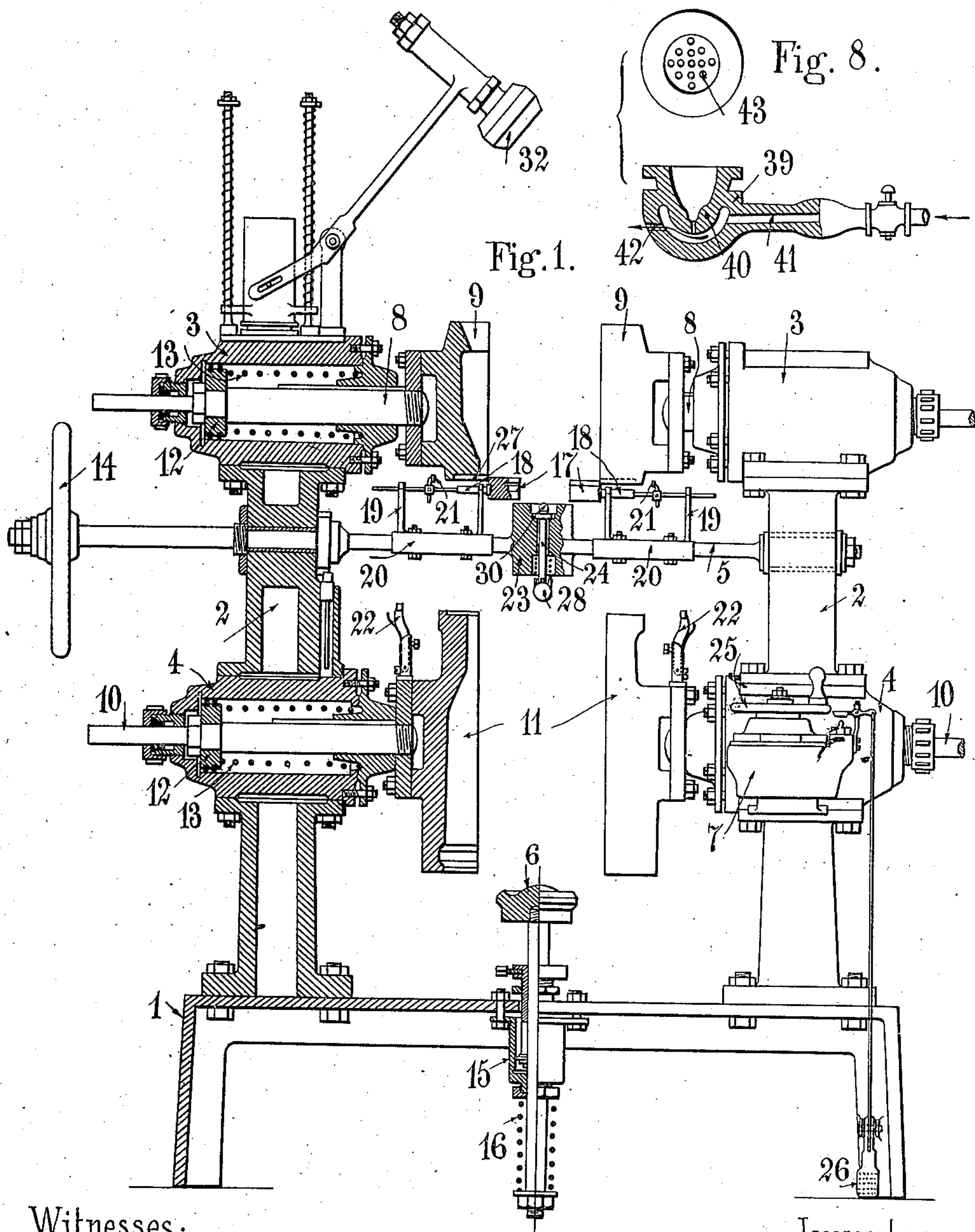


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MACHINE FOR THE AUTOMATIC MANUFACTURE OF BLOWN GLASS ARTICLES.  
APPLICATION FILED AUG. 2, 1907.

964,198.

Patented July 12, 1910.

3 SHEETS—SHEET 1.



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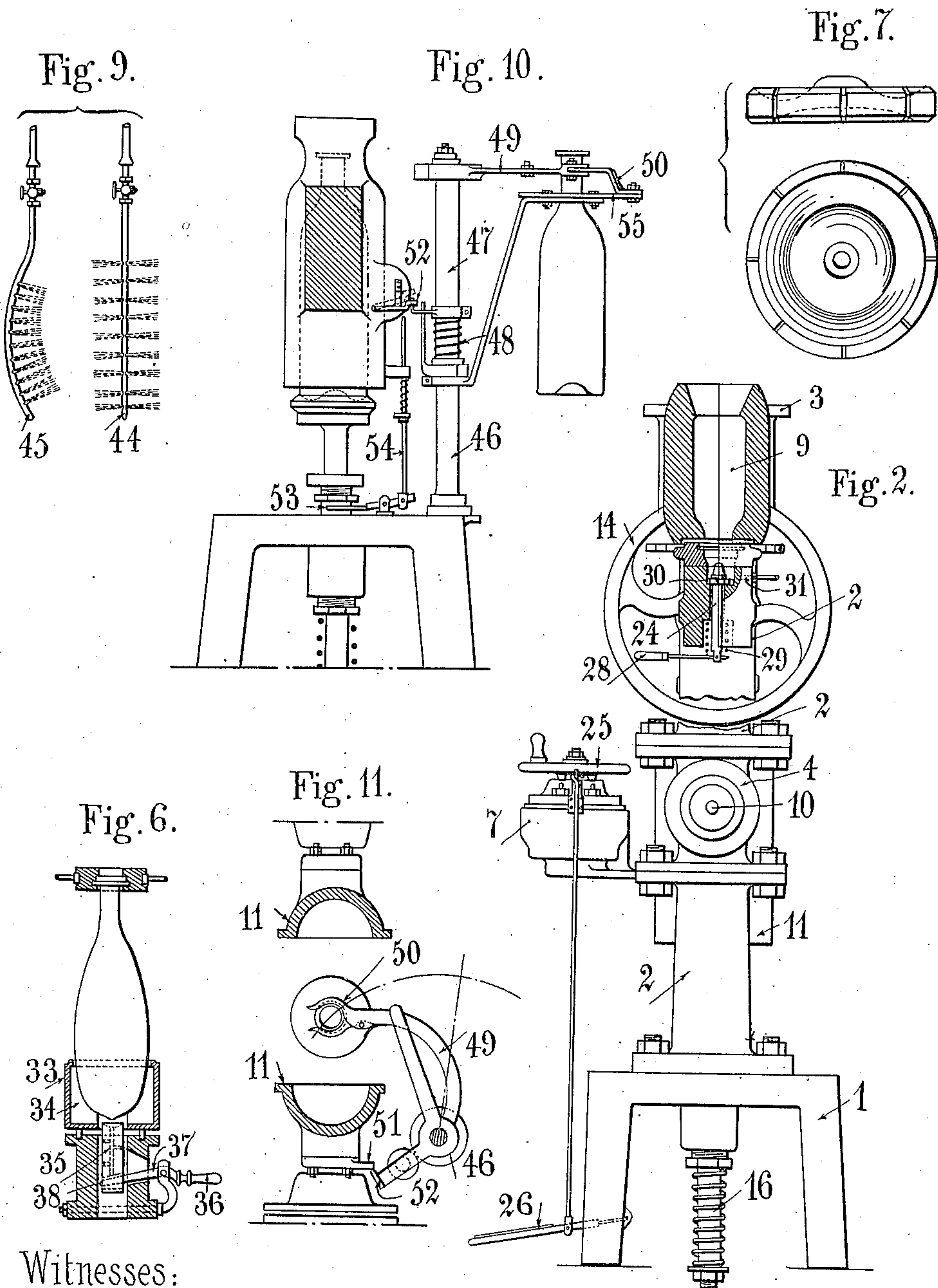
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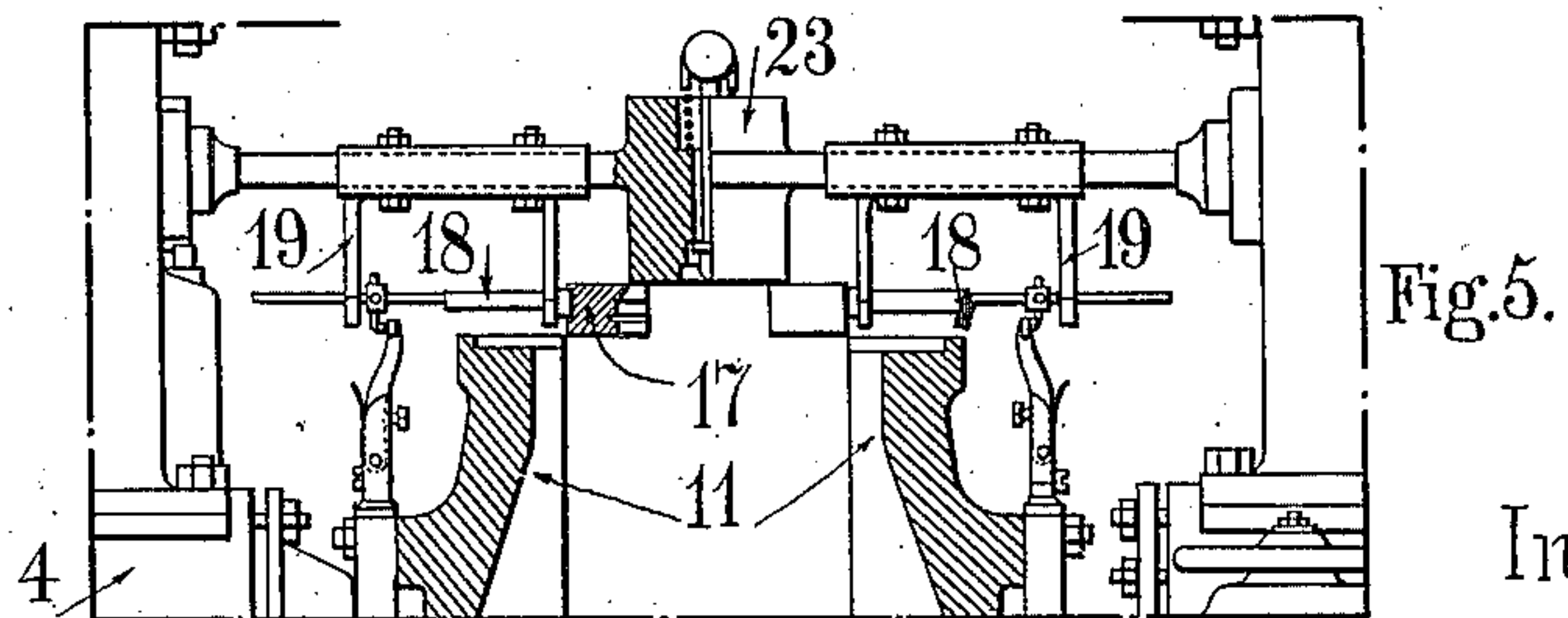
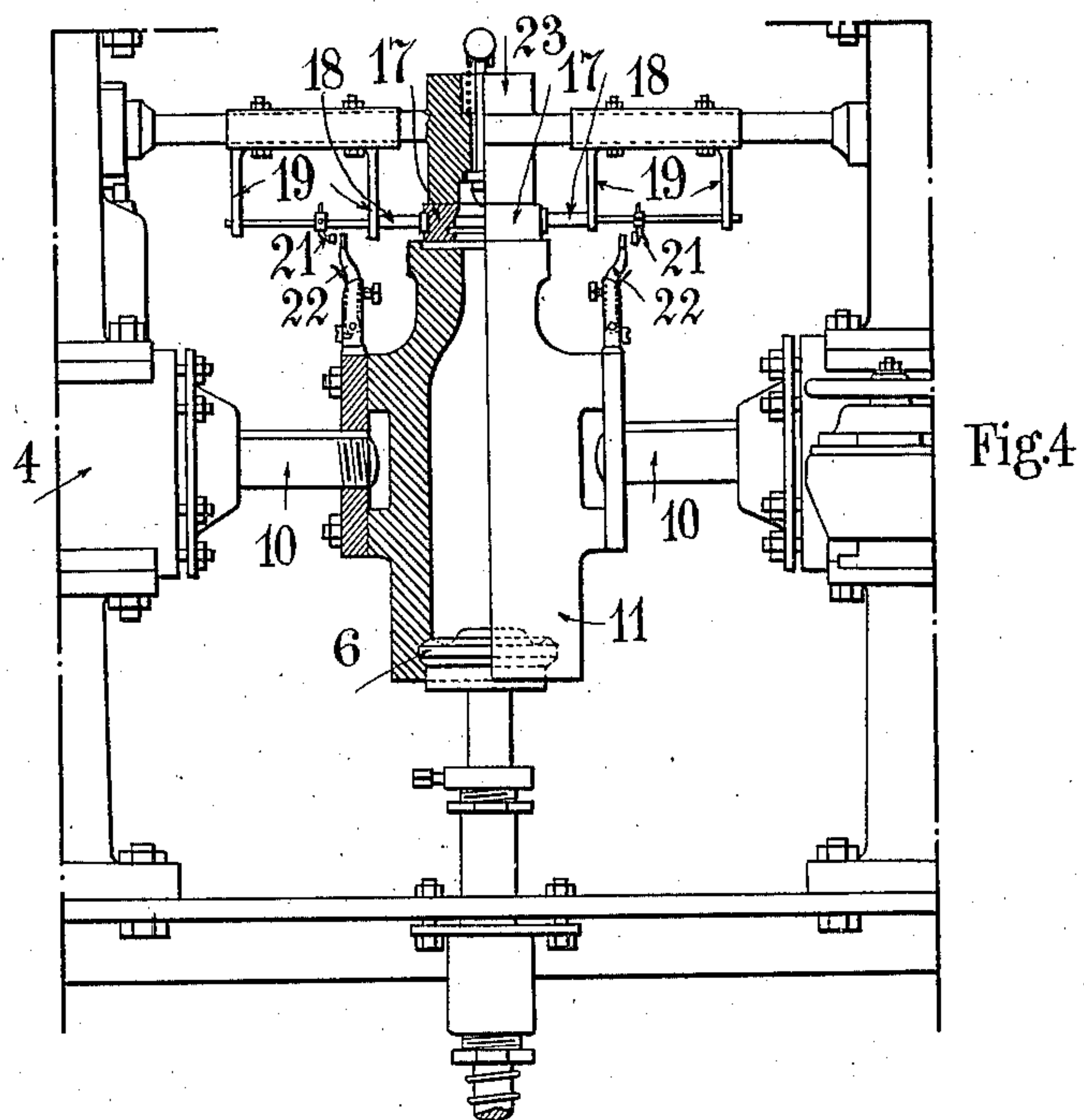
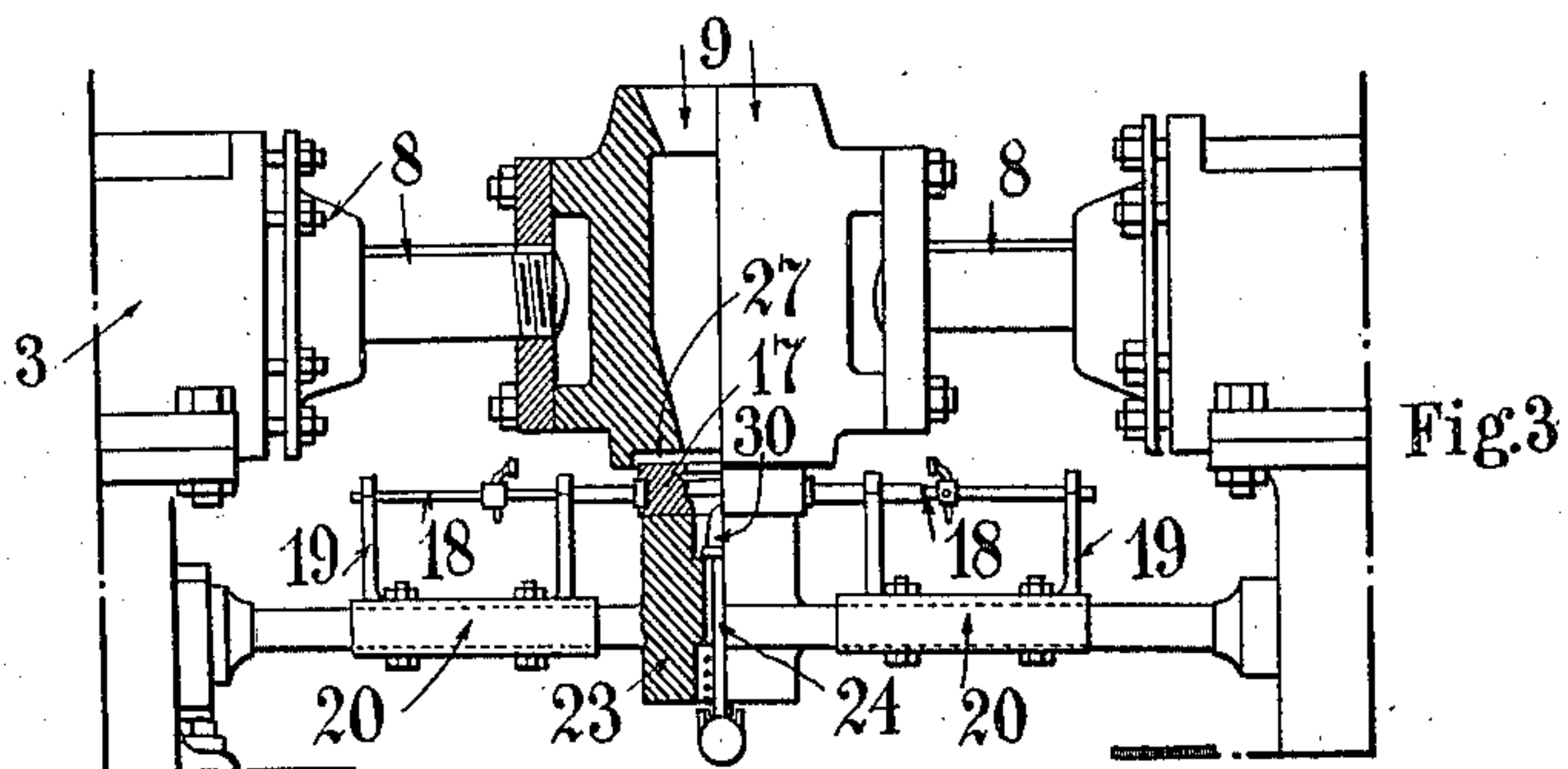
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Witnesses:

*Louis Fourmestran*

Inventor:

*Charles Barrez*



# UNITED STATES PATENT OFFICE.

CHARLES BARREZ, OF PARIS, FRANCE.

MACHINE FOR THE AUTOMATIC MANUFACTURE OF BLOWN-GLASS ARTICLES.

964,198.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed August 2, 1907. Serial No. 386,849.

*To all whom it may concern:*

Be it known that I, CHARLES BARREZ, a citizen of the Republic of France, residing at Paris, France, have invented certain new and useful Improvements in Machines for the Automatic Manufacture of Blown-Glass Articles, of which the following is a specification.

The present invention relates to improvements in machines for the automatic manufacture of articles of blown glass, bottles, etc., and is chiefly characterized 1. by the method of automatic opening and closing of the ring-mold, the workman thus not having to attend to the manipulation of the mold, which results in the economy of movements, reliability and rapidity of the manufacture. 2. by the easy and adjustable manipulation of the "punch" intended for closing the ring-mold and the admission or inlet for air for blowing. 3. by the very simple method of opening and closing the molds, raising and lowering the bottom and the compressor, these movements being brought about simply by the manipulation of a cock for distributing and discharging compressed air. 4. by the use of a permanent perforating bottom and the rotation of bottles on the machine itself. 5. by the use of various accessory parts, such as a perforated or non-perforated cup with air circulation, the cup being capable of rotating about the blank, cooling devices, extractors of finished bottles, all the above parts reducing the movements of the attendant, or enabling the manufacture to be otherwise improved or simplified. 6. by the whole of these combinations which make this machine an entirely new machine in which the work of the attendant is reduced to a minimum, thereby making the manufacture more reliable and enabling the output to be increased.

A machine according to this invention is illustrated in the accompanying drawings, in which:—

Figure 1 is an elevation of the machine partly in section; Fig. 2 a side elevation parts being in section; Fig. 3 a view of the rough-shaping parts and of the ring-molds; Fig. 4 a view of the ring-mold inverted, and of the finishing mold; Fig. 5 a view of the finishing mold showing the method of opening the ring-mold; Fig. 6 a view of the parts for recessing the bottoms of the bottles and the method of making the "kick" or re-

cess; Fig. 7 another shape of the part for recessing the bottom of the bottle; Fig. 8 a view of the air circulation cup used for working the blank; Fig. 9 a view of some of the different shapes of the cooling devices for the blanks and the molds; Figs. 10 and 11 are views of the bottle-removing device.

On the frame 1 are mounted: 1. Uprights 2 supporting the cylinders 3 and 4 and the spindle supporting the ring-mold. 2. The bottom 6 of the finishing mold. 3. The distributing device 7. 4. The supports for the cylinders 3 and guide rods 8 connected to the two parts constituting the rough-shaping mold 9. These rods control both its opening and closing.

The supports for the cylinders 4 and guide-rods 10 connected to the two parts constituting the finishing mold 11, and controlling its opening and closing.

The closing of the rough-shaping and finishing molds is effected by means of compressed air supplied by the cock or valve 7 and acting on one of the faces of a piston 12, while the opening is effected by the discharge of the air and the pressure of the springs 13.

The ring-mold supporting spindle 5 is provided with a hand-wheel 14 enabling the ring mold to be turned.

The raising of the bottom 6 is effected by means of compressed air acting on a piston 15 provided with a return spring 16.

The ring-mold 17 consists of two parts secured to rods 18 adjustable in brackets 19 forming one piece with a part 20 secured to the supporting spindle 5.

Lugs or tappets 21 enable the ring-mold to be automatically opened and closed.

Stops 22 are secured to the two upper halves of the finishing mold 11 for effecting the opening of the ring-mold.

The recessed cylinder 23, supported by the spindle 5, receives the ring-mold 17 and serves for receiving a punch 24.

A hand-wheel 25 serves for manipulating the valve 7 for opening and closing the molds and raising the bottom.

A pedal 26 controls the admission of air for blowing the bottle.

Semi-circular shoulders 27 of the rough-shaping mold serve for automatically closing the ring-mold.

A handle 28 serves for raising the punch returned by the spring 29.



30 is a collar of the punch.

31 (Fig. 2) is the blowing air inlet.

32 (Fig. 1) is the compressor.

33 (Fig. 6) is a cast iron casing for the bottom of the bottle when being recessed.

34 is the refractory clay bottom.

35 is a recessing device operated by a handle 36 which raises it by means of a lever 37 arranged in a hole 38 in the recessing device.

The recessing device can be provided with perforations through which air could be admitted under the blank.

39 (Fig. 8) is a cup serving for supporting and lengthening the blank, cooled at given places by means of one or more conduits 40 in which circulates cold air supplied through the hollow handle 41 and escaping at 42.

43 are perforations in the bottom of the cup. These perforations are made only in certain cups intended to be used for perforating or strongly cooling the bottom of the blank.

44 45 are different shapes of sprayers for directing air against certain portions of the blank or for cooling the ring-mold etc.

46 is the leg of the apparatus for extracting the bottles.

47 to 55 are various parts of the apparatus serving for removing the bottles from the machine.

Air-inlet pipes connect the cylinders for manipulating the molds and the bottom to the distributing cock, and are arranged as may be thought advisable, or concealed in the frame.

The working of the machine is as follows:—The ring-mold 17 being in its upper position (Fig. 1) the attendant turns the hand-wheel 25 operating the cock 7, and air is admitted against the pistons 12 of the cylinders 3, thus closing the rough-shaping mold 9 by forcing inward the rods 8. At the same time, the two halves of the ring-mold 17 are also driven inward by the two semi-circular shoulders 27 on the inner face of the two halves of the rough-shaping mold, and the two molds are thus closed (Fig. 3)

without any possibility of accident due to forgetfulness, and by a single operation performed by the attendant of the machine. The two mold-halves having been closed, the attendant, by means of the handle 28 (Fig. 2) raises the punch 24 arranged in the cylinder 23. The workman attending to the

ladling then pours the glass into the rough-shaping mold and into the ring-mold 17. A fork, not shown in the drawing, can be provided on the machine for enabling him to support his blowing pipe during the pouring of the glass. The compressor 32 is then operated, if desired, then the attendant releases the handle 28, and the punch 24 is returned to its original position by the

spring 29. The descent of the punch is limited by the collar 30. At the same time he turns the hand-wheel 25 in order to allow air to escape from the cylinders 3, and thereby to open the rough-shaping mold 9 by means of the springs 13. At the same moment he presses on the pedal 26 and air for blowing the bottle penetrates into the mass of glass through the conduit 31 (Fig. 2) made in the cylinder 23 at the side of the punch head 24. The blowing continuing slightly, and the blank being released from the rough-shaping mold 9, the attendant turns over the ring-mold and the blank by manipulating the hand-wheel 14, and the spindle 5 (Fig. 4) the blank supported then by the ring-mold coming between the two parts or halves of the finishing mold 11. At that moment the attendant, by means of a sprayer 44 45, directs cooling air against any portions of the blank which he thinks advisable, at the same time shaping the blank with his spoon or cup 39 and cooling it, lengthening or perforating according as may be required by the work and by the object to be attained. The sprayer, in view of its different shapes, could also be used for cooling different parts of the machine, such as the ring-mold, etc. The blank thus having been brought to the desired state, the attendant again turns the hand-wheel 25 of the cock 7, and the air admitted under the piston 15, raises the bottom 6 (Fig. 4), then, by continuing to turn the hand-wheel 25, he admits air to the pistons 12 of the finishing mold and closes the latter which then surrounds the blank. During all these manipulations the attendant continues to blow the blank, and as soon as the finishing mold is closed and surrounds the blank, he blows more energetically, always by means of the pedal 26. When the blowing is completed the attendant opens the finishing mold 11 by releasing the air behind the piston to allow the spring 13 to act; the finishing mold, on opening, opens the ring-mold and completely releases the bottle which then rests on the raised bottom 6.

The opening of the ring-mold by the finishing mold is effected by means of the stops 22 which come into contact with the tappets 21 during the opening movement of the finishing mold, the rods 19 for manipulating the ring-mold sliding them in their supports 17 (Fig. 5).

As already stated, the bottle is supported freely on the bottom 6, so that a boy has merely to take it and transport it to the annealing furnace. The attendant then lowers the bottom 6 by turning the cock 7 to allow the spring 16 to act; then, by rotating in the opposite direction the hand-wheel 14 of the spindle 5, the open ring-mold is returned into the position shown in Fig. 1, and the operations hereinbefore described



can again take place for the manufacture of another bottle.

In the event of its being desired to make a kick in the mold, the following arrangement could be adopted: Instead of the bottom 6, its supporting rod is provided with a special kick-forming bottom 33 34 (Fig. 6) comprising the bottom proper consisting of a hollow part 34 of refractory clay or other material contained in a cast iron frame 33, the said two parts being provided in the center with an opening for the passage of the recessing device 35. This bottom being in place, and the finishing mold closed and containing the blank, the attendant presses on the handle 36, which raises the recessing device 35 through the clay bottom, and penetrates into the blank, forcing back the glass, and at the same time he imparts to the bottom, by means of the same handle, a turning movement of about three-quarters of a revolution, then he releases the handle 36 whereupon the bottom is recessed and finished and it only remains to open the finishing mold as hereinbefore described.

The recessing device instead of being operated by hand, could also be operated automatically, and the shape of the recessing device and of the clay bottom can also vary in accordance with the shapes to be obtained.

The spoon or cup (Fig. 8) used for supporting and working the blank as hereinbefore described, could in certain cases be provided with perforations in the bottom, the said perforations making possible a more energetic cooling of the blank or even, in the manufacture of certain articles, enabling their bottom to be perforated or indented. Naturally the inner shape of the said cup or spoon will vary in accordance with the shape of the articles to be treated.

The bottle having been completed, and the finishing mold opened, the bottle, instead of being removed by a boy as stated, could be withdrawn from the bottom by an automatic bottle extractor shown in the drawings in Figs. 10 and 11 in elevation and plan. This apparatus comprises an arm 46 secured to the machine and supporting a pipe or tube 47 movable on the said arm, a spring 48, a curved arm 49 secured to the tube and provided at the end with a fork or gripper 50 intended to seize the bottle under the ring. This fork could be provided with an opening and closing motion for better seizing and holding the bottle. The working of this apparatus is as follows:—The bottle having been completed, the attendant opens the finishing mold provided (when the said apparatus is used) on one of its halves with a stop 51 which, at the opening of the mold, strikes a tappet 52 (Fig. 11) which partly rotates the tube

47 and consequently the arm 49 describes a circular and rectilinear movement which brings the gripper 50 exactly under the ring of the bottle and causes it to embrace it tightly. When the attendant lowers the bottom supporting the manufactured bottle, the bottle remains suspended in the gripper 50, (Fig. 10), but at the moment when the bottom arrives at the end of its travel, it meets a pedal or lever 53 which, by raising a rod 54, releases the whole movable part of the extractor, that is to say, the tube 47, the curved arm 49, the gripper 50 and the bottle supported by it, and the whole, operated by the spring 48, turns, and the bottle is thus automatically removed from the bottom without the attendant having to attend to it. It is then removed from the gripper 50 either by striking a stop 55, or by the boy himself.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a machine for making bottles or other hollow articles of glass the combination with divided rough-shaping and finishing molds, supports therefor, a source of compressed air, a pair of oppositely-arranged cylinders adjacent the parts of the rough-shaping mold, a pair of oppositely-arranged cylinders adjacent the parts of the finishing mold, a reciprocable piston in each of the cylinders, rods connected with the pistons and with the parts of the rough-shaping and finishing molds as set forth, a spring within each cylinder arranged to act upon each of the pistons, a regulating cock adapted to regulate the flow of the compressed air, and connections between the said cock and the respective cylinders, of a movable divided ring-mold arranged in the path of the closing movement of the parts of the rough-shaping mold and adapted to be operated thereby so as to close as described, and means intermediate the ring-mold sections and the parts of the finishing mold whereby said ring mold will be opened by the opening movement of the parts of the finishing mold.

2. In a machine of the character described, the combination with rough-shaping and finishing molds each comprising movable parts, of a finished bottle transporter comprising an upright arm, a tube movable on said arm, a spring acting upon said arm, a curved arm secured to the tube, a bottle-neck gripper carried by said curved arm, a tappet on the tube, and a stop on one of the parts of the finishing mold adapted to strike said tappet.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES BARREZ.

Witnesses:

GEORGES FAUZIR,  
LOUIS FOURMESTRAUX.