

No. 740,375.

PATENTED SEPT. 29, 1903.

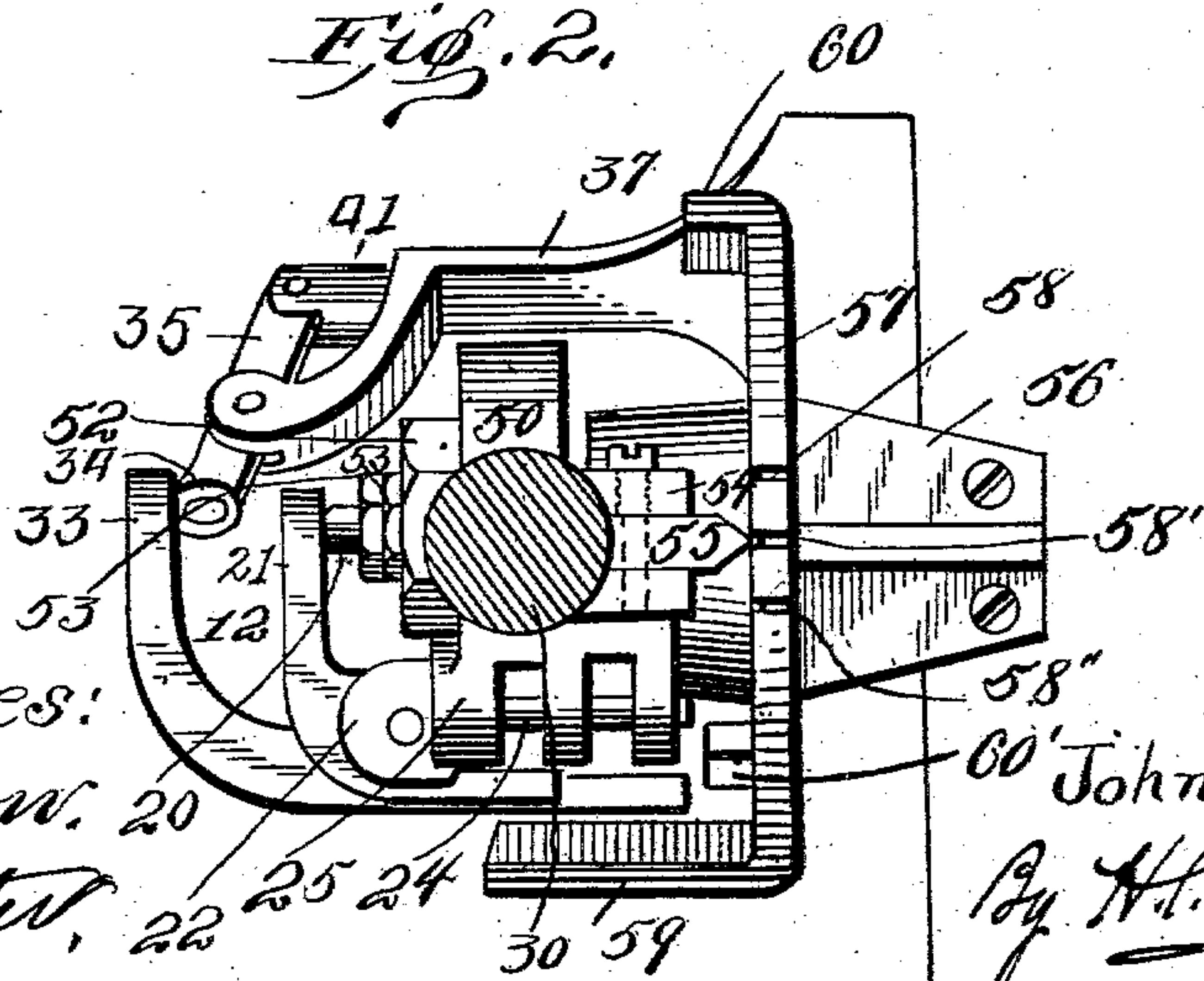
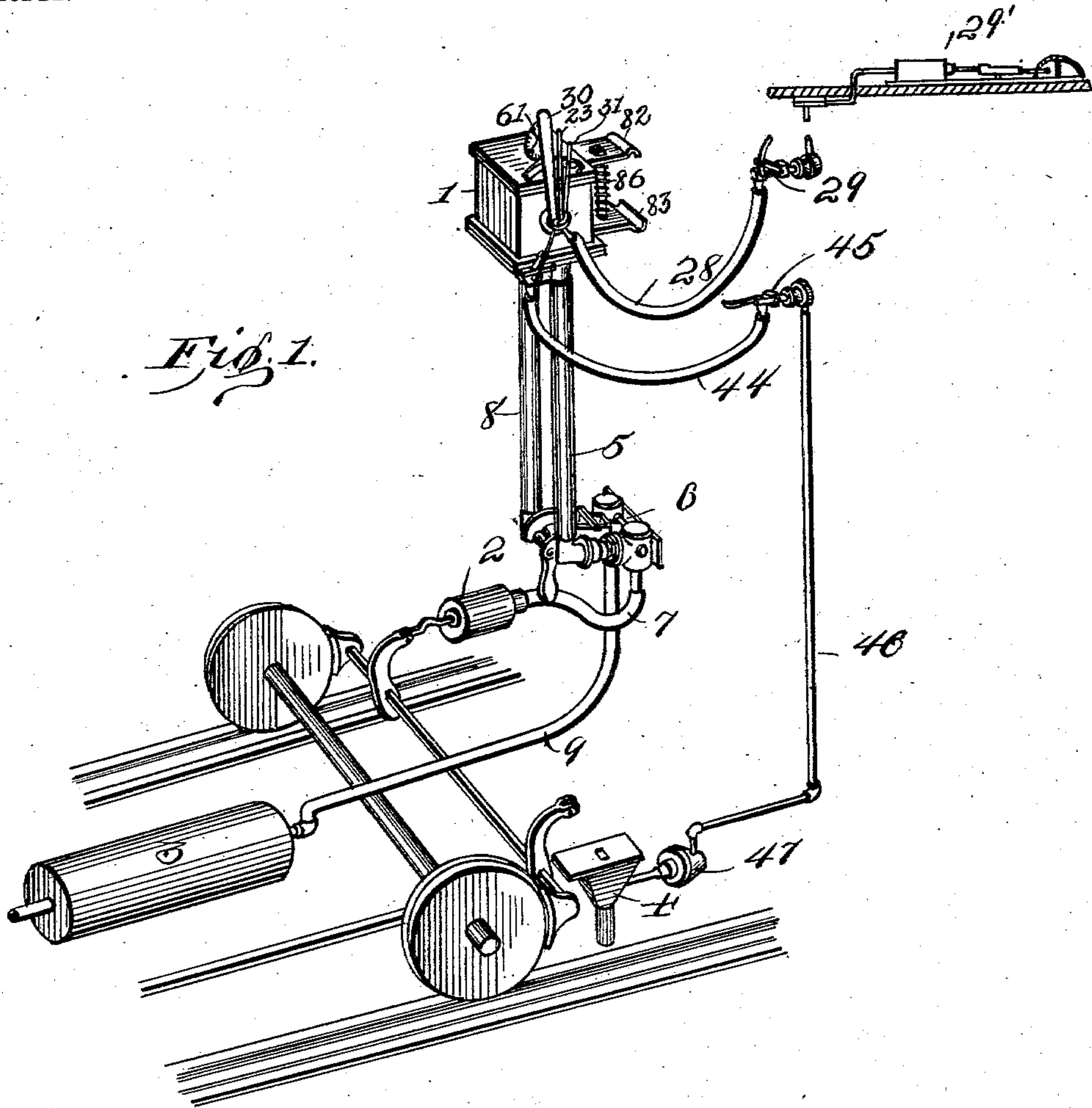
J. SHOUREK.

MOTORMAN'S VALVE FOR AIR BRAKES.

APPLICATION FILED DEC. 22, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:

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3 SHEETS—SHEET 2.

NO MODEL.

Fig. 3.

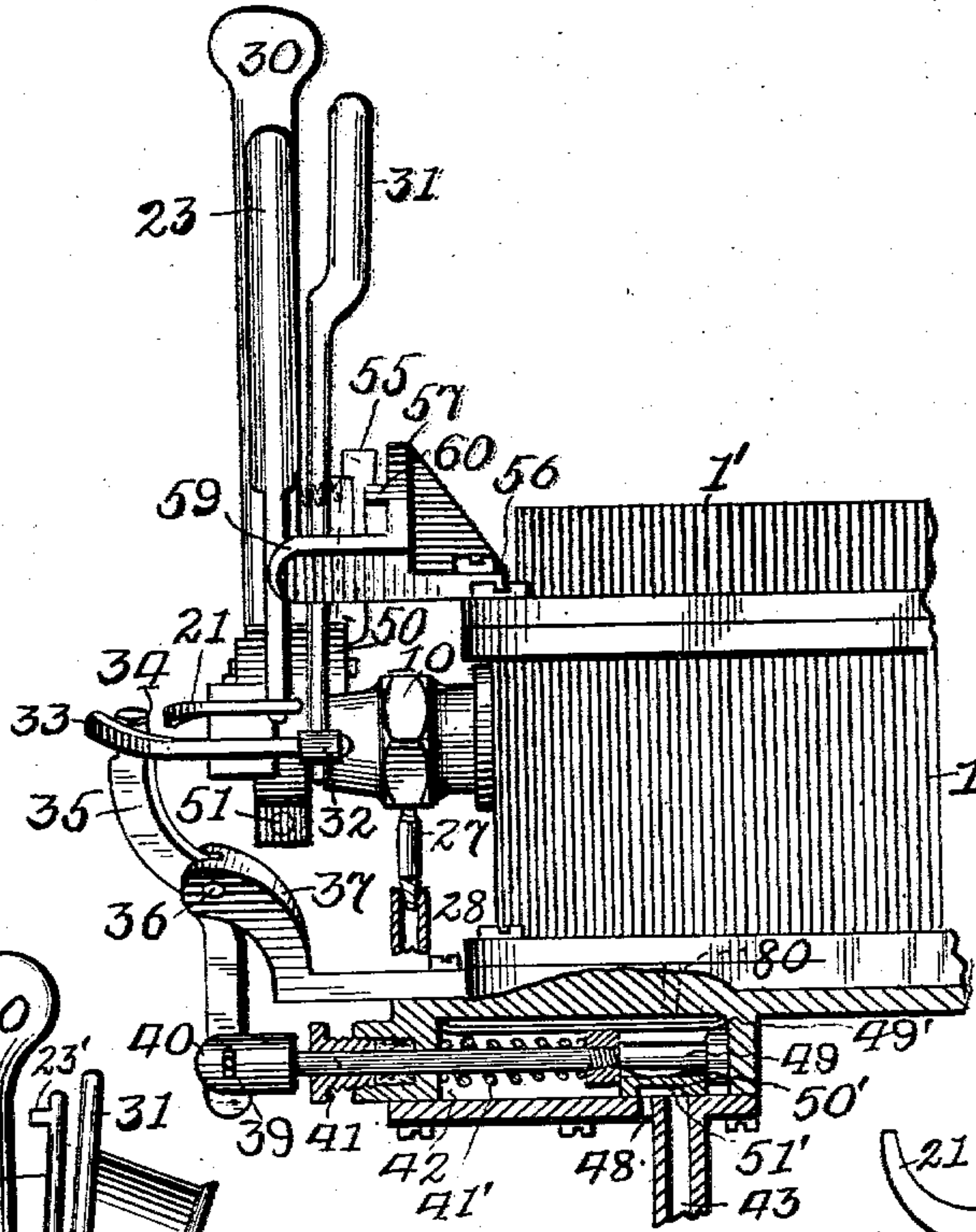


Fig. 6.

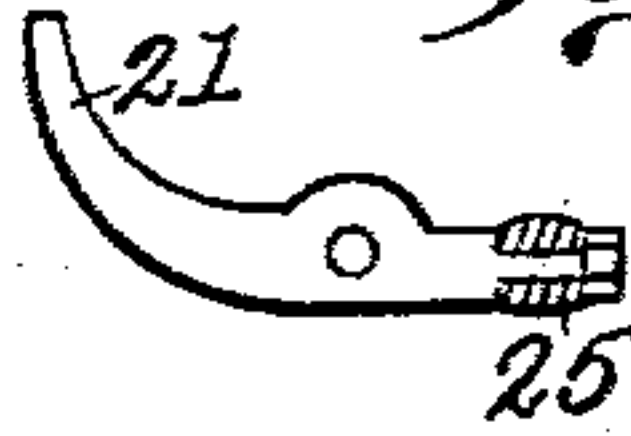


Fig. 4.

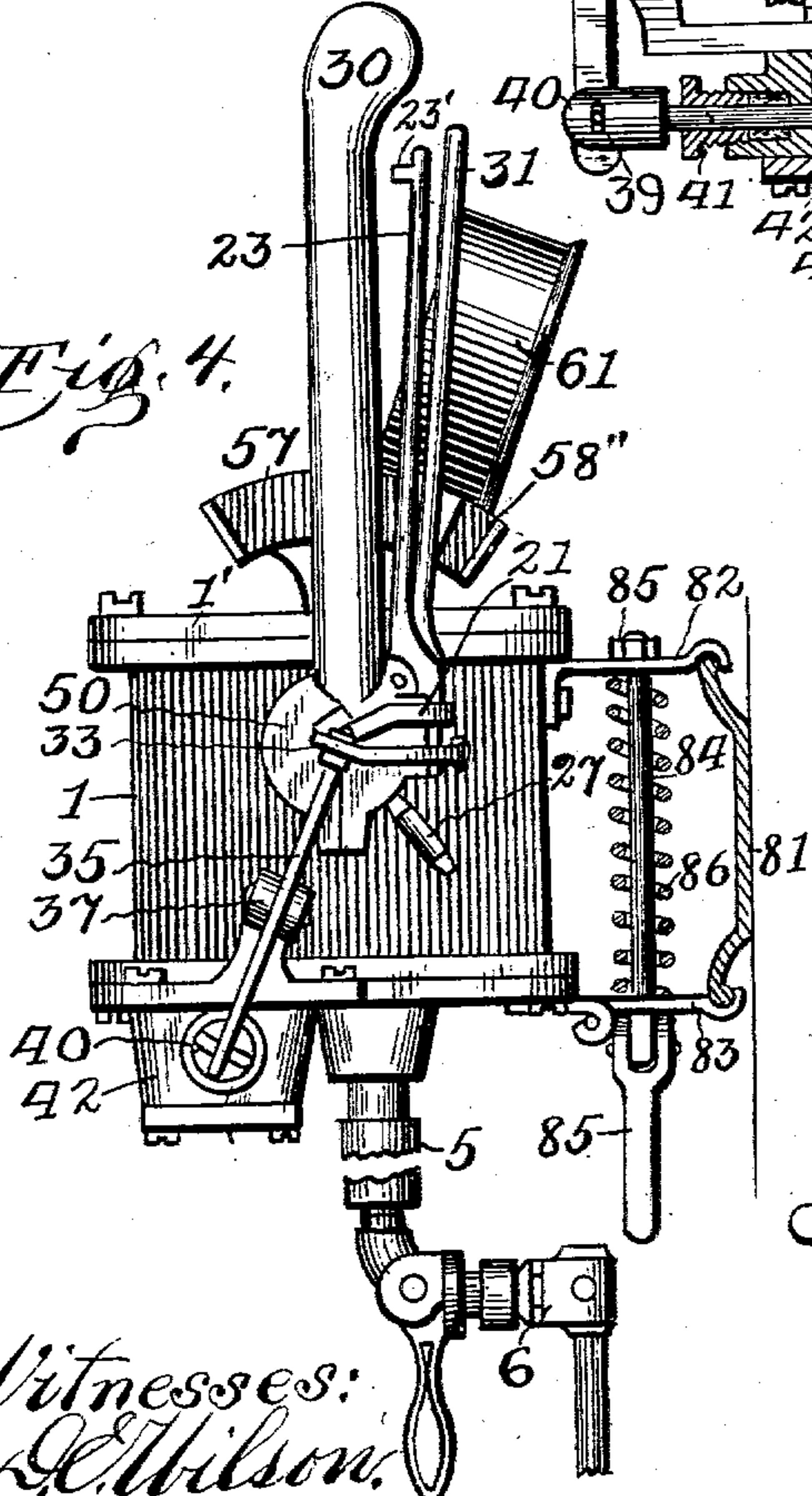


Fig. 5.

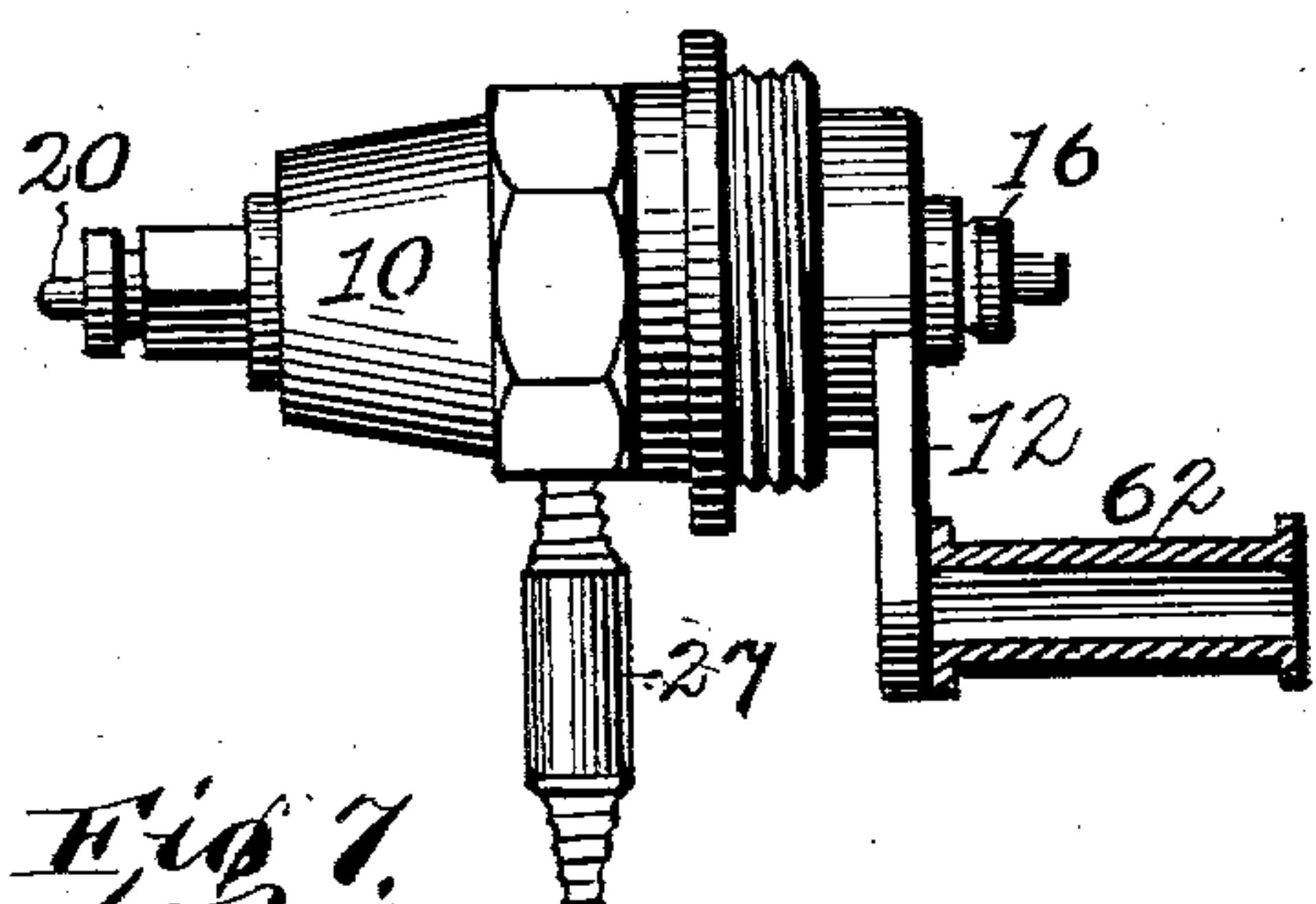
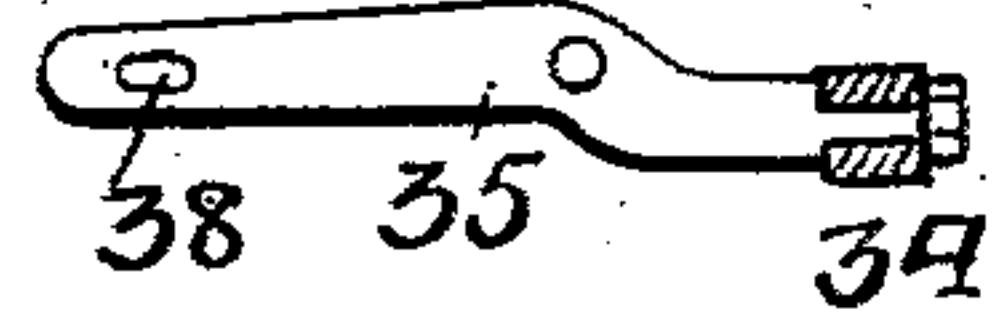


Fig. 7.



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3 SHEETS—SHEET 3.

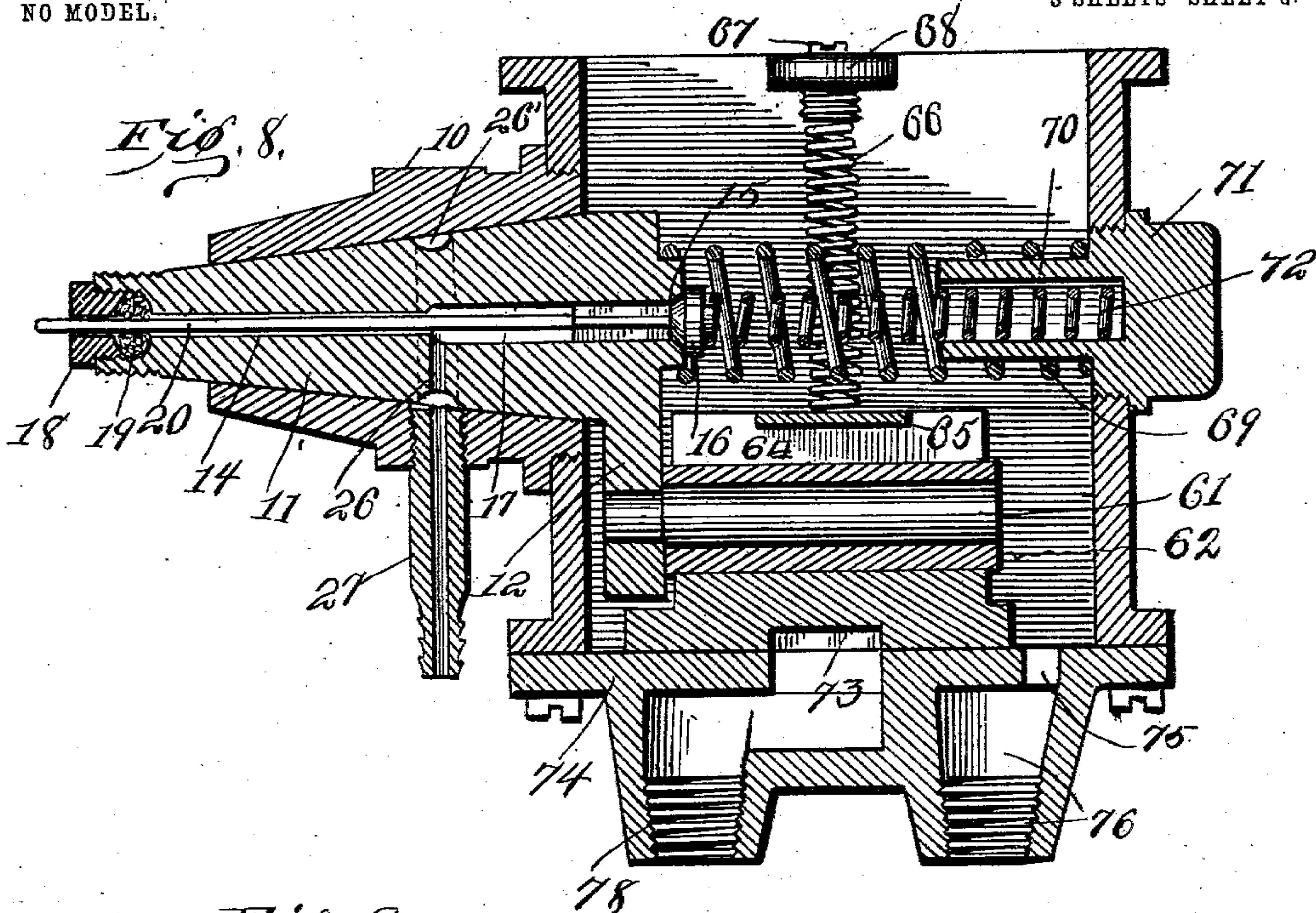


Fig. 9.

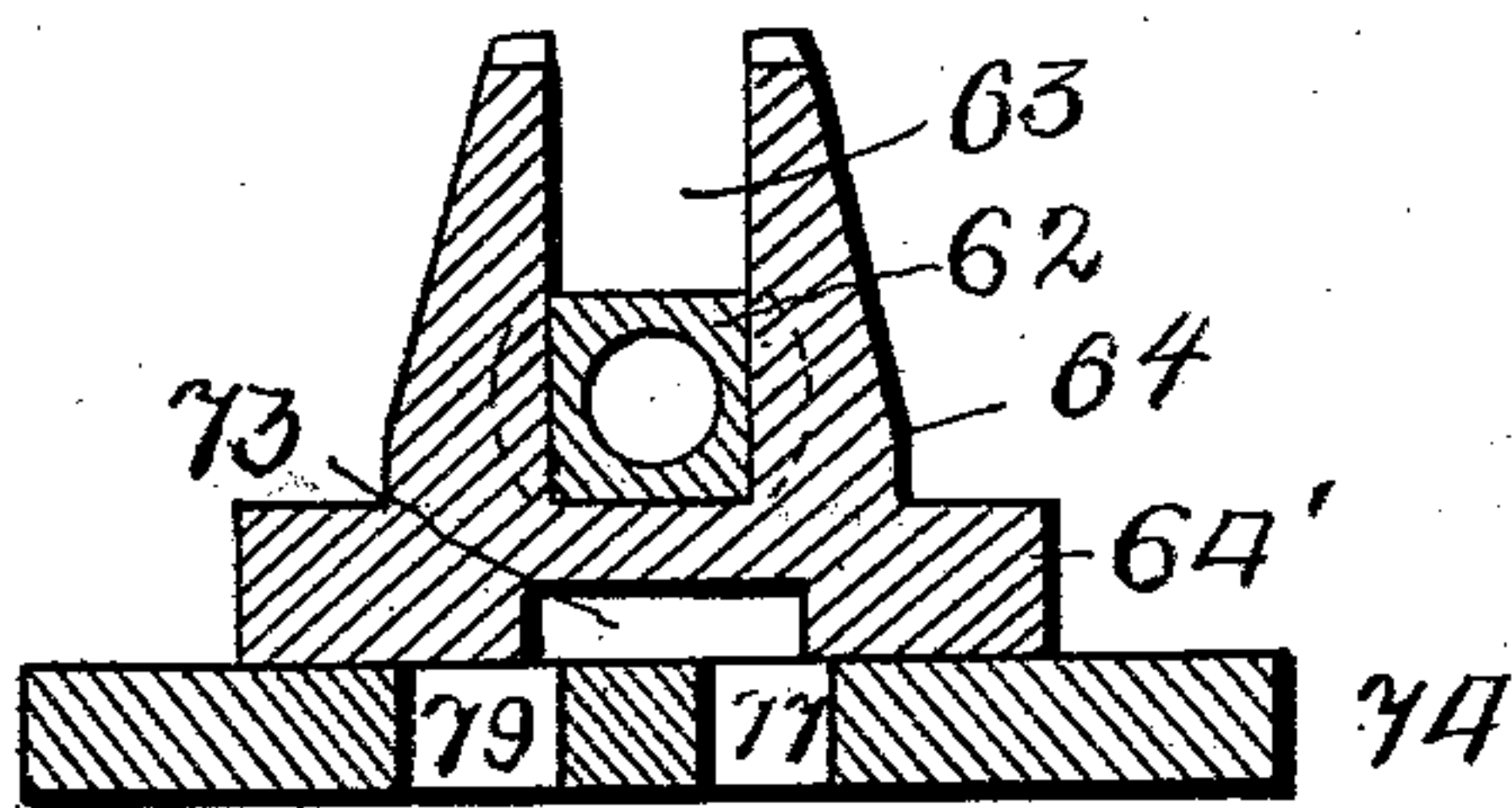


Fig. 10.

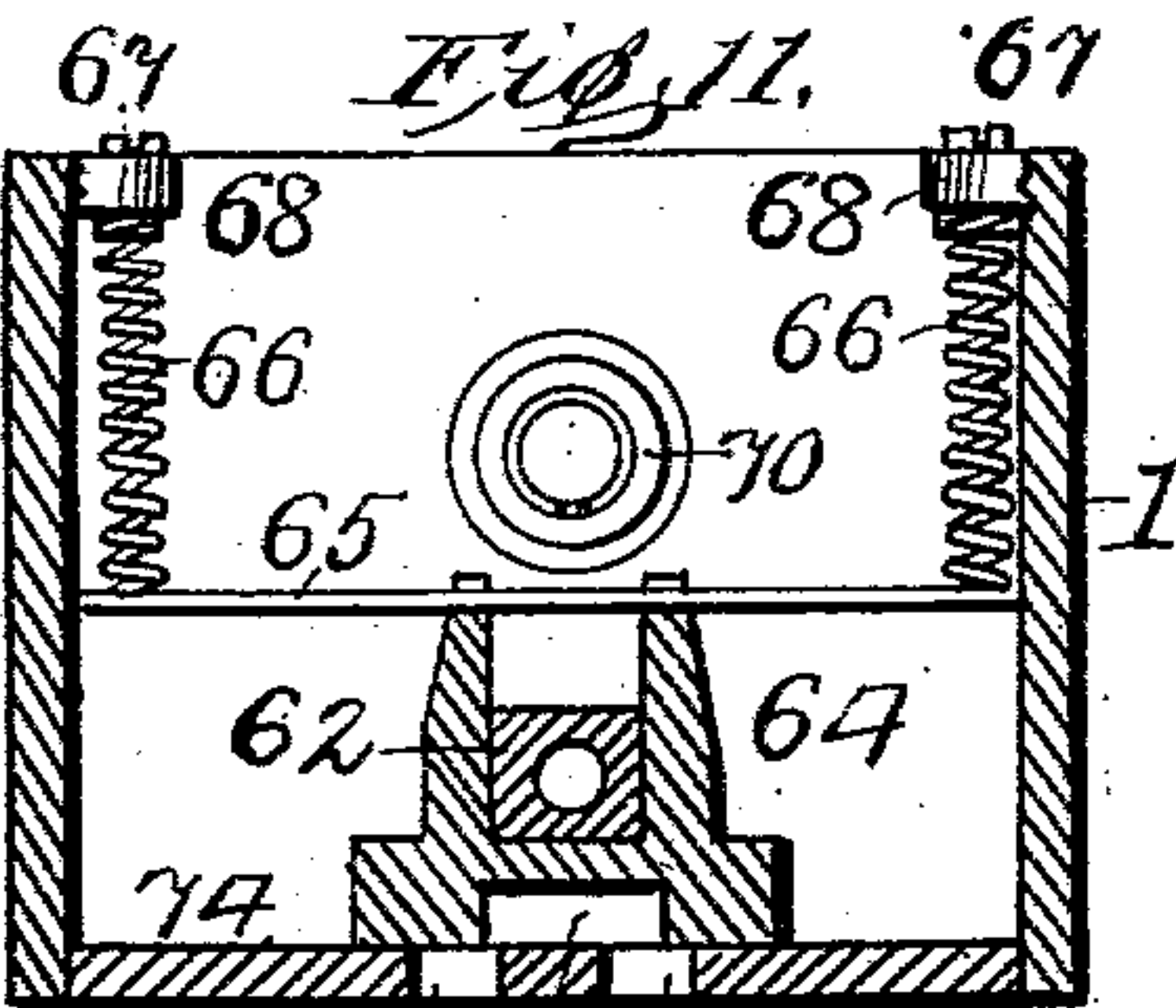
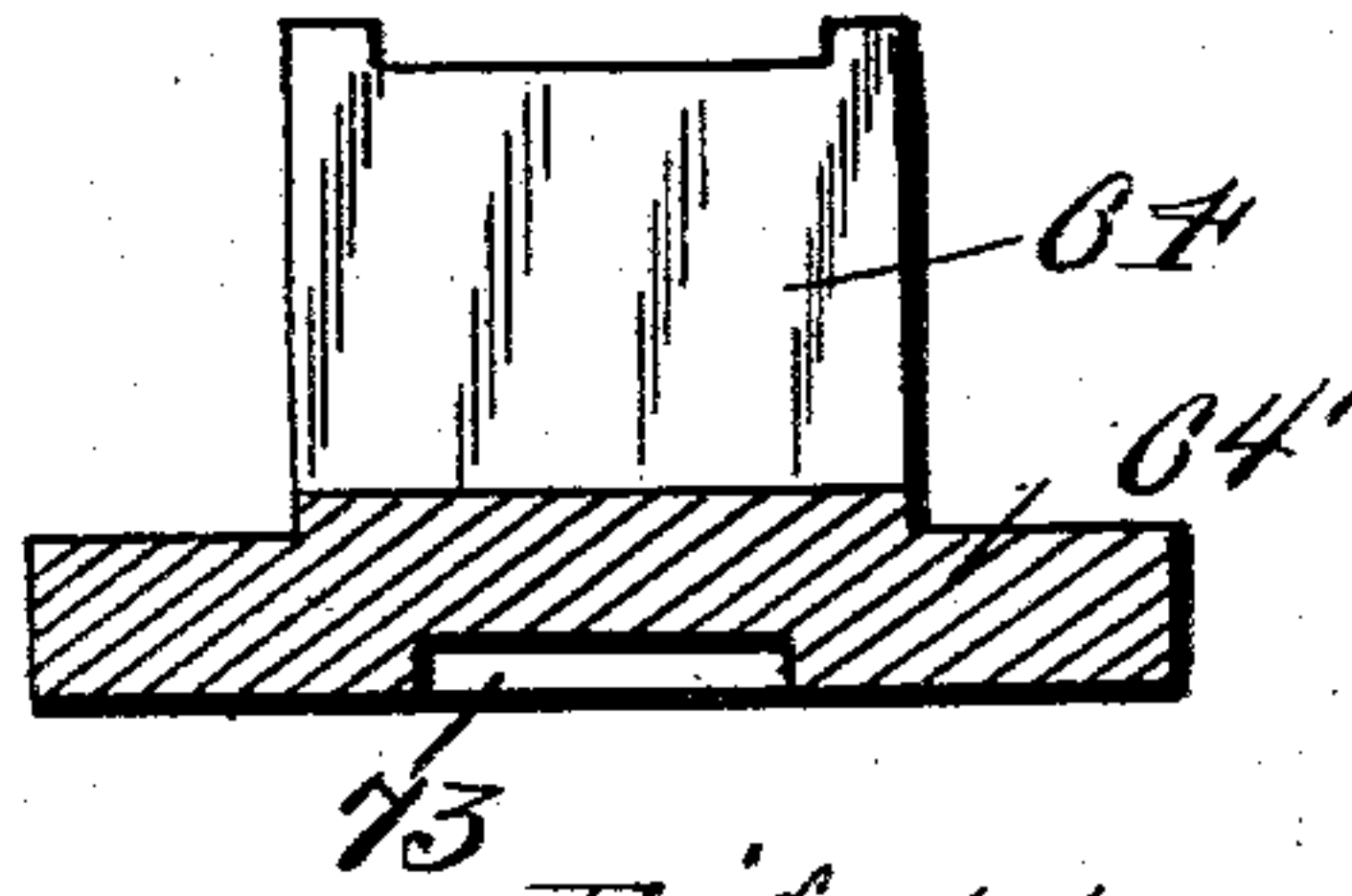


Fig. 12.

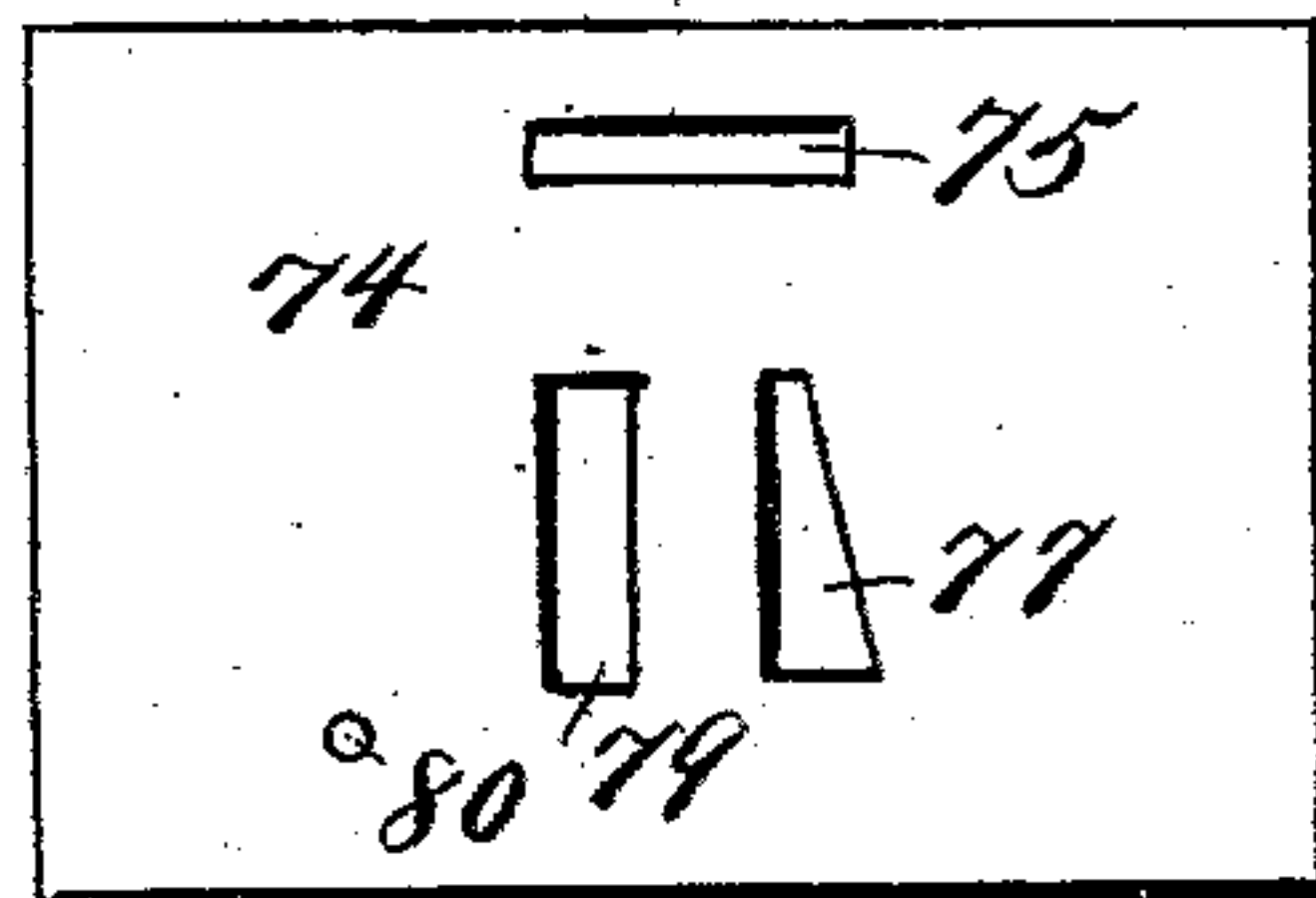
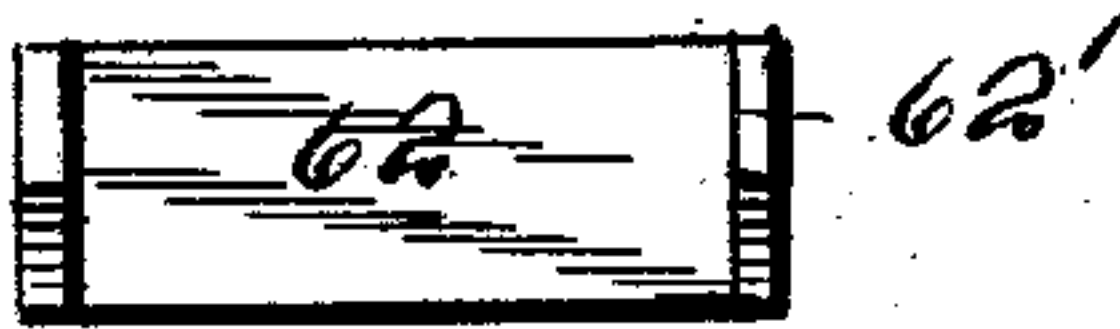
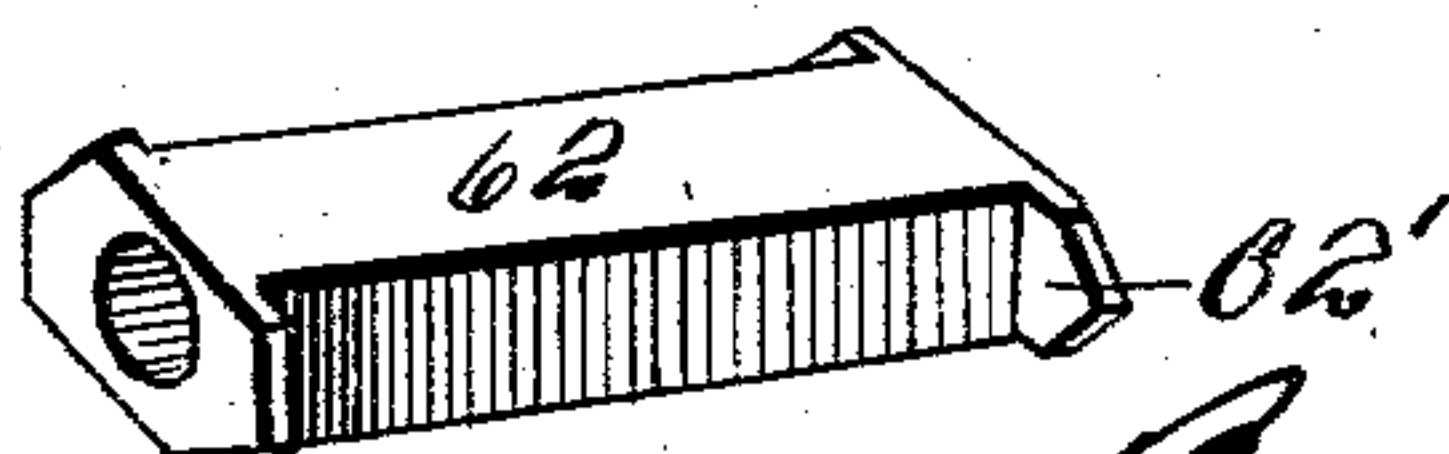


Fig. 13.
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UNITED STATES PATENT OFFICE.

JOHN SHOUREK, OF PITTSBURG, PENNSYLVANIA.

MOTORMAN'S VALVE FOR AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 740,375, dated September 29, 1903.

Application filed December 22, 1902. Serial No. 136,226. (No model.)

To all whom it may concern:

Be it known that I, JOHN SHOUREK, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Motormen's Valves for Air-Brakes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in air-brakes; and it relates particularly to the motorman's valve of such brakes as are employed in connection with street-cars.

The object of the invention is to improve and simplify the construction of the motorman's valve and to provide novel and easily-operated means for admitting air into the line leading to the gong-ringing mechanism to sound the gong and for admitting air to the mechanism which operates the valve in the sand-box to open said valve and permit the sand to be applied to the track.

A further object of the invention is to provide means whereby the gong-ringing mechanism, the sand-applying mechanism, and the brake may all be operated without requiring the motorman to remove his hand from the brake-lever, thus giving the motorman or operator absolute control of his car at all times.

This invention is an improvement on the motorman's valve such as is employed in the air-brake patented by me November 14, 1899, No. 636,858, and also used in Patent No. 661,111, patented to me November 6, 1900. In these patents referred to the motorman's valve is employed, by means of which the motorman controls the air admitted to the brake-cylinder, the air admitted to the gong-ringing device, and the air admitted to the sand-applying device, and, as stated, this invention relates to certain improvements in this motorman's valve. In the use of the brake, as shown in said Letters Patents, a single motorman's valve is employed, which is adapted to be moved from one end of the car to the other, according to which end of the car is being used as the front thereof. Improved means is provided in this invention for detachably supporting the motorman's valve and also for coupling the valve to the brake-

cylinder. This improved coupling means, since it has been made the subject of a separate application, will only be referred to herein generally.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a detail perspective view showing a part of the truck, the main reservoir, the brake-cylinder, sand-box, the coupling, motorman's valve, and the connections between the brake-cylinder, sand-operating mechanism, bell-ringing device, main reservoir, and the motorman's valve. Fig. 2 is a top plan view of the supporting-bracket which is attached to the motorman's valve, the sand-operating lever and bell-actuating lever being removed and the motorman's-valve lever being in section. Fig. 3 is a side elevation of the motorman's valve, partly broken away, and showing in section the cylinder communicating with the sand-operating mechanism and the valve mechanism in said cylinder. Fig. 4 is a side elevation of the motorman's valve, showing the manner in which the same is supported from the car. Fig. 5 is a detail side elevation of the casing containing the valve-operating crank, a part of the latter being shown in section. Fig. 6 is a detail plan view, partly in section, of the pivoted lever or finger adapted to engage with the valve-stem for opening the valve to admit air to the gong-ringing device. Fig. 7 is a like view of the pivoted lever for actuating the valve to admit air to the sand-operating device. Fig. 8 is a central vertical sectional view through the motorman's valve, with the top plate and operating-levers removed. Fig. 9 is a transverse vertical sectional view through the slide-valve and valve-plate. Fig. 10 is a side elevation of the slide-valve. Fig. 11 is a transverse vertical sectional view through a part of the motorman's valve. Fig. 12 is a detail plan view of the block or sleeve which connects the slide-valve with the crank to which the operating-lever is attached. Fig. 13 is a detail perspective view of the same. Fig. 14 is a top plan view of the bottom or valve plate of the valve-casing.

In the diagrammatical view shown in Fig. 1, illustrating the relative position of the motorman's valve with respect to the main reservoir, brake-cylinder, &c., 1 indicates the motorman's valve; 2, the brake-cylinder; 3, the main reservoir, and 4 the sand-receptacle, 5 indicating the pipe which connects the motorman's-valve casing with the brake-cylinder 2 through the medium of the coupling 6 and pipe 7, and 8 indicates a pipe or tube which connects the motorman's valve with the main reservoir 3 through the medium of the coupling 6 and the pipe or tube 9. The coupling 6 comprises a stationary and movable part adapted for quick connection with each other, and as this coupling has been made the subject of a separate application for Letters Patent it is not shown in detail herein. The motorman's valve comprises an exterior casing 1, into one side of which is threaded a plug 10, having a conical opening therethrough to receive the conical body 11 of the valve-operating crank, this body carrying a crank 12, which is connected to the slide-valve in a manner to be hereinafter more fully described. The conical body 11 is provided with a central opening 14 and at its inner end with a valve-seat 15, which is engaged by the valve 16, the wings of which lie within the enlarged portion 17 of the opening 14. The opening 14 is closed at the outer end of the tubular body 11 by a plug 18, through which the rod extends, and air is excluded from passing out through the opening 14 by interior packing 19, which is arranged in the recess in the end of the tubular body 11 to be compressed by the plug 18. The operating-rod 20 lies in the opening 14, with its inner end resting against the end of the valve 16 and its outer end projecting beyond the end of the threaded plug 18, whereby it may be engaged by the finger 21, pivoted in lugs 22, carried by the hub of the lever for operating the valve. This finger is actuated so as to be thrown into engagement with the end of the rod 20, so as to force said rod inwardly by means of the lever 23, pivoted on the pin 24, carried by lugs 25, formed integral with the hub of the operating-lever. The finger or lever 21 is preferably provided at the end to be engaged by the lever 23 with a small roller 25. (See Fig. 6.) The tubular body 11 is provided with a port 26, communicating with a groove 26' and establishing communication with the motorman's-valve casing through the port 14 to the port in the nipple 27, threaded into the plug 10. Connection is made from the nipple 27, by means of the hose or pipe 28, with the nipple 29, leading to the gong-ringing mechanism 29'. The brake-valve operating-lever 30 is mounted on the outer end of the tubular body 11, and the lever for operating the valve of the sand-applying mechanism 31 is pivoted by the pin 24, which pivots the lever 23, employed for operating the valve of the bell-

ringing mechanism. The lever 31 at its lower end contacts with the roller 32, carried by the finger 33, pivoted in the same bracket or lug 22 and by the same pivot-pin as finger 21 is pivoted, the finger 33 engaging the roller 34, carried by the link 35, which is pivoted at 36 in the supporting-bracket 37, attached to the valve-casing. The other end of the link 35 is provided with a slot 38 to receive a pin 39, working in the slot provided therefor in the head 40 of the valve-stem 41. This valve-stem 41 extends into the cylinder 42, through which the air is fed to the sanding device. This cylinder is in communication with the sanding device through pipe 43, hose or pipe 44, coupling 45, pipe 46, and the casing 47, in which latter is arranged the diaphragm (not shown) for operating the valve (not shown) in the sand-box 4. The cylinder 42 is provided with an exhaust-port 48. The valve 49 controls the inlet of the air into the pipe 42 and is connected to the stem 41, being held normally closed by spring 41'. This valve is similar in construction to the slide-valve in the motorman's valve, hereinafter described. The brake-lever 30 is constructed with a split hub 50, which is mounted on the extending end of the conical body 11 and bound thereon by the screw or bolt 51, passing through lugs on the lower side of the hub, the latter being secured against displacement by the nut 52 and jam or lock nuts 53, which nuts engage on the exteriorly-threaded portion of the conical body 11. This hub carries the lugs 22 25, in which the fingers 21 and 33 and the levers 23 and 31 are pivoted. The hub also carries a pair of lugs 54, in which is pivotally mounted the spring-pressed indicating-pointer 55. A bracket 56 is securely fastened to the valve-casing and carries a segmental-shaped rack 57, provided with a series of notches 58, 58', and 58'', which extend vertically on the inner face of the segmental rack and also across the upper edge thereof. The indicating-pointer 55 engages with these notches or grooves on the inner face of the rack, this face being tapered, so as to readily pass out of each notch as the operating-lever is moved back and forth. The segmental rack 57 is provided with inwardly-extending ends 59 60 and a stop 60', the function of which will more presently appear. A suitable air-pressure gage 61 is supported from the bracket 56 in any desirable or suitable manner. The crank 12 carries a crank-pin 61, which extends into the sleeve 62, which fits in the way 63, provided therefor in the slide-valve 64, the sleeve 62 having extending lugs 62' at its end which hold the sleeve in position in the valve. This valve is notched in its upper face to receive the plate 65, spring-pressed against the valve by springs 66, the lower ends of which engage the plate and the upper ends of which engage adjusting-screws 67, mounted in lugs 68, carried on the opposite side of the inner face of the casing. The tu-

bular body 11 is held normally seated by means of the spring 69, one end of which engages over the small extension on the larger end of the body 11 and the other end of which engages over the sleeve 70, carried by the plug 7, which is threaded into the casing 1. This sleeve 70 also receives the spring 72, which is arranged inside of the spring 69, with its other end bearing against the valve 16, so as to hold said valve normally seated.

The valve 64 has its base-plate 64' provided with a recess 73, this base-plate engaging and moving on the base or bottom 74 of the motorman's-valve casing, which bottom forms the valve-plate of the slide-valve. This plate or bottom 74 is provided with a port 75, in communication with the main reservoir 3 through pipe 8, which is connected onto the nipple 76, carried by the plate or bottom. This plate or bottom is also provided with a port 77, which is in communication with the brake-cylinder 2 through pipe 5, which is connected onto the nipple 78, carried by the bottom of the valve-casing, and the plate or bottom is further provided with an exhaust-port 79 and a port 80, establishing communication between the cylinder of the motorman's valve and the cylinder 42 of the sand-operating device. I preferably construct the opening 77, leading to the brake-cylinder, somewhat triangular in form, whereby the graduated application of the air may be obtained, since the valve in moving across the valve-plate will uncover only a portion of the port 77 instead of uncovering the port throughout its length. The valve 49 in the sand-operating cylinder 42 is of a similar form of construction to the valve 64, the sleeve of the same form as the sleeve 62 being placed in the valve into which the stem 41 is threaded. This valve is held down on its seat by means of the spring 49', and I preferably place the spring 50' underneath the sleeve in said valve to cushion the same. The valve 49 is provided with a recess 51' in its underneath face, whereby communication may be established between the pipe 43 and the exhaust-port 48.

Improved means is provided whereby the motorman's valve may be quickly connected and firmly supported in position and whereby it may be readily and easily disconnected when it is desired to change the valve from one end of the car to the other. This means in the present illustration comprises a bracket consisting of a plate 81, suitably attached to a desired point on the car, the upper and lower edges of the plate being turned outwardly, whereby they may be engaged by the supporting-bracket 82, attached to the motorman's-valve casing 1, and a hinged plate 83, also carried by the said motorman's-valve casing. The bracket 82 and hinged plate 83 are provided with hooked ends to engage over outwardly-extending edges of the plate 81 and are connected together by the bolt 84, provided on its upper end with a nut 85 and at

its lower end extending through the hinged plate 83, with a locking-lever 85 pivoted to said lower end. A spring 86 is arranged on the bolt between the bracket 82 and hinged plate 83, the said bracket and hinged plate being held firmly in engagement with the bracket-plate 81 when the lever is in the vertical position, at which time the ends of the jaws of the lever act as a cam against the hinged plate 83. When this lever 85 is moved to the horizontal position, the spring 86 forces the hinged plate downwardly and permits the ready disengagement of the motorman's valve from the plate 81. The coupling 6, as heretofore stated, is made the subject of a separate application, and hence is not shown herein in detail.

The motorman's-valve casing is provided with a suitable cover-plate 1'. In operation when the coupling 6 is made and the motorman's valve is suspended in position from the supporting-plate 81 air from the reservoir is in communication with the chamber of the motorman's valve through pipe 9, through coupling 6, pipe 8, nipple 76, and port 75. When the motorman's valve is set so that the indicating-pointer 55 is in the running position, as at 76, the port 77, leading to the brake-cylinder, is closed. If it is desired to make a slow brake or graduated stop, the operating-lever 30 is moved to notch 58', shifting the valve 64, so as to partially uncover the port 77 and permit the air to pass through the recess 73, port 77, nipple 78, pipe 5, through coupling 6 and pipe 7 to the brake-cylinder 2. If it is desired to make an emergency stop, the operating-lever 30 is moved over so that the indicating-pointer 55 will engage the emergency stop 60', and simultaneously with the engagement of the pointer 55 with said stop 60' levers 23 and 31 will engage with the stop or arm 59, so as to automatically admit air to the gong-ringing device and also to open the ports to admit air through pipes 44 and 46 to the sand-operating mechanism, the operation of the three mechanisms being simultaneous with the movement of the brake-lever, so as to engage the pointer 55 with the emergency stop, and if it is desired to make a quick exhaust the lever is operated in the reverse direction, so as to throw the pointer 55 against the lug or stop 60, which will operate the valve 64, so as to fully uncover the exhaust-port 79. If it is desired to make a gradual or a slow exhaust, the operating-lever is moved so as to bring the pointer 55 to the notch 58 in the rack, which will move valve 64 so as to partially uncover the exhaust-port 79. It is to be noted that when the brake-lever is set at any of its positions the bell-ringing mechanism may be operated through the medium of lever 23 and the sand-operating mechanism may be operated through the movement of lever 31 without changing the position of the brake-lever or removing the hand therefrom, the motorman simply draw-

ing the lever 23 or 31, both of which have been described, toward the brake-lever 30 by means of the fingers of the same hand holding the brake-lever. It is also to be noted
 5 that when the brake-lever is moved over to make the emergency stop the levers 23 and 31 are automatically operated, so as to open the ports and admit the air to both the gong-ringing mechanism and the sand-applying
 10 mechanism. The lever 23 may be provided with a stop 23', as shown in Fig. 4 of the drawings, to limit the movement of the upper end of said lever toward the brake-lever 30, as will be apparent.

15 Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a motorman's valve for air-brakes, the combination with a valve-casing, a con-
 20 trolling valve therein, and a crank connected to said valve, of a brake-lever connected to the crank, a bell-ringing controlling-lever pivoted to the brake-lever, a sand-applying controlling-lever pivoted to said brake-lever, said
 25 bell-ringing controlling-lever and sand-applying controlling-lever operative independently of or in unison with the brake-lever, as and for the purpose described.

2. In a motorman's valve, the combination
 30 with a valve-casing, a controlling-valve therein, and a crank connected to said valve, of a brake-lever connected to the crank, a bell-ringing controlling-lever, and a sand-applying controlling-lever carried by the brake-lever
 35 and operative independently thereof or in unison therewith, pivoted fingers adapted to be engaged by said bell-ringing controlling-lever and sand-applying controlling-lever to open the ports to admit air to the respective
 40 devices, substantially as described.

3. In a motorman's valve, controlling the application of air to the brake-cylinder, to the sand-applying device and the bell-ringing device, the combination with a valve-
 45 casing, a controlling-valve therein, a crank connected to the valve, a brake-lever connected to said crank, a bell-ringing controlling-lever pivoted to the hub of the brake-lever, a sand-applying controlling-lever piv-
 50 oted to the said hub of the brake-lever, fingers pivotally mounted in said hub to be engaged by said bell-ringing controlling-lever and sand-applying controlling-lever, and valves engaged by said fingers, to control the
 55 ports leading to the bell-ringing mechanism and sand-applying mechanism, substantially as described.

4. In a motorman's valve controlling the application of air to the brake-cylinder, to the
 60 gong-ringing mechanism, and to the sand-applying mechanism, the combination with a valve-casing a slide-valve mounted in said casing, a crank connected to said slide-valve, a brake-lever mounted on the crank, a pivot-
 65 ed bell-ringing controlling-lever, and a pivot-

ed sand-operating controlling-lever movable in unison with the brake-lever, and operative independently thereof, pivoted fingers adapted to be engaged by said levers, valve oper-
 70 ated by said fingers, and means for holding said valve normally closed, substantially as described.

5. The herein-described improvements in a motorman's valve comprising a valve-casing, a slide-valve mounted therein, and a crank
 75 connected to said slide-valve, a brake-lever connected to said crank, a pivoted bell-ringing controlling-lever, and a pivoted sand-applying controlling-lever carried by the brake-lever, valves controlling the ports establish-
 80 ing communication with the bell-ringing device and the sand-applying device, pivoted fingers adapted to be engaged by the bell-ringing controlling-lever and the sand-applying controlling-lever to actuate said valves,
 85 and means carried by the valve-casing to engage the bell-ringing controlling-lever and sand-applying controlling-lever to operate the same simultaneously with the brake-lever, substantially as described.

6. The combination with a motorman's valve, of supporting means comprising a rigid bracket-plate, a spring-pressed means carried
 90 by the motorman's valve for engagement with said bracket-plate to support the valve in po-
 95 sition, substantially as described.

7. In a motorman's valve, a valve-casing in communication with the brake-cylinder, a bell-ringing device and a sand-applying de-
 100 vice, a slide-valve in the valve-casing, and a crank connected to said slide-valve, in combination with a brake-lever having a hub mounted on the crank, lugs carried by said
 105 hub, a bell-ringing controlling-lever and sand-applying controlling-lever pivoted on said lugs, and means adapted to be engaged by said levers for opening and controlling the valves to admit air to the bell-ringing mech-
 110 anism, and sand-applying mechanism, substantially as described.

8. In a motorman's valve, a valve-casing in communication with the main reservoir, and provided with a brake-cylinder port and an exhaust-port, a sanding-device cylinder, a
 115 port establishing communication between the brake-valve chamber and said cylinder, connections between said cylinder and the sanding device, connections between the valve-chamber and a gong-ringing mechanism, a valve controlling the admission of air to the
 120 sanding device and gong-ringing mechanism, a brake-lever, a pivoted bell-ringing controlling-lever, a pivoted sanding-device controlling-lever, and means operated by said levers for operating the valves independently or in
 125 unison, substantially as described.

9. In combination with a motorman's valve, a supporting bracket-plate, a bracket attached
 130 to the motorman's valve, a hinged plate carried by the motorman's valve, and means

connecting said plates together and binding the same to the bracket-plate, substantially as described.

10. In combination with a motorman's valve, supporting means therefor comprising a rigid bracket-plate and spring-pressed means carried by the motorman's valve for engagement with the bracket-plate to secure

the valve in position on said bracket-plate, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN SHOUREK.

Witnesses:

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A. M. WILSON.