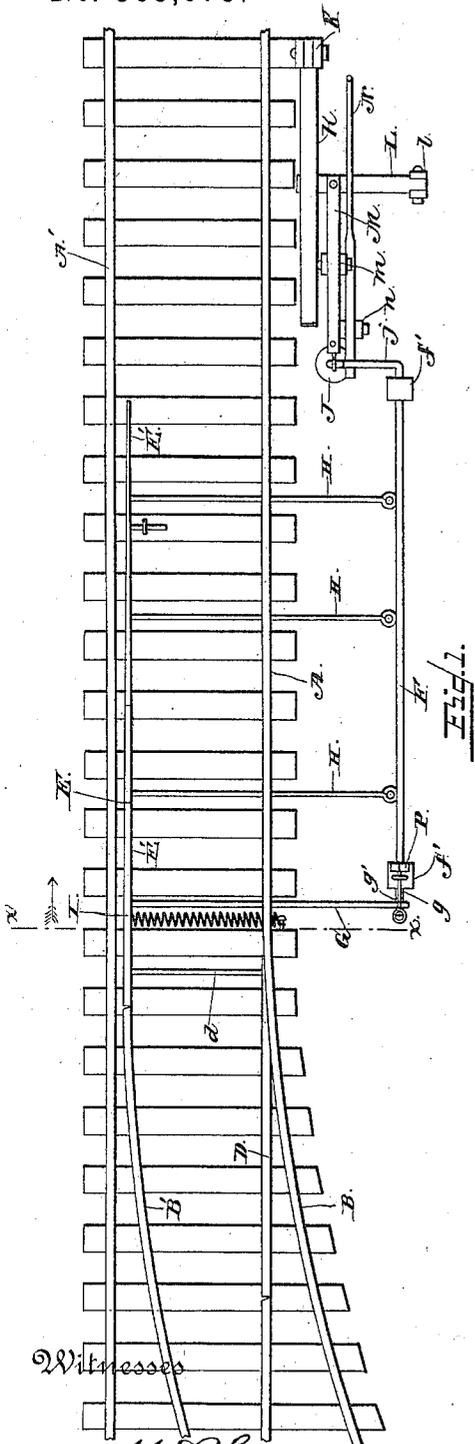


Fig. 1.

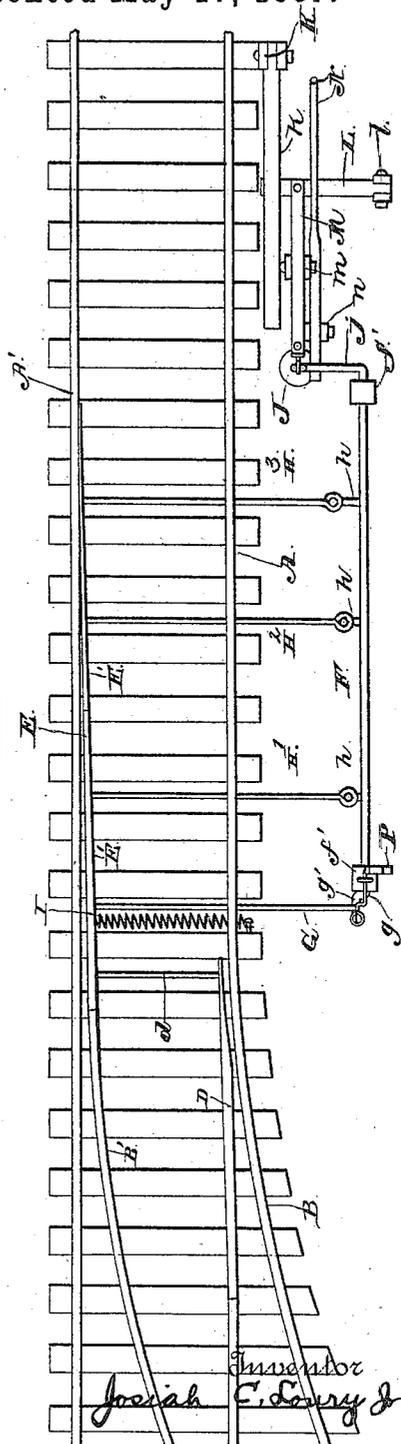


Fig. 2.

Witnesses

M. C. Fowler
H. Purchase

Inventor

Josiah C. Loury, Jr.

By his Attorneys

C. A. Howden

(No Model.)

2 Sheets—Sheet 2.

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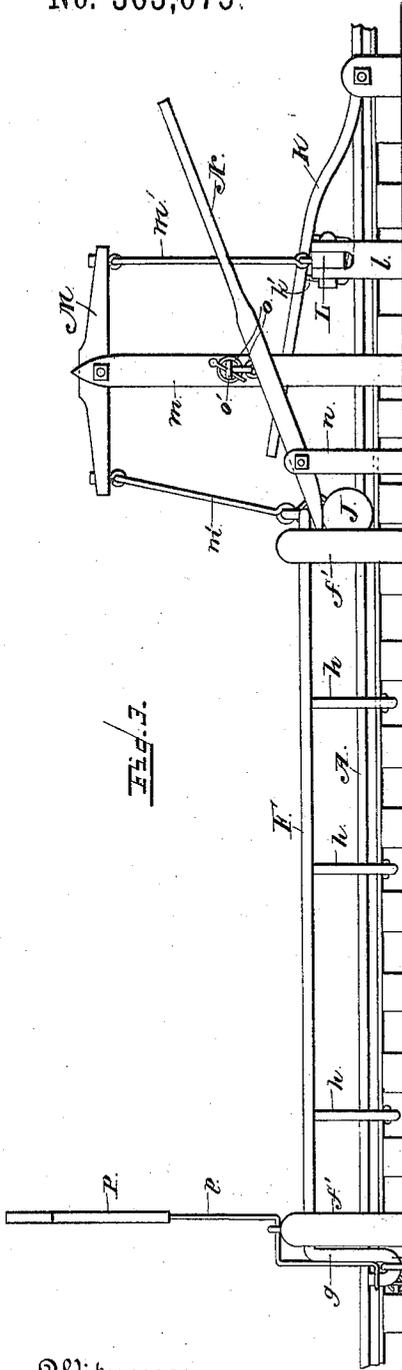


FIG. 3.

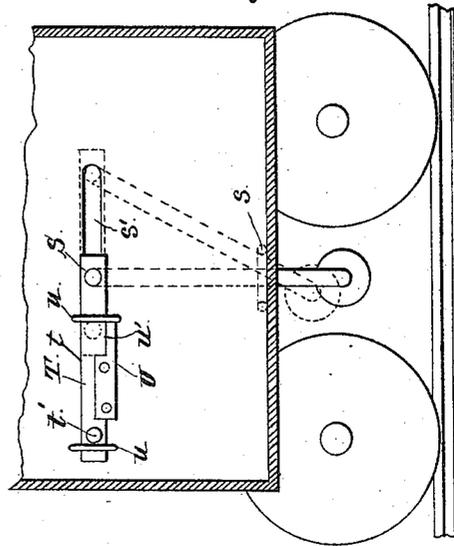


FIG. 5.

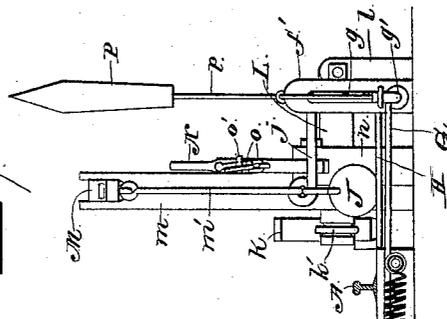


FIG. 4.

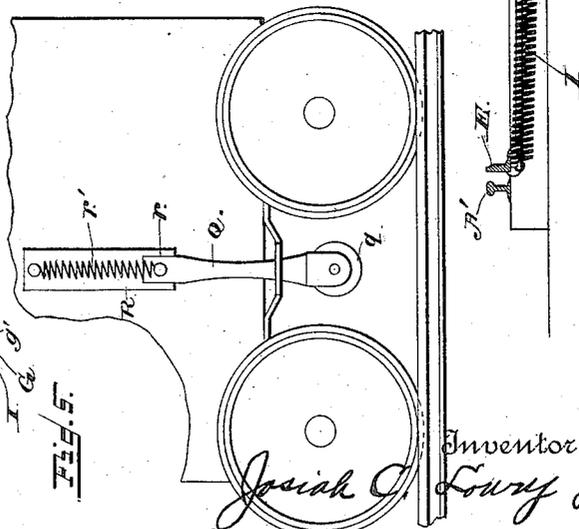


FIG. 6.

Witnesses
M. Loure
H. Berichoff

Inventor
Josiah C. Loury Jr
 By his Attorneys
C. A. Howden

UNITED STATES PATENT OFFICE.

JOSIAH C. LOURY, JR., OF HUNTERSVILLE, WEST VIRGINIA.

AUTOMATIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 363,075, dated May 17, 1887.

Application filed November 6, 1886. Serial No. 218,164. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH C. LOURY, Jr., a citizen of the United States, residing at Huntersville, in the county of Pocahontas and State of West Virginia, have invented new and useful Improvements in Automatic Switches, of which the following is a specification.

My invention relates to improvements in automatic railway-switches; and it consists of the peculiar combination of devices and novel construction and arrangement of the various parts for service, substantially as hereinafter fully described, and particularly pointed out in the claims.

The primary object of my invention is to provide an improved automatic switch, the throw or shifting rails of which are normally pressed or forced away from the rails of the main track to leave the latter open, the said shifting rails being controlled by suitable devices of great power, so that they are not liable to become accidentally displaced to close the main line, the throw-rails being in effect locked in place by the devices which hold them from contact with the main track.

A further object of my invention is to provide an improved switch which can be automatically operated by means of a train passing from side track to main track by the contact of the wheel-flanges impinging against the movable throw or switch rails to overcome the resistance of the devices which hold the said rails from the main track, and thereby move the throw-rails into contact with the main track to permit the train to pass from side track to the main line.

A further object of my invention is to provide a switch with means which are adapted to be operated by a passing train on the main line, so that the train can pass from the main line to the side track without stopping the train, the said devices being operated by mechanism in the locomotive-cab, which is controlled by the engineer, so that the train can pass along the main line or from the main track to the siding, at the will of the engineer.

A further object of my invention is to provide the switch with improved means for operating it by hand, the hand-operating mechanism being normally locked, so that it will not interfere with the operation of the mechanism

for controlling the throw-rails; and, finally, the object of my invention is to provide an improved switch of simple and strong construction, and which shall be comparatively cheap and inexpensive of manufacture and effective and reliable in operation.

In the accompanying drawings, which illustrate a railway-switch embodying my improvements, Figure 1 is a top plan view thereof, showing the switch set for the main line. Fig. 2 is a like view showing the switch set for the siding. Fig. 3 is a side elevation showing the hand-lever for operating the switch. Fig. 4 is a vertical transverse sectional view on the line *xx* of Fig. 1. Figs. 5 and 6 are detail views of different forms of devices for operating the switch, which are to be carried by a passing train.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A and A' designate the rails of the main track or line, and B B' the rails of the side track. The rail B of the switch is curved inwardly toward the rail A of the main line, and it joins the same, as shown, the rail A of the main line and the rail B of the switch being continuous and unbroken.

D E designate the throw-rails, one of which, E, is normally held out of contact with one of the rails, A', of the main line, so as to leave the said main line clear for the passage thereon of trains, while the throw-rail D is arranged to come in contact at its free end with the main-track rail where it joins the curved part of the switch-rail B. These throw-rails D E are connected to the ties in any suitable manner, so that their free ends will have a swinging movement, to adapt them to be thrown into or out of contact with the rails of the main track, as desired, and they are connected near their free ends by means of a coupling-bar, *d*, so that they move simultaneously and in the same direction. The throw-rail E is made of considerably greater length than the rail D, in order that the wheels on one side of both the front and rear trucks of a railway-car will come in contact with the same, the rear truck-wheels coming in contact with the rail before the wheels of the front truck pass the rail, as will be very readily understood. As it has been found to be impractical to construct the

rail E in a single piece, owing to the extreme length required, I have made it in two or more sections, E', which are connected with suitable devices, so that all of the said sections will
5 move simultaneously and to an equal extent.

F designates a rock-shaft, which is arranged to one side of the main and side track rails, and parallel therewith, and this rock shaft is
10 journaled in suitable bearings, which are secured to or formed with vertical posts f', which are rigidly affixed or secured in the ground or other place. This rock-shaft is provided at one end with a crank-arm, g, which
15 has a pin, g', at or near its lower extremity, to which is connected the outer end of a link or pitman, G, which extends toward and beneath the rails of the main track, the inner end of the said link or pitman being connected to one of the throw-rails or to the coupling-bar
20 between the same. The inner end of the pitman or link is preferably connected to the swinging section of the throw-rail E, so that the latter is moved simultaneously with the rock-shaft, and the sections E' of the said
25 throw-rail are movable bodily with the rock-shaft, as they are connected thereto by means of links H, which are connected at their inner ends to the said movable section or sections, and at their outer ends to angular arms h, which are rigidly affixed to the rock-shaft, to
30 be operated thereby.

It will be seen that when the rock-shaft is moved or oscillated in its bearings the arms h and pitmen or links H will move the sections E' of the throw-rail laterally or against
35 the rail A' of the main line, and the crank-arm of the rock-shaft will also be moved to adjust the swinging section of the throw-rails simultaneously with the movement of the other sections
40 of the said rail.

I designates a powerful coiled spring, which is arranged alongside of one of the ties and beneath the plane of the main-track rails, and one end of this coiled spring is connected to the
45 throw-rail E, while the other end thereof is connected to the tie or to any other immovable object to adapt the spring to actuate the switch or throw rails. This spring serves to draw upon the movable throw-rails, so as to normally force
50 the free end of the rail B into contact with the rail A of the main line, and to draw the free end of the rail E away from the rail A' of the main line, the spring serving to exert a powerful strain or pull upon the said throw-rails,
55 in order to lock them against retrograde movement, except when acted upon by the rock-shaft.

It will be seen that the rail D serves as a continuation of the rail A of the main track to
60 permit the passing train to pass over the said rail D from the rail A of the main track, while the rail E is normally drawn away from the rail A' of the main track to adapt the train to pass over the said rail A' without hinderance
65 from the throw-rail E, the main track being thus normally left clear or open, while the

throw-rails of the switch are locked against movement by the action or pull thereon of the powerful coiled spring.

The end of the rock-shaft opposite to the
70 crank-arm thereon is provided with another arm, j, which lies at a different angle or position thereto than the arm g, and to the free end of this crank-arm j is connected a weight, J, which is suspended therefrom and serves to
75 control the rock-shaft to draw upon the arms h and the links H to normally draw the sections E' of the throw-rail E away from the rail A' of the main track. This spring and weight thus serve to normally force or draw one of the
80 throw-rails of the switch away from one of the rails of the main line, while the other throw-rail is normally pressed at its free end into contact with the other rail of the main line to form a continuation thereof; but either one of
85 these devices can be employed to perform this result if they are made of sufficient power—as, for instance, the weight alone can be suspended from the rock-shaft to cause the links to control the throw-rails, as described, or the
90 spring can be employed singly to actuate the pivoted section of the rail E and the rail D, and thus control the rock-shaft through the link G, which in turn controls the sections E' of the rail E through the links H, as will be
95 very readily understood.

K designates an operating-lever, which is arranged alongside one of the rails of the main track and in close proximity thereto, and one end of this operating-lever is pivoted in a short
100 standard, k, which is rigidly affixed or secured in place. The said operating-lever rests upon the outer end of a pivoted bar, L, which is arranged at right angles to the operating-lever, and the latter is connected loosely to the pivoted
105 bar by an intermediate keeper, k', as shown. The outer end of this bar is pivoted in a short post or standard, l, and the said bar is supported by a horizontal oscillating beam, M, which is pivoted centrally to the upper end
110 of a vertical post or standard, m, the free ends of this beam being connected by intermediate rods, m', to the horizontal pivoted bar L and the free end of the crank-arm j, to transmit the movement of the bar to the crank-arm of the
115 rock-shaft.

N designates a pivoted hand-lever, which is adapted to operate the rock-shaft to move the switch by hand. The said lever is arranged
120 in a horizontal position, and it is pivoted near one end in a short standard or post, n, so that the switchman can exert great power or leverage on the rock-shaft, in order to overcome the strain of the weight and the coiled spring. The inner pivoted end of the lever is arranged
125 beneath the short arm j of the rock-shaft, so as to elevate the said arm when the free end of the lever is depressed, and this lever is normally locked against movement by means of suitable links, o, which are connected to the
130 lever at an intermediate point of its length, a fixed keeper, o', on the fixed post m, over

which the upper link fits or takes, and a pin passing through the keeper to prevent the link which engages therewith from becoming detached.

5 P designates a signal or target, which is of an approved pattern, and this signal is carried by the upper end of a vertical standard, *p*, which is pivoted at an intermediate point of its length upon one of the short standards, *f'*, in which the rock-shaft is journaled, the lower end of the standard being loosely connected to the crank-arm *g*, so that the position of the target is changed when the rock-shaft is oscillated.

15 In Fig. 5 of the drawings I have shown a vertically-disposed arm or standard, *Q*, which carries a roller, *q*, at its lower end, that is adapted to ride upon and depress the free end of the operating bar or lever *K*. This vertical bar or standard is capable of a vertical end-wise movement, and it passes at its lower end through a vertical opening formed in a depending hanger or guide, that is rigidly affixed to the cab of the locomotive. The upper end of the arm or lever is adapted to fit in a notch, *r*, that is formed in the lower edge of a bracket-plate, *R*, that is secured to the cab of the locomotive, and to the upper end of the said arm or lever is connected a coiled spring, *r'*, which is secured at its opposite end to the bracket-plate *R*. When the upper end of the standard is fitted in the notch of the bracket-plate, the lower end of the standard is projected through the fixed guide or hanger, so that the roller thereon is adapted to ride upon the inclined operating-lever *K*; and when the said upper end of the standard is withdrawn from the notch of the fixed bracket-plate the standard and roller are elevated by the pull exerted thereon by the spring, so that the roller is elevated above the plane of the operating-lever to permit the train to pass the switch without operating the same.

45 In Fig. 6 of the drawings I have shown another device that is to be carried by the locomotive to operate the switch without stopping the train. In this device I employ a standard having a roller at its lower end, and this standard also passes through a fixed guide, *s*, on the locomotive. The upper end of the standard has a right-angled arm, *S*, that is passed through a horizontal slot, *s'*, formed in the cab, or any other device. To the inner end of this arm is secured or affixed one end of a plate, *T*, which has a notch, *t*, in its lower edge, and a handle or piece, *t'*, affixed thereto, so as to control the position of and actuate or move the plate and the standard with its roller. This plate moves in guides *u*, which are rigidly affixed to the cab, and the notch of the plate is adapted to receive a fixed plate, *U*, which prevents the said notched plate and the standard from movement, one end of this fixed plate being also provided with a notch, *u'*, in which one end of the movable plate is adapted to fit.

When the movable plate is fitted over the fixed plate, the standard and its roller are in position to operate on the operating-lever; but when the movable plate is adjusted so that one end thereof rests in the notch of the fixed plate, the standard and the roller are elevated, to prevent the roller from riding on the operating-lever, as will be very readily understood, this device being readily controlled by the engineer, so that the passing train can be caused to operate the switch as it passes along the tracks.

This being the construction of my improved switch, the operation thereof is as follows: The throw-rail *E* is normally clear of the rail *A'* of the main track, and the rail *D* is normally in contact with the rail *A* of the said main track, so that when a train passes along the main line in either direction it will pass the switch without affecting the position of the throw rails. When the train approaches the switch from one direction the roller on the lever or standard, hereinbefore referred to, in the cab of the locomotive rides upon the operating-lever to depress the same, and this movement is communicated to the rock-shaft through the intermediate devices to force the rail *E* against the rail *A'* of the main track and withdraw the rail *D* from the rail *A*. The train can now pass along the rails *A B* and *E* to the side-track, and the flanges of the wheels on the trucks of the cars come in contact with the rail *E* to prevent the latter from movement which is liable to change the position of the rock-shaft and operate the switch. As soon as all the cars of the train have passed over the rail *E* the spring and weight return the throw-rails to their former positions, and thus automatically restore the throw-rails to their normal position and open the main line. In passing from the side-track to main line the flanges of the wheels impinge upon the throw-rail *D* to force the free end of the same away from the rail *A* of the main track, and this movement of the rail *D* is communicated by the coupling-bar to the rail *E*, so that both the rails *D E* move simultaneously. The rail *E* is thus forced against the rail *A'* of the main track to permit the train to pass over the rail *E* to the rail *A'*, and over the rail *B* to the rail *A*, the movement of the throw-rails being communicated by the link to the rock-shaft which actuates the movable sections *E'* of the rail *E*, as will be very readily understood.

It will thus be seen that I provide simple and effective devices for locking the throw-rails of the switch against movement, and so as to leave the main line clear; that the switch can be operated by hand by merely adjusting the lever after the locking devices have been released, and that the switch can be operated by a passing train without stopping the same, the locomotive being supplied with devices for operating the switch which are under the control of the engineer.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the main track, the side track, the divided throw-rail E, arranged in proximity to one side of the main track and communicating at its pivoted end with one side of the side track, and the throw-rail D, arranged in line with the main track, the point of the rail D being opposite the inner end of the rail E and connected to the same, substantially as described.

2. The combination of the main track, the side track, the divided throw-rail E, arranged in proximity to one side of the main track and communicating at its pivotal end with one side of the side track, the throw-rail D, arranged in line with the main track, the point of the rail D being opposite the inner end of the rail E, the rod *d*, connecting the rails D and E, the rock-shaft F, having the lever-arms connected to the rail E, to operate the rails D and E simultaneously, and the spring I, adapted to hold the rail E normally out of contact with the main track, substantially as described.

3. The combination of the main track, the side track, the divided throw-rail E, arranged in proximity to one side of the main track and communicating at its pivotal end with one side of the side track, the throw-rail D, arranged in line with the main track and having its point opposite the inner end of rail E, the rock-shaft F, means, substantially as set forth, connecting the rock-shaft with the rails D and E, to operate the same simultaneously, and the lever arranged alongside the main track, connected to the rock shaft and adapted

to be operated by a passing train, and thereby automatically set the rails D and E, substantially as described.

4. In an automatic railway-switch, the combination of the main and side tracks, the coupled throw-rails, a spring connected with the throw-rails to normally lock them in position to leave the main track clear, the rock-shaft connected at one end with the throw-rails and having the crank-arms at its opposite ends, the operating-lever pivoted at one end and arranged in close proximity to the main track to be operated by a passing train, the centrally-pivoted beam connected with the crank-arm of the rock-shaft by an intermediate rod, and a pivoted bar connected to the operating-lever and to the beam, substantially as described, for the purpose set forth.

5. In an automatic switch, the combination of the main and side tracks, the throw-rail D, the rail E, coupled by an intermediate bar with the rail D, and made in two sections, the spring connected with the pivoted section of the throw-rail E, the rock shaft having the arms, the links intermediate of the arms, and the sections of the throw-rail E, the link connected to the throw-rails and the rock-shaft, an operating-lever, and connections intermediate of the lever and the rock-shaft, substantially as described, for the purpose set forth.

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

JOSIAH C. LOURY, JR.

Witnesses:

H. J. ENNIS,

WM. N. MOORE.