

No. 641,342.

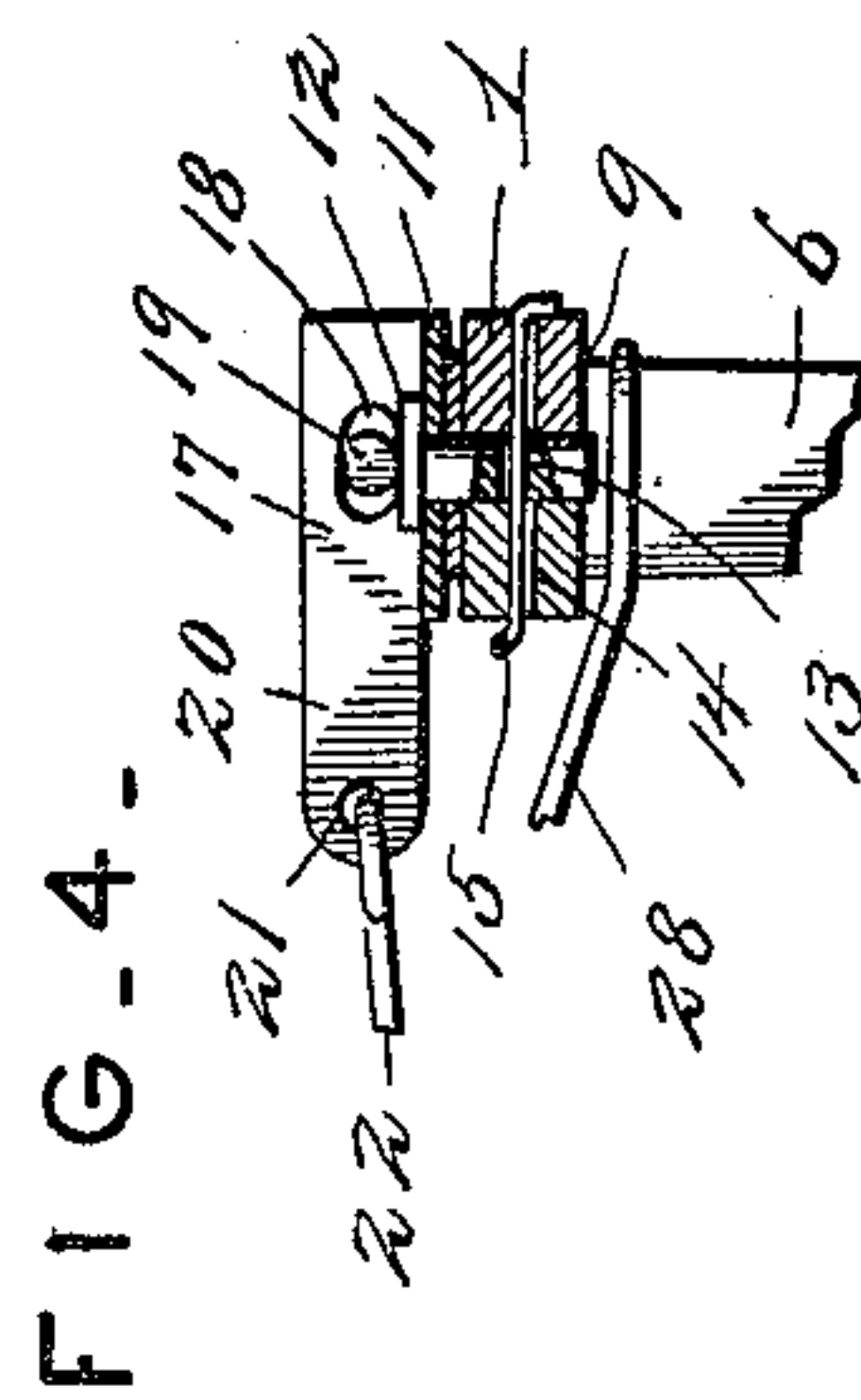
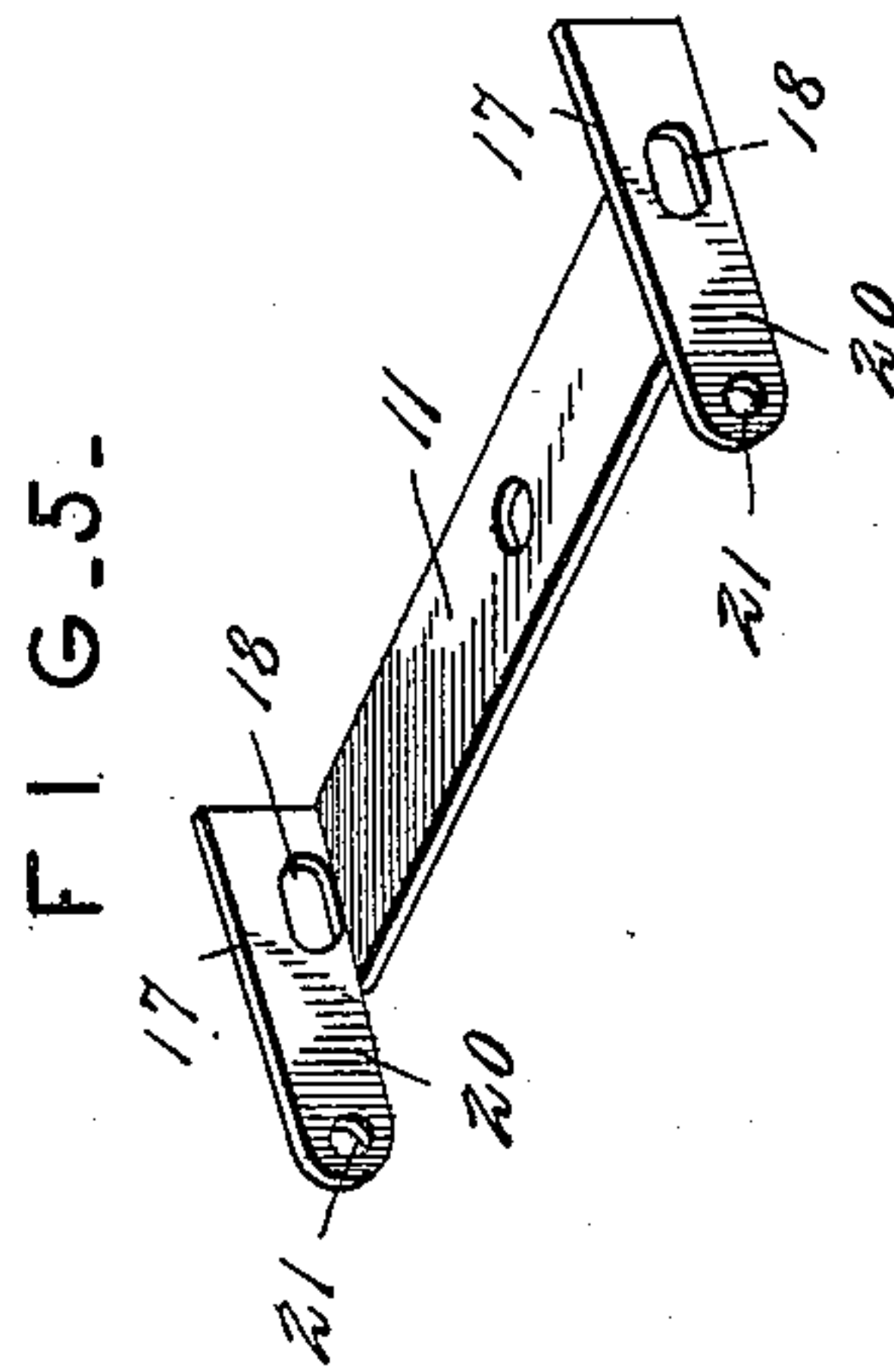
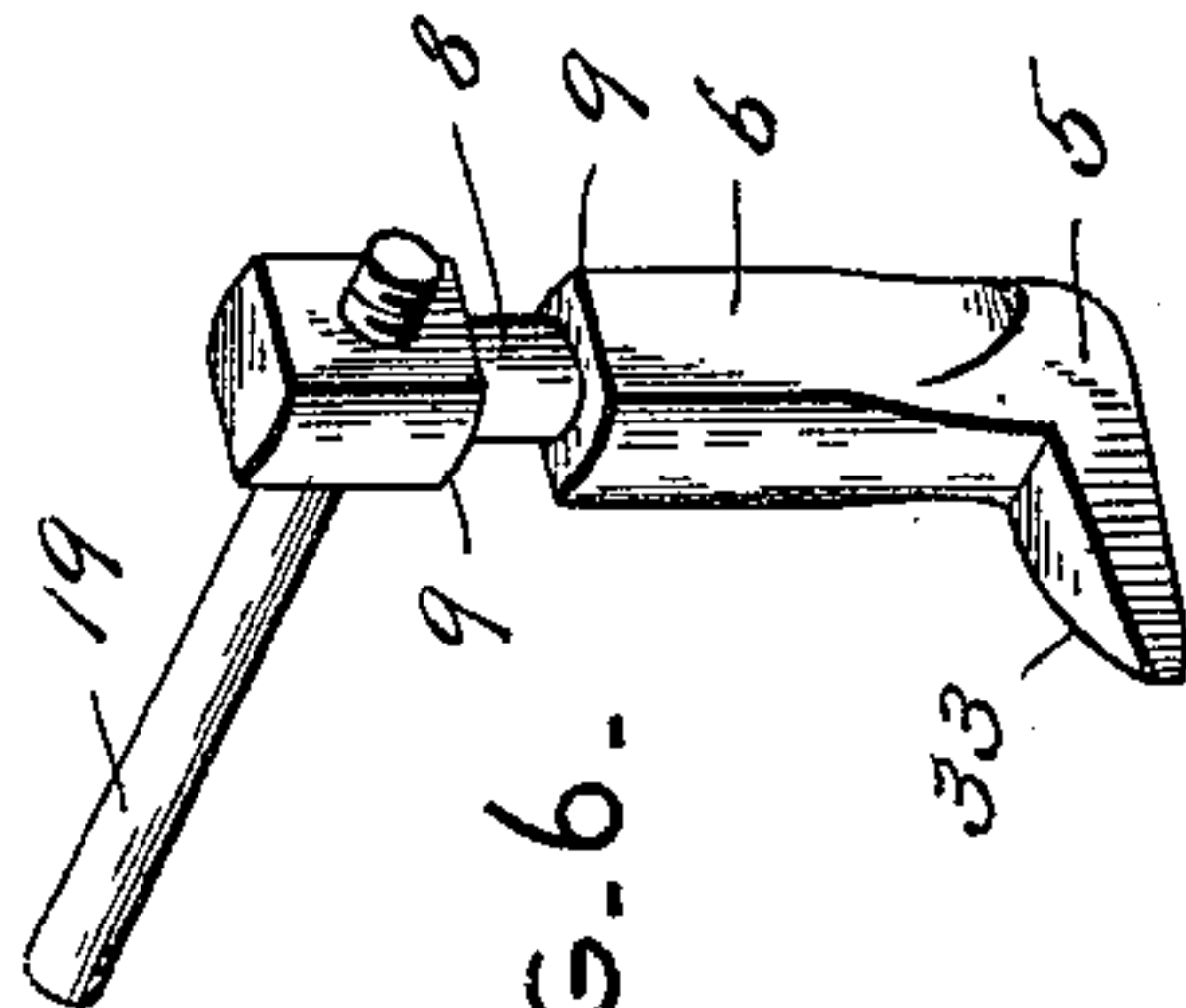
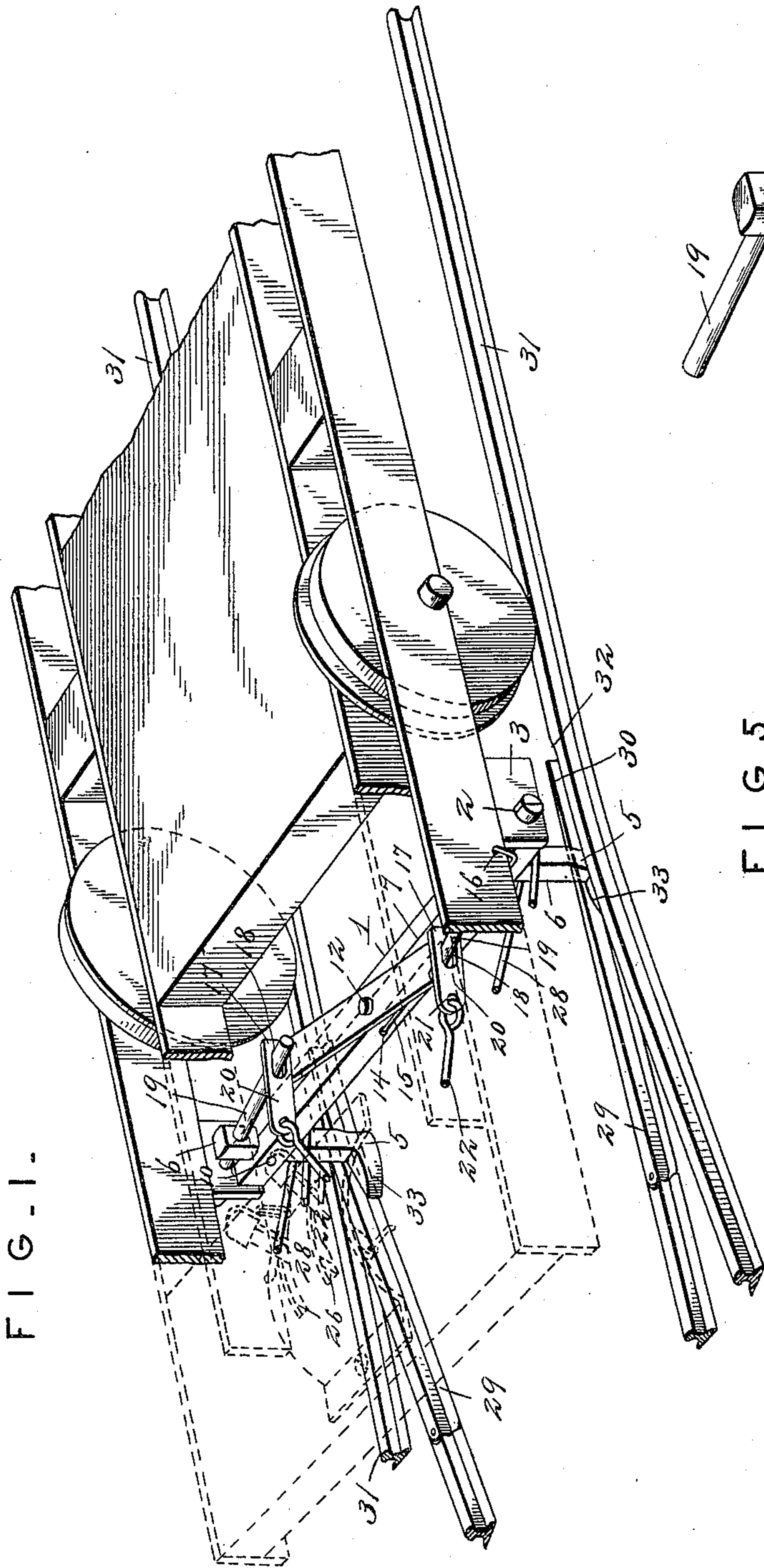
Patented Jan. 16, 1900.

**E. J. STANLEY.
SWITCH OPERATING MECHANISM.**

(Application filed Sept. 30, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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2 Sheets—Sheet 2.

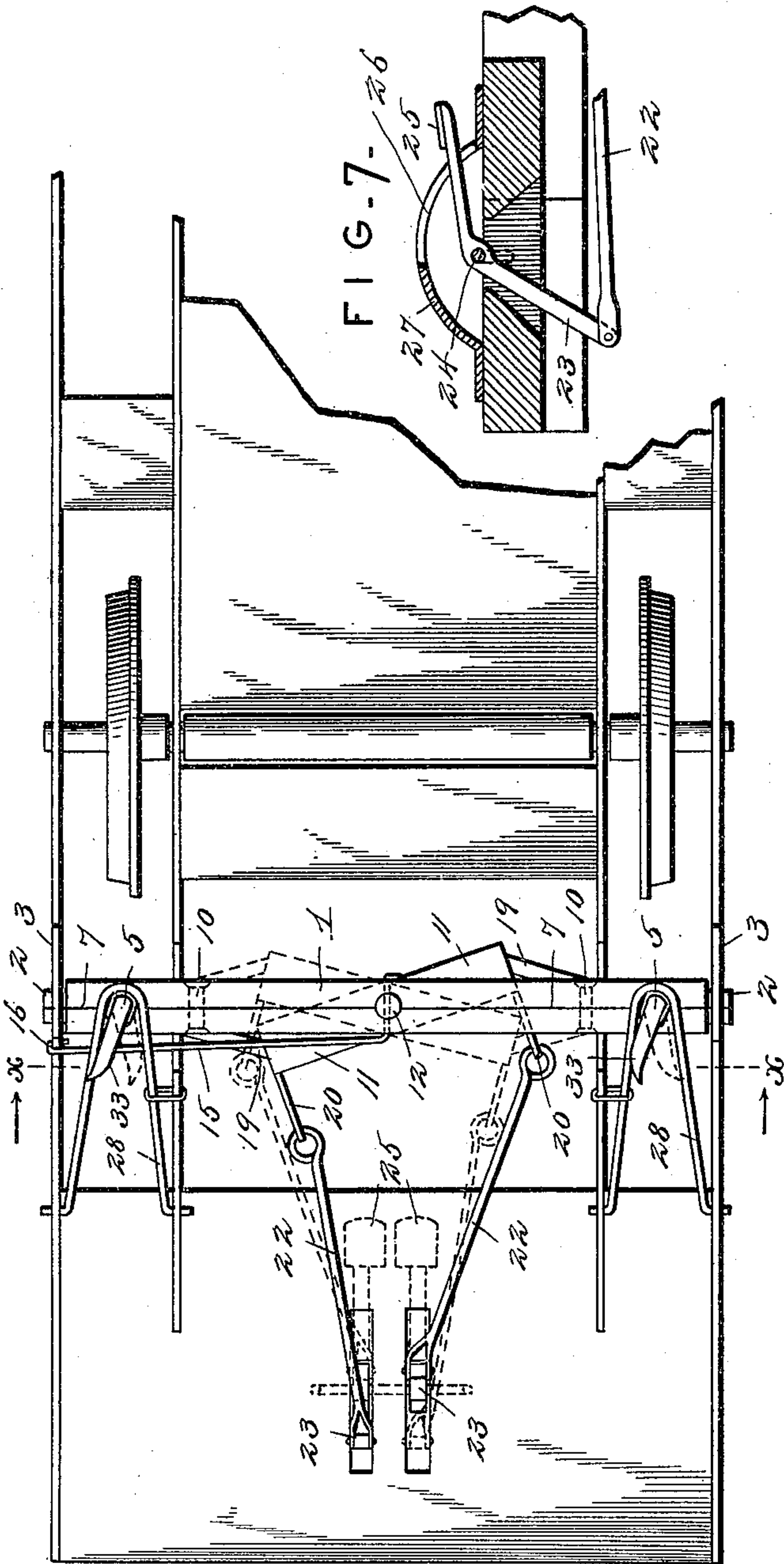


FIG. 2.

Witnesses

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FIG. 3.

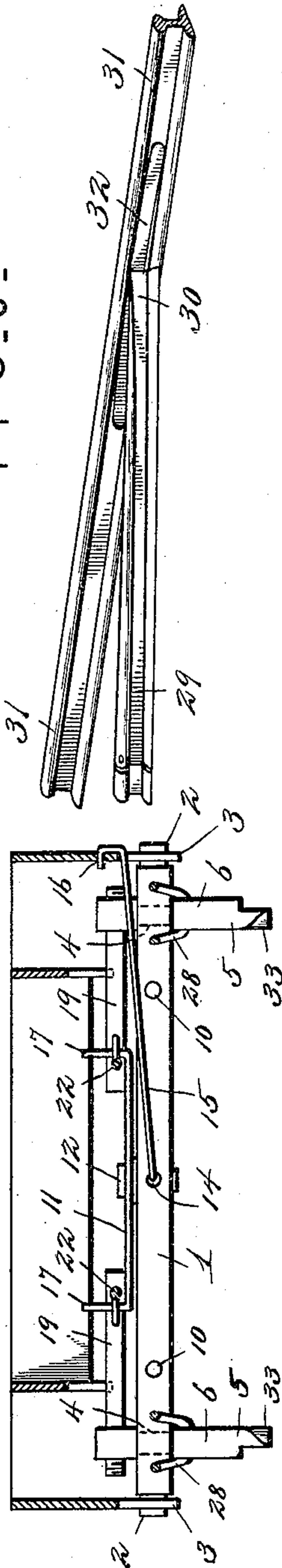


FIG. 8.

Inventor

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UNITED STATES PATENT OFFICE.

ELLIS J. STANLEY, OF LANARK, ILLINOIS.

SWITCH-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 641,342, dated January 16, 1900.

Application filed September 30, 1899. Serial No. 732,192. (No model.)

To all whom it may concern:

Be it known that I, ELLIS J. STANLEY, a citizen of the United States, residing at Lanark, in the county of Carroll and State of Illinois, have invented a new and useful Switch-Operating Mechanism, of which the following is a specification.

This invention relates to switch-operating mechanism for cars, and is designed with special reference to the needs of rapid transit.

The object of the invention is to provide switch-operating mechanism of a simple and durable character which may be mounted upon any ordinary car and which is under the ready control of the motorman, who by throwing into operation the mechanism hereinafter described may operate the switch-rails and throw the same laterally in either direction, according as to whether the car is to continue on the main track or to be directed onto the siding or switch. When the devices which shift the switch-rails are not in use, they are automatically elevated and normally held at a considerable distance above the rails. The same means employed for depressing the rail-shifting devices are used for simultaneously operating the shifting devices after they have been depressed, thus greatly simplifying the construction and rendering the same more durable and reliable in operation.

Other objects and advantages of the invention will appear in the course of the ensuing description.

The invention consists in switch-operating cross-bars embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claims.

In the accompanying drawings, Figure 1 is a perspective view of the front portion of a car with the platform broken away to show the switch-operating mechanism, showing also a portion of the road-bed adjacent to a switch and the rail-shifting devices in engagement with the switch-rails. Fig. 2 is a bottom plan view of the same portion of a car, showing the rail-shifting mechanism and illustrating the rail-shifting shoes thrown to one side in full lines and to the opposite side in dotted lines. Fig. 3 is a transverse section on the

line *xx* of Fig. 2, taken in line with or parallel to the rock-shaft of the rail-shifting mechanism. Fig. 4 is a detail section taken centrally of the rock-shaft, showing the manner of pivotally mounting the shifting-lever and the engagement of the elevating-spring therewith. Fig. 5 is a detail perspective view of the shifting-lever. Fig. 6 is a similar view of one of the shifting-shoes and its attached parts. Fig. 7 is a detail longitudinal section through the front portion of the car, showing the treadle mechanism. Fig. 8 is a detail perspective view showing the manner of grooving one of the railway-rails adjacent to the free end or point of the switch-rail.

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

The switch-operating mechanism contemplated in the invention comprises, essentially, a rock-shaft 1, which extends transversely of the truck immediately in front of the forward axle and wheels. The rock-shaft extends the entire width of the truck, and its end portions 2 are journaled in hangers 3 of any suitable character connected fixedly to the truck-frame. The rock-shaft is provided about in the vertical lines with the rails with openings 4, forming bearings for the shanks or standards of a pair of rail-shifting shoes 5. The shoes 5 are preferably formed integrally with their standards 6 and the latter passed through the openings 4 in the rock-shaft, being free to swivel or turn therein. The rock-shaft 1 is preferably made in two parts or sections, or, in other words, is divided centrally and longitudinally, as shown at 7. The two sections are approximately rectangular in cross-section and are provided in their meeting faces with opposite cylindrical recesses which when the sections are secured together form the bearings 4 for the shoe-standards. The standards 6 where they pass through the rock-shaft are reduced to form journal portions 8, leaving oppositely-located shoulders 9, which bear against the upper and lower sides of the rock-shaft, as shown in the sectional view of the rock-shaft. The two sections of the rock-shaft may be connected by bolts, rivets, or other suitable fastenings, as shown at 10.

A shifting-lever 11 is fulcrumed centrally on the rock-shaft, said lever being provided with a depending stud 12, which is received in an opening in the center of the rock-shaft. Said stud is provided with a transverse opening 13, registering with a through transverse opening 14 in the rock-shaft, and inserted through said openings 13 and 14 is one end of a torsion-spring 15, which extends longitudinally along the side of the rock-shaft and has its opposite ends in engagement with a fixed part of the car-truck, as shown at 16. The torsional action of this spring is utilized to rock the shaft in a direction which will elevate the rail-shifting shoes, causing their standards or shanks to assume a horizontal position, as shown in Fig. 8.

The shifting-lever is provided at its opposite ends with angular flanges 17, which extend upwardly therefrom and are provided with openings 18, in which are received the inner adjacent ends of crank-arms 19, secured rigidly to the standards of the rail-shifting shoes where the latter project above the rock-shaft. The end flanges of the shifting-lever are also extended forward, as shown at 20, and are formed with openings 21 to receive the rear ends of a pair of connecting-rods 22, said rods being connected pivotally at their forward ends to a pair of treadle-levers 23, fulcrumed intermediate their ends, as shown at 24, on the car-platform and provided at their upper ends with foot-pieces 25, the inner adjacent edges of which approach very closely to each other in order that the motorman may simultaneously depress both treadles or by moving his foot from one side or the other depress whichever treadle he desires. The upper portions of the treadle-levers work in individual slots 26 in a guide-plate 27, secured to the car-platform.

Arranged beneath the platform are combined guides and stays 28. These stays are connected at their ends, which are disposed toward the front of the car, to the car truck or body at any convenient point, from which they extend rearwardly and embrace the standards of the shifting-shoes just beneath the rock-shaft. In this manner they not only guide and steady the movements of the shoe-standards, but they also limit the rearward movement of the standards and shoes and also assist in taking the lateral strain applied to the shoes when the latter are operating against the switch-rails.

In connection with the switch-operating mechanism hereinabove described pivoted switch-rails 29 are employed, the same being tapered from their pivoted ends to points at their free ends, as shown at 30. The main rails 31 are longitudinally grooved or recessed upon their inner adjacent sides, as shown at 32, in order to form an open space between the web or body portion of the main rail and the pointed free end of the switch-rail. When

the shoes are thrown downward into their operative positions, one of the shoes bears at its point against the inner surface of the web portion of the rail, and therefore enters the groove or recess 32, passing behind the free end of the switch-rail, and in the further progress of the shoe the switch is moved laterally in a manner which will be readily understood. The shoe at the opposite side also coöperates with the switch-rail at that side in such manner as to move the switch-rail laterally close up to and in contact with the main rail. The inner adjacent faces or sides of the shoes are rounded to provide cam-surfaces 33, and these cam-surfaces operate against the switch-rails to force the latter away from the main rails.

The operation of the mechanism is as follows: Upon approaching a switch the motorman places his foot upon both treadles and simultaneously depresses them, which has the effect of turning the rock-shaft and moving the rail-shifting shoes downward, so that they lie between and in close proximity to the rails. If the motorman desires to go to the right, he transfers the pressure of his foot to the right-hand treadle, which has the effect of throwing forward the corresponding end of the shifting-lever without allowing the rock-shaft to turn back, and this acting on the crank-arm of the shoe-standard throws the point of the right-hand shoe to the right, causing it to bear closely against the rail until it reaches and enters the recess in the rail, when it passes behind the free end of the adjacent switch-rail and moves the same laterally, so as to allow the flanges of the right-hand wheels to pass behind it. In the same operation the opposite or left-hand end of the shifting-lever is moved rearwardly, carrying the crank-arm of the other shoe-standard in the same direction, and thereby swinging the free end of said shoe away from the rail. When said shoe therefore comes in contact with the free end of the adjacent switch-rail, it operates with a cam action on said rail and forces it toward the main rail, thereby causing the flanges of the wheels at that side of the car or truck to engage against the inner face of the switch-rail. When the motorman desires to go to the left, he depresses the other treadle, thus setting the operative parts of the device in a position the reverse of that above described.

When the shoes are rocked upward to their position of rest, their standards assume approximately a horizontal position and the shifting-lever occupies a position behind the rock-shaft. When the treadles are depressed to throw down the shoes, the shifting-lever is brought to a position directly over the rock-shaft. When the motorman slides his foot from both treadles to a single treadle and the pressure is transferred to the single treadle, the latter is moved downward quickly and acts to swing the shifting-lever and throw one of the shoes against a rail before the spring

has time to act upon the rock-shaft and turn the latter back.

By having the rock-shaft of sectional construction the shoe-standards and the shifting-lever may be easily associated therewith and a new shoe may be readily substituted for a broken one. By passing the terminal portion of the elevating-spring through the rock-shaft and pivot of the shifting-lever the shifting-lever is held in place on the rock-shaft. The connections between the rail-shifting shoes are of simple construction and arrangement and not liable to get out of order; but it will be apparent that toothed gearing may be substituted for the pin-and-hole engagement between the ends of the shifting-lever and the crank-arms on the shoe-standards. These and other changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes thereon, and means for rocking the shaft and simultaneously moving the shoes laterally in the same direction.

2. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes swiveled thereon, and means for rocking the shaft and simultaneously swinging the shoes laterally in the same direction.

3. In switch-operating mechanism for cars, a rock-shaft, operating means therefor, rail-shifting shoes swiveled thereon, and means for simultaneously rocking said shoes, substantially as described.

4. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes swiveled thereon, and means for rocking said shaft and simultaneously swinging the shoes laterally.

5. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes swiveled thereon, connections between the shoes causing them to simultaneously swing laterally in the same direction, and means for operating said shaft and shoe connections.

6. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes journaled thereon in axes transverse to the axis of the shaft, operating means for the shaft, and connections for causing the shoes to simultaneously swing laterally in the same direction, substantially as described.

7. In switch-operating mechanism for cars, a rock-shaft, shoes swiveled thereon and adapted to be swung upward and downward thereby, a shifting-lever operatively coupled to both shoes, and operating means for said lever and rock-shaft, substantially as set forth.

8. In switch-operating mechanism for cars, a rock-shaft, shoes swiveled thereon, crank-

arms connected to said shoes, a shifting-lever fulcrumed on the rock-shaft and having its opposite ends in engagement with said crank-arms, and operating means for said shaft and lever, substantially as described.

9. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes swiveled thereon, crank-arms connected to said shoes, a shifting-lever fulcrumed on the rock-shaft and engaging said crank-arms, and operating means for said rock-shaft and lever, substantially as described.

10. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes swiveled thereon, a pair of treadle-levers having their foot portions arranged in close proximity to each other so that they may be simultaneously depressed, and operative connections between said treadles and the rock-shaft and shoes, substantially as described.

11. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes swiveled thereon, a pair of treadles having foot portions arranged in close proximity to each other whereby they may be collectively or individually depressed, and operative connections between the treadles and the rock-shaft and shoes, substantially as described.

12. In switch-operating mechanism for cars, a sectional rock-shaft provided with recesses in the meeting faces of its sections forming bearings for operative parts of the mechanism, substantially as described.

13. In switch-operating mechanism for cars, a sectional rock-shaft divided on a central longitudinal line, the sections being provided in their meeting faces with oppositely-located recesses forming bearings for operative parts of the mechanism, substantially as described.

14. In switch-operating mechanism for cars, a rock-shaft provided with a bearing-opening, a shifting-lever having a stud or pivot arranged in said opening and provided itself with a transverse opening, and a shaft-operating spring having one end passed through the rock-shaft and also through the opening in the pivot of the lever, substantially as described.

15. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes carried thereby, and stays embracing said shoes and serving to engage the shoes and limit the rocking movement of the shaft, substantially as described.

16. In switch-operating mechanism for cars, a rock-shaft, rail-shifting shoes thereon, means for rocking said shaft to throw the shoes into operation, and a retracting-spring for said shaft, substantially as described.

17. In switch-operating mechanism for cars, a rock-shaft, a rail-shifting shoe thereon, means for rocking said shaft, and a torsion-spring for restoring said shaft to its normal position and elevating the shoe, substantially as described.

18. In switch-operating mechanism for cars,

a rock-shaft, a rail-shifting shoe thereon,
means for rocking said shaft and pressing the
shoe, and a torsion-spring for elevating the
shoe, said spring extending lengthwise of the
5 rock-shaft and having one end connected
thereto the spring being connected at its op-
posite end to a fixed part of the car or truck,
substantially as described.

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

ELLIS J. STANLEY.

Witnesses:

W. S. CRINKLAW,
WILLIAM ROSS.