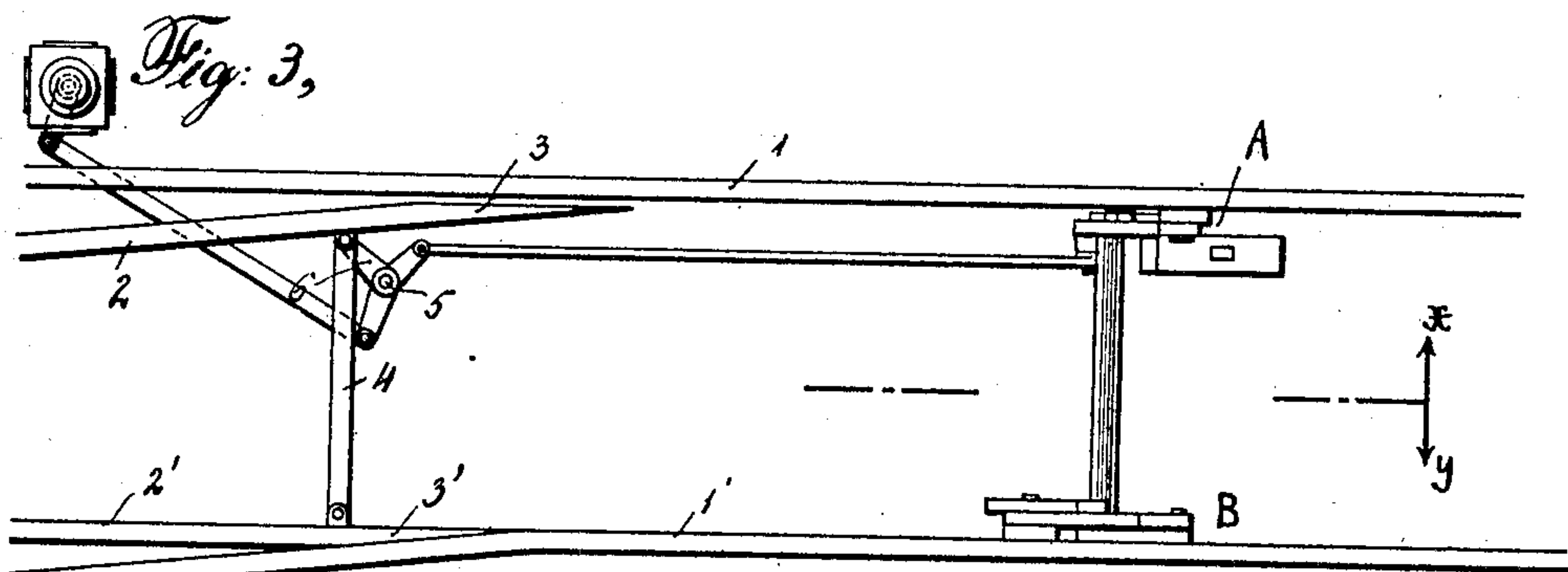
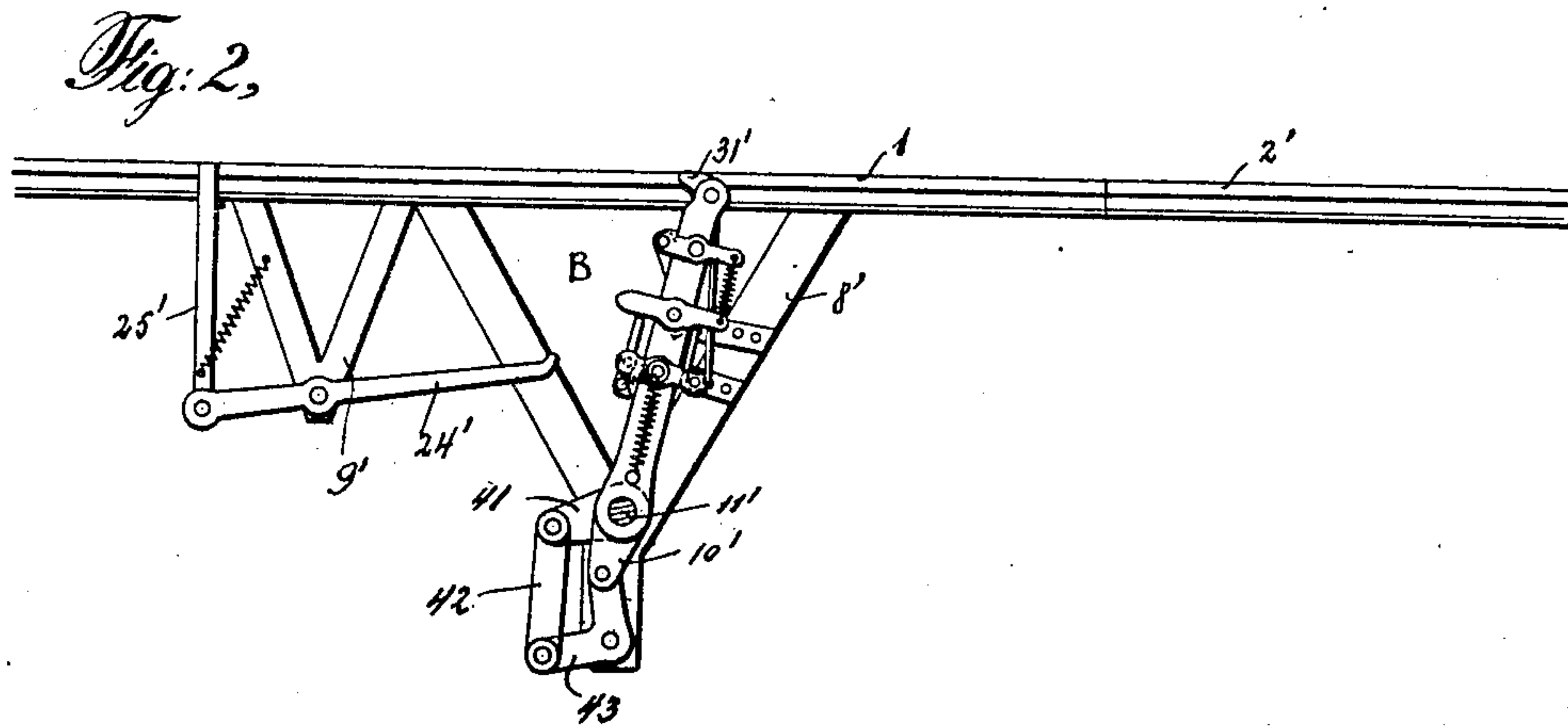
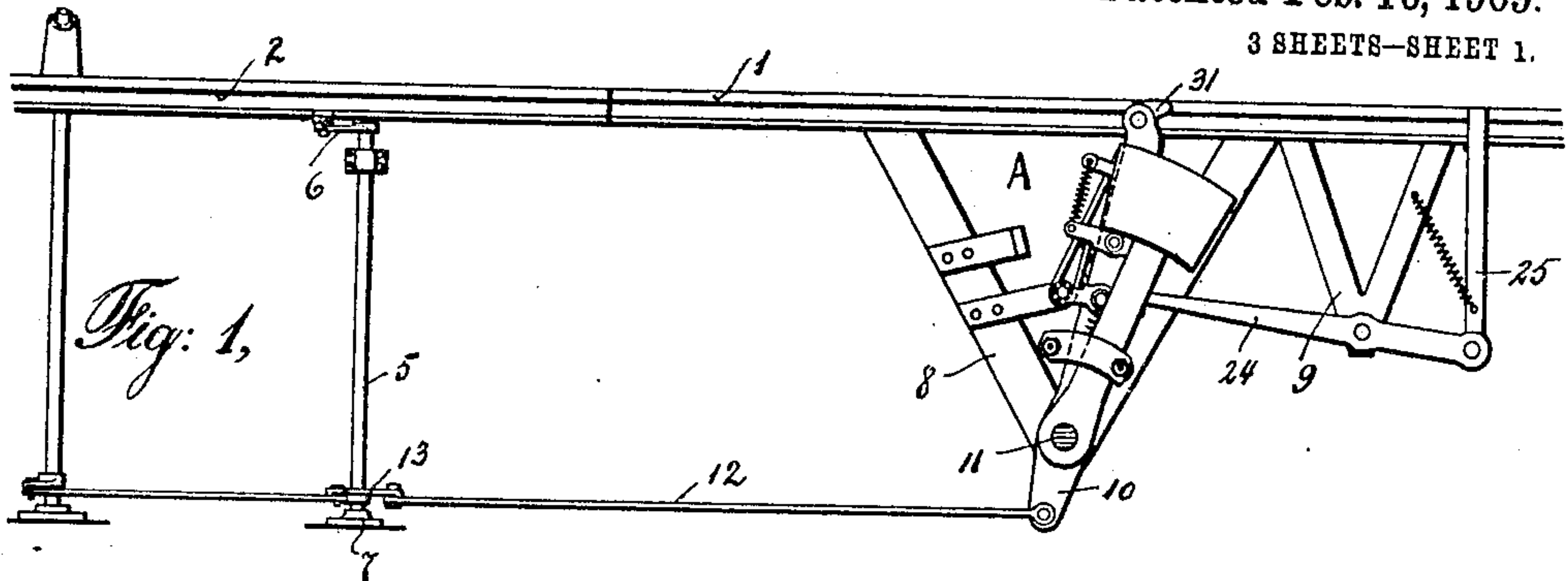


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912,861.

Patented Feb. 16, 1909.

3 SHEETS—SHEET 1.



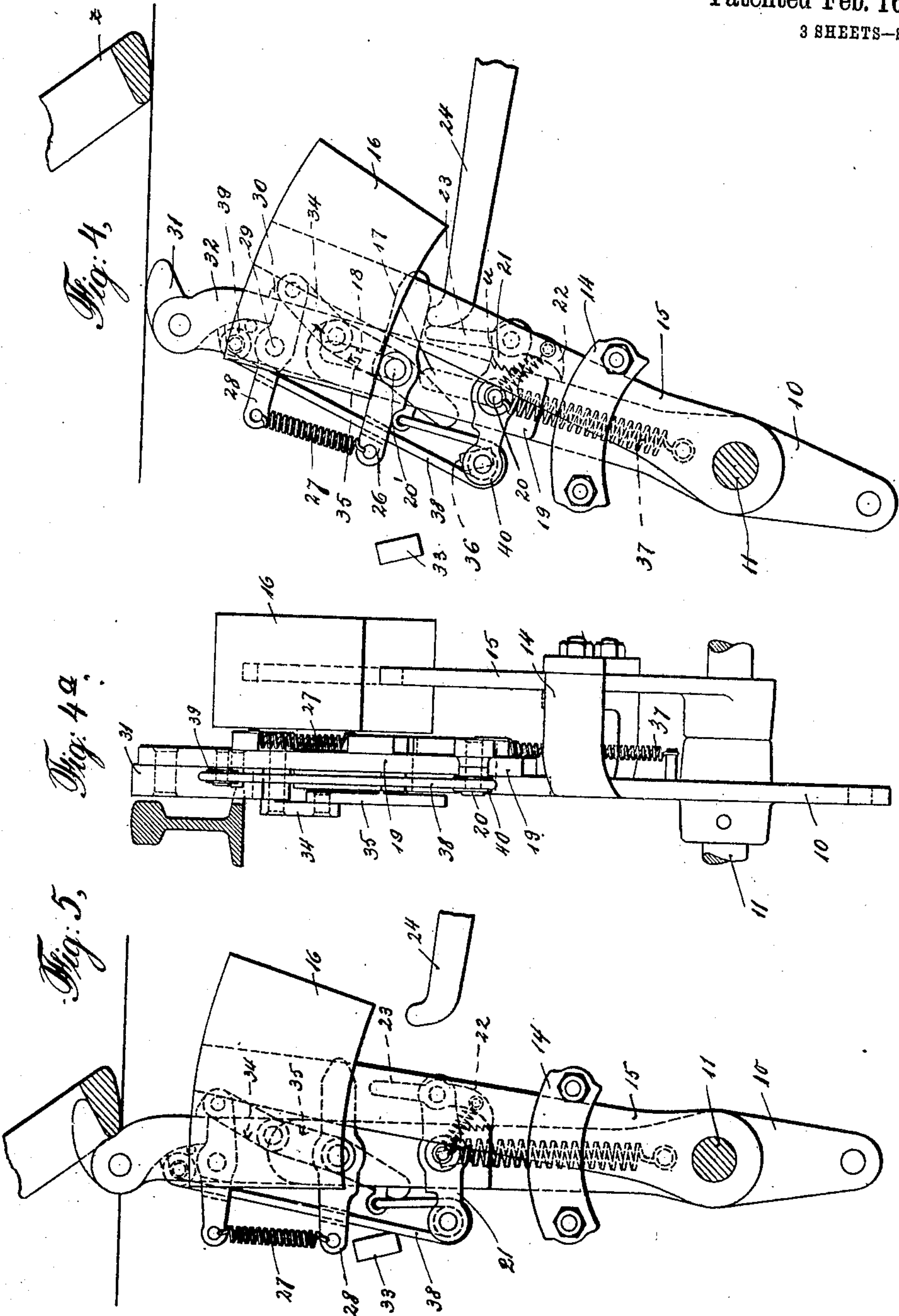
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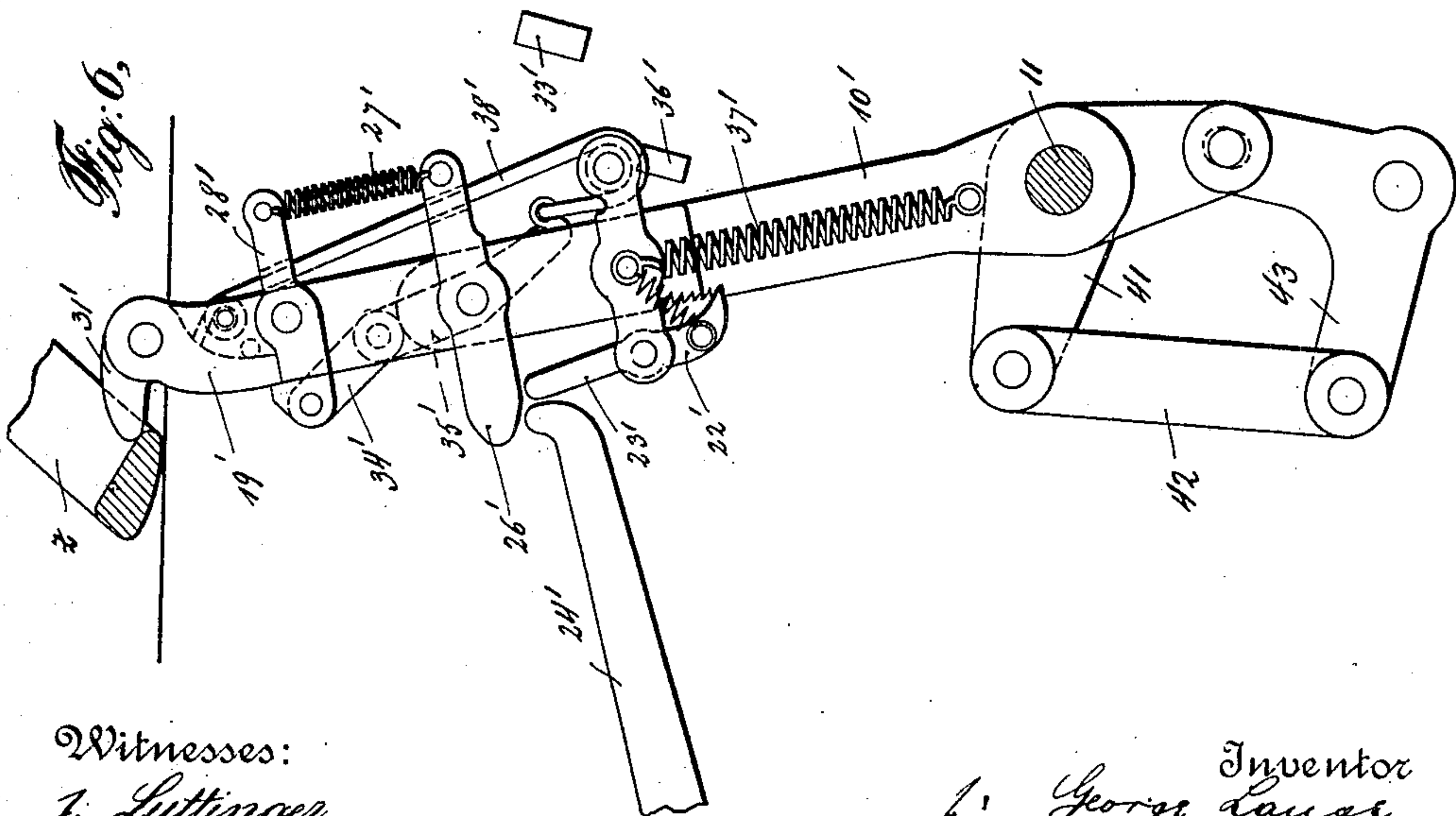
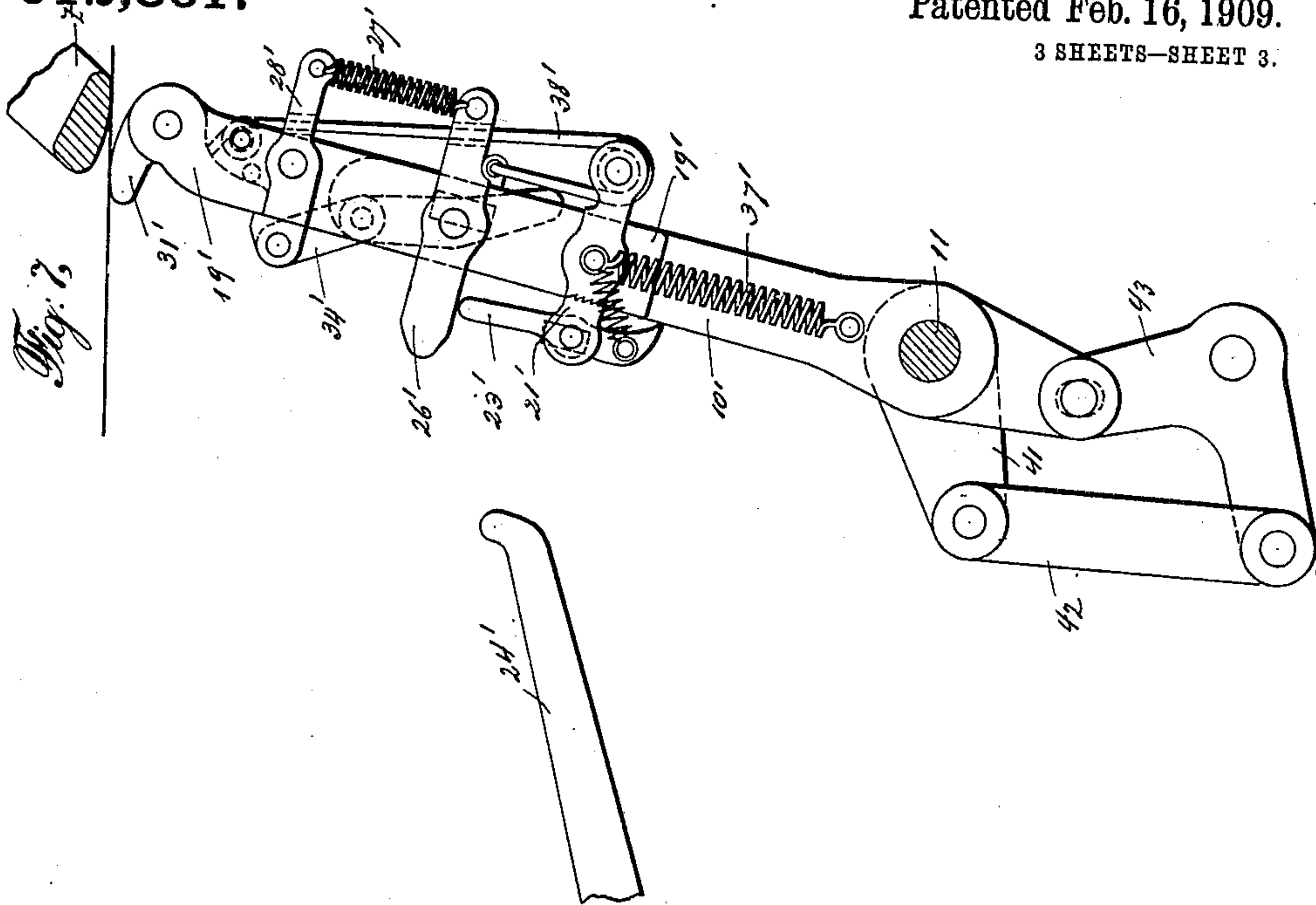
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# UNITED STATES PATENT OFFICE.

GEORGE LANGE, OF TAUNTON, MASSACHUSETTS.

## RAILROAD-SWITCH.

No. 912,861.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed June 18, 1908. Serial No. 439,139.

*To all whom it may concern:*

Be it known that I, GEORGE LANGE, a subject of the Emperor of Germany, and a resident of Taunton, Bristol county, State of Massachusetts, have invented certain new and useful Improvements in Railroad-Switches, of which the following is a specification.

The present invention pertains to railroad switches, and particularly to the so-called split switches and has for its object to provide a device which will automatically operate the switch as the train or car approaches the junction.

To make my invention more clear the same is illustrated in the accompanying drawings in which similar reference numerals and letters denote corresponding parts and in which—

Figure 1 is an elevation of a part of the device arranged adjacent to one of the rails of the track seen in the direction of arrow *x* Fig. 3; Fig. 2 is an elevation of the other part of the device arranged adjacent to the opposite rail of the track and seen in the direction of arrow *y* Fig. 3; Fig. 3 is a plan view of the track and of the entire device; Fig. 4 is an elevation of a part of the device adjacent to one rail, the same being shown out of operation; Fig. 4<sup>a</sup> is a side view thereof; Fig. 5 is a similar view as Fig. 4 showing the device in operation; Figs. 6 and 7 shows similar views as Figs. 4 and 5 of the other part of the device adjacent to the opposite rail.

With reference to the drawings, 1, 1' denote the outer full rails and 2, 2' are the inner flexible rails having the split edges 3, 3' and which are connected with each other by means of a bar 4. At the place where my device is to be mounted I provide a cavity between the rails in which I arrange appropriate bearings 7, 8, 8', 9, 9' for a vertical spindle 5, which by a crank lever 6 is connected with the flexible rails, and for the mechanisms that I shall presently describe.

The new switch operating device is made up of two parts A, B of which one is arranged adjacent to one rail of the track and the other at the opposite rail thereof. These mechanisms being substantially identical in their main parts, I shall proceed to describe only one of them, it being understood that the same reference numerals apply also to the mechanism at the opposite rail, said numerals being marked with an accent.

The mechanism A whereby the switch is directly operated, is illustrated in Figs. 1, 3, 4, 4<sup>a</sup> and 5. It consists of a double armed lever 10 which extends in a vertical plane through the above named cavity between the rails and which is keyed to a spindle 11 extending crosswise through the said cavity and which is suitably borne therein. The lower arm of this lever 10 is connected by means of a rod 12 with a crank lever 13 keyed to the lower end of the vertical spindle 5. The upper arm of the lever 10 is formed with a guide piece 14 in which an arm 15 is guided that is loosely mounted on the cross spindle 11 and that at its upper end carries a counter-weight 16. This arm by its counter-weight 16 has the tendency to swing downwards around the spindle 11 but by the guide 14 of the lever 10 is held in raised position. The object of this counter-weighted lever is to cause most rapidly the return of the lever 10 into original position. The lever 10 terminates some distance below the rail and is provided at its upper end with two longitudinal recesses or slots 17 and 18. Slidably secured by means of pins 20, 20', that project through the said slots, to the lever 10 and extending longitudinally of the latter is a bar 19 which normally terminates at the upper edge of the rail. Secured to the bar 19 is a cross piece 21 to one end of which a spring actuated pawl 22 is pivoted. The lower end of this pawl is adapted at a certain position of the lever 10 and of the bar 19 to engage a notch of a series of notches *u* arranged opposite thereto in the side of the lever 10. When disengaged the upper extension 23 of the pawl 22 is adapted to rest against a lever 24. The latter is a double armed lever pivoted in the bracket 9 to extend longitudinally in the cavity, and carrying at the other end a spring actuated rod 25 which extends in vertical direction and terminates at the upper edge of the rail. This rod 25 is adapted to be operated by the wheel of the passing car so that by its depression it will swing the double armed lever 24 to operate the mechanism A. For this purpose the bar 19 has a second cross piece 26, against one end of which the lever 24 is normally adapted to rest. The opposite end of this piece is connected by means of a spiral spring 27 with the end of a lever 28 pivoted at 29 in the bar 19 and provided at its opposite end with a nose 30. In the upper end of the bar 19 a hook or catch 31 is



pivoted which is provided with an extension 32 that normally is engaged by the nose 30 of the lever 28, to be held in lowered position so as not to obstruct the track. Upon the  
 5 depression of the rod 25 the lever 24 is swung upwards, whereby, in pressing against the cross piece 26 it raises the bar 19 in moving the same longitudinally of the lever 10. By this raising of the bar the catch 31  
 10 is projected beyond the upper edge of the rail to such an extent that when a correspondingly shaped projection *z* is lowered, by the driver, from the approaching car, this projection will engage the catch 31, and as the  
 15 car continues to travel will carry the catch along. The catch being then rigid with the lever 10, it will swing the latter to the left (Fig. 5), thereby operating by means of the rod 12, crank 13, spindle 5 and crank 6, the  
 20 switch. Secured at a suitable point to the bracket 8 is a block 33 which serves to automatically release the engagement of the catch 31 from the lowered projection *z* of the car. For this purpose the nose shaped end  
 25 of the lever 28 is connected by means of a link 34 to a double armed lever 35 which is mounted on the pin 20'. When the lever 10 has completed the full stroke of its swinging movement the block 33 in striking against  
 30 the lower arm of the lever 35, will swing the latter to the right, causing the nose portion 30 of the lever 28 to swing downwards against the tension of the spring 27, and to thereby disengage the catch 31 so that the  
 35 latter will be allowed to be swung upon its pivot by the projection *z* and to become released from the latter.

During the time of the operation of the lever 10 the bar 19 is supported in its raised  
 40 position by the pawl 22 engaging one of the notches of the lever 10. Now, after the disengagement of the catch 31, it is necessary to cause the bar 19 to return into its original position, *i. e.*: to be lowered so that  
 45 the catch 31 will not project beyond the upper edge of the rail. To accomplish this I provide a second block 36 at another point of the bracket 8 which lies in the path of the pawl 22 and which simultaneously  
 50 with the release of the catch 31 will strike the pawl 22 and release the same from the teeth of the lever 10 returning it into the position shown in Fig. 4. By the spring 37 one end of which is attached to the lever 10  
 55 and the other at a suitable point to the bar 19, the latter upon being released will be forced downward. To cause at the same time the return of the catch 31 into original position the extension 32 thereof is con-  
 60 nected by means of a wire 38 or the like to the lever 10, the same being guided over a grooved sheave 39 provided at the upper end of the bar 19 and a sheave 40 carried by the cross piece 21 thereof. It will be seen  
 65 that as the bar 19 is forced downward by its

spring 37 the cross piece 21 will pull the wire 38 and return the catch 31 into the position indicated in Fig. 4. After the disengagement of the catch 31 and the return of the  
 latter and the bar 19 into original position  
 70 the counter-weight 16 will cause the arm 15 to swing downward, and thereby bring the main lever 10 and the switch into original position.

When the train is composed of a number  
 75 of cars each car may be provided with such projections *z* to be operated by the driver and arranged alternately at opposite sides of the cars, so that these projections will operate alternately the mechanism A and  
 80 mechanism B arranged adjacent to each rail of the track.

As already stated the mechanism B (Figs. 2, 3, 6 and 7) substantially consists of the  
 85 same parts as the mechanism A, and these parts are denoted by corresponding numerals marked with an accent. The lever 10' is loosely mounted upon the cross spindle 11 and keyed upon the latter is a lever arm 41  
 90 which by a link 42 is connected with one arm of the bell crank lever 43 that is pivoted in the bracket 8', and the other arm of which is connected with the lower end of the lever 10. Owing to this arrangement the  
 95 mechanism B will be caused to operate in a reverse direction relative to that of the mechanism A, *i. e.*: when by the engagement of the catch 31 of the mechanism A with the lowered projection of one of the cars the  
 100 lever 10 is swung from right to left, the lever 10' of the mechanism B will be caused to swing in the reverse direction and vice versa. Thus after the passage of one of the cars of the train and after the release of the  
 105 catch 31 of the mechanism A and its return, by virtue of the counter-weight 16 into initial position the catch 31' of the mechanism B is brought into the path of the wheel of the next following car to be operated thereby, so as to again operate the  
 110 switch in the aforesaid manner, and so on alternately until the passage of the last car. In every other respect the mechanism B operates the same way as the mechanism A, there being similar blocks in the path of  
 115 the swinging lever 10' to cause the release of the parts upon the completion of the stroke in the swinging movement of the lever 10'. Fixed upon the vertical shaft 5 is a crank lever 44 which is connected with  
 120 one end of a rod or bar 45. The opposite end of said rod is connected with a crank lever 46, by means of which a semaphore or lantern C (Fig. 3) will be automatically operated simultaneously with the operation  
 125 of the switch.

What I claim is:

1. In a railway switch, the combination with the inner flexible rails, of vertically  
 130 swinging levers arranged adjacent to each



outer rail, means for operatively connecting said levers with the flexible rails, hook shaped noses slidably secured to said levers and adapted to normally lie below the rails, means whereby said noses, by the wheels of the approaching cars, are automatically raised to project beyond the rails to be operated from the cars imparting a swinging movement to the levers, substantially as set forth.

2. In a railway switch, the combination with the inner flexible rails, of vertically swinging levers arranged adjacent to the outer rails, means for operatively connecting said levers with the flexible rails, bars slidably secured to the said levers, hook shaped noses pivoted to said bars and adapted to normally lie below the rails, means to temporarily hold said noses in rigid connection with the bars, means whereby said bars, by the wheels of the approaching cars, are automatically raised projecting their noses beyond the rails to permit of their being automatically operated from the cars imparting a swinging movement to the levers, substantially as set forth.

3. In a railway switch, the combination with the inner flexible rails, of vertically swinging levers arranged adjacent to the outer rails, means for operatively connecting said levers with the flexible rails, bars slidably secured to said levers, hook shaped noses pivoted to said bars, means to temporarily hold said noses in rigid connection with the bars, means whereby said bars, by the wheels of the approaching cars, are automatically raised projecting their noses beyond the rails to permit of their being automatically operated from the cars, and means to temporarily support the bars in raised position, substantially as set forth.

4. In a railway switch, the combination with the inner flexible rails, of vertically swinging levers, means for operatively connecting said levers with the flexible rails, spring actuated bars slidably secured to said levers, hook shaped noses pivoted to said bars, means to temporarily hold said noses in rigid connection with the bars, means whereby the bars, by the wheels of the approaching cars, are automatically raised to project their noses beyond the rails, so as to be automat-

ically operated from the cars, means to temporarily support the bars in raised position and means to automatically release the bars at the completion of the swinging stroke of the levers, substantially as set forth.

5. In a railway switch, the combination with the inner flexible rails, of a cross shaft between the outer rails, of vertically swinging levers mounted on said shaft and connected with the latter so that by the swinging of one lever in one direction the swinging of the other in reversed direction is caused, means operatively connecting one of said levers with the flexible rails, spring actuated bars slidably secured to said levers, hook shaped projections pivoted to said bars and adapted to normally lie below the rails, means to temporarily hold said noses in rigid connection with the bars, means to automatically release said noses at the completion of the swinging stroke of the levers, means whereby, by the wheels of the approaching cars, the bars are raised projecting their noses beyond the rails to permit of their being automatically operated from the cars, and to impart swinging movement to the levers, means to temporarily support the bars in raised position, and means to automatically release the said bars, substantially as set forth.

6. In a railway switch, a mechanism for automatically operating the same, said mechanism consisting of a vertically swinging double armed lever, a spring actuated bar slidably secured to the other arm of said lever, a hook shaped projection pivoted to the upper end of said bar, a spring actuated catch temporarily holding the said nose in rigid connection with the bar, means for automatically releasing the said nose, means for automatically raising the bar, means for supporting the latter in raised position, means for automatically releasing the same and means for returning the nose into original position simultaneously with the lowering of the bar, substantially as set forth.

Signed at Boston, Mass., this 15th day of May, 1908.

GEORGE LANGE.

Witnesses:

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