

(No Model.)

2 Sheets—Sheet 1.

E. B. GIBSON.
RAILROAD CROSSING.

No. 482,352.

Patented Sept. 13, 1892.

FIG. 1.

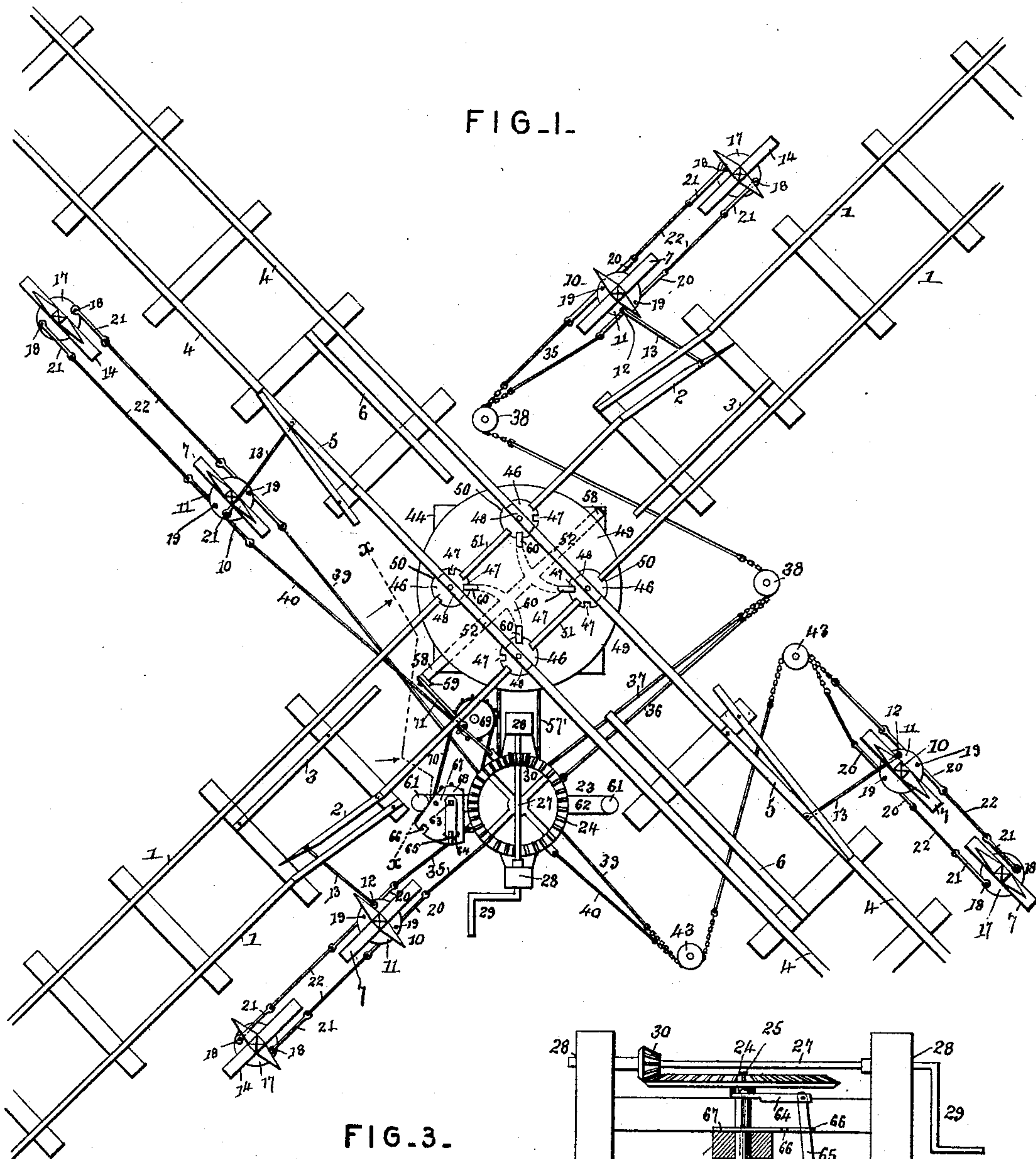
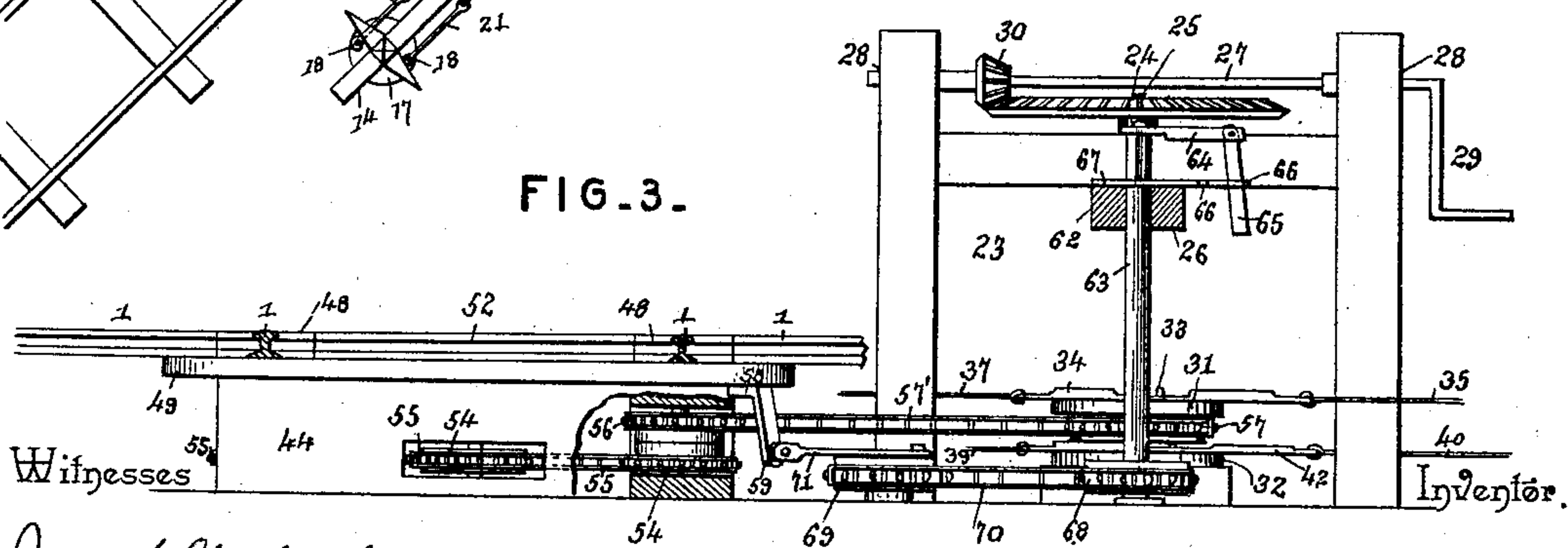


FIG. 3.



Witnesses
Jas. K. McLathran

W. S. Duwall.

By his Attorneys,

Ezra B. Gibson

C. A. Snow & Co.

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2 Sheets—Sheet 2.

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FIG. 2.

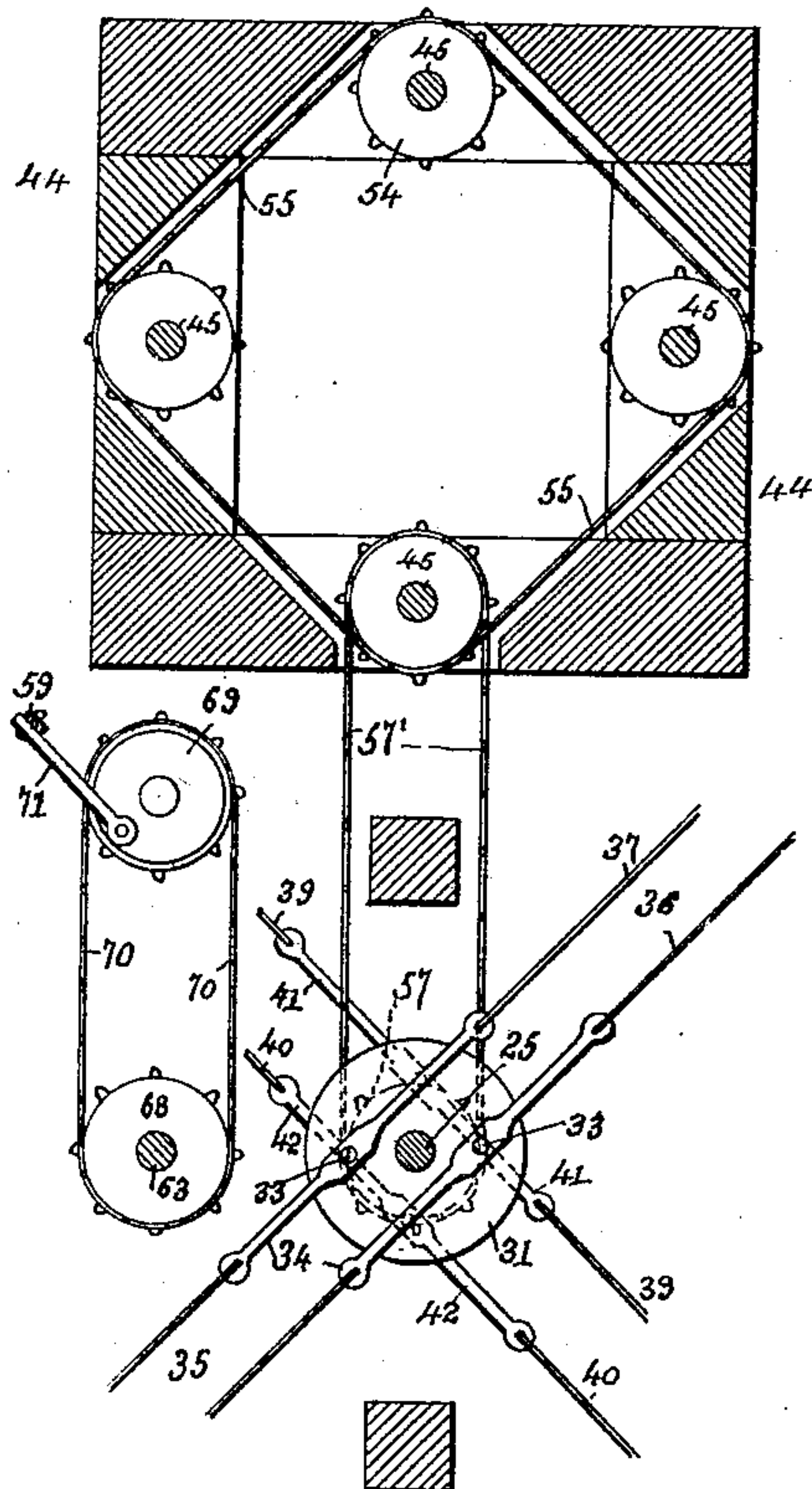
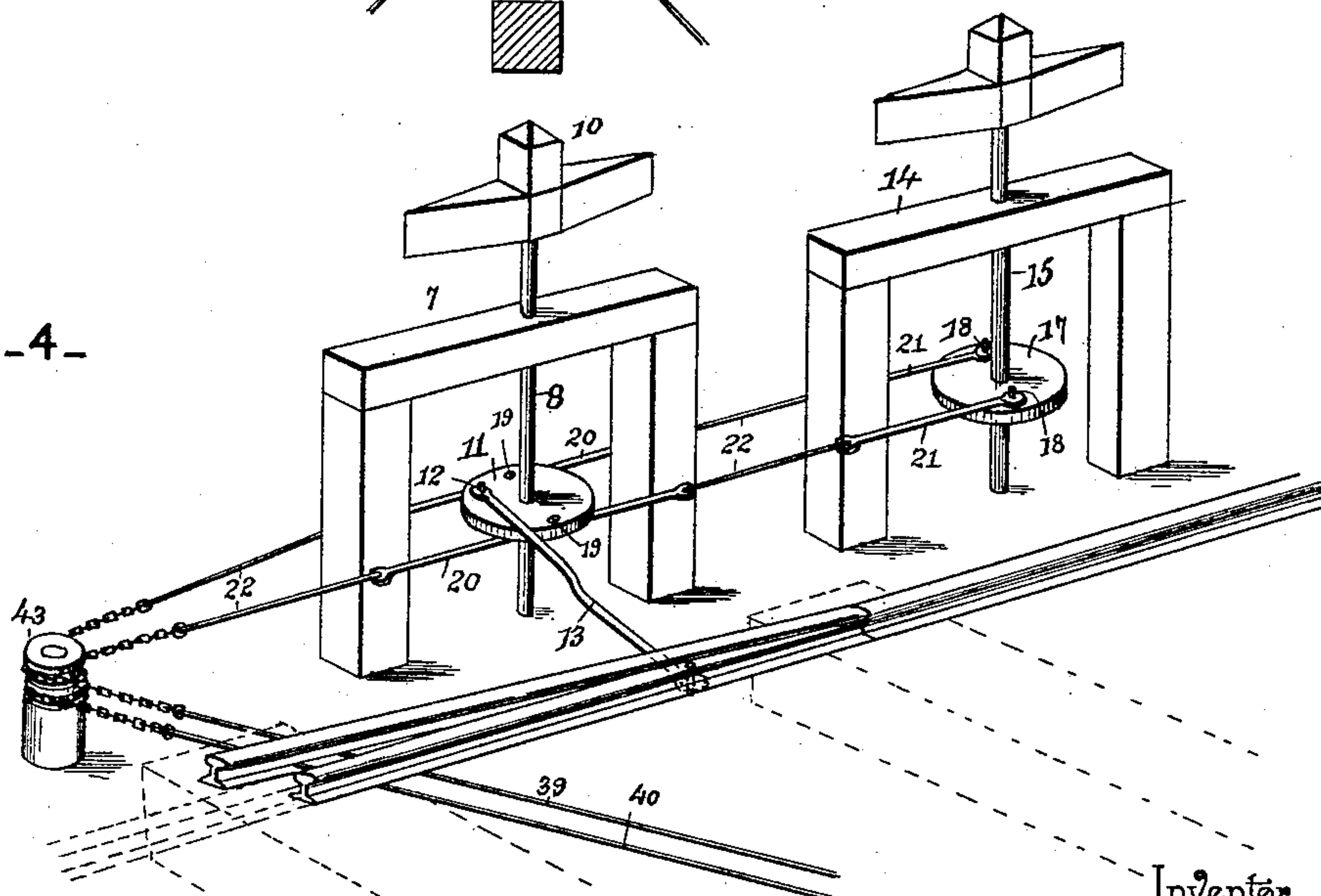


FIG. 4.



Witnesses

Inventor

Jas. K. McLathran

Ezra B. Gibson

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By his Attorneys,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

EZRA B. GIBSON, OF CADILLAC, MICHIGAN, ASSIGNOR OF ONE-FOURTH TO
HARRY WOOD, OF SAME PLACE.

RAILROAD-CROSSING.

SPECIFICATION forming part of Letters Patent No. 482,352, dated September 13, 1892.

Application filed November 28, 1891. Serial No. 413,424. (No model.)

To all whom it may concern:

Be it known that I, EZRA B. GIBSON, a citizen of the United States, residing at Cadillac, in the county of Wexford and State of Michigan, have invented a new and useful Inter-locker or Railroad-Crossing, of which the following is a specification.

This invention relates to improvements in railway-crossings, the objects in view being to provide an improved crossing to be employed at the intersection of two roads running at an angle to each other, and to so arrange said crossing that it will be impossible for the train of one road to cross the track of another at the same time that a train of the other road is crossing, even though negligence upon the part of the crossing attendant should take place.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a plan of a crossing constructed in accordance with my invention. Fig. 2 is a partial plan and horizontal section, the power-gearing and cover of crossing removed. Fig. 3 is a transverse section on line *x x*, Fig. 1, through the crossing-timbers, the power being viewed in side elevation. Fig. 4 is a detail in perspective of the short shifting rail-sections and their supports.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 designates the main rail of what I shall for the purpose of convenience term the "north" and "south" tracks of a given road. 2 designates the switch-rail, and 3 the guard-rails thereof.

4 designates the main rails of the east and west bound tracks, 5 the switch-rails, and 6 the guard-rails.

Opposite the switch-rail of each track—north, east, south, and west—is located a switch-stand 7, having a vertical switch-mast 8, terminating at its upper end in a day and night target 10, adapted to display the usual colors for open and closed switches. A disk 11, secured to the mast, carries a pin 12, and to the same is loosely connected the outer

end of a switch-rod 13, the inner end being loosely connected with the adjacent switch-rail.

Some distance from each of the switch-stands signal-stands 14 are located, in each of which is journaled a vertical mast 15, carrying at its upper end day and night signals of ordinary construction. Near the lower end of the mast a disk 17 is mounted, and at diametrically-opposite sides thereof pins 18 are located, corresponding with similar pins 19, located upon the under side of each of the disks 11. Pivotal links 20 are connected at their centers with the pins 19, and similar links 21 are connected at their rear ends loosely with the pins 18 of the disks 17, and the inner ends of the links 20 and 21 are connected by wire rods 22. Between the east and south tracks there is in this instance located a framework 23, comprising opposite vertical posts and an intermediate table supported by the posts. Upon the table there is located a gear-wheel 24, which is keyed to the upper end of a vertical shaft 25, journaled in the table and in a bearing 26, located under the table. A transverse or horizontal shaft 27 is mounted for rotation in the bearings 28, formed in the opposite posts, above the gear 24, one end of said shaft beyond one of the bearings being provided with cranks 29, while near the other end thereof there is mounted on the shaft a small gear or pinion 30, the teeth of which engage with those of the gear 24, and therefore by the rotations of the shaft through the medium of its crank, rotary motion is imparted to the vertical shaft 25. The vertical shaft 25 supports an upper disk 31 and a lower disk 32. The upper disk has at diametrically-opposite sides upon its upper face bearing-pins 33, and links 34 are perforated at their centers to loosely engage over the same. Wire cables 35 connect the ends of said links with the adjacent ends of the links 20, attached to the disk 11 of the south-bound track, while a pair of cables 36 and 37 connect the opposite ends of the links with the ends of the links 20 of the north-bound track, and between such connections the cables are passed about suitable guide-pulleys 38, journaled loosely upon standards arranged at op-

posite sides of the north-bound track. These cables are composed principally of wire twisted into a cable, and at those points thereof at which the pulleys are crossed chain sections are provided. Cables 39 and 40 lead from the inner ends of the links 20 of the east and west tracks to the opposite ends of links 41, that are loosely pivoted at their centers upon the pins 42 of the lower disks 32 upon the shaft 25, and those cables 39 and 40 that lead to the links 20 of the east track are passed about guide-pulleys 43, located at opposite sides of the east track. These cables, like the cables 36 and 37, are composed of wire, with chain sections at those points that pass about the pulleys.

A rectangular frame 44 is located at the crossing of the rails below the same, the four angles of the frame occurring coincident with the four tracks, and beneath each intersection of the rails of the four tracks there is journaled in the frame a vertical shaft 45. These shafts at their upper ends have rigidly mounted thereon small disks 46, and each disk is provided with a pair of notches 47, formed in its inner periphery, and also carries a small shifting section 48 of track. A cover 49 fits upon the frame 44 and is provided coincident with the disks 46 with circular openings 50, through which the disks extend, whereby they are flush with the cover. Between each pair of disks short track-sections 51 of the north and south bound tracks and similar sections 52 of the east and west bound tracks are located and are adapted through the rotations of the short shifting sections 48 to form continuations of their respective tracks.

The shafts 45 each have mounted thereon within a recess formed in the side of the frame 44 a sprocket-wheel 54, and the four wheels of the series of shafts are connected and encompassed by an endless sprocket-chain 55. That shaft of the series located adjacent to the before-described power is provided with an extra sprocket-wheel 56 and is connected to a similar sprocket-wheel 57, located upon the shaft 25, between the disks 31 and 32, by means of a sprocket-chain 57'. It will now be obvious that movements of the shaft 25 will not only operate to close the switches and open them, but also to display the signals indicating the switches to be opened or closed, and will, furthermore, partially rotate the entire series of shafts 45 in either direction and in accordance with said direction shift the short rails 48 either into alignment with the east and west tracks or north and south tracks, in accordance with the desire of the attendant. It will thus be seen that at no time can both tracks be open and at no time can safety-signals of the two tracks be simultaneously displayed at either side of the crossing, and that when the danger-signal is displayed at one track the safety-signal is displayed at the opposite track. This may constitute the

crossing; but I have deemed it expedient and desirable to devise a means for locking the shifting rails in either of their positions and against any accidental displacement by passing trains or otherwise. This means I will now proceed to describe.

Journaled in the north and south angles of the frame 44, immediately below the cover 49, is a rock-shaft 58, the southern end of which is bent to form a crank-arm 59. Intermediate to its bearings and between each pair of the disks 46 this rock-shaft is provided with laterally-disposed oppositely-curved locking rock-arms 60, the outer ends of which are designed to be thrown into engagement with either of the two notches of the two pairs of disks at the east and west sides of the rock-shaft, and thus lock them, with their rails forming continuations of either line of tracks.

Posts 61 support a cross-bar 62, adjacent to the switch-operating power mechanism, and in the cross-bar a vertical shaft 63 is journaled. This shaft carries at its upper end an arm 64, the outer extremity of which is bifurcated and has loosely fitted therein-between a handle 65, adapted to drop into and interlock with notches 66, formed in the edge of a curved locking-plate 67. A sprocket-wheel 68 is mounted on the shaft 63, near the bottom of the same, and a similar sprocket 69 is journaled for rotation in a double bearing at one side of the cranked end of the rock-shaft and between it and the sprocket-wheel 68, and is connected to the latter by a sprocket-chain 70, so that movement of the shaft 63 is conveyed through the chain 70 to the sprocket 69, and it in turn, being connected by a pitman 71 to the free end of the crank-arm of the rock-shaft, will in its partial rotations convey a rocking motion to the rock-shaft, and thus lock or unlock the arms of the shaft with the notched disks carrying the shifting rail-sections. The operation of locking and unlocking will, as is therefore obvious, necessarily take place previous to any shifting of the shifting rails.

From the foregoing description, in connection with the accompanying drawings, it will be seen that by first unlocking the shifting rails through the mechanism described the crank-shaft of the power may be rotated and in turn conveys motion to each of the signals and switch-targets, turning those of the east and west tracks in one direction, for instance, to indicate a "clear road" and "safety," and those of the north and south tracks to indicate "danger," at the same time properly shifting the switch-rails of each. By again unlocking the shifting rails and giving the crank of the power opposite several rotations the reverse of the described operation takes place, so that an engineer is notified whether he be traveling northward, southward, eastward, or westward, whether the track is continuous, and hence open for travel, or whether it be closed for the passage of a train at an

angle, and in this manner it will be impossible for accidents to occur, even though the switch-tender neglects the duty imposed upon him and fails to shift the mechanism. It will also be seen that the mechanism described is very simple, not liable to wear or be injured by the weather, can be attended solely by one person, and is absolutely infallible.

It will be obvious that gas-pipe or rods may be substituted for the cables running from shaft 25 to the switches and that disks may be substituted for the pulleys. In other words, I do not wish to limit my invention to the exact details of construction herein shown and described.

Having described my invention, what I claim is—

1. In a railroad-crossing, the combination, with the intersecting tracks, of signal-stands located at the side of each track, target-masts journaled in the stands and terminating at their upper ends in signal-targets, disks mounted on the shafts, pins located upon the disks at diametrically-opposite sides of the shafts, a power-frame, a vertical shaft journaled therein, a gear on the shaft, upper and lower disks on the shaft, a transverse operating crank-shaft, a gear mounted thereon, links loosely pivoted at their centers at diametrically-opposite sides of the upper and lower disks of the power, and cables, links, and rods leading from the opposite ends of the links to the pins of the disks of those signal-targets located at the sides of the tracks disposed at a right angle to each other, substantially as specified.

2. The combination, with the intersecting tracks and the switch-rails thereof, of the switch-stands located opposite the switch-rails of the tracks, the switch-masts in the stands, the targets or signals at the upper ends thereof, the disks upon the masts, the switch-rods loosely connected to the switch-rails and to the disks, the power-frame, the vertical shaft therein, the gear at the upper end of the shaft, the transverse shaft terminating in a crank and having a gear for operating the main gear, the upper and lower disks on the gear-carrying shaft, pairs of links pivoted at diametrically-opposite sides of each of the disks of the power-shaft, and cables leading from the ends of one pair of links to the disks upon the switch-stands of the south and north bound tracks and from the other pair to those of the east and west bound tracks, and suitable pulleys located between the tracks, substantially as specified.

3. The combination, with the four intersecting tracks and the switches thereof, of the switch and signal stands located at the side of each track, each comprising a mast terminating at its upper end in a signal and a disk below the same, pitmen connecting the disks of the switch-masts with the switches, links pivoted at diametrically-opposite sides of the disks of each of the masts, rods connecting

the links, a power-frame, a power mechanism mounted in the frame and adapted to rotate, and cables leading from the ends of the links of the switch-stands to said rotatable power mechanism, substantially as specified.

4. The combination, with the four intersecting tracks and their switches, of the switch and signal stands, the masts for the same, the disks on the masts, switch-rods connecting the disks of the switch-stands with the switches, links pivoted to diametrically-opposite sides of the switch-stand disks, links pivoted at their ends to the disks of the signal-masts, rods connecting the two links, a power-frame, a vertical shaft mounted therein, means for operating the shaft, upper and lower disks mounted on said shaft, pairs of links pivotally connected between their ends to diametrically-opposite sides of the upper and lower disks, cables leading from the opposite ends of the links of the upper disk to the links of the switch-disks of tracks running in one direction, and similar cables similarly connecting the remaining lower disk to the pair of angularly-disposed tracks, substantially as specified.

5. The combination, with the four intersecting tracks, of the frame located at said intersection, the vertical shafts mounted in the frame beneath the intersections of the rails, the short shifting rails located at the upper ends of the shafts, sprocket-wheels mounted on the shafts, a sprocket-chain embracing the same, a second sprocket-wheel mounted upon one of the shafts, a power-frame, a winding-shaft therein, means for operating the same, a sprocket thereon, and a sprocket-chain encircling said wheel and connecting with the second sprocket-wheel of the shifting-rail-carrying shaft, substantially as specified.

6. The combination, with the intersecting rails and the intermediate frame, of the vertical shafts beneath the rails, the disks at the upper ends of the shafts, the short shifting rails on the disks and notches formed in the disks, mechanism for simultaneously operating the shifting rails, the rock-shaft journaled in the frame intermediate to the pairs of disks and provided with rock-arms adapted to interlock with the notches of the disks, and means for operating said rock-shaft, substantially as specified.

7. The combination, with the intersecting rails and the intermediate frame, of the vertical shafts beneath the rails, the disks at the upper ends of the shafts, the short shifting rails on the disks and notches formed in the disks, mechanism for simultaneously operating the shifting rails, the rock-shaft journaled in the frame intermediate to the pairs of disks and provided with rock-arms adapted to interlock with the notches of the disks, a frame having a curved notched locking-plate, a shaft journaled in the frame and terminating at its upper end in a crank having a pivoted gravity-handle for locking with the

plate, a sprocket on the lower end of the shaft,
a crank on the rock-shaft, a sprocket located
between the crank of the rock-shaft and that
of the vertical shaft, a pitman connecting the
5 same with the crank of the rock-shaft, and a
sprocket-chain connecting the sprocket car-
rying the pitman with that of the vertical
shaft, substantially as specified.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in 10
the presence of two witnesses.

EZRA B. GIBSON.

Witnesses:

H. M. DUNHAM,
W. E. MCTAGUE.