No. 849,461. PATENTED APR. 9, 1907.

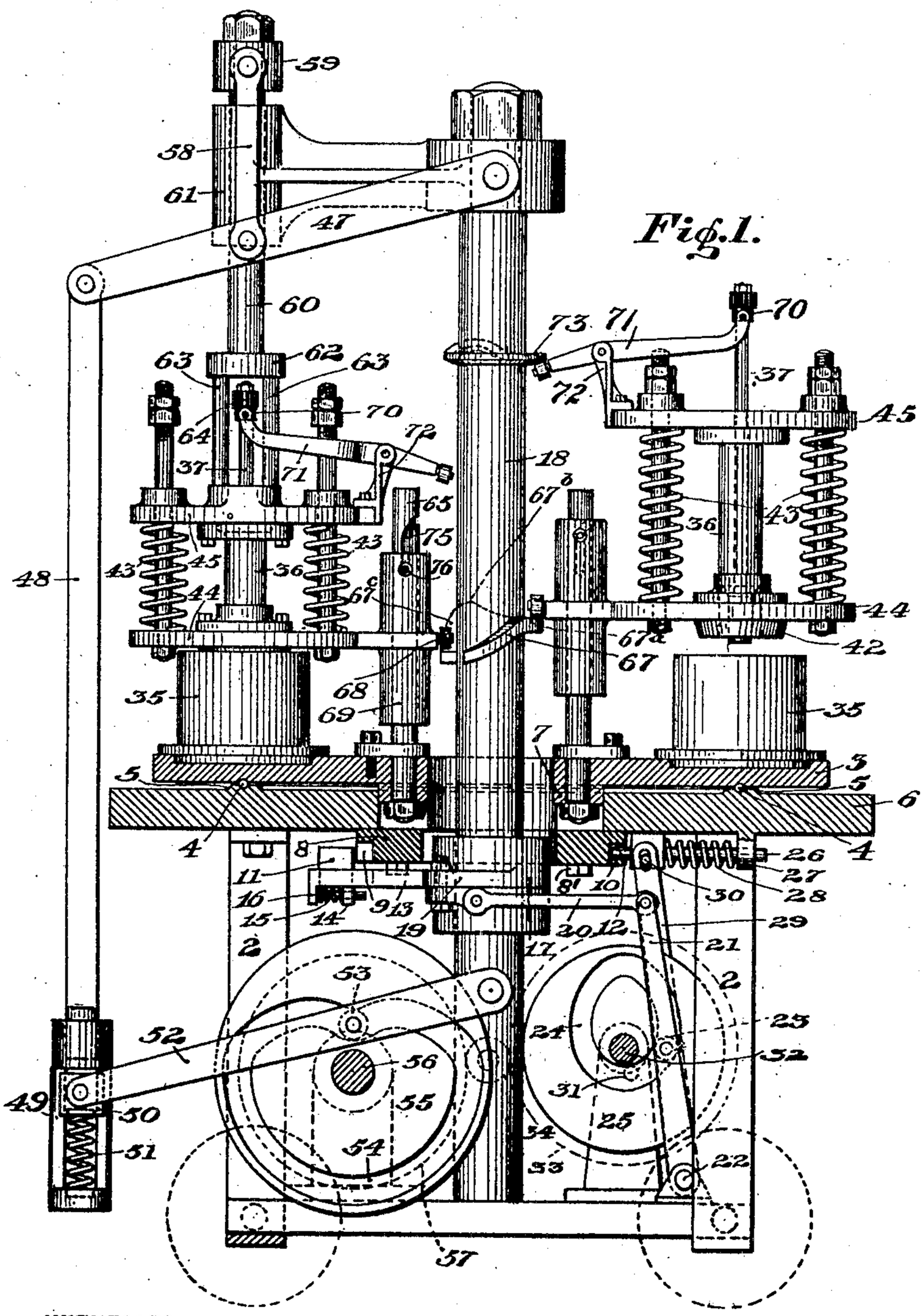
T. J. CONWAY.

GLASS PRESS.

APPLICATION FILED MAR. 23, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



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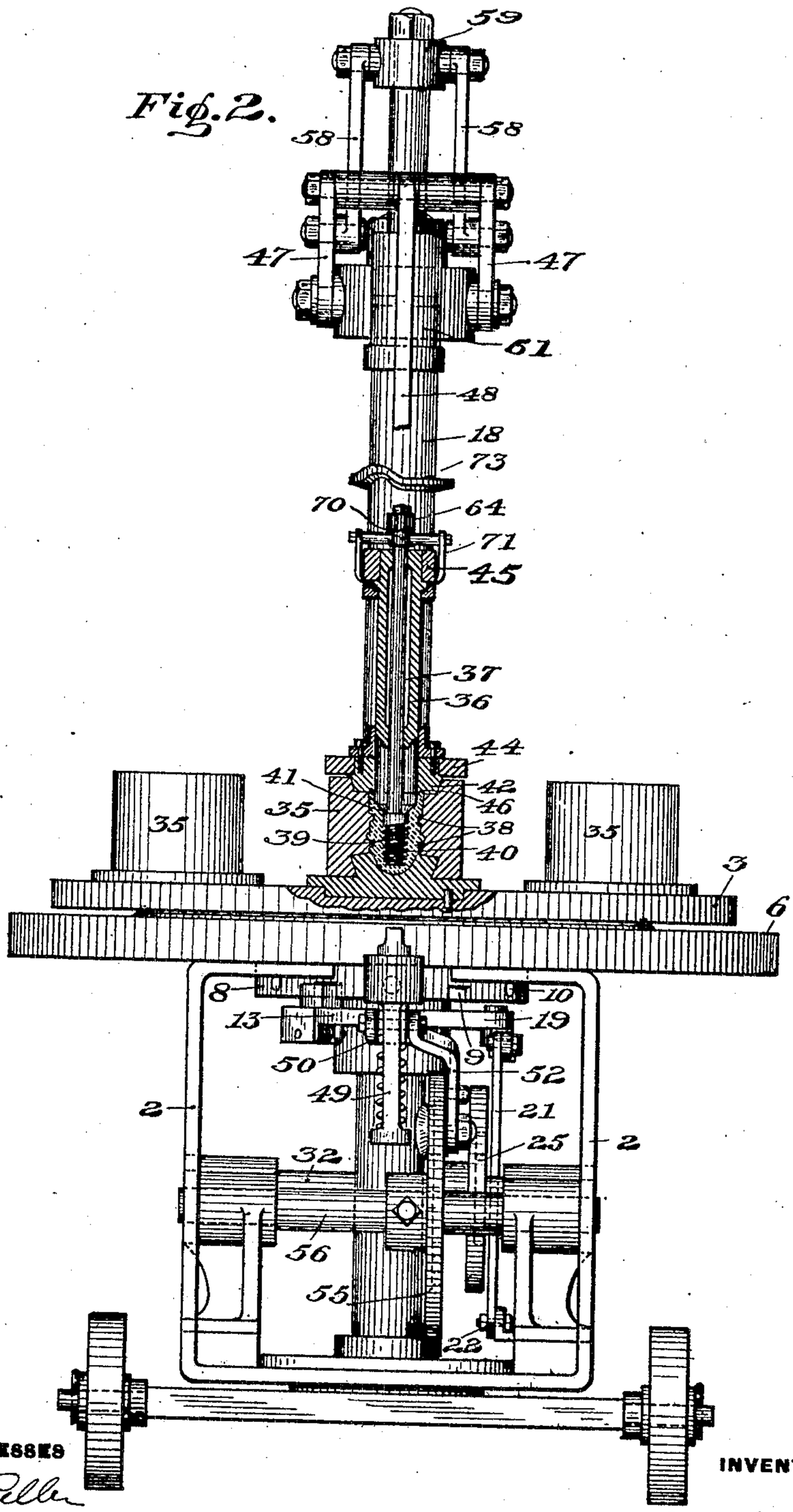
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

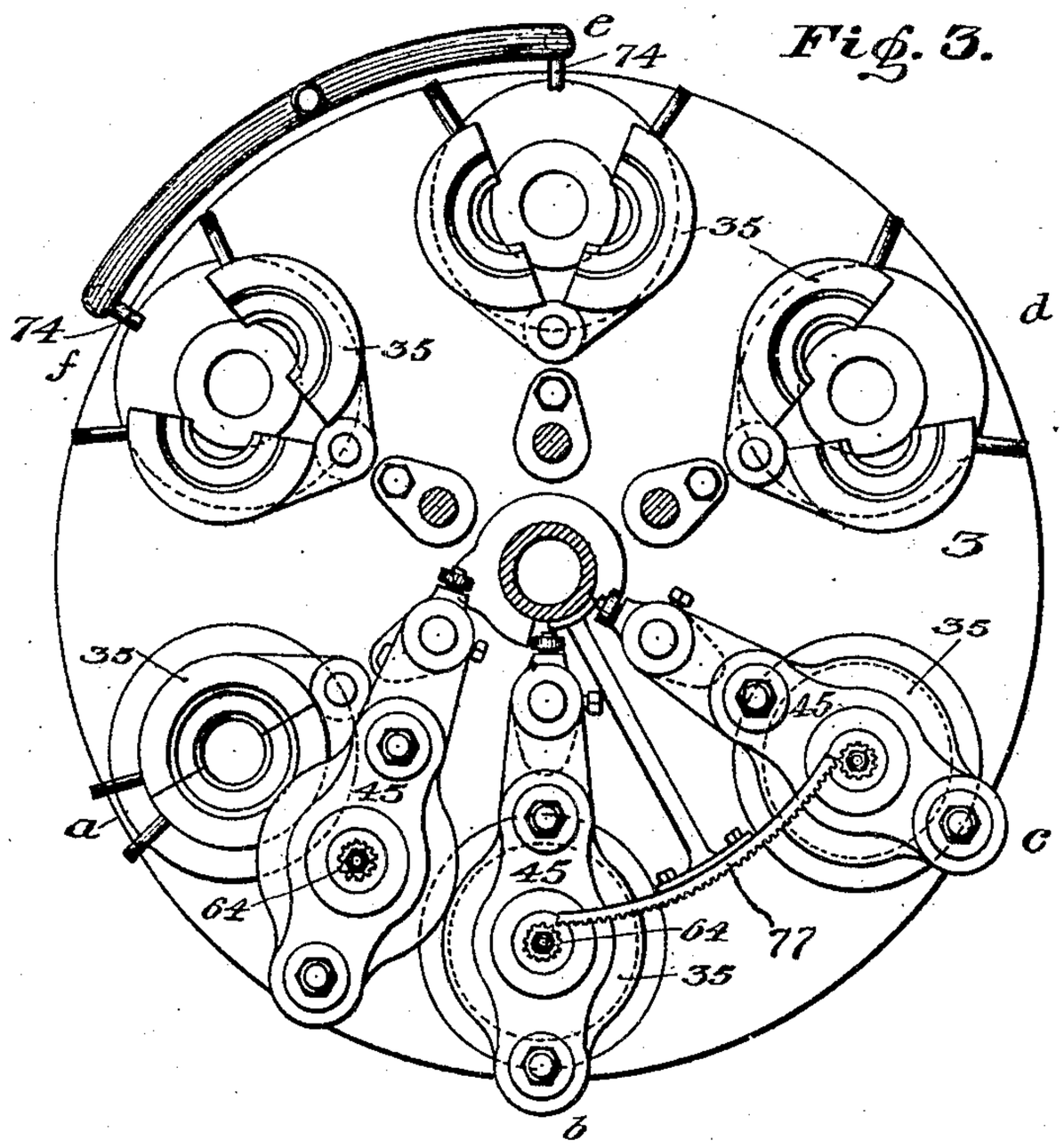
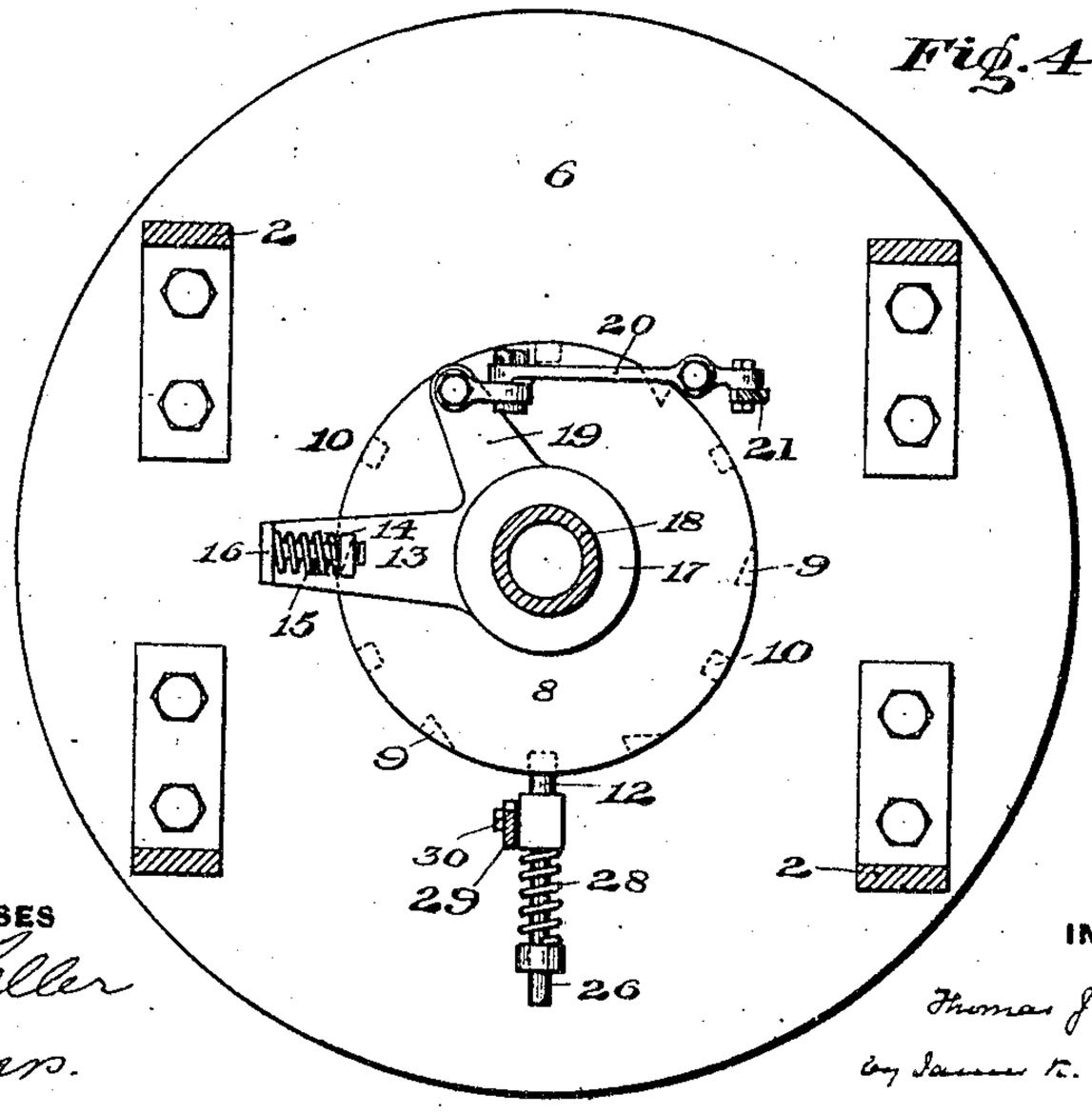


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS J. CONWAY, OF MUNCIE, INDIANA.

GLASS-PRESS.

No. 849,461. Specification of Letters Patent. Patented April 9, 1907.

Application filed March 23, 1906. Serial No. 307,645.

To all whom it may concern:

Be it known that I, THOMAS J. CONWAY, of Muncie, county of Lawrence, and State of Indiana, have invented a certain new and useful Improvement in Glass-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partially in section, of a glass-press, illustrating my invention. Fig. 2 is a side elevation, partially in section, of the press at right angles to the plane of Fig. 1. Fig. 3 is a plan view of the same, certain parts being broken away; and Fig. 4 is a plan view of the bottom face of the table 6 and collar 8, together with a portion of the actuating mechanism by which the collar is caused to rotate.

My invention relates to an improvement in apparatus for pressing glass, which, although it may be used in connection with the manufacture of different articles of glassware, I have shown as applied to the manufacture of insulators and like articles having an interior screw-thread; and it consists in automatic devices by means of which the body of the glass article is pressed, the interior screw-thread is formed, and the screw-thread-forming plunger is withdrawn, as is hereinafter more fully described.

I will now describe my invention, so that others skilled in the art may manufacture and use the same.

In the drawings, 2 represents a frame on which is mounted a table 3, this table being supported by ball-bearings 4. These ball-bearings are fitted in a race formed in a raised ring 5, which is secured to or forms part of the upper face of a stationary table 6, which is fixed to the frame 2. Extending downwardly from the rotatory table 3 is an annular ring 7, to the lower portion of which by means of the bolts 8′ is secured an annular collar 8. This collar 8 is provided with a double series of notches 9 and 10, arranged alternately, the notches 9 being provided with an inclined side wall to permit the release of an actuating spring-dog 11 by the cam action of the inclined face of the notch, while the notches 10 are provided with square side walls slightly inclined to receive a spring-pressed bolt 12, which serves to intermittently hold the rotatory table 3 in a stationary position. The actuating-dog 11, which serves to rotate the rotatory table 3, is slidably mounted on the arm 13, the dog 11 fitting in the slide and having a depending lug 14, which engages with a spiral spring 15, which is supported between the depending lug 14 and a depending shoulder 16, formed on the end of the arm 13. The arm 13 extends from a collar 17, which loosely surrounds the vertical central post 18 and to which an oscillating movement is imparted by means of a suitable arm 19 and link 20, the link 20 being pivoted by a universal joint to the arm 19 and also by a universal joint to the lever 21. This lever 21 is pivoted at 22 to the base of the frame 2, and it is provided with a roller 23, which extends horizontally from the lever and engages in a cam-groove 24 in the disk 25.

The locking-bolt 12 is secured to a pin 26, which is slidably mounted in the depending lug 27, a spring 28 surrounding the pin 26 and extending between the lug 27 and the body of the locking-bolt 12, the purpose of the spring being to keep the locking-bolt normally in engagement with the recess 10. This locking-bolt 12 is actuated by a lever 29, which is connected with the locking-bolt 12 by a pin-and-slot connection 30. The lever 29 is given a rocking movement by a pin 31, which is fixed to the rear face of the disk 25 and which as the disk rotates strikes the lever 29 and rocks it momentarily sufficiently to carry the locking-bolt 12 out of the recess 10, thus unlocking the table and permitting it to be given a partial rotatory movement through the spring-dog 11, as already described. As the table moves the recess 10 is carried away from the locking-bolt 12, which bears against the periphery of the collar 8 until another of the recesses 10 registers with the bolt 12, and the spring 28 forces the bolt into the recess, again locking the table. The bolt 12 and dog 11 do not engage with the recesses belonging to the other, for the reason that the recesses are of such shape as to engage only with the corresponding bolt or dog. The disk 25 is keyed to the shaft 32, and power is applied to this shaft by means of a gear-wheel 33, meshing with the pinion 34 of an electric or other suitable motor. These parts, which I have just described, serve to impart an intermittent rotary movement to the table 3, and although they are well adapted to the purpose of my invention I do not desire to limit myself thereto.

The table 3 serves to carry a series of molds 35, arranged at stations equally distant from

the center of the table and preferably at equal distance from each other. The first of these stations *a* is at the place where the molten glass is placed within the mold, which may be done by means of any suitable mechanical gatherer or by hand in any usual manner of transporting the glass. The second station *b* is where the glass is pressed within the mold. For this purpose I employ a two-part plunger having an outer portion 36 and an inner portion 37, which has a reciprocatory movement as well as a rotatory movement within the part 36.

In the drawings I have shown the mold and plunger of a shape adapted to the manufacture of insulators for use in connection with electric circuits. These insulators are of the ordinary form, having the groove 38 on the outer surface, around which the electric wire is to be wrapped, and having an interior thread 39, by means of which the insulator is to be screwed on its support. The mold is therefore necessarily a two-part mold. The part 36 of the plunger is of such shape as to form the mouth of the interior cavity of the insulator, and the part 37 of the plunger is adapted to form the interior thread 39, the lower portion of the interior plunger 37 being provided with a screw-thread 40, adapted to form the screw-thread 39 in the glass. The lower end of the part 36 of the plunger fits against a shoulder 41 formed on the part 37, thus making an unbroken joint on the outer surface of the two parts. The mold 35 is provided with the usual ring 42 and springs 43, which are situate between the two cross-heads or spring-plates 44 and 45. The lower face of the ring may be provided either with a plain groove to form a smooth base to the insulator, or this groove may be indented to form the ornamental teeth 46 on the face of the insulator.

The devices which operate the plunger consist of a lever 47, which is pivoted at one end to the central post 18 in any suitable manner and at the other end to a vertical link 48, the lower end of which is fixed to the yoke 49, in which is a slidable block 50 and a spiral spring 51, the spring being situate between the block 50 and the bottom of the yoke 49. The outer end of the cam-lever 52 is pivoted to the block 50, the inner end being pivoted to the central post 18. On the inner face of the cam-lever 52 is a cam-roller 53, which extends within the heart-shaped cam-groove 54 in the rotatory disk 55, which is mounted on the horizontal shaft 56. Keyed to the shaft 56 is a gear-wheel 57, which meshes with the pinion 34 of the motor. Pivoted to the levers 47, there being a pair of these levers, are the links 58, the other ends of which links are pivoted to the cross-head 59. Extending from the cross-head 59 through the guide-sleeve 61 is the guide-rod 60, to the lower end of which is fixed a plate 62. Extending downwardly from the plate 62 are the posts 63, adapted to come in contact with the spring-plate 45, to which the plunger 36 is secured. The upper stem of the plunger 37 extends slidably through the bore of the plunger 36 and beyond the spring-plate 45 between the posts 63. To the upper end of the plunger 37 is secured the pinion 64, which engages with the segmental rack 77, which is situate between the stations *b* and *c* of the table 3. The posts 63, which come in contact with the spring-plate 45 and operate the plungers of the mold in the manner described, together with the mechanism which support and actuate these posts, are independent of and separable from the mold-plungers and spring-plates, these parts being stationary in relation to the frame of the apparatus while the mold, with its plungers and spring-plates, rotates with the table. The plungers and spring-plates are slidably and pivotally mounted on the posts 65, which extend vertically and upwardly from the rotary table 3. At the station *b* by means of the heart-shaped cam-groove 54 posts 63 are depressed to force the two plungers 36 and 37 to the limit of their downward movement into the glass in the cavity of the mold. When the posts 63 are retracted through the further movement of the cam-groove 54, the plunger 37 is left in its lowered position while the plunger 36 rises under the force of the springs 43, which were contracted by the downward movement of the spring-plate. At the same time the spring-plate and the plungers are released from any engagements with the posts 63, and the mold, the plungers, and the spring-plates are free to move with the table from the station *b* to the station *c*. When the posts 63 have been raised to the limit of their upward movement, the cam-groove 24, acting through the spring-dog 11, gives a partial rotation to the rotatory table 3 and carries the mold 35 from the station *b* to the station *c*. At the same time the pinion 64, traveling in the segmental rack 77, gives a rotary movement to the plunger 37, which movement is very slow at its beginning, which enables the thread 40 on the end of the plunger 37 to gradually release itself from the glass in the cavity of the mold. This gradually-accelerating motion imparted to the rotatory table 3, and consequently to the plunger 37, is due to the peculiar shape or curvature of the cam-groove 24. This groove is of such shape that it not only gives a gradually-accelerating rotation to the plunger 37, but it also gives a gradually-retarding movement to the rotation of the table 3 as the notch 10 nears the locking-bolt 12. The rotation of the plunger 37 in this stiffening glass in the mold carries the plunger 37 upwardly in the cavity of the plunger 36, and when the mold has reached the sta-

tion *c* the screw-thread 40 of the plunger will have been sufficiently released from the thread 39 of the glass to permit the plunger to be withdrawn without injury to the edges of the glass.

Opposite the station *c*, secured to the post 18, is a cam-shelf 67, which engages with a roller 68 of the spring-plate 44, this spring-plate being fixed to the slidable sleeve 69 on the post 65. When the mold 35, the spring-plates, and plungers come to the station *c*, the roller 68 commences to ride up on the cam-shelf 67, causing the sleeve 69 to slide upwardly on the post 65 and to carry the spring-plates 44 and 45, together with the plungers 36 and 37, away from and out of the cavity of the mold 35, which position they will have attained when the parts arrive at station *d*.

After the mold and its parts have reached the station *d* the mold is opened either by suitable automatic means or by hand and the glass insulator is drawn therefrom. As the spring-plates 44 and 45 are lifted in their passage from station *c* to station *d* it is also necessary to lift the plunger 37, which is not lifted directly by the plates themselves. To accomplish this, a collar 70 fits loosely on the stem of the plunger 37 below the pinion 64. Pivoted to this collar is a forked lever 71, which is pivoted to a bracket 72, extending from the spring-plate 45. The free end of the lever 71 extends beyond the bracket 72 and is adapted to contact with a collar 73, fixed to the post 18 in such a position that the end of the lever 71 will engage with the collar during the upward movement of the plate 45 in its passage from station *c* to station *d*, the effect of which is to elevate the yoke end of the lever through the elevation of the pivotal point of the lever, and thus withdraw the plunger 37 from the cavity of the mold, bringing the parts to the position shown at the right-hand part of Fig. 1 of the drawings. Owing to the construction of these parts the plate 45 is free to rise under the pressure of the springs 43 at station *b* without imparting an upward movement to the collar 70 and the plunger 37, so that no strain is exerted on the thread 39 by the movement of this plate.

During the passage of the empty mold from station *d* to station *f* a current of cold air may be applied to the mold and plunger for the purpose of cooling the same. I find, however, that it is most practicable to apply this current of air by means of jets 74, arranged at stations *e* and *f* and adapted to play upon the molds and plungers while they are stationary at these points. When the mold reaches the station *f*, it is necessary to swing the spring-plates and plungers to one side to leave the mouth of the mold open and free for the introduction of the molten glass. To accomplish this, in the post 65 is a cam-slot 75, within which projects a pin 76, which passes through and is secured to the sleeve 69. The lower portion of the slot 75 is straight and serves to secure the plungers and spring-plates directly over the mold during the pressing and releasing operations. The upper portion of the slot is curved or cam-shaped and serves to turn the sleeve 69 on the post 65, when the sleeve 69 is lifted to its top position, which lifting is accomplished by the second cam 67^b of the cam-shelf 67, the cam-shelf 67 having four portions—the first cam 67, a level portion 67^a, a second cam portion 67^b, and a decline portion 67^c, which lowers the roller 68, swinging the plate 44 over the mold and gently lowering it to its position on the mold at station *b* ready for the pressing operation.

It will be apparent to those skilled in the art that changes may be made in the mechanisms which I have described without departing from my invention, and, as I have already stated, that these mechanisms may be adapted to the manufacture of other articles than glass insulators.

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

1. In an apparatus for pressing glass, the combination of a rotatory table, a mold mounted thereon, devices for imparting an intermittent rotary movement to the table, a two-part plunger, automatic devices for positively depressing the plunger and for raising the upper part thereof, and automatic devices for rotating the lower part of the plunger to release the same from the glass, the said two parts of the plunger in all of said movements being connected together, substantially as described.

2. In apparatus for pressing glass, the combination of a table, devices for imparting an intermittent rotatory movement to the table, a mold mounted on the table, a two-part plunger, devices for imparting a positive downward movement to the plunger, devices for raising one part of the plunger, and devices for subsequently and automatically releasing the other part of the plunger from the glass by a rotary movement of the plunger the said two parts of the plunger in all of said movements being connected together; substantially as described.

3. In apparatus for pressing glass, the combination of a mold, a two-part plunger one of the parts of which is threaded, devices for depressing the plunger, devices for releasing one part of the plunger by an upward movement, and devices for releasing the other part of the plunger by a gradually-accelerating rotation; substantially as described.

4. In apparatus for pressing glass, the combination of a table, mechanism for imparting an intermittent rotatory movement to the table, a series of molds mounted on the

table, a two-part plunger, mechanism for imparting a positive downward movement to the plunger, a single motor for operating said table and plunger, devices for raising one part of the plunger, and devices for subsequently and automatically releasing the other part of the plunger from the glass by a rotary movement the said two parts of the plunger in all of said movements being connected together; substantially as described.

5. In apparatus for pressing glass, the combination of a rotatory table, a series of molds mounted thereon, devices for imparting an intermittent rotatory movement to the table, a plunger normally above and in line with said molds when brought thereover, and automatic devices for swinging said plunger to one side of said molds when the same are brought to the charging position; substantially as described.

In testimony whereof I have hereunto set my hand.

THOMAS J. CONWAY.

Witnesses:
HARRY MCDONALD,
J. FRANK MANN.