

No. 810,828.

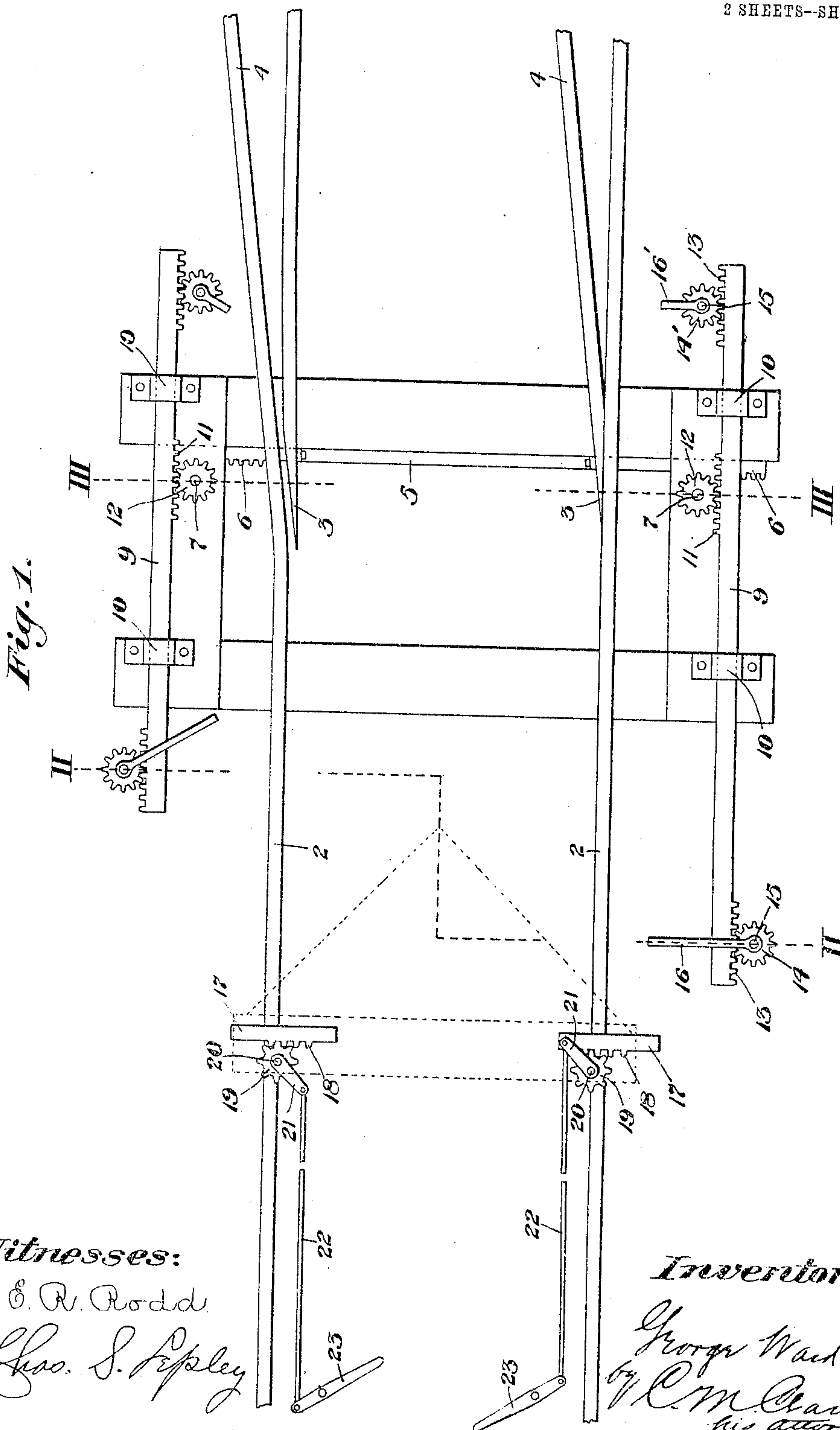
PATENTED JAN. 23, 1906.

G. WARD.

SWITCH OPERATING MECHANISM.

APPLICATION FILED AUG. 31, 1905.

2 SHEETS--SHEET 1.



*Witnesses:*

G. R. Rodd.

Chas. S. Sibley

*Inventor:*

George Ward

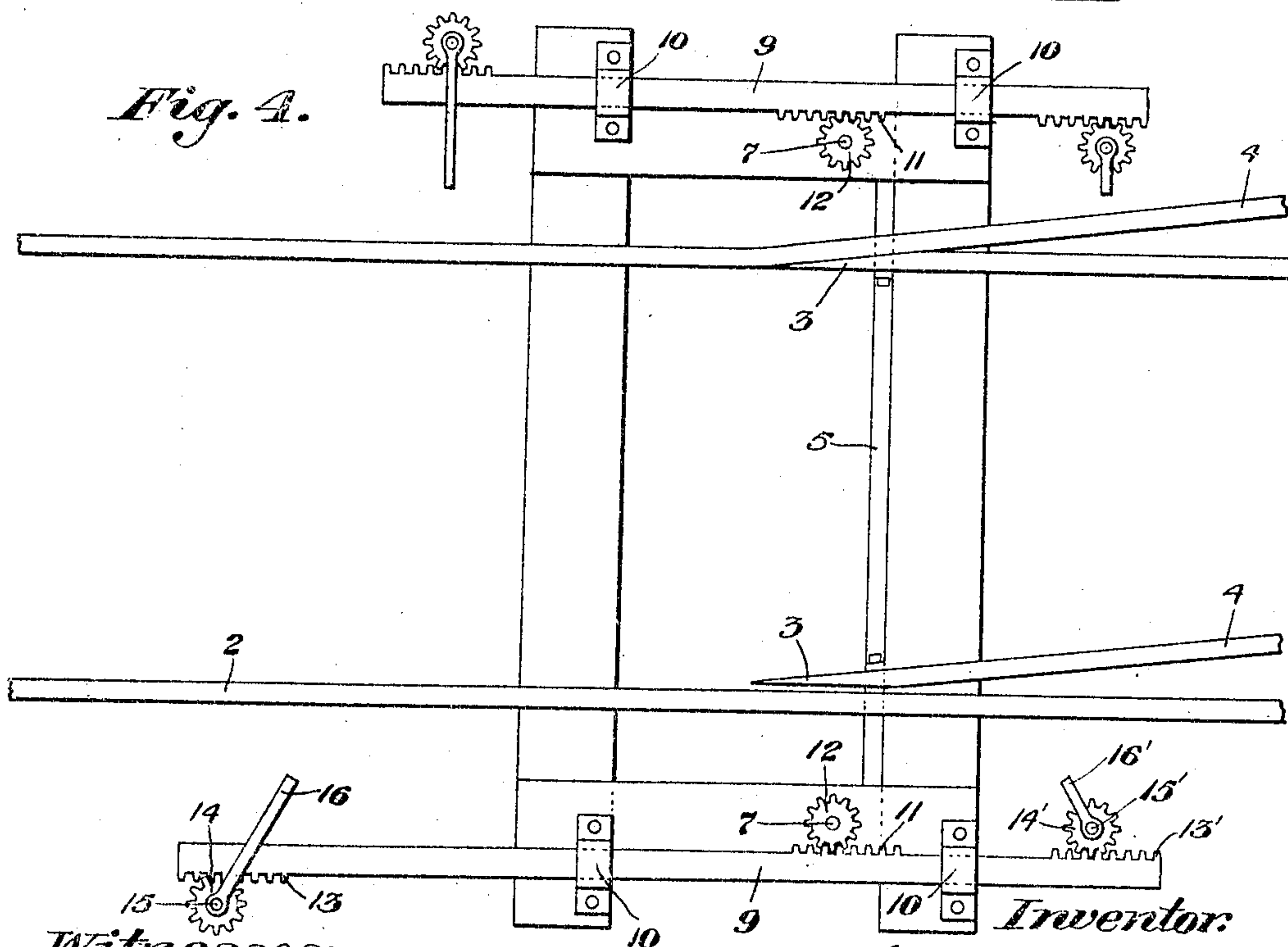
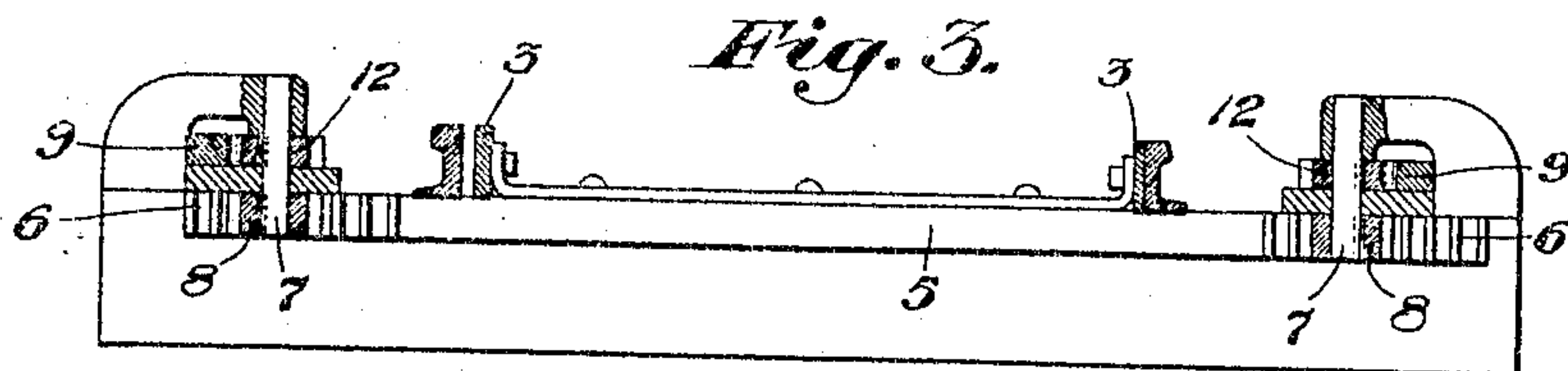
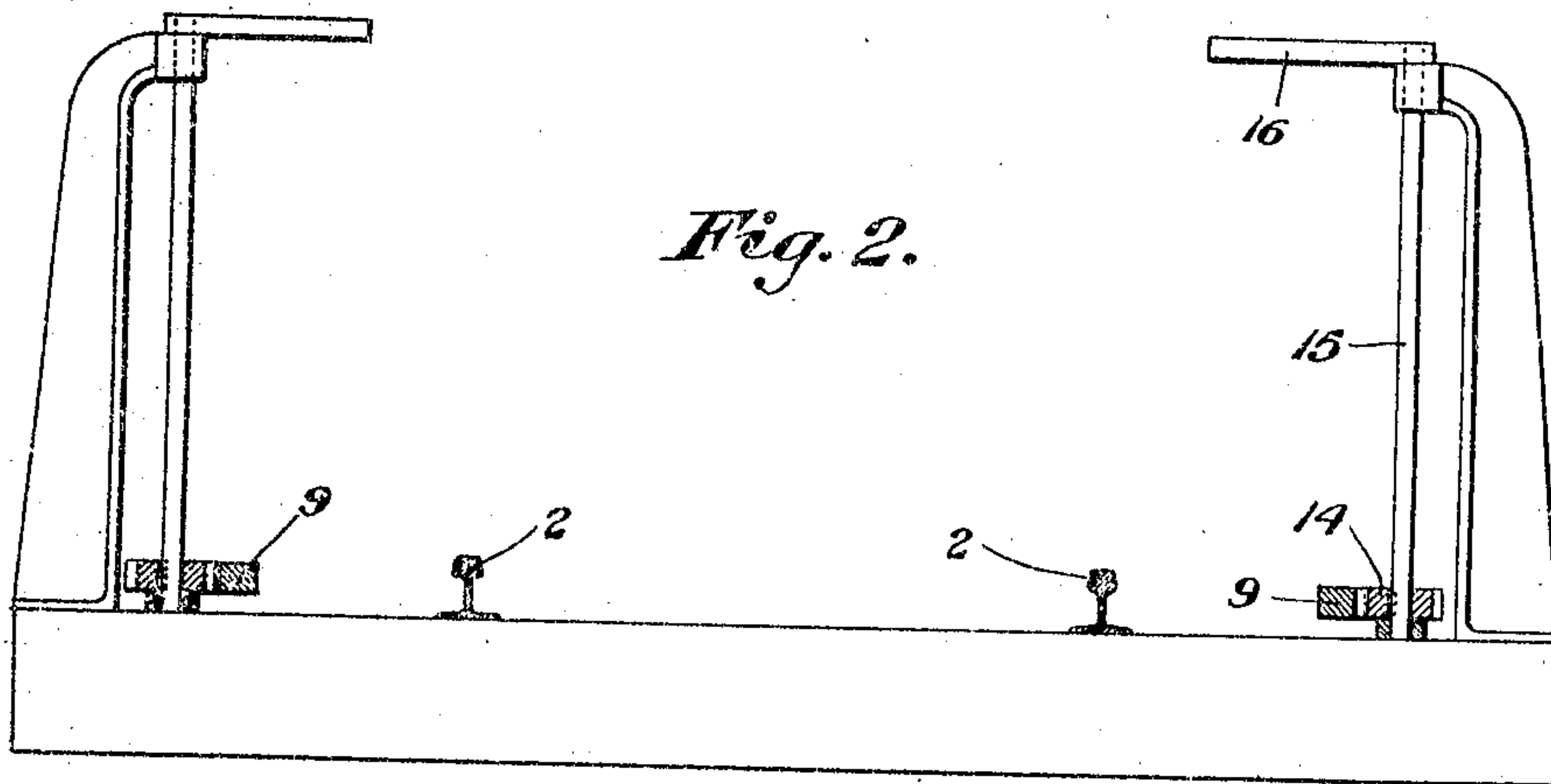
Wm Clarke  
his attorney.

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2 SHEETS—SHEET 2.



Witnesses:

C. R. Rodd:

Chas. S. Repley

Inventor:

George Ward  
by C. M. Clarke  
his Attorney



# UNITED STATES PATENT OFFICE.

GEORGE WARD, OF HOMESTEAD, PENNSYLVANIA, ASSIGNOR OF ONE-EIGHTH TO THOMAS J. TIERNEY AND ONE-EIGHTH TO FRANK R. AGNEW, OF PITTSBURG, PENNSYLVANIA.

## SWITCH-OPERATING MECHANISM.

No. 810,828.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed August 31, 1905. Serial No. 276,517.

*To all whom it may concern:*

Be it known that I, GEORGE WARD, a citizen of Great Britain, residing at Homestead, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Switch-Operating Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of my improved switch and operating mechanism therefor, indicating the locomotive provided with adjustable engaging abutments for actuating the switch-operating mechanism. Fig. 2 is a vertical sectional view on the line II II of Fig. 1. Fig. 3 is a similar view on the line III III. Fig. 4 is a plan view similar to Fig. 1, but showing the switch closed for main line.

My invention refers to improvements in switch-operating mechanism for railways, and is designed for the purpose of providing means whereby the switch may be set by actuating mechanism mounted upon the locomotive or car under the control of an operator and so arranged that the switch may be set at will to throw it to opened or closed position for main line or branch line, respectively.

The invention involves the setting of the switch by means of the usual transverse connecting-bar, actuated at one or both ends by means of rack-and-pinion gearing, which in turn is actuated by means of supplemental rack-and-pinion gearing adapted to be operated by an adjustable abutment located, as stated, on the locomotive or elsewhere on a suitable portion of the rolling-stock.

Referring now to the drawings, 2 2 represent the main-line tracks, with which cooperate the switch-points 3 3 for throwing the cars to the side track 4 4. The switch-points 3 3 are connected by a transverse operating-bar 5, secured to the switch-points and extending outwardly, preferably at both sides, and provided with terminal rack extensions 6.

7 is a vertical shaft mounted in suitable bearings, one such shaft being preferably located at each side of the track and carrying at its lower portion a pinion 8, engaging a rack-terminal 6 of bar 5, whereby when

either of shafts 7 is partially rotated bar 5 and the switch-points will be thrown to the right or to the left, according to the desired direction, and will operate to open or close the switch.

9 is a rack-bar mounted in suitable bearings 10, arranged alongside the main track, preferably at each side, and provided with rack-teeth 11, engaging pinion 12, also mounted on shaft 7 above pinion 8, both of said pinions being secured to the shaft. It will thus be seen that when motion is transmitted to bar 9 corresponding motion will be transmitted to the switch-shifting mechanism, as stated. At one or both ends bar 9 is also provided with additional rack-teeth 13, engaging pinion 14, mounted on vertical shaft 15, provided at the top with an extended arm 16, projecting into the path of an adjustable abutment 17, mounted upon the locomotive or on any other suitable moving element of the rolling-stock. As shown in Fig. 1 of the drawings, this construction is also duplicated at the other end of bar 9, the corresponding elements being referred to by the same numerals prime, as just described. I also preferably duplicate the same construction at the other side of the track, so that it will be operable from one side or the other of the locomotive and also in the reverse direction, as will be readily understood without further detailed description.

The adjustable operating abutment 17 may be set outwardly or inwardly within the control of the operator by any suitable operating mechanism, and I have shown in the drawings such abutment 17 as consisting of a laterally-movable bar mounted in suitable bearings and provided with rack teeth 18, engaged by the teeth of pinion 19, mounted on a stem 20, provided with an operating-lever 21 and connected by rod 22 with a shifting-lever 23 of any suitable construction or with any convenient operating mechanism mounted within the locomotive-cab and in convenient position to be readily reached by the engineer.

The operation of my invention will be readily understood from the foregoing description. By setting the abutment 17 outwardly at the right or the left the desired motion will be transmitted to the switch-



point-shifting bar 5, either to the right or to the left, in order to open or close the main line.

The location and arrangement of the shifting abutments 17, the arms 16 or 16', and the various other elements of the device may be made to suit the various conditions of use or adaptation of the invention within the province of the designing engineer or skilled mechanic, while various other changes or modifications may be made in the different details of construction without departing from the scope of the invention as covered by the following claims.

15 What I claim is—

1. In switch-operating mechanism, the combination with movable switch-points, of a connecting-bar provided with a side rack, a vertical shaft provided with a pinion engaging said rack, a second vertical shaft provided with a laterally-projecting arm, gearing connecting said shaft with the first-named shaft, and contacting mechanism mounted on a movable element arranged to cooperate with said means, substantially as set forth.

2. In switch-operating mechanism, the combination with movable switch-points, of a connecting-bar provided with a side rack, a vertical shaft provided with a pinion engaging said rack, a second vertical shaft provided with a laterally-projecting arm, gearing connecting said shaft with the first-named shaft, and adjustable contacting mechanism mounted on a movable element arranged to cooperate with said means, substantially as set forth.

3. In switch-operating mechanism, the combination with adjustable switch-points, of a connecting-bar provided with a rack-terminal, a pinion engaging said rack, a pinion adapted to transmit movement to said first pinion, a rack-bar engaging said second pinion provided with a rack extremity, a pinion engaging said rack extremity, and an operating-shaft and lever therefor, substantially as set forth.

4. In switch-operating mechanism, the combination with adjustable switch-points, of a connecting-bar provided with a rack-terminal, a pinion engaging said rack, a pinion adapted to transmit movement to said first pinion, a rack-bar engaging said second pinion provided with rack extremity, a pinion engaging said rack extremity, with an operating-shaft and lever therefor, and a movable track-supported adjustable abutment arranged to engage said lever to transmit motion to said mechanism, substantially as set forth.

5. The combination with switch-operating mechanism provided with a vertical actuating-shaft having a pinion engaging shifting gearing and a laterally-projecting arm; of an adjustable abutment mounted upon the locomotive, with means for setting said abutment into or out of operative relation with said arm, substantially as set forth.

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

GEORGE WARD.

Witnesses:

C. M. CLARKE,  
CHAS. S. LEPLEY.