

No. 857,291.

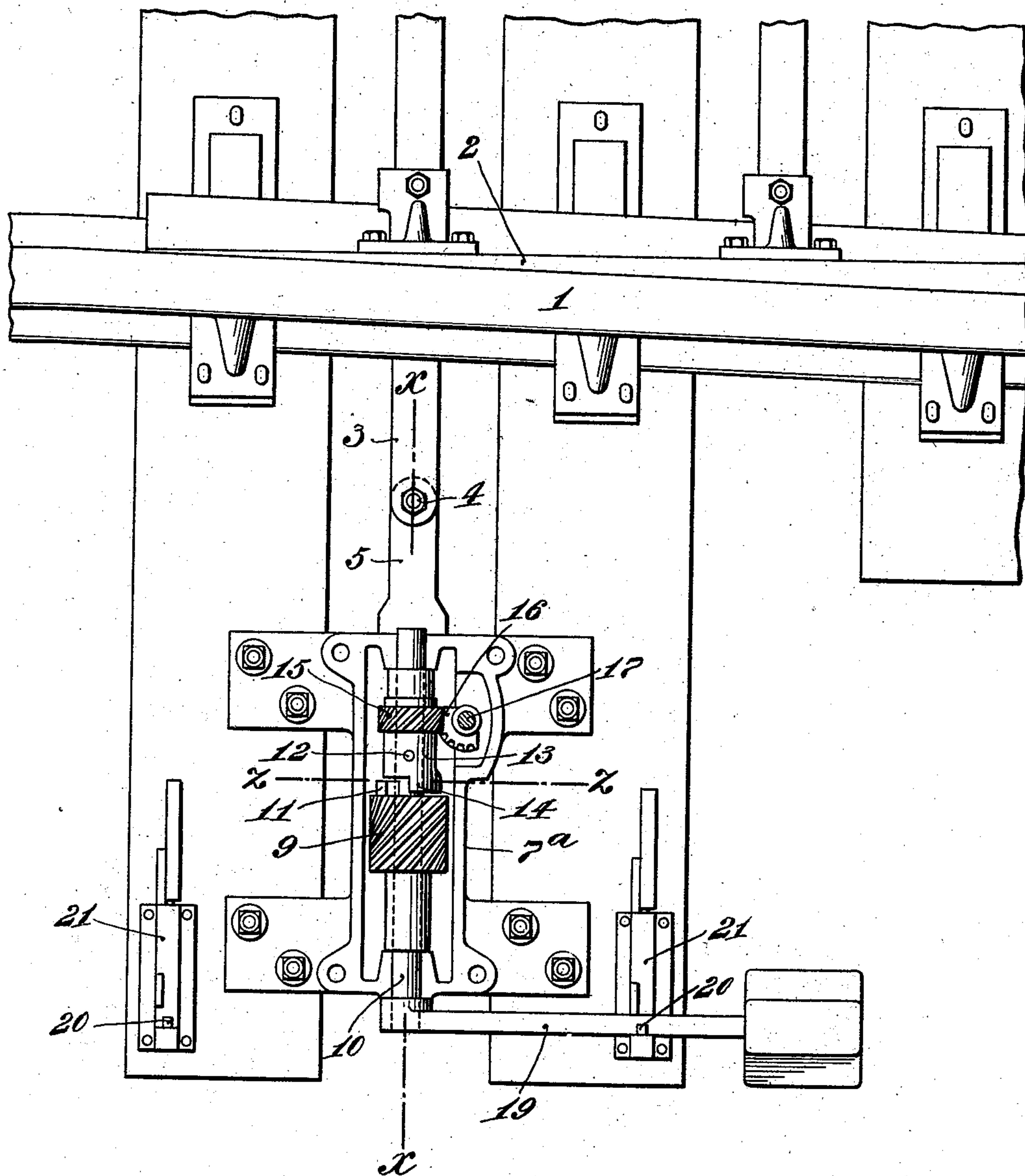
PATENTED JUNE 18, 1907.

M. W. LONG.
SWITCH STAND.

APPLICATION FILED OCT. 12, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

Jas. C. Woburnsmith
 Ella M. Ware

INVENTOR

INVENTOR
Malcolm W. Long.
BY

BY

Walter C. Pinney
ATTORNEY.

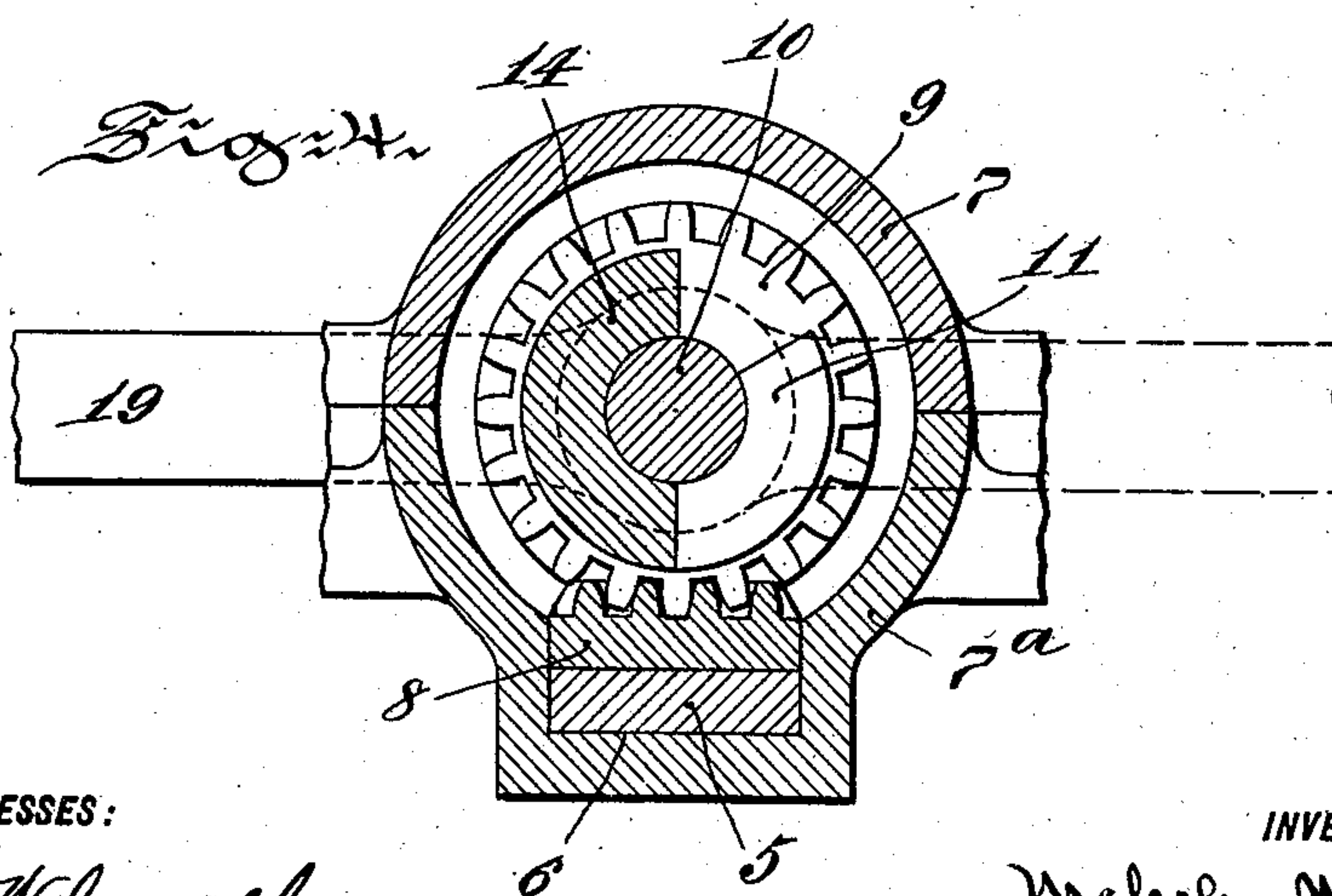
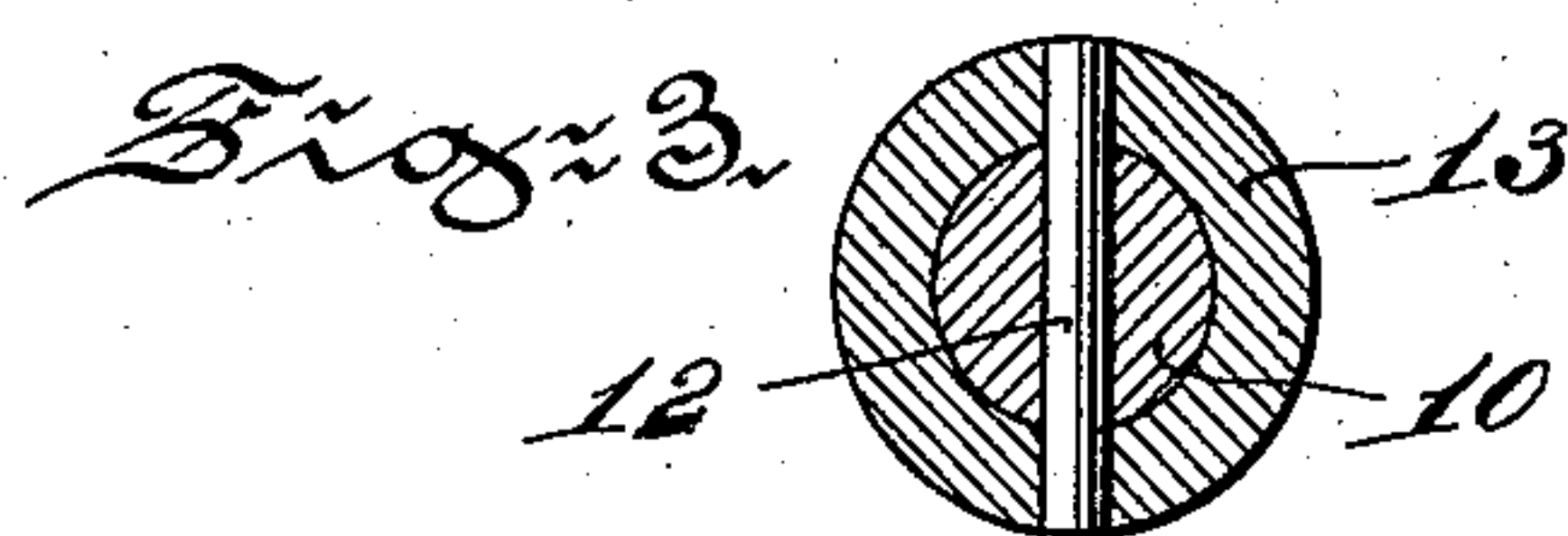
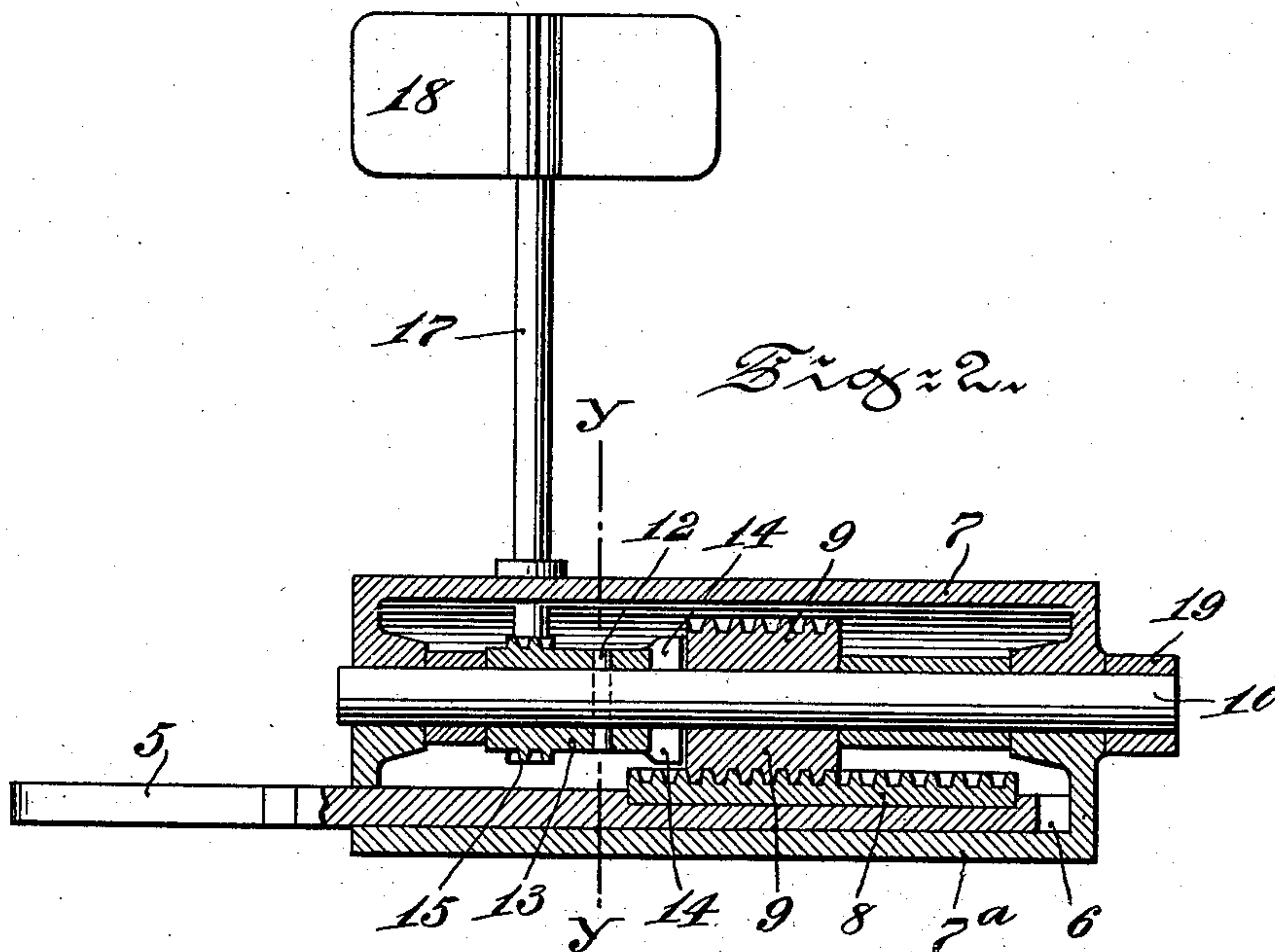
No. 857,291.

PATENTED JUNE 18, 1907.

M. W. LONG.
SWITCH STAND.

APPLICATION FILED OCT. 12, 1906.

2 SHEETS—SHEET 2.



WITNESSES:

Jas. C. Woburnsmith
Ella M. Ware.

INVENTOR

Malcolm W. Long.

BY

Walter C. Pusey.
ATTORNEY.

UNITED STATES PATENT OFFICE.

MALCOLM W. LONG, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR TO THE
PENNSYLVANIA STEEL COMPANY, OF PHILADELPHIA, PENNSYLVANIA,
A CORPORATION OF PENNSYLVANIA.

SWITCH-STAND.

No. 857,291.

Specification of Letters Patent.

Patented June 18, 1907.

Application filed October 12, 1906. Serial No. 338,632.

To all whom it may concern:

Be it known that I, MALCOLM W. LONG, a citizen of the United States, and a resident of Harrisburg, Dauphin county, State of Pennsylvania, have invented certain new and useful Improvements in Switch-Stands, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a plan view of a switch-stand in which my invention is embodied, showing the same connected with a closed switch; the upper portion of the casing of the working parts of the stand having been removed to show said parts. Fig. 2 is a section on the line $x-x$, Fig. 1. Fig. 3 is a section as on the line $y-y$, Fig. 2. Fig. 4 is a section on the line $z-z$ Fig. 1.

This invention relates to improvements in automatic switch-stands in which the operating lever is parallel with the track-way and the switch is operated through the medium of a helical gear on the shaft of the operating lever which engages the corresponding teeth of a rack-bar parallel with said shaft, and connected to the switch-point rails.

The main object of the invention is to provide, in a switch-stand of this general type, means whereby, if a train trails through the switch and the operating lever is locked down so as to be incapable of movement, the switch will be automatically operated and the target will be actuated to indicate the position of the switch, notwithstanding the immovability of said lever.

The precise character of the invention will appear from the following description:—

1 is a main track-rail, and 2, a switch point rail, the said rails being shown in position in which the switch is closed. Extending from the point-rail, 2, is the usual switch-bar, 3, which is connected by a bolt, 4, to a rack-bar, 5, which is adapted to be reciprocated longitudinally in guide-ways, 6, of the bottom portion, 7^a, of the casing, 7, of the switch-stand. The rack-bar, 5, is provided with a rack, 8, having suitably shaped teeth meshing with the teeth of a helical gear, 9, loosely mounted upon a shaft, 10, journaled in the casing, 7, and parallel with said rack-bar.

Extending from one end of the gear, 9, is a lug, 11, which, in this instance, extends

about one-third of the distance around the end of said gear, as clearly seen in Fig. 4. Secured to the shaft, 10, by a pin, 12, is a collar, 13, having, extending from the end thereof, adjacent the helical gear, a lug, 14, which, in this instance, extends about one-half the distance around the end of said collar and gear, either end of which is adapted to engage, for a purpose hereinafter described, the corresponding end of the lug, 11, of the helical gear. Upon said collar, 13, is a helical gear 15, meshing with the teeth of a segment gear, 16, on the vertical target shaft, 17, journaled in and extending upwardly from the casing, 7; said vertical target-shaft, 17 carrying, at its upper end, a usual target, 18. On the outer end of the shaft, 10, is secured the usual weighted lever, 19.

The operation of the switch-stand is as follows:—The parts being in the position illustrated in the drawings, and the lever being engaged by the catch, 20, of the latch stand, 21, and it being desired to throw the switch by hand, the operator releases the catch from engagement with the said lever, and grasps the weighted end thereof, and lifts the same, thereby rotating the shaft, 10, and consequently the collar, 13 secured thereon, and so through the medium of the helical gear, 15, and segment gear, 16, the target shaft, 17 is rotated. As the lug, 14, of the collar, 13, extends one-half of the way round the shaft, 10, while the lug, 11, on the helical gear, 9, extends but one-third way around said shaft, there is a lost motion between said lugs, when the shaft, 10 is rotated by lifting the lever, so that, while the operation of the lever correspondingly rotates the vertical target shaft so that a movement of said lever through an arc of 180 degrees will rotate said target shaft 90 degrees, the work of throwing the switch will not be begun until the lug, 14, engages the lug, 11, thereby enabling the operator to get the benefit of the inertia of the weighted lever, 19. When the lug, 14, engages the lug, 11, the helical gear, 9, is thereby rotated, and consequently the rack-bar, 5 is moved outwardly and so opens the switch. If, however, the parts be in the position of the drawings, and the lever be not locked down, and a train come trailing through the closed switch, the movement of the point-

rail away from the track rail, by the action of
 the train passing over the switch, will draw
 over the switch-bar 3, and consequently the
 rack-bar, 5, and thereby through the rack, 8,
 5 the helical gear, 9, is rotated and its lug, 11
 engaging the lug, 14, rotates the collar, 13,
 and consequently the shaft, 10; and so the
 lever 19, is rotated from the position shown
 in Figs. 1 and 4, to the dotted line position of
 10 the latter figure, and the vertical target shaft
 is rotated 90 degrees to indicate the position
 of the switch. If, however, the lever is in
 the position of Fig. 1, and is locked down, as
 indicated in said figure, and a train trail
 15 through the closed switch, the actuation of
 the switch bar, rack-bar, and helical gear, 9,
 will occur as when the lever is not locked
 down, as above described; and the lug, 11,
 engaging the lug, 14, of the collar, 13, will ro-
 20 tate said collar upon the shaft, 10, the pin, 12,
 securing said collar to the said shaft being
 made weak enough that, under these condi-
 tions, it will shear off, and so permit the ro-
 tation of said collar on said shaft; whereby
 25 through the medium of the helical gear, 15,
 and the segment gear, 16, the target shaft is
 rotated 90 degrees, thus indicating that the
 switch has been opened by the passing train,
 regardless of the position of the lever.

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

1. In a switch-stand, the combination of
 the case, the horizontal shaft journaled there-
 35 therein, the lever on said shaft, the collar on
 said shaft, the target shaft, driving connec-
 tions between said collar and target shaft:
 the longitudinally movable switch-bar, con-
 nections between said switch-bar and said
 40 collar, whereby rotation of said collar causes
 longitudinal movement of said switch-bar,
 and the converse; together with a frangible
 connection securing said collar to said hori-
 zontal shaft, whereby, if said shaft be locked
 45 against rotation, and the switch automat-
 ically operated, said frangible connection will
 be severed, and the collar will be caused to
 rotate on said shaft, and so the target-shaft
 rotated, substantially as set forth.

50 2. In a switch-stand, the combination of
 the case, the horizontal shaft journaled there-
 in, the lever on said shaft, the helical gear
 loosely mounted on said shaft, the rack-bar,
 having teeth engaging said gear, said rack-
 55 bar being adapted to be reciprocated longi-

tudinally in said case, and its outer end con-
 nected to the switch-rails; a collar on said
 shaft, provided with a part engaging a part
 on the said helical gear, the target-shaft,
 driving connections between said target shaft 60
 and said collar; together with a frangible
 connection securing said collar to said first-
 mentioned shaft, whereby, if said horizontal
 shaft be locked against rotation, and the
 switch automatically operated, said collar 65
 will be caused to rotate on said shaft, and so
 the target shaft rotated, substantially as set
 forth.

3. In a switch stand, the combination of
 the case, the horizontal shaft journaled there- 70
 in, the lever on said shaft, the helical gear
 loosely mounted on said shaft, the rack-bar,
 having teeth engaging said gear, said rack-
 bar being adapted to be reciprocated longi-
 tudinally in said case, and its outer end con- 75
 nected to the switch-rails; a collar on said
 shaft, provided with a part engaging a part
 on the said helical gear; there being a lost
 motion between said two parts; the target
 shaft, driving connections between said tar- 80
 get shaft and said collar; together with a
 frangible connection securing said collar to
 said first-mentioned shaft, whereby, if said
 horizontal shaft be locked against rotation,
 and the switch automatically operated, said 85
 collar will be caused to rotate on said shaft,
 and so the target shaft rotated, substantially
 as set forth.

4. In a switch-stand, the combination of
 the case, the horizontal shaft journaled there- 90
 in, the lever on said shaft, means for locking
 said lever against rotation; the helical gear
 loosely mounted on said shaft, the rack-bar
 adapted to be reciprocated longitudinally in
 said case below said shaft, and provided with 95
 teeth engaging said helical gear, the outer end
 of said rack-bar being connected to the
 switch-rails; the collar on said shaft, the
 frangible pin connecting said collar and shaft,
 the lug on said collar, and the corresponding 100
 lug on said helical gear engaging the first
 mentioned lug; the vertical target shaft,
 driving connections between said collar and
 target shaft, substantially as set forth.

In testimony whereof, I have hereunto 105
 affixed my signature.

MALCOLM W. LONG.

Witnesses:

WM. R. MILLER,
 B. S. WEAVER.