

No. 685,378.

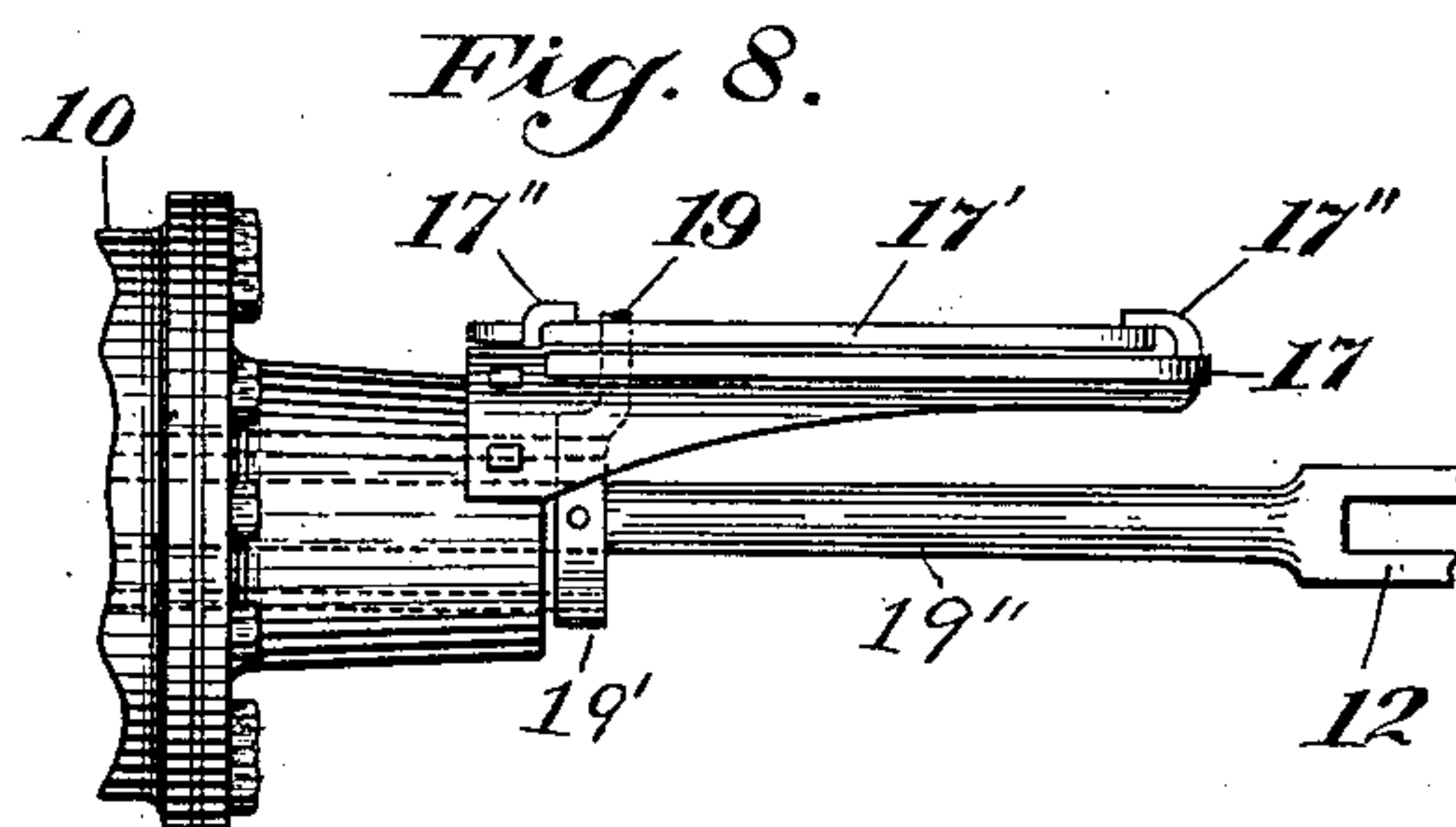
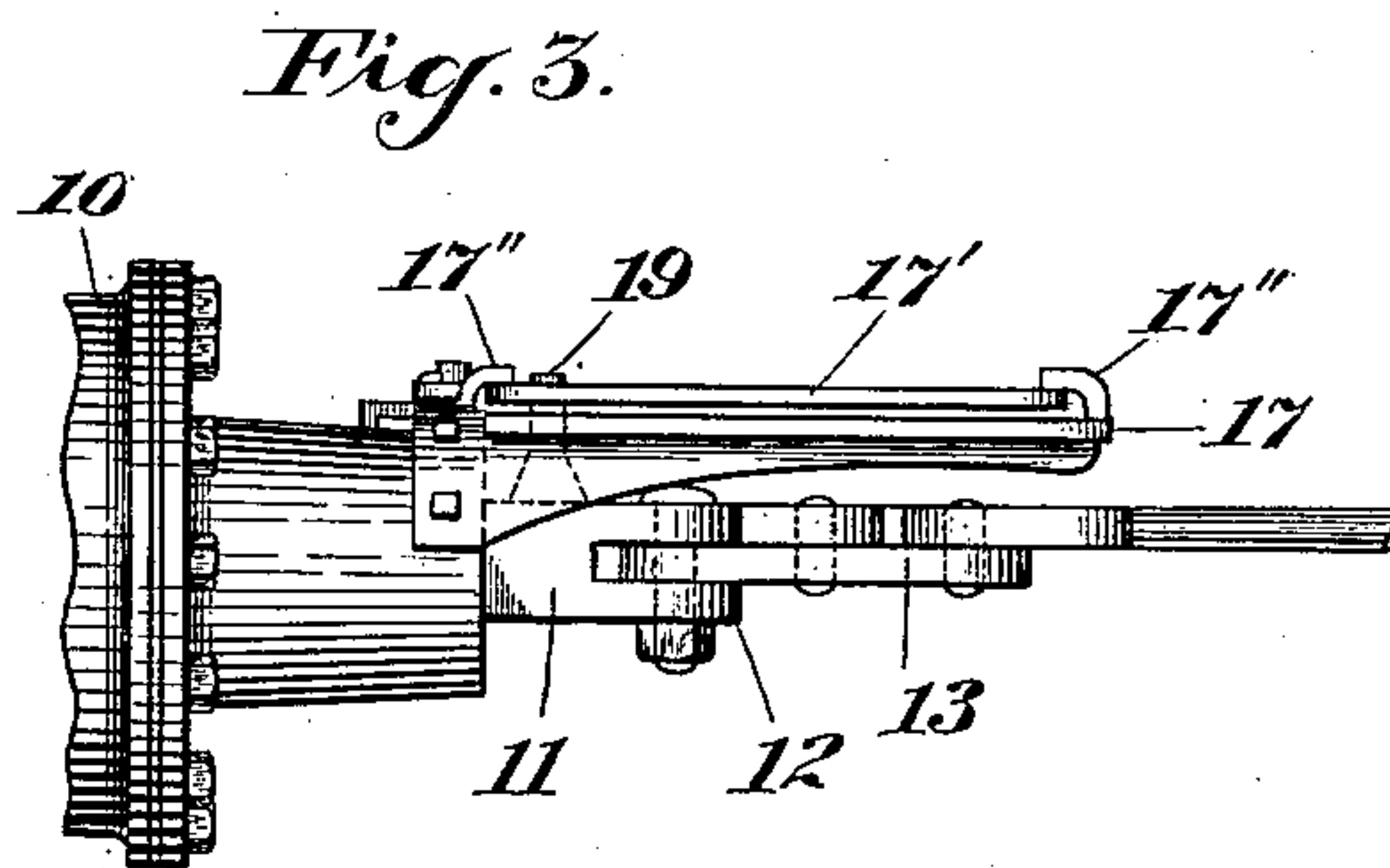
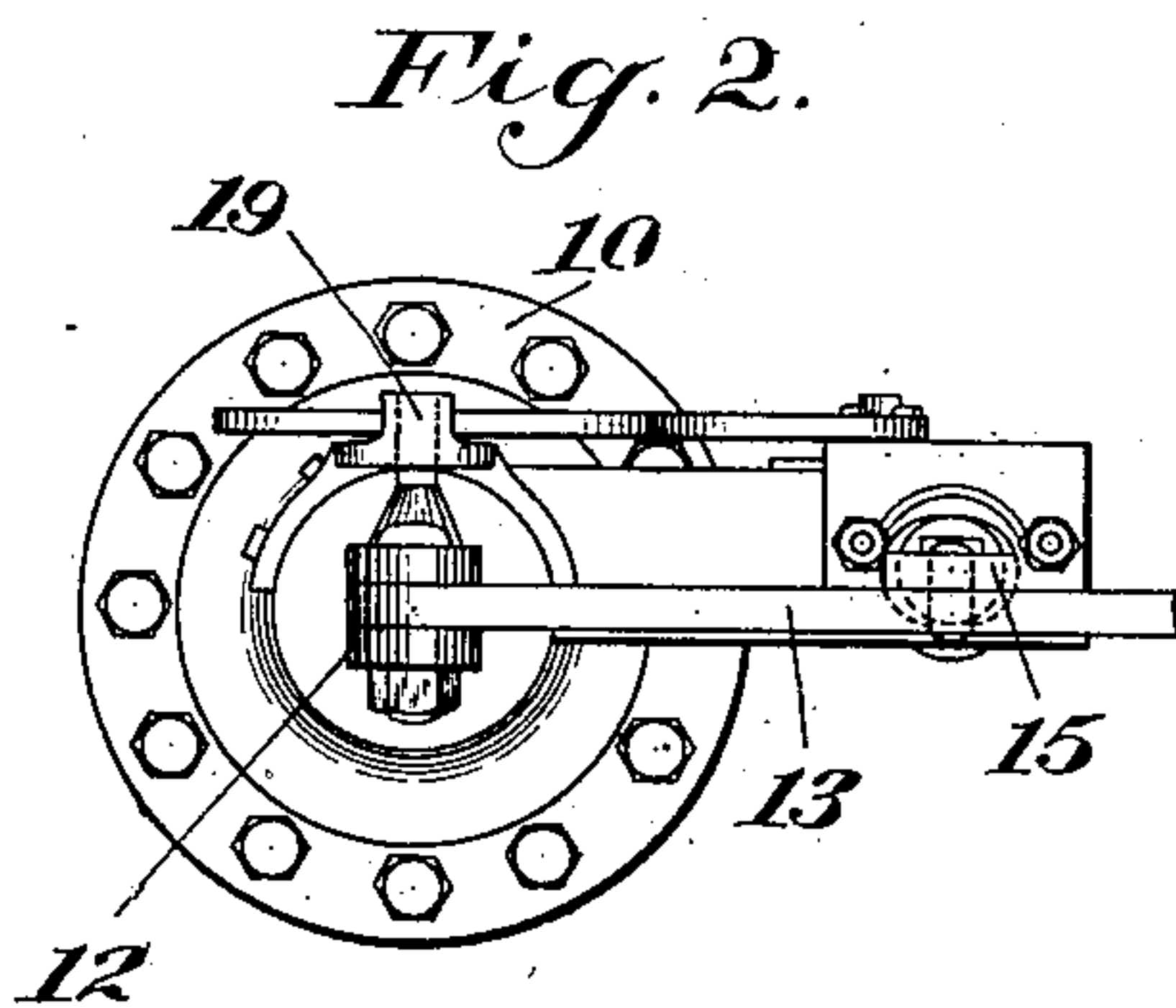
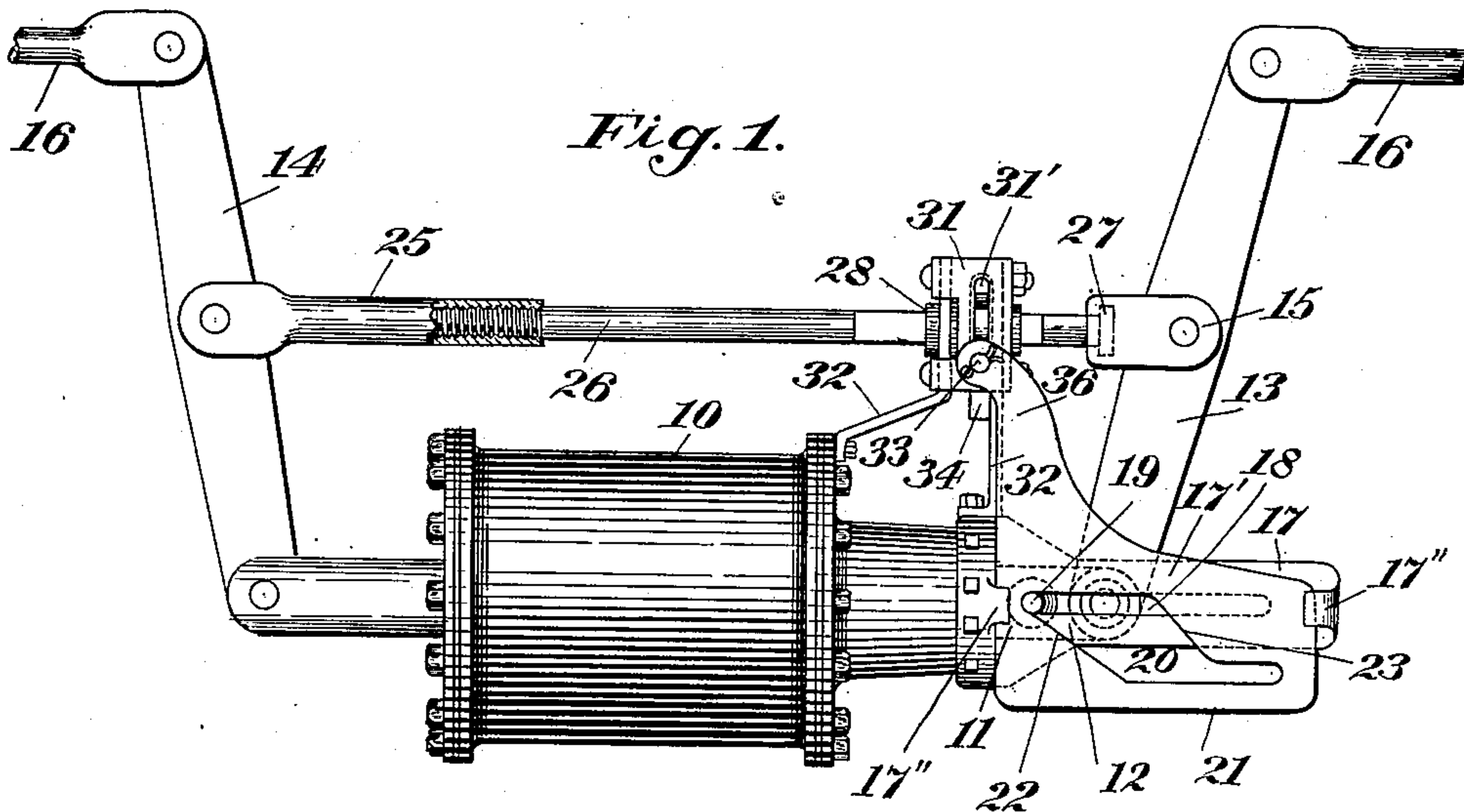
Patented Oct. 29, 1901.

S. J. JOHNSON.
SLACK ADJUSTER FOR BRAKES.

(Application filed Dec. 3, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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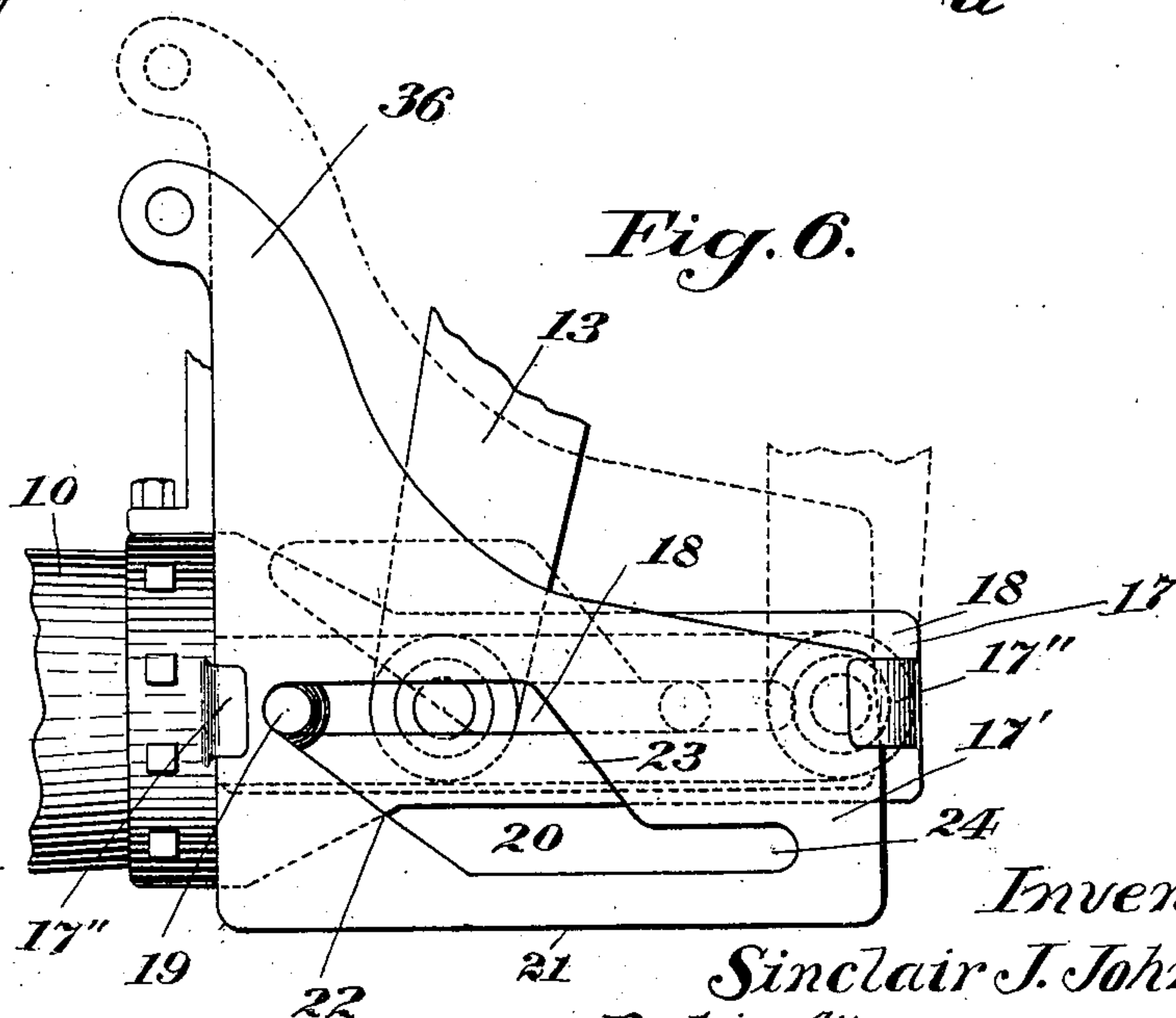
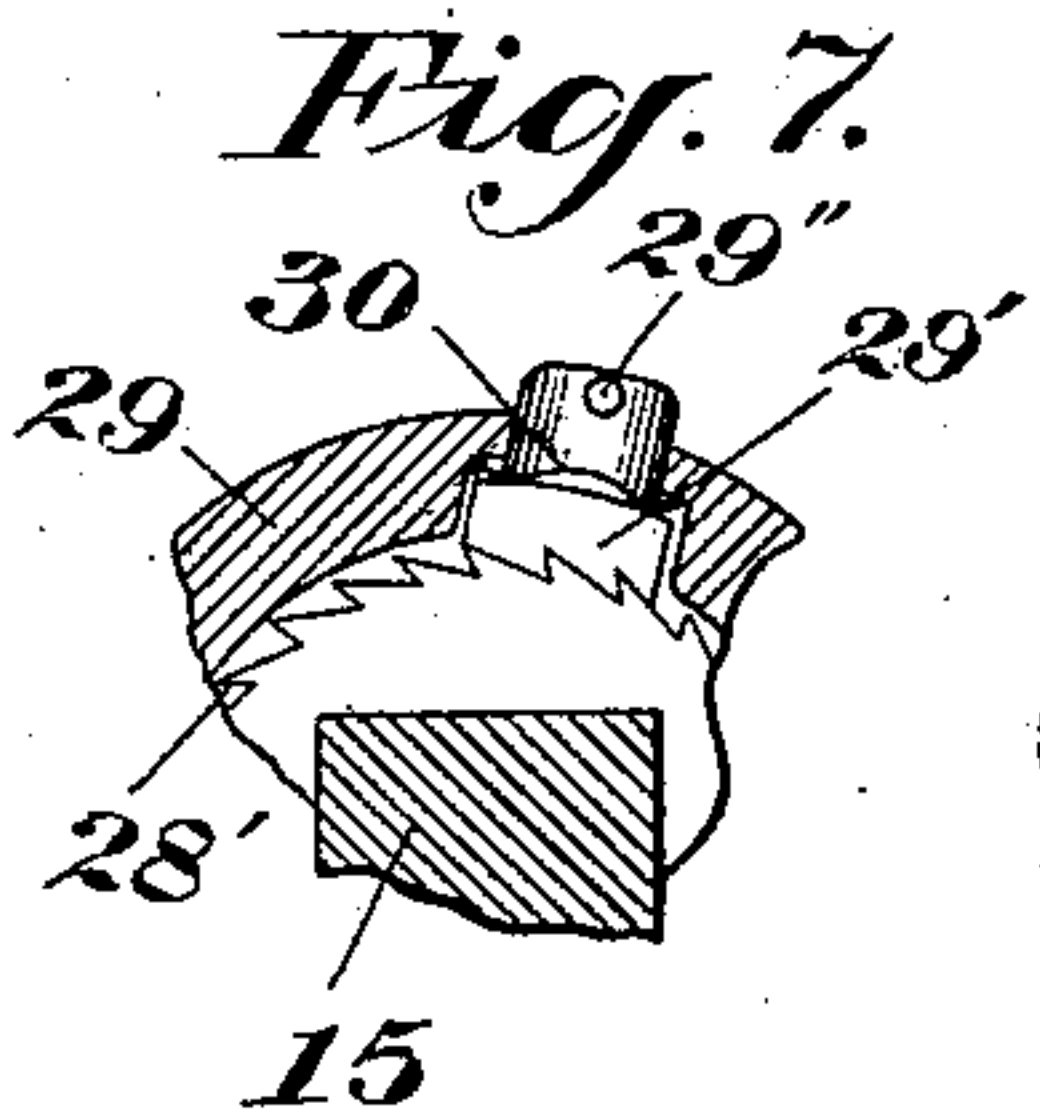
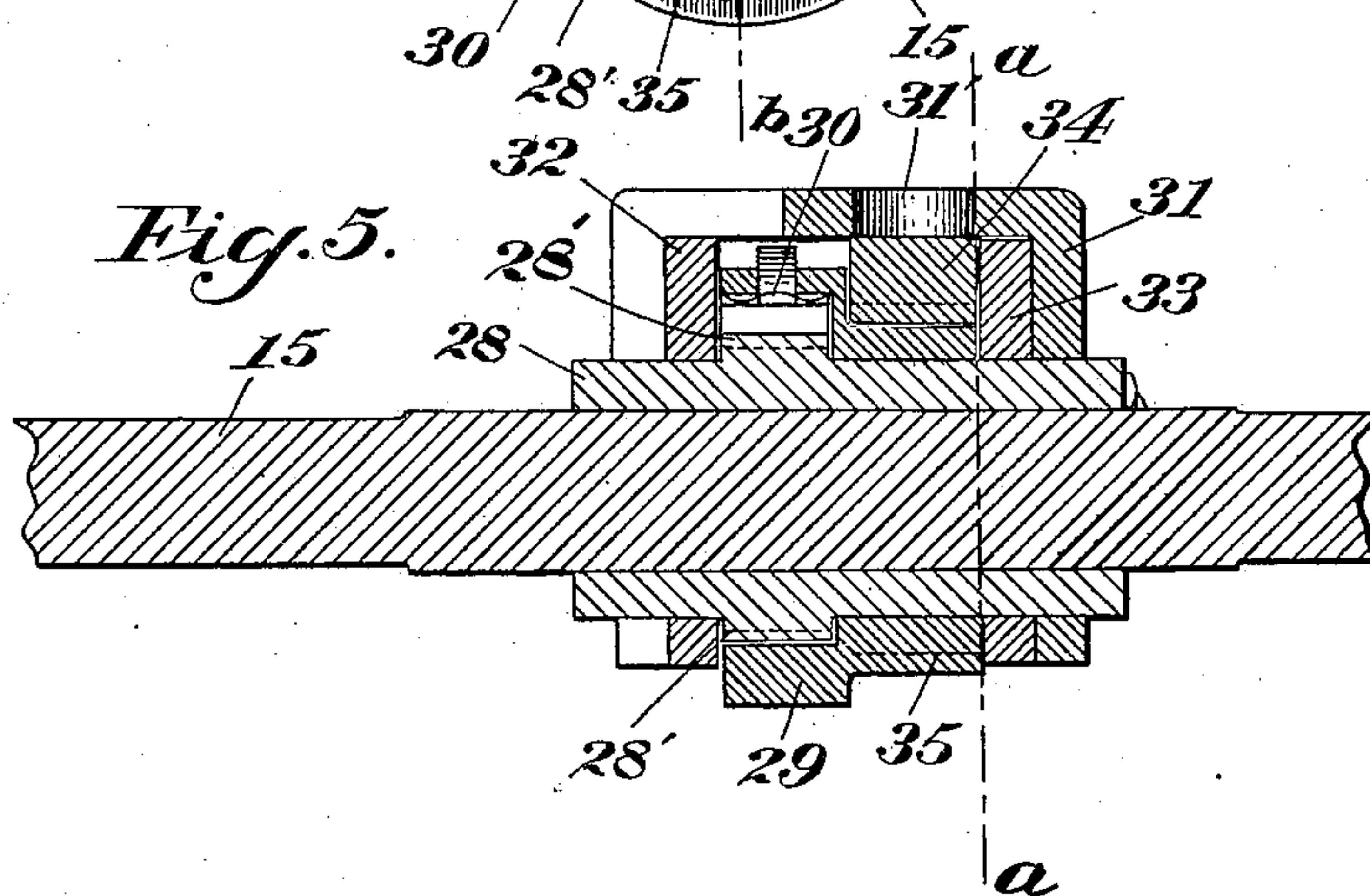
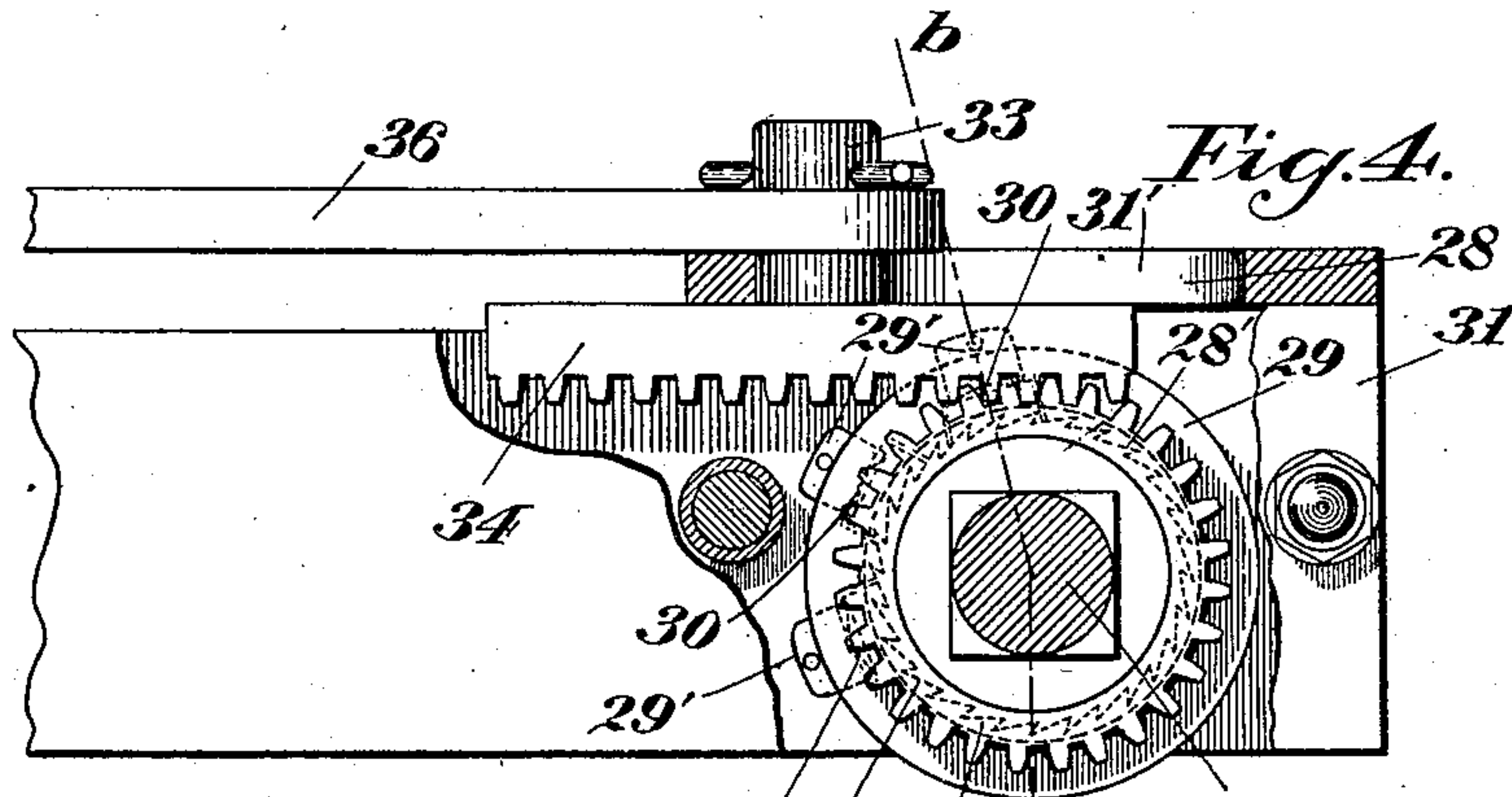
S. J. JOHNSON.

SLACK ADJUSTER FOR BRAKES.

(Application filed Dec. 3, 1900.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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SLACK-ADJUSTER FOR BRAKES.

SPECIFICATION forming part of Letters Patent No. 685,378, dated October 29, 1901.

Application filed December 3, 1900. Serial No. 38,383. (No model.)

To all whom it may concern:

Be it known that I, SINCLAIR J. JOHNSON, a citizen of the United States, residing in Nutley, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Slack-Adjusters for Brakes, of which the following is a specification.

This invention relates to improvements in slack-adjusters for brake mechanism, being more particularly adapted for use in connection with air-brakes upon railway rolling-stock, and has for its object the provision of simple and efficient means for taking up the slack or space in the connections caused by the wear of the brake-shoes or other parts or by the springing of various members.

In the drawings accompanying this specification, Figure 1 is a plan view of slack-adjusting mechanism made according to the present invention, being shown with a brake-cylinder for passenger-cars, and a portion of the brake-connections therefor. Fig. 2 is an end elevation thereof. Fig. 3 is a side elevation of the right-hand portion of Fig. 1. Fig. 4 is a section of the ratchet mechanism on the line *a a* of Fig. 5. Fig. 5 is a section of the same on the line *b b* of Fig. 4. Fig. 6 is an enlarged plan of the actuating mechanism. Fig. 7 is an enlarged detail of a pawl, and Fig. 8 is a side elevation showing a connection between the piston member and the actuating device in the form of brake mechanism used for freight-cars.

Similar characters designate like parts in the different figures of the drawings.

As shown in Figs. 1 to 7 of the drawings, the numeral 10 designates a brake-cylinder, (herein shown as of the type used in the well-known Westinghouse system upon passenger-cars,) from which projects a piston-rod 11, carrying a cross-head 12, the piston, piston-rod, and its cross-head forming what is hereinafter termed the "piston member." To the cross-head a cylinder-lever 13 is pivoted in the usual manner. At the end of the cylinder is pivoted a lever 14, and a cylinder-lever rod 15 pivotally connects the two levers together. From the outer ends of the levers 13 14 lead rods 16 16, furnishing connection with the brakes.

To the brake-cylinder or the head thereof, in proximity to and at one side of the piston-

rod, is secured a plate or support 17, having a slot 18, through which extends a pin or projection 19, here shown as mounted directly upon the cross-head, but which might be connected to the piston member in other ways. Upon the support 17, conveniently situated upon the opposite side from the cross-head, a plate or member 17' is mounted to slide transversely of the piston-rod in guides 17'' 17'' near the ends of the support, said guides being formed integrally with or secured thereto. This plate, which serves as an actuator for mechanism to be hereinafter described, is provided with a cam-opening, the main portion 20 of which may be quadrilateral, with its side walls or edges 21 lying outside the slot 18 and the inner and outer end walls or edges 22 23, respectively, so located as to cross said slot as the plate is slid. At the outer end of the main opening and at or near one side may be an open extension 24. The length of the opening between the walls 22 23 is sufficient to permit the free travel of the pin on the cross-head during its normal range of movement in the operation of setting the brakes, while the total length from the wall 22 to the end of the extension 24 may be equal to the greatest possible movement of the cross-head.

A portion of the brake connections, preferably the cylinder-lever rod, is divided, one portion 25 being tubular and supplied with an internal thread and the other, 26, with an external thread adapted to engage it. The latter has a swivel connection 27 with its lever to permit its rotation and carries upon it a sleeve or collar 28, which is compelled to turn therewith, while it is free to slide along the rod by a means here shown as a squared portion of the rod fitting a corresponding opening in the collar. This collar is provided upon its exterior at 28' with ratchet-teeth. Surrounding the collar 28 and turning loosely thereon is a collar 29, in recesses in which over the ratchet-teeth are one or more sliding pawls 29' (here shown as three in number) to secure engagement upon comparatively slight movement, which may be pressed against the teeth by springs 30, resting in an enlarged portion of the recesses and against a like portion of the pawls. The pawls are here shown as extending through the collar, and each is provided with an opening 29'', by

which it may be drawn out of contact with the ratchet-teeth, if desired.

To retain the collars 28 29 against lateral movement, they preferably have about them
5 a retaining-frame 31, supported by arms 32 32 from the brake-cylinder and conveniently made in sections fastened together by bolts. This frame has a slot 31' at one side, through
10 which projects a pin 33 upon a rack 34, sliding upon the inner face of the frame, with its teeth engaging a pinion 35, fast upon the collar 29. A connecting-rod 36, pivoted upon the pin 33 outside the frame, also has pivotal
15 connection with the plate 17' at an extension at one side thereof to reciprocate the rack.

In the operation of this device the pin connected to the cross-head during the normal travel of the piston before the parts become worn or sprung moves between the inner end
20 of the slot and the edge 23 of the opening in plate 17'. When wear of the parts causes the brake-shoe to be held farther from the wheel in its off position, so that a longer stroke of the piston is necessary to bring the two to-
25 gether, the pin 19 in its increased travel on the application of the brakes comes into contact with the inclined or curved end wall 23. This presses the plate 17' upward, the parts assuming the position shown in dotted lines
30 in Fig. 6, and by means of the connecting rod, rack, and pinion thereof turns the collar 29, the pawls sliding loosely over the ratchet-teeth in this direction. Then when the brakes are released and the piston-rod is forced back
35 by its spring, the pin moving back through the slot which comes into contact with the side 22 of the opening and pressing it downward returns the plate to substantially its original position, and thus turns the collar 29
40 in the opposite direction. In the movement the ratchet-teeth are engaged by the pawls, and as a result the collar 28 is rotated, turning the threaded section 26 and shortening the rod 15, thus taking up slack in the parts.
45 The extension of the opening 24 permits an added movement of the pin, which might occur through increased travel of the piston as a result of abnormal changes in the brake connections.

50 It will be seen that the action of the adjuster in taking up slack comes at a time when the parts are relaxed, so that there will be little strain or friction in the rotating mechanism for varying the length of the cylinder-lever rod.
55

By mounting the supporting and retaining elements directly upon the cylinder, as shown, the correct positioning of the various parts is assured, they not being subjected to the
60 changes which might result from sagging or like movements if secured, for example, to the car-body.

In the use of the invention with a freight-brake mechanism, as illustrated in Fig. 8, the
65 arrangement may be substantially the same as that just described, except that the projection 19 may be conveniently made upon a col-

lar 19', which is fastened in any desired way upon the end of the tubular cylinder-rod, the
70 push-rod 19" extending loosely through it. Here, however, the term "piston member" includes only the piston and piston-rod, the cross-head being carried by the push-rod and not rigidly connected to the piston member.

Having described my invention, I claim— 75

1. The combination, with a brake-cylinder and a piston member, of a rod having a threaded portion and forming a part of the connection with the brake mechanism; a threaded
80 portion surrounding the same; means for rotating one of the threaded elements; a member mounted to slide upon a support adjacent to the piston member and adapted to be operated by said piston member; receiving movement therefrom independently of the sup-
85 porting means; and a connection therefrom to the rotating means.

2. The combination, with a brake-cylinder and a piston member, of a rod having a threaded portion and forming a part of the connection with the brake mechanism; a threaded
90 portion surrounding the same; means for rotating one of the threaded elements; a plate mounted to slide upon a relatively-fixed support adjacent to the piston member and adapted
95 to be operated by said piston member; and a connection therefrom to the rotating means.

3. The combination, with a brake-cylinder and a piston member, of a rod having a threaded portion and forming a part of the connection with the brake mechanism; a threaded
100 portion surrounding the same; means for rotating one of the threaded elements; a sliding plate provided with an opening adjacent to the piston member and adapted to be operated
105 thereby; and a connection therefrom to the rotating means.

4. The combination, with a brake-cylinder and a piston member, of a rod having a threaded portion and forming a part of the connection with the brake mechanism; a threaded
110 portion surrounding the same; a sliding reciprocating device for rotating one of the threaded elements; a movable member adapted to be operated by the piston member; and
115 a connection therefrom to the reciprocating device.

5. The combination, with a brake-cylinder and a piston member, of a rod having a threaded portion forming a part of the connection with the brake mechanism; a threaded
120 portion surrounding the same; means for rotating one of the threaded elements; a sliding plate supported upon the cylinder adjacent to the piston member and adapted to be operated
125 thereby; and a connection therefrom to the rotating means.

6. The combination, with a brake-cylinder, a piston member, and brake connections, of a rotating mechanism for varying the position
130 of a portion of said brake connections; and an actuator therefor mounted to slide upon a support and adapted to be operated by the piston member.

7. The combination, with a brake-cylinder, a piston member, and brake connections, of a rotating mechanism for varying the length of a portion of said brake connections; and
 5 an actuator therefor mounted to slide upon a support and adapted to be operated by the piston member.

8. The combination, with a brake-cylinder, a piston member, and brake connections, of
 10 a rotating mechanism for varying the length of a portion of said brake connections; a sliding member provided with an opening in which an element operated by the piston member may move during its normal travel; and
 15 an edge of said opening with which said element contacts when the travel exceeds the normal.

9. The combination, with a brake-cylinder, a piston member, and brake connections, of
 20 a rotating mechanism for varying the length of a portion of said brake connections; a sliding member provided with an opening in which an element operated by the piston member may move during its normal travel and
 25 with an extension therefrom.

10. The combination, with a brake-cylinder, a piston member, and brake connections, of a rotating mechanism for varying the length of a portion of said brake connections, and a
 30 plate mounted to slide upon a relatively-fixed support for actuating the rotating mechanism.

11. The combination, with a brake-cylinder, a piston member, and brake connections, of a mechanism for varying the length of a portion of said brake connections, and a plate
 35 mounted to slide upon a relatively-fixed support for actuating the rotating mechanism.

12. The combination, with a brake-cylinder, a piston member, and brake connections, of
 40 a mechanism for varying the length of a portion of said brake connections, and an actuator for the rotating mechanism movable transversely of the piston member on each side thereof and provided with an opening
 45 having inclined edges.

13. The combination, with a brake-cylinder, a piston member, and brake connections, of a rotating mechanism for varying the length of a portion of said brake connections, and
 50 an actuator for the rotating mechanism movable transversely of the piston member on each side thereof and provided with an opening having inclined edges.

14. The combination, with a brake-cylinder, a piston member, and brake connections, of a mechanism for varying the length of a portion of said brake connections, and a plate
 55 sliding upon a support mounted upon the cylinder for actuating said rotating means.

15. The combination, with a brake-cylinder, a piston member, and brake connections, of a rotating mechanism for varying the length of a portion of said brake connections, and a
 60 plate sliding upon a support mounted upon the cylinder for actuating said rotating means.

16. The combination, with a brake-cylinder, a piston member, and brake connections, of

a rotating mechanism for varying the length of a portion of said brake connections; a movable member provided with an opening for
 70 actuating said rotating means; and a projection carried by the piston member adapted to contact with the edges of said opening.

17. The combination, with a brake-cylinder, a piston member, and brake connections, of
 75 a rotating mechanism for varying the length of a portion of said brake connections; a support provided with a slot through which an element operated by the piston member projects; and a sliding plate provided with an
 80 opening having at least one of its edges intersecting the slot.

18. The combination, with a brake-cylinder, a piston member, and brake connections, of a rotating mechanism for varying the length
 85 of a portion of said brake connections; a support provided with a slot through which an element operated by the piston member projects; and a plate sliding upon a support provided with an opening having at least one of
 90 its edges intersecting the slot.

19. The combination, with a brake-cylinder and a piston member, of a divided rod forming a part of the connection with the brake
 95 mechanism and having its adjacent ends threaded to engage one another; means for rotating a portion of said rod in one direction, and an actuator of said means movable transversely of the piston member on each side
 100 thereof.

20. The combination, with a brake-cylinder and a piston member, of a divided rod forming a part of the connection with the brake
 105 mechanism and having its adjacent ends threaded to engage one another; a swiveled connection for a portion of said rod to the brake mechanism; means for rotating the swiveled portion in one direction, and an actuator of said means movable transversely of
 110 the piston member on each side thereof.

21. The combination, with a brake-cylinder and a piston member, of a divided rod forming a part of the connection with the brake
 115 mechanism and having its adjacent ends threaded to engage one another; a collar loose upon a portion of said rod provided with means adapted to rotate said portion in one direction; and a sliding reciprocating device operating with said collar to effect the movement.
 120

22. The combination, with a brake-cylinder and a piston member, of a divided rod forming a part of the connection with the brake
 125 mechanism and having its adjacent ends threaded to engage one another; a collar loose upon a portion of said rod provided with means adapted to rotate said portion in one direction; a sliding reciprocating device operating with said collar to effect the movement; and means operated by the piston member for
 130 reciprocating the same.

23. The combination, with a brake-cylinder and a piston member, of a divided rod forming a part of the connection with the brake

mechanism and having its adjacent ends threaded to engage one another; a collar loose upon a portion of said rod provided with means adapted to rotate said portion in
 5 one direction; a sliding reciprocating mechanism operating with said collar to effect the movement; and a retaining-frame surrounding the collar in which the reciprocating mechanism slides.

10 24. The combination, with a brake-cylinder and a piston member, of a divided rod forming a part of the connection with the brake mechanism and having its adjacent ends threaded to engage one another; a collar
 15 loose upon a portion of said rod provided with means adapted to rotate said portion in one direction; a sliding reciprocating mechanism operating with said collar to effect the movement; and a retaining-frame supported
 20 upon the cylinder and surrounding said collar in which the reciprocating mechanism slides.

25 25. In a slack-adjuster for brakes, the combination, with a brake-cylinder and a piston member, of a connecting-rod actuated by said piston member to operate brakes; means for varying the length of said rod to take up
 slack; and actuating means adapted to be slid upon a support by the piston member.

30 26. In a slack-adjuster for brakes, the combination, with a brake-cylinder and a piston member, of a connecting-rod actuated by said piston member to operate the brakes; means for varying the length of said rod to take up
 35 slack; and a sliding plate provided with an opening having two of its edges adapted to intersect the path of an element operated by the piston member.

27. The combination with a brake-cylinder and a piston member, of a rod having a
 40 threaded portion and forming a part of the connection with the brake mechanism; a threaded portion surrounding the same; means for rotating one of the threaded elements; a member movable transversely and
 45 on each side of the piston member and adapted to be operated thereby; and a connection therefrom to the rotating means.

28. The combination with a brake-cylinder, a piston member and brake connections, of a
 50 rotating mechanism for varying the position of a portion of said brake connections, and an actuator therefor movable transversely and on each side of the piston member and adapted to be operated thereby. 55

29. The combination with a brake-cylinder, a piston member and brake connections, of a
 60 rotating mechanism for varying the length of a portion of said brake connections, and an actuator therefor movable transversely and on each side of the piston member and adapted to be operated thereby.

30. The combination with a brake-cylinder, a piston member and brake connections, of a
 65 rotating mechanism for varying the length of a portion of said brake connections; a movable member provided with an opening in which an element operated by the piston member may move during its normal travel; and an edge of said opening with which said
 70 element contacts when the travel exceeds the normal.

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