

No. 759,989.

PATENTED MAY 17, 1904.

J. HALEY.
BOTTLE OR JAR PRESS.
APPLICATION FILED SEPT. 15, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

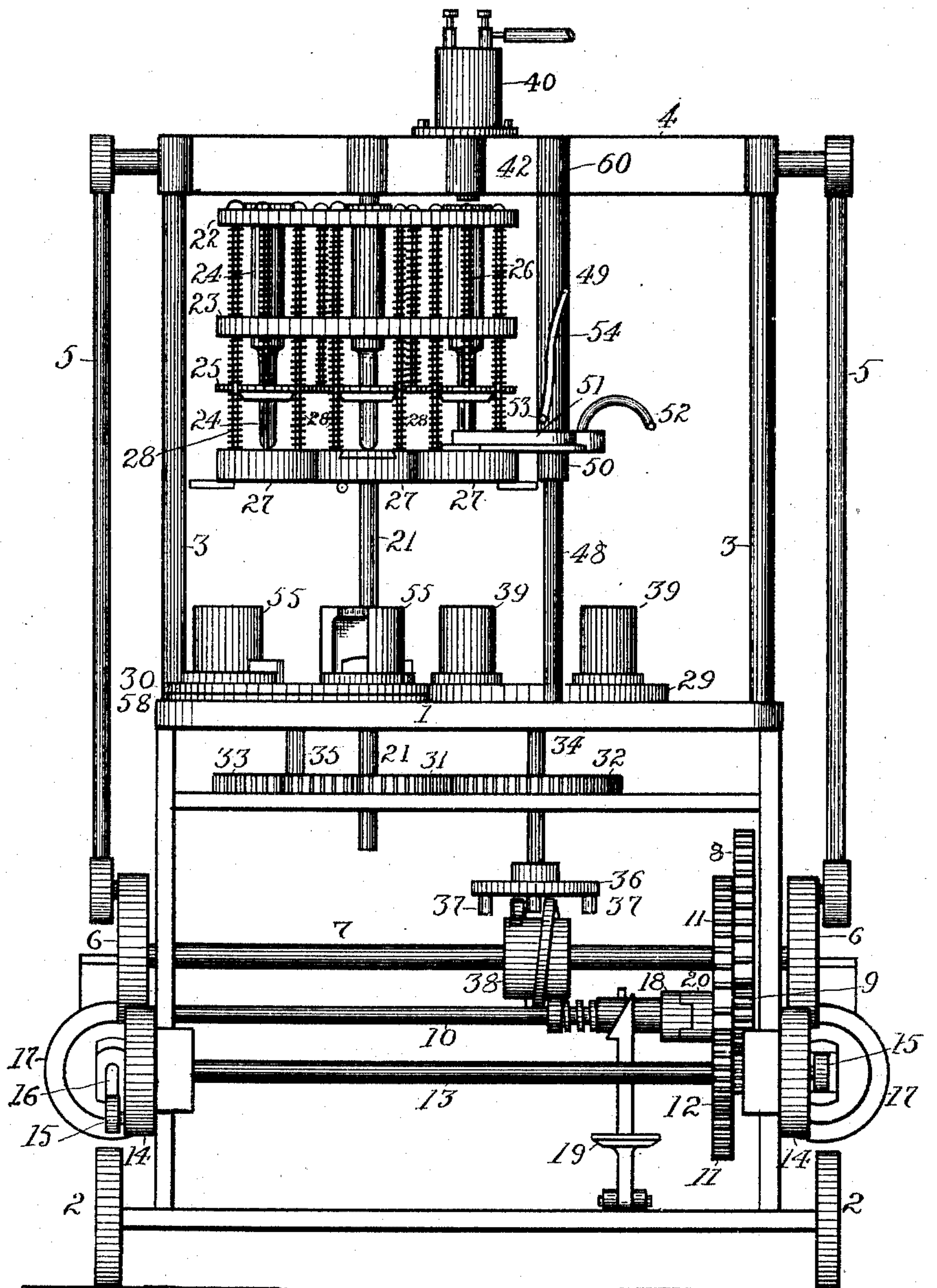


Fig. 1.

Witnesses:

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Maude Grisler*

Inventor

*Jonathan Haley,
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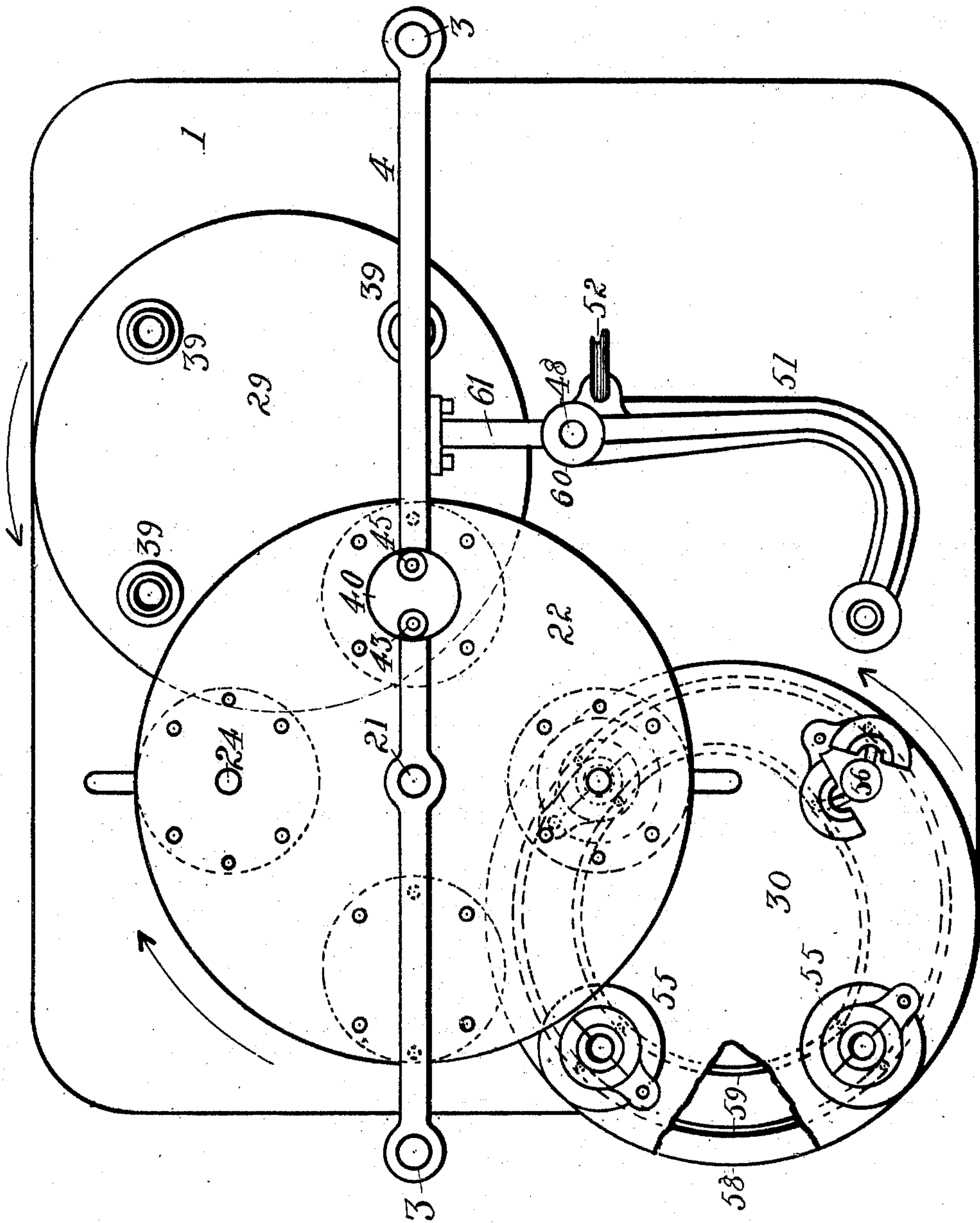


Fig. 2.

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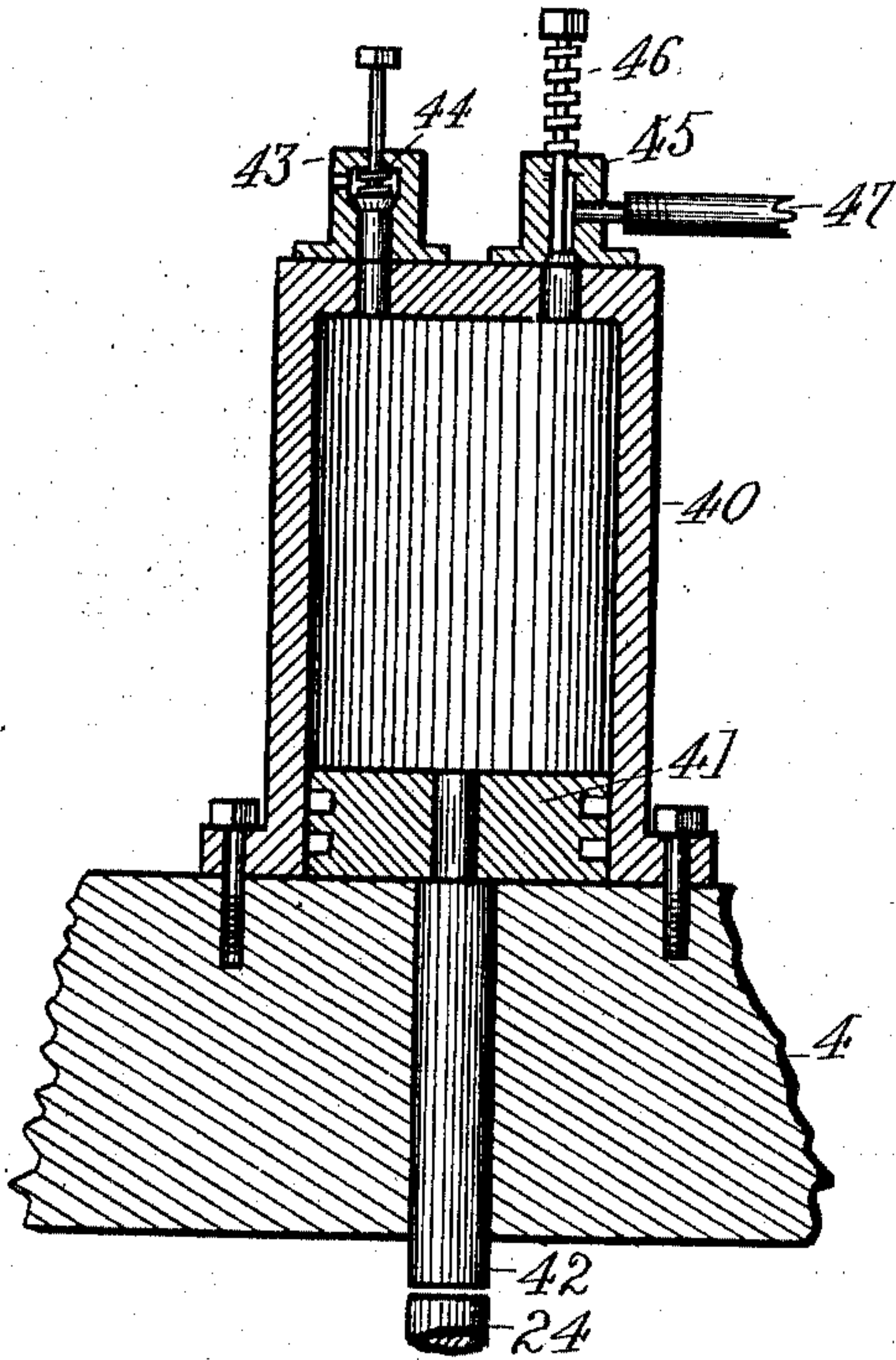


Fig. 3.

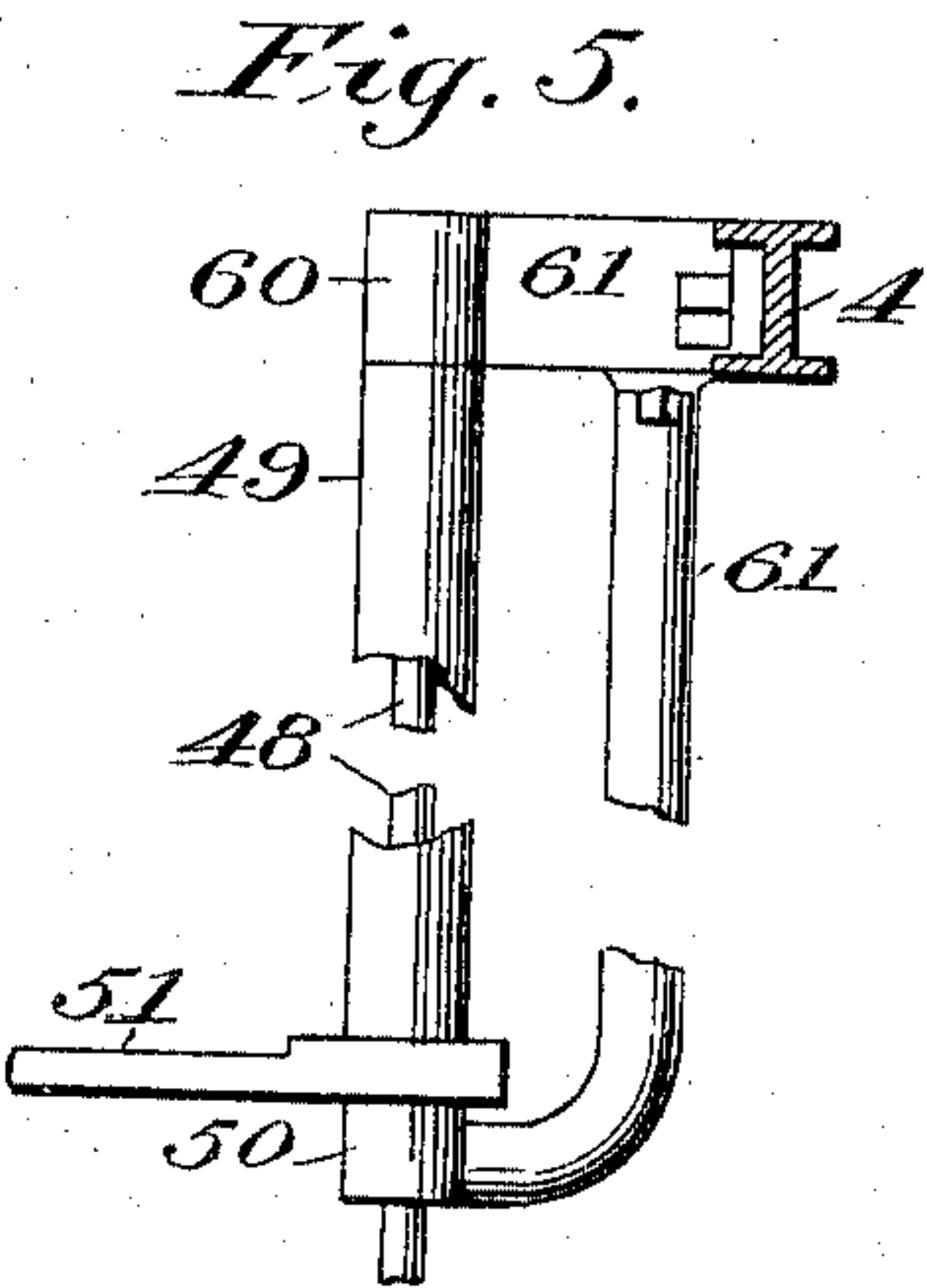
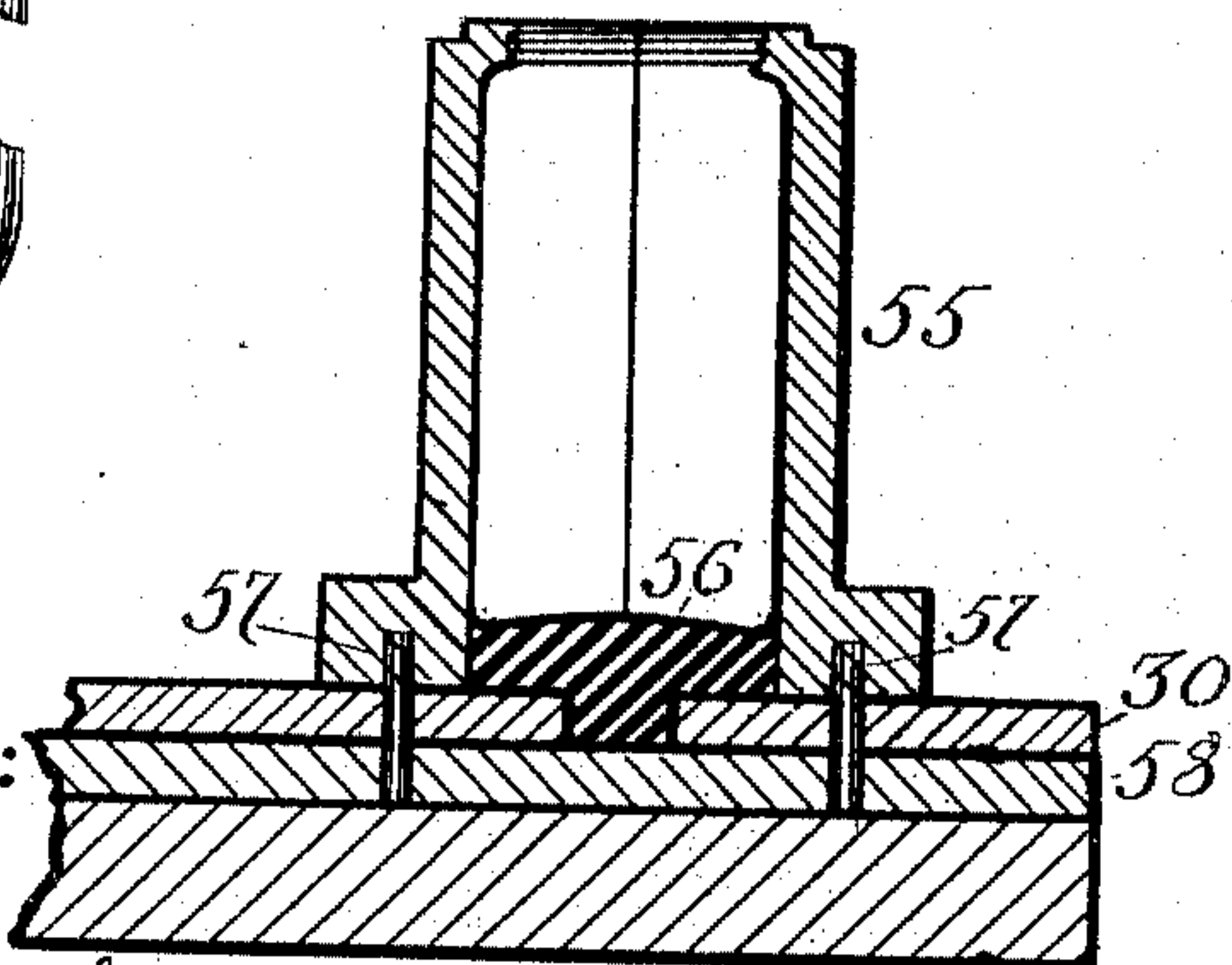


Fig. 5.

Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

JONATHAN HALEY, OF AKRON, OHIO.

BOTTLE OR JAR PRESS.

SPECIFICATION forming part of Letters Patent No. 759,989, dated May 17, 1904.

Application filed September 15, 1902. Serial No. 123,463. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN HALEY, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have
5 invented a certain new and useful Improvement in Bottle or Jar Presses, of which the following is a specification.

My invention has relation to improvements in machines for the manufacture of articles
10 formed from molten glass, which involves first forming a blank in one mold and transferring the blank thus formed to a divided mold and applying air thereto by which the article is
15 shaped to conform to the interior configuration of the divided mold.

The object of my invention is to produce a machine of a new and original design which shall be provided with such mechanism as will cause the various molds to automatically
20 swing into position by power-driven mechanism as contradistinguished from those in which the molds are slid backward and forward across the table-top and to apply to this machine a plunger-resistance device in which
25 the amount of resistance offered to the stroke of the plunger in forming the blank will be uniform and generally to produce a new and improved machine for producing glass articles more rapidly and economically than has
30 heretofore been done.

For the attainment of the aforesaid objects my invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described, and
5 then specifically pointed out in the claims, reference being had to the accompanying drawings, which form a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts
40 in the different figures, Figure 1 is a side elevation of my improved press; Fig. 2, a plan of the table and parts above it; Fig. 3, a section of the resistance device; Fig. 4, a detail of the blowing-mold-opening device, and Fig.
45 5 is a detail of the bracket for raising and lowering the blowing-arm.

In the drawings, 1 is a housing or frame mounted on wheels 2, by which it may be rolled or moved to any convenient part of a
50 building or factory. Rising from the table-

top of the housing 1 are upright guides 3, extending between which and slidable thereon is a cross-head 4. This cross-head is caused to reciprocate vertically along the guides 3 by means of two connecting-rods 5, whose lower
55 ends are attached to wrist-pins on cranks 6, mounted on a transverse shaft 7, journaled in the housing 1. This crank-shaft is caused to revolve by means of a gear 8, mounted thereon, which meshes into a gear 9 on a parallel
60 shaft 10. Adjacent to the gear 9 on the shaft 10 is a larger gear 11, which in turn meshes into a pinion 12, on the engine-shaft 13. On the outer ends of the engine-shaft 13 are cranks 14 to which are connected the cross-
65 heads 15 of connecting-rods 16, attached in turn to piston-rods bearing pistons working in the cylinders 17, mounted on the sides of the housing 1. The motive power to operate these cylinders, which are of the ordinary
70 common slide-valve-engine type, is usually compressed air, or any other power may be used which is convenient or appropriate.

On the shaft 10 is a spring-actuated clutch 18, which is thrown out of gear by a foot-lever
75 19, placed in the housing at any desired or preferred place in the housing 1 and shown as attached to the axle of the wheels 2. The gear-wheel 11 and its hub 20, which is also a member of the clutch 19, is freely rotatable
80 on the shaft 10, and hence does not serve to connect or communicate motion from the engine-shaft 7 unless the clutch 18 is thrown into gear.

From the table-top of the housing 1 and entering the cross-head 4 is a rotatable shaft 21,
85 which is fastened rotatably in the cross-head 4 by any desired means, and this shaft is designed to rise and fall with the cross-head 4. On this shaft 21 are two circular plates 22 23,
90 which serve to support vertically-movable plungers 24 of the ordinary type used in producing glass articles and are provided with heads which engage the upper surface of the plate 22, so that they are loosely supported in
95 the plates 22 and 23 in order that they may slide therethrough. The number of these plungers is usually four, and they are arranged about the center of the shaft 21 equidistant from each other.

Suspended around each of the plungers 24 by rods are rim-mold plates 25, which are constantly forced downward by the springs 26, surrounding the rods which support them. Below the rim-molds and supported by similar rods are an equal number of neck-mold-carrying plates 27, which are similarly pressed down by springs 28. The neck-molds which are in the plates 27 are divided, and the two halves thereof are opened and closed by suitable hand-levers. The plates 22 and 23 are designed to rise and fall with the cross-head by being fastened thereto.

On top of the table-top of the housing 1 are two circular rotating plates 29 30, (see Fig. 2,) which are arranged to rotate on the table-top by the following mechanism: Below the table-top of the housing 1 on the shaft 21 is a gear-wheel 31, which is adapted to revolve with the shaft 21 by means of the fact that the shaft 21 is splined to receive a key in the hub of the gear 31. This gear 31 meshes into two gears 32 and 33 on shafts 34 and 35, depending, respectively, from plates 29 and 30. On the lower end of the shaft 34 of the mold-bearing plate 29 is a horizontal plate 36, having on its lower face depending roller-bearing pins 37, which are arranged to be engaged and moved by a worm 38 on the shaft 7. The gears 31, 32, and 33 are all of identically the same diameter at the pitch-line, and consequently the movement of the shaft 34 causes them all to move equally.

It is designed to place on the plate 29 a number of blank-molds 39, whose distances apart is the same as the distances between the plungers 24, and also to place on the plate 30 a similarly-situated lot of blow-molds of the ordinary construction. The relation of the plates 29 and 30 with each other and with the plunger-bearing plates 22 and 23 is such that as the cross-head descends one of the plungers will enter one of the blank-molds on the plate 29, and the plunger adjacent thereto will operate an inlet-air valve over the blow-mold nearest thereto on the plate 30 and cause the blowing of the glass contained therein—that is, the descent of the plunger into the blank-mold will make the blank—and as the plunger rises will carry the plastic blank out of the blank-mold, and as the cross-head nears its highest point in its stroke it will be moved by means of the worm and connected mechanism in the direction of the arrow, so as to bring the blank immediately over the blow-mold nearest, and as the plungers descend it will drop the plastic blank into the blow-mold at the same instant that the next succeeding plunger is pressing out a new blank. In cases where too much glass is placed in the blank-molds it is necessary to place above the plunger a device which can relieve the machinery of too great a strain and yet have sufficient force to properly permit the blank to be formed. To that end I place on the

upper face of the cross-head a cylinder 40, bolted thereto. In this cylinder is a piston 41, having a depending piston-rod 42, which is placed to stand immediately over the plunger then operating in the blank-mold. On the upper face of the cylinder is an escape-valve 43, whose pressure is regulated by a spring 44 and is arranged to be of sufficient strength to carry a comparatively high pressure of air in the cylinder. Also mounted on the top of this cylinder is an inlet-valve 45, having a downwardly-opening valve normally kept closed by a spring 46, and an inlet-pipe 47, which when there is no upward pressure on the piston is designed to keep the pressure in the cylinder equal to the pressure normally used for operating the motors or the cylinders 17. To illustrate, as the plunger 24 descends into the blank-mold if there is no excess of glass in the blank-mold the pressure in the cylinder obtained through the pipe 47 is sufficient to hold the plunger 24 from an upward movement; but if for any reason an excess of glass has been placed in the blank-mold the resistance to the descent of the plunger 24 is so great as to raise the piston 41 by means of the piston-rod 42, which immediately closes the inlet-valve 45, and when this pressure has reached a degree which endangers the safety of the machinery the upwardly-opening valve 43 will open and stay open as long as the piston is ascending, but meanwhile maintaining a uniform opposing force above it.

It will be seen that it is necessary to swing the arm carrying a current of air in over the neck-mold immediately above the blowing-mold at each stroke of the plunger in order to permit an inlet of air into the blank in the blow-mold to blow the glass outward against the interior of the blow-mold. This is attained by the following mechanism: From the table-top 1 rises a stationary shaft 48. On this is a sleeve 49, which is held between collars 50 and 60, projecting from a bifurcated bracket 61, attached to the cross-head 4, so that at each stroke of the cross-head the sleeve 49 will be slid upward and downward. The lower collar 50 is an ordinary cylindrical collar, made integral with the bifurcated bracket 61 and properly bored to inclose the shaft 48, so that as the cross-head 4 rises it will, by means of the bracket 61, raise this lower collar 50, and thus raise the sleeve 49, and as the cross-head descends this collar 50 will permit the downward movement of the sleeve 49 on the shaft 48 both by gravity and by reason of the downward push of the upper collar 60, which is also integral with the bifurcated bracket 61. Projecting horizontally from this sleeve 49 is a blowing-arm 51 of the ordinary type, which consists of a hollow arm having near its outer end an outwardly-opening valve, the hollow portion being connected to a pipe 52 from any source of air-supply under pressure. This

arm is swung in over the neck-mold and out again by the following mechanism: Projecting from the shaft 48 is a pin 53, which operates in a curved slot 54 on the sleeve 49, so that as the cross-head descends the blow-arm will be swung in and over the upper part of the neck-mold at the time it has deposited its plastic blank in the blow-mold, and as the plunger 24 descends it opens, by means of its weight, the valve in the blowing-arm, thus allowing air to enter the interior of the blank, and before the cross-head rises the levers which open the neck-mold are opened to cause the two halves to separate, thus leaving the finished product in the blow-mold, and as the cross-head rises it will swing out and free from engagement with the neck-mold.

The means whereby the blow-molds are opened automatically as the machine works is as follows: The blow-molds 55 (see Figs. 2 and 4) consist of two halves united by a hinged joint and have between them a base-plate 56, which forms the bottom of the jar to be made. Depending from each half of the blow-mold is a pin 57. These pins pass through a plate 30, which supports the blow-mold, and in this plate 30 are two grooves whose common center is the center of the hinged joint of the blow-mold, so that as the blow-mold opens and closes these curved grooves will serve as guides for the opening and closing thereof. Below the plate 30 is a stationary plate 58 on top of the table-top 1 and coincident with the plate 30 in size. In this plate 58 are cut two grooves 59, which extend concentrically with the center of the plate 30 about one-half of the distance around the plate 58, and from thence to the original starting-point they gradually diverge from each other and afterward gradually return to their original distance apart, the object of these grooves being to serve as guides for the pins 57, which project into them—that is, as the blow-mold stands under the plunger which operates the blowing-arm the grooves will be nearest together, and from thence on about one-half of their length will remain so in order to hold the still-heated glass firmly and allow it to gradually cool during the next two strokes of the cross-head. Then as it gradually approaches the first-mentioned position the grooves gradually diverge, causing the blow-mold to open, and at the stop next before the first-mentioned position the mold is fully opened and the completed glass article is removed, and as the plate 30 continues its movement forward the grooves gradually converge until in the first-mentioned position they are so close together as to close the blow-mold tightly.

What I claim, and desire to secure by Letters Patent, is—

1. The combination in a machine for making glass articles of a reciprocating cross-head bearing a plurality of plungers, a pair of rotating plates below said cross-head, one of

said plates bearing blank-molds and one of said plates bearing blow-molds with mechanism to bring one of said blow-molds and one of said blank-molds singly and successively under the plungers of said cross-head, substantially as shown and described.

2. The combination in a machine of the class designated of two rotating plates, one bearing blank-molds and the other blow-molds, a reciprocating cross-head carrying a plurality of plungers and mechanism to cause one of said plungers to operate on one of said blank-molds simultaneously with the operation of another of said plungers with one of said blow-molds, substantially as shown and described.

3. The combination in a machine of the class designated of two rotating plates, one bearing blank-molds and the other blow-molds adapted to move at a uniform speed, with a reciprocating cross-head bearing a revolving series of plungers and mechanism to cause a simultaneous operation of one of said plungers with a blank-mold and another plunger with one of said blow-molds, substantially as shown and described.

4. The combination in a machine of the class designated of two rotating plates, mechanism to rotate them at a uniform speed, one of said plates bearing blank-molds and the other blow-molds, a reciprocating cross-head bearing a series of plungers revoluble about a common center, mechanism to cause the descent of one of said plungers into a blank-mold and the simultaneous operation of another of said plungers upon a blow-mold, mechanism to cause said series of plungers to make a partial revolution at the upward point in their stroke and mechanism to cause the plunger which primarily entered the blank-mold to descend on the next succeeding blow-mold at the next stroke, substantially as shown and described.

5. The combination in a machine of the class designated of three upright parallel shafts bearing gears intermeshing, one of said shafts bearing a blow-mold-carrying plate another bearing a blank-mold-carrying plate and the third sustaining a series of plungers revoluble about its shaft as a common center, substantially as shown and described.

6. In a machine for the manufacture of glass articles the combination of a rotatable plate blow-molds mounted on said plate, pins depending from the under faces of said blow-molds in combination with a plate having grooves below said rotating plate arranged to open and close the halves of said blow-molds, substantially as shown and described.

In testimony that I claim the above I hereunto set my hand in the presence of two subscribing witnesses.

JONATHAN HALEY.

In presence of—

H. H. BRIDGWATER,

C. E. HUMPHREY.