

No. 714,060.

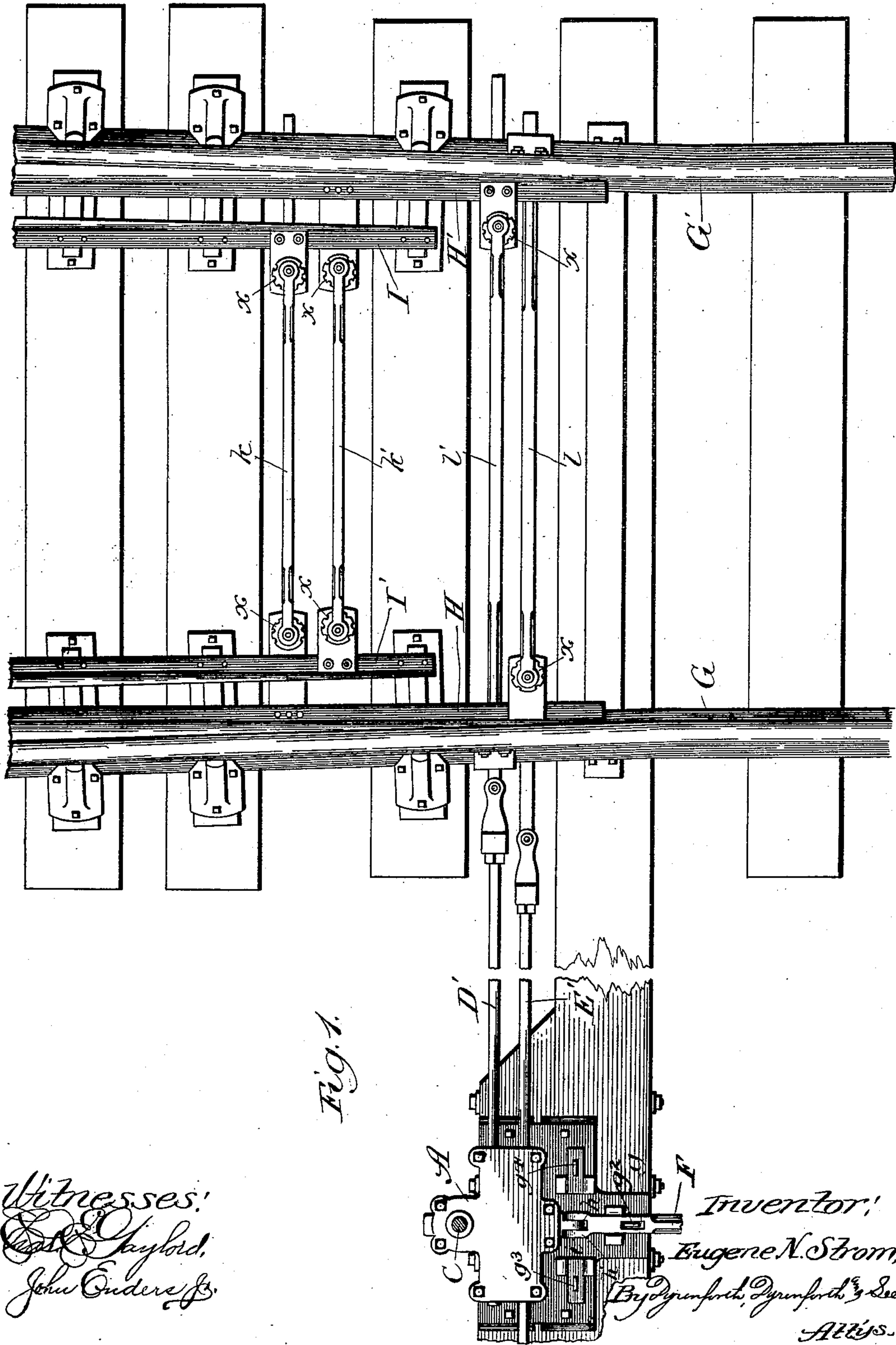
Patented Nov. 18, 1902.

E. N. STROM.
SWITCH STAND.

(Application filed Sept. 8, 1902.)

(No Model.)

3 Sheets—Sheet 1.

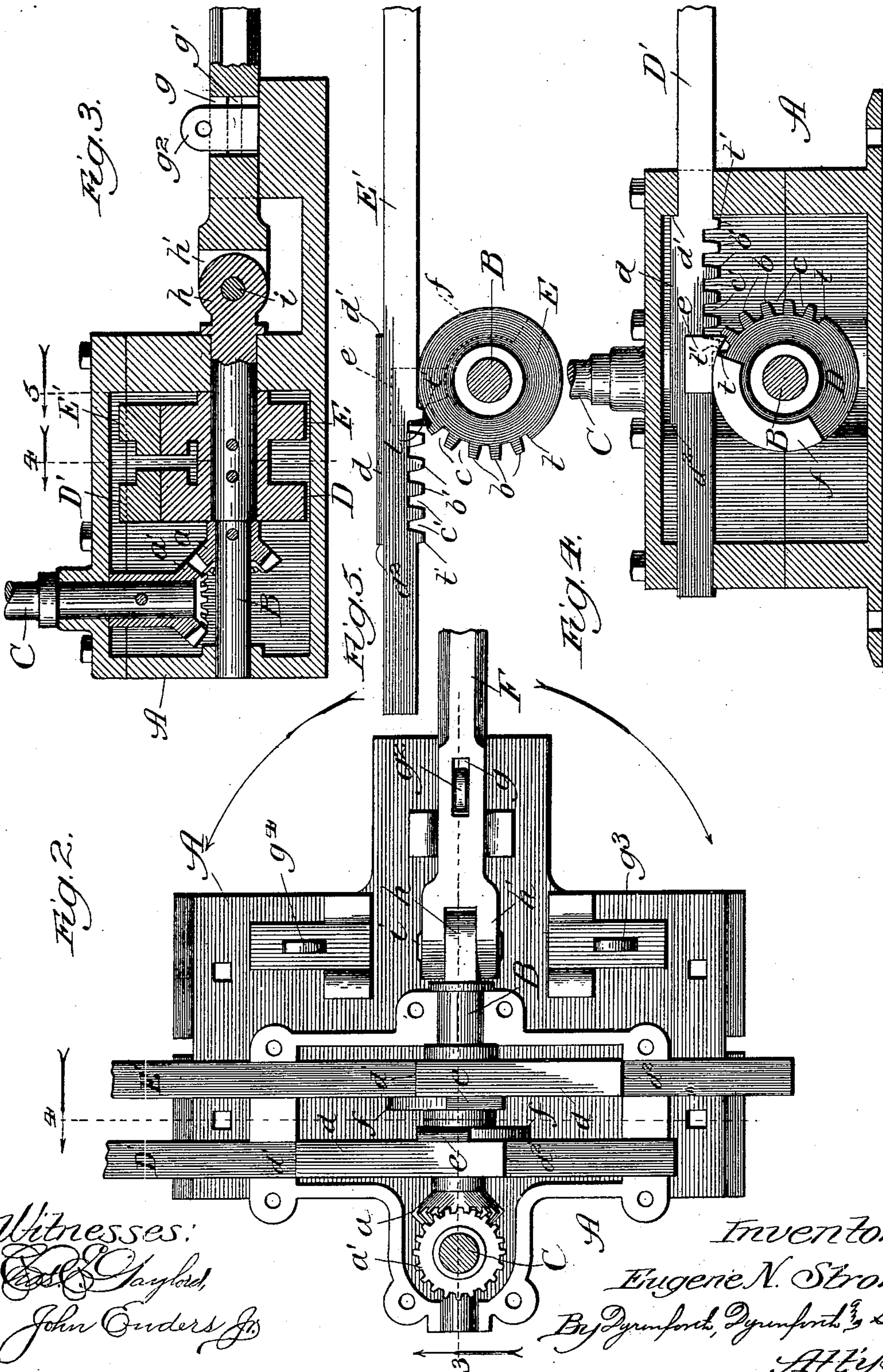


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(No Model.)

3 Sheets—Sheet 2.



Witnesses:
Edw. Gaylord,
John Enders Jr.

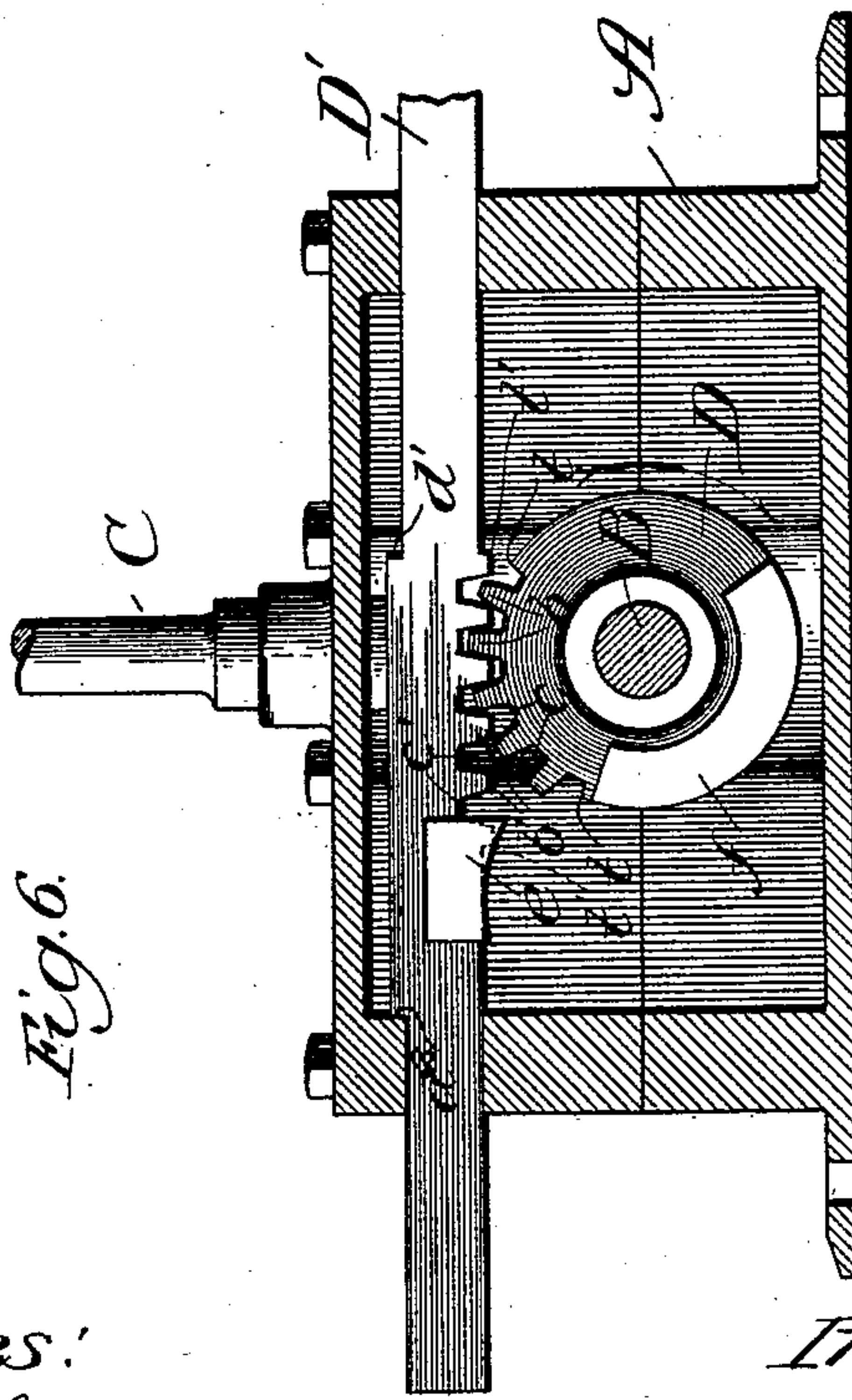
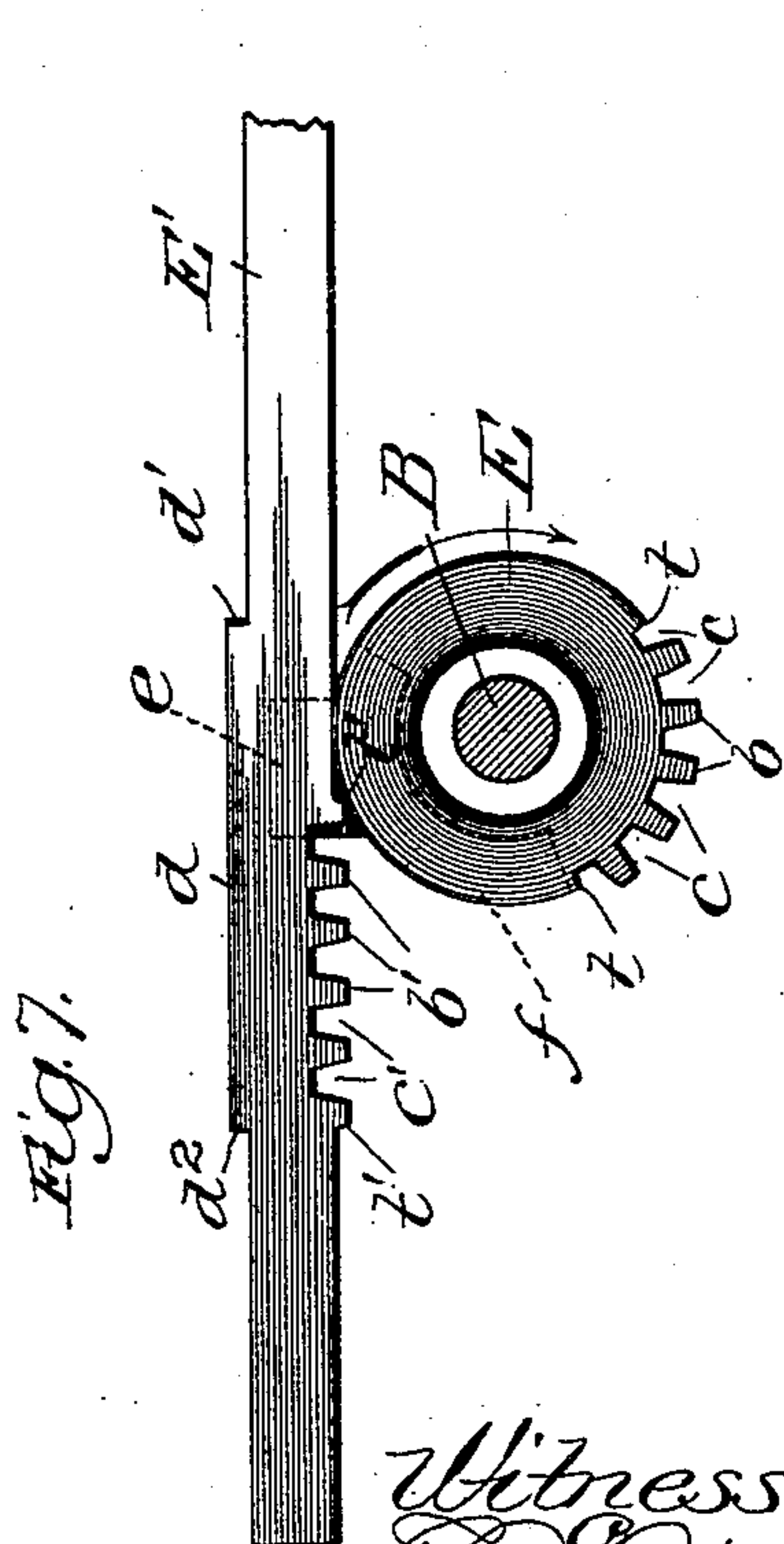
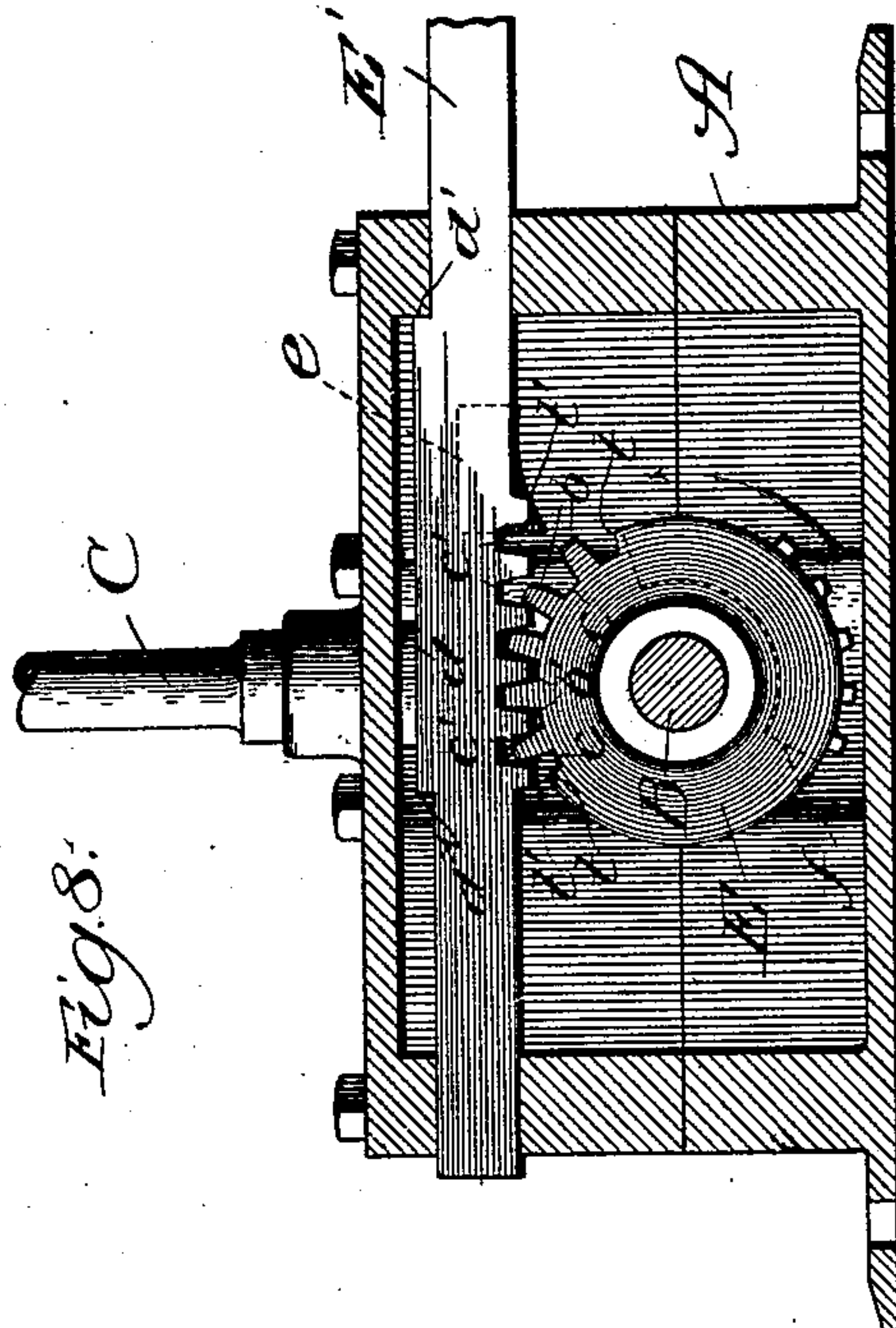
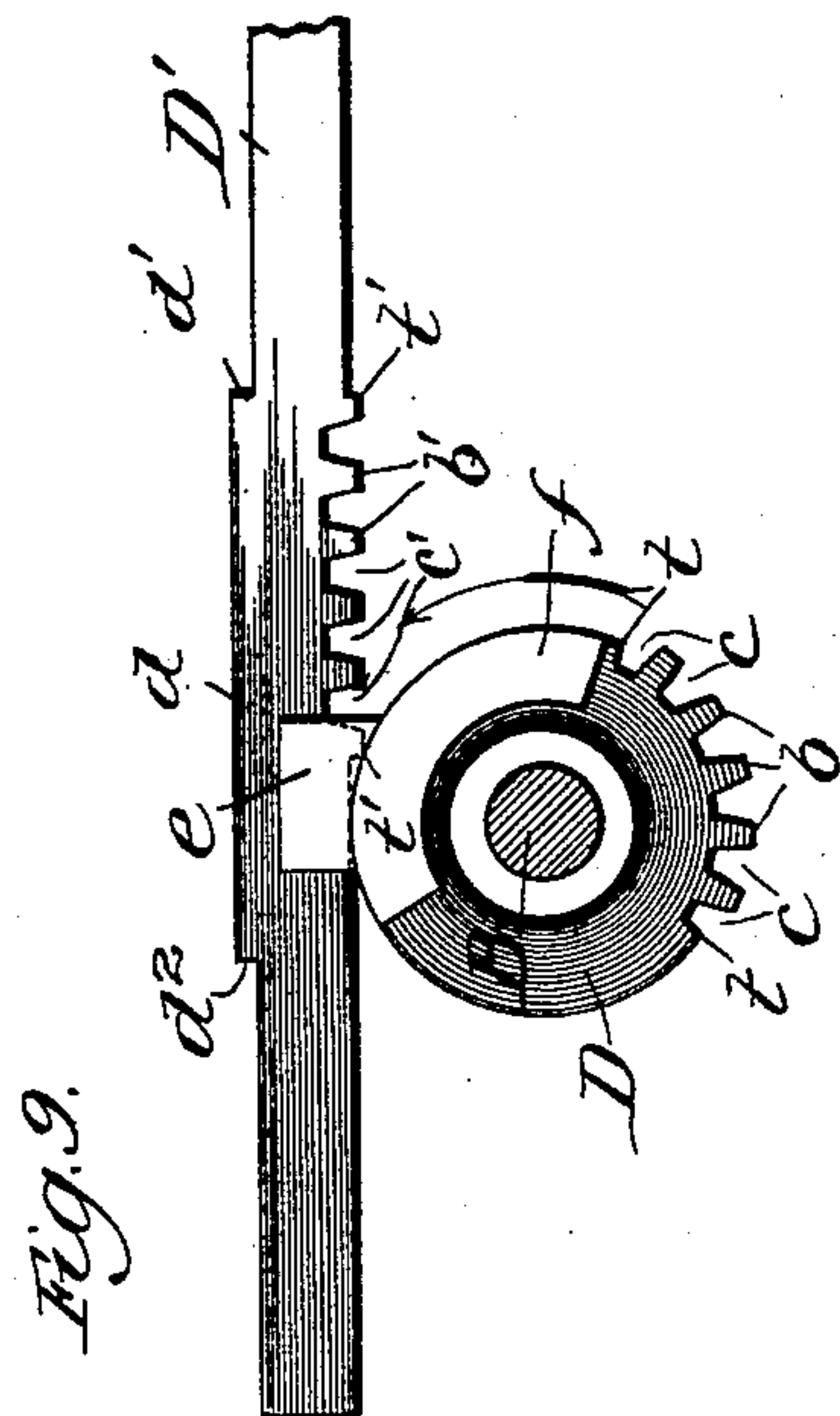
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E. N. STROM.
SWITCH STAND.

(Application filed Sept. 8, 1902.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

EUGENE N. STROM, OF CHICAGO, ILLINOIS, ASSIGNOR TO STROM MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SWITCH-STAND.

SPECIFICATION forming part of Letters Patent No. 714,060, dated November 18, 1902.

Application filed September 8, 1902. Serial No. 122,505. (No model.)

To all whom it may concern:

Be it known that I, EUGENE N. STROM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Switch-Stands, of which the following is a specification.

My invention relates to an improvement in the class of switch-stands of the construction which adapts them for use in operating the three-throw variety of railway-switches, this being one of the purposes for which I have devised my improvement, though it is also adapted for use with other multiple-throw switches, particularly those sometimes employed in the kind of railway-crossing known as a "combination-crossing."

In the class referred to my invention relates more particularly to an improvement in the variety of switch-stand in which two longitudinally-reciprocable bars are connected each with a switch for throwing it by turning an oscillating shaft with which the bars are connected; and my invention also relates to an improvement in the construction of the operating-lever of the switch-stand.

Referring to the accompanying drawings, Figure 1 is a plan view of a three-throw railway-switch equipped with my improved switch-stand. Fig. 2 is a plan view of the switch-stand with details shown broken and with the upper portion of the casing removed; Fig. 3, a section taken at the line 3 on Fig. 2 and viewed in the direction of the arrow; Fig. 4, a section taken at the line 4 on either Fig. 2 or Fig. 3 and viewed in the direction of arrows; Fig. 5, a section taken at the line 5 on Fig. 3 and viewed in the direction of the arrow; Fig. 6, a view like that presented by Fig. 4, but showing one of the rack-bars at the extreme end of its throw in the direction away from the track in Fig. 1, with its pinion in the position then occupied by it; Fig. 7, a view like that presented by Fig. 5, but showing the position of the mutilated pinion of one rack-bar when the rack and pinion presented to view in Fig. 6 occupy the relative positions shown therein; Fig. 8, a view like that presented by Fig. 6, but showing the other of the two rack-bars and mutilated pinions, with the bar at the extreme

end of its throw in the direction toward the track in Fig. 1; and Fig. 9, a view like that presented by Fig. 7, but showing the relative positions of the mutilated pinion and rack-bar of Fig. 6 when the rack-bar of Fig. 8 is at the end of its throw, as presented in the last-named figure.

A is the switch-stand casing, which I prefer for convenience to form in three horizontal sections, fitting one upon the other and bolted together, as shown. In the center of the casing is journaled to extend transversely thereof the shaft B, shown to be provided at one end with a beveled gear *a*, meshing with a similar gear *a'* on the switch-stand spindle C, which is journaled to oscillate in a lateral extension of the casing. Secured side by side on the shaft B to turn with it are the two mutilated pinions D and E, both of the same construction. Each pinion is provided with a single series of teeth *b*, the number of which is preferably, as shown, less by one than the notches *c*, (shown to be six, though the number of teeth and notches may vary from the representation in the drawings without departure from my invention.) The plain portion of the pinion-perimeter between the extreme notches describes an arc in a circular plane between the arc described by the outer extremities of the teeth and that described by the bases of the notches. Thus the plain perimeter portion of each pinion extends between opposite ends of the series of teeth in the arc of a circle intersecting the teeth, whereby the latter protrude beyond the plane of the unserrated portion of the pinion-perimeter, while the notches extend inside that plane, forming shoulders *t* or partial teeth at the outer margins of the extreme notches.

D' and E' are rack-bars mounted to reciprocate longitudinally in the opposite ends of the casing A, beyond which they protrude and within which they engage at their under toothed sides, respectively, with the pinions D and E, being so adjusted relatively to the latter that their plain lower surfaces extend tangentially to the plain portions of the perimeters of the pinions when the latter are turned to positions in which the plain portions of their perimeters meet the under sides of the bars. On the upper side of each bar

is provided an elongated offset d , forming at its opposite ends the shoulders d' and d'' to abut against the inner sides of the casing A and limit the movements therein of the bars.

- 5 The notches c' , forming the teeth b' on the under sides of the rack-bars to engage with those on the respective pinions, are preferably fewer by one on each bar than those of each pinion, while the rack-teeth of each bar exceed by one the number of teeth of each pinion, though the outer sides of the extreme teeth on each bar are shallower than the sides of the remaining teeth of the series to conform to the shoulders t at the opposite ends of the respective series of pinion-teeth.

The pinions are so set on the shaft B that their respective series of teeth are always on opposite sides of the axis of the shaft, as they are shown to be in the relative positions of the pinions represented in Fig. 8. I prefer to provide on a side of each rack-bar near one end of its series of teeth a shoe e , having a concave lower edge to conform to the arc of the plain perimeter portion of the pinion below it, which carries on one side to engage with the shoe e , for a purpose hereinafter described, a companion shoe f , convexly arc-shaped on its outer edge to coincide with the arc of the plain perimeter portion of the pinion.

F is the operating-lever, pivotally connected at one end with the outer end of the shaft B and having elongated slots g and g' , Fig. 3, intersecting at right angles to each other between its ends to embrace the hasps g^2 , g^3 , and g^4 in different positions of the throw of the lever. To enable the lever to be easily thrown from one to the other of the three positions at right angles to each other at which the hasps are shown to be provided in Figs. 1 and 2, it is bifurcated at its inner end, there to embrace the flattened headed end h of the shaft B, on which the lever is fulcrumed by a pivot-pin i , passing through it and through the fork h' of the lever. Thus in the central position of the operating-lever it may be raised on its fulcrum for turning it to either of the two other positions. In turning the lever toward either hasp g^3 or g^4 the flat sides of the fork engage with the flat-sided head h to effect rotation of the shaft B and a quarter-turn of the target-shaft C, besides throwing a switch in the manner hereinafter described, and the lever in reaching its horizontal position embraces at its slot g' the hasp there coinciding with it. To return the lever to the central position in which it is illustrated, it is raised (thereby turning the shaft B to set the target and throw a switch accordingly) to a vertical position, in which the shaft-head h and fork h' are vertical and permit the lever to be lowered into alinement with the shaft B to embrace at its slot g the hasp g^2 . In either of the three positions of the operating-lever it may be secured by a padlock (not shown) engaging with the hasp.

The three-throw railway-switch in connection with which my improved switch-stand is shown to be operatively applied presents no feature of novelty.

G and G' represent the divergent stock-rails.

H and H' are the longer point-rails, and I and I' are the shorter point-rails. The point-rail I is connected in a usual manner by a head-rod k through a known form of switch-rail adjustment (indicated at x) with the point-rail H. The point-rail I' is similarly connected by a head-rod k' with the point-rail H'. The point-rail H is pivotally connected through the medium of a switch-rod l , also provided with an adjustment x , with the adjacent end of the rack-bar E', and the point-rail H' is similarly connected with the adjacent end of the rack-bar D' through the medium of a switch-bar l' , likewise shown to be provided with a throw-adjusting device x . As will therefore be understood, when with the rails in the relative positions for the main track in which they are shown the point-rail H is thrown in the direction away from the rail G into contact with the point-rail I', it throws the point-rail I through the medium of the head-rod k into contact with the point-rail H', and with the rails in the illustrated relative positions when the point-rail H' is thrown in the direction away from the rail G' into contact with the point-rail I it throws the point-rail I' through the medium of the head-rod k' into contact with the point-rail H.

The described throwing of the switch-rails is accomplished by turning the operating-lever F as follows: As shown, the lever of the switch-stand is in its central position, with the switch-rails set for the main track. In that condition of the switch-stand the pinion D and rack-bar D' occupy the relative positions in which they are represented in Fig. 4, with the rack-bar shoulder d' abutting against the casing and a pinion-shoulder t engaging with an extreme rack-tooth to lock the rack against longitudinal return movement, in which position it is further locked by the engagement with each other of the respective shoes e and f , and the pinion E and rack-bar E' occupy the relative positions in which they are represented in Fig. 5, with a pinion-shoulder t engaging with an extreme rack-tooth to lock the rack against longitudinal advance movement, in which position it is further locked against such movement by the engagement with each other of the respective shoes e and f . To throw the switch-rails H I, the lever is raised to a vertical position and turned toward the right to a horizontal position to rotate the shaft B and actuate the pinion E and rack E' to the relative positions represented in Fig. 8, thus to advance the rack E', while the rack D' remains stationary and the pinion D will have been turned to the position in which Figs. 8 and 9 represent it. By reversing the lever F to restore it to its central position and turn back the shaft

B the switch-rails H I are returned to the positions shown in Fig. 1 to reset them for the main track and the rack E' and pinions D' and D are restored to their initial positions.

5 To throw the switch-rails H' I', the operating-lever is raised and turned toward the left to a horizontal position to rotate the shaft B and actuate the pinion D and rack D' to the relative positions represented in Fig. 6,
10 thus to retract the rack D', while the rack E' remains stationary and the pinion E will have been turned to the position in which Fig. 7 represents it. By reversing the throw of the lever to restore it to its central position the
15 switch-rails H' I' are returned to the positions in which they are shown in Fig. 1 to reset them for the main track, and the rack D' and pinions are again restored to their initial positions, (shown in Figs. 4 and 5,) in which
20 each is in readiness to be engaged with its rack-bar for moving it by turning the operating-lever from its normal central position to one side or the other.

What I claim as new, and desire to secure
25 by Letters Patent, is—

1. In a switch-stand, the combination with the casing of a shaft journaled therein, mutilated pinions set on said shaft with their series of teeth respectively on opposite sides of
30 the shaft-axis, and rack-bars supported to be reciprocated longitudinally in said casing by engagement with their teeth of said pinion-teeth.

2. In a switch-stand, the combination with
35 the casing of a shaft journaled therein, mutilated pinions each having a series of teeth and a plain perimeter portion extending between opposite ends of said series in the arc of a circle intersecting said teeth, said pin-
40 ions being set on the shaft with their series of teeth respectively on opposite sides of the shaft-axis, and rack-bars supported to be reciprocated longitudinally in said casing by engagement with their teeth of said pinion-
45 teeth.

3. In a switch-stand, the combination with the casing of a shaft journaled therein, mutilated pinions each having a series of teeth and a plain perimeter portion extending be-
50 tween opposite ends of said series in the arc of a circle intersecting said series and forming shoulders of the outer walls of the extreme notches, said pinions being set on the shaft with their series of teeth respectively
55 on opposite sides of the shaft-axis, and rack-bars supported to be reciprocated longitudinally in said casing by engagement with their teeth of said pinion-teeth, the extreme members of each series of rack-teeth being
60 shallower on their outer than on their inner sides.

4. In a switch-stand, the combination with the casing of a shaft journaled therein, mutilated pinions each having a series of teeth
65 and a plain perimeter portion extending between opposite ends of said series in the arc of a circle intersecting said teeth, said pin-

ions being set on the shaft with their series of teeth respectively on opposite sides of the shaft-axis, rack-bars supported to be reciprocated longitudinally in said casing by engage- 70
ment with their teeth of said pinion-teeth, and mutually engaging rack-locking shoes on said bars and pinions.

5. In a switch-stand, the combination with 75
the casing of a vertical spindle journaled therein, a horizontal shaft journaled in said casing and geared at one end to said spindle to turn it by turning said shaft, mutilated
80 pinions, D and E, mounted side by side on said shaft with their series of teeth respectively on opposite sides of its axis, rack-bars D' and E' supported to move longitudinally in said casing and respectively engaging with
85 said pinions, and an operating-lever fulcrumed on the opposite end of said shaft.

6. A switch-stand comprising, in combination with its casing, a target-shaft C provided at its lower end with a beveled gear *a'*, a horizontal shaft B journaled in the casing and 90
carrying at one end a beveled gear *a* meshing with said gear *a'* and having fulcrumed on its opposite end an operating-lever, mutilated pinions D and E secured side by side on said shaft to extend their series of teeth respec- 95
tively on opposite sides of the shaft-axis, rack-bars D' and E' supported in the casing respectively above said pinions D and E to be reciprocated longitudinally by engagement with their teeth of the pinion-teeth, and shoes *e* 100
and *f* respectively on said rack-bars and pinions, substantially as described.

7. In a switch-stand, the combination with the casing, of a shaft journaled therein and having a flattened outer end, mutilated pin- 105
ions set on said shaft with their series of teeth respectively on opposite sides of the shaft-axis, rack-bars supported to be reciprocated longitudinally in said casing by engagement with their teeth of said pinion-teeth, and an 110
operating-lever having a bifurcated end at which it embraces and is fulcrumed on the flattened end of said shaft, substantially as and for the purpose set forth.

8. In a switch-stand, the combination with 115
the casing of a shaft journaled therein and provided with a flat head at its outer end, mutilated pinions set on said shaft with their series of teeth respectively on opposite sides of the shaft-axis, rack-bars supported to be 120
reciprocated longitudinally in said casing by engagement with their teeth of said pinion-teeth, an operating-lever having a bifurcated end at which it embraces and is fulcrumed on said shaft-head and provided between its 125
ends with longitudinal slots intersecting each other at right angles, and hasps on the stand at the three different positions of throw of the lever to be embraced by said slots, substantially as described.

EUGENE N. STROM.

In presence of—

ALBERT D. BACCI,
M. S. MACKENZIE.