

(No Model.)

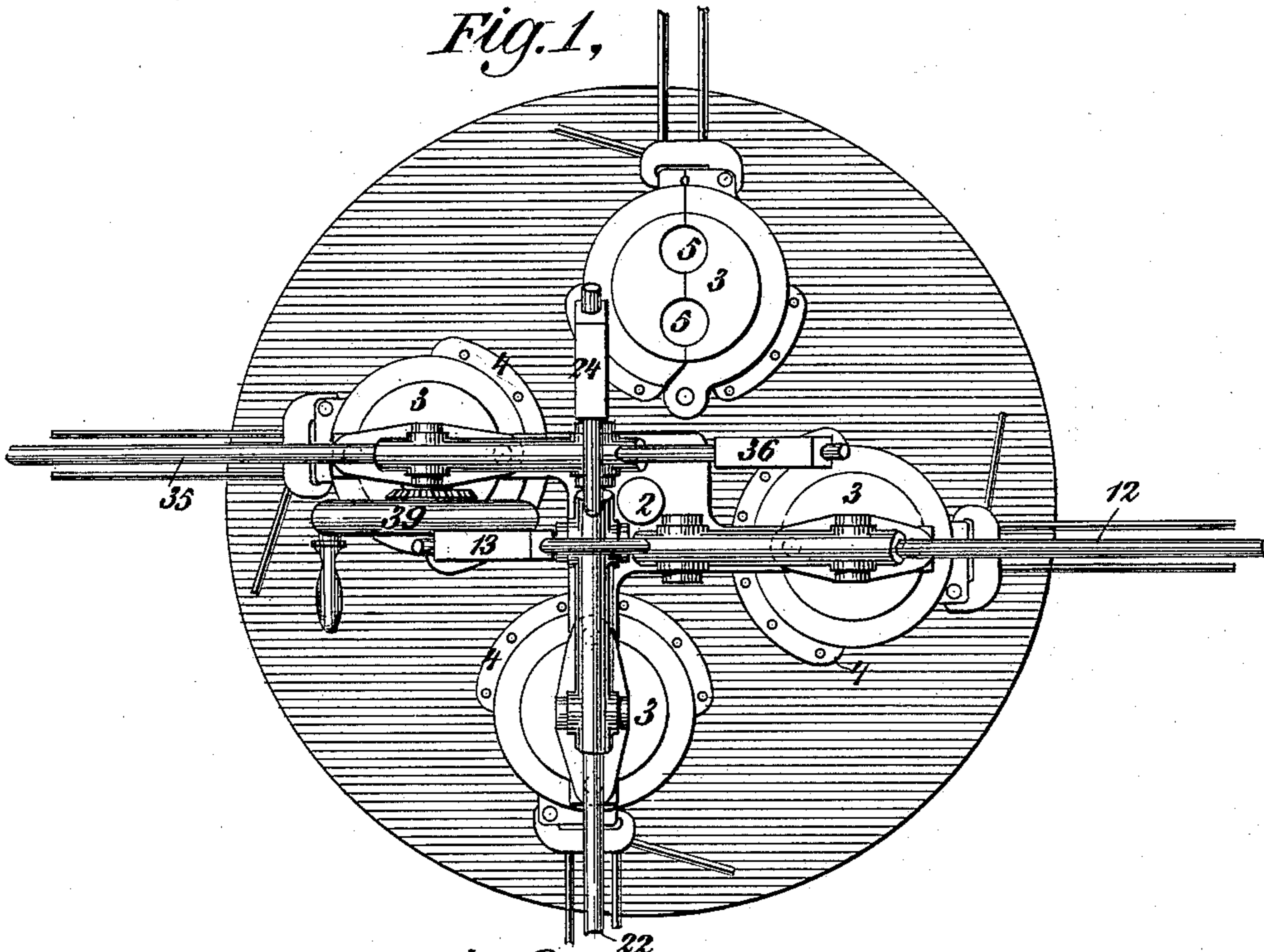
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H. M. BROOKFIELD.  
PRESS FOR MAKING INSULATORS.

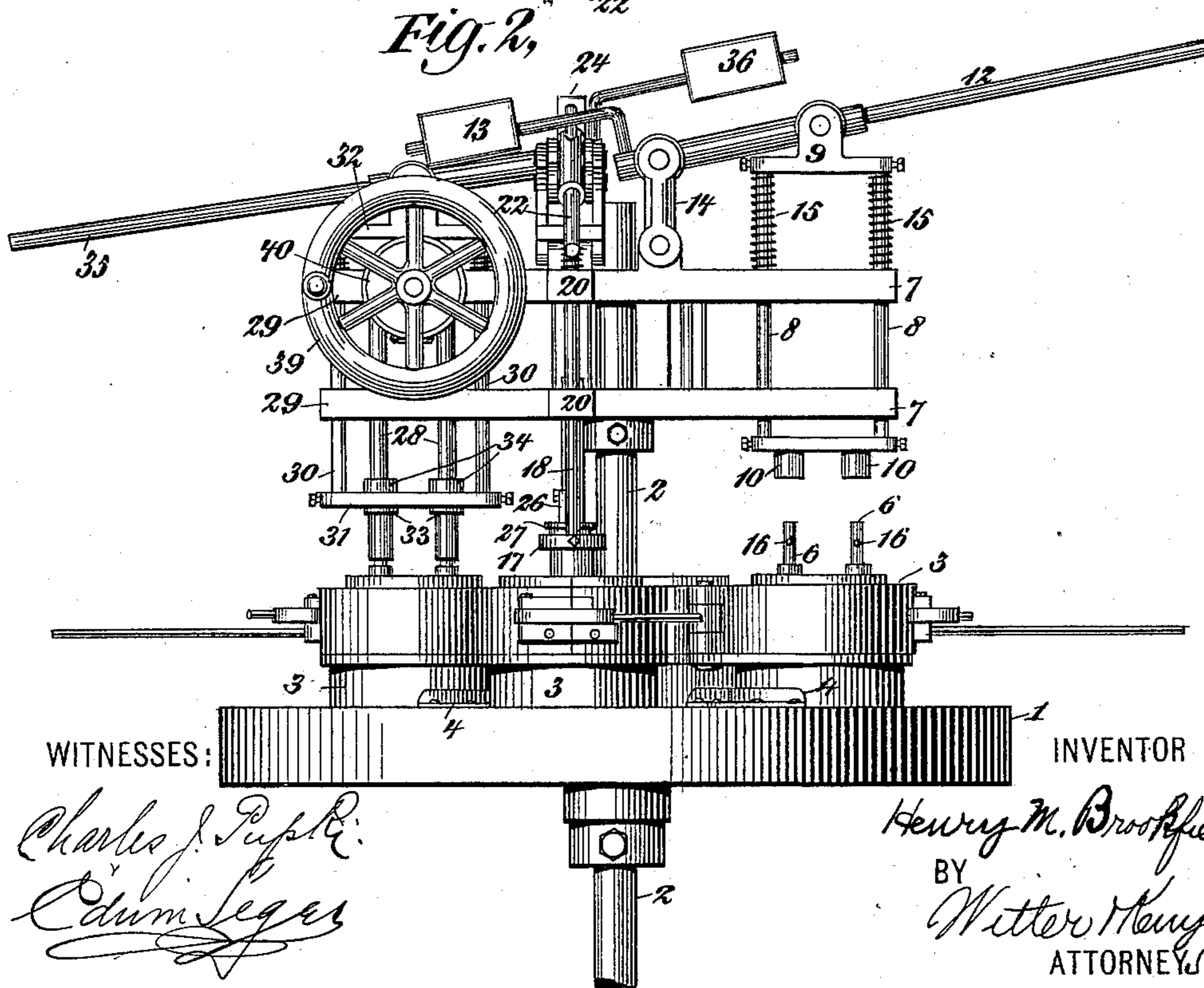
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Patented Jan. 4, 1898.

*Fig. 1,*



*Fig. 2,*



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(No Model.)

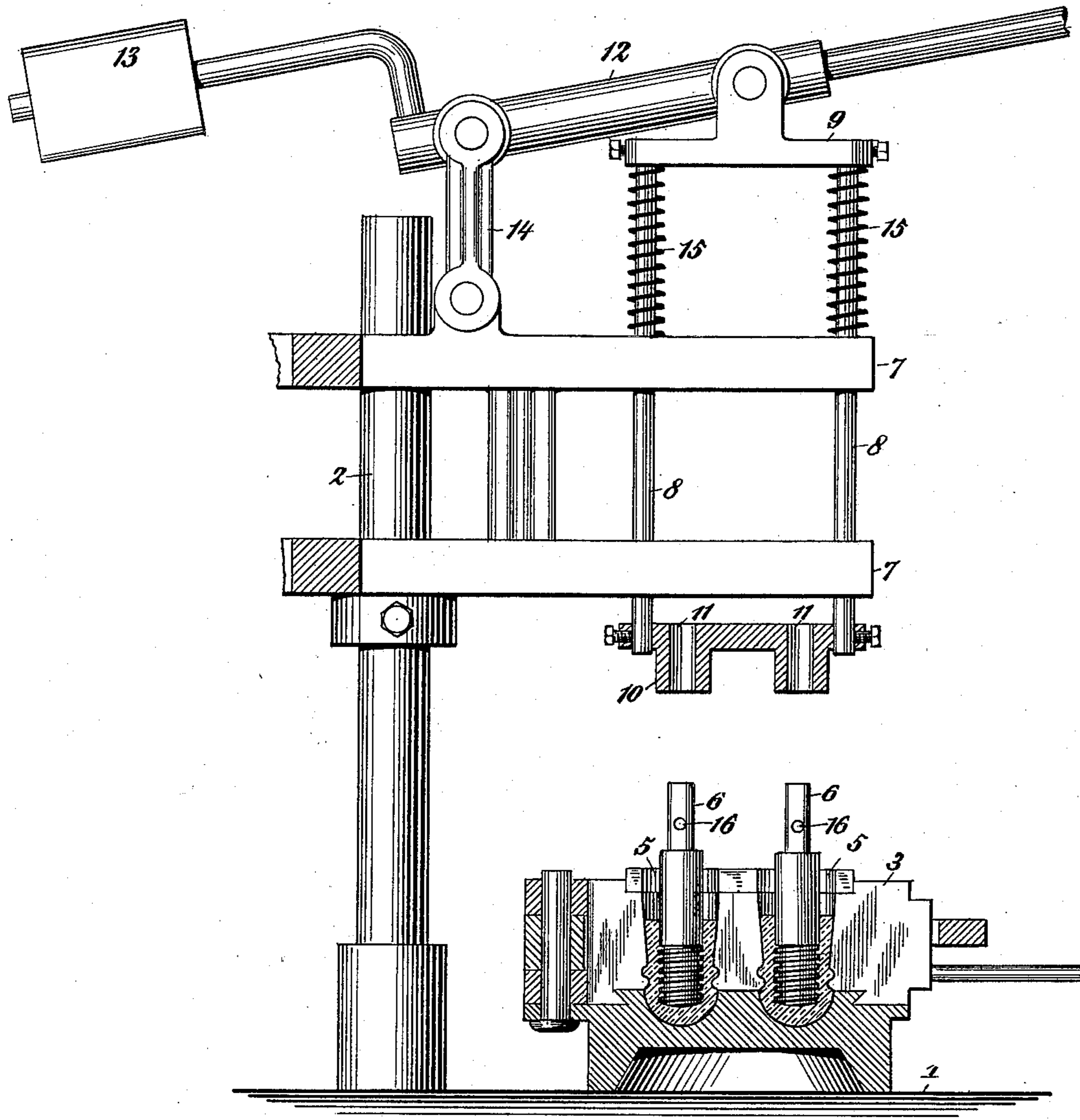
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*Fig. 3.*



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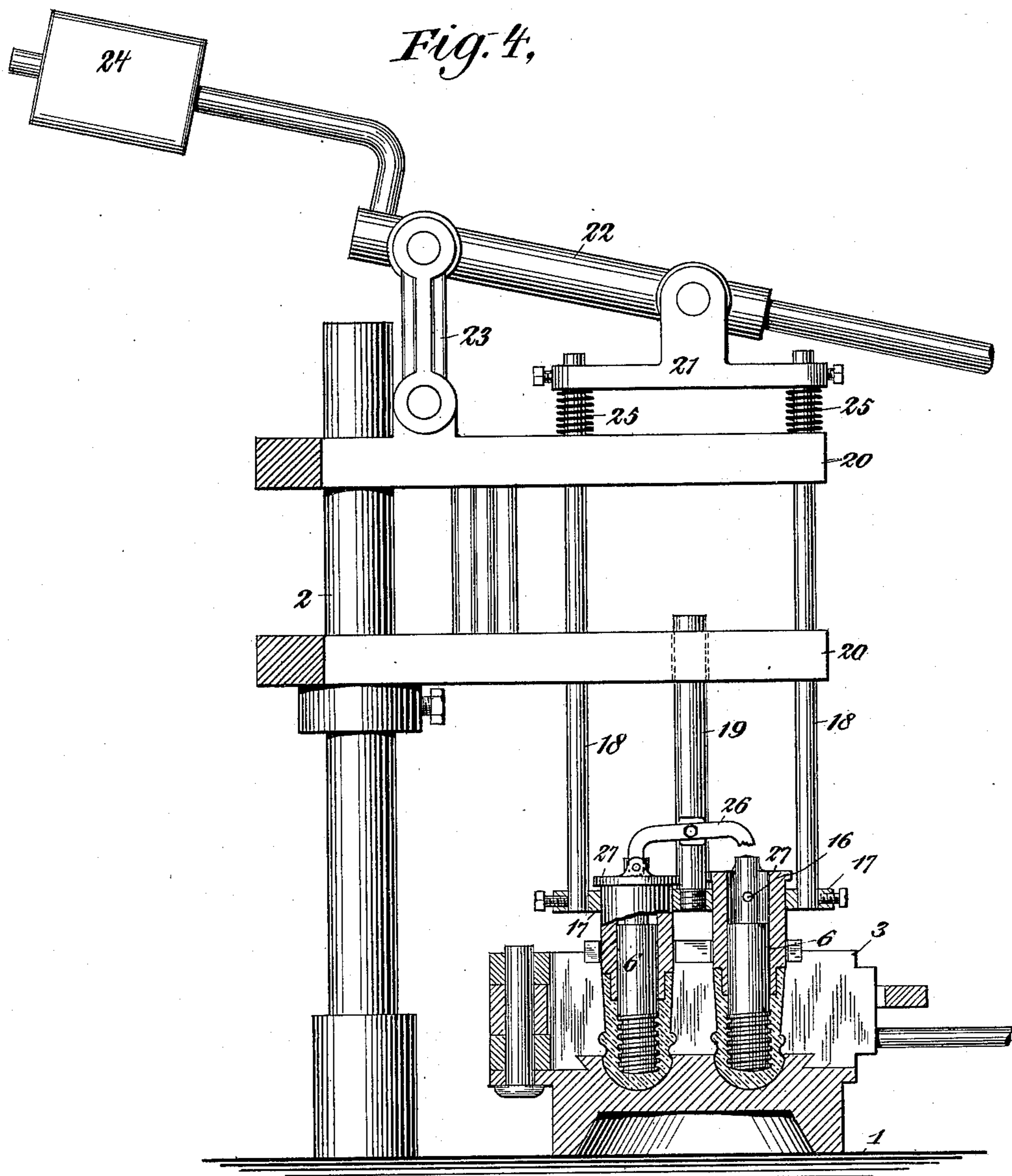
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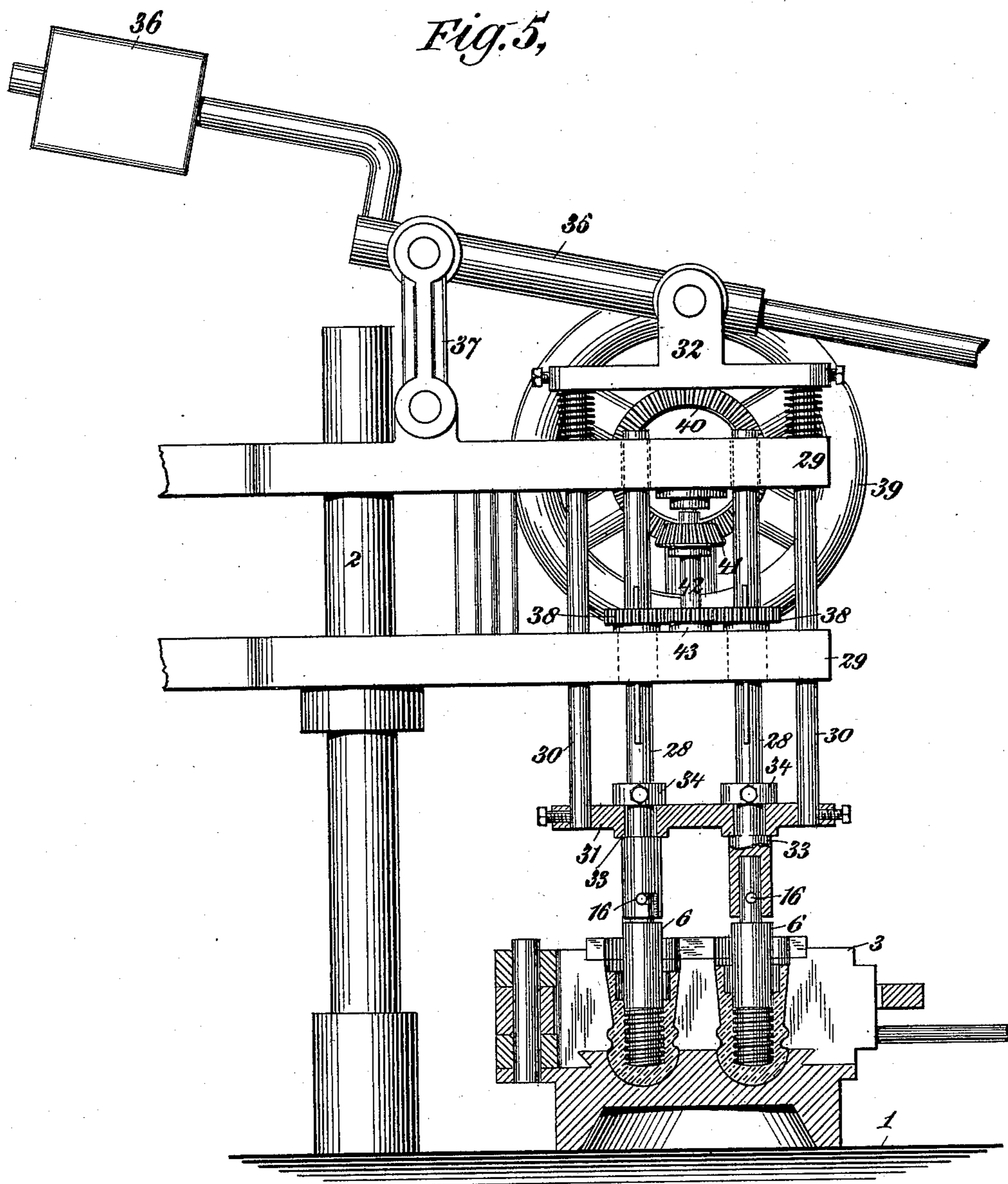
(No Model.)

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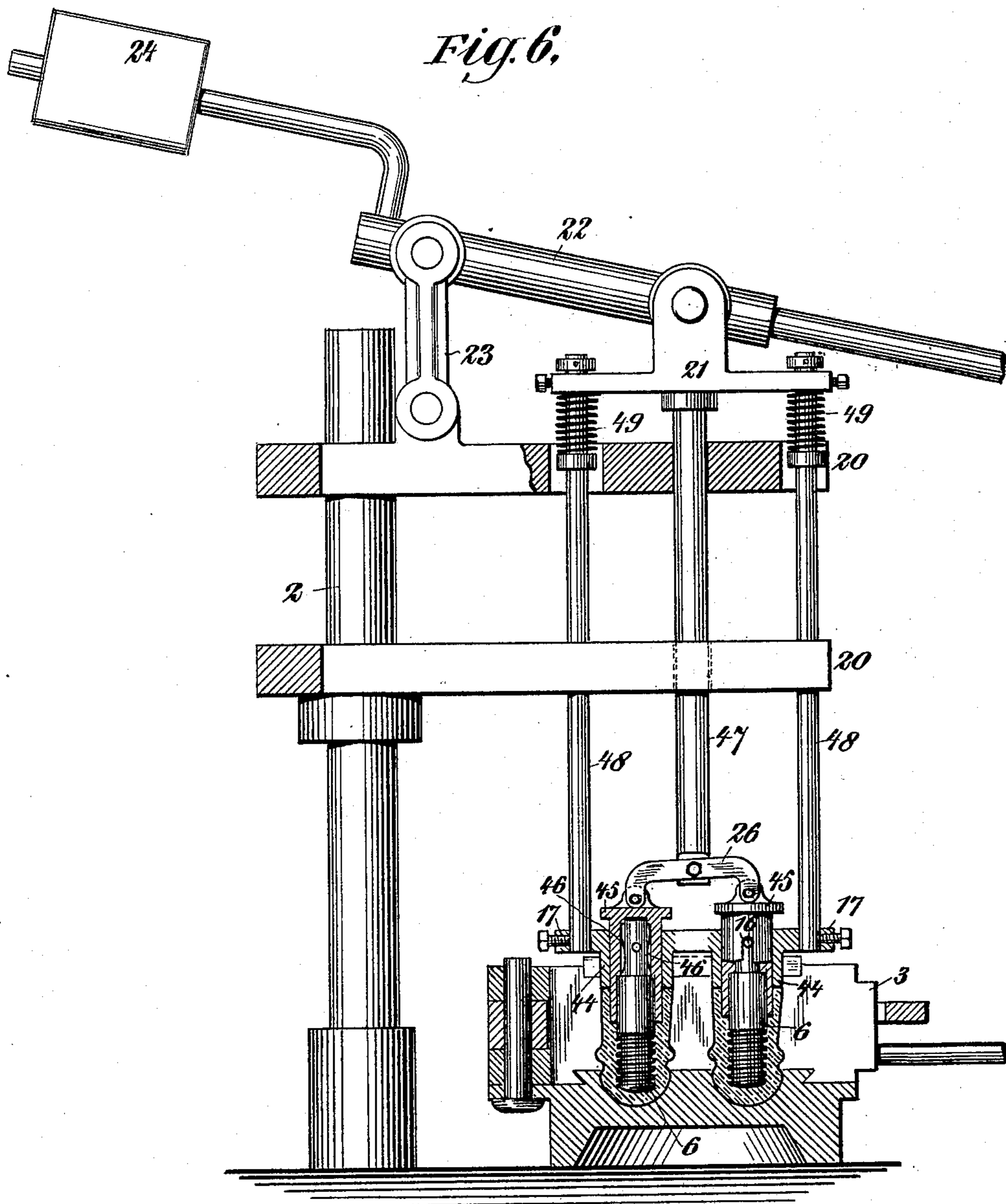
(No Model.)

5 Sheets—Sheet 5.

H. M. BROOKFIELD.  
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# UNITED STATES PATENT OFFICE.

HENRY M. BROOKFIELD, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM BROOKFIELD, OF SAME PLACE.

## PRESS FOR MAKING INSULATORS.

SPECIFICATION forming part of Letters Patent No. 596,651, dated January 4, 1898.

Application filed December 26, 1896. Serial No. 616,995. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY M. BROOKFIELD, a citizen of the United States, residing in New York city, in the county and State of New York, have invented a new and useful Improvement in Presses for Making Insulators or other Similar Articles, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to presses for manufacturing insulators for telegraph-lines and other similar articles; and its object is to so improve the construction of such presses as to increase their capacity and efficiency, whereby a much larger number of insulators or similar objects may be made within a given time and economy of production thereby secured, the quality of the article being at the same time maintained. Another object of my invention is to increase the simplicity and compactness of construction of the machine.

My invention consists, broadly, in the combination, with the other necessary parts of such machine, of an actuating device adapted to carry a plurality of plungers, two being the number which I prefer to use, a mold having a plurality of recesses, a plurality of detachable plungers, and a plurality of revolving and reciprocating spindles adapted to be attached to the plungers and to remove them from the mold after the articles have been formed, a compensating lever attached to the actuating device, and a plurality of formers connected with the ends of the compensating lever. In some cases the compensating lever may be pivotally connected with formers adapted to hold and carry the plungers, this being the particular embodiment of my invention which I prefer to use. In other cases the compensating lever may be pivotally connected with formers adapted to slide upon but not to hold or carry the plungers.

My invention also consists in the combination, with the other usual or necessary parts of such a machine, of a reciprocating follower-plate, two or more formers sliding in bearings in the follower-plate and provided with central openings or recesses adapted to re-

ceive and encircle the plungers, the formers being adapted to enter the mold and press upon the top of the glass or other material in the mold, and a compensating lever pivoted to the actuating device and pivoted at each end to one of the formers.

My invention also consists in the combination, with the revolving and reciprocating spindles for removing the plungers from the mold, of gear-wheels feathered to said spindles and a hand-wheel to operate the spindles and gearing between the hand-wheel and the said gear-wheels, and suitable means for supporting the spindles.

My invention also consists in certain other features of construction and combinations of parts hereinafter described and claimed.

My invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a top or plan view of the press. Fig. 2 is a side elevation of the same; Fig. 3, an elevational view, partly in section, of one form of actuating device for inserting the plungers in the mold and of the mold itself. Fig. 4 is a similar view of one form of follower-plate and formers and operating parts. Fig. 5 is a similar view of the spindles for removing the plungers from the mold; and Fig. 6 is a similar view of the best form of my invention, in which the compensating lever is connected at its ends with formers having central openings, whereby the formers are adapted to receive and encircle and hold the plungers.

Similar numbers refer to corresponding parts in the different figures.

Referring to the drawings, 1 is a platform or support mounted so as to revolve upon a central standard or post 2.

3 3 are molds which are carried upon the table 1 and are adapted to be held in proper places thereon by suitable guides 4. These molds are shown in section in Figs. 3 to 6. They are provided with a plurality of recesses. In the form shown the molds are provided with two recesses 5 5. Each recess is shaped so as to produce an insulator or other article of the desired form. These molds and recesses are so arranged that as the platform 1 is revolved they will be brought first under the actuating device for inserting

the plungers, then under the follower which carries the formers, if that form of invention is used in which the plungers are inserted separately from the formers, and, lastly, under the spindles for removing the plungers. The molds are made in the usual way, so as to be opened after the plungers have been removed and the article finished, so as to permit the articles to be taken from the mold.

10 The molds are also preferably provided with handles and catches, as shown.

6 6 are detachable plungers. The form which I have shown in the drawings is what is known as a "screw-plunger"—that is to say, one having a screw-threaded portion at its lower end adapted to form a screw-thread upon the interior of the article.

Referring to Fig. 3, two arms 7 7 project from the standard upon which is supported the actuating device for carrying the plungers and inserting them in the molds. This device consists of the rods 8 8, which are adapted to slide in bearings in the supporting-arms 7 7, the cross-head 9, the cross-piece 10, connecting the lower ends of the rods 8 and provided with openings 11, adapted to receive the upper ends of the plungers, and the operating-lever 12, which is suitably connected with the cross-head 9 and provided at its other end with the weight 13. The lever 12 is pivotally mounted upon the supporting-arms of the machine by means of the pivoted link 14. 15 15 are coiled springs encircling the rods 8 8 and operating to aid the weight 13 in raising the actuating device when pressure is removed from the lever 12. The plungers are provided with pins 16 to enable them to engage with the lower ends of the spindles shown in Fig. 5. The size of the opening 11 in the cross-piece 10 is so adjusted with reference to the upper end of the plunger that when the plunger is inserted therein it will be held in place in the cross-piece 10 either by frictional contact or in any other suitable way, as by a spring, such as is shown in Fig. 6. It will be understood that slots may be provided in the cross-piece 10 to receive the pins 16.

The actuating device for inserting the plungers in the mold may be greatly varied in its construction, although I prefer to use the form shown in the drawings.

Referring to Fig. 4, 17 is the follower-plate, to which are suitably attached the operating-rods 18 18 and a middle rod 19, all of which are so constructed as to slide in bearings in the supporting-arms 20, which project from the standard 2 of the machine. The rods 18 are connected at their upper ends by means of the cross-head 21, which is itself suitably connected with an operating-lever 22. This lever is connected with one of the arms 20 by means of the pivoted link 23, and is provided at its other end with the weight 24. 25 25 are coiled springs which are placed around the rods 18 and which aid the weight 24 in raising the lever 22 when that lever is relieved

from pressure. 26 is a compensating lever which is pivoted to the rod 19 and which is pivotally connected at its ends with the formers 27 27. The formers are constructed with central openings or bores adapted to receive the plungers, so that the formers can encircle and slide over the plungers and thus enter the mold and bear upon the top of the material being shaped therein. Where the formers are arranged so that their upper ends pass below the upper ends of the plungers, it is necessary to provide the compensating lever 26 with a forked end, so as not to strike the upper end of the plunger. The follower-plate 17 is provided with openings in which the formers 27 slide, as a result of which the formers have a certain capacity of motion independent of the follower. The lower end of the former is shaped in the usual way, so as to give to the insulator or other article the desired form.

It will be understood that the devices for operating the follower and the formers may be greatly varied.

Referring to Fig. 5, 28 28 are two spindles for removing the plungers from the mold after the article has been formed. These spindles are adapted to slide and to revolve in bearings in the arms 29 29, which project from the central standard 2 of the machine. The spindles are raised and depressed by means of the operating-rods 30 30, which are connected at their lower ends by the cross-piece 31 and at their upper ends by the cross-head 32 and which slide in bearings in the arms 29 29 of the machine. The cross-piece 31 is fastened rigidly to the spindles by means of the shoulder 33 and the collar 34. The spindles move up and down with the cross-piece 31, but are so arranged that they can revolve in their bearings in the said cross-piece. The cross-head 32 is connected with the operating-lever 35, which is provided at its other end with the weight 36, and is connected with one of the supporting-arms 29 of the machine by means of the pivoted link 37. Each of the spindles is provided with a gear-wheel 38, which is feathered to the spindle so that the spindle may move up and down while the gear-wheel remains stationary, but will revolve with the gear-wheel. 39 is a hand-wheel supported in any suitable way on the arms or frame of the machine and provided with a beveled gear 40, which engages with the beveled gear 41, which is fastened to the shaft 42. This shaft is provided at its lower end with a gear wheel or pinion 43, which engages with the gear-wheels 38 38. When the hand-wheel is turned, the shaft 42 is revolved by means of the gearing, and thereby the two spindles are revolved in the same direction through and by means of the gears 38 38 and 43. The hand-wheel must be turned in such a way as to cause the spindles to revolve in the proper direction to unscrew the plungers. The lower end of each spindle is provided with a recess to receive the upper end of the

plunger and also a slot to receive and engage with the pin 16, projecting from the upper end of the plunger. When the spindles are fastened to the plungers by this means, the plungers will be caused to revolve with the spindles and thereby unscrewed from the article in the mold.

The best form of my invention is shown in Fig. 6. In this form the plungers are inserted at the same time that the formers are pressed into the mold, the formers being constructed so as to receive and encircle and hold the plungers, and one actuating device serving at the same time to insert the plungers and operate the formers. The mold and plungers are constructed the same as already explained. 47 is the actuating-rod, adapted to slide in bearings in the arms 20 20 of the machine and attached at its upper end to the cross-head 21, which is pivoted to the operating-lever 22. This lever is supported by the pivoted link 23 and is provided with the counterweight 24. 26 is a compensating lever which is pivoted to the rod 47 and pivotally connected at its ends with the formers 45 45. These formers are provided with central openings or recesses adapted to receive and encircle and hold the plungers 6. The formers are provided with a slot on one side, as shown, to receive the pin which projects from the top of the plunger. The plungers may be held in the formers either by simple frictional contact, or the formers may be provided with springs 46, adapted to hold the plungers in place while they are being inserted in the mold, but enabling the formers to be withdrawn from the plungers when the rod 47 is raised by the operation of the weight 24. 17 is the follower-plate carrying the follower 44. 48 48 are reciprocating rods carrying the follower-plate and sliding in bearings in one of the arms 20 and in the cross-head 21. 49 49 are coiled springs around the rods 48 48, bearing at their lower ends on collars fastened to the rods and at their upper ends on the cross-head 21. Collars are fastened to the upper ends of the rods 48 48, so as to cause those rods to be lifted by the rod 47.

The operation of my device is as follows: The glass or other material of which the insulator or other article is to be made is poured into the mold when it is in its first position, as shown at the upper part of Fig. 1. The table is then revolved around the standard 2 until the mold is brought under the actuating device shown in Fig. 3, and also illustrated at the right in Fig. 2, if this form of my invention is used. Meanwhile the plungers 6 6 have been inserted in the openings 11 in the cross-piece 10. When the recesses in the mold are immediately under the plungers, the lever 12 is depressed and thereby the plungers are forced into the material in the mold, as shown in Fig. 3. The lever 12 is then released and the weight 13 operates to lift the rods 8 and cross-piece 10, the plungers 6 6 remaining in position in the mold.

The table is then revolved again until the mold is brought under the device shown in Fig. 4. The plungers would then be exactly in line with the central apertures or bores in the formers 27. The lever 22 is depressed and the formers 27 slide over the plungers and enter the mold and are brought into contact with the top of the material contained therein and give to it its proper form. It is practically impossible to put into each recess of the mold exactly the same amount of material. Consequently one recess will in almost every case contain a slightly greater amount of material than the other. Assuming that the recess on the right in Fig. 4 contains more material than the recess on the left, it will follow that the right-hand former will strike the top of the material in that recess before the other former bears upon the top of the material in the other recess. When this happens, the right-hand former remains stationary and the follower-plate 17 continues to descend, sliding upon this former 27. The right-hand end of the compensating lever 26 is prevented from descending any farther. Consequently that lever is rocked on its pivot and its other end is forced downward at a rate of speed greater than that of the follower-plate 17 and until the left-hand former 27 strikes the top of the material in the left-hand recess of the mold. As a result of this construction and operation a uniform pressure will be exerted on the top of the material in both recesses by the respective formers and each insulator will be perfectly formed, although one insulator will be longer than the other. Two insulators or other articles can be made in this way at the same time and each insulator will be as complete and perfect in shape and outline as the other. The lever 26 operates to compensate for any difference between the quantity of material in the two cavities of the mold. If the formers were rigidly secured to the follower-plate 17, the insulator in the cavity having the greater amount of material would be properly formed, but the other article would be left imperfect. The lever 22 is then released from pressure, as a result of which the rods 18 and 19 are lifted and the formers are withdrawn from the mold and from around the plungers. The platform is again revolved so as to bring the mold and plungers under the spindles shown in Fig. 5. The lever 35 is then depressed. The upper ends of the plungers enter the recesses in the lower ends of the spindles and the pins 16 enter the slots in the lower ends of the spindles, as shown. The hand-wheel 39 is then revolved in the right direction, as a result of which both spindles 28 are turned to the left and, the pressure being removed from the lever 35, the plungers are unscrewed from the articles in the mold and removed therefrom.

The form shown in Fig. 6 is adapted to manufacture insulators or other articles which are required to be of the same length on the exterior. This device is adapted to take the

place of the two devices shown in Figs. 3 and 4. The plungers are first inserted in the formers 45, being held therein either by frictional contact or by means of the springs 46.

5 The platform is then turned so as to bring the mold directly under the plungers. The lever 22 is then depressed, as a result of which the plungers are forced into the material in the mold and the formers 45 are brought down  
10 on top of the material next to the plungers. At the same time the follower is brought down into the position shown, so as to bear against the upper end of the material outside of the formers. Assuming that there is  
15 more material in the right-hand recess, the former will bear upon the material there first and will force the material around the plunger until it fills up the mold and bears against the follower at the top, at which time the  
20 plunger, former, and follower will cease their downward motion, and any further motion downward of the arm 47 will tend to rock the compensating lever 26 and force the other  
25 plunger down into the material of the other recess until both articles are completely formed. A uniform pressure will in this way be exerted on the material in both recesses and both articles will be completely and perfectly and easily formed. If the formers  
30 were rigidly connected with the arm 47 and one recess contained more material than the other one, one article would be completely shaped, but the other article would be imperfect and unsalable.

35 By means of the present invention two articles are formed as easily and rapidly as a single article is formed in the old and well-known machines. The capacity of the machine is thereby doubled and the cost of the  
40 article is correspondingly reduced.

This device is simple in construction and operation and easily manipulated.

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

45 1. The combination of an actuating device, a mold having a plurality of recesses, a plurality of detachable plungers, a compensating lever attached to the actuating device, a plurality of formers connected with the ends  
50 of the compensating lever, and a plurality of revolving spindles adapted to remove the plungers from the mold, substantially as set forth.

55 2. The combination of an actuating device, a mold having a plurality of recesses, a plurality of detachable plungers, a reciprocating follower-plate, a compensating lever attached to the actuating device, a plurality of formers sliding in bearings in the follower-plate  
60 and connected with the ends of the compensating lever, and a plurality of revolving spindles adapted to remove the plungers from the mold, substantially as set forth.

65 3. The combination of an actuating device, a mold having a plurality of recesses, a plurality of detachable plungers, a reciprocating

follower-plate, a compensating lever attached to the actuating device, a plurality of formers sliding in bearings in the follower-plate and connected with the ends of the compensating lever, a plurality of revolving spindles adapted to remove the plungers from the mold, and a movable support for the mold adapted to carry the mold from the actuating device to the revolving spindles, substantially as set forth. 70 75

4. The combination of an actuating device, a mold having two recesses, two detachable plungers one for each recess of the mold, a reciprocating follower-plate, two formers sliding in bearings in the follower-plate and provided with central openings whereby the formers are adapted to receive and encircle the plungers, a compensating lever pivoted to the actuating device and pivoted at each end  
80 to one of the formers, and two revolving spindles adapted to remove the plungers from the mold, substantially as set forth. 85

5. The combination of an actuating device, a mold having two recesses, two detachable  
90 plungers one for each recess of the mold, a reciprocating follower-plate, two formers sliding in bearings in the follower-plate and provided with central openings whereby the formers are adapted to receive and encircle the  
95 plungers, a compensating lever pivoted to the actuating device and pivoted at each end to one of the formers, two revolving spindles adapted to remove the plungers from the mold, and a movable support for the mold  
100 adapted to carry the mold from the actuating device to the revolving spindles, substantially as set forth.

6. The combination of an actuating device, a mold having two recesses, two detachable  
105 plungers one for each recess of the mold, a reciprocating follower-plate, two formers sliding in bearings in the follower and provided with central openings whereby the formers are adapted to receive and encircle the plungers, a compensating lever pivoted to the actuating-rod and pivoted at each end to one of the formers, one or more reciprocating rods, an operating-lever, two reciprocating and revolving spindles adapted to remove the plungers  
110 from the mold connected with the rods, and sliding in bearings in the frame of the machine, gear-wheels feathered to the spindles, a hand-wheel, and intermediate gearing between the hand-wheel and the said gear-  
115 wheels, substantially as set forth. 120

7. In a machine for making insulators or similar articles, the combination of a mold having a plurality of recesses, a plurality of plungers, an actuating device, a reciprocating follower-plate, a compensating lever attached to the actuating device, a plurality of formers sliding in bearings in the follower-plate and connected with the ends of the compensating lever, substantially as set forth. 125 130

8. In a machine for making insulators or similar articles, the combination of a mold

having two recesses, two plungers one for each recess of the mold, an actuating device, a reciprocating follower-plate, two formers sliding in bearings in the follower-plate, and  
5 provided with central openings whereby the formers are adapted to receive and encircle the plungers, a compensating lever pivoted to the actuating device, and pivotally connected at each end with one of the formers,  
10 substantially as set forth.

9. In a machine for making insulators or similar articles, the combination of a mold having two recesses, two plungers one for each recess of the mold, an actuating device,  
15 a reciprocating follower-plate, a follower carried by said plate, two formers sliding in bearings in the follower, and provided with central openings whereby the formers are adapted to receive and encircle and hold the  
20 plungers, a compensating lever pivoted to the actuating device, and pivotally connected at

each end with one of the formers, substantially as set forth.

10. In a machine for making insulators or similar articles, the combination of the mold 25 3, having the recesses 5, 5, the plungers 6, 6, the follower-plate 17, the follower 44, the rods 48, 48, the actuating-rod 47, the compensating lever 26, the formers 45, 45, the lever 22 connected with the rod 47, the springs 49, 49, 30 means for raising the lever, and one or more supporting-arms 20 having bearings in which the rods 47, 48, 48, slide, substantially as set forth.

In testimony whereof I have signed my 35 name to this specification in the presence of two subscribing witnesses.

HENRY M. BROOKFIELD.

Witnesses:

GEO. W. MILLS, Jr.,  
TIMOTHY E. RAFTERY.