

No. 881,799.

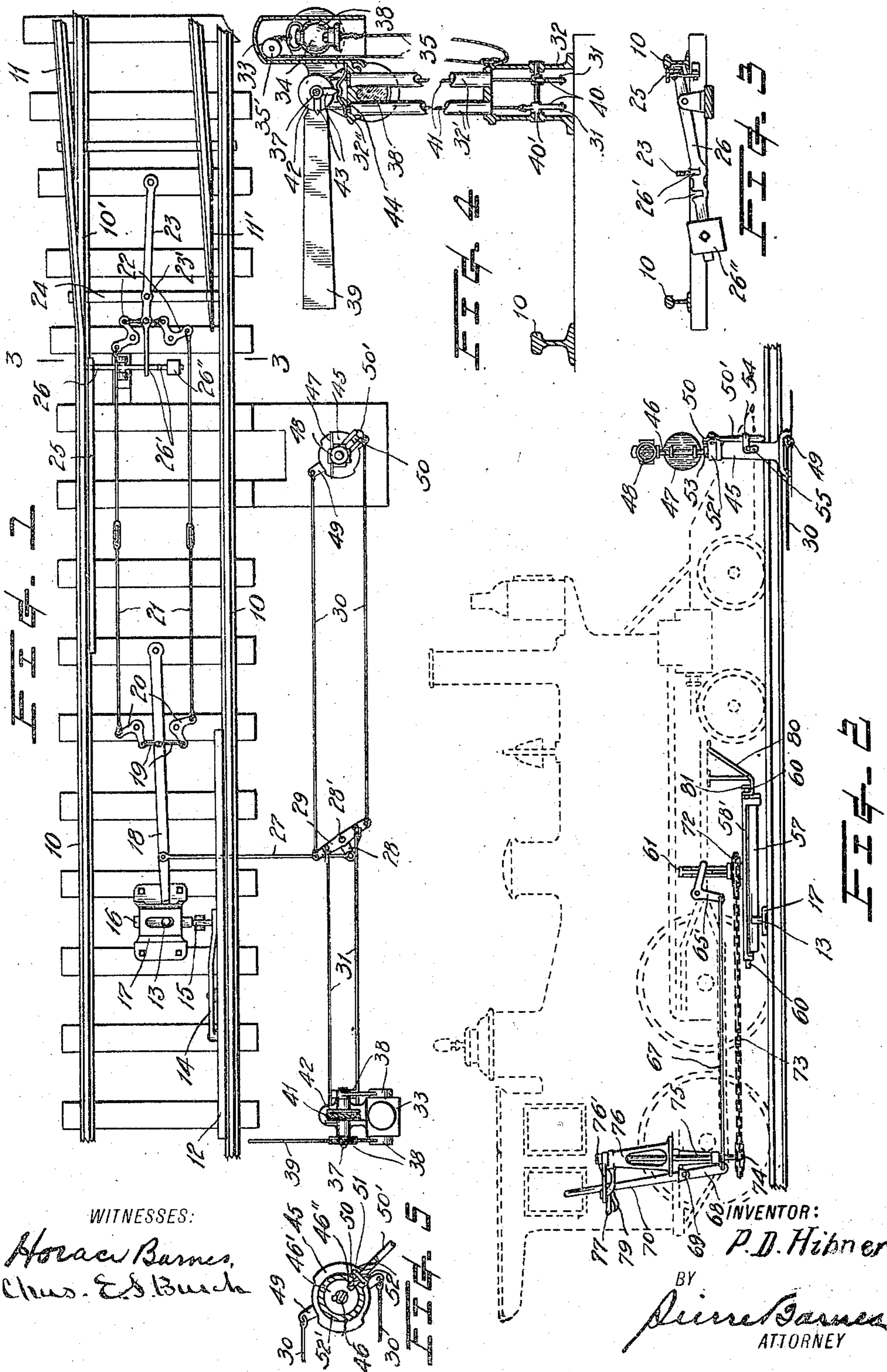
PATENTED MAR. 10, 1908.

P. D. HIBNER.

RAILWAY SWITCH.

APPLICATION FILED MAY 31, 1907.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

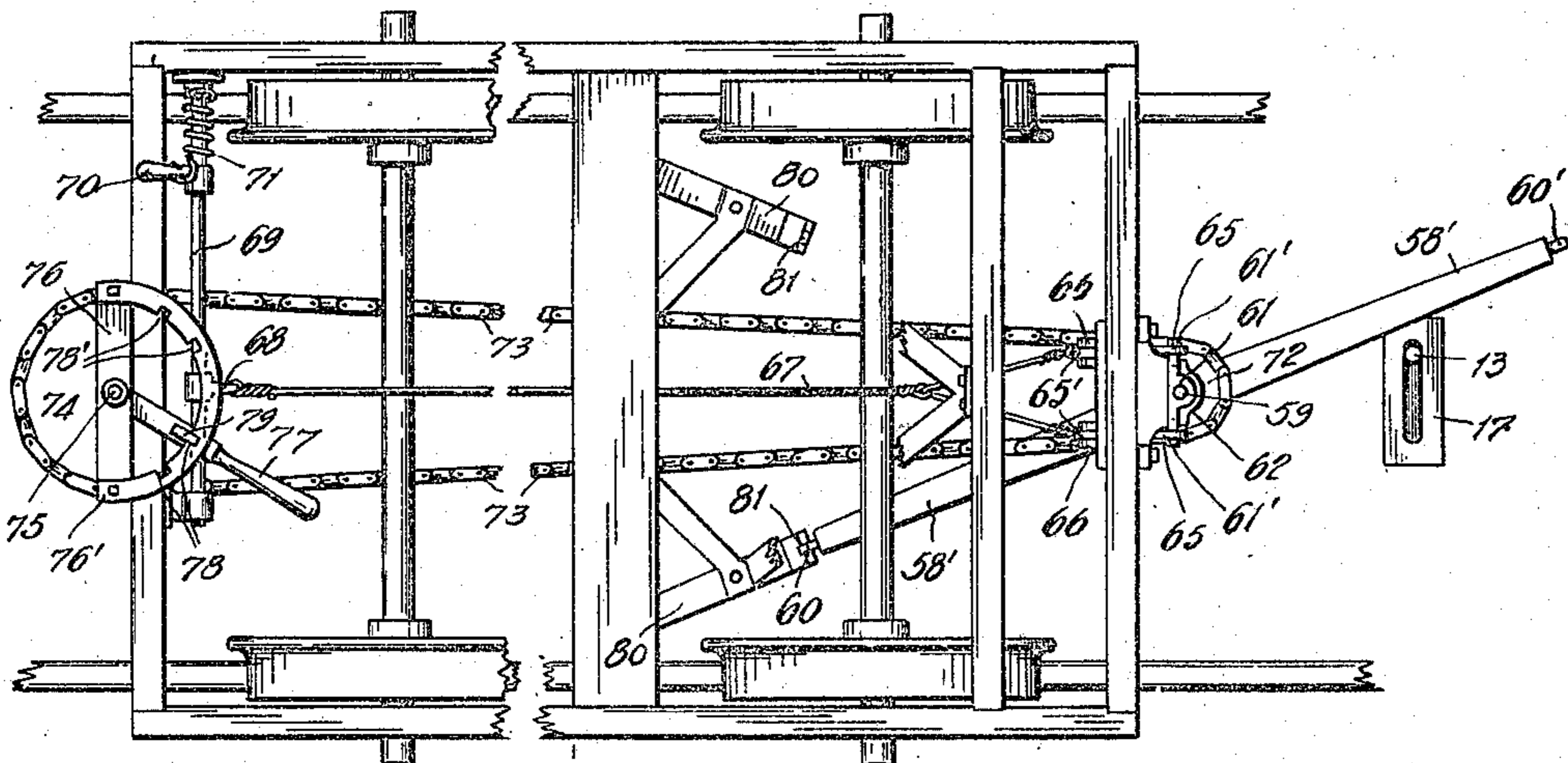


FIG. 6

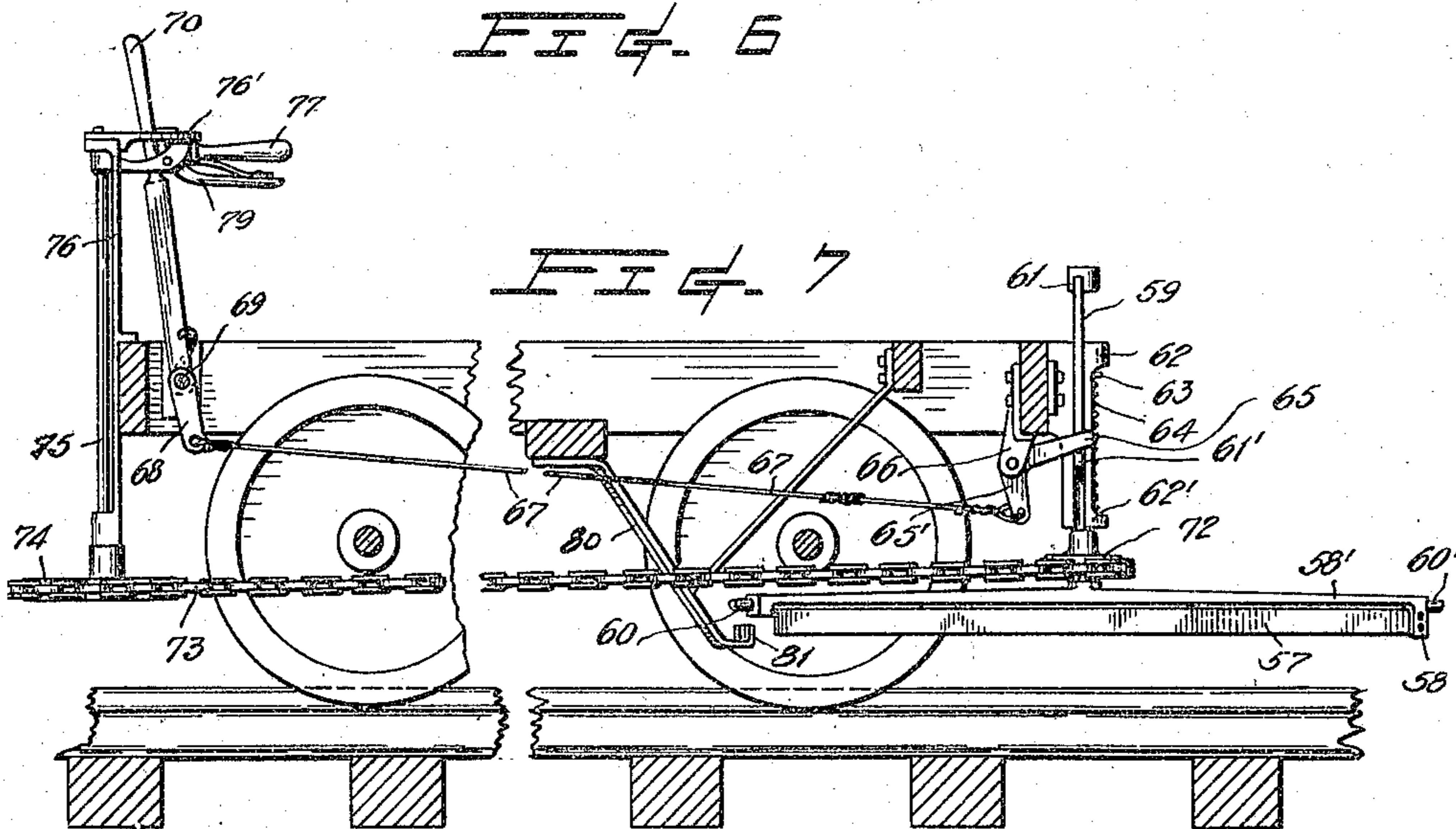


FIG. 7

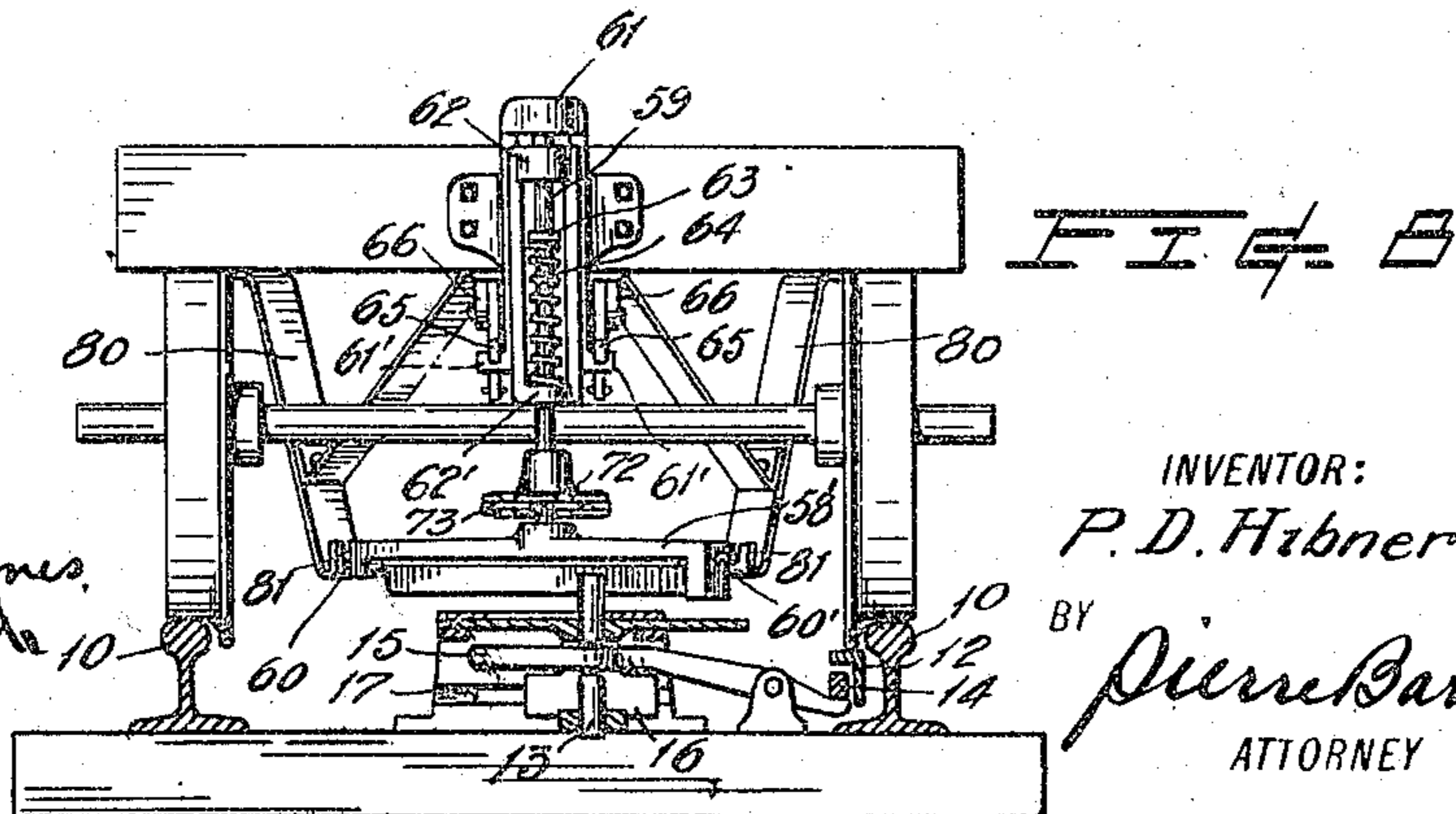


FIG. 8

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# UNITED STATES PATENT OFFICE.

PHILIP D. HIBNER, OF SEATTLE, WASHINGTON.

## RAILWAY-SWITCH.

No. 881,799.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed May 31, 1907. Serial No. 376,580.

*To all whom it may concern:*

Be it known that I, PHILIP D. HIBNER, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Railway-Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to mechanism for operating railway switches of that type disclosed in United States Patent No. 842,460, issued to me January 29, 1907.

The object of this invention is the provision of manually operated devices, supplementary to those described in the aforesaid patent, for actuating a switch.

A further object of the invention is the provision of signal devices to coöperate with and be actuated by the switch movements when the same is effected by said manually operated means or by devices carried upon the car.

A still further object of the invention is to provide devices for locking the switch in both its open and closed positions.

The invention consists in the novel construction and adaptation of parts, and the combinations thereof, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of a railway-track and associated parts constructed in accordance with this invention; Fig. 2, a side-elevation of portions of the same with devices carried by a locomotive or car for operating the switch; Fig. 3, is a cross sectional view enlarged taken through 3—3 of Fig. 1; Fig. 4, is a vertical cross sectional view enlarged of the signal apparatus; and Fig. 5, is a horizontal sectional view enlarged taken through the switch stand. Fig. 6 is a plan view enlarged of a car truck provided with my improved switch operating devices; Fig. 7 is a longitudinal sectional view of Fig. 6; and Fig. 8 is an end view of Fig. 6 with said devices illustrated in engaged position with respect to certain of the switch operating parts which are also shown.

The reference numerals 10 and 11, respectively designate the fixed rails of the main and branch lines of a railway track, and 10' and 11' the corresponding movable rail or switch points, which are connected by tie-rods 24, as usual.

In proximity to one of the rails 10, and at some distance from the switch, is a rail 12

adapted to be depressed by the passing thereover of the flanges of the car wheels upon that side of the track and thereby effecting the elevation of a vertically movable pin 13 through intervening levers 14 and 15. This pin is carried by a block 16 slidably fitted in a frame 17 which is fixedly in turn secured to the track-ties or other suitable supports. A lever 18 is connected at one end to the block 16 and connected at the other end by rods 19 with bell-cranks 20 and the latter respectively connected by rods 21 with bell-cranks 22 which in turn are similarly connected with a lever 23, and the latter connected, as by a pin 23', with one of the tie-rods 24. The lever 23 is pivoted at 23<sup>2</sup> to one of the rail joints, as shown in Fig. 1.

The aforesaid parts are substantially like the corresponding parts which are more fully described and illustrated in the above mentioned patent.

According to the present invention I provide adjacent to the switch and in proximity to one of the rails 10 of said main-line, a supplementary rail 25 which is capable of being depressed and thus maintained by the flanges of the car-wheels while they are traveling over the same. The office of this rail is to engage and tilt upwardly the notched arm of a lever 26, see Figs. 1 and 3, and engage the same with the lever 23 in either of the notches 26' which are spaced apart in the lever 26 to accommodate the above named lever 23 in the positions it assumes when the switch is respectively in its open or closed position, and thus prevent such conditions being altered during the passage of a car or train over the switch. When the rear wheel of a train has, however, moved beyond the rail 25 the latter is released and automatically restored to its normal raised position by the action of an overbalancing weight 26'', and thus disengaged from the lever 23.

Operatively connected with the lever 18 by a rod 27 is an arm 28 connected to an upright spindle 28' journaled in a suitable support which is positioned at one side of the track. A yoke 29 is fixedly mounted upon the spindle 28' and is connected from its opposite arms by cables, or rods, 30 and 31, respectively, with the manually actuated devices for operating the switch, to be presently explained, and also with the signal apparatus. Such apparatus comprises a tower formed of a chambered base 32 from which

extend upwardly the tubular members 32' surmounted by a head 32'' carrying a casing 33 for the reception of a lantern 34, or its equivalent, which is open at its bottom and provided with oppositely disposed sight apertures in its side walls. The lantern is attached at its bail with a hoisting line 35 which passes over a sheave 35' and thence downwardly to within easy reach of an attendant, for securing the lantern in its raised position within said casing. Upon said head 32'' are standards in which is journaled a shaft 37 having upon each end a pair of spectacle glasses 38, of the conventional colors, as red or green, employed in railway signaling and disposed at right angles to each other and also upon one side of the glasses is arranged a semaphore blade 39. These glasses 38—38 are arranged to be respectively brought opposite the aforesaid sight apertures by the movement of the lever 18 which controls the switch and corresponding to the condition of the latter, that is to say to bring the semaphore blade or either pair of the differently colored glasses into position to indicate the changed conditions of the switch according to the ordinary or predetermined code of signals employed. Such changes are effected by the rods 31 operating vibratory bell-cranks 40 upon a shaft 40' within the tower base 32, and through the medium of cables 41 having their ends connected with the bell-cranks 40 and passing about and stapled or otherwise secured in the peripheral groove of a wheel 42 which is rigidly mounted upon the shaft 37 carrying the above described signal contrivances.

To reliably bring the proper pair of said glasses in register with the sight apertures I provide detents 43 fixedly secured or formed upon the wheel 42 and arranged to engage within a notched spring catch 44 upon the head 32'' when the glasses are in such register.

The before mentioned manually operated devices for throwing the switch consists of a stand 45, see Figs. 1, 2 and 5, in which is rotatably seated a vertical post 46 having at its upper end, signal devices, such as a target 47 and a lamp 48, while at its lower end is a yoke 49 which is operatively coupled by the rods 30 with the aforesaid yoke 29, and whereby the actions of the switch and of the signal operating mechanism is transposed to effect the partial rotation in the post, or vice versa.

Intermediate the length of the post 46 is an annular collar 46' provided in its periphery with a notch 46'' adapted to be engaged by the short arm 50 of a lever 50' when the latter is brought into a corresponding radial line therewith and tilted to cause said arm to enter. The lever is fulcrumed by a pin 51 to ears 52 of a ring 52' loosely fitted about the collar 46' whereat it is retained by a set collar 53 upon the post.

The lever 50' is ordinarily disengaged from the post leaving the latter free to turn with the switch movements but affording upon occasion, conveniently connected means for controlling the switch when it is desirable for it to be operated by other than the devices provided therefor upon a car, as, for example, when a car unprovided with shifting mechanism, or in station yards where trains are being made up, and where it is oftentimes inexpedient to move the locomotive carrying such shifting mechanism into position to effect the movements of the switch, more especially where the shifting pin is located at a considerable distance from the switch. Locking devices, such as a hasp 54 and a padlock 55, are provided for securing the lever 50' in its disengaged position in order to safeguard the switch from being tampered with by irresponsible or malicious people.

For actuating the switch from a moving car is provided a blade carried by and under the car for encountering the pin 13 when, as before explained, the same is forced up by the car depressing the rail 12. In Fig. 2, such controlling devices are illustrated as adapted to railway train service and are shown in connection with a locomotive, indicated in broken lines, while in Figs. 6, 7 and 8, corresponding devices are shown as applied to a car-truck. Referring to these last mentioned views, 57 represents the blade of spring metal and is secured at one end to a terminally disposed pendent lug 58 of a horizontal bar 58' which is provided centrally of its length with an upright spindle 59 and studs 60 and 60' protruding longitudinally from its respective ends. Said spindle 59 is journaled in a vertically movable standard 61 and also in a bearing 62' of the frame 62 which carries the standard. Upon the spindle 59 is a fixed collar 63 and between which and the bearing 62' is positioned a helical spring 64 tending to maintain the spindle and standard in their uppermost positions, and whereupon the blade 57 will be held at such a height as to enable it to pass over the pin 13 without engaging the same. The standard 59 is provided also with laterally extending lugs 61' which are engaged from above by one of the arms 65' of bell-cranks which are fulcrumed in hangers 66 provided upon the car. The other arms 65' of these bell-cranks are operatively connected by a chain or cable 67 with an arm 68 of a vibratory shaft 69 which is provided with a handle bar 70 and through the medium of which the downward movement of the blade 57 is effected against the action of the spring 64 and a supplementary spring 71 which serves to take up any lost motion and likewise restore said handle bar to its inoperative position.

Rigid upon the spindle 59 is a sprocket wheel 72 for a chain 73 which is operated by

a sprocket wheel 74 secured to an upright spindle 75 journaled in frame-work 76 and provided with an operating arm 77 at its upper end. At the top this frame-work is formed with an arc-plate 76' provided with notches 78 and 78' for engagement with a spring-pressed latch lever 79 fulcrumed to the arm 77. The notches 78 are so disposed as to accommodate the latch lever when the arm 77 has been swung to one side, and the other notches 78' to the opposite side and respectively present the blade 57 at efficient angles of incidence with the travel of the pin 13 to effectually swerve the latter when the blade is depressed, as aforesaid, for engaging the pin. To secure the blade in such positions I provide below the car body two frames 80 formed with suitably arranged notches 81 for the reception of the aforesaid studs 60 or 60' as the case may be.

The operation of the invention may be explained as follows: When the wheel-flanges of a car in its travel toward the switch, encounters the rail 12 it depresses the same to effect the elevation of the pin 13, as shown in Fig. 8, and thereby affording means through which the switch may be opened or closed to properly direct the on-moving car or train. Assuming that the switch has to be altered as will be indicated to the operator upon the car, by the hereinbefore explained signal devices, sufficiently in advance of the arrival of the train at the pin to allow the operator, manipulating through the arm 77 and the connecting mechanism, to swing the blade 57 into proper position for engaging the pin in such manner as to swerve the latter for accomplishing the desired movement of the switch-point. If the car is traveling in the direction denoted by the arrow in Figs. 6 and 7, then the latch lever 79 should be brought into register with one or the other of the notches 78 which are arranged to have the blade-securing lug 60' of the bar 58' in advance so that when the blade is thrust down by operating the controlling lever 70 into engageable position with said pin 13, the stud 60 will have entered the proper one of the notches 81 and thus rigidly hold the bar against horizontal oscillation, while the resiliency of the blade will accommodate itself to effect the movement of the pin and coincidentally the switch-point. Should the car, however, be moving in the opposite direction, the bar 58' is swung end for end by manipulating the arm 77 to bring said latch lever into register with one or the other of the notches 78'. When the switch is properly set, the operating devices upon the car would obviously be left undisturbed.

It is to be noted that the elevation of the pin 13, through which the switch is influenced, is mechanically brought into operative position by the mechanism on the car,

and so likewise is the locking lever caused to operate and be retained in such operative condition until the car or train has passed beyond the end of the controlling rail 25 for the locking devices, and human agency 70 is required only in adjustably moving the shifting appliances provided upon the car. When the switch is changed the semaphore signal devices are correspondingly varied through the offices of the cables and other mechanical elements as explained in the foregoing specification. The offices and operation of the devices for actuating the switch from the side of the track will also be understood from the preceding description.

Among the advantages of the present improvements is the provision of means for the safeguarding of a train against accident while passing over a switch; the coupling of the several operating and signal members so as to act in unison; the provision of means for operating the switch for trains unprovided with operating devices; and, generally, in the simplifying and perfecting of the various factors employed for the accomplishing of their several functions, and for operating them as nearly automatically as possible.

Having described my invention, what I claim is,—

1. The combination with a railway-track provided with switch-points, mechanism connected with said points and including a pin which is normally in inoperative position, a car, means actuated by a wheel of the car for disposing the pin in operative position, a bar swinging upon the car, means for alternately actuating said bar for effecting the alternate movement of the switch points, and means for locking said bar in either of its adjusted positions.

2. The combination with a railway-track provided with switch-points, mechanism connected with said points and including a pin which is maintained normally in inoperative position, a car, means actuated by the wheel of the car for disposing the pin in operative condition, means for locking the switch-points in set positions, a bar swinging upon the car whereby the pin is alternately engaged for effecting the alternate movements of said switch-points, and means for locking said bar in either of its adjusted positions.

3. The combination with a railway-track provided with switch-points; mechanism connected with said points and including a pin which is normally in inoperative position, a car, and means actuated by a wheel of the car for elevating the pin into operative condition, of mechanism upon the car whereby the pin is engaged for effecting the movements of said switch-points, such mechanism comprising a vertical spindle provided

with a horizontal bar at its lower end and arranged for rotation, a blade secured to one end of said bar, a spring serving to retain the spindle in its uppermost position, means for  
 5 depressing the spindle, and means for effecting the rotation of the spindle.

4. The combination with a railway-track provided with switch-points, mechanism connected with said points and including a  
 10 pin which is normally in inoperative position, a car, means actuated by a wheel of the car for elevating the pin into operative condition, and means for locking the switch-point in set positions, of mechanism upon  
 15 the car whereby the pin is engaged for effecting the movements of said switch-points, such mechanism comprising a vertical spindle provided with a horizontal bar at its lower end and arranged for rotation, a blade  
 20 secured to one end of said bar, a spring serving to retain the spindle in its uppermost position, means for depressing the spindle, and means for effecting the rotation of the spindle.

5. The combination with a railway-track provided with switch-points, mechanism connected with said points and including a  
 25 pin which is normally in inoperative position, a car, means actuated by a wheel of the car for elevating the pin into operative condition, and means for locking the switch-point in set positions, of mechanism upon  
 30 the car whereby the pin is engaged for effecting the movements of said switch-points, such mechanism comprising a vertical spindle provided with a horizontal bar at its lower end and arranged for rotation, a blade secured to one end of said bar, a spring serving to retain the spindle in its uppermost position, means including a lever for depressing  
 40 the spindle, means for effecting the rotation of the spindle, and a rack provided with notches arranged to secure the spindle in various rotary positions.

6. The combination with a railway track including switch points, of a block, a device movable with the block and arranged to be maintained in inoperative position, connecting means between the switch points and  
 50 said movable device, a car running upon said track, a device swinging upon said car and adapted to be alternately moved into the path of said movable device, means carried by the car for actuating said swinging device, and means carried by the car for locking the  
 55 swinging device in either of its positions.

7. The combination with a railway track including switch points, means operated by the wheels of the car for securing the switch  
 60 points from displacement, a block, a device movable with the block and arranged to be maintained in inoperative position, connecting means between the switch-points and said movable device, a car running upon said  
 65 track, a device swinging upon said car, and

adapted to be alternately moved into the path of said movable device, means carried by the car for actuating said swinging device, and means carried by the car for locking the swinging device in either of its positions. 70

8. The combination with a railway track including a switch point, a semaphore, device, a block, a device movable in the block and arranged to be maintained in inoperative position, connecting means between the switch points and said movable  
 75 device, connecting means between said semaphore device and the connecting means of said movable device, a car running upon the track, a device swinging upon said car and adapted to be alternately moved into the path of said movable device, and means carried by the car for actuating said swinging device. 80

9. The combination with a railway track including switch points, an actuating device, means operative by the wheels of a car for maintaining the switch points from displacement, a block, a device movable in the block and arranged to be maintained in inoperative position, connecting means between the switch points and said movable  
 90 device, connecting means between said actuating device and the connecting means of said movable device, a car running upon said track, a device swinging upon said car and adapted to be alternately moved into the path of said movable device, means carried by the car for actuating said swinging device, and means carried by the car for locking the swinging device in either of its positions. 100

10. The combination with a railway track including switch points, means for securing the switch points from displacement, a car movable upon said track, means carried by said car for actuating said switch point securing means, connecting means between the switch securing means and the actuating device, and means for operating the switch  
 110 points independently of the operating means carried by the car.

11. The combination with a railway track including switch points, means for securing the switch points from displacement, an actuating device, connecting means between the switch points and said actuating device, a car movable on said track, means carried by said car for operating said switch points and the actuating device connected there-  
 120 with, and means for operating the switch points and actuating device independently of the operating means carried by the car.

12. The combination with a railway track, a switch-point, a block, mechanical connections between the block and said point, and means actuated by the wheel of a car for rendering the block capable of being engaged by devices upon the car, of said devices comprising a blade secured at one end  
 130

to a bar arranged for rotation, means whereby said bar is rotated, means whereby the bar is depressed into position to engage the block, and means whereby the bar is locked  
5 when depressed in various predetermined rotary positions.

13. The combination with a railway track, a switch-point, means actuated by the wheel of a car for securing the point against accidental displacement, a block, mechanical  
10 connections between the block and said point, and means actuated by the wheel of a car for rendering the block capable of being engaged by devices upon the car, of  
15 said devices comprising a blade secured at one end to a bar arranged for rotation, means whereby said bar is rotated, means whereby the bar is depressed into position to engage the block, and means whereby the bar is  
20 locked when depressed in various predetermined rotary positions.

14. The combination with a railway track including switch points, a frame connected to the road bed of said track, a block slidable in said frame, a pin carried by said  
25 block, connecting means between said block and the switch points, a car movable on said track, means carried by said car for operating said pin, means operative by the  
30 wheels of said car for securing the switch points from displacement, a bar mounted to swing upon said car, and means carried by said car to operate said bar to cause the same to be alternately disposed relative to said  
35 pins.

In testimony whereof I affix my signature in presence of two witnesses.

PHILIP D. HIBNER.

Witnesses:

PIERRE BARNES,  
CHAS. E. S. BURCH.