

No. 742,211.

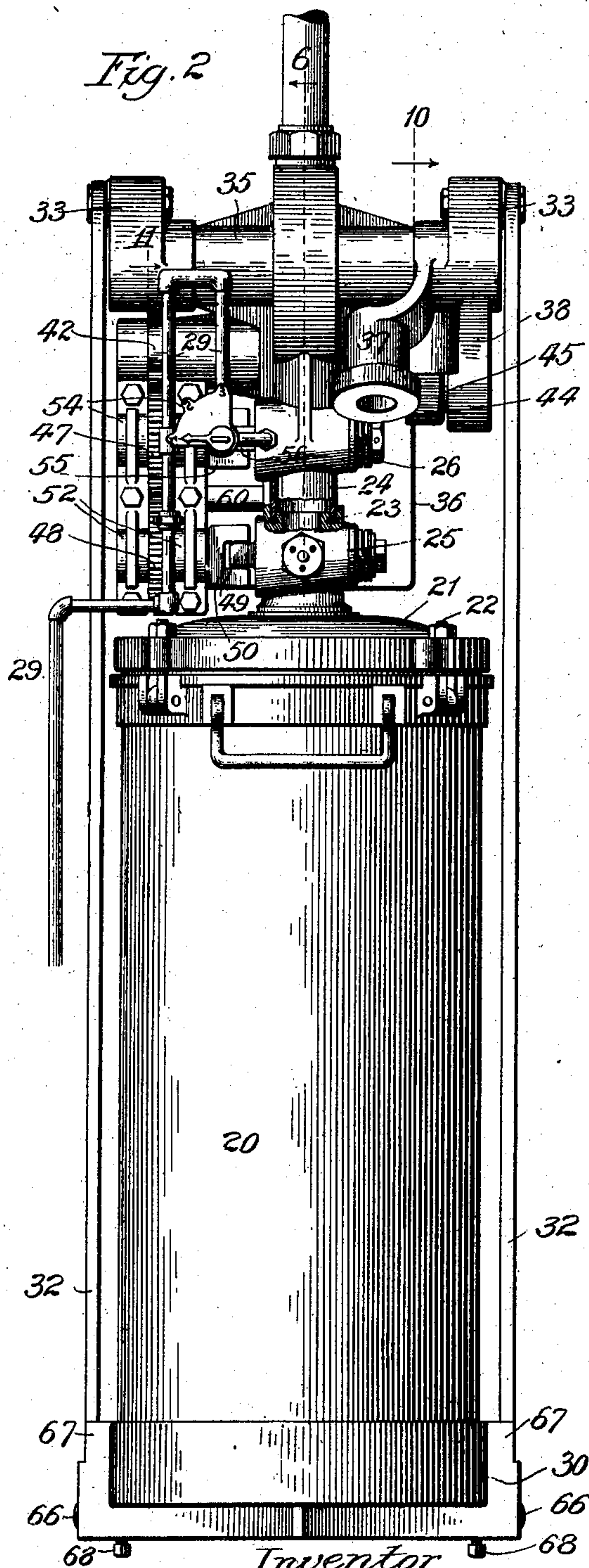
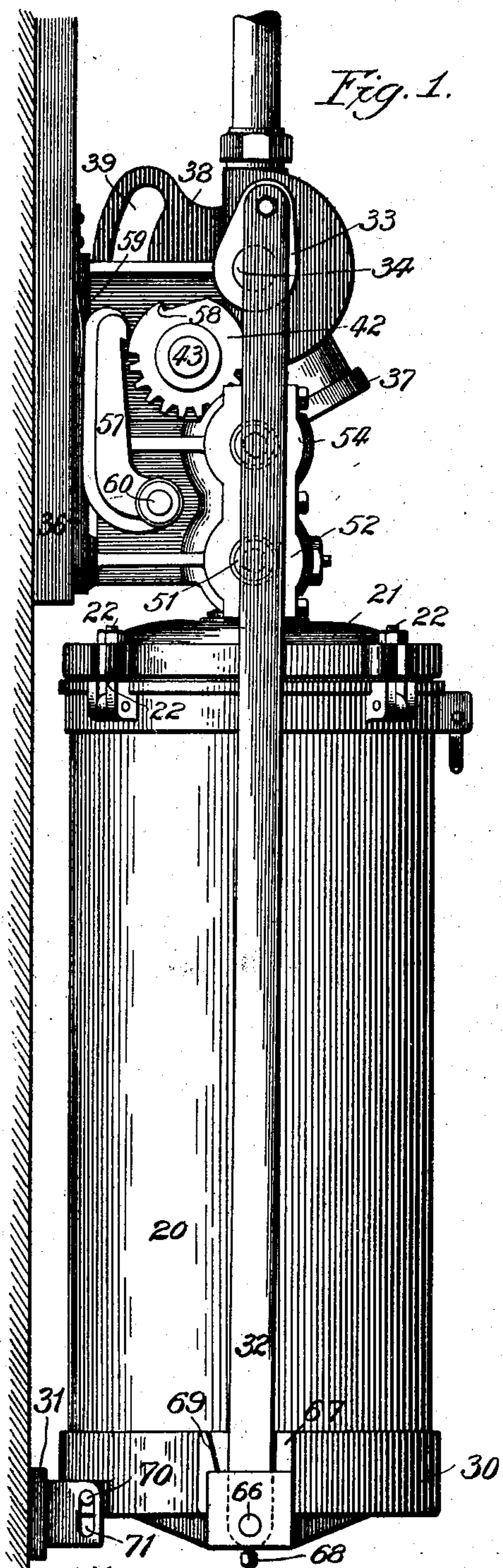
PATENTED OCT. 27, 1903.

J. A. MOSHER.
ACETYLENE GAS GENERATOR.

APPLICATION FILED MAR. 6, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:

Edw. Gaylord.
John Enders Jr.

Inventor

J. A. Mosher
By *Lawrence T. Nelson*
Att'y.

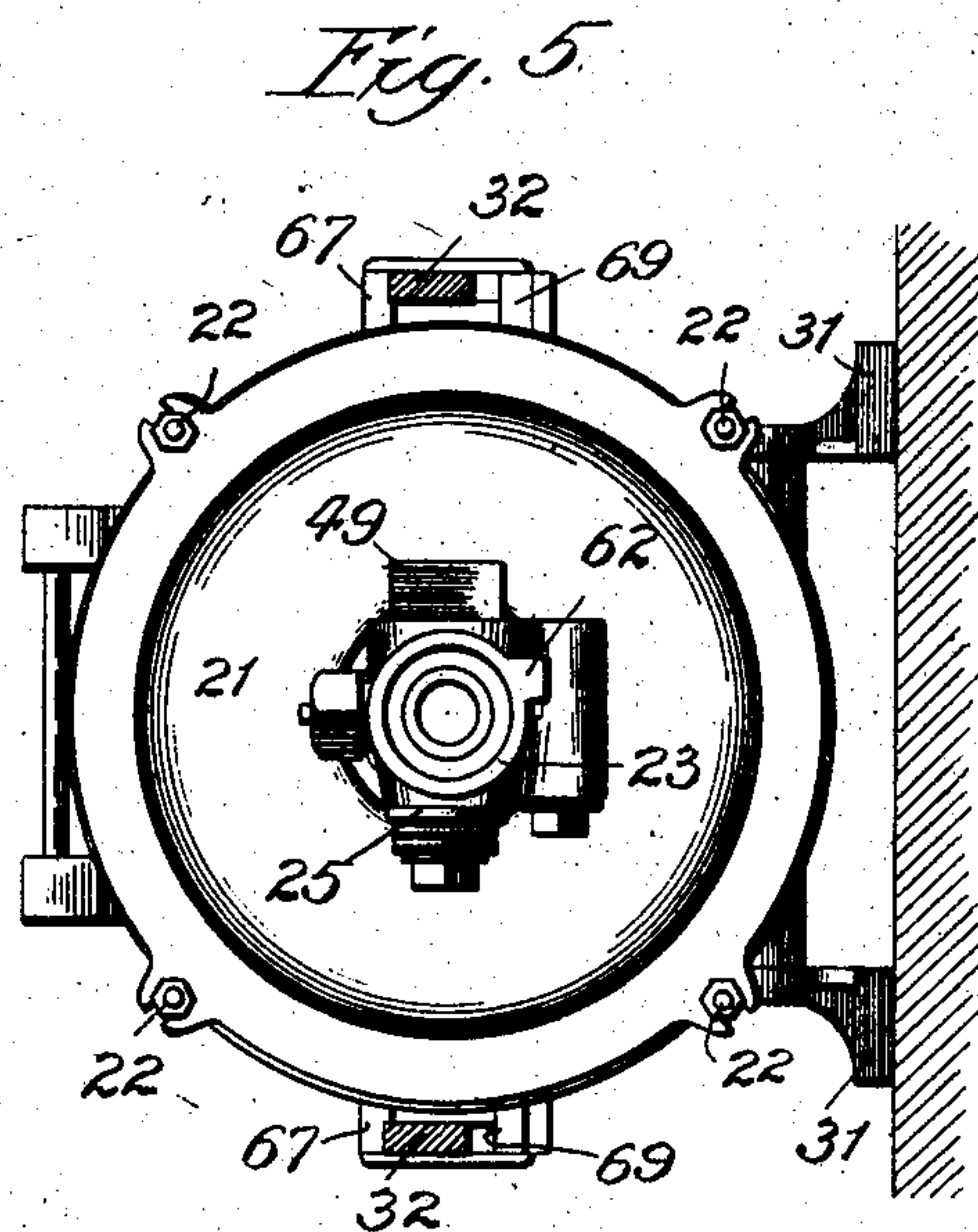
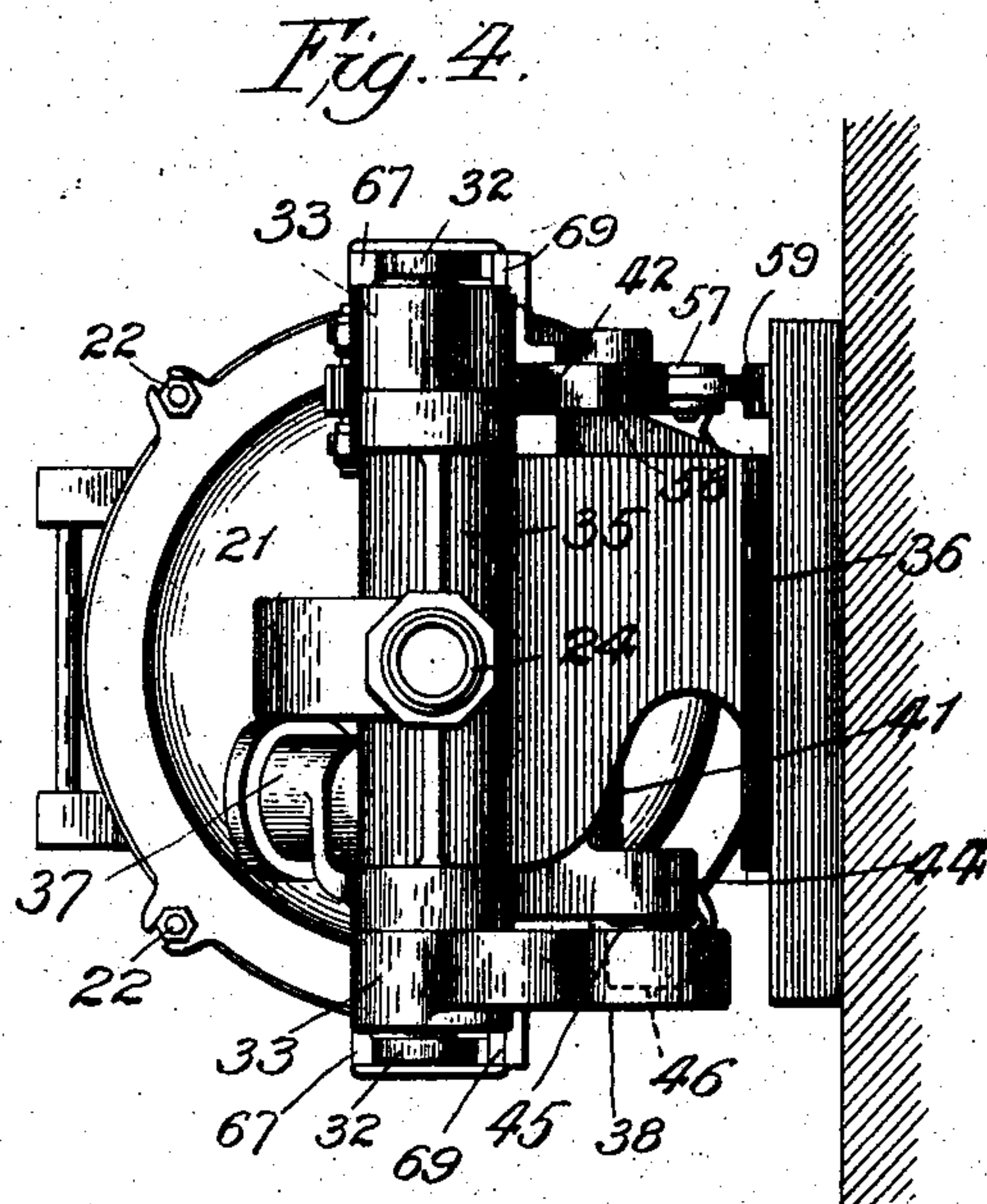
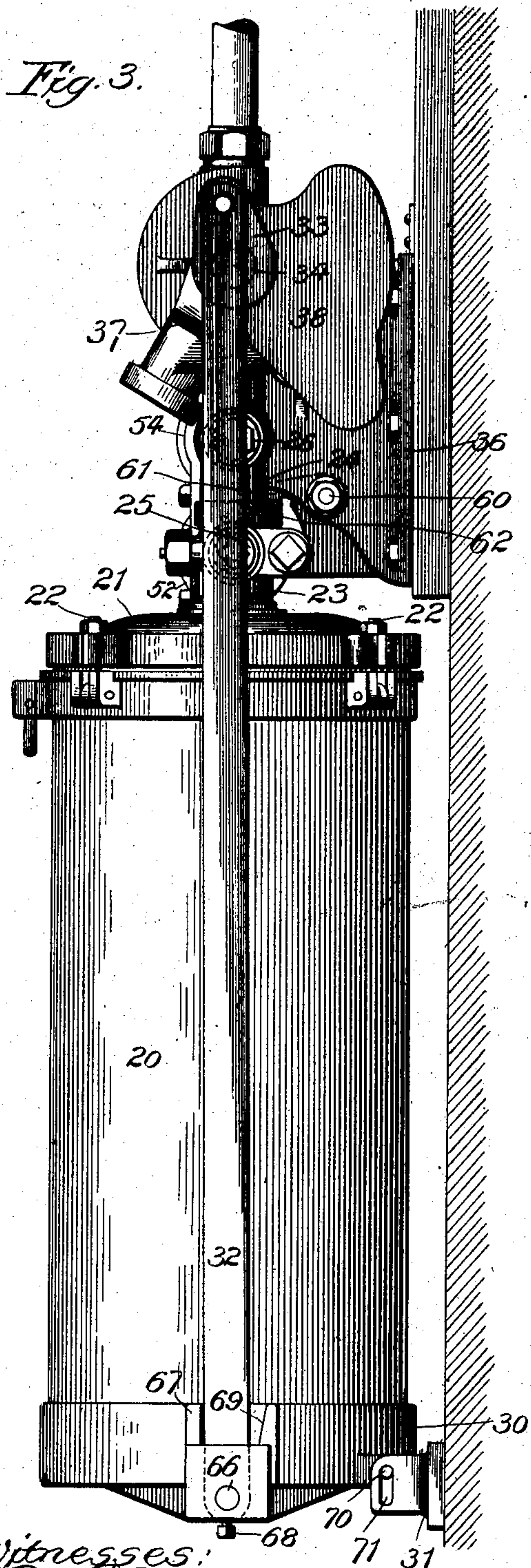
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4 SHEETS—SHEET 2.



Witnesses:
Paul J. Gaylord
John Enders Jr.

Inventor:
John A. Mosher
By *Lamar T. Gileson*
Att'y

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4 SHEETS—SHEET 3.

NO MODEL.

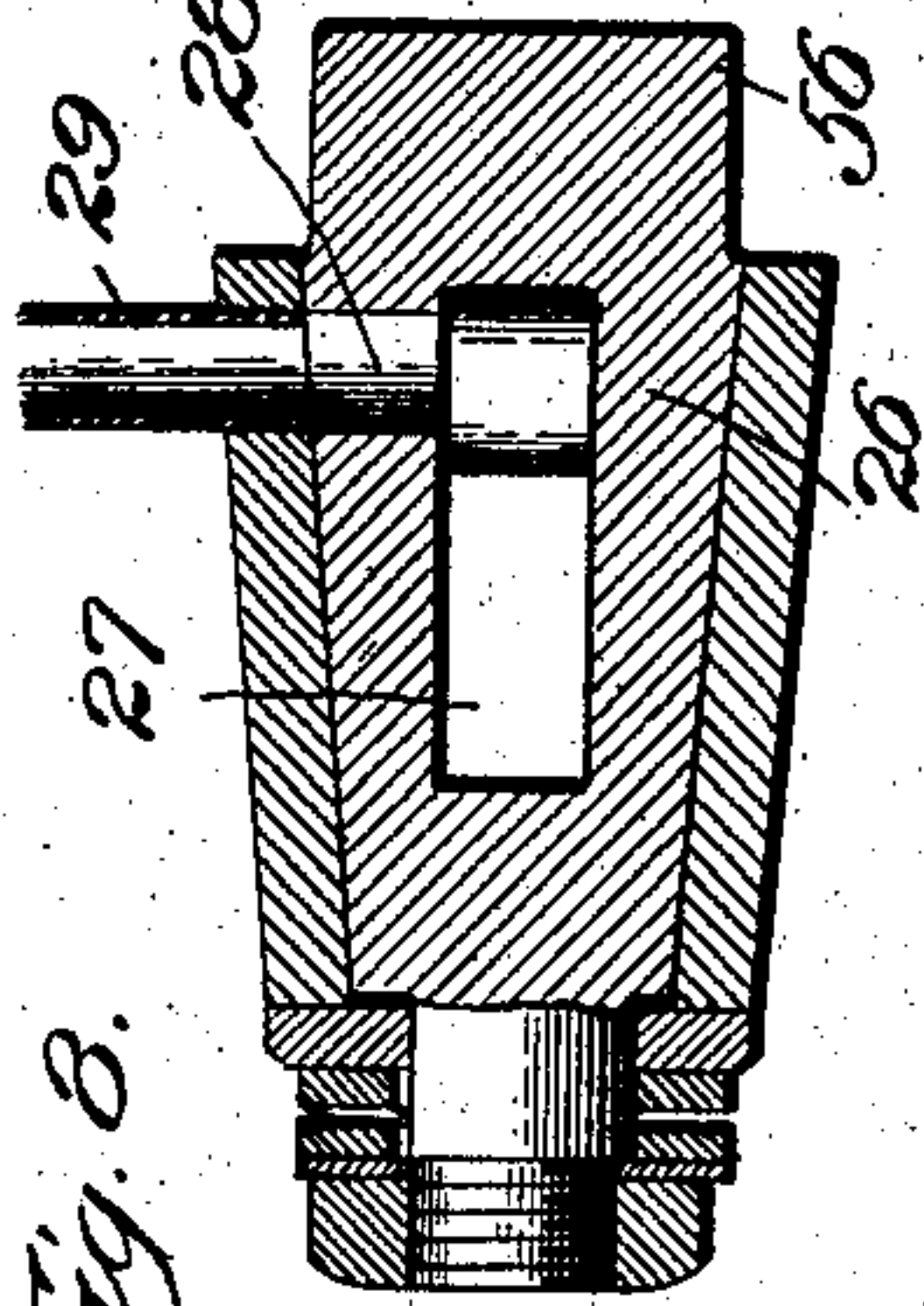


Fig. 8.

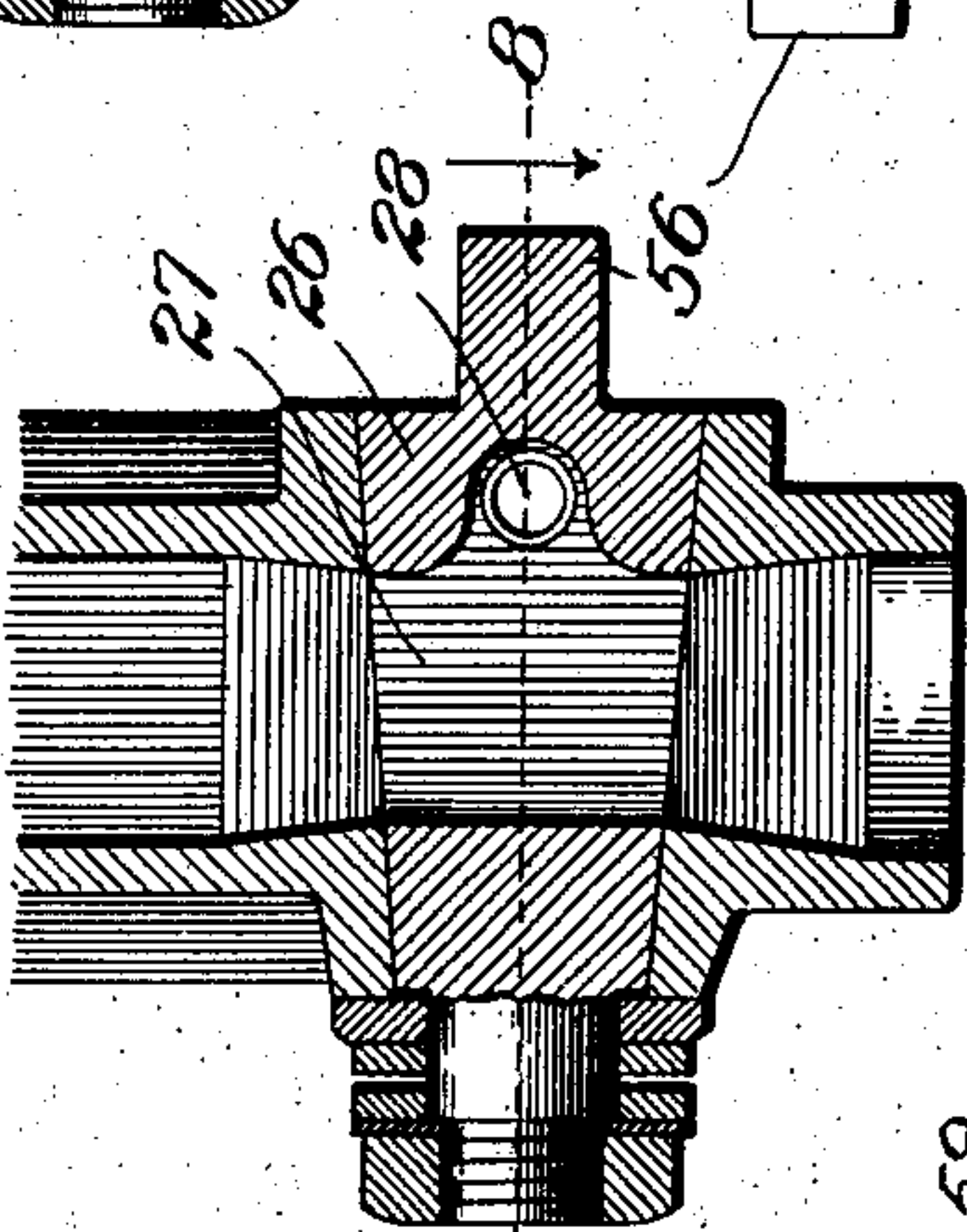


Fig. 7.

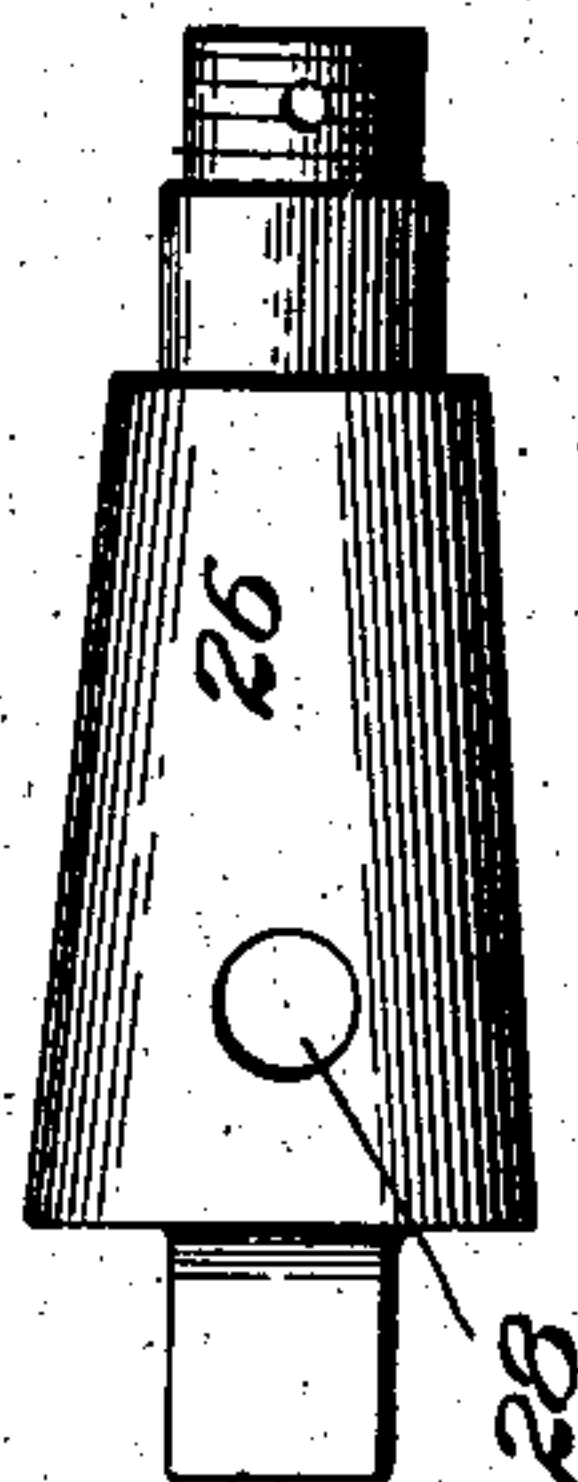


Fig. 9.

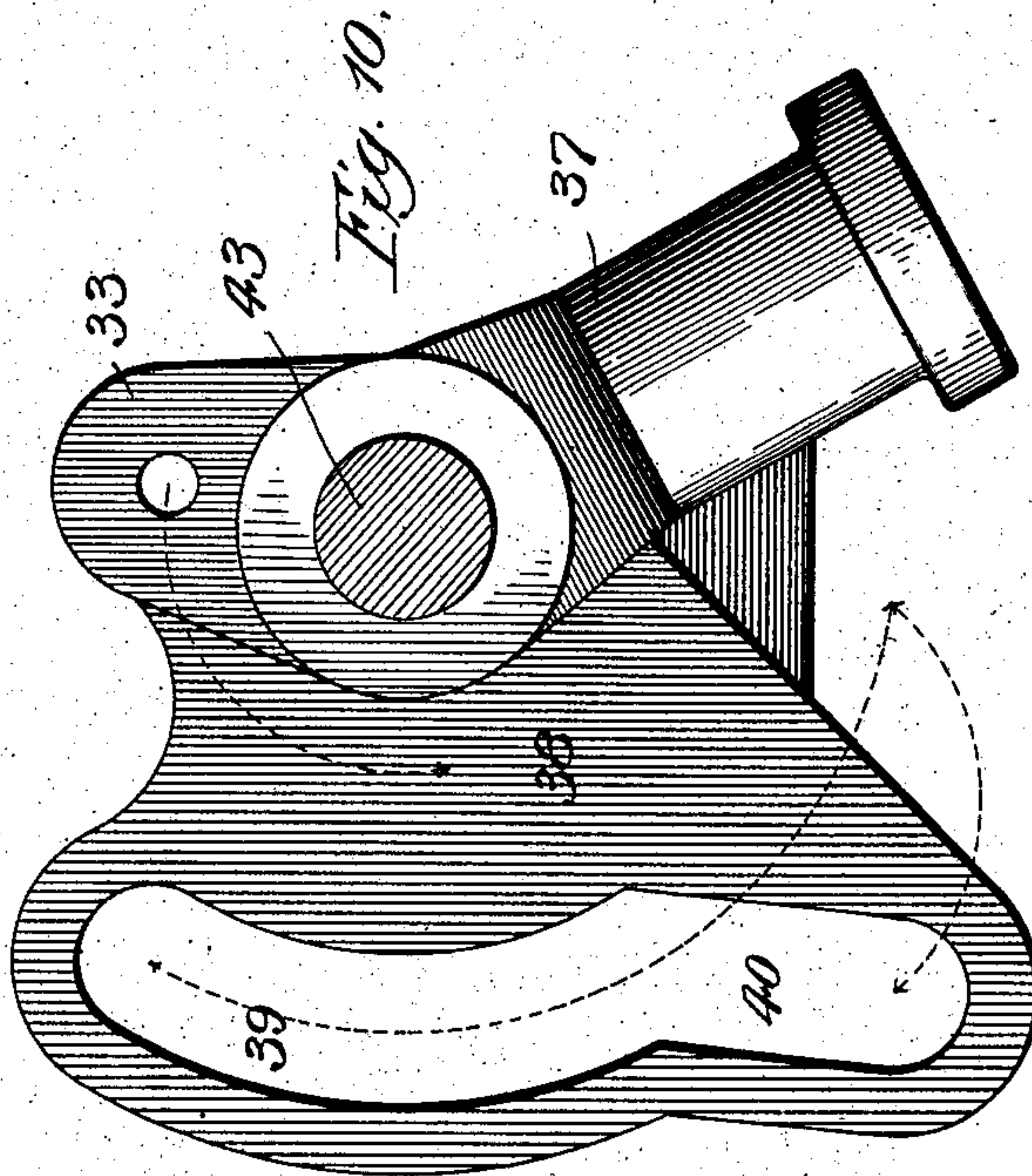


Fig. 10.

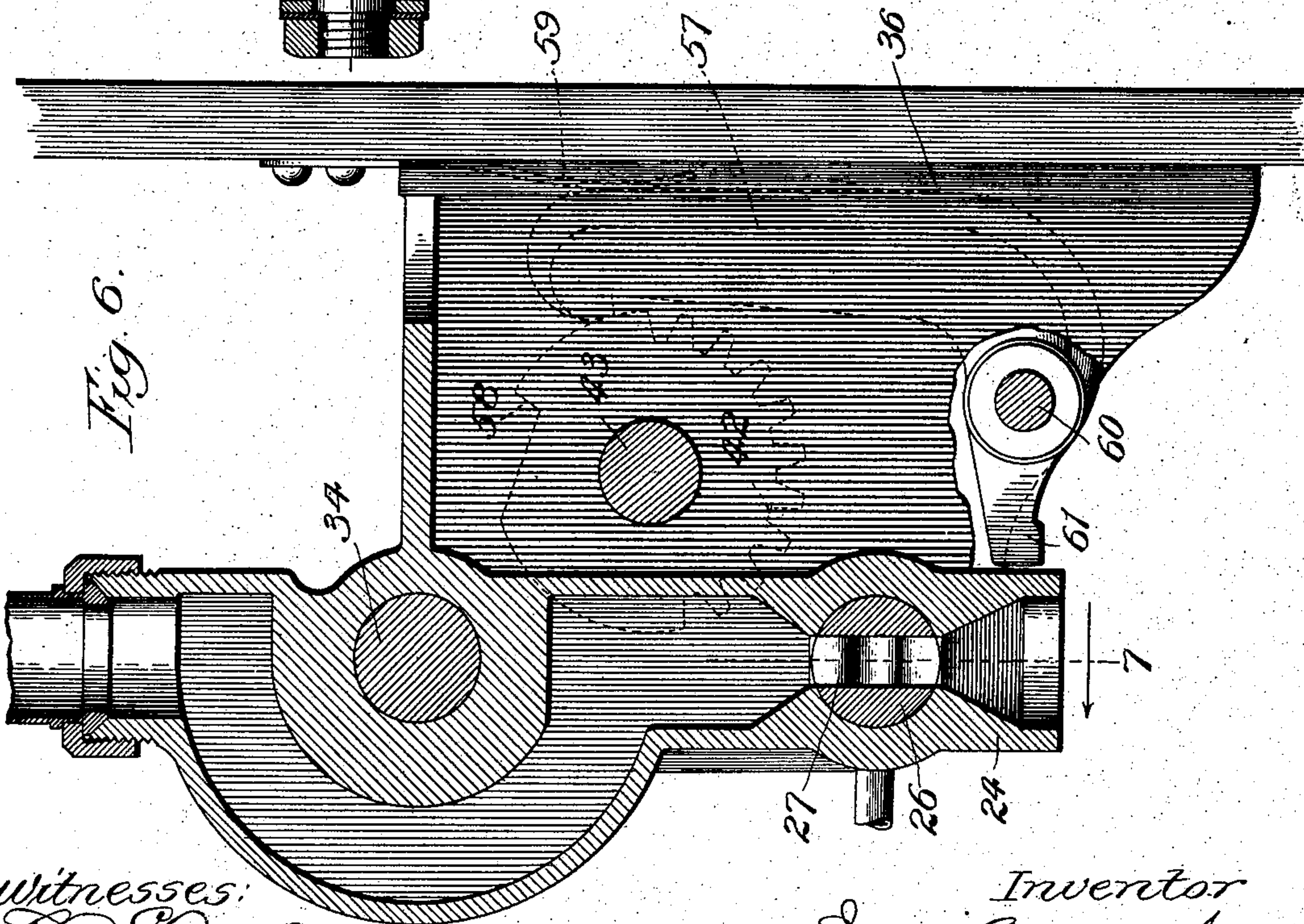


Fig. 6.

Witnesses:
Ed. O. Taylor.
John Enders &

Inventor
J. A. Mosher
By Louis A. Green
Att'y

No. 742,211.

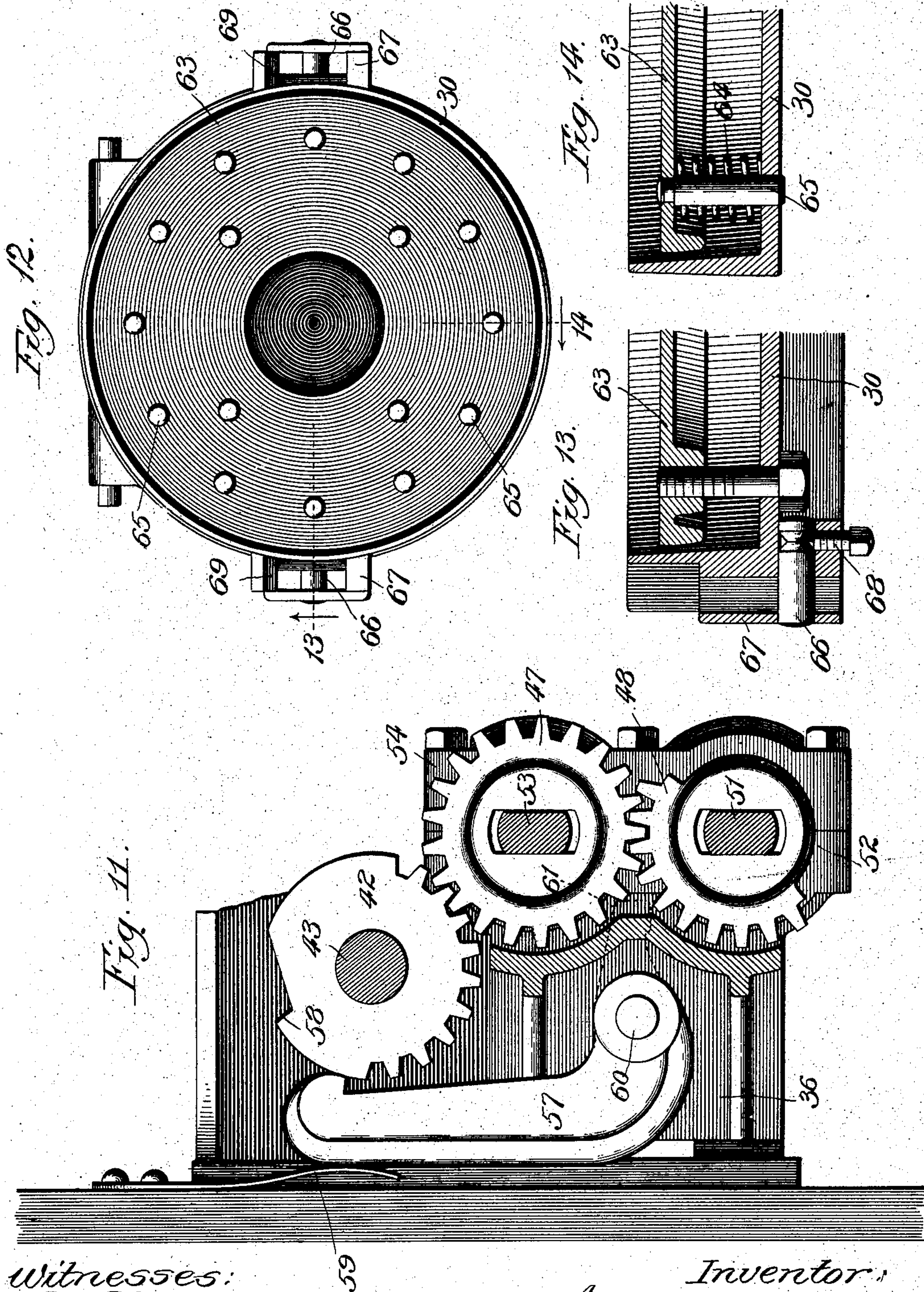
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NO MODEL.

4 SHEETS—SHEET 4.



Witnesses:
Edw. Taylor
John Enders Jr.

Inventor:
J. A. Mosher
By *Lucretia Seeson*
Att'y

UNITED STATES PATENT OFFICE.

JOHN A. MOSHER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE ADAMS & WESTLAKE COMPANY, A CORPORATION OF ILLINOIS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 742,211, dated October 27, 1903.

Application filed March 6, 1903. Serial No. 146,498. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MOSHER, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

10 This invention relates to improvements in that type of acetylene-gas-generating apparatus with which there is employed a cell or "cartridge" designed to be detachably connected with a lighting system and being removable therefrom for recharging.

15 The invention is applicable to any type of machine in which the carbid and water are stored in separable compartments, one of which constitutes the generating-chamber. In all such cases there should be provision for separating the containers without permitting the escape of gas from either, and the means employed should not only be automatic, but so constructed as to prevent the opening of the machine while the removable part thereof is detached.

20 This invention consists, broadly, in the provision of unitary means for bringing the separable parts into communication and for operating the valves in the throats or nipples thereof, so that by a single act the removable part is attached to the machine and the valves are turned to open communication with it, and, conversely, by a single act the valves are closed and the removable part detached.

25 Differently stated, the invention consists of a reciprocating support for the removable receptacle, intergeared or operatively connected with the valve-gear for operating the valves of the nipple of the removable receptacle and the nipple of the stationary part of the machine, so that the receptacle is attached or detached and the valves opened or closed by a single action.

30 The invention consists, further, in an automatic lock for the valve of the mouth or nipple of the stationary part of the machine, such lock being released by the seating of the removable part.

35 While the invention is not restricted to

that type of machine, for the purpose of disclosing it an apparatus is herein illustrated and described in which water is fed to the carbid.

35 In the accompanying drawings, Figure 1 is a side elevation of a generator-cell and of the mechanism for securing the same in operative position. Fig. 2 is a front elevation of the same. Fig. 3 is an elevation taken from the side opposite that shown in Fig. 1. Fig. 4 is a plan of the invention with the generator in place. Fig. 5 is a plan of the generator alone. Fig. 6 is a vertical section on the line 6 of Fig. 2 of the connection leading from the generator when in place to the piping system and showing in dotted lines the means for locking the valve-controlling mechanism. Fig. 7 is a section on the line 7 of Fig. 6 through the connection-valve. Fig. 8 is a section of such valve, taken on the line 8 of Fig. 7. Fig. 9 is a detail of the valve removed. Fig. 10 is a side elevation of the crank and cam for seating or unseating the generator-cell and actuating the cell and connection valve. Fig. 11 is a detail, on an enlarged scale, of the valve-turning gears and the dog for locking the same. Fig. 12 is a plan of the seat or support for the generator-cell. Fig. 13 is a section on the line 13 of Fig. 12, and Fig. 14 is a section on the line 14 of Fig. 12.

40 As shown, the generator consists of a cell 20, having a removable cap 21, secured in position, as by bolts 22. Extending from the cap 21 is a nipple 23, adapted, when the cell is in position, to engage a connection 24 of the piping system leading from the water-receptacle and to the burners. The nipple 23 is provided with an oscillating valve 25, having a suitable passage, which when the valve is open throws the cell into communication with the connection 24, the latter also being provided with a similar valve 26, as shown in Figs. 6, 7, 8, and 9. When the generator is in action, the gas passes to the piping system through a diametrical port 27, and the water fed to the carbid enters through a duct 28, communicating with a port 27 and which may be placed in register with the mouth of the pipe 29, leading from a source of water-supply. The precise means for feeding the

water to the carbid and conducting away the gas are not material, however, and form no part of the invention, except in so far as the valves 25 and 26 are concerned. In order to
 5 compel the closing of the valves of the cell and of the connection 24 to prevent the escape of gas when the cell is removed for re-charging or for other purposes and to provide for the opening of such valves when the cell
 10 is restored, connection is provided between the means for securing the cell in position and the valve-gear. To this end the cell 20 is supported by a chair 30, which may be free, but is preferably hinged to brackets 31, fixed
 15 to a wall or other support. The pintles 70 of the hinges move in vertical slots 71 in the said brackets, which slots are at least as long as the range of movement necessary to disengage the cell-nipple 23 from the end of the
 20 connection 24. The chair 30 is sustained by a pair of vertical rods 32, pivoted to the opposite sides thereof and the upper ends of which are jointed to crank-arms 33, one of which is fixed to each end of a horizontal
 25 rock-shaft 34, journaled in a sleeve 35 of a bracket 36, fixed to the wall or other support above the cell, a crank-arm 37 also being fixed to the shaft 34 and socketed to receive a bar for turning the shaft. The crank-arms
 30 33 and 37 are preferably relatively so disposed that when the chair 30 is in its lowest position the former are substantially horizontal and the latter is inclined upwardly. The valve-gear, by which the valves are turned, is operated from or by the action of the same rock-shaft and may be variously worked out. As
 35 shown, it comprises a pair of spindles so disposed and formed as to engage the stems of the valves and being provided with gears driven from a rock-shaft having a crank-arm, which is engaged by a cam-plate carried by the rock-shaft 34 during the latter part of the movement of that shaft for attaching the cell and the early part of the movement of the
 40 shaft to disengage the cell.

Rigid with the shaft 34 is a rearwardly-projecting arm 38, particularly shown in Fig. 10, taking the form of a segmental plate and provided with a cam-groove, the upper portion
 50 39 of which is concentric with the shaft 34 and its lower end terminating in a straight portion 40, inclined tangentially from the curved portion.

Journaled in a sleeve 41 on the bracket 36 and having fixed thereto a segmental gear 42 is a shaft 43, the end thereof adjacent the cam-plate 38 having fixed thereto a crank-arm 44, provided with a pin 45, carrying an antifriction-roller 46, (shown in dotted lines,
 60 Fig. 4,) which plays in the cam-groove of the plate 38. The segmental gear 42 meshes with a gear 47, communicating motion to the connection-valve 26 and driving a gear 48, through the medium of which the nipple-valve
 65 25 is turned.

To provide a detachable connection between the cell-valve 25 and the operating

means to permit of the removal of the cell, such valve is formed with a squared stem 49, Fig. 2, which is engaged by the bifurcated
 70 end 50 of a spindle 51, carrying the gear 48. The spindle is preferably squared, as shown in Fig. 11, and the gear, the hub of which is journaled in bearings 52, is provided with a corresponding aperture, so that the spindle
 75 may be slipped into or out of the same in case of necessity for repairs and for convenience in assembling, the spindle being reduced in diameter beyond the squared portion. The connection between the valve 26
 80 and its gear 47 may be made in the same manner and is so shown, a spindle 53 being mounted in the elongated bore of the gear, which is journaled in bearings 54 on the bracket 36. The spindle also has a bifurcated
 85 inner end 55, which engages the squared stem 56 of the said valve.

When the cell is in action, the parts assume the position shown in Figs. 1, 2, and 3, the roller 46 of the crank-shaft 43 being at the
 90 bottom of the straight portion 40 of the cam-groove. To remove the cell, the crank 37 is turned upwardly, thereby rocking the shaft 34 and turning the crank-arms 33, which when the cell is in position extend vertically from
 95 the shaft downwardly and lowering the chair 30 bodily, the hinge-pintles 70 thereof moving along the slots 71. The chair is not materially lowered, however, until the valves
 100 25 and 26 have been closed, for the initial angular movement of the crank-arms 33 is slight, and during such movement the shaft 43, through the medium of its crank-arm 44, is turned far enough to close the valves, such action being incidental to the movement of
 105 the roller 46 along the straight portion 40 of the cam-groove. The roller having reached the curved groove, the crank-arms 33 begin to rapidly lower the chair 30, the shaft 43 then, however, being unaffected, owing to
 110 the fact that the curved groove is concentric with the center about which it turns and simply permits the pin 46 to pass along the same. The valves having been closed, as described, and assumed a position ninety degrees re-
 115 moved from that seen in Fig. 2, the stem 49 of the valve 25 as the chair drops away and the cell lowers slides out of the bifurcated end of the spindle 51, and the separation of the nipple 23 from the connection 24 is ef-
 120 fected. The hinge-pintles 70 having by this time reached the bottom of the slots 71, the chair is tilted on the brackets 31, throwing the upper end of the generator outwardly from between the rods 32, and thereby faci-
 125 lilitating the removal of the generator.

To prevent the opening of the connection-valve 26 while the generator-cell is out, provision is made for locking the said valve in its closed position. Such means may consist
 130 of a dog 57, adapted to engage a shoulder or notch 58 on the gear 42, Figs. 1, 9, and 14, when the said gear has reached the limit of its movement in closing the connection and

cell valves and which is thrown and held into such engagement by a spring 59, reacting against the said dog. The dog 57 may be fixed to a shaft 60, pivoted in side plates of the bracket 36, and such shaft is provided with a forwardly-projecting toe 61, adapted to be engaged by a tappet 62 on the nipple of the generator and thrown out of engagement with the gear 42 when the generator is restored, as will be hereinafter explained.

In order to prevent the separation of the connection 24 and the nipple 23 during the initial movement of the lowering mechanism and until the valves have entirely closed, the means now to be described may be employed.

The chair 30, as shown in Figs. 12, 13, and 14, is provided with a plate or seat 63, upon which the cell 20 rests, having interposed between it and the bottom of the chair coiled springs 64, held in place by pins 65, secured to the seat 63 and sliding in apertures in the bottom of the chair. This spring-seat exerts a constant tendency to press the tank-nipple up against the connection 24, permitting of the slight dropping of the arms 32 during the closing of the valves without breaking the nipple connection. The lower ends of the rods 32 may be mounted on pins 66, passing through socketed extensions 67 at the sides of the chair 30, and each of which is held by a set-screw 68, as shown in Fig. 13, and the rear walls of such sockets are inclined, as at 69, to permit of the tilting of the chair when lowered without any hindrance from the rods.

To connect the tank up into the system after recharging, the cap 21 being secured, the cell is placed on the seat of the chair 30 and the crank 37 turned downwardly. During the upward movement of the crank-arms 33 and while the chair is being lifted to force the nipple 23 up against the mouth of the connection 24 the shaft 43 remains stationary, the cam-plate 38 simply turning back past the roller 46, and before the straight portion passes onto the roller the nipple will have been forced up against the connection, the springs 64 assisting by their reaction in pressing the nipple into snug engagement with the connection. The springs 64 also allow for the slight raising of the arms 32 after the tank-nipple and connection 24 have been connected and incident to the opening of the valves and in order to insure a tight joint between the parts. At or instantly after the cell is coupled up the tappet 62 on the cell engages the toe 61 of the dog 57 and disengages the latter from the gear 42, and at the same time the straight portion 40 of the cam-groove engages the roller and in consequence turns the crank-shaft 43, which, driving the segmental gear, communicates motion to the gears 47 and 48, thereby opening the valves and putting the generator-cell into communication with the piping system. As the crank 37 reaches the limit of its movement the pivots of the arms 33, to which the rods are attached, are drawn slightly past the cen-

ter of the shaft 34, thereby overcoming any tendency of the shaft to turn backwardly.

Looking at Figs. 2 and 11, wherein the parts are shown in the positions they assume when the generator-cell is in action, it will be observed that the apertures in the gears 47 and 48 are elongated and at a right angle to the bifurcations of the spindles 51 and 53. This arrangement permits the valve-stems 49 and 56 to slide in the bifurcations of the spindles and also the latter to move laterally in the gear-slots, thereby providing a kind of universal coupling between the valves and the operating-gears in order to center the valves in case of wear of the parts, as of the bushing or packing between the cell-nipple and the piping connection or in case of defects in construction.

I claim as my invention—

1. In combination, a piping system having a valve-closed nipple, a tank or cell having a valve-closed nipple adapted to engage the first-named nipple, a crank-shaft, connecting-rods leading from the cranks of the shaft and provided with means for engaging the tank or cell, valve-operating gear, and operative connection between the crank-shaft and the valve-operating gear.

2. In combination, a piping system having a valve-closed nipple, a cell having a valve-closed nipple adapted to engage the first-named nipple, gear for operating the valves of both nipples, a support for the cell movable toward and away from the pipe-nipple, and unitary means for moving the support and operating the valve-gear.

3. In combination, a piping-system connection, a cell, means for coupling the cell up with or uncoupling it from, the connection, a valve in the connection, and means controlled by the former means for actuating the valve.

4. In combination, a piping-system connection, a cell, means for coupling the cell up with or uncoupling it from the connection, a valve in the connection, means controlled by the former means for actuating the valve, and means for locking the valve in its closed position.

5. In combination, a piping-system connection, a valve in the connection, a cell provided with a valve-closed nipple, means for moving the cell to couple the cell-nipple with or uncouple it from the connection, and means controlled by the cell-moving means for actuating the valves.

6. In combination, a piping-system connection, a valve in the connection, a cell provided with a valve-closed nipple, means for moving the cell to couple the cell-nipple with or uncouple it from the connection, means controlled by the cell-moving means for actuating the valves, and means for locking the connection-valve in its closed position.

7. In combination, a removable cell, a movable chair by which the cell is supported, a piping-system connection, a valve in such connection, means for moving the chair to

couple the cell with or uncouple it from the connection, and means controlled by such moving means for actuating the connection-valve.

5 8. In combination, a removable cell, a movable chair by which the cell is supported, a piping-system connection, a valve in such connection, means for moving the chair to couple the cell with or uncouple it from the connection, and an operative connection between
10 the chair-moving means and the connection-valve.

9. In combination, a movable chair, a cell removably supported by the chair, a piping-system connection, a valve in such connection, means for moving the chair to couple the cell with or uncouple it from the connection, means controlled by such chair-moving means for actuating the connection-valve,
20 and means for locking the connection-valve in its closed position.

10. In combination, a movable chair, a cell removably supported by the chair and having a valve-closed nipple, a piping-system connection, a valve in such connection, means
25 for moving the chair to couple the cell-nipple with or uncouple it from the connection, and means operated by the chair-moving means for actuating the said valves.

30 11. In combination, a movable chair, a cell removably supported by the chair and having a valve-closed nipple, a piping-system connection, a valve in such connection, means for moving the chair to couple the cell-nipple with or uncouple it from the connection,
35 means operated by the chair-moving means for actuating the said valves, and means for locking the connection-valve in its closed position.

40 12. In combination, a movable cell having a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, a movable chair by which the cell is supported, a crank-shaft, rods pivotally connected to the crank-shaft and the chair, and
45 a cam moved by the shaft and controlling the valves.

13. In combination, a movable cell having a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, a movable chair by which the cell is supported, a crank-shaft, rods pivotally connected to the crank-shaft and the chair, a cam moved by the shaft and controlling the valves,
55 a shaft actuated by the cam, a gear fixed to the latter shaft, and connection between the gear and the valves.

14. In combination, a movable cell having a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, intermeshing gears for turning the valves, a movable chair by which the cell is supported, a crank-shaft, rods pivotally connected to the crank-shaft and the chair, a cam
60 moved by the shaft and controlling the valves, a shaft provided with a crank-arm engaged

by the cam, and a gear fixed to the latter shaft and meshing with one of the valve-gears.

15. In combination, a movable cell having a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, a movable chair by which the cell is supported, a crank-shaft, rods pivotally connected to the crank-shaft and the chair, a cam moved by the shaft and controlling the valves,
70 and a dog for locking the connection-valve in its closed position.

16. In combination, a movable cell having a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, a hinged chair by which the cell is supported, a bracket located above the cell, a shaft journaled on the bracket, a crank-arm at each end of the shaft, rods pivoted to the crank-arms and to the opposite sides of the chair, an arm fixed to the shaft and provided with a slot concentric with the shaft and terminating downwardly in a straight groove inclined from the curved groove, a shaft having a crank-arm engaging the groove, a segmental gear fixed to the latter shaft, spindles provided with intermeshing gears and engaging the valves and one of which is driven by the segmental gear.
80 85 90

17. In combination, a movable cell having a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, a hinged chair by which the cell is supported, a bracket located above the cell, a shaft journaled on the bracket, a crank-arm at each end of the shaft, rods pivoted to the crank-arms and to the opposite sides of the chair, an arm fixed to the shaft and provided with a slot concentric with the shaft and terminating downwardly in a straight groove inclined from the curved groove, a shaft having a crank-arm engaging the groove, a segmental gear fixed to the latter shaft, spindles provided with intermeshing gears and engaging the valves and one of which is driven by the segmental gear, and a dog for holding the segmental gear against movement.
95 100 105 110

18. In combination, a movable cell having a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, a hinged chair by which the cell is supported, a bracket located above the cell, a shaft journaled on the bracket, a crank-arm at each end of the shaft, rods pivoted to the crank-arms and to the opposite sides of the chair, an arm fixed to the shaft and provided with a slot concentric with the shaft and terminating downwardly in a straight groove inclined from the curved groove, a shaft having a crank-arm engaging the groove, a segmental gear fixed to the latter shaft, spindles provided with intermeshing gears and engaging the valves and one of which is driven by the segmental gear, a dog for holding the segmental gear against movement, and a projection on the cell for releasing the dog.
115 120 125 130

19. In combination, a movable cell having

a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, a movable chair by which the cell is supported, a crank-shaft, rods pivotally connected to the crank-shaft and the chair, a cam carried by the shaft, a segmental gear actuated by the cam, intermeshing gears driven by the segmental gear, spindles on which the intermeshing gears are fixed and which detachably engage the valves.

20. In combination, a movable cell having a valve-closed nipple, a valve-closed piping-system connection in communication with the nipple, a movable chair by which the cell is supported, a crank-shaft, rods pivotally connected to the crank-shaft and the chair, a cam carried by the shaft, a segmental gear actuated by the cam, intermeshing gears driven by the segmental gear, spindles on which the intermeshing gears are fixed and provided with bifurcated ends, the stems of the valves being squared and engaged by the bifurcations.

21. In combination, a cell having a valve-closed nipple, a valve-closed piping-system connection, intermeshing gears for turning the valves, a spring-seated chair upon which the cell rests, a shaft having crank-arms at the ends, rods pivotally connected to the chair and to the crank-arms, a curved cam terminating in a straight portion fixed to the shaft, a shaft having a crank-arm engaged by the cam, and a gear on the latter shaft and engaging one of the intermeshing gears.

22. In combination, a cell having a valve-closed nipple, a valve-closed piping-system connection, intermeshing gears for turning the valves, a spring-seated chair upon which the cell rests, a shaft having crank-arms at the ends, rods pivotally connected to the chair and to the crank-arms, a curved cam terminating in a straight portion fixed to the shaft, a shaft having a crank-arm engaged by the cam, a gear on the latter shaft and engaging one of the intermeshing gears, and a spring-pressed dog for locking the parts against movement.

23. In combination, a cell having a valve-closed nipple, a valve-closed piping-system connection, intermeshing gears for turning the valves, a spring-seated chair upon which the cell rests, a shaft having crank-arms at the ends, rods pivotally connected to the chair and to the crank-arms, a curved cam terminating in a straight portion fixed to the shaft, a shaft having a crank-arm engaged by the cam, a gear on the latter shaft and engaging one of the intermeshing gears, a spring-pressed dog

for locking the parts against movement, a toe rigid with the dog, and a tappet on the cell engaging the toe.

24. In combination, a valve-closed piping-system connection, a cell having a valve-closed nipple engaging the connection, a hinged chair upon which the cell is seated, rods pivotally attached to the chair, and a device for raising and lowering the rods.

25. In combination, a valve-closed piping-system connection, a cell having a valve-closed nipple engaging the connection, a chair upon which the cell is seated, a fixed bracket having a vertical slot, a pintle fixed to the chair and entering the slot, a crank-shaft, and connecting-rods pivotally attached to the crank-shaft and the chair.

26. In combination, a valve-closed connection, a cell having a valve-closed nipple engaging the connection, a spindle having a bifurcated end engaging the nipple-valve, a gear turning the spindle and the aperture of which is elongated and at a right angle to the bifurcation, and a gear for turning the connection-valve and meshing with the nipple-valve gear.

27. In combination, a valve-closed connection, a cell having a valve-closed nipple engaging the connection, a pair of spindles each of which has a bifurcated end engaging one of the valve-stems, and intermeshing gears rotating the spindles and the apertures of which are elongated and at a right angle to the bifurcations.

28. In an acetylene-generator, in combination, a valved nipple leading from a source of water-supply, a carbid-receptacle having a corresponding valved nipple, a reciprocating receptacle-support, and valve-gear intergeared with the support.

29. In an acetylene-generator, in combination, a valved attaching-nipple, a detachable receptacle having a valve-engaging nipple, a rock-shaft, a receptacle-support reciprocating to and from the attaching-nipple, and operative connection between the rock-shaft and the support and the valves.

30. In combination, in an acetylene-generator, a valved attaching-nipple, a detachable receptacle having a corresponding valved attaching-nipple, and unitary valve-gear controlling the valves of both nipples.

JOHN A. MOSHER.

Witnesses:

LOUIS K. GILLSON,
E. M. KLATCHER.