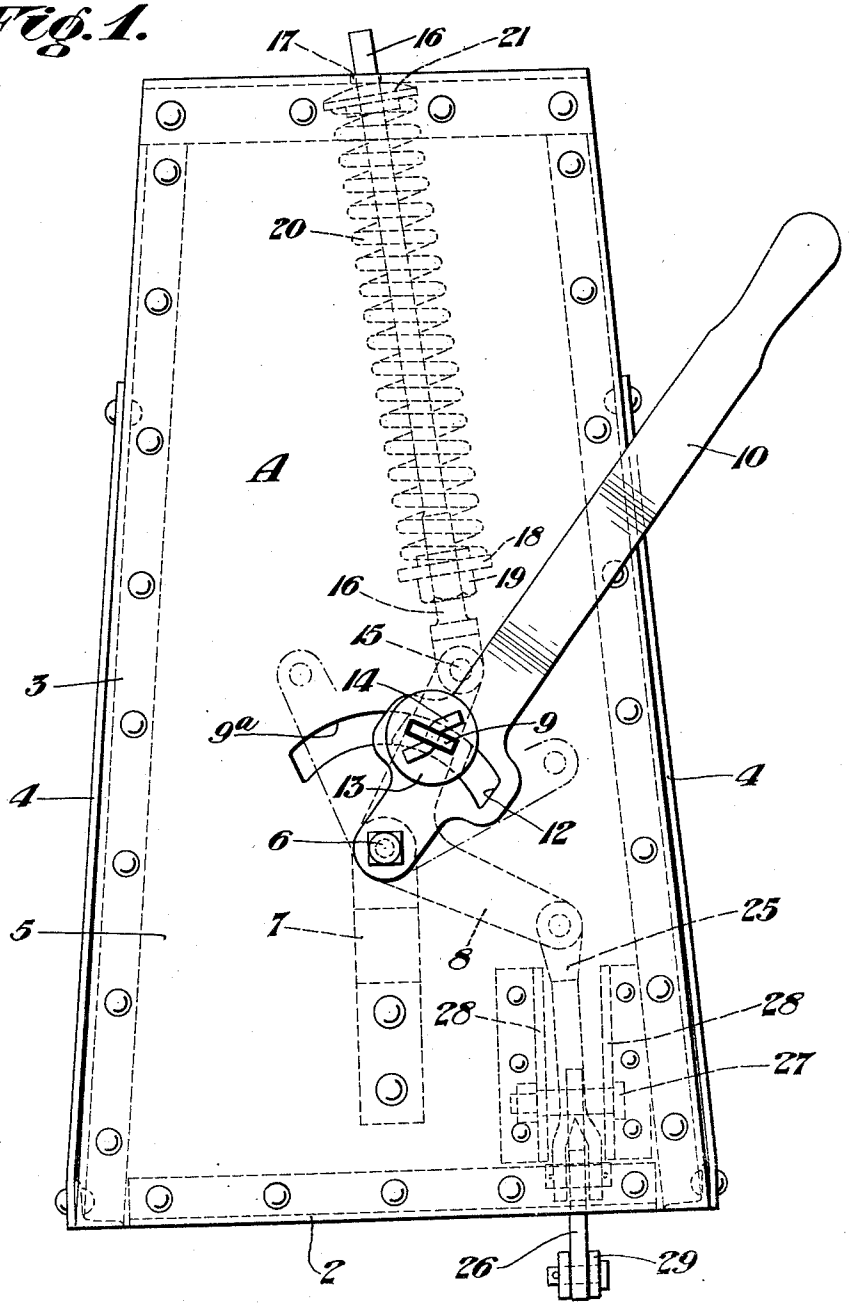
May 22, 1928. 1,670,472

G. MILLWARD

SWITCH THROWING DEVICE

Filed Jan. 20, 1928 2 Sheets-Sheet 1

Fig. 1.




Witnesses:

Edwin Truet

Inventor:

GEORGE MILLWARD,

by: Anthony Usina

his Attorney.

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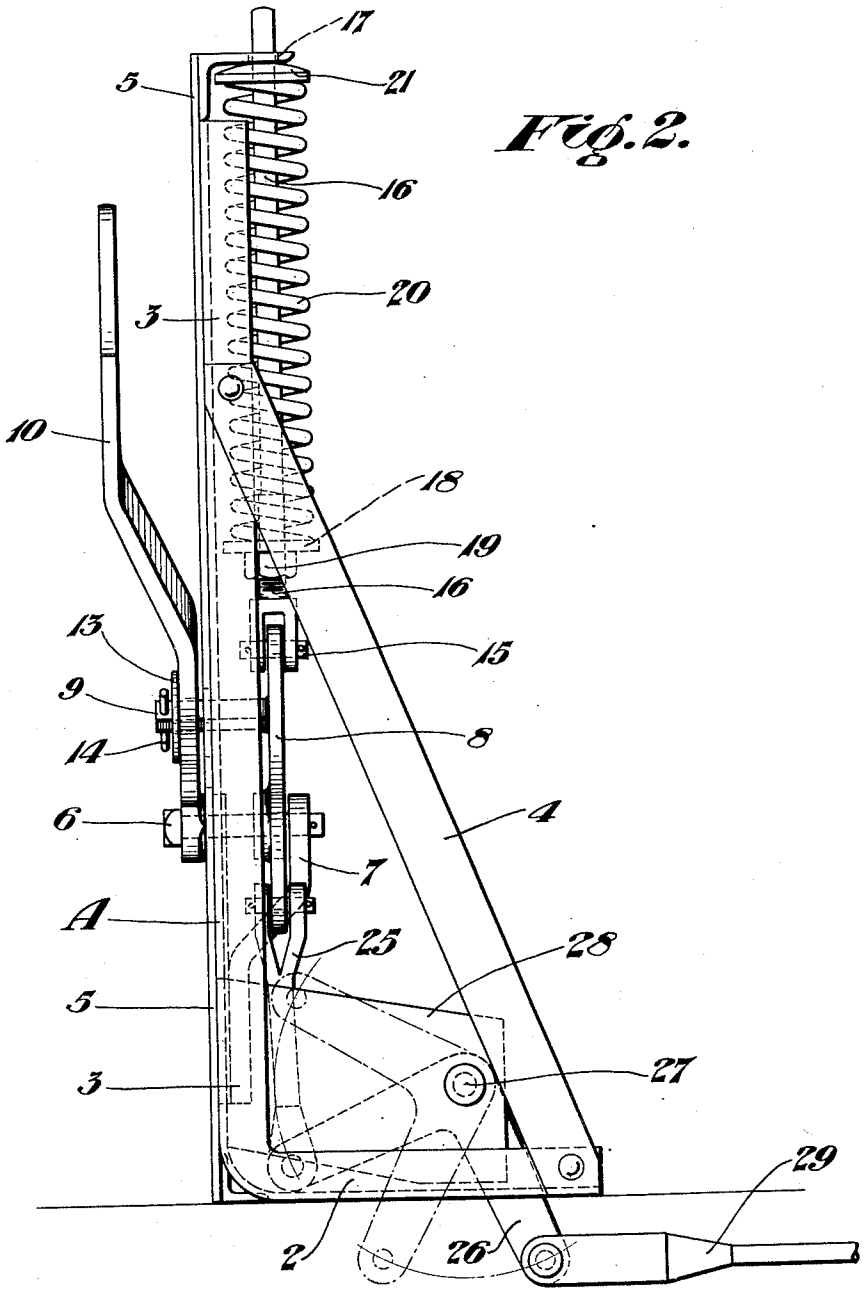



Fig. 2.

Witnesses:
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Patented May 22, 1928. 1,670,472

# UNITED STATES PATENT OFFICE.

GEORGE MILLWARD, OF LECKRONE, PENNSYLVANIA.

## SWITCH-THROWING DEVICE.

Application filed January 20, 1928. Serial No. 248,165.

This invention relates to switch throwing devices, and more particularly to devices for throwing railway track switches, and has for its object the provision of a yieldable locking means for holding the switch in its thrown position, against accidental displacement.

Another object is to provide a switch throwing mechanism in which the mechanism will be snapped over through approximately its last half of movement free of the operating lever, thereby facilitating the throwing of the switch.

In the drawings—

Figure 1 is a side elevation of a switch throwing device constructed in accordance with this invention.

Figure 2 is a side elevation, taken at right angles to the elevation of Figure 1.

Referring more particularly to the drawings, the letter A designates the frame as a whole, which comprises a base portion 2 and a vertical or upright portion 3, and angularly disposed brace members 4 extending from the base 2 upwardly to a point intermediate the top and bottom of the upright portion 3 to stiffen the frame.

A cover-plate 5 is secured on the upright portion 3 of the frame A and a spindle 6 is mounted in the cover-plate 5 and a bracket 7.

A bell-crank 8 is journaled on the spindle 6 between the plate 5 and bracket 7 and the upper leg thereof is provided with a lug 9 which extends outwardly through a curved slot $9^a$ in the cover-plate 5. An operating lever 10 is journaled on the spindle 6 on the outside of the plate 5 and is provided with a curved slot 12 of materially greater length than the width of the lug 9. The lug 9 is adapted to project through the slot 12 in the lever 10 and to be retained in said slot by a washer 13 and pin 14.

The upper leg of the bell-crank 8 is pivotally connected as at 15 to the lower end of a spring guide rod 16 which extends upwardly and has its upper end projected through an opening 17 in the frame A. A spring seat 18 is mounted on the rod 16 and held in position by a nut 19. A coiled spring 20 is mounted around the rod 16 and has its lower end seated in the seat 18 and its upper end engaged in a cap-member 21 which is adapted to engage the frame.

When the operating lever 10 is moved about the spindle to throw the switch, the lever will have free movement for a distance equal to the length of the slot 12 in excess of the width of the lug 9. Further movement of the lever 10 will cause the lug 9 to be engaged by the end wall of the slot 12 and thereby cause the bell-crank 8 to be rotated about the spindle 6. As the bell-crank 8 is rotated, the upper leg thereof will co-operate with the spring guide-rod 16 in the form of toggle levers and will compress the spring 20. After the upper leg of the bell-crank lever 8 and the rod 16 are moved beyond the dead center or vertical position, the compressed spring 20 will exert its stored energy to snap the bell-crank 8 and rod 16 over through the remainder of their travel free of the operating lever 10, due to the elongated slot 12 in the lever 10, thus providing for a snap-throw of the switch elements and also preventing the jerking of the operating lever.

The lower leg of the bell-crank 8 is pivotally connected to the upper end of a link 25, which link has its lower end pivotally connected to the upper leg of a second bell-crank 26. The bell-crank 26 is journaled on a pivot pin 27 mounted in bracket plates 28 and has its lower leg projecting downwardly below the base 2 of the frame. A reach-rod 29 is pivotally connected to the lower leg of the bell-crank 26 and serves as an operating connecting link between the throw mechanism and the switch tongue or other switch element, (not shown), to be thrown.

The spring 20 not only serves to cause a snap-throw of the switch parts but also serves to yieldably hold or lock the switch element in its extreme positions.

While I have shown and described one specific embodiment of my invention it will be understood that I do not wish to be limited thereto since various modifications may be made without departing from the scope of my invention as defined in the appended claims.

I claim—

1. A switch throwing mechanism comprising an upright frame portion, a spindle mounted in said frame portion, a bell-crank journaled on said spindle, an operating lever journaled on said spindle, a lug projecting from one leg of said bell-crank and extending into a slot in said operating lever, the slot in said operating lever being of greater length than the width of said lug so as to permit a limited free movement of said lug

relative to said operating lever, a spring guide-rod having its lower end pivotally connected to the upper leg of said bell-crank and its upper end projected through a guide opening in said frame, a spring seat secured on said rod adjacent its lower end, a coiled spring mounted around said guide-rod and seated between said spring seat and said frame, said spring guide-rod, and the upper leg of said bell-crank being adapted to form a toggle, which toggle is adapted to be moved from one extreme through its dead center by the operation of said operating lever so as to cause said lever to engage said lug on said bell-crank, and said spring being adapted to snap said toggle elements from their dead center position to their extreme position, and means connecting the lower leg of said bell-crank to a switch element.

2. A switch throwing mechanism comprising an upright frame portion, a spindle mounted in said frame portion, a bell-crank journaled on said spindle, an operating lever journaled on said spindle, a lug projecting from one leg of said bell-crank and extending into a slot in said operating lever, the slot in said operating lever being of greater length than the width of said lug so as to permit a limited free movement of said lug relative to said operating lever, a spring guide-rod having its lower end pivotally connected to the upper leg of said bell-crank and its upper end projected through a guide opening in said frame, a spring seat secured on said rod adjacent its lower end, a coiled spring mounted around said guide-rod and seated between said spring seat and said frame, said spring guide-rod and the upper leg of said bell-crank being adapted to form a toggle, which toggle is adapted to be moved from one extreme through its dead center by the operation of said operating lever so as to cause said lever to engage said lug on said bell-crank, and said spring being adapted to snap said toggle elements from their dead center position to their extreme position, and means connecting the lower leg of said bell-crank to a switch element, said means comprising a second bell-crank, a link connecting the lower leg of said first named bell-crank to the upper leg of said second named bell-crank, and a reach-rod connected to the lower leg of said second named bell crank.

3. A switch throwing mechanism comprising an upright frame portion, a spindle mounted in said frame portion, a bell-crank journaled on said spindle, an operating lever journaled on said spindle, a lug projecting from one leg of said bell-crank and extending into a slot in said operating lever, the slot in said operating lever being of greater length than the width of said lug so as to permit a limited free movement of said lug relative to said operating lever, means for limiting the movement of said bell-crank and lug, a spring guide-rod having its lower end pivotally connected to the upper leg of said bell-crank and its upper end projected through a guide opening in said frame, a spring seat secured on said rod adjacent its lower end, a coiled spring mounted around said guide-rod and seated between said spring seat and said frame, said spring guide-rod and the upper leg of said bell-crank being adapted to form a toggle, which toggle is adapted to be moved from one extreme through its dead center by the operation of said operating lever so as to cause said lever to engage said lug on said bell-crank, and said spring being adapted to snap said toggle elements from their dead center position to their extreme position, and means connecting the lower leg of said bell-crank to a switch element, said means comprising a second bell-crank, a link connecting the lower leg of said first named bell-crank to the upper leg of said second named bell-crank, and a reach-rod connected to the lower leg of said second named bell crank.

4. A switch throwing mechanism comprising an upright frame portion, a spindle mounted in said frame portion, a bell-crank journaled on said spindle, an operating lever journaled on said spindle, a lost motion connection between one leg of said bell-crank and said operating lever so as to permit a limited free movement of said lug relative to said operating lever, a spring guide-rod having its lower end pivotally connected to the upper leg of said bell-crank and its upper end projected through a guide opening in said frame, a spring seat secured on said rod adjacent its lower end, a coiled spring mounted around said guide-rod and seated between said spring seat and said frame, said spring guide-rod and the upper leg of said bell-crank being adapted to form a toggle, which toggle is adapted to be moved from one extreme through its dead center by the operation of said operating lever so as to cause said lever to engage said lug on said bell-crank, and said spring being adapted to snap said toggle elements from their dead center position to their extreme position, and means connecting the lower leg of said bell-crank to a switch element.

5. A switch throwing mechanism comprising an upright frame portion, a spindle mounted in said frame portion, a bell-crank journaled on said spindle, an operating lever journaled on said spindle, a lost motion connection between one leg of said bell crank and said operating lever so as to permit a limited free movement of said lug relative to said operating lever, means for limiting the movement of said bell-crank and lug, a spring guide-rod having its lower end pivotally connected to the upper leg of said bell-

crank and its upper end projected through a guide opening in said frame, a spring seat secured on said rod adjacent its lower end, a coiled spring mounted around said guide-rod and seated between said spring seat and said frame, said spring guide-rod and the upper leg of said bell-crank being adapted to form a toggle, which toggle is adapted to be moved from one extreme through its dead center by the operation of said operating lever so as to cause said lever to engage said lug on said bell-crank, and said spring being adapted to snap said toggle elements from their dead center position to their extreme position, and means connecting the lower leg of said bell-crank to a switch element, said means comprising a second bell-crank, a link connecting the lower leg of said first-named bell-crank to the upper leg of said second named bell-crank, and a reach-rod connected to the lower leg of said second named bell-crank.

In testimony whereof, I have hereunto signed my name.

GEORGE MILLWARD.