No. 804,069. PATENTED NOV. 7, 1905.

A. STRUB.

GLASS MOLDING MACHINE.

APPLICATION FILED DEC. 2, 1904. RENEWED OCT. 10, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

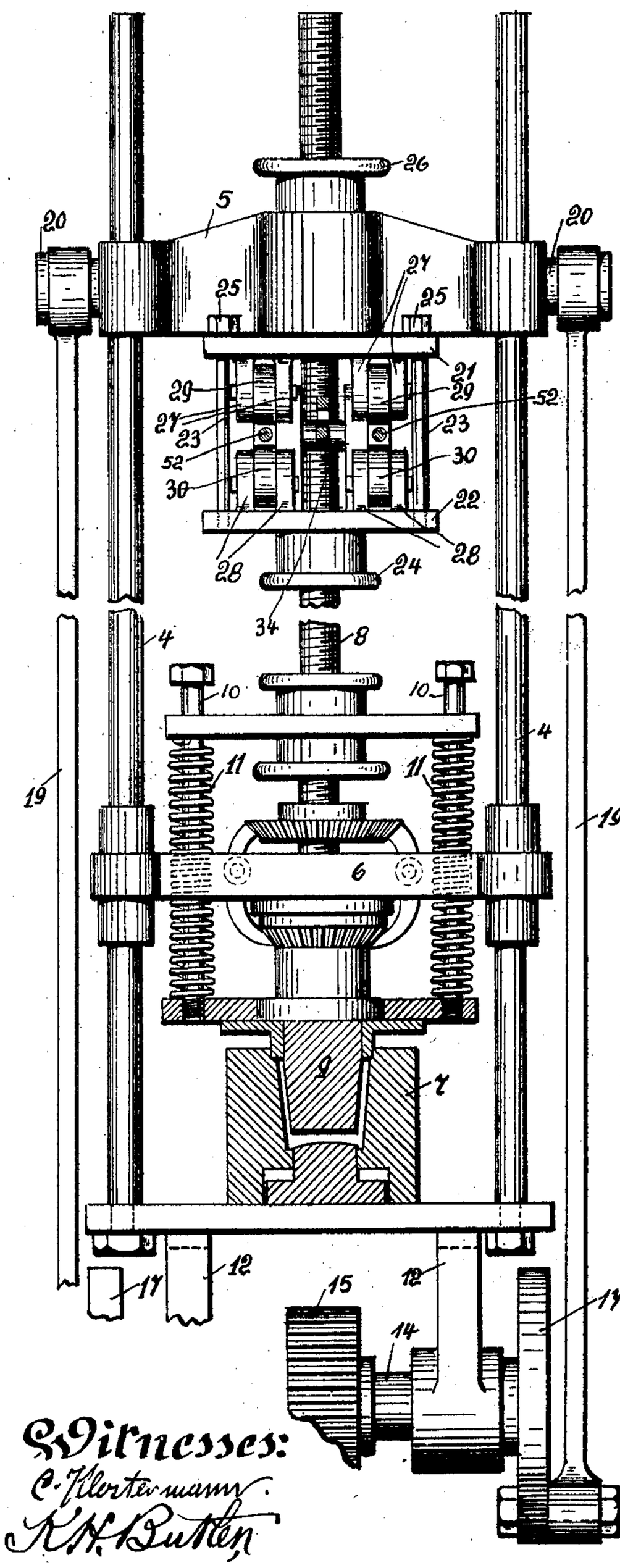
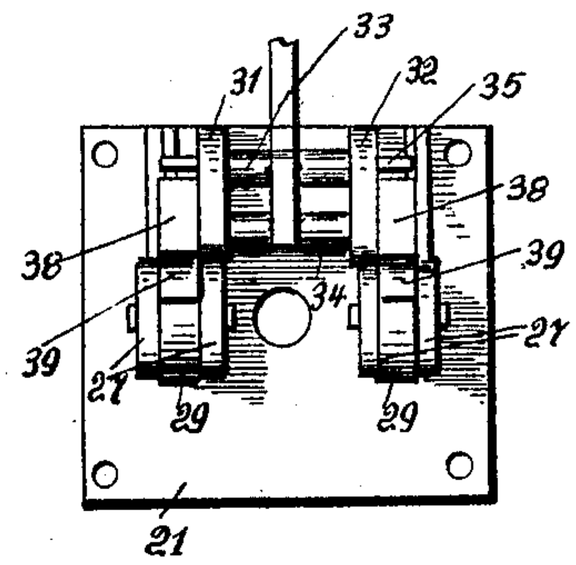


Fig. 2.



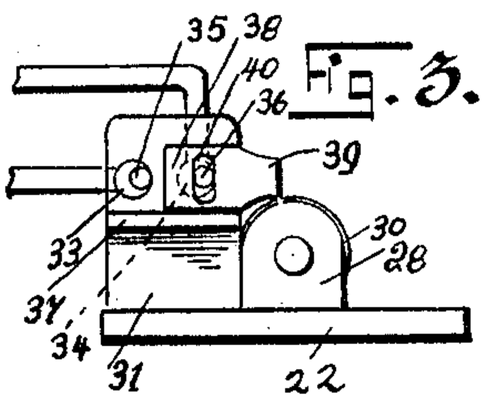


Fig. 3.

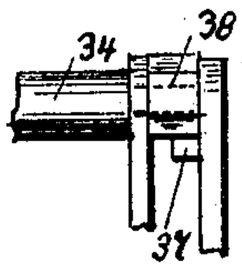


Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 5.

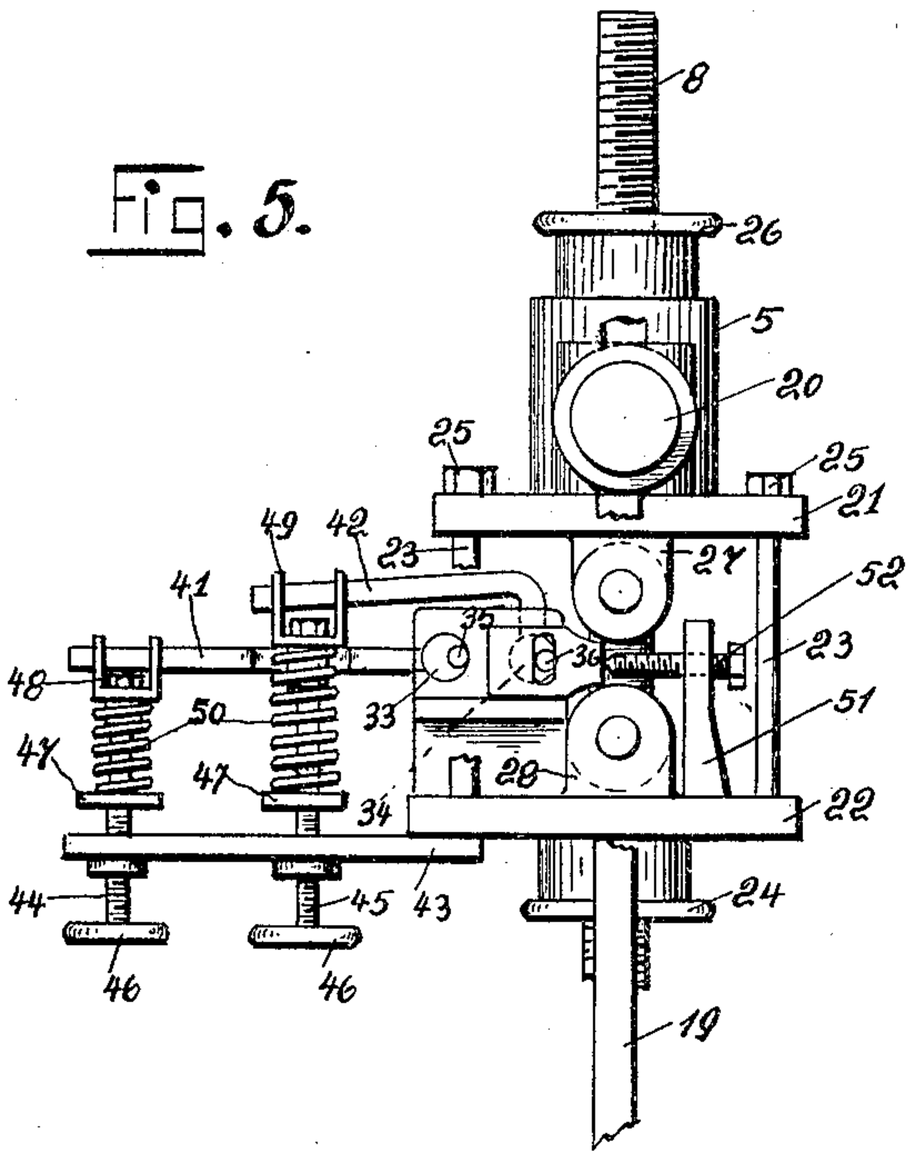
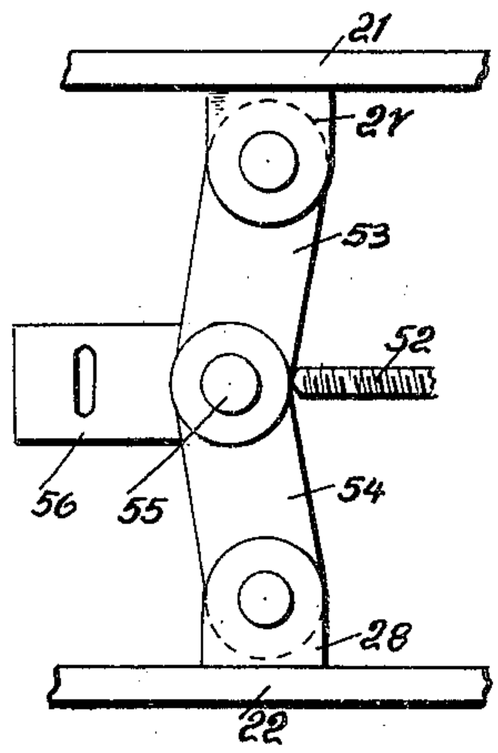


Fig. 7.



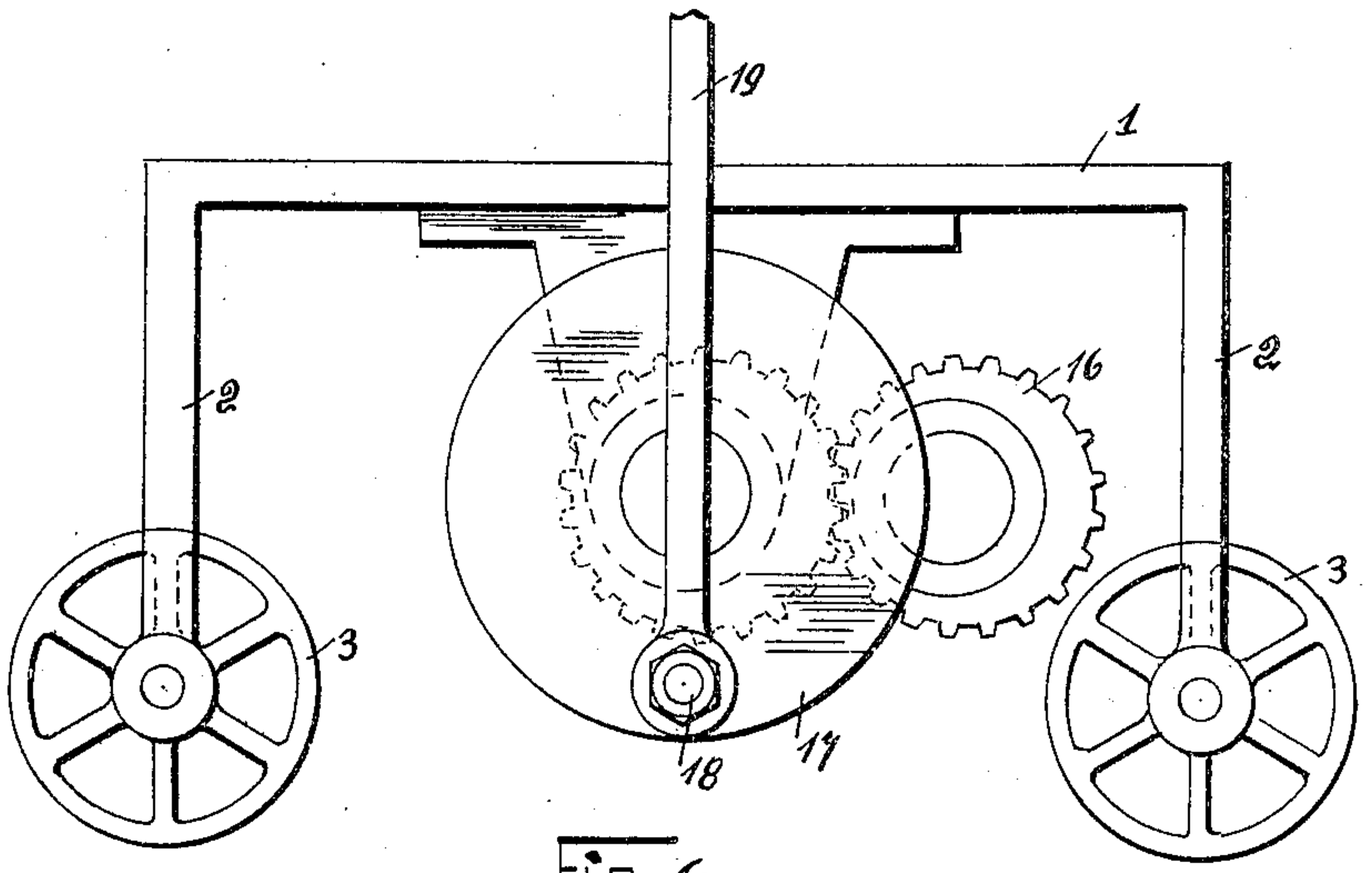


Fig. 6.

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UNITED STATES PATENT OFFICE.

ALBERT STRUB, OF BEAVERFALLS, PENNSYLVANIA.

GLASS-MOLDING MACHINE.

No. 804,069 Specification of Letters Patent. Patented Nov. 7, 1905.

Application filed December 2, 1904. Renewed October 10, 1905. Serial No. 282,167.

To all whom it may concern:

Be it known that I, ALBERT STRUB, a citizen of the United States of America, residing at Beaverfalls, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Glass-Molding Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in glass-molding machines, and more particularly to a device for controlling the movement of the plunger of the glass-molding machine.

The object of this invention is to provide a device which may be readily connected to glass-molding machines now being used, and the device as constructed by me is adapted to govern and control the pressing and return movement of the plunger.

It is a well-known fact that when the molded glass has been pressed into a mold that as the plunger withdraws a suction is created which has a tendency to distort and withdraw the molded form from the sides of the mold. It is therefore with this fact in view that I have put into practice a novel device for governing and controlling the pressing and return movement of the plunger and have employed novel means for adjusting the controlling mechanism of the plunger.

With the above and other objects in view reference will be had to the drawings accompanying this application, wherein like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is a front view of a glass-molding machine, partly broken away and partly in section. Fig. 2 is a plan view of a part of my device which is applicable to the glass-molding machine illustrated in Fig. 1 of the drawings. Fig. 3 is a side elevation of the same. Fig. 4 is an edge view of a part of my device. Fig. 5 is a side elevation of the upper portion of a glass-molding machine, illustrating my device applied thereto. Fig. 6 is a similar view of the lower part of the glass-molding machine, and Fig. 7 is a detail view of a modified form of construction which may be employed in connection with my device.

In order that my improved device may be fully understood, I have illustrated the same in the accompanying drawings as being applied to a glass-molding machine; but I do not care to confine myself to this specific type of machine, as the device may be readily employed in connection with machines wherein a vertically-reciprocating plunger is used and it is desired to control and govern the movement of said plunger.

To familiarize those not conversant with the general construction and operation of glass-molding machines, a brief description of the machine as illustrated in the accompanying drawings is as follows: The machine comprises a table 1 having depending legs 2 2, in which are journaled the wheels 3 3, whereby the machine may be moved to any desired position to operate the same. The top of the table is provided with upright rods 4 4, upon which is slidably mounted a cross-head 5 and a sliding cross-head 6. Upon the top of the table between the uprights 4 4 is mounted a female mold-die 7, and in the cross-head 6 is mounted a vertical screw-threaded rod 8, which carries the male mold-die 9. The cross-head 6 carries guide-rods 10, upon which are mounted the spiral springs 11 11, these springs being adapted to return the male mold-die 9 to its normal position after the glass has been pressed within the mold. The male mold-die 9 and its appurtenant parts, which are of a conventional form, will be hereinafter termed the "plunger." The bottom face of the table 1 is provided with hangers 12 12, and in these hangers a shaft 14 is rotatably mounted. Centrally of the shaft is mounted an eccentric gear-wheel 15, which is adapted to mesh with a similar wheel 16, by which power is transmitted to the glass-molding machine. Upon the ends of the shaft 14 are mounted the wheels 17 17, to which are connected, as indicated at 18, crank-rods 19, these rods extending upwardly upon each side of the machine and being trunnioned upon the pins 20, carried by the cross-head 5. Through the medium of the gears 15 and 16, wheels 17, and crank-rods 19 the cross-head 5 is vertically reciprocated upon the uprights 4 4, and as the screw-threaded rod 8 passes through the cross-head 5 the plunger in its entirety will be raised and lowered when the machine is operated.

The device which is applicable to this type of machine consists of two plates 21 and 22. The plate 21 is bolted to the cross-head 5, and passing through said plate are the bolts 23 23, carried by the lower plate 22, and said plate 22 is retained upon the screw-threaded rod 8 by an adjusting-nut 24 and by the nuts

25 25, secured on the upper ends of the bolts 23 23. The reference-numeral 26 designates a nut which is employed for adjusting the position of the screw-threaded rod 8 within the cross-head 5. The plates 21 and 22 are provided with lugs 27 and 28, respectively, and between these lugs are journaled rollers 29 and 30. The plate 22 upon its one edge is provided with the brackets 31 and 32, and rotatably mounted between said brackets are the shafts 33 and 34, which upon their ends carry the eccentrically-arranged pins 35 and 36. The brackets 31 and 32 are flanged, as indicated at 37 37, to support blocks 38 38. Each block is provided with a tapering end 39, and in the body portion of each block is formed the vertically-disposed slot 40, in which the eccentrically-arranged pins 36 of the shaft 34 are adapted to engage. The shaft 33 is provided with an outwardly-extending arm 41, and the shaft 34 is provided with an angular arm 42, which extends in the same direction. The plate 22 is provided with an outwardly-extending arm 43, through which pass screws 44 and 45, that are provided with hand-wheels 46. The screws are also provided with adjusting-nuts 47, and upon the upper ends of the screws 45 are slidably mounted the substantially U-shaped pierced brackets 48 and 49. Interposed between the adjusting-nuts 47 and said brackets are the spiral springs 50. The end of the arm 42 is adapted to engage in the U-shaped bracket 49, while the arm 41 is adapted to engage in the bracket 48. The plate 22 is provided with standards 51, through the upper ends of which pass screws 52. The blocks 38 are so positioned upon the brackets 31 and 32 that the tapering ends 39 will lie between the rollers 29 and 30, the exact position of the blocks being determined by the position of the screws 52, which limit the inward movement of said blocks.

We will now assume that the plunger has formed a piece of molded glass within the mold and that the springs 11, which are under tension, are returning the plunger to its normal position. As the plunger recedes the screw-threaded rod 8, carrying the nut 24, moves upwardly and the plate 22 will be carried along with the screw, this movement causing the rollers 30 to engage the tapering ends 39 of the blocks 38. As the rollers engage these blocks the blocks will be forced outwardly, carrying with them the eccentric-pins 36, and as the blocks move rearwardly the shaft 34 will be rotated, the rotation of said shaft being governed by the spiral spring 50. The spiral spring 50, shaft 34, and blocks 38 will retard the upward movement of the plunger and prevent any abrupt or jerky receding movement of the plunger. A further receding of the plunger out of the mold is controlled and governed by the eccentric-pins 35 of the shaft 33, these eccentric-pins being struck and moved by the rear face of the blocks 38, and the spiral spring 50, mounted upon the screw 44, will control the rotation of the shaft 33, which is provided with the eccentrically-arranged pins 35.

The arm 41 and shaft 33 are employed for controlling the withdrawal of the plunger from the mold after its movement has been primarily governed by the arm 42 and shaft 34. It will be observed from Fig. 5 of the drawings that at no time during the operation of my improved device do the blocks 38 overlie an imaginary line drawn between the centers of the rollers 29 and 30, and that by an upward movement of the plate 22 the rollers 29 29 will force the tapering blocks 38 outwardly, and that the movement of these blocks will be governed by the springs 50. Therefore it is obvious that it will be impossible for the plunger to recede rapidly or in an abrupt manner from out of the mold, and the ware which is being pressed within said mold will be given sufficient time to become shaped and settled, whereby it will not be affected by any suction that may be created by the withdrawing of the plunger. It will also be observed that the rearward movement of the blocks 38 is governed by the screws 44 and 45, and it is through the movement of these screws that the springs 50 may be compressed to exert a greater tension upon the arms 41 and 42 to retard the rotation of the shafts 33 and 34.

The reverse movement of parts to that above described—that is, the downward movement of the plunger in pressing the glass—is also governed and controlled by the mechanism hereinbefore described and in the following manner: The molten glass having been dropped in the mold and the mechanism operated to actuate the cross-head 5 the latter descends, carrying with it the plunger and other appurtenant parts. The plunger contacts with the glass and presses the same to the required form in the mold. When the article is fully formed, the further descent of the cross-head brings the rollers 29 29 into contact with the blocks 38 38 and the blocks are moved rearwardly, as before described, their rearward movement being resisted by the springs 50 50. The plunger is thus preserved from undue pressure during the time the rods 19 are passing over the lower centers of the wheels 17.

In Fig. 7 of the drawings I have illustrated two links 53 and 54, which are connected together by a pin 55, that also connects a block 56 to the links. These links 53 and 54 and the block may be employed in lieu of the rollers 29 and 30, and the block 56 can be employed instead of the blocks 38. An upward movement of the plate 22 would transmit a similar movement to the block 56 as the rollers previously described, and I do not care to confine myself to the use of the rollers

or to the general arrangement of the different parts of my improved device, but may make various changes in the details of construction without departing from the general spirit and scope of the invention.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a glass-molding machine having a reciprocating cross-head, a plunger actuated by said cross-head, of mechanism carried by said plunger and said cross-head, said mechanism consisting of means for primarily retarding the movement of said plunger, and means for exerting a secondary retardation upon said plunger, substantially as described.

2. The combination with a glass-molding machine having a vertically-reciprocating cross-head, a plunger actuated by said cross-head, of a retarding mechanism carried by said cross-head, said mechanism consisting of one or more blocks adapted to be actuated by the pressing and return movement of said plunger, means carried by said mechanism for controlling the movement of said blocks, substantially as described.

3. A device of the character described comprising relatively movable rollers, one or more blocks mounted between the rollers, means for retarding the movement of said blocks when said rollers move in close proximity to one another, and means for regulating the movement of said blocks, substantially as described.

4. The combination with a glass-molding machine having a reciprocating cross-head, a plunger actuated by said cross-head, of a mechanism carried by said plunger and said cross-head, said mechanism consisting of means for primarily retarding the movement of said plunger, means for exerting a secondary retardation to said plunger, and means for regulating the primary and means for regulating the secondary retarding means, substantially as described.

5. The combination with a glass-molding machine having a reciprocating cross-head, a plunger actuated by said cross-head, of a mechanism carried by said plunger, and said cross-head, said mechanism consisting of rollers, wedges interposed between said rollers for primarily retarding the movement of said plunger, means for retarding the movement of said wedges, means for exerting a secondary retardation to said plunger, and means for regulating the secondary retardation means, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

ALBERT STRUB.

Witnesses:

JAS. G. REEVES,

JOS. C. ROUZER.