M. W. LONG.

RAILROAD SWITCH.

APPLICATION FILED JULY 20, 1908.

925,712. **Patented June 22, 1909.**

5 SHEETS—SHEET 1.

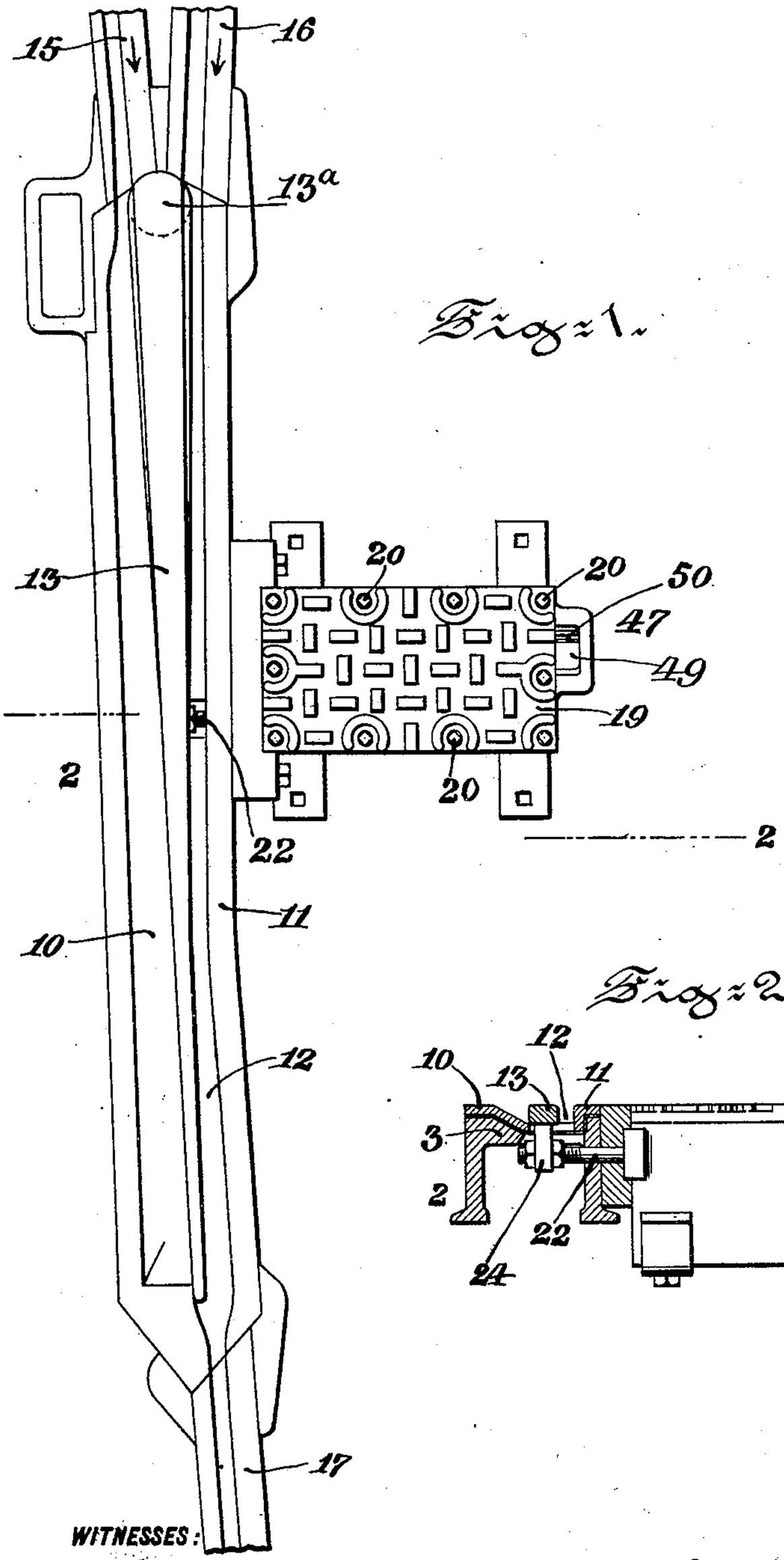

Fig. 1.

Fig. 2.

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5 SHEETS—SHEET 2.

Fig. 3.

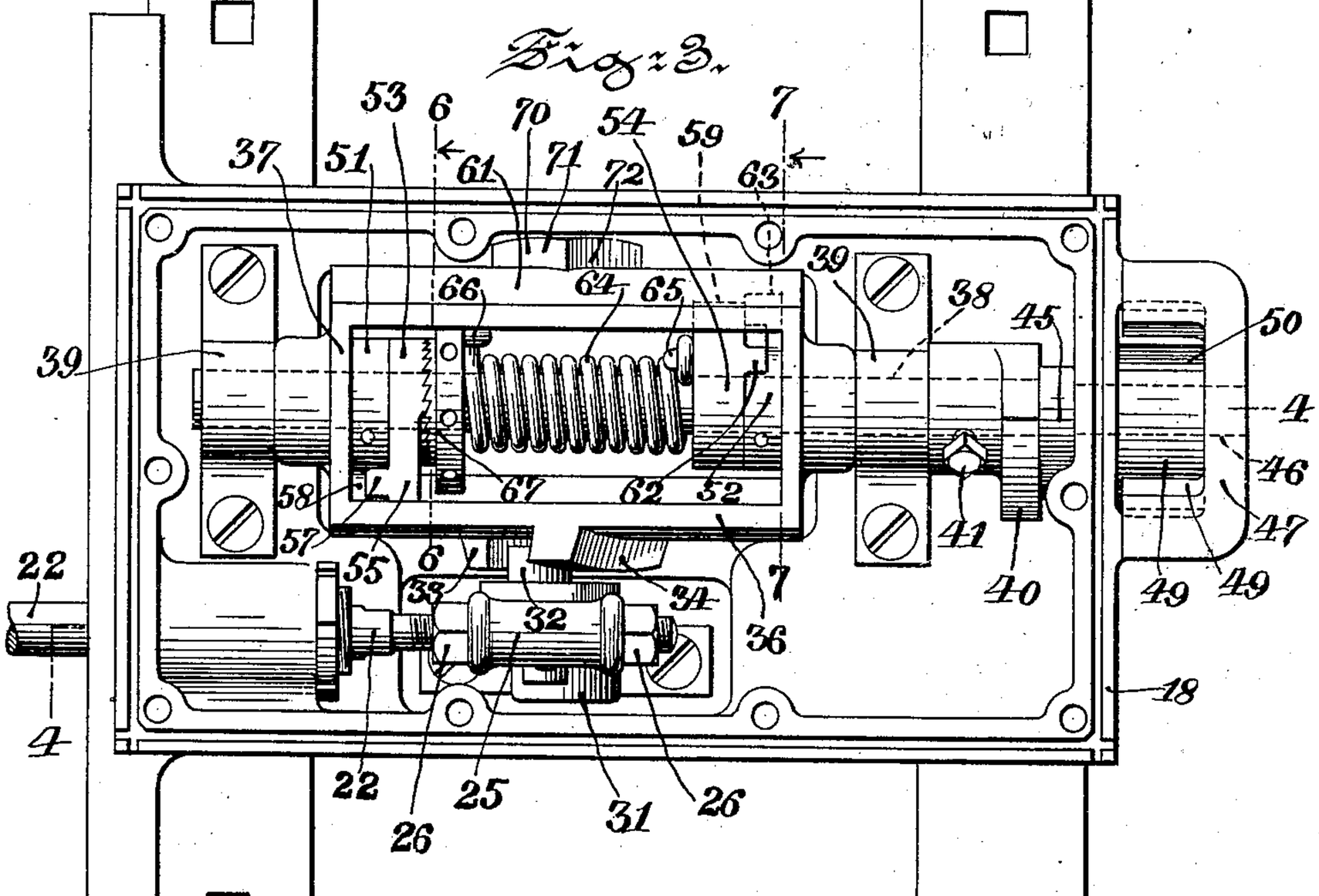
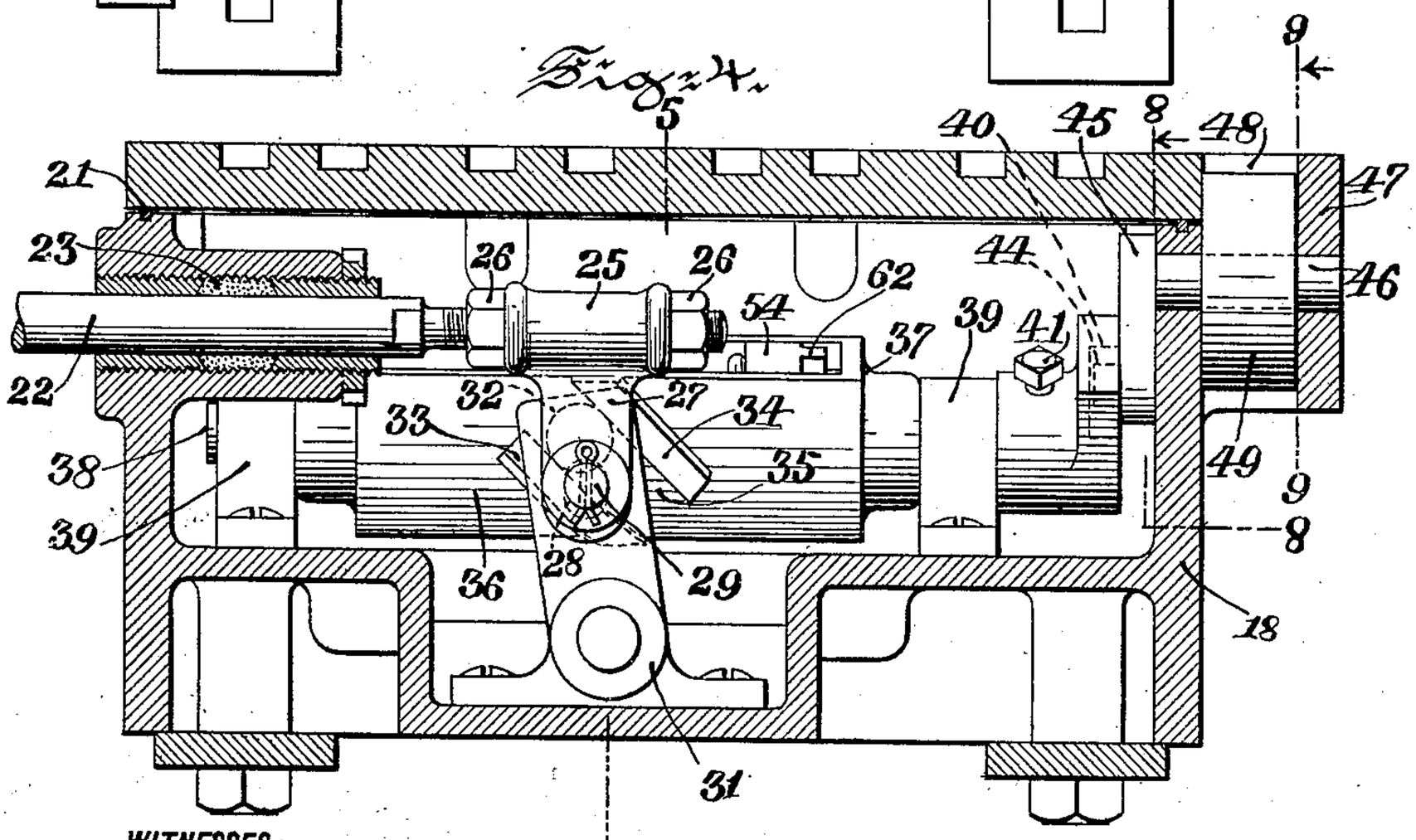


Fig. 4.



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5 SHEETS—SHEET 3.

Fig. 5.

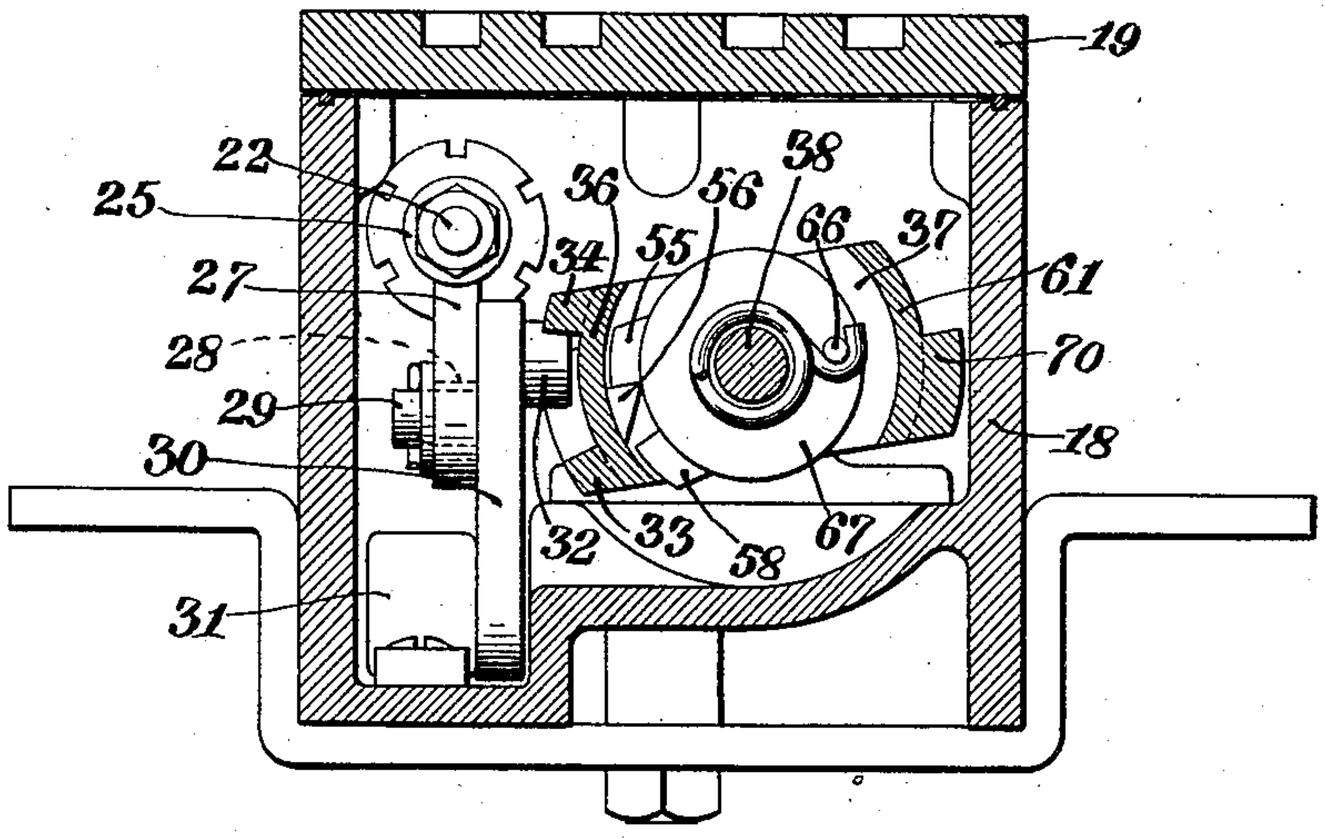

Fig. 6.

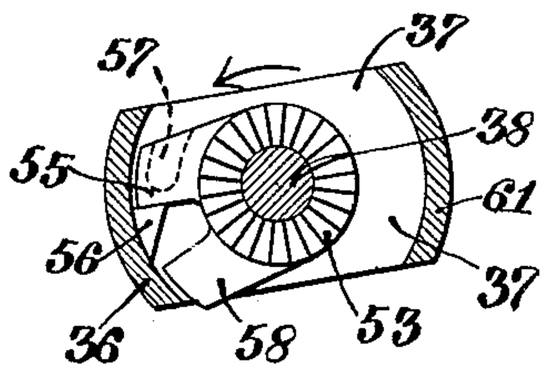

Fig. 7.

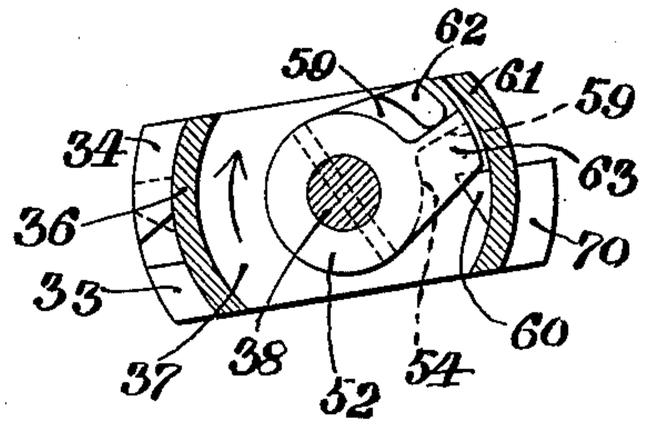

Fig. 8.

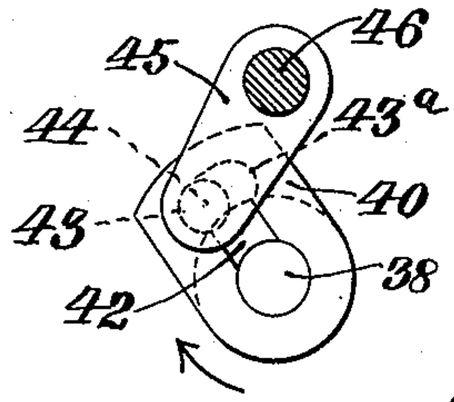

Fig. 9.

Fig. 8a.

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5 SHEETS—SHEET 4.

Fig. 10.

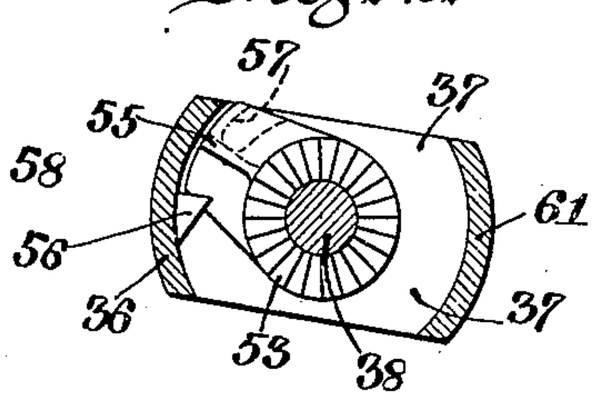


Fig. 11.

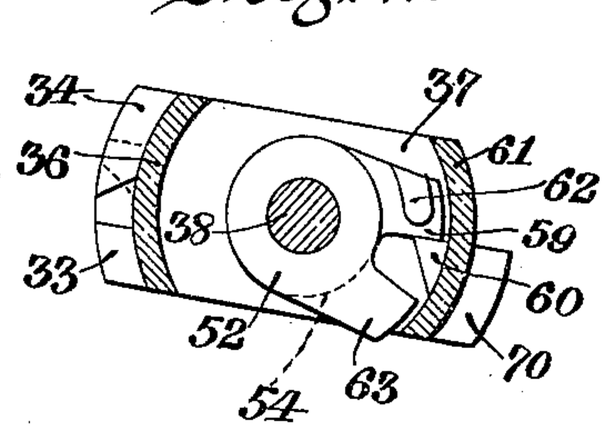


Fig. 12.

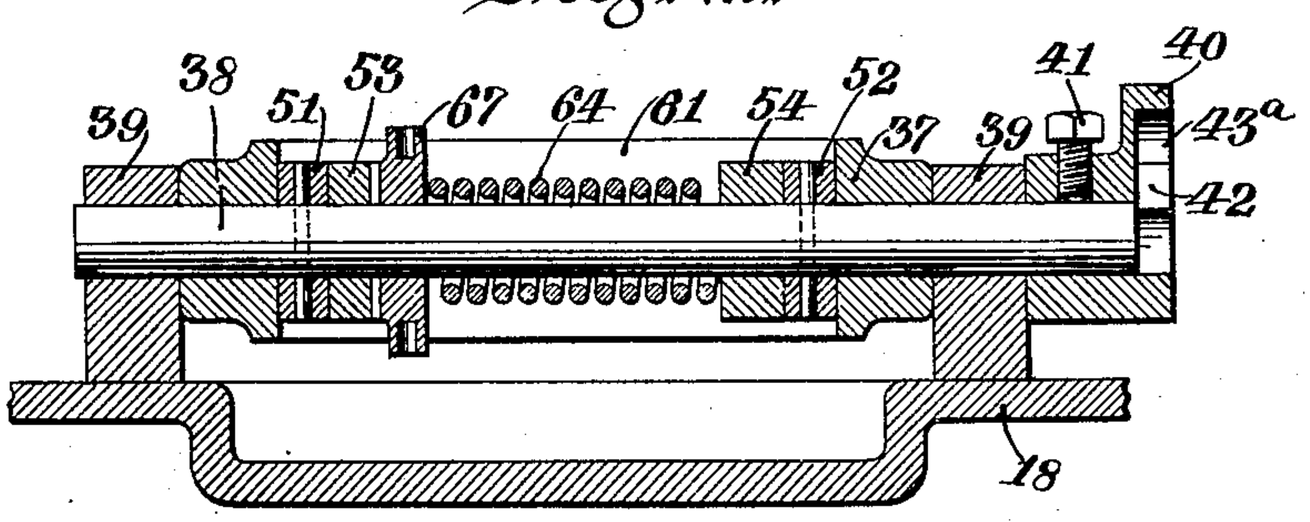


Fig. 13.

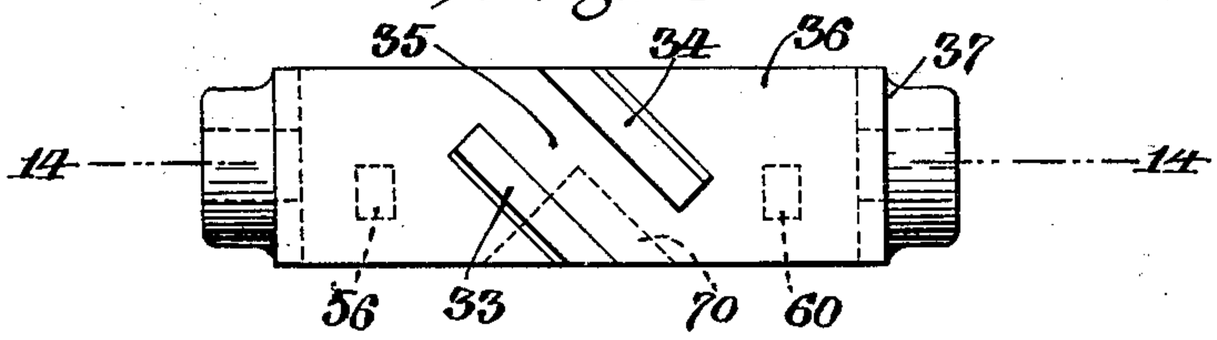
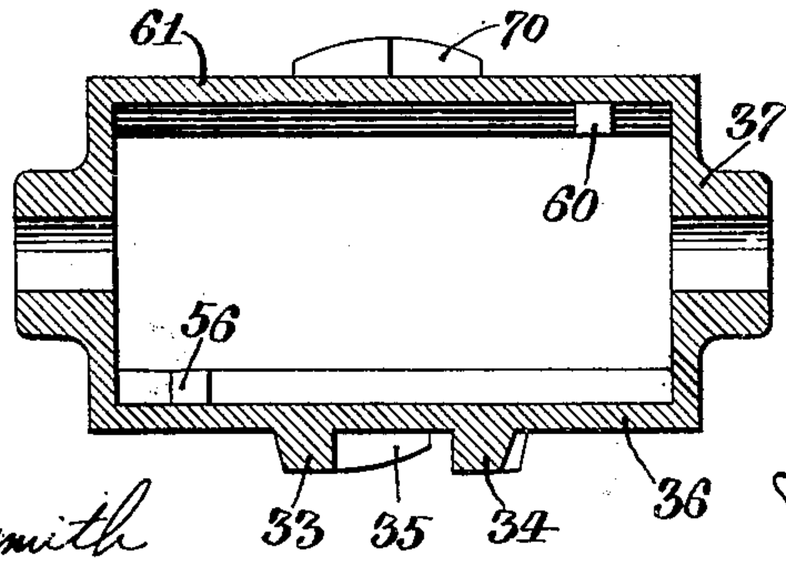


Fig. 14.



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5 SHEETS—SHEET 5.

Fig. 15.

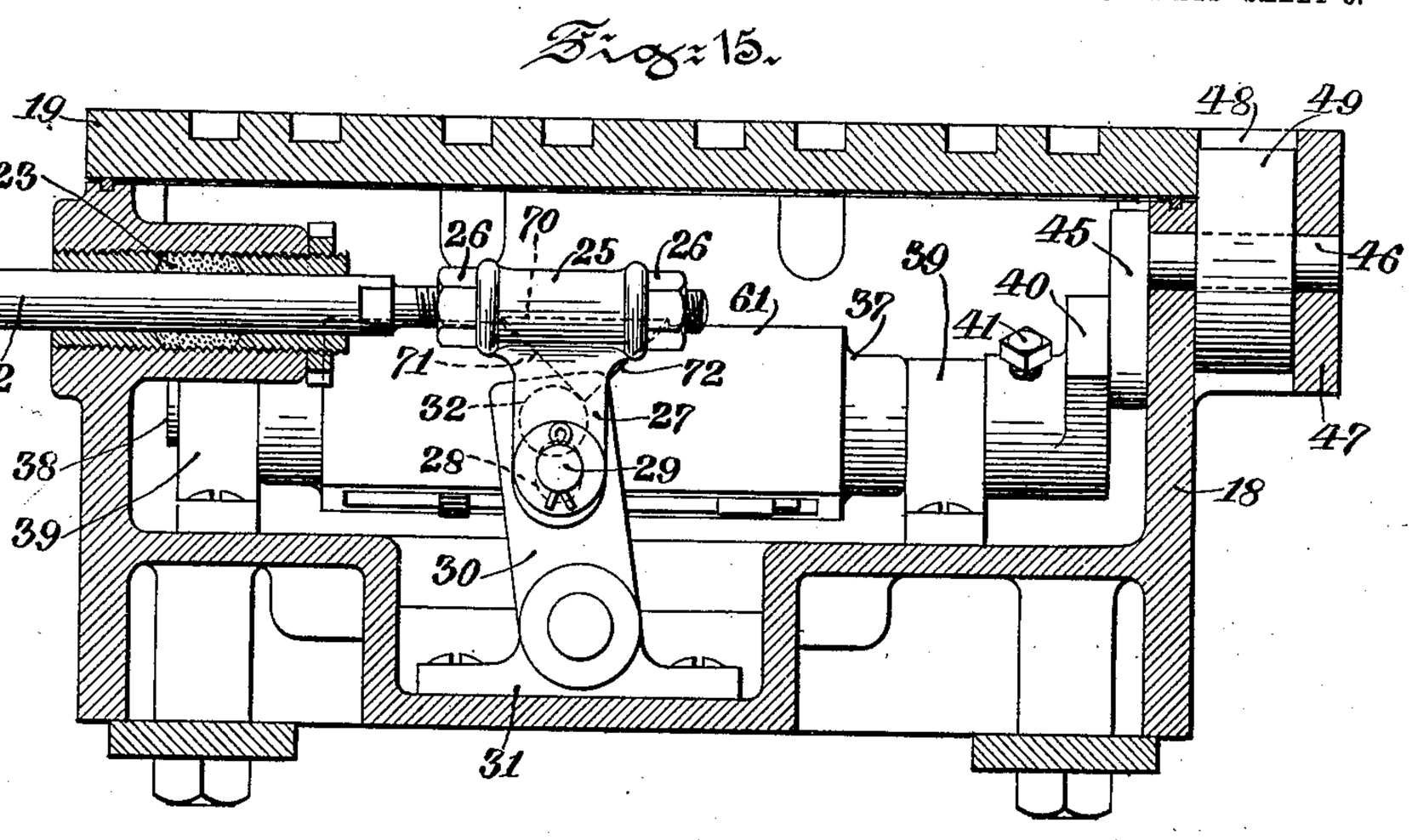


Fig. 16.

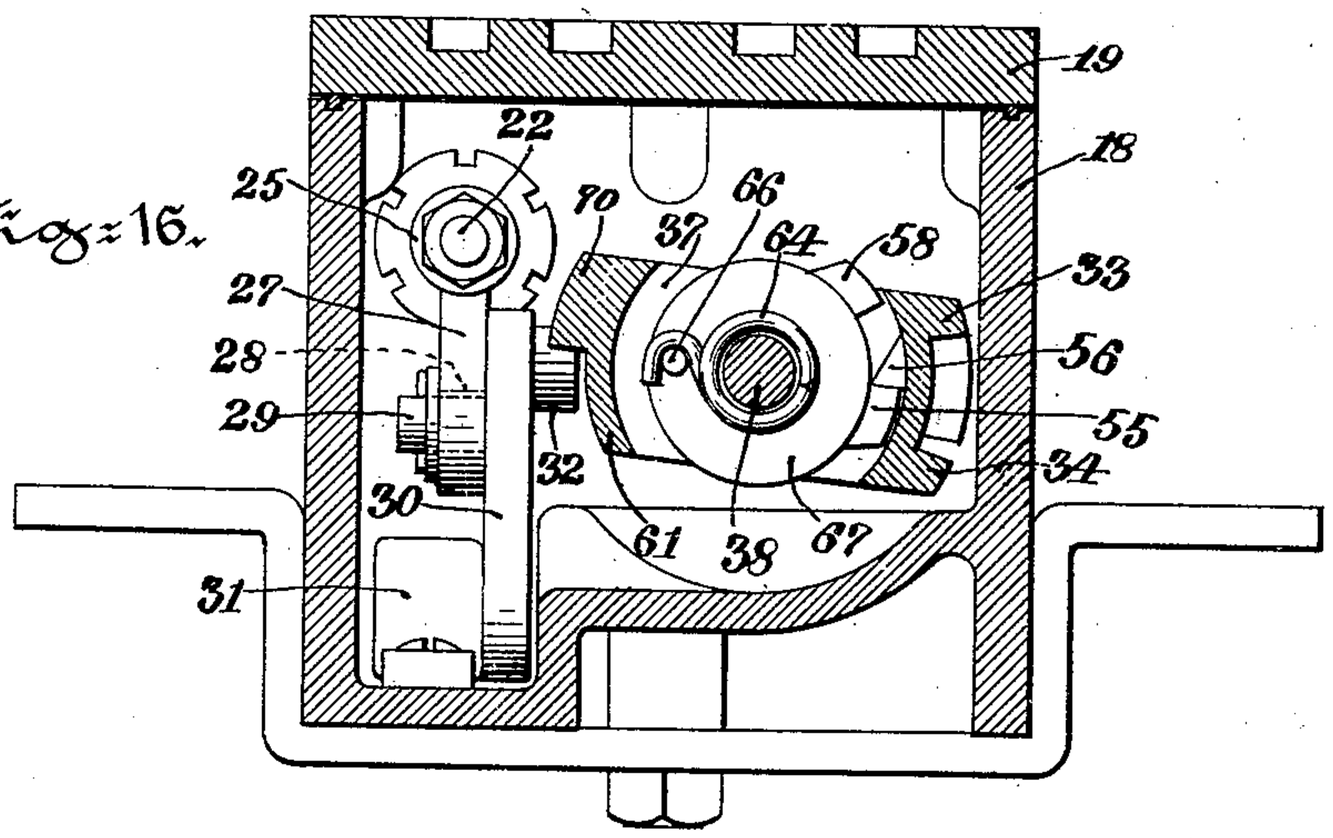


Fig. 17.

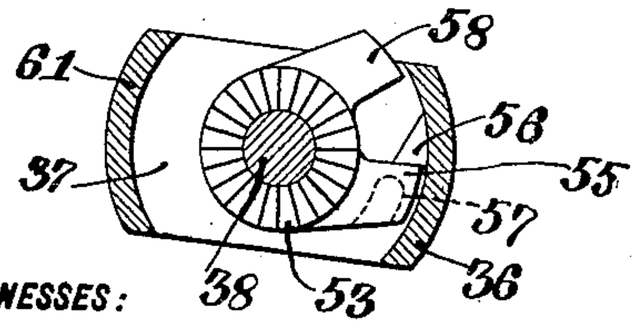
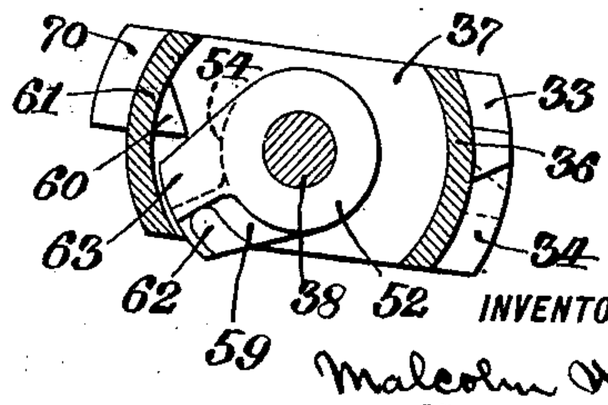


Fig. 18.



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UNITED STATES PATENT OFFICE.

MALCOLM W. LONG, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR TO THE PENNSYLVANIA STEEL COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RAILROAD-SWITCH.

No. 925,712. Specification of Letters Patent. Patented June 22, 1909.

Application filed July 20, 1908. Serial No. 444,540.

To all whom it may concern:

Be it known that I, MALCOLM W. LONG, citizen of the United States, and resident of Harrisburg, Dauphin county, State of Pennsylvania, have invented certain new and useful Improvements in Railroad-Switches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to railroad switches, the object being to provide a simple, durable, and efficient mechanism which may be set to maintain the switch tongue of a railroad switch yieldingly in one of its two positions and automatically return it to such position after being moved therefrom; which may be set to maintain the switch tongue yieldingly in the other of its two positions and automatically return it to said other position after being moved therefrom; and which may be set to maintain the switch tongue yieldingly in either of the two positions to which it may be adjusted.

To this end the invention consists in the novel construction and combinations of parts hereinafter fully described and claimed.

In the drawings:—Figure 1 is a plan view of a railroad switch section provided with my invention. Fig. 2 is a vertical section thereof as on the line 2—2, of Fig. 1. Fig. 3 is a plan view of the box containing the switch tongue operating mechanism, the cover for the box being removed. Fig. 4 is a vertical section as on the line 4—4 of Fig. 3, including the cover for the box. Fig. 5 is a vertical section as on the line 5—5 of Fig. 4. Fig. 6 is a sectional detail as on the line 6—6 of Fig. 3. Fig. 7 is a sectional detail as on the line 7—7 of Fig. 3. Fig. 8 is a sectional detail as on the line 8—8 of Fig. 4. Fig. 8[a] is a view similar to Fig. 8, showing the parts in different positions. Fig. 9 is a sectional detail as on the line 9—9 of Fig. 4. Figs. 10 and 11 are views similar to Figs. 6 and 7, showing the parts in different positions. Fig. 12 is a longitudinal section showing the locking shaft for the torsional spring, its support, and the parts carried thereby. Fig. 13 is a side elevation of the cam-carrying frame. Fig. 14 is a horizontal section as on the line 14—14, of Fig. 13. Figs. 15 and 16 are views similar to Fig. 4, showing the parts in a different position. Figs. 17 and 18 are views similar to Figs. 6 and 7 showing the parts in a different position.

2 designates the switch section comprising the base 3, the upwardly extending side walls 10 and 11, between which is formed the groove 12 for the car wheel flanges. Within the groove 12 is a switch tongue 13, the heel end of which is pivoted, as at 13[a] to the base 3. Leading from the base 3 and connected thereto at the heel end of the switch are two diverging rails 15 and 16, and leading from and connected to the base 3 at the point of the switch is the rail 17. The tread portion of the rail 16 connects with one end of the wall 11, and forms in effect a continuation thereof; the tread portion of the rail 17 connects with the other end of the wall 11 and forms in effect a continuation thereof; and the tread portion of the rail 16 connects with the heel end of the switch tongue, and forms in effect a continuation of the tongue. Thus it will be seen that when the switch tongue occupies the position shown in Fig. 1, against the wall 10, the car wheels will be directed between the tracks 16 and 17; and when the switch tongue occupies a position against the wall 11, the car wheels will be directed between the tracks 15 and 17.

The construction and operation of the parts thus far described are common and well known.

Secured to one side of the base 3 is a laterally extending box or frame 18, which is provided with a suitable cover 19. The cover 19 is secured to the box 18 by cap-screws 20, and interposed between the bottom of the cover 19 and the top of the box 18 is a strip of packing material 21 to provide a tight joint between the box and cover, the box 18 being designed to be kept filled with oil for the purpose of lubricating the working parts of the device contained therein. The top of the cover 19 is flush with the top of the wall 11, or substantially so, so that it may form a portion of the surface of the road bed in which the switch is employed.

Extending transversely of the switch tongue 13 and into the box 18, is a rod 22 which extends through a suitable stuffing box 23 in the wall of the box 18. The stuffing box 23 is provided to prevent the oil from leaving the box 18 through the opening through which the rod 22 extends. One end of the rod 22 extends through one side of the base 3 to a position beneath the switch tongue 13, and the rod 22 is connected to a lug 24 which projects downwardly from the

switch tongue 13 and through a slot in the base 3. The other end of the rod 22 extends into the box 18, and is provided with a collar 25, which surrounds the rod and is engaged at each end by nuts 26 which are screwed on to the screw-threaded end of the rod 22, the nuts 26 securing the collar 25 and providing for its longitudinal adjustment thereon. Projecting downwardly from the collar 25 is an arm 27 in which is formed a vertical slot 28, and extending into the slot 28 is a pin 29 carried by an arm 30, the lower end of which is pivotally mounted on a bearing 31 secured to the bottom of the box 18. The upper end of the arm 30 is provided with a projection or roller 32, which extends between cam-walls 33 and 34 between which is formed a helical cam-way 35. The cam walls 33 and 34 are formed on the side bar 36 of an elongated hollow frame or frame-like part 37. This frame 37 is rotatably mounted on a shaft 38 which extends through bosses on the end walls of the frame and through bearings 39 on the floor of the box 18, the bearings 39 supporting the shaft 38 and parts carried thereby.

By the construction hereinbefore described, it will be seen that if a yielding pressure be exerted against the bar 36 to move it downwardly about the axis of the shaft 38, the cam wall 34 will be pressed against the projection 32 and thus force said projection 32 and therewith the arms 30 and 27 and rod 22 toward the wall 10 of the switch section, thus forcing the switch tongue 13 yieldingly against the wall 10, so that if, for any reason, the switch tongue 13 is moved away from the wall 10 against the spring pressure acting upon the cam wall 34, said cam wall will automatically return the switch tongue 13 to its position against the wall 10 when the opposing pressure against the tongue is removed.

It will also be seen that if, a yielding pressure be exerted against the bar 36 to move it upwardly about the axis of the shaft 38, the cam wall 33 will be pressed against the projection 32 and then force said projection and therewith the arms 30 and 27 and rod 22 away from the wall 10 of the switch section, thus forcing the switch tongue 13 yieldingly against the wall 11, so that if, for any reason, the switch tongue 13 is moved away from the wall 11 against the spring pressure acting upon the cam wall 33, said cam wall will automatically return the switch tongue 13 to its position against the wall 11, when the opposing pressure against it is removed.

In order to produce the yielding pressure against the frame 36 to force the cam walls 33 and 34 either upwardly or downwardly, to produce the conditions just described, I provide the following construction:—One end of the shaft 38 is provided with an arm 40 which is secured to the shaft by a set screw 41. The arm 40 has formed therein a slot 42, which extends radially with respect to the shaft 38 and the outer end of the slot 42 is provided with laterally disposed sockets 43 and 43[a], for a purpose hereinafter explained. Arranged within the slot 42 is a pin 44 which projects from an arm 45 fixed to a shaft 46. The shaft 46 extends outwardly through the wall of the box 18 and into a bracket 47 formed on the box 18 and providing a chamber 48 through which the shaft 46 extends. Fixed to the shaft 46 within the chamber 48 is a collar 49, provided with a notch 50. By inserting a hand bar in the notch 50, the collar 49, and shaft 46 may be rocked to bring the arm 45 to the position shown in Fig. 8[a]. This movement of the arm 45 will cause the pin 44 to move through the slot 42 toward and from the shaft 39, and rock the arm 40 and therewith the shaft 39 to the position shown in Fig. 8[a]; or when the parts occupy the position shown in Fig. 8[a], by inserting a bar into the notch 50, they may be again returned to the position shown in Fig. 8.

Pinned to the shaft 38 within the frame 37 adjacent the end walls thereof, are two collars 51 and 52. Adjacent the collar 51 is a collar 53, which is loosely mounted on the shaft 38, and adjacent the collar 52 is a collar 54, which is also loosely mounted on the shaft 38. The collar 53 is provided with a tooth 55, which is adapted to engage a tooth 56 on the inner wall of the bar 36 of the frame 37; and the tooth 55 is provided with a laterally extending lug 57, which is adapted to engage a tooth 58 on the collar 51, the tooth 58 being out of line with the tooth 55. The collar 54 is provided with a tooth 59, which is adapted to engage a tooth 60 on the inner wall of the side bar 61 of the frame 37, and the tooth 59 is provided with a laterally extending lug 62, which is adapted to engage a tooth 63 on the collar 52, the tooth 63 being out of line with the tooth 59.

Encircling the shaft 38 and extending between the collars 53 and 54, is a torsional spring 64. One end of the spring 64 is engaged with a pin 65 projecting from the collar 54, in a manner to cause a torsional action of the spring 64 to press the tooth 59 toward the tooth 60. The other end of the spring 64 is engaged with a pin 66, on a collar 67, which is forced into engagement with the collar 53 by the pressure of the spring 64 longitudinally of the shaft 38. The opposing faces of the collars 67 and 53 are provided with co-acting teeth which are so disposed as to cause the collar 67 to turn the collar 53 under the torsional action of the spring 64 acting against the pin 66, to press the tooth 55 toward the tooth 56.

When the parts occupy the positions shown in Figs. 1 to 9 inclusive, the operation is as follows:—The torsional action of one end of the spring 64 is to press the collar 53

in the direction indicated by the arrow in Fig. 6, and engage it with the tooth 56 and force the bar 36 downwardly to maintain the switch tongue 13 yieldingly against the wall 10; and the torsional action of the other end of the spring 64 is to press the collar 54 in the reverse direction, as indicated by the arrow in Fig. 7. The pressure of the spring 64 in this reverse direction, forces the lug 62 into engagement with the tooth 63 on the fixed collar 52 on the shaft 38, which is held in position against the action of the spring 64 by the pin 44 engaging the socket 43 in the arm 40, which prevents the torsional action of the spring 64 from turning the shaft 38 and therewith the arm 40 in the direction indicated by the arrows in Figs. 7 and 8. In other words, the pin 44 and socket 43 lock the shaft 38 and the collars 52 and 54 engaged therewith, against the movement of one end of the spring 64; while the other end of the spring 64 presses the switch tongue yieldingly against the wall 10 from which it may be moved against the action of the spring 64.

When it is desired to maintain the switch tongue 13 yieldingly against the wall 11 of the switch section, a hand bar or other tool is inserted into the notch 50 of the collar 49 on the shaft 46, and the shaft 46 is thereby turned to bring the arm 45 to the position shown in Fig. 8[a]. The initial movement of the arm 45 will slightly depress the arm 40 against the action of the spring 64, to disengage the pin 44 from the socket 43; whereupon, the continued movement of the arm 45 will cause the pin 44 to move through the slot 42 and adjust the arm 40 to the position shown in Fig. 8[a]. During this movement of the arm 40, the shaft 38 and the fixed collars 51 and 52 carried thereby, are rocked to the position shown in Figs. 10 and 11. During this movement of the fixed collars 51 and 52, the tooth 58 engages the lug 57 and raises the tooth 55 from engagement with the tooth 56, thus removing the torsional action of one end of the spring 64 from the bar 36, or one side of the frame 38 as shown in Fig. 10, while the torsional action of the other end of the spring is being applied to the other side of the frame 37 or bar 61, by the tooth 59 coming into engagement with the tooth 60 and the tooth 63 leaving its position against the lug 62 as shown in Fig. 11. Thus it will be seen that when the parts have been adjusted to the positions shown in Figs. 8[a], 10, and 11, one end of the spring 64 will be locked against its torsional action by the pin 44 and socket 43[a] locking the shaft 38 and the collars 51, 53 and 67 engaged therewith, while the torsional action of the other end of the spring 64 acts upon the loose collar 54 to press the tooth 59 into engagement with the tooth 60 and thus press the bar 61 of the frame 37 downwardly, and the bar 36 of the frame 37 upwardly, thus maintaining the switch tongue 13 yieldingly against the wall 11, from which it may be moved against the action of the spring 64.

When it is desired to maintain the switch tongue 13 yieldingly in engagement with either the wall 10 or the wall 11, against which it may be adjusted, I adjust the parts of the device to bring into operation a cam projection 70 on the bar 61 of the frame 37, which projection is arranged opposite the cam walls 33 and 34 on the bar 36 of the frame 37. This cam projection 70 is adapted to engage the projection 32 on the arm 30, or by reversing the positions of the bars 36 and 61 by turning the frame 37 about the axis of the shaft 38. This is accomplished by loosening the set screw 40 which will permit the shaft 38, the frame 37, and the parts carried by the shaft within the frame 37 to be bodily turned about the axis of the shaft 38, thus moving the bar 36 to the position previously occupied by the bar 61, and moving the bar 61 to the position previously occupied by the bar 36. During this operation, the collar 25 may be adjusted longitudinally upon the rod 22, to permit the disengagement of the projection 32 from the cam walls 33 and 34.

The cam projection 70 is provided with inclined cam walls 71 and 72, arranged in V-form, and which, when the frame 37 is adjusted to the position shown in Figs. 15 and 16, diverge upwardly. The cam projection 70 is so positioned with relation to the movement of the projection 32 on the arm 30, that the point, or lower meeting ends, of the diverging cam walls 71 and 72, is midway between the position occupied by the projection 32 when the switch tongue is in engagement with the wall 10, and the position occupied by the projection 32 when the switch tongue 13 is in engagement with the wall 11; so that if downward pressure be exerted upon the bar 61, the cam projection 70 will engage the projection 32 to force the switch tongue 13 yieldingly into engagement with either the wall 10 or the wall 11. In the position shown in Figs. 15 and 16, the cam wall 71 is in engagement with the projection 32, and the switch tongue 13 is being forced yieldingly into engagement with the wall 10. If, for any reason, the switch tongue is moved from its position against the wall 10 to a position against the wall 11, the movement of the projection 32 will raise the cam projection 70 and pass from engagement with the wall 71 into engagement with the wall 72, which will then maintain the switch tongue 13 yieldingly in engagement with the wall 11. Thus the switch tongue may be moved from side to side, and will be held yieldingly in either of its positions by the action of the cam projection 70.

The required downward pressure of the bar 36 is produced by the torsional action of the spring 64, as follows:—Before adjusting the frame 37 to the position shown in Figs. 15 and 16, the shaft 46 is turned to bring its arm 45 into vertical position, thus causing the pin 44 to act within the slot 42 and move the arm 40 also into vertical position, or midway between the positions shown in Figs. 8 and 8[a]. In this position of the parts, there is no pressure whatever exerted upon the frame 37 by the spring 64, for the reason that the lug 62 of the loose collar 54 comes into engagement with the tooth 63 of the fixed collar 52 and the lug 57 of the collar 53 comes into engagement with the tooth 58 of the collar 51. In other words, the torsional action of one end of the spring is against one fixed collar 51, while the torsional action of the other end of the spring is against the other fixed collar 52. In this position of the parts contained within the frame 37, said parts and frame and shaft 38 may be turned as a unit about the axis of the shaft 38, to bring the cam projection 70 into engagement with the projection 32 of the arm 30, as, for example, in the position shown in Figs. 15 and 16. After this has been done, a bar or other tool is inserted into the notch and the arms 45 and 40 are rocked from their vertical positions to the positions shown in Fig. 8. This operation will bring the parts contained within the frame 37 to the position shown in Figs. 16, 17, and 18; that is to say, the tooth 63 of the fixed collar 52 will engage the lug 62 of the loose collar 54, and cause the shaft 38 to take the pressure of one end of the spring 64, while the pressure of the other end of the spring 64 will be against the frame 37 by the engagement of the tooth 55 of the loose collar 53 with the tooth 56 of the frame 37, thus forcing upwardly the bar 36 of the frame 37, and forcing downwardly the bar 61 of the frame 37, and producing the required pressure of the cam projection 70 upon the projection 32 of the arm 30.

The collar 67 on the shaft 38 is provided as a means for tightening or increasing the pressure of the torsional spring 64, and the collar 67 is provided with radial holes or sockets as shown, into which any suitable tool may be inserted for the purpose of turning the collar 67 about the shaft 38 against the action of the spring 64, the arrangement of the teeth between the collars 67 and 53 permitting the collar 67 to be turned with relation to the collar 53 and against the action of the spring 64, and locking the collars 53 and 67 to turn as a unit by the action of the spring 64.

During the operation of tightening or increasing the pressure of the spring 64, the collar 53 is held by any suitable instrument against rotation upon the shaft 38, while the collar 67 is turned, and during the turning of the collar 67 relative to the collar 53, the collar 67 moves slightly in a longitudinal direction upon the shaft 38 to permit the engagement and disengagement of the teeth between the collars 53 and 67, the longitudinal pressure of the spring 64 maintaining the collar 67 yieldingly in engagement with the collar 53.

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

1. In a railway switch, the combination of the supporting structure, the movable switch tongue, a part movable in a direction transversely of said tongue and connected thereto, a torsional spring, and adjustable mechanism when in one position causing one end of said spring to press said part in one direction and when in another position causing the other end of said spring to press said part in the reverse direction, substantially as described.

2. In a railway switch the combination of the supporting structure, the movable switch tongue, a part movable in a direction transversely of said tongue and connected thereto, a movable frame, operative connections between said frame and said part, a torsional spring, and adjustable mechanism including a shaft upon which said spring and said frame are mounted said mechanism when in one position causing one end of said spring to press said frame in one direction, and when in another position causing the other end of said spring to press said frame in the reverse direction, substantially as described.

3. In a railway switch the combination of the supporting structure, the movable switch tongue, a part movable in a direction transversely of said tongue and connected thereto, an adjustable shaft, means for holding said shaft in positions of adjustment about its axis, a movable frame on said shaft, operative connections between said frame and said part, a torsional spring, means connected to said shaft and said spring and causing said spring to press said frame in one direction when the shaft is in one position, and means connected to said shaft and said spring and causing said spring to press said frame in the reverse direction when the shaft is in another position, substantially as described.

4. In a railway switch, the combination of the supporting structure, the movable switch tongue, a part movable in a direction transversely of said tongue and connected thereto, an adjustable shaft, means for holding said shaft in positions of adjustment about its axis, a movable frame on said shaft, two loose collars on said shaft, a torsional spring on said shaft having one end engaged with one collar and the other end engaged with the other collar and tending to rotate said collars in reverse directions, means on said shaft for limiting the movement of said col-

lars by said spring, means for engaging one collar with said frame against the action of said spring when the shaft is moved to one of its positions of adjustment, and means for engaging the other collar with said frame against the action of said spring when the shaft is moved to another position of adjustment, substantially as described.

5. In a railway switch the combination of the supporting structure, the movable switch tongue, a part movable in a direction transversely of said tongue and connected thereto, an adjustable shaft, means for holding said shaft in positions of adjustment about its axis, a movable frame on said shaft, two loose collars on said shaft, a torsional spring on said shaft having one end engaged with one collar and the other end engaged with the other collar, and tending to rotate said collars in reverse directions, two collars fixed on said shaft one adjacent one loose collar and the other adjacent the other loose collar, means on one fixed collar for engaging one loose collar to prevent its movement by said spring, means on the other fixed collar for engaging the other loose collar to prevent its movement by said spring, means for engaging one loose collar with said frame in one direction around said shaft, means for engaging the other loose collar with said frame in the other direction around said shaft, one of said frame engaging means being so positioned with relation to the other that when said shaft is adjusted to one position one loose collar will press against said frame, and when said shaft is adjusted to another position the other loose collar will press against said frame, substantially as described.

6. In a railway switch the combination of the supporting structure, the movable switch tongue, a part movable in a direction transversely of said tongue and connected thereto, a shaft adjustable about its axis, a movable frame on said shaft, a torsional spring on said shaft, means connected to said shaft and said spring and causing said spring to press said frame in one direction when the shaft is in one position, means connected to said shaft and said spring and causing said spring to press said frame in the reverse direction when the shaft is in another position, a second shaft adjustable about its axis, an arm projecting from the first named shaft, an arm projecting from said second shaft and provided with means adjustably engaging the first named arm whereby the adjustment of the second named shaft will adjust the first named shaft, means for adjusting the second named shaft, and means for locking said shafts in positions for adjustment, substantially as described.

7. In a railway switch the combination of the supporting structure, the movable switch tongue, a part movable in a direction transversely of said tongue and connected thereto, a shaft adjustable about its axis, a movable frame on said shaft, a torsional spring on said shaft, means connected to said shaft and said spring and causing said spring to press said frame in one direction when the shaft is in one position, means connected to said shaft and said spring and causing said spring to press said frame in the reverse direction when the shaft is in another position, a second shaft adjustable about its axis, an arm projecting from the first named shaft and having a radial slot therein in the outer end of which is formed two oppositely and laterally disposed sockets, an arm projecting from said second shaft and provided with a projection extending into said slot, whereby the adjustment of said second shaft in either direction will cause the adjustment of the first named shaft to one side or the other, and the engagement of said projection with one of said sockets, and the locking of said shafts against the action of said spring, and means for locking said shafts in positions of adjustment, substantially as described.

8. In a railway switch the combination of the supporting structure, the movable switch tongue, a part movable in a direction transversely of said tongue and connected thereto, a shaft adjustable about its axis, a movable frame on said shaft, a torsional spring on said shaft, means connected to said shaft and said spring and causing said spring to press said frame in one direction when the shaft is in one position, means connected to said shaft and said spring and causing said spring to press said frame in the reverse direction when the shaft is in another position, a second shaft adjustable about its axis, an arm projecting from the first named shaft, an arm projecting from said second shaft and provided with means adjustably engaging the first named arm whereby the adjustment of the second named shaft will adjust the first named shaft, a collar having a notch therein fixed to said second shaft, and means for locking said shafts in positions of adjustment, substantially as described.

9. In a railway switch the combination of the supporting structure, the movable switch tongue, a cam-operated part movable in a direction transversely of the switch tongue, connections between said cam-operated part and said tongue, a movable cam-carrying part having cam walls thereon engaging said cam-operated part, said walls being arranged to move said cam-operated part in one direction when pressure is applied to said cam-carrying part in one direction, and to move said cam-operated part in the reverse direction when pressure is applied to said cam-carrying part in the reverse direction, and adjustable spring-actuated mechanism when adjusted to one position exerting spring-pressure against said cam-carrying part in one direction and when adjusted to another

position exerting spring pressure against said cam-carrying part in the reverse direction, substantially as described.

10. In a railway switch the combination of the supporting structure, the movable switch tongue, a cam-operated part movable in a direction transversely of the switch tongue, connections between said cam operated part and said tongue, a movable cam-carrying part having cam walls thereon engaging said cam-operated part, said walls being arranged to move said cam-operated part in one direction when pressure is applied to said cam-carrying part in one direction, and to move said cam-operated part in the reverse direction when pressure is applied to said cam carrying part in the reverse direction, an adjustable shaft, means for holding said shaft in positions of adjustment about its axis, a torsional spring on said shaft, means connected to said shaft and said spring and causing said spring to press said cam-carrying part in one direction when the shaft is in one position, and means connected to said shaft and said spring and causing said spring to press said cam-carrying part in the reverse direction when the shaft is in another position, substantially as described.

11. In a railway switch the combination of the supporting structure, the movable switch tongue, a cam-operated part movable in a direction transversely of the switch tongue, connections between said cam-operated part and said tongue, a frame having a helical camway therein and a cam projection thereon having diverging cam walls, said frame being rotatable to bring either the camway or the cam projection into engagement with said part, said camway being arranged when in engagement with said cam-operated part to move said cam-operated part in one direction when pressure is applied to said frame in one direction, and to move said cam-operated part in the reverse direction when pressure is applied to said frame in the reverse direction, and said cam projection being arranged when in engagement with said cam-operated part to cause one of its diverging walls to move said cam operated part in one direction and the other of its diverging walls to move said said cam-operated part in the reverse direction when pressure is applied to said frame, said cam-operated part being movable into engagement with either of said diverging walls; and adjustable spring-actuated mechanism when adjusted to one position exerting spring pressure against said frame in one direction, and when adjusted to another position exerting spring pressure against said frame in the reverse direction, substantially as described.

12. In a railway switch the combination of the supporting structure, the movable switch tongue, a cam-operated part movable in a direction transversely of the switch tongue, connections between said cam-operated part and said tongue, a frame having a helical camway therein and a cam projection thereon having diverging cam walls, said frame being rotatable to bring either the camway or the cam projection into engagement with said part, said camway being arranged when in engagement with said cam-operated part to move said cam-operated part in one direction when pressure is applied to said frame in one direction, and to move said cam-operated part in the reverse direction when pressure is applied to said frame in the reverse direction, and said cam projection being arranged when in engagement with said cam-operated part to cause one of its diverging walls to move said cam-operated part in one direction and the other of its diverging walls to move said cam-operated part in the reverse direction when pressure is applied to said frame, said cam-operated part being movable into engagement with either of said diverging walls; an adjustable shaft upon which said frame is rotatably mounted, means for holding said shaft in positions of adjustment about its axis, a torsional spring, means connected to said shaft and said spring and causing said spring to press said frame in one direction, when the shaft is in one position, and means connected to said shaft and said spring and causing said spring to press said frame in the reverse direction when the shaft is in another position, substantially as described.

In testimony whereof I have hereunto affixed my signature.

MALCOLM W. LONG.

Witnesses:
H. WEAVER,
WM. R. MILLER.