

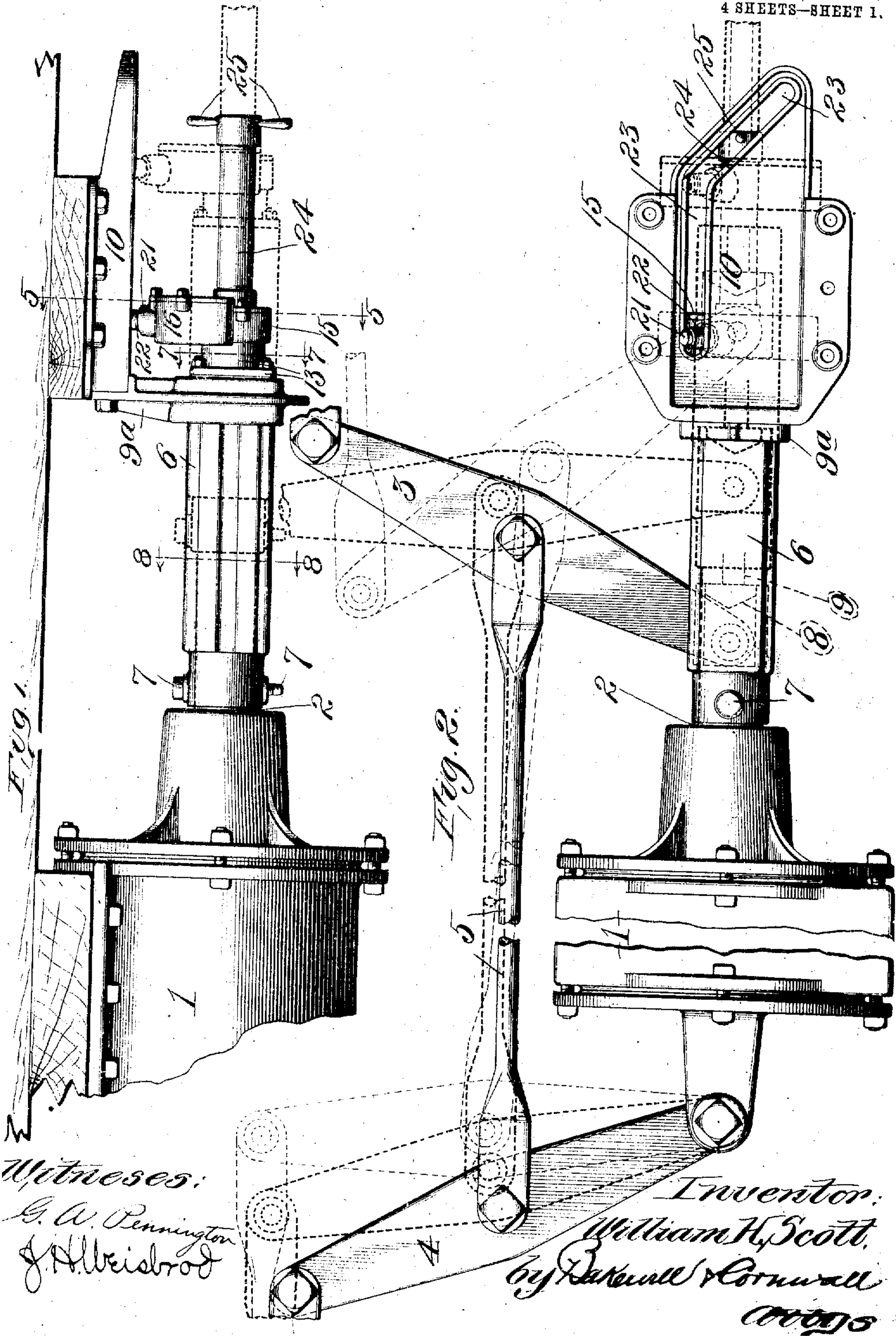
No. 754,393.

PATENTED MAR. 8, 1904.

W. H. SCOTT.
AIR BRAKE CONTROLLER.
APPLICATION FILED DEC. 24, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



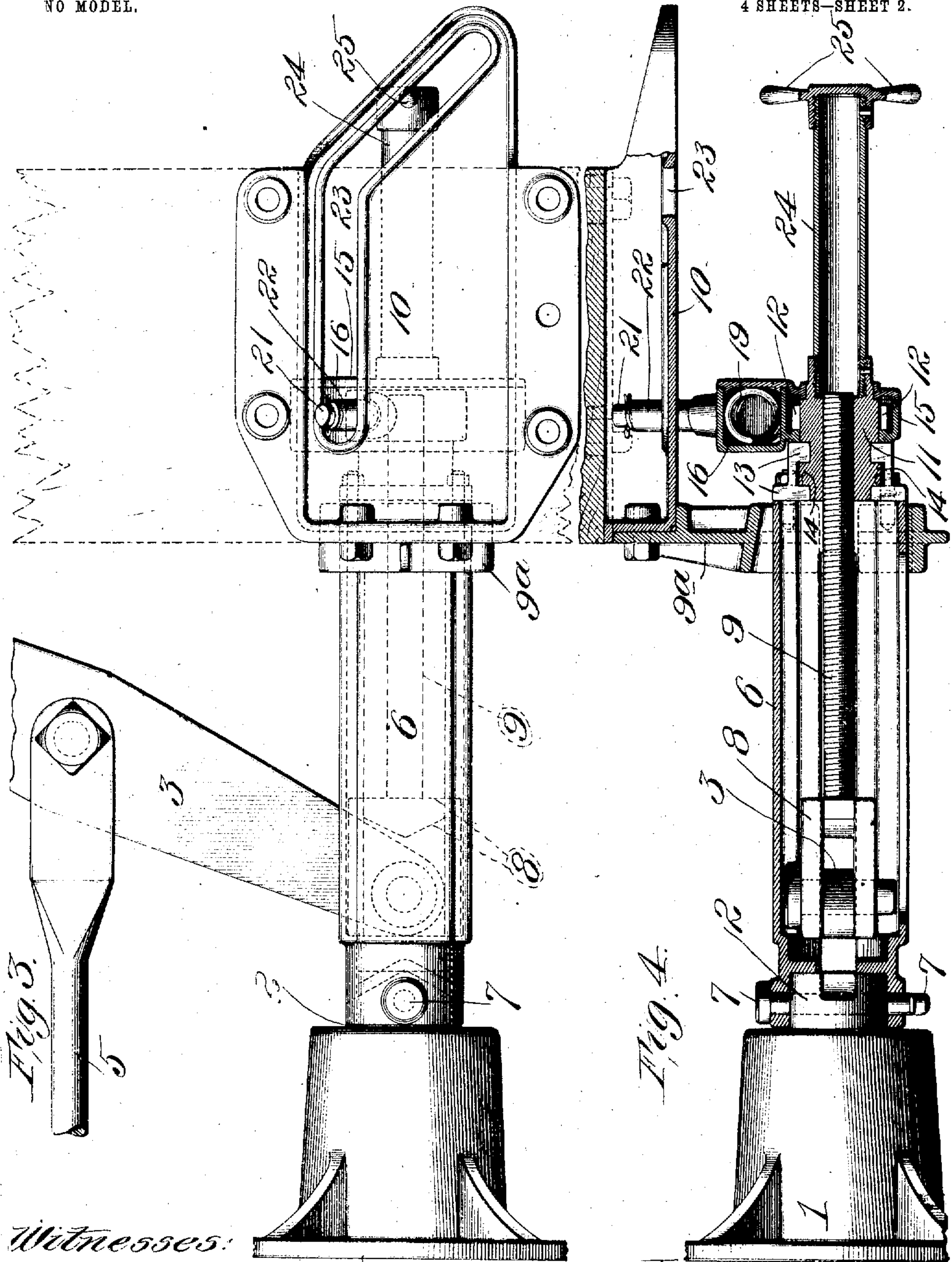
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

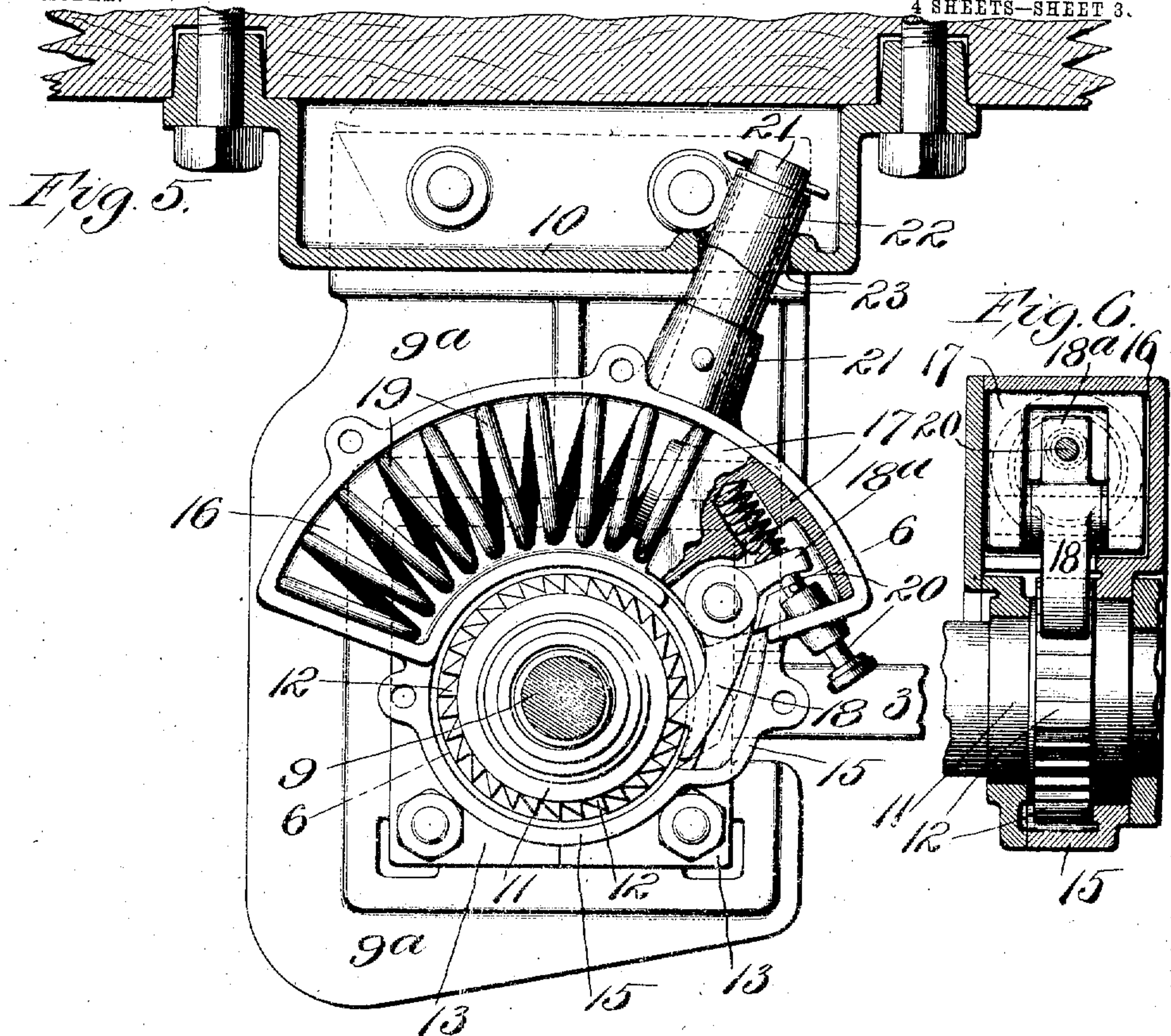


Fig. 7.

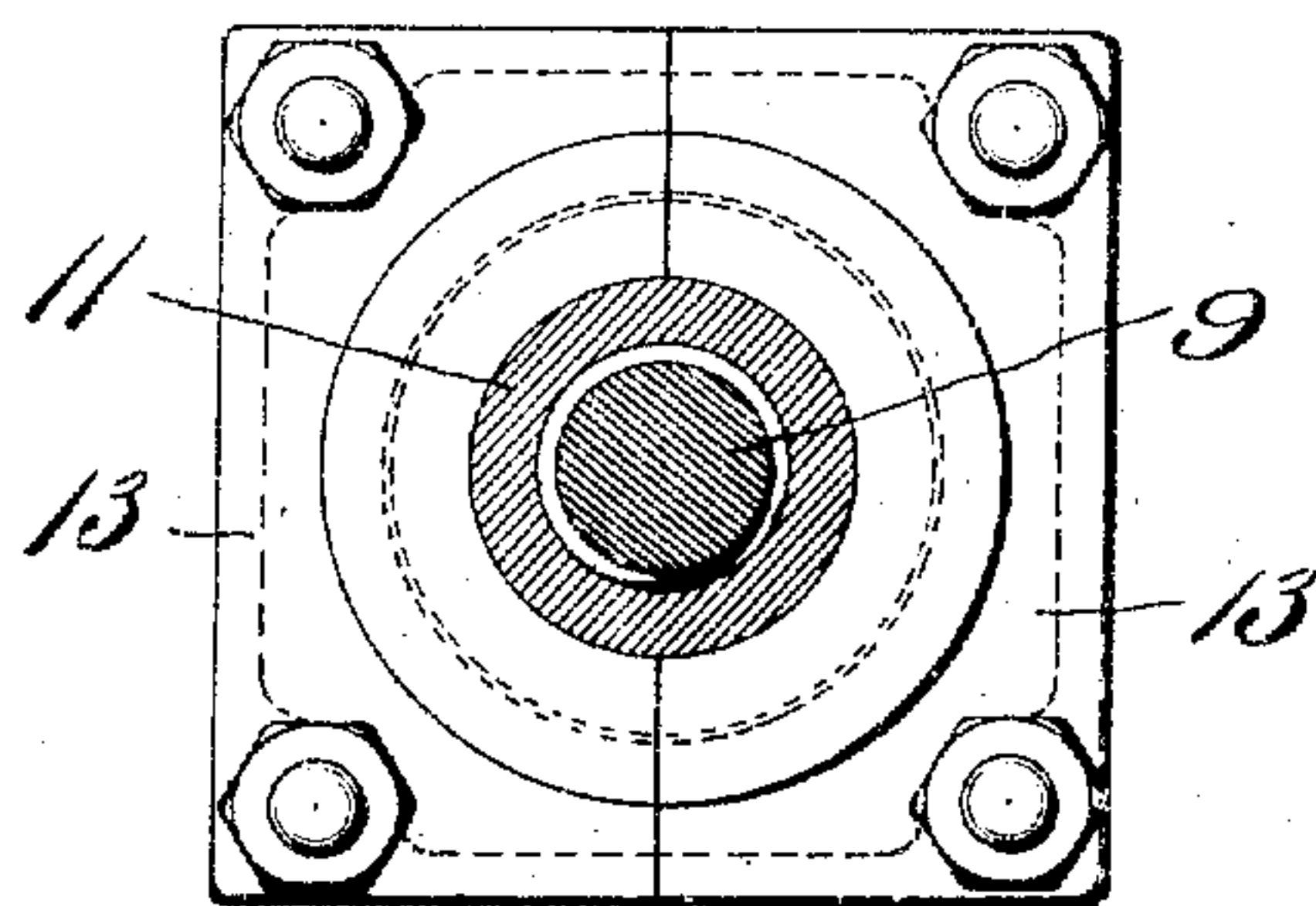
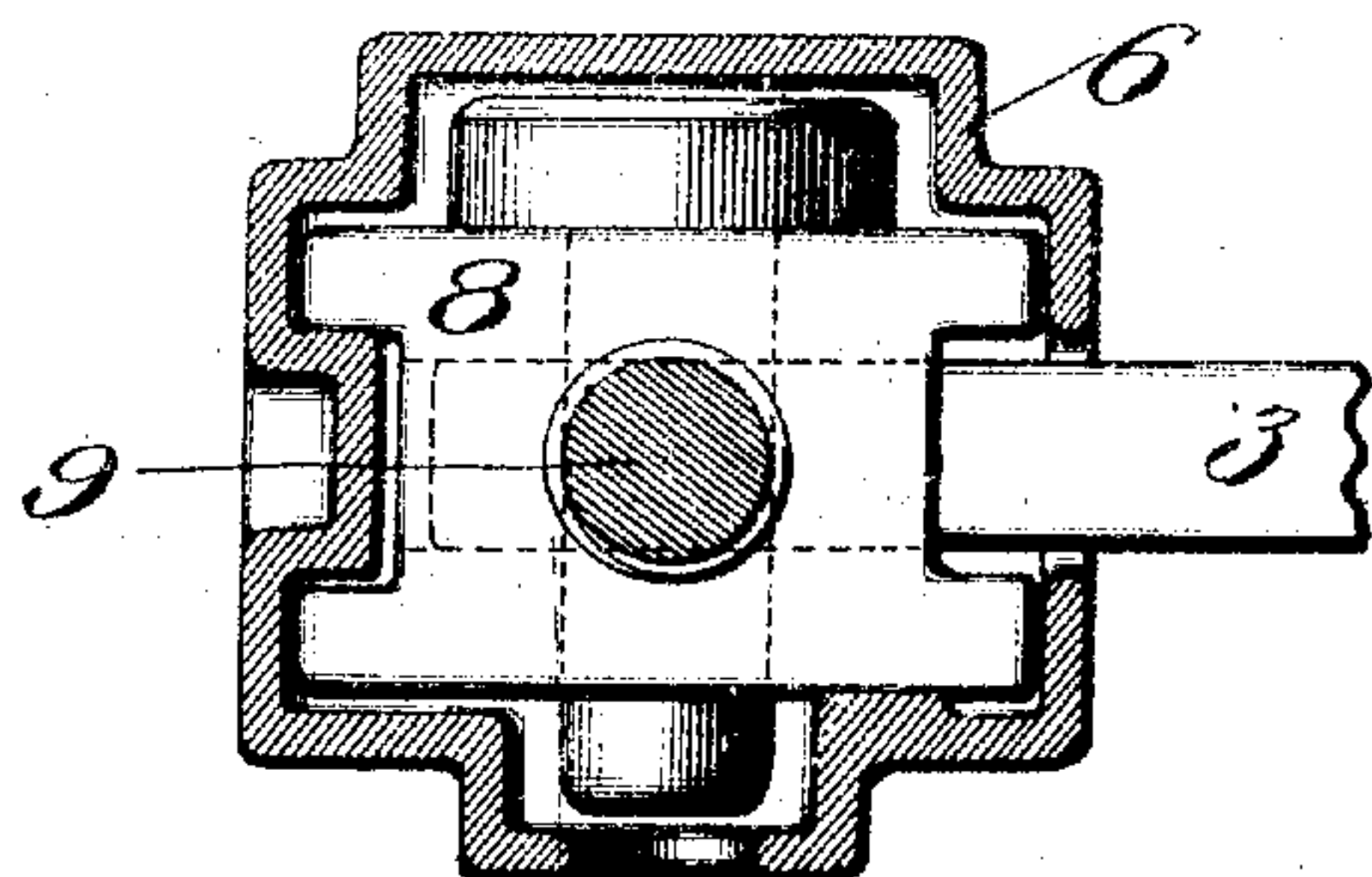


Fig. 8.



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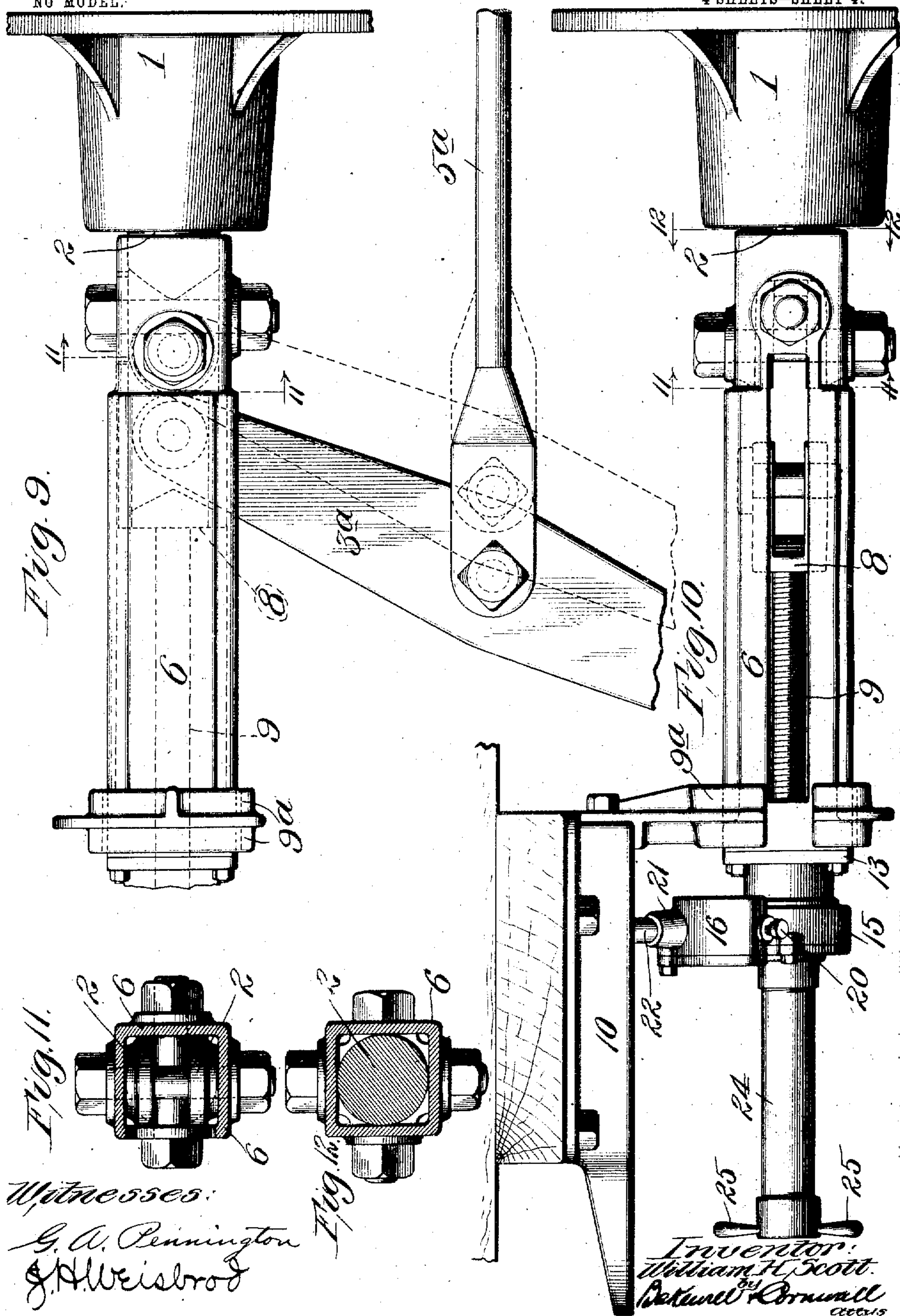
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NO MODEL.

4 SHEETS—SHEET 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

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AIR-BRAKE CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 754,393, dated March 8, 1904.

Application filed December 24, 1903. Serial No. 186,427. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SCOTT, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Air-Brake Controllers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevational view of a portion of an air-brake cylinder, showing my improved controller in position thereon. Fig. 2 is a top plan view of the same, and in addition thereto is illustrated the rear end of the cylinder, its fulcrum-lug, the cylinder-lever, and cylinder-lever tie-rod. Fig. 3 is a top plan view of my controller, together with a portion of the cylinder-head, piston-lever, and cylinder-lever tie-rod. Fig. 4 is a vertical longitudinal sectional view of my controller, showing its application to the piston-rod and the piston-lever. Fig. 5 is an enlarged sectional view on line 5 5 of Fig. 1. Fig. 6 is a sectional view on line 5 5 of Fig. 5. Fig. 7 is an enlarged sectional view on line 7 7 of Fig. 1. Fig. 8 is an enlarged sectional view on line 8 8 of Fig. 1. Fig. 9 is a top plan view of a portion of my improved controller, showing a modified form of attachment of the same to the piston-rod. Fig. 10 is a side elevational view of my improved controller as viewed from the center of the car or as seen from the opposite direction, as that of Fig. 1, said view also showing the modified form of attachment of the same to the piston-rod as referred to in Fig. 9. Fig. 11 is a sectional view on line 11 11 of Figs. 9 and 10, and Fig. 12 is a sectional view on line 12 12 of Fig. 10.

This invention relates to a new and useful improvement in air-brake controllers, the object being to compensate for or take up the wear on the brake-shoes, so that the braking power of the cylinder will be effected with an approximately uniform travel of the piston at each application of the brakes. Various devices for accomplishing this purpose have been devised, and among the most common

of these, when applied to passenger brake-cylinders, provide for adjusting the fulcrum of the cylinder-lever. Another construction with which I am familiar contemplates adjusting the piston-rod and is disclosed in United States Patent No. 639,798, of December 26, 1899, issued to John C. Wands. This construction, however, without making material alterations in the piston-rod is only applicable to freight brake-cylinders.

My present invention is designed to use certain of the elements disclosed in the above-mentioned patent in such manner as to make the same applicable to not only freight brake-cylinders, but passenger and tender brake-cylinders as well with but very slight alteration of the same.

As will be apparent from an inspection of Figs. 1 and 2 of the accompanying drawings, wherein a standard passenger brake-cylinder and its piston rod and levers are illustrated, all that is necessary to do to equip the same with my improved controller is to cut off the end of the piston-rod, drill a hole in the remaining portion of the same which protrudes from the nose of the cylinder-head, mount the cam-plate and its carried guide-bracket in correct position, and put the remainder of the controller into place by passing it through said bracket and then pinning or bolting it to the piston-rod.

With these objects in view the invention consists in the construction, arrangement, and combination of the several parts, all as will be hereinafter described, and afterward pointed out in the claims.

In the drawings, wherein I have illustrated a passenger brake-cylinder, 1 indicates the brake-cylinder, 2 the piston-rod, 3 the piston-lever, 4 the cylinder-lever, and 5 the cylinder-lever tie-rod, all of said parts being of the usual construction. In the preferred construction, which is illustrated in Figs. 1 to 8, inclusive, I prefer to cut or saw off the bifurcated end of the usual piston-rod and drill a hole in the end of that portion of said piston-rod which protrudes from the nose of the cylinder-head.

6 indicates a casting which is attached to the

end of the piston-rod, preferably by means of a pin or bolt 7, which bolt passes through the before-mentioned hole in said piston-rod. This casting is designed to act as a housing and guide for a longitudinally-movable fulcrum-block 8, in which the piston-cylinder is mounted, said block carrying a screw-threaded extension 9. The outer end of the casting 6 is preferably guided and partially supported by a bracket 9^a, which in turn is supported by a cam-plate 10, bolted or otherwise secured to the under side of the car.

11 indicates a nut which coöperates with the screw-threaded extension 9, said nut having formed thereon a plurality of ratchet-teeth 12. This nut 11 is preferably located at the outer end of the casting 6 and is carried thereby, the same being rotatably supported thereon, preferably by means of section-plates 13 13, (see Figs. 4 and 7,) which embrace an annular projection 14, formed on said nut, said plates 13 13 being bolted or otherwise secured to said casting 6.

15 indicates a housing which is rotatably mounted on, but longitudinally immovable of, the nut 11, and incloses the ratchet-teeth 12. This housing 15 is also provided with a compartment 16, in which is slidably mounted a block 17, carrying a spring-actuated pawl 18, which pawl coöperates with the ratchet-teeth 12 of the nut 11.

19 indicates a coiled spring which is located within the compartment 16, one end of which bears against the block 17 and tends to force or hold said block toward or against the end wall of said compartment 16.

20 indicates a push button or rod slidably mounted in that end wall of the compartment 16 next adjacent the block 17, which push button or rod is in alinement with a projection 18^a, formed on the pawl 18.

21 indicates a projection carried by the housing 15, which projection may simply be a plain rod or may be a rod carrying a roller 22, as shown. This projection 21 coöperates with a slot 23, formed in the cam-plate 10, which slot is straight for a part of its length, being parallel to the direction of movement of the piston-rod of the brake-cylinder and thence deflected laterally, as is clearly shown in the drawings.

24 indicates a housing for the screw-threaded extension 9, and consists, preferably, of a piece of pipe non-rotatably secured to the nut 11, said housing being preferably provided on its outer end with a suitable arm or fingers 25, by which the same can be manually rotated.

The operation of the device is as follows: When my improved controller is placed in proper position on the car and secured to the piston-head and new brake-shoes have been placed in the heads of the brake-beams, the fulcrum-block 8 is designed to be as close to the outer end of the piston-rod, as it will go and the projection 21 of the housing 15 to be

at the extreme end of the straight portion of the slot 23 nearest the piston-lever. The proper stroke of the piston to set the brakes with new shoes being known the straight portion of the slot 23 of the cam-plate is made of like length, so that when the piston travels its correct distance the projection 21 will move only the length of said straight portion of the slot 23. However, when the brake-shoes become worn and the piston exceeds its original travel the projection 21 is caused to enter the inclined portion of slot 23 and rock the housing 15, to which it is attached. This movement will cause the pawl 18 to slip over one or more of the ratchet-teeth 12 of the nut 11, it being understood that the nut 11 will not turn during this action of the pawl, due to the power exerted by the piston against the nut through the instrumentality of the screw-threaded extension 9. Upon the return of the piston to release the brakes a great pressure is exerted on the various levers of the system, so much so, in fact, that the screw-threaded extension 9 and the nut 11 are likely to become impinged so tightly together that if some yielding medium were not interposed between the housing 15 and its carried pawl 18 the parts might be broken. To relieve the parts from strain under the conditions mentioned, the spring 19 is employed, which spring acts as a cushion to absorb any sudden movement before sufficient force can be applied to the nut to bind it tightly on its screw. Should the nut 11 become non-rotatable due to the impingement just mentioned, the block 17 and its carried pawl 18 are permitted to remain stationary in engagement with the ratchet-teeth 12 while the housing 15 is being returned to its initial position, which action obviously compresses spring 19, storing up sufficient energy thereinto, when the impingement ceases, force the block 17 and its carried pawl in proper direction to turn said nut and move the screw-threaded extension longitudinally, thereby moving the end of the piston-lever away from its piston-rod and taking up what slack exists in the brake system.

The construction illustrated in Figs. 9 to 12 of the drawings contemplates attaching my improved controller to a piston-rod as commonly employed without altering the latter, but necessitates lengthening the cylinder-lever tie-rod 5^a and moving the piston-lever 3^a outwardly away from the piston-rod sufficiently far to compensate for the displacement of the fulcrum of the piston-lever. The casting 6 has its inner end so shaped as to take the end of the piston-rod, while in other respects the construction and operation of the parts illustrated are the same as heretofore described.

When new shoes are to be applied after the controller has extended the piston-rod herein described and it is necessary to restore the

parts to normal position, the push-button 20 is pressed inwardly, so as to raise the pawl from the ratchet, when the housing 24 may be rotated to turn the nut and restore the fulcrum-block of the piston-lever to its original position.

From the above description it will be noted that my improvement is applicable to air-brakes as commonly used, it being unnecessary to change any of the parts or to substitute new parts for those in general use to adapt my controller thereto. According to the preferred construction the end of the piston-rod is cut off to give a firmer bearing for the extension which is attached thereto; but this change requires little labor and could be dispensed with if the connection between the extension and the piston-rod were employed, as shown in Figs. 9 to 12. This latter connection, however, would necessitate a longer tie-rod between the cylinder and the piston-rod levers.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. In an air-brake controller, the combination with a piston-rod, of a housing or guide carried thereby, a nut rotatably mounted in the housing, a fulcrum-block slidingly mounted in the housing or guide and provided with a threaded rod engaging the nut, and means for rotating the nut as the piston exceeds its ordinary limit of travel; substantially as described.

2. In an air-brake controller, the combination with a piston-rod, of an extension secured thereon and forming a guideway for the fulcrum-block of the piston-lever, a threaded rod connected to said fulcrum-block, a nut rotatably mounted in said piston-rod extension and in engagement with said threaded rod, ratchet-teeth on said nut, a pawl in engagement with said ratchet-teeth, and means for retracting the pawl when the piston exceeds its ordinary limit of travel; substantially as described.

3. In an air-brake controller, the combination with a piston-rod, of an extension on said piston-rod forming a guideway, a fulcrum-block for the piston-lever slidingly mounted in said guideway, a threaded rod extending from said fulcrum-block, a nut rotatably mounted in said guideway for engaging said threaded rod, means for rotating said nut, and a housing for receiving the projecting end of said rod as it passes through the nut, said housing being secured to the nut; substantially as described.

4. In an air-brake controller, the combination with a piston-rod, of a slotted extension

carried thereby and forming a guideway, a fulcrum-block for the piston-lever slidingly mounted in said guideway, a piston-lever fulcrumed in said block and operating through the slot in said extension, a threaded rod extending from said fulcrum-block, a nut engaging said rod, and means for rotating said nut; substantially as described.

5. In an air-brake controller, the combination with a piston-rod, of an extension mounted thereon and carried thereby, a fulcrum-block for the piston-lever movably mounted in said extension, and means for moving said fulcrum-block, said means including a plate having a cam-slot and a rockable element mounted on the piston-rod extension and operating in said cam-slot; substantially as described.

6. In an air-brake controller, the combination with a piston-rod, of an extension mounted thereon, a fulcrum-block for the piston-rod lever mounted in said extension, a threaded rod extending from said fulcrum-block, a nut through which said rod passes, ratchet-teeth on said nut, a housing mounted adjacent the nut and rotatable independently thereof, a pawl carried by said housing, a spring cooperating with the pawl, and a cam-plate for rocking said housing; substantially as described.

7. In an air-brake controller, the combination with a fulcrum-block, of a threaded rod extending therefrom, a nut through which said rod passes, ratchet-teeth on said nut, a housing rotatably mounted on said nut, a pawl mounted in a follower arranged in said housing and cooperating with said ratchet-teeth, a push-button for lifting the pawl from engagement with the ratchet-teeth, and a spring in said housing bearing against said follower; substantially as described.

8. In an air-brake controller, the combination with a fulcrum-block and a threaded rod, of a ratcheted nut engaging said rod, a rotatable housing mounted in juxtaposition to said nut, said housing having a concentric way, a follower mounted in said way, a pawl mounted in the follower and engaging the ratcheted nut, a spring in the way for holding said follower in normal position at one end of said way, a projection extending from the housing, and a plate having a cam-slot for cooperating with said projection; substantially as described.

9. In an air-brake controller, the combination with a piston-rod, of an extension fixedly mounted thereon and carried thereby, a fulcrum-block for the piston-rod slidingly mounted in said extension, a threaded rod extending from said fulcrum-block, a nut rotatably mounted in said extension through which said rod passes, ratchet-teeth on said nut, a housing mounted in juxtaposition to said nut and movable with relation to said ratchet-teeth, a spring-pressed pawl-carrying block arranged

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in said housing, a pawl mounted in said block
and engaging said teeth, a plate having a cam-
slot, and a projection on the housing cooper-
ating with said cam-slot whereby when the
5 piston exceeds its ordinary limit of travel said
housing will be moved to enable the pawl to
take a new bite after which, when the parts
are restored to normal position, the spring-
pressed pawl-carrying block will yieldingly
10 force the ratcheted nut to make a partial rev-

olution, thereby causing the fulcrum-block to
move outwardly with respect to the cylinder;
substantially as described.

In testimony whereof I hereunto affix my
signature, in the presence of two witnesses, 15
this 21st day of December, 1903.

WILLIAM H. SCOTT.

Witnesses:

F. R. CORNWALL,
GEORGE BAKEWELL.