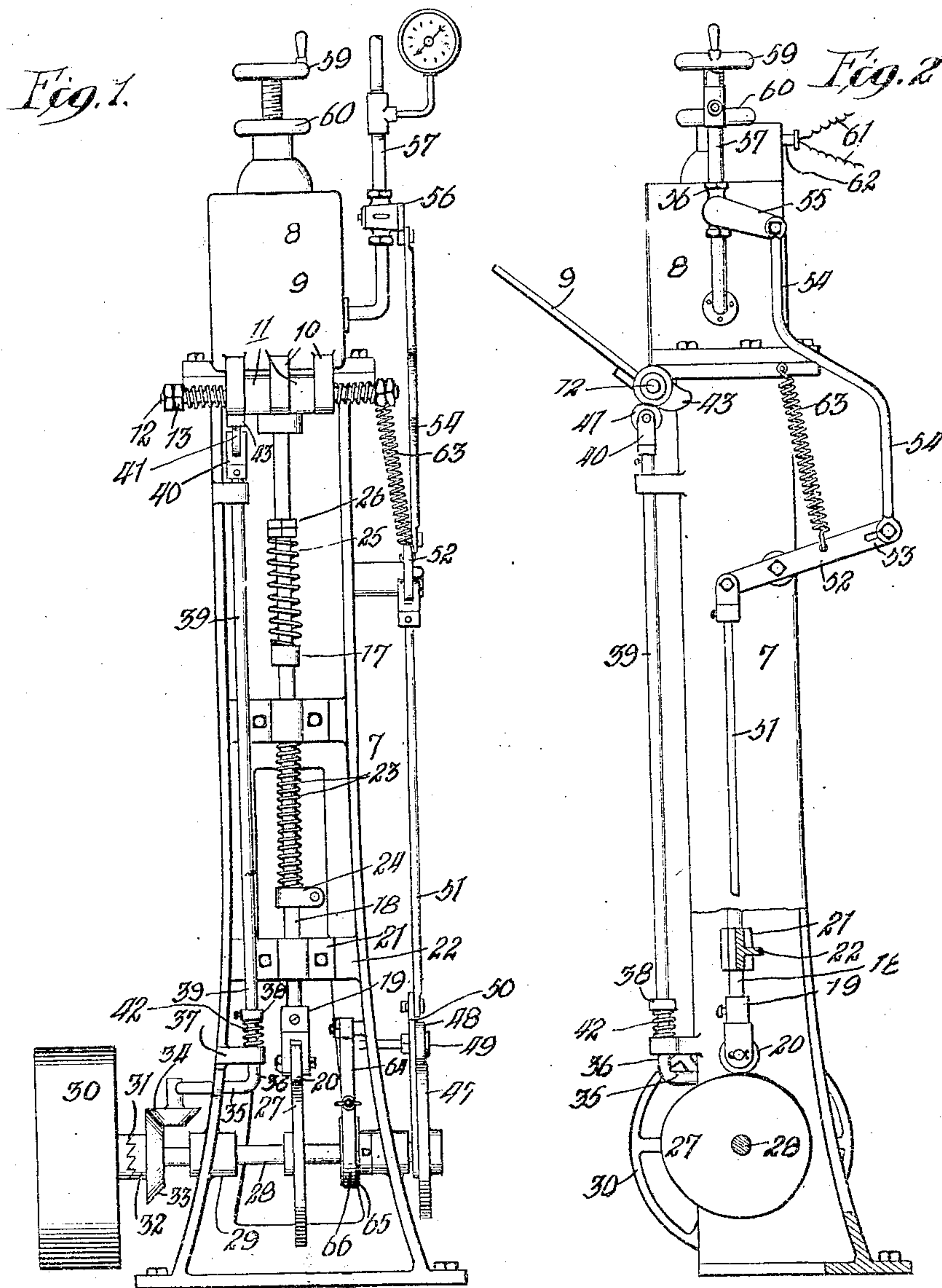


G. A. BEARDSLEY & D. WARDELL.
VACUUM SEALING APPARATUS.
APPLICATION FILED JAN. 11, 1909.

930,025.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 1.



Witnesses:
Wm. P. Bond

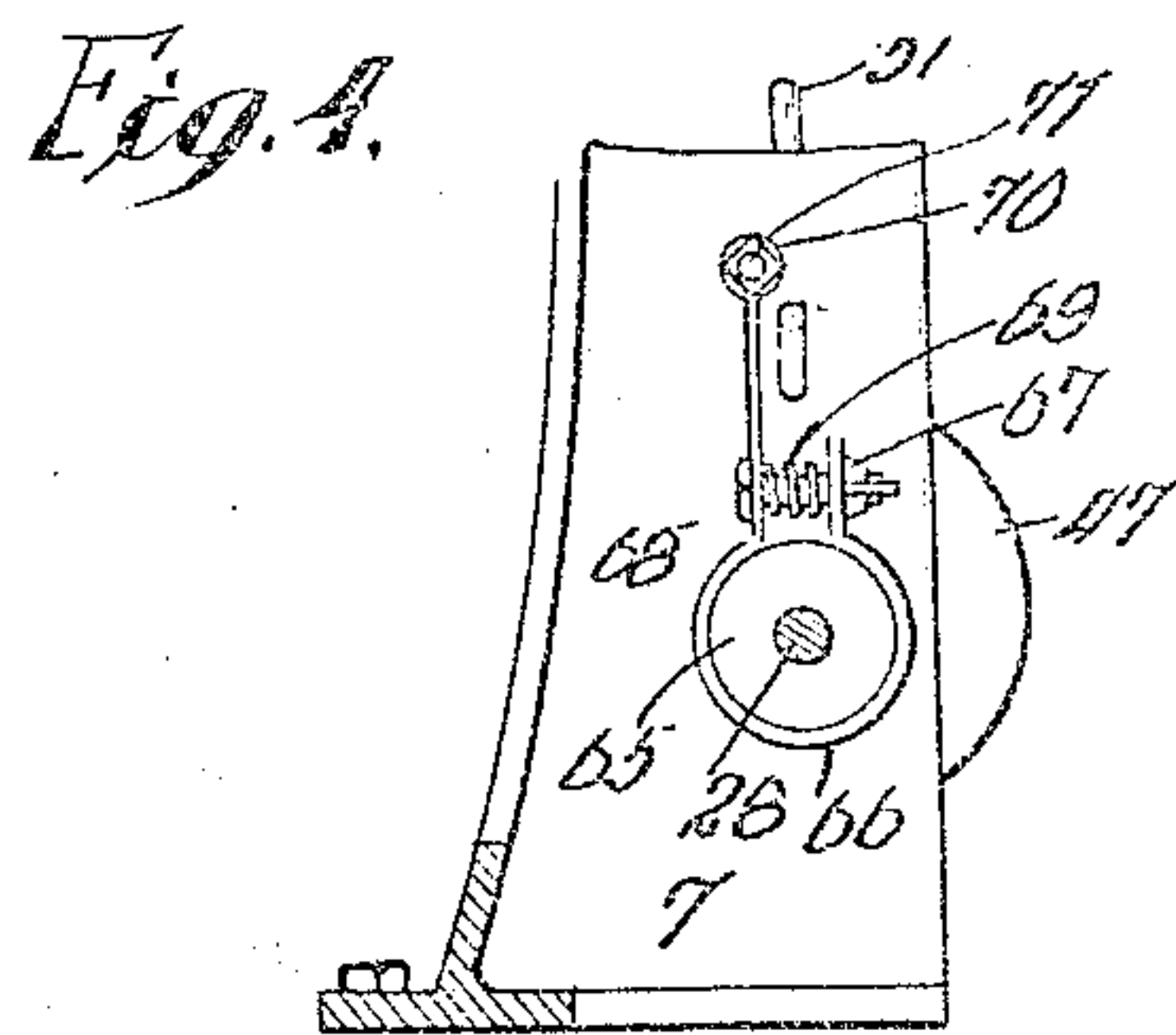
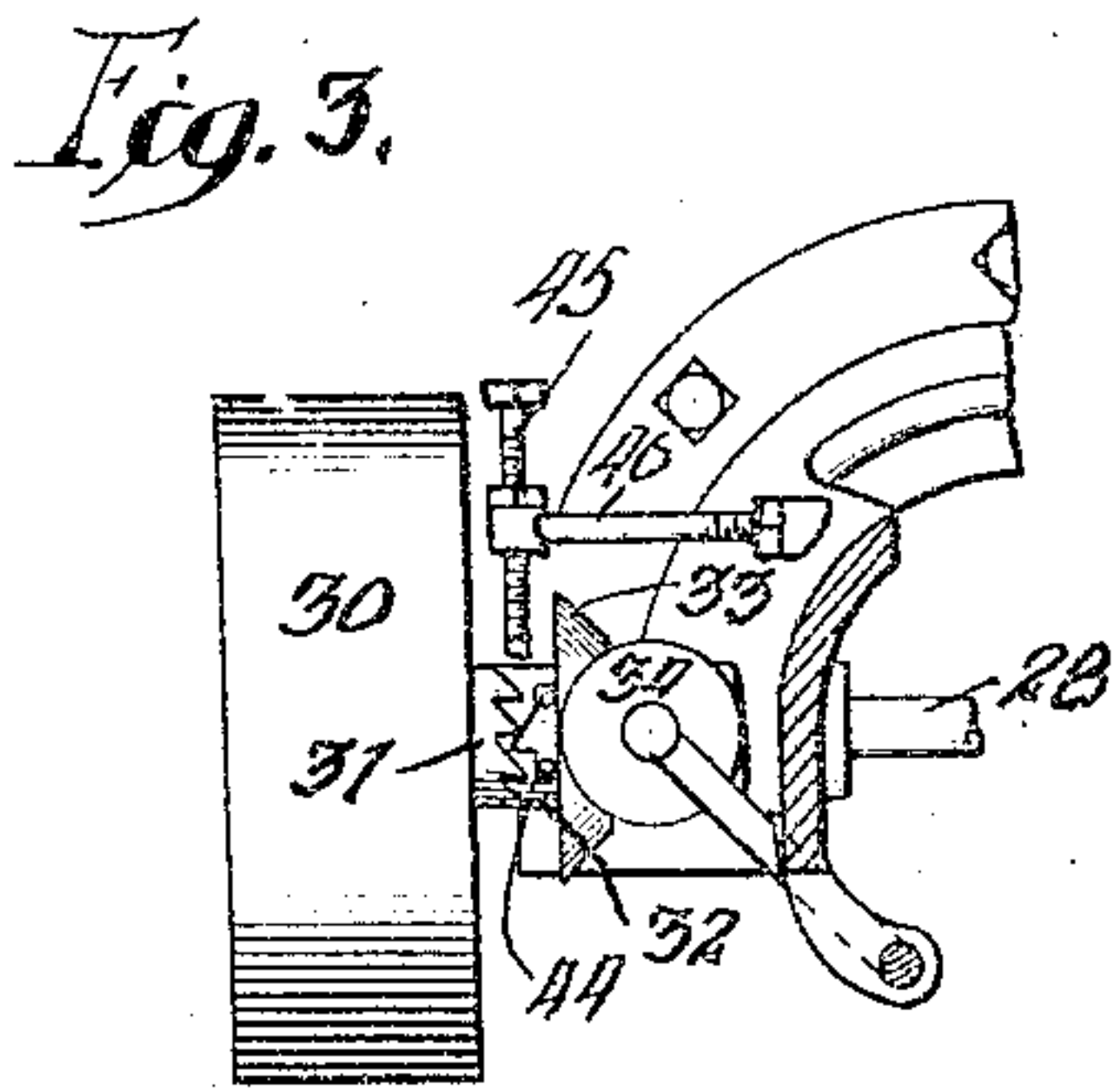
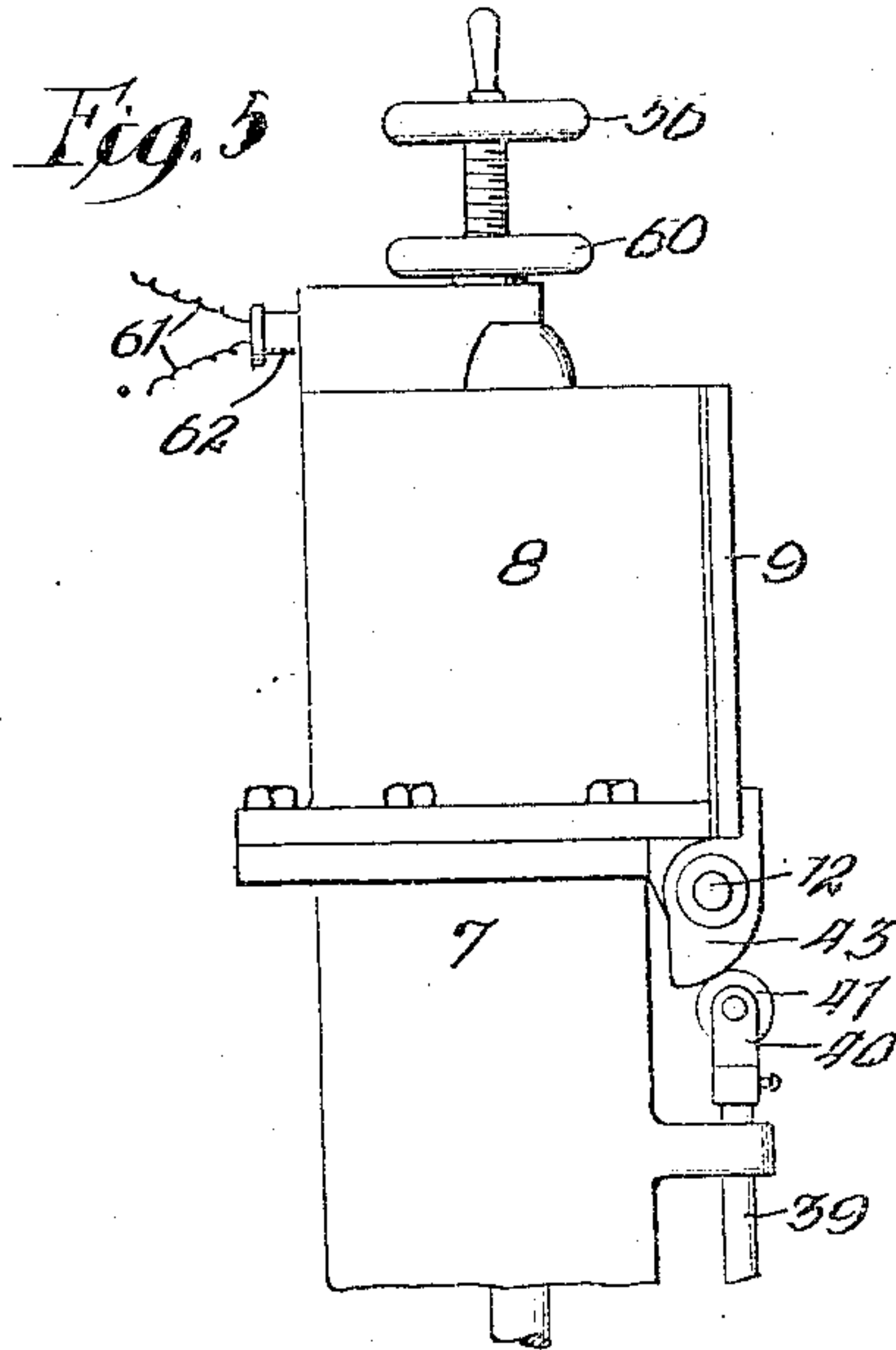
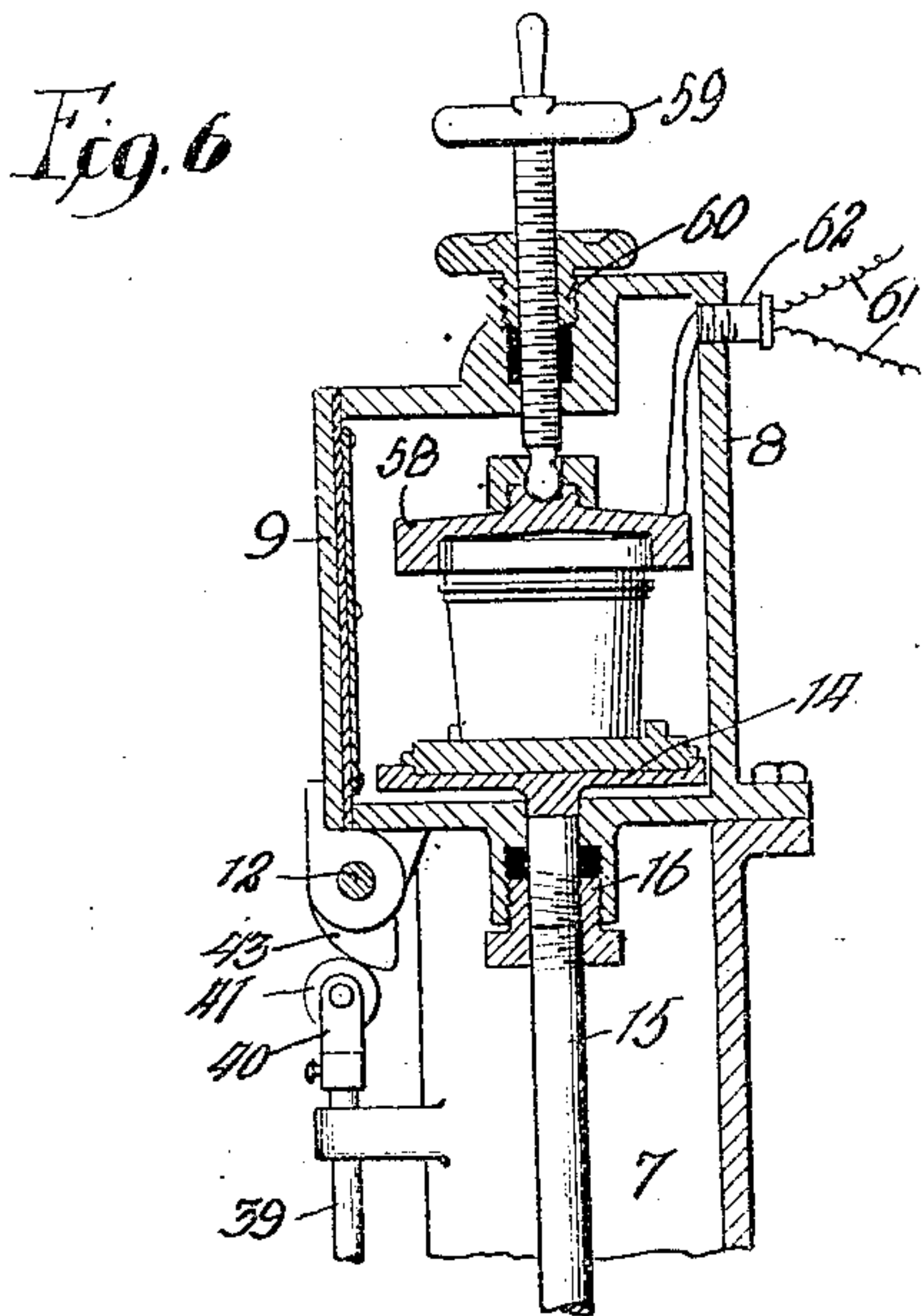
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Wm. V. Bond

Pinson W. Dan.

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UNITED STATES PATENT OFFICE.

GEORGE A. BEARDSLEY, OF EAST ORANGE, NEW JERSEY, AND DANIEL WARDELL, OF NEW YORK, N. Y., ASSIGNORS TO HERMETIC CLOSURE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

VACUUM SEALING APPARATUS.

No. 930,025.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed January 11, 1909. Serial No. 471,641.

To all whom it may concern:

Be it known that we, GEORGE A. BEARDSLEY, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, and DANIEL WARDELL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Vacuum Sealing Apparatus, of which the following is a specification.

This invention relates to apparatus of the general type shown in Patent No. 842,320, issued January 29, 1907. In vacuum sealing apparatus of this general type the sealing is performed by placing a vacuum jar and cover in position within the vacuum chamber, and thereafter closing the door and establishing a vacuum within the chamber. The final operation whereby the seal is perfected consists of applying pressure between the cap and the receptacle, in order to firmly fix the one onto the other. In the patent above referred to, the sealing is performed by means of a foot treadle, which serves to apply the compression and release the door after the sealing operation. These operations of the foot treadle impose a heavy strain on the attendant, especially after the operations have continued for some time, so that frequently the results, especially toward the end of a day's work, are very unsatisfactory. Furthermore, the amount of pressure applied and the time accorded to each operation will greatly vary, according to the strength and condition of the attendant, all of which factors render the use of a foot actuated apparatus objectionable.

The object of the present invention is to overcome the difficulties above noted, by making the several operations automatic, and by relieving the attendant of all onerous physical exertion in operating the machine. In the present invention, the time accorded for each operation will be uniform, the degree of pressure applied will be uniform, and the various operations will take place automatically and in proper sequence.

Further objects will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation

of the entire machine, with the door closed; 55 Fig. 2 a side elevation, showing the door open, and showing the base partly broken away; Fig. 3 a detail, showing the clutch mechanism; Fig. 4 an enlarged side elevation of the friction brake; Fig. 5 an enlarged 60 detail of the clutch actuating cam on the door; and Fig. 6 a cross sectional detail, showing the sealing chamber and the door.

The various operating devices are supported or built into an upright frame or 65 standard 7 which, as shown, is in the form of a hollow column of semi-cylindrical shape and open in front, and carries, at its upper end, a sealing chamber 8, which is open at the front and is adapted to be closed by 70 means of a door 9. The door is provided, at its lower edge, with tongues 10 which register with brackets 11 rigidly formed on the front upper edge of the standard; and the door is 75 pivoted by means of a shaft 12, which outwardly projects beyond the tongues and is encircled by means of coil springs, the inner ends of which are entered into the outer tongues on the door, and the outer ends of which are entered into adjustable nuts 13. 80 The arrangement is one which puts the door under a slight spring tension when it is closed and at the same time prevents the door from falling back beyond a predetermined position. These features relating to the general ar- 85 rangement of the door and standard are identical with the patent above referred to, and further description is deemed not necessary.

Within the sealing chamber is a plunger 90 14 having a stem 15, which is entered through a stuffing box 16 and has its lower end entered into a hollow coupling 17. The coupling connects the stem with a reciprocating rod 18, the upper end of which is en- 95 tered into the coupling, and the lower end of which is provided with a bifurcated head 19 which mounts a roller 20. The reciprocating rod is slidably mounted within bearings 21, bolted to cross plates 22 which extend 100 from side to side of the standard. The upper bearing serves as an abutment for a coil spring 23, which encircles the reciprocating rod and is held in position by means of a collar 24 clamped onto the rod. The plun- 105 ger stem, above the coupling, is encircled by means of a coil spring 25, the tension of which can be adjusted by means of adjust-

ing nuts 26. This arrangement of springs is shown in the patent referred to, and further description is deemed unnecessary. The roller 20 is held under spring tension against a plunger cam 27 which is fixedly mounted upon a driving shaft 28 extending horizontally and journaled through bearings 29 in the side walls of the standard near the base thereof. The shaft has loosely mounted thereon, at one end, a driving pulley 30 provided with a clutch face 31, which is adapted to coact with a slidable clutch member 32, splined or otherwise slidably secured to the shaft. The slidable clutch member is provided with a beveled inner face 33 which is adapted to co-act with a beveled cam roller 34, which works on a vertical axis and at right angles to the axis of the clutch member. The cam roller is carried by an L bracket 35, the vertical arm 36 of which is slidably mounted within a bracket 37 and is provided, at its upper end, with a socket head 38 which receives an operating rod 39 provided, at its upper end, with a bifurcated head 40 which journals a roller 41. A spring 42 is interposed between the head of the L rod and the bracket through which it is entered, which spring is adapted to be compressed by a lowering of the clutch actuating rod. The roller 41 is held in engagement with a cam plate 43, the shape of which is shown in Fig. 5, which cam plate is rigidly secured to and movable with one of the tongues 10 which serve to hinge the door, so that as the door is thrown into vertical position in closing, the cam will act to depress the rod, thereby bringing the cam surfaces into engagement with one another and throwing the clutch member into position to engage the loose pulley. In order to throw the clutch out of engagement, after a complete revolution of the shaft, the clutch member is provided, on its periphery, with a beveled tooth 44. The beveled outer face of this tooth, when the clutch member is thrown into engagement, will swing into engagement with the projecting end of an adjustable pin 45 carried by a bracket arm 46 outwardly projecting from the side of the standard. The opposite end of the shaft has located thereon a cam 47, which engages a roller 48 journaled on the end of a pin 49, which pin is rigidly mounted within a slotted arm 50 which embraces the shaft. The slotted arm has upwardly extending therefrom a rod 51, the upper end of which is pivoted to the forward end of the pivoted lever 52, the rear end 53 of which is slotted to connect with a valve rod 54 which is pivoted to a valve arm 55 controlling a valve 56 located in an exhaust or vacuum pipe 57, the inner end of which communicates with the interior of the vacuum chamber. Within the chamber is located a presser head 58, which is loosely hung from an adjusting

screw wheel 59 entered through a stuffing box 60. These features are fully illustrated in the patent previously referred to. The pressure head is heated electrically in the usual way, by circuit wires 61, which are connected to any suitable source of electrical power and are led into the chamber through a stuffing box 62 and are terminally connected to the pressure head. The lever 52 acts against the tension of a coil spring 63, the upper end of which is suitably secured to the standard.

In order to prevent turning of the shaft, save when clutched to the driving pulley, a band brake 64 is provided, comprising a disk 65, mounted on the shaft and encircled by means of a split strap 66, the tension of which is adapted to be regulated by means of a thumb nut 67 on the end of a tie bolt 68 which is encircled by a coil spring 69. One end of the strap is extended and is provided with a sleeve 70 which embraces a bracket pin 71 which inwardly extends from the side wall of the standard.

In use, when it is desired to seal a can, the latter is placed in position on the plunger, in the usual manner, with the sealing cap over the top of the jar. When in position, the operator closes the door against the tension of the hinge springs. The door, being air tight, will be held shut as soon as the vacuum conditions are sufficiently established. The closing of the door moves the clutch cam into position to depress the clutch rod, which operation throws down the beveled roller into engagement with the beveled inner face of the slidable clutch member, and this movement of the parts throws such slidable member into clutch with the constantly revolving loose pulley and starts the shaft revolving. The shaft, being provided with two cams, one for establishing a vacuum and the other for operating the plunger, will commence its revolution, and the vacuum valve will be immediately operated by a movement of the rod 51, which shifts the lever 52 and draws down the rod 54, thereby turning the valve and establishing vacuum. Immediately thereafter the plunger will be lifted by the movement of its cam, thereby forcing the capped and sealed jar into engagement with the presser head, the position of which can be adjusted. The presser head, being heated electrically, will serve to soften or mold such sealing substance as may be employed in the form of a ring between the jar and its cap, so that the sealing will be performed *in vacuo* and under conditions of pressure and heat. The revolution of the shaft will continue until the tooth 44 is brought into engagement with the forward end of the trip pin 45, which serves to disengage the clutch and stop the revolution of the shaft. This stopping will be immediate, by reason of the friction of the band brake, and will occur at a

time when the cams have returned the vacuum valve and the plunger to their normal positions. The valve is adapted, when in normal position, to establish atmospheric pressure within the sealing chamber, so that, after the sealing operation has been completely performed, the vacuum within the chamber will be relieved by the admission of air, and the door will fly open under spring tension and assume its normal position with respect to the tension of the springs which control it.

The construction is one which is entirely automatic after the clutch has been thrown by the initial closing of the door. The pulley, being constantly revolved at a given speed, will revolve the shaft uniformly when the clutch is thrown, so that the sealing operations will be uniform and each jar will be subjected to the same degree of pressure, heat and vacuum, and the proper period of time accorded to each operation. In the use of a foot treadle machine, it is impossible to secure uniformity in the several operations, but the present apparatus secures this uniformity without any severe physical exertion on the part of the operator, whose sole office is to place the capped jars in position and close the door, after which the vacuum sealing will be performed and the door automatically thrown open in preparation for the induction of another capped jar.

The invention is one which permits the operations to be performed rapidly, uniformly, and without the supervision of a strong or skilled attendant, since the latter exercises no discretion as regards the amount of pressure, nor the periods of time during which the sealing should be continued.

What we regard as new and desire to secure by Letters Patent is:

1. In a vacuum sealing apparatus, a vacuum chamber, a valve for establishing vacuum conditions therein, a plunger having its

head within the chamber and in position to apply a sealing pressure to a can, a door for the vacuum chamber, a driving shaft, a constantly rotating pulley loosely mounted thereon, a clutch on the shaft for engaging said pulley, cams on such shaft for operating the valve and throwing the plunger, a cam on the door, and a member adapted to throw said clutch and operable by the movement of said cam in closing the door, substantially as described.

2. In a vacuum sealing apparatus, the combination of a sealing chamber, a hinged door adapted to close the same, a cam on the door, a plunger within the sealing chamber, a valve controlled pipe for establishing vacuum conditions within the chamber, a power shaft, a constantly rotating pulley loosely mounted thereon, a clutch for engaging said shaft to said pulley, connections actuated by the closing of the door for throwing said clutch, and cams on such shaft for actuating the plunger and the vacuum valve, substantially as described.

3. In a vacuum sealing apparatus, the combination of a sealing chamber, a hinged door adapted to close the same, a cam on the door, a plunger within the sealing chamber, a valve controlled pipe for establishing vacuum conditions within the chamber, a power shaft, a constantly rotating pulley loosely mounted thereon, a clutch for engaging said shaft to said pulley, connections actuated by the door cam for throwing said clutch, cams on such shaft for actuating the plunger and the vacuum valve, and means for disengaging said clutch from said pulley after a predetermined degree of revolution, substantially as described.

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