No. 695,277. Patented Mar. 11, 1902.

W. L. CLARK.

OVERHEAD SWITCH.

(Application filed Aug. 8, 1901.)

(No Model.) 5 Sheets—Sheet 1.

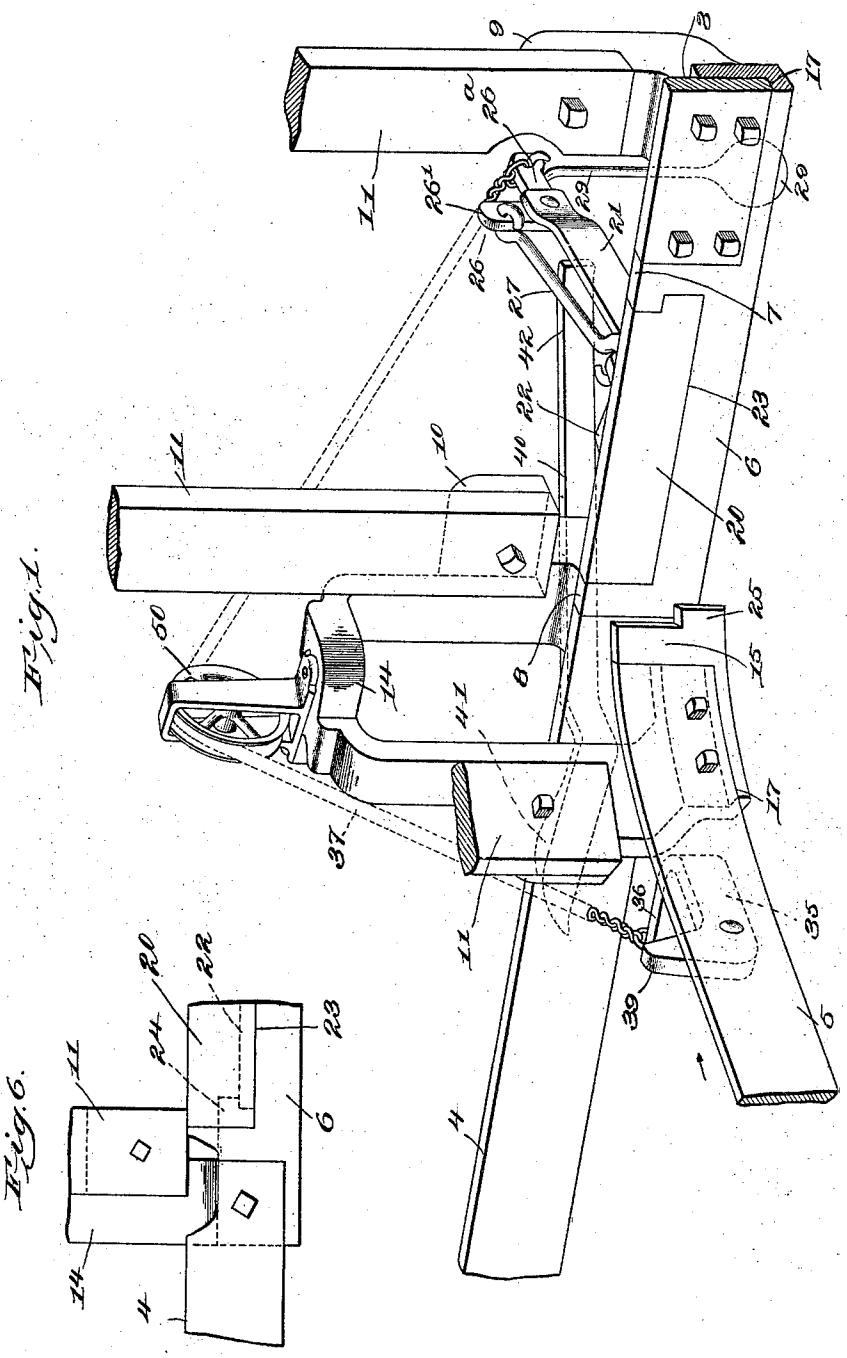


Fig. 1.

Fig. 6.

Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 695,277. Patented Mar. 11, 1902.

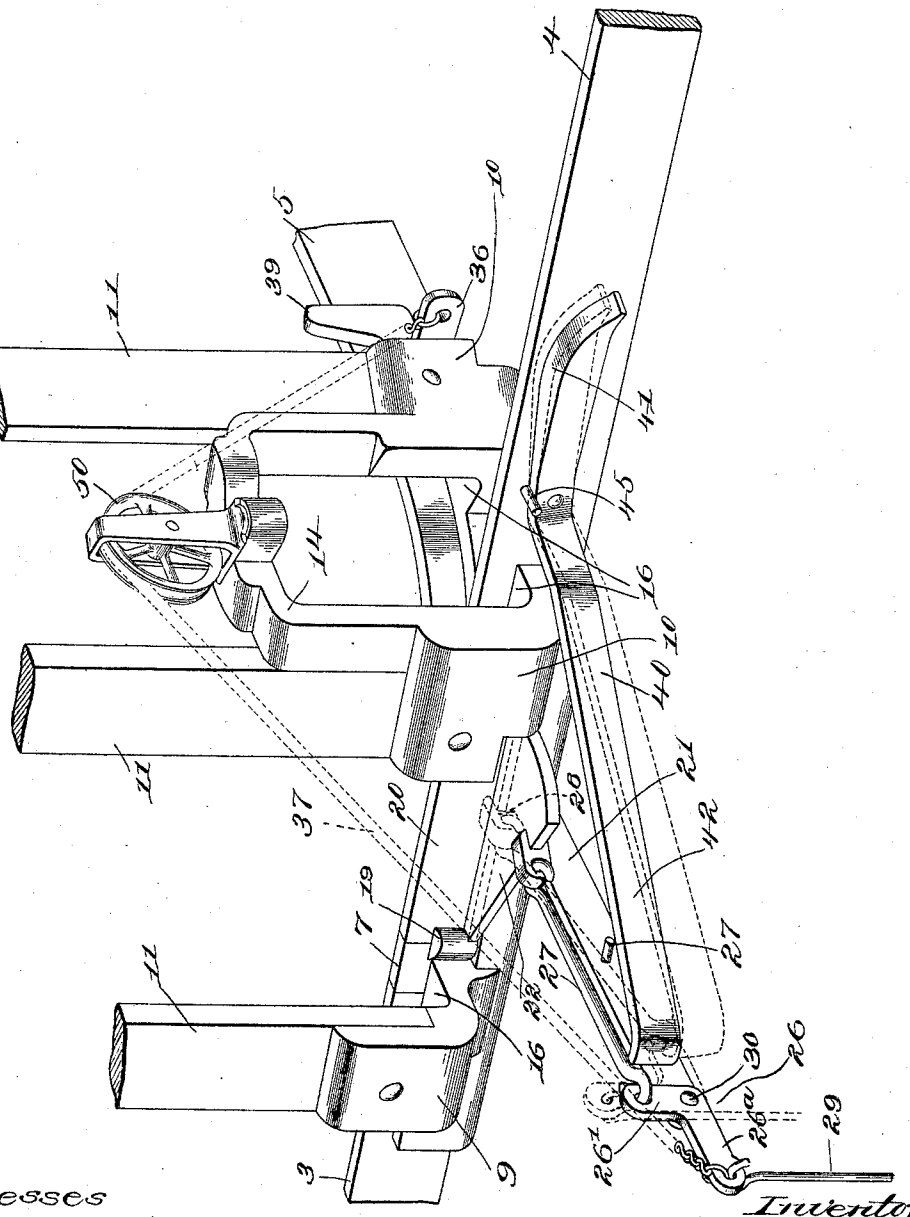
W. L. CLARK.

OVERHEAD SWITCH.

(Application filed Aug. 8, 1901.)

(No Model.) 5 Sheets—Sheet 2.

Fig. 2.



Witnesses
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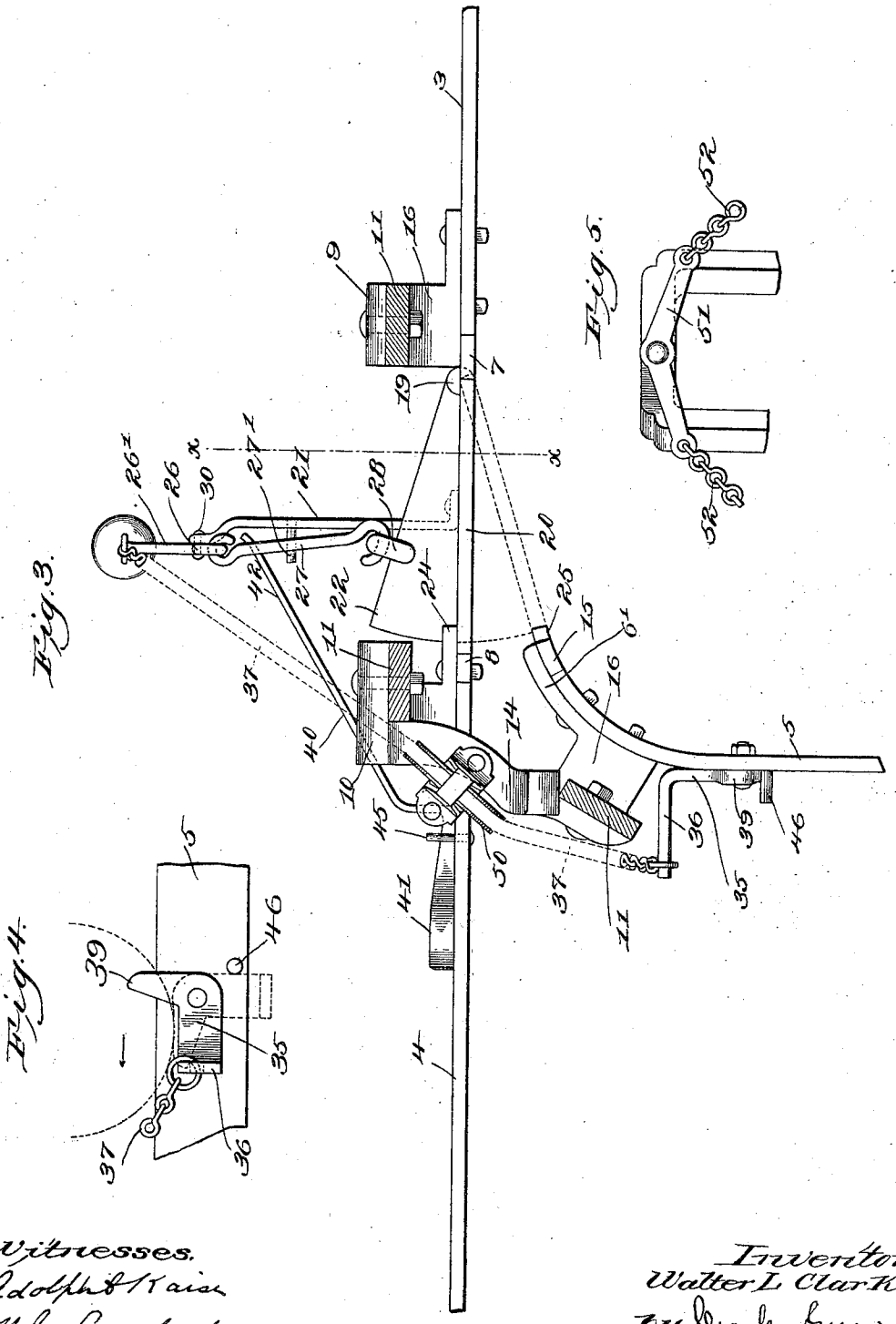
No. 695,277. Patented Mar. 11, 1902.

W. L. CLARK.

OVERHEAD SWITCH.

(Application filed Aug. 8, 1901.)

(No Model.) 5 Sheets—Sheet 3.



Witnesses.
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No. 695,277. Patented Mar. 11, 1902.

W. L. CLARK.

OVERHEAD SWITCH.

(Application filed Aug. 8, 1901.)

(No Model.) 5 Sheets—Sheet 4.

Fig. 8.

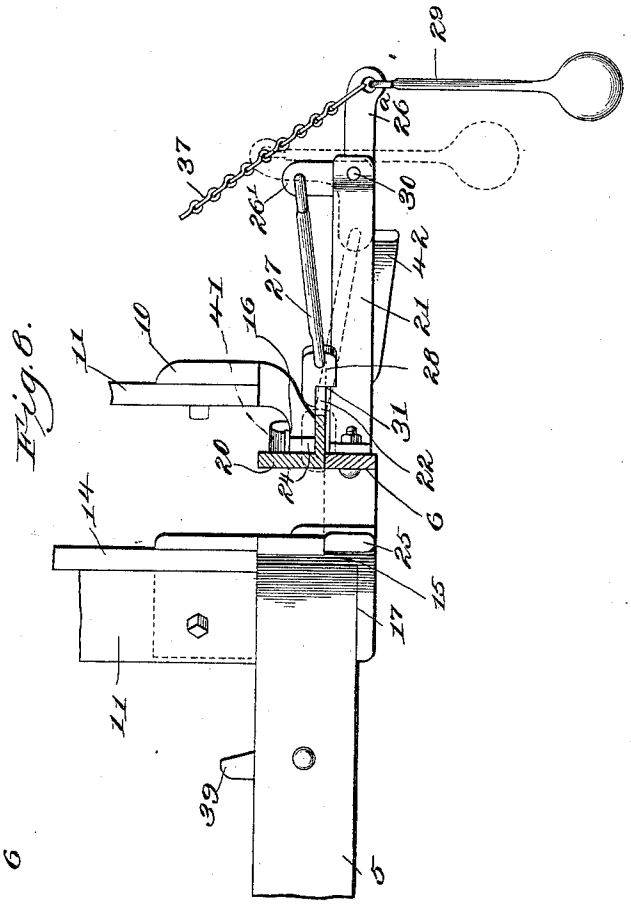
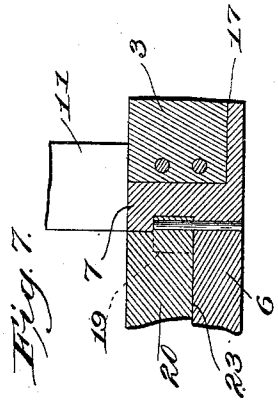


Fig. 7.



Witnesses.
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No. 695,277. Patented Mar. 11, 1902.

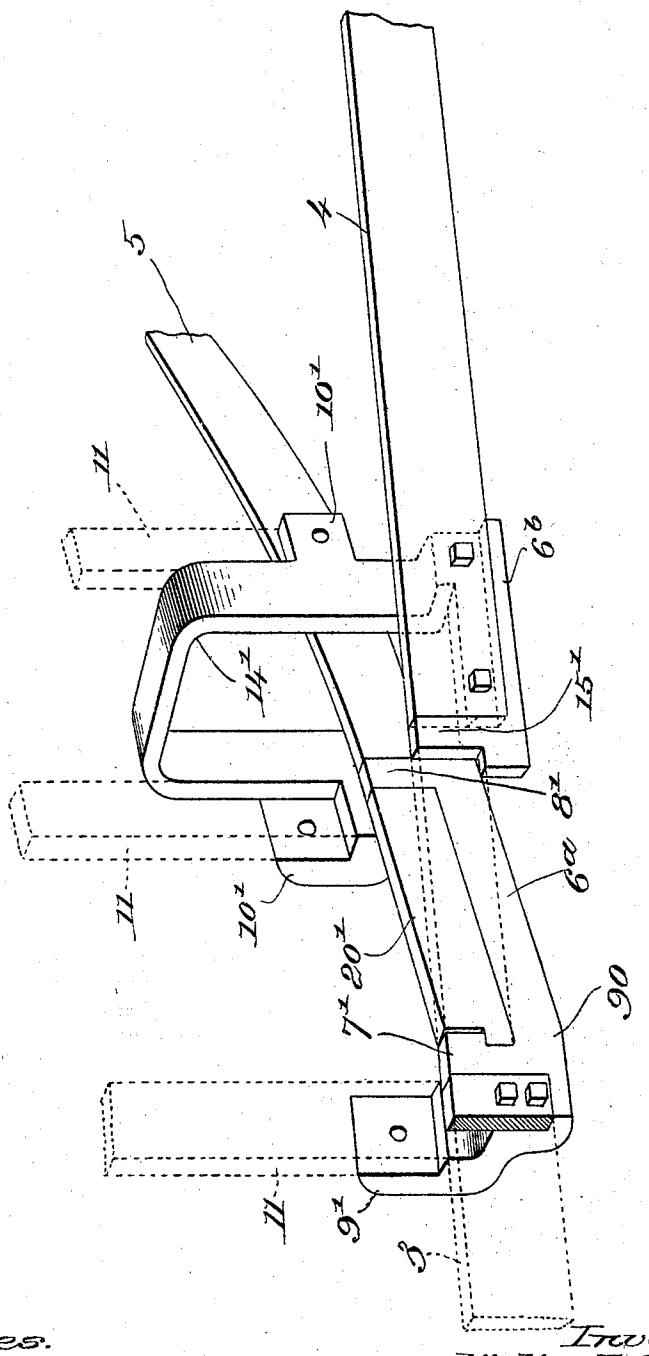
W. L. CLARK.

OVERHEAD SWITCH.

(Application filed Aug. 8, 1901.)

(No Model.) 5 Sheets—Sheet 5.

Fig. 9.



Witnesses.
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UNITED STATES PATENT OFFICE.

WALTER L. CLARK, OF EVERETT, MASSACHUSETTS.

OVERHEAD SWITCH.

SPECIFICATION forming part of Letters Patent No. 695,277, dated March 11, 1902.

Application filed August 8, 1901. Serial No. 71,288. (No model.)

To all whom it may concern:

Be it known that I, WALTER L. CLARK, a citizen of the United States, residing at Everett, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Overhead Switches, of which the following description, in connection with the accompanying drawings, is a specification, like figures on the drawings representing like parts.

In overhead tramways such as are used in slaughter-houses, cold-storage plants, &c., it is customary to connect the main rail with the branch rails or tracks leading to different sections of the building by means of a suitable switch device which is manually operated to connect the main rail with the branch rails when it is desired to deflect a carrier or traveler from the main rail to any branch rail. It sometimes happens that after a carrier has passed the switch and the switch has been thrown to open the track or rail onto which the carrier has been deflected the said carrier runs back on its rail toward the open switch and unless some means are employed to either stop the carrier or to throw the switch to close the rail on which said carrier is traveling said carrier will run off the rail and drop through the switch.

It is one of the objects of my present invention to provide a switch mechanism which may be manually operated, as usual, to make the main rail continuous or to connect the main rail to any one of a number of branch rails and which may be also automatically operated by a carrier or traveler moving toward an open switch on any one of said branch rails to connect said rail with the main rail or to close said switch to the rail on which the carrier is traveling, thus preventing the carrier or traveler from dropping through the switch.

Another object of my invention is to so construct the switch that the switch-point will be properly alined with either rail even though the rails themselves may become twisted or warped; and still another object is to provide a switch of such a character that it may be suspended any desired distance from the ceiling, whereby the track may be placed at any elevation deemed most advantageous.

With these objects in view my invention comprises a suitable suspended frame having integral therewith a plurality of rail-sections, said frame being so constructed that the rails of the track may be bolted or otherwise connected thereto in alinement with the rail-sections. A suitable switch-tongue is pivoted to the frame and adapted to connect one of the rail-sections or that rail-section connected to the main frame with either of the rail-sections. Since the switch in its operative positions is brought to aline with the rail-sections which are integral with the frame instead of the rail ends, it will be seen that the warping or twisting of the rails will not throw the switch out of alinement. The frame has integral therewith offset lugs or hanger-supports to which the suspenders or hangers which support the device are attached, and since these suspenders or hangers are separate from the switch structure they may be longer or shorter, according to the elevation at which it is desired to place the track structure. The switches being thus independent from the hangers may be placed at any elevation by employing hangers of the proper length. To prevent a carrier from falling through an open switch, I have provided mechanism which is automatically operated by a car traveling toward an open switch and which when operated closes the switch to the track on which the carrier is traveling, whereby said carrier will pass through the switch onto the main track or rail. Any suitable mechanism may be employed to accomplish this, but I prefer to employ a trip or other device adapted to be operated by a carrier traveling toward the switch, which trip device is suitably connected to a pivoted switch-tongue, the construction being such that when a carrier is traveling toward an open switch the trip device is operated to throw the switch-tongue into alinement with the rail on which the carrier is traveling to thereby close the switch to said rail or track. Any carrier or traveler therefore which is running back toward the switch is automatically directed on the main rail and is prevented from dropping through an open switch.

Various other features of my invention will be hereinafter described, and particularly pointed out in the claims.

Figure 1 is a perspective view of my improved switch. Fig. 2 is also a perspective view looking at the switch from the opposite direction from Fig. 1. Fig. 3 is a top plan view. Fig. 4 is a detail of one of the trip devices. Fig. 5 is a modification. Fig. 6 is a detail to be hereinafter referred to. Fig. 7 is a section on line *x x*, Fig. 3. Fig. 8 is a detail of the switch-tongue pivot, and Fig. 9 shows a modification.

In the drawings, 3 designates the main rail, and 4 and 5 designate branch rails, which are adapted to be connected to the main rail 3 by my improved switch mechanism. As illustrated in the drawings, the rail 4 forms a straight continuation of the main rail 3, and while in one sense the rails 3 and 4 form the main track and the rail 5 is the branch rail, yet for convenience I have designated both the rails 4 and 5 as "branch rails" and have called the rail 3 the "main rail." I wish it distinctly understood, however, that my invention is not limited in its application to a switch wherein a curved branch track leads from a straight main track, as illustrated, for obviously the invention is equally applicable to the form of switch wherein both the rails 4 and 5 diverge from the main rail. I have therefore hereinafter used the term "branch rail" or "branch track" in the broader sense, as meaning one of two or more tracks which diverge from each other, but which are adapted to be connected independently with a single track by a suitable switch mechanism.

My improved switch device comprises a two-part frame which supports the switch-tongue and to which the ends of the rails 3, 4, and 5 are adapted to be secured in some suitable way, said frame being illustrated as comprising a shoe member 6, to which two of the rails are secured, and a branch member 6′, spaced from the shoe 6 to allow the depending portion of the carrier to pass between said members.

In Figs. 1 to 8, inclusive, I have shown what is commonly known as a "No. 1 switch"—that is, a switch wherein the shoe member 6 of the switch-frame is in alinement with and connects the straight rails 3 and 4, and the diverging rail 5 is connected to the branch member 6′ of the frame, and in Fig. 9 I have illustrated my invention embodied in what is commonly called a "No. 2 switch"—that is, one in which the shoe member is made to diverge from the straight line and connects the main rail 3 with the diverging branch rail 5, while the rail 4, which is in alinement with rail 3, is connected to the branch member of the frame. Referring to the first embodiment of my invention—that is, the No. 1 switch—it will be seen that the shoe member 6 of the switch-frame is straight and has the alined rails 3 and 4 connected thereto, while the branch member 6′ has the branch rail 5 connected thereto by some suitable means, said member being rigidly secured to the shoe 6 by some suitable connection adapted to admit of the passage of the carrier from the main rail 3 to the branch rail 4, such connection being shown as the inverted-**U**-shaped yoke or support 14, which is preferably integral with and forms part of the frame. The lower ends of the legs of the **U**-shaped support 14 are offset from the rails, as seen at 16, such offset portion providing ample room for the carrier to pass on either branch rail without coming in contact with either leg. The shoe 6 is provided at each end with rail-sections 7 and 8, which are preferably integral with said frame, the rail-section 7 alining with the rail 3 and the rail-section 8 alining with the rail 4, and the branch portion 6′ of the frame has integral therewith the rail-section 15, which is in alinement with the branch rail 5. The shoe 6 and the branch portion of the frame 6′ are each recessed to form seats 17 to receive the ends of the rails 3, 4, and 5, respectively, said seats being so situated that the rail ends when secured therein by any suitable means, as by bolts, are in alinement with the adjacent rail-sections. The shoe portion 6 of the frame is cut away, as at 23, between the rail-sections 7 and 8, and a single switch-tongue 20, pivoted to the frame at 19, adjacent the rail-section 7, alined with the main rail 3, operates in said cut-away portion, said switch-tongue being adapted to connect said rail-section 7 to either the rail-sections 8 or 15. Since the switch 20 in its two positions is made to aline with the rail-sections 8 and 15, which are integral with the frame, it will be seen that any twisting or warping of the rails 4, 5, or 3 will not in any way effect the proper action of the switch-tongue, as would be the case if the point of the switch were brought into alinement with the rails themselves.

The switch-tongue 20 has extending horizontally therefrom and in alinement with the under side thereof a fin or web 22, which operates to support the switch when it is thrown to connect with the branch rail 5, as seen in dotted lines, Fig. 3, the said fin in such position of the switch resting upon the upper surface of the cut-away portion 23 of the shoe 6. A suitable lug 24 projects over the edge of the fin 23 and serves to properly guide the same, the said lug also acting as a stop to limit the motion of the switch-point in one direction. The rail-section 15 is preferably provided with a supporting-lug 25, which is adapted to receive the end of the switch-tongue when the same is thrown to connect the main rail with the branch rail 5, and preferably said lug will have an inclined upper surface, as shown in Fig. 7, to insure the proper positioning of the switch-tongue.

Heretofore it has been common to make the hangers integral with the switch-frame; but with this construction the track must always be at a given distance from the ceiling or other support, and when it was desired to place the switch higher or lower a special

switch had to be made with a hanger of the right length. To overcome this disadvantage, I form integral with my switch-frame a plurality of hanger-supports, to which the lower ends of suitable hangers, which may be ordinary strap-iron, are detachably secured, said hangers in turn being secured to a ceiling or other support. By thus making the switch-frame independent from the hangers it will be seen that the switches may be placed at any desired height by simply varying the length of the hanger used. No special construction of switch is required, therefore, when the switch is to be placed higher or lower than usual.

As illustrated, each leg of the U-shaped yoke 14 has projecting therefrom a lug 10, to which lugs the lower ends of hangers 11 are detachably secured in any usual way, as by bolts 11′, and the shoe 6 adjacent the rail-section 7 has an offset lug or hanger-support 9, to which the lower end of another hanger 11 is similarly secured, said hangers being of any suitable construction and being secured to the ceiling or other support in any usual way. The lug 9 is offset, as shown, to provide room for the passage of the carrier. The hangers 11 being very inexpensive to manufacture may be made of any desired length to support the switch at any desired elevation, and it is unnecessary to construct a special switch when the height of the switch is to be changed. This I consider as quite an important feature of my invention.

The switch-operating mechanism will now be described.

Connected to the main portion 6 of the frame and extending therefrom is a supporting-arm 21, to which the actuating-lever 26 is pivoted, said actuating-lever being illustrated as a bell-crank lever and having one arm thereof connected by a suitable link 27 to an eye 28 on the fin 22. The other arm of said bell-crank lever has connected thereto the weighted handle 29, by means of which the switch may be manually operated, and the construction of the parts is such that when the switch is thrown to connect the main rail 3 with the branch rail 5 the arm 26′ of the bell-crank lever and the link 27 are in a substantially straight line, as illustrated in dotted lines, Fig. 2, the said link at such time engaging a stop 27′ on the arm 21, and the point of attachment between the weighted handle 29 and the arm 26^a of the bell-crank lever is substantially vertically over the pivot or fulcrum 30 of the said lever, whereby the switch is locked in such adjusted position. When the switch is in this position, the shoulder 31 on the lug or eye 28 abuts against the main portion 6 of the frame and acts as a stop to limit the movement of the switch in one direction, the said switch being locked against movement in the opposite direction by the link 27 and the arm 26′ of the bell-crank lever, as above described. By pulling downwardly on the weighted handle 29 the bell-crank lever 26 will be thrown into the position seen in Fig. 1, and the switch will be thrown to connect the main rail with the branch rail 4, the switch being held in such position by the weighted lever. I would here remark that when the bell-crank lever is in the dotted-line position, Fig. 2, the point of attachment between the weighted handle and the arm 26^a of said lever is not exactly vertically over the fulcrum 30, but is slightly to one side thereof, so that a downward pull upon the handle will turn the said lever, but with the parts in such dotted-line position the effective lever-arm of the weighted handle is so short that the handle will not of itself throw the switch.

In addition to the above features my invention includes means operated by a carrier moving on either branch rail toward the switch to throw the switch automatically into such a position as to connect the rail on which the carrier is moving with the main rail, whereby the carrier is prevented from falling through the open switch. The drawings illustrate one simple form of mechanism to accomplish this object; but as I believe I am the first to employ, in connection with a switch having a single switch-point, any mechanism for automatically operating the switch by the carrier I do not wish to be limited to the exact construction shown.

My preferred mechanism for automatically operating the switch comprises a trip mechanism adjacent each branch rail and in position to be operated by a carrier traveling over said rail toward the switch, said trip being connected to the switch-tongue by connections of such a construction that as the trip is operated the switch-tongue is thrown to connect said branch rail with the main rail, whereby the carrier is directed onto the main rail and is prevented from falling through the switch. In the embodiment of my invention herein illustrated the trip devices are for convenience pivoted to the branch rails, though it is obvious that they may be pivoted to any other suitable support, if desired, provided they are in a position to be operated on by a carrier as it travels toward the switch. The branch rail 5 is shown as having pivoted thereto the trip 35, having the offset arm 36, to which a chain 37 or other flexible connection is attached, said chain passing over a guide-pulley 50, mounted on the top of the U-shaped frame 14 and being connected to the arm 26^a of the bell-crank lever. The trip 35 has a nose 39, which extends above the track or rail 5 and in position to be operated upon by the wheels of a traveler or carrier moving in the direction of the arrow, Fig. 1. Assuming that the parts are in the position shown in Fig. 1, it will be seen that should the trip 35 be thus acted on by the wheels of a carrier and turned into the dotted-line position, Fig. 4, the arm 36 of said trip will, through the flexible connection 37, turn the bell-crank lever from the full-line position,

Fig. 1, into the dotted-line position, Fig. 2, thus throwing the switch into alinement with the branch rail 5. The carrier or traveler therefore will be directed automatically onto the main rail 3 and will not drop through the switch.

The track or rail 4 has pivoted thereto a trip-lever 40, said trip-lever having the portion 41, adapted to be operated upon by the flanges of the wheels of the carrier, and the offset portion 42, extending underneath and adapted to engage the arm 26′ of the bell-crank lever. If the parts are in the dotted-line position, Fig. 2, with the switch thrown to connect with the branch rail 5, and a carrier should back off of the branch rail 4 toward the switch, the wheels of said carrier will strike the inclined portion 41 of the trip 40 and swing the same into full-line position, Fig. 2, thus giving an impulse to the actuating-lever 26 and turning the same sufficiently so that the weighted handle 29 will carry the lever into the full-line position, Fig. 2, thereby automatically throwing the switch into alinement with the branch rail 4 and preventing the carrier from dropping through the switch.

It will thus be seen that I have provided an overhead switch having a single switch-point in which said switch-point is automatically operated by a carrier or traveler moving on a branch track toward the main track to connect the main track with that branch track on which the carrier is moving, thus preventing the carrier from falling through an open switch.

A suitable stop-lug 45 may be employed to limit the movement of the trip-lever 40, and a similar stop 46 will be used in conjunction with the trip 35.

The connections between the trips and the actuating-lever are such that whenever the switch is thrown to connect the main rail with one branch rail the trip on the other branch rail will be brought into position to be operated upon by the wheel of a carrier.

Instead of using a guide-pulley 38 for the flexible connection 37 I may employ a lever 51, suitably connected to the stand 14′, the said lever having connected to each end thereof flexible connections 52, which are in turn connected to the trip 35 and to the bell-crank lever 26, respectively.

The switch thus far described is of the type employed where a branch track diverges from a single straight track, and in a switch of this type (known as a "No. 1 switch") the shoe 6 is straight and has attached to its opposite ends the two rails (3 and 4 in this instance) which form part of the straight main track. I desire to state, however, that my invention is equally applicable to that form of switch wherein both the branch rails diverge from the main rail, in which case the shoe would be curved and the main rail and one branch rail would be connected thereto, the other branch rail being connected to a separated member of the frame corresponding to 6′. The invention is also equally applicable to that type of switch known as "No. 2 switch," wherein the shoe portion of the frame is curved to connect the main rail to the diverging branch rail, while the other branch rail in alinement with the main rail is attached to a member of the frame separate from the shoe, and in Fig. 9 I have illustrated a switch of this type, the trip devices and other parts for operating the switch being omitted to avoid confusion. In said figure the rail 3 (shown partially in dotted lines) is connected to one end of the shoe member 6^a of the switch-frame to aline with the rail-section 7′, and said shoe member is bent at 90, the main body of said shoe member diverging from the plane of the straight rails 3 and 4, as shown, and having the diverging rail 5 secured to the other end thereof and in alinement with the rail-section 8′. The yoke 14′, which is cast integral with and forms part of the switch-frame, supports the branch member 6^b of the frame having the rail-section 15′ thereon and to which the rail 5 is secured. Suitable lugs 9′ and 10′ are pivoted for detachably securing the switch to the hangers 11. (Shown in dotted lines.) The trip devices and hand-operated devices for controlling the switch-tongue 20′ are not shown, but may be the same as illustrated in connection with the No. 1 switch.

While I have herein described one particular form in which my invention may be embodied, yet I desire to have it understood that my invention is not limited in all respects to the particular form of the device herein shown, as various changes may be made in the mechanical details of the structure of the device without departing from the spirit of my invention.

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

1. In apparatus of the class described, a main rail, two branch rails, a switch to connect said main rail to either branch rail, a bell-crank lever, a link connecting one arm of said lever with the switch, whereby the rocking of said bell-crank operates the switch, and means operated by a carrier moving over the track to actuate said bell-crank, the construction being such that the link and the arm of the bell-crank to which it is attached are in a substantially straight line when the switch is alined with one branch rail, whereby said switch is automatically locked in such position.

2. In an overhead switch, a single, unitary switch-frame having a plurality of rail-sections integral therewith, a switch-tongue pivoted to said frame, and adapted to connect one of said rail-sections to any one of the other sections, rails secured to said frame in alinement with the rail-sections respectively, and means operated by a carrier moving on said rails to actuate the switch-tongue.

3. In apparatus of the class described, a

main rail, two branch rails, a switch to connect said main rail to either branch rail, a bell-crank lever, a link connecting one arm thereof with the switch, the construction being such that the link and the said arm are in a substantially straight line when the switch is in one extreme position, whereby the switch is automatically locked in such position.

4. In an apparatus of the class described, a main rail, two branch rails, a switch to connect said main rail to either branch rail, a bell-crank lever, a link connecting one arm thereof with the switch and a weighted handle connected to the other arm thereof, the link and the arm of the bell-crank lever to which it is connected being in a substantially straight line when the switch is in one extreme position whereby the switch is automatically locked in such position.

5. In an apparatus of the class described, a main rail, two branch rails, a switch to connect said main rail to either branch rail, a bell-crank lever, a link connecting one arm thereof to the switch, and a weighted handle connected to the other arm thereof, the parts being so constructed that when the switch is in alinement with one branch rail the link and the arm of the bell-crank lever to which it is attached is in a substantially straight line and the point of connection between the weighted handle and the other arm is substantially vertically over the fulcrum of the lever, and when the switch alines with the other branch rail the arm having the weighted handle attached thereto is substantially horizontal whereby the switch is locked in both of its operative positions.

6. In an apparatus of the class described, a main rail, two branch rails, a switch to connect said main rail to either branch rail, a bell-crank lever, a link connecting one arm thereof to the switch, a weighted handle attached to the other arm thereof, a trip connected to one branch rail, connections between said trip and said bell-crank whereby a carrier traveling on said branch rail automatically actuates the trip and throws the switch, the construction of the parts being such that when the switch is in one extreme position the link and the arm of the bell-crank to which it is attached are in a substantially straight line, while in the other position of the switch the arm of the bell-crank to which the handle is attached is horizontal whereby the switch is locked in either position.

7. In an apparatus of the class described, a main rail, two branch rails, a switch to connect said main rail to either branch rail, a bell-crank lever, a link connecting one arm thereof to said switch, a weight attached to the other arm, a trip pivoted to one branch rail and connected to the weighted arm of said bell-crank lever, and a second trip connected to the other branch and adapted to engage the other arm of said lever whereby a carrier traveling on either branch rail will actuate the switch.

8. In an apparatus of the class described, a main rail, two branch rails, a switch to connect said main rail to either branch rail, a bell-crank lever, a link connecting one arm of the latter to the switch, means to actuate said lever in one direction by a carrier traveling on one branch rail, and to actuate said lever in the opposite direction by a carrier traveling on the other branch rail, the construction being such that when the switch is in one extreme position, the link and the arm of the bell-crank to which it is attached are in alinement.

9. In an overhead-switch device, a suspended frame having integral therewith a plurality of diverging rail-sections, rails connected to said rail-sections, and a pivoted switch-tongue adapted to connect one of said rail-sections to either of the other rail-sections.

10. In an overhead-switch device, a suspended frame having integral therewith a plurality of divergent rail-sections, rails connected to said frame and alined with the rail-sections, a pivoted switch-tongue to connect one of said rail-sections to either of the other rail-sections, and means automatically operated by a carrier traveling on one of said rails to actuate the switch.

11. In an apparatus of the class described, a suspended frame including two separated members secured together by an overhanging yoke, two rail-sections integral with one member of said frame and a diverging rail-section integral with the other member thereof, rails secured to said frame in alinement with said rail-sections and a pivoted switch to connect one of said rail-sections with either of the other rail-sections.

12. In an apparatus of the class described, a suspended frame having two separated members rigidly connected together, one of said members having a cut-away portion to form at each end a rail-section, and the other of said members having a diverging rail-section, rails secured to said frame in alinement with the rail-sections, a switch-tongue pivoted to the first-named member and adapted to connect one of the rail-sections thereon to either of the other rail-sections.

13. In an apparatus of the class described, a suspended frame having two separated members rigidly connected together, one of said members having a cut-away portion to form at each end a rail-section and the other of said members having a diverging rail-section, rails secured to said frame in alinement with the rail-sections, a switch-tongue pivoted to the first-named member and adapted to connect one of the rail-sections thereon to either of the other rail-sections, said switch having a horizontally-disposed fin or web engaging the bottom of the cut-away portion and serving as a guide and support for said switch-tongue.

14. In an overhead switch, a frame presenting a unitary structure and to which the rails are attached, a switch-tongue pivoted to the frame and hangers detachably connected to said frame to support the same.

15. In an overhead switch, a unitary frame comprising a shoe member, and a branch member separated from the shoe member but rigid therewith, and hangers detachably connected to said frame to support the same.

16. In an overhead switch, a unitary frame to which the rails are attached, a switch-tongue pivoted to the frame, said frame having integral therewith offset ears or lugs, and hangers detachably secured to said lugs.

17. In an overhead switch, a frame to which the rails are attached, said frame comprising a shoe member and a branch member separated from the shoe member but rigidly connected thereto, offset ears or lugs integral with said frame, and hangers detachably secured to said lugs.

18. In an overhead-switch device, a suspended frame having integral therewith a plurality of diverging rail-sections, rails secured to said frame in line with the rail-sections, and a pivoted switch-tongue adapted to connect one of said rail-sections to either of the other rail-sections.

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

WALTER L. CLARK.

Witnesses:
LOUIS C. SMITH,
GEO. W. GREGORY.