

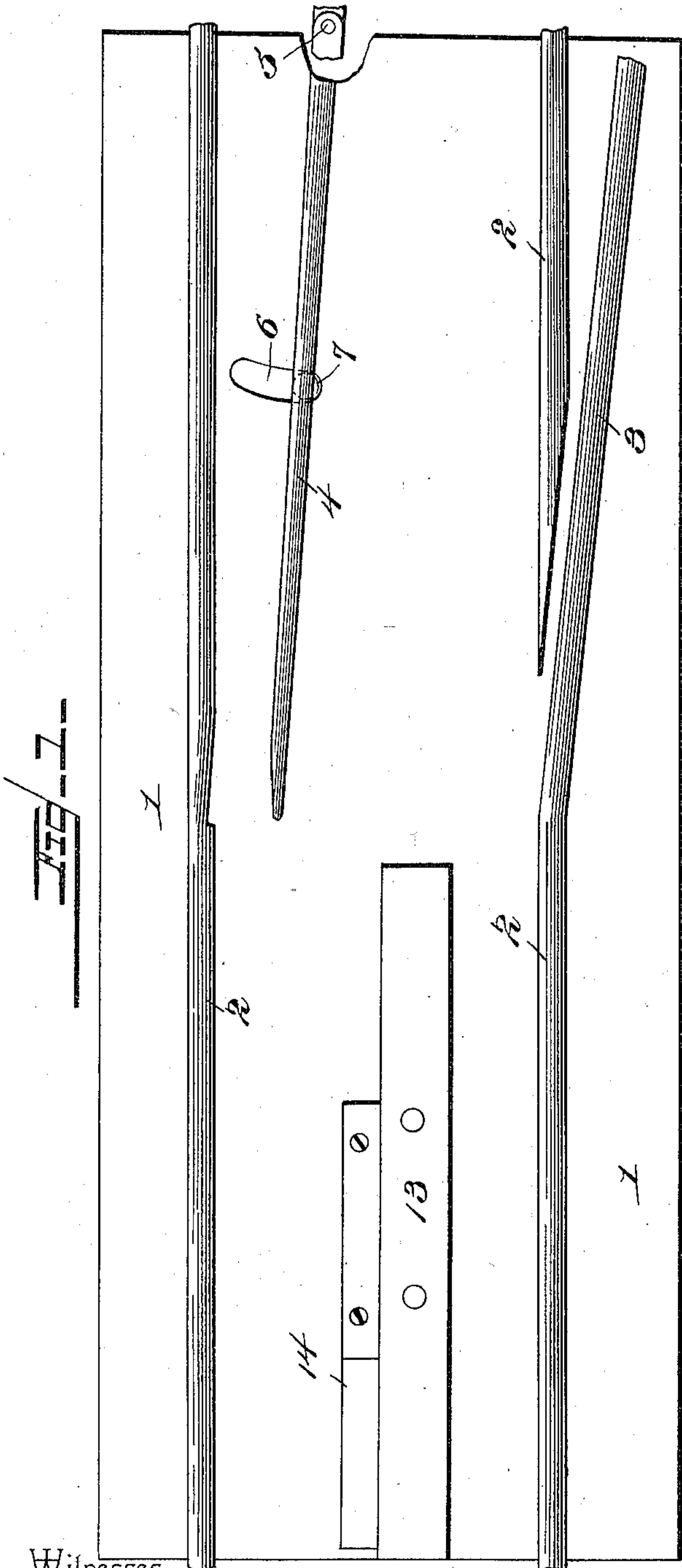
(No Model.)

2 Sheets—Sheet 1.

J. H. GARNER.
AUTOMATIC RAILWAY SWITCH.

No. 598,626.

Patented Feb. 8, 1898.

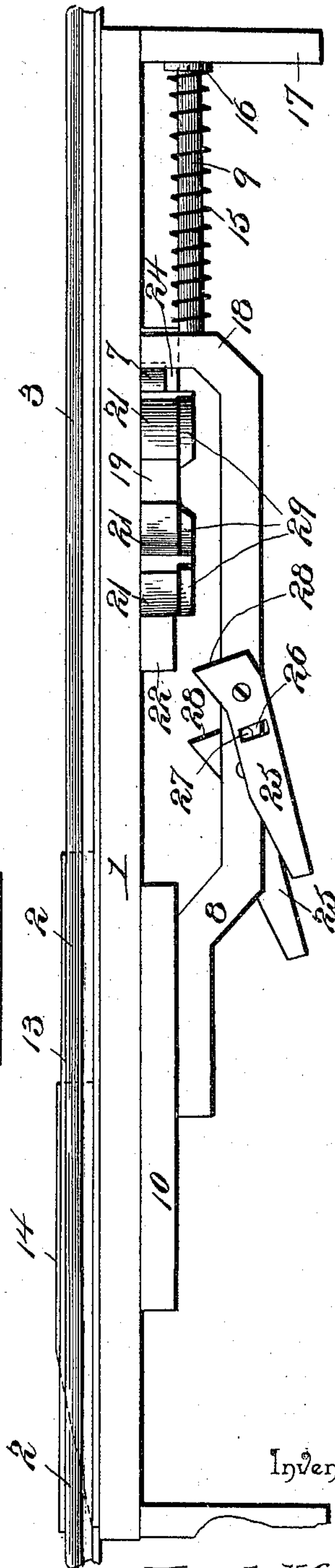


Witnesses

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By his Attorneys,

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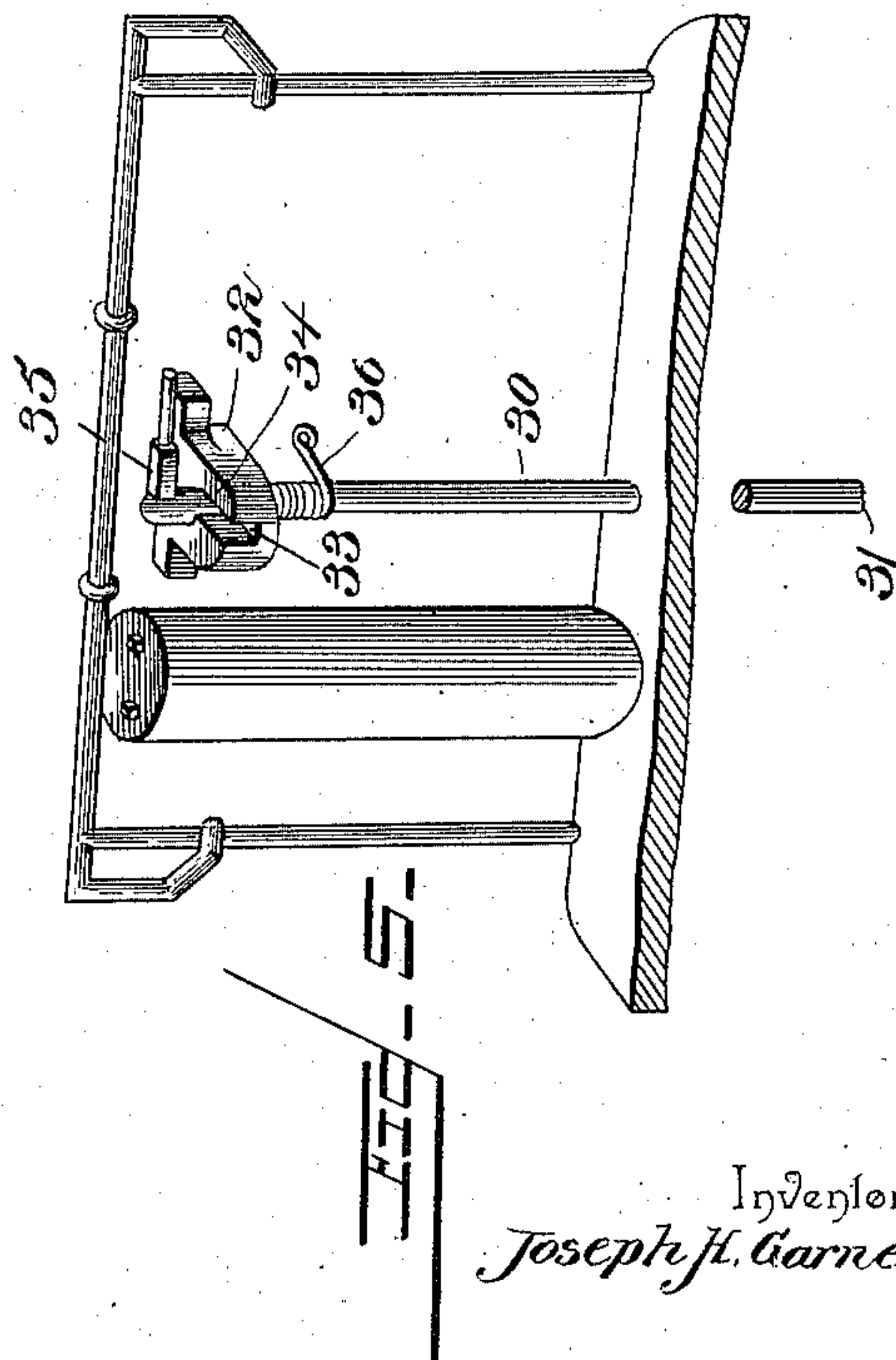
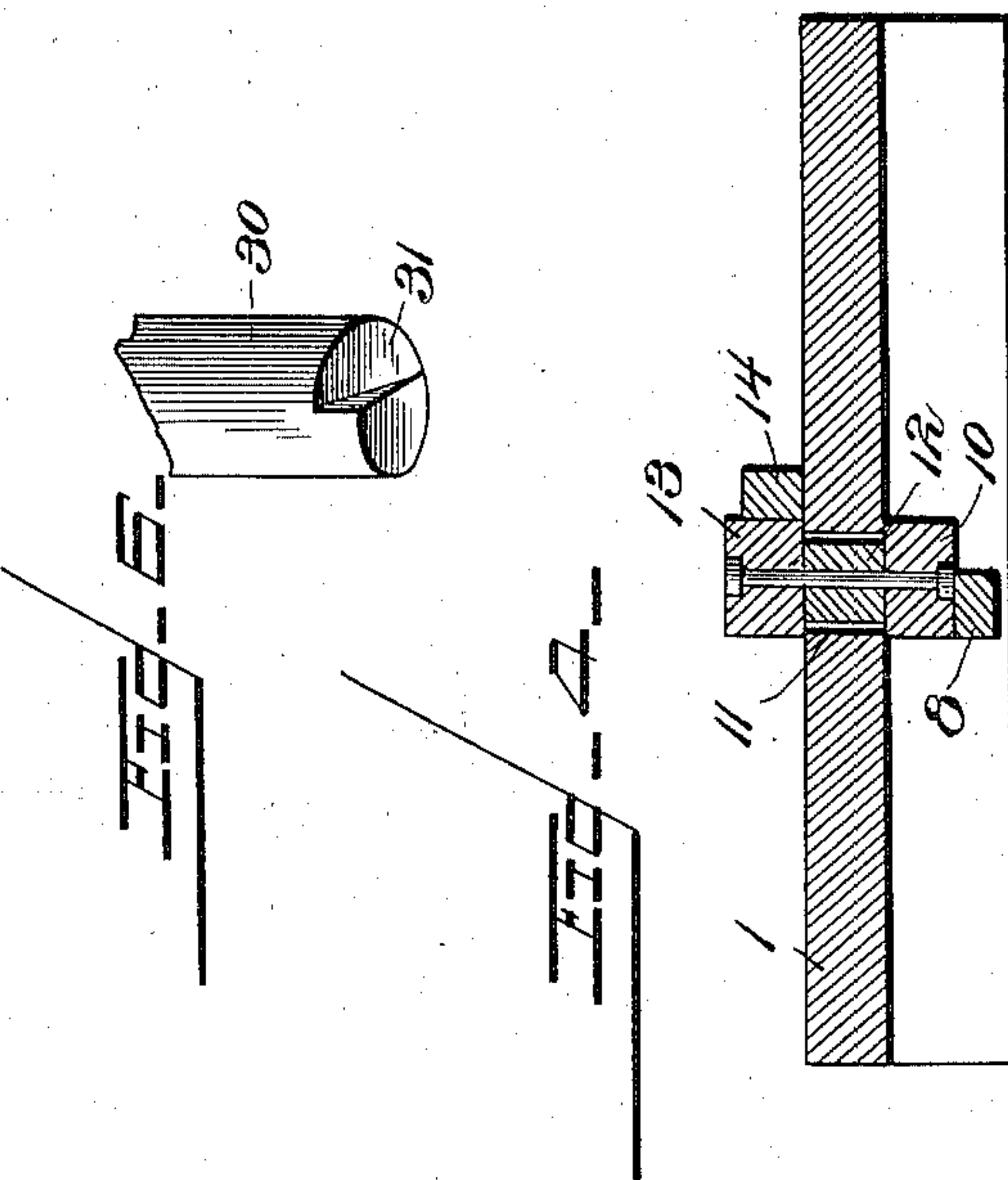
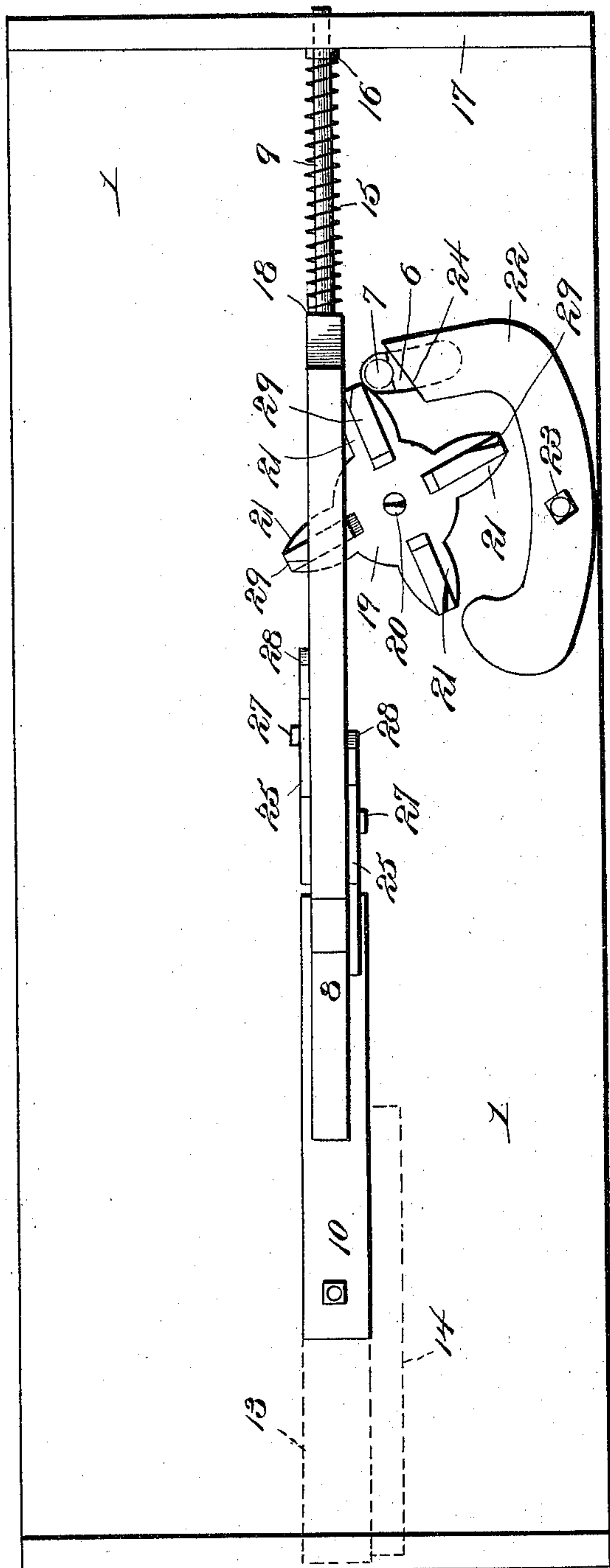
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOSEPH H. GARNER, OF TAMAQUA, PENNSYLVANIA.

AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 598,626, dated February 8, 1898.

Application filed June 26, 1897. Serial No. 642,465. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. GARNER, of Tamaqua, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Railway-Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in automatic railway-switches and operating mechanism therefor.

The object of the invention is to provide a railway-switch which is designed to be automatically shifted by the passage of a car or train when suitable mechanism carried by the said car or train has been properly set by the operator thereof; and, furthermore, the invention aims to provide a railway-switch which shall respond instantly to the operating mechanism, so that the switch may be shifted without the necessity of decreasing the speed of the car or train or otherwise effecting the same in any manner.

With these objects in view the invention consists in the novel construction, combination, and arrangement of parts, as will be hereinafter fully illustrated, described, and claimed.

In the accompanying drawings, Figure 1 is a top plan view of a railway-switch constructed in accordance with the present invention. Fig. 2 is a side elevation thereof. Fig. 3 is a bottom plan view. Fig. 4 is a transverse sectional view on the line 4-4 of Fig. 1. Fig. 5 is a detail perspective view of the mechanism carried by a car or train for operating the shifting mechanism, the portion of the car shown being in section to more fully disclose the mechanism carried thereby. Fig. 6 is a detail perspective view of the lower end of the shaft for contacting with the trip-block to operate the latter during the passage of a car or train.

Similar numerals of reference designate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, 1 designates a bed-plate, which may be of any approved material adapted for the purpose, and mounted on the bed-plate 1 and extending over the

same are the main rails 2 of the railway-track.

3 designates one of the branch rails, which leads into the main line, and 4 the switch-point, which is pivoted at 5 to the bed-plate 1 to permit said point swinging in the usual manner. The bed-plate 1 is provided with a transverse slot 6, which lies beneath the switch-point 4, near the free end thereof, and working within the slot 6 and carried by the point 4 is a guide-pin 7, the lower end of which projects below the underface of the bed-plate 1 for a purpose to be presently stated.

Arranged beneath the bed-plate 1 is a longitudinally-movable shift-bar 8, which is provided at one of its ends with an elongated shank 9, and it will be noted at this point that the body of the shift-bar 8 is out of alinement with the shank 9 and extends downwardly, so as to provide a space between the same and the under surface of the bed-plate 1 for a purpose which will presently appear. The end of the shift-bar 8 opposite to the shank 9 thereof has secured thereto or formed integral therewith a shoe 10, which shoe lies directly beneath and contacts with the under surface of the bed-plate 1, and formed in the bed-plate 1, above the shoe 10, is a longitudinally-extending elongated slot 11, in which works a connecting-block 12, secured to or formed on the shoe 10. A longitudinally-movable trip-block 13 is attached to or formed on the connecting-block 12, so that when the trip-block 13 is moved the connecting-block 12 slides within the elongated slot 11, and rigidly secured to the bed-plate 1, at one side of the elongated slot 11 and adjacent to the trip-block 13, is a guide-block 14, the end of which farthest from the switch-point 4 is inclined, so that the mechanism carried by a car or train may ride over the same for effecting the shifting of the switch. A coiled spring 15 encircles the shank 9 of the shift-bar 8, and it will be observed at this point that the free end of the shank 9 slides within a bearing 16, formed in a transverse rib 17, secured to the under side of the bed-plate 1, and by reason of the shank 9 working within the bearing 16 and the trip-block 13 being secured to the shoe 10 by the connecting-block 12 it is obvious that the shift-bar 8 is retained upon the under side of the bed-plate 1 and

suspended therefrom, but at the same time in a position to move longitudinally along the same for shifting the switch-point 4. The coiled spring 15 is interposed between the rib 17 and a shoulder 18, formed on the shift-bar 8 at the end of the shank 9, and it will thus be seen that as the shift-bar 8 is moved toward the rib 17 the spring 15 is compressed, which is due to the operating mechanism carried by the car or train engaging the trip-block 13; but immediately upon said mechanism being released from engagement with the block 13 the coiled spring 15 forces the shift-bar 8 in a reverse direction and returns the trip-block 13 to its normal position.

A shifting-wheel 19 is journaled to the under side of the bed-plate 1, between the body of the shift-bar 8 and said bed-plate, by a bolt 20 or its equivalent, and said wheel 19 has a series of radially-projecting arms 21, the wheel 19 being journaled sufficiently near to the transverse slot 6, so that the ends of the arms 21 may pass beneath said slot during the rotation of the wheel 19, and thereby contact with the guide-pin 7 for shifting said pin in the slot 6. An escapement 22 is also pivoted by a bolt 23 or its equivalent to the under side of the bed-plate 1 adjacent to the shifting-wheel 19, and the ends of said escapement project at substantially right angles to the body thereof, as clearly shown, the end of the escapement which lies adjacent to the slot 6 being beveled, as shown at 24, so that the guide-pin 7 may slide along said end when in contact therewith. It will also be noted that the arms 21 of the wheel 19 pass between the ends of the escapement 22, and by this means it will be seen that the escapement 22 is swung upon its pivot by reason of the arms 21 contacting with the end of said escapement which is opposite to the beveled end thereof, and by this swinging of the escapement it is apparent that after the guide-pin 7 has been forced to one end of the slot 6 by the arms 21 the arm preceding that which has thus moved said guide-pin will contact with the end of the escapement 22 opposite to the beveled end thereof, and thus swing the escapement upon its pivot, so that the guide-pin 7 will be returned to the end of the slot 6.

A gravity tripping-lever 25 is pivoted to each side of the shift-bar 8, adjacent to the shoe 10; but it will be observed that one of said levers is in advance of the other, and it will also be noted that the pivot of each of the levers 25 is arranged nearer one end thereof than the other end, so that the ends of the levers 25 which are farthest from the pivots thereof will always gravitate and thus place the said levers in their proper operative positions. Each of the levers 25 is provided with a transverse slot 26, and working within each of said slots 26 is a limiting-stud 27, which studs project from the sides of the shift-bar 8, and by reason of the studs 27 working within the slots 26 it will be seen that downward

movement of the levers 25 is limited. The ends of the levers 25 adjacent to the pivots thereof are each provided with an engaging shoulder 28, said shoulders projecting above the upper edge of the shift-bar 8, and formed on the under side of each of the radial arms 21 is a downwardly-extending flange 29, one side of the outer end of each of which is beveled in order that the engaging shoulders 28 when brought into contact with the flanges 29 may readily pass over the outer ends thereof as the shift-bar 8 is moved toward the rib 17 for rotating the shifting-wheel 19.

The parts thus far described pertain solely to the switch; but in order that the switch may be operated from the platform of a car or train without the necessity of leaving the same a vertical shaft 30 is located, preferably, upon the platform of the car and passes through an opening formed therein, so that the lower end of said shaft may project below the platform sufficiently to engage the guide-block 14. To facilitate the engaging of the shaft 30 with the guide-block 14 and also to move the shaft 30 sufficiently to permit the same being free from contact with the trip-block 13, the lower end of said shaft 30 is provided with an inclined surface 31, which lies at one side of the center of said shaft, and the upper end of the shaft 30 passes through a collar 32, which is attached to the dashboard of the car or other suitable locality, so that the said shaft is always retained in a proper operative position. The collar 32 is provided at one side of the opening through which the shaft 30 passes with a recess 33, and the upper edge of the collar 32 at one side of said recess 33 is inclined, as at 34, to permit a handle 35 riding easily thereover, said handle being attached to the shaft 30 and projecting at right angles thereto. A coiled spring 36 encircles the shaft 30 between the collar 32 and the platform of the car, and one end of said spring 36 is secured to the shaft 30, while the other end is attached to the dashboard. The purpose of the spring 36 is not to force the shaft 30 upwardly, but to rotate said shaft, and it will thus be seen that when the shaft 30 has been moved and lowered, so that the handle 35 may enter the recess 33, the spring 36 becomes tightened upon the shaft 30, but by reason of the handle 35 engaging the recess 33 said spring cannot become loosened. This latter movement is only effected when the lower end of the shaft 30 passes up the inclined end of the guide-block 14, and it is evident that the handle 35 is thus elevated, so that the same becomes free from the recess 33, and from the fact that the coils of the spring 36 have become tightened upon the shaft 30 said coils will immediately loosen and the shaft 30 rotate, so that said shaft makes a quarter-revolution, and thereby positions the handle 35 at substantially right angles to the position which it occupies when in the recess 33.

The operation of the herein-described

switch and the shifting mechanism therefor will be readily seen by those skilled in the art. The shaft 30, in order to shift the switch, is forced downwardly and the handle 35 thereof is placed within the recess 33. The lower end of the shaft 30 is thereby so placed that the inclined surface 31 thereof is in direct alinement with the inclined end of the guide-block 14. When the car or train has approached sufficiently near to the switch that the lower end of the shaft 30 may contact with the trip-block 13, it will be seen that further movement of the car or train toward the switch will move the trip-block 13 forwardly and to a sufficient extent so as to cause the shift-bar 8 to be also moved forwardly against pressure of the coiled spring 15, which movement compresses said coiled spring. As the shift-bar 8 is thus moved the engaging shoulder 28 of one of the tripping-levers 25 is brought into contact with the downwardly-projecting flange 29, carried by one of the radial arms 21, and as the bar 8 continues its forward movement the wheel 19 is partially rotated, so that the arm 21 which is adjacent to the end of the escapement 22 opposite to the beveled end thereof will be swung toward the shift-bar 8. This swinging of the arm 21 causes the beveled end of the escapement to move toward the shift-bar 8, and by reason of said beveled end contacting with the guide-pin 7 the latter is shifted in the slot 6, which movement turns the switch-point 4 to such an extent that the car or train may continue its passage over the switch and along the main line. If the switch be in the position just described before the shaft 30, carried by the car, contacts with the trip-block 13, it is evident that the forward movement of the trip-block 13 will be the same and also the forward movement of the shift-bar 8. It will be seen that one of the tripping-levers 25 will contact with the flange 29, depending from one of the radial arms, and it is also evident that the shifting-wheel 19 will be partially rotated; but in lieu of the beveled end of the escapement 22 moving the guide-pin 7, as previously described, the radial arm 21 which is in advance of that engaged by the tripping-lever 25 will contact with the guide-pin 7 and move the same to the opposite end of the transverse slot 6. This movement of the pin 7 causes the switch-point 4 to swing toward the main rail 2, which is adjacent thereto, and hence the switch-point 4 is in such position that the car will be shifted from the main line to the branch line. The shifting of the switch-point 4 occurs during the period between the first contact of the lower end of the shaft 30 and the time that the shaft 30 has been moved upwardly sufficiently by reason of the inclined surface 31 thereof riding up the beveled end of the guide-block 14 to release the handle 35 from the recess 33, and immediately upon the release of said handle it will be seen that the latter swings around at substantially right angles to its former position,

and the lower end of the shaft 30 is sufficiently above the guide-block 14 as to move thereover. When the handle 35 has been elevated to a sufficient extent as to be opposite the inclined portion 34, it will be seen that as the shaft 30 is rotated by the spring 36 said handle rides upon the inclined portion 34 and thus elevates the lower end of said shaft. After the shaft 30 has become released from the trip-block 13 the pressure of the spring 15 forces the shift-bar 8 rearwardly and away from the rib 17, so that the trip-block 13 is returned to its normal position for engagement by another car or train as the latter passes over the main line.

From the foregoing description it is apparent that the herein-described improvements provide a railway-switch which is entirely automatic in its operation after the shaft 30 has been properly set upon the car or train, and it will further be seen that the invention may be constructed with little difficulty and is applicable to various kinds of roads. It will also be noted that the mechanism beneath the bed-plate 1 must necessarily be inclosed within a chamber in order that the same may freely operate without liability of being affected by the earth immediately adjacent thereto, and it will of course be understood that the invention is susceptible of various changes in the form, proportion, and minor details of construction, which may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In an automatic switch, the combination of a switch-point, a shifting-wheel adapted to actuate the switch-point in one direction, an escapement mounted adjacent to the shifting-wheel and adapted to be operated thereby to move the switch-point in the opposite direction, and means for operating the shifting-wheel, substantially as described.

2. In an automatic switch, the combination with a switch-point, a shifting-wheel adapted to shift the switch-point, a longitudinally-reciprocating shift-bar and a trip-lever carried by the shift-bar and arranged to engage the shifting-wheel to rotate the latter when the shift-bar is moved, substantially as described.

3. In an automatic switch, the combination of a switch-point, a shifting-wheel arranged to shift the switch-point, a longitudinally-reciprocating shift-bar, and a pair of pivotally-mounted trip-levers carried by the shift-bar and arranged to engage and rotate the shifting-wheel, one of the levers being arranged in advance of the other, substantially as and for the purpose described.

4. In an automatic switch, the combination of a switch-point, a shifting-wheel, a longitudinally-reciprocating shift-bar, a trip-block carried by the shift-bar and adapted to be operated by a car or train during the passage

of the same, and trip-levers pivotally mounted on the shift-bar and arranged to engage and rotate the shifting-wheel, substantially as described.

5. In an automatic switch, the combination of a switch-point, a longitudinally-reciprocating shift-bar, a shifting-wheel provided with radially-projecting arms beveled at the ends, and trip-levers mounted on the shift-bar, and means to engage the radial arms for rotating the shifting-wheel, substantially as described.

6. An automatic switch, comprising a switch-point, a shift-bar arranged in suitable relation to the switch-point, a shifting-wheel journaled between the switch-point and the shift-bar, an escapement pivoted adjacent to the shifting-wheel and adapted to be operated thereby, suitable connections between said escapement and the switch-point, whereby when the wheel is rotated the switch-point is shifted, and means carried by the shift-bar for rotating the shifting-wheel when said shift-bar is moved, substantially as described.

7. An automatic switch, comprising a switch-point, a shift-bar arranged in suitable relation to said switch-point, a shifting-wheel journaled between the switch-point and the shift-bar and provided with radially-projecting arms, an escapement pivoted adjacent to the shifting-wheel and adapted to be operated by the arms thereof when said wheel is rotated, suitable connections between the escapement and the switch-point whereby the latter is shifted when the escapement is operated, trip-levers carried by the shift-bar and adapted to contact with the arms of the shifting-wheel to rotate the latter when the shift-bar is moved, and means for operating said shift-bar during the passage of a car or train, substantially as described.

8. An automatic switch, comprising a switch-point, a shift-bar arranged in suitable relation to said switch-point, a shifting-wheel journaled between the switch-point and the shift-bar and provided with radially-projecting arms, an escapement pivoted adjacent to the shifting-wheel and adapted to be operated by the arms thereof when said wheel is rotated, suitable connections between the escapement and the switch-point, whereby the latter is shifted when the escapement is operated, trip-levers carried by the shift-bar and adapted to contact with the arms of the shifting-wheel to rotate the latter when the shift-bar is moved, means for operating said shift-bar during the passage of a car or train, and means for returning the shift-bar to its normal position, substantially as described.

9. An automatic switch, comprising a switch-point, a shift-bar arranged in suitable relation to the switch-point, a shifting-wheel journaled between the switch-point and the shift-bar, radially-projecting arms formed on said wheel, an escapement pivoted adjacent to the shifting-wheel, suitable connections between said escapement and the switch-point whereby said point is shifted when the

escapement is operated, the arms of the shifting-wheel being adapted to operate said escapement when said wheel is rotated, a series of gravity trip-levers carried by the shift-bar and adapted to contact with the arms of the shifting-wheel for rotating the latter, and means for operating said shift-bar, substantially as described.

10. An automatic switch, comprising a bed-plate, a switch-point pivoted on said bed-plate, a shift-bar arranged on the under side of the bed-plate and in suitable relation to the switch-point, a shifting-wheel journaled to the bed-plate, radially-projecting arms formed on said shifting-wheel, an escapement also pivoted to the bed-plate and adjacent to the shifting-wheel, said escapement being adapted to be operated by the arms of the shifting-wheel, suitable connections between said escapement and the switch-point, whereby the latter is shifted when the link is operated, a series of gravity trip-levers carried by the shift-bar and adapted to engage the shifting-wheel to rotate the latter when the shift-bar is operated, means for operating the shift-bar during the passage of a car or train, and means for returning the shift-bar to its normal position, substantially as described.

11. In an automatic switch, the combination of a switch-point, a sliding trip-block, connections between the trip-block and the switch-point, a stationary guide-block arranged at one side of the trip-block and having an inclined face, and a shaft or rod designed to be carried by a car and arranged to engage the trip-block to slide the same, said shaft or rod being provided at one side of its lower end with an inclined portion projecting laterally beyond the trip-block and arranged to ride up the inclined face of the stationary inclined block, whereby it is disengaged from the trip-block, substantially as described.

12. An automatic switch, comprising a switch-point, an inclined guide-block and a slidably-mounted shift-bar parallel thereto and operatively connected with said switch-point for shifting the latter, in combination with a shaft carried by a car or the like having a portion of its lower end provided with an inclined surface adapted to slide upon said guide-block and to engage said shift-bar, and means for rotating said shaft after it has passed up upon said guide-block, as and for the purpose described.

13. An automatic switch, comprising a switch-point, an inclined guide-block and a slidably-mounted shift-bar parallel thereto and operatively connected with said switch-point for shifting the latter, in combination with a shaft carried by a car or the like and having a portion of its lower end provided with an inclined surface, a collar secured to a stationary part of said car through which said shaft passes and provided with a recess in its upper surface leading outwardly from the opening provided for the passage of said shaft, a handle upon the upper end of said

shaft adapted to fit within said recess, and a spring secured to a stationary part of the car and to said shaft for rotating the latter and holding the same normally in inoperative position, as and for the purpose described.

14. In an automatic switch, the combination of a switch-point having a pin, a shifting-wheel adapted to engage the pin at one side thereof, an escapement engaging the pin at the opposite side thereof and adapted to be operated by the shifting-wheel, and means for operating the shifting-wheel, substantially as described.

15. In an automatic switch, the combination of a switch-point having a pin, a shifting-wheel provided with radial arms and arranged to engage the pin at one side thereof, an escapement pivoted between its ends, having one of its ends engaging the other side of the pin and having its other end arranged to be engaged and operated by the shifting-

wheel, and means for operating the latter, substantially as described.

16. In an automatic switch, the combination of a switch-point, a shifting-wheel adapted to directly engage and actuate the switch-point in one direction, an escapement pivotally mounted between its ends and having one end arranged to engage and move the switch-point in the opposite direction, the other end of the switch-point being arranged to be engaged and actuated by the shifting-wheel, and means for operating the shifting-wheel, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOSEPH H. GARNER.

Witnesses:

LEVI I. SCHUFFLER,
JOHN H. LUTZ.