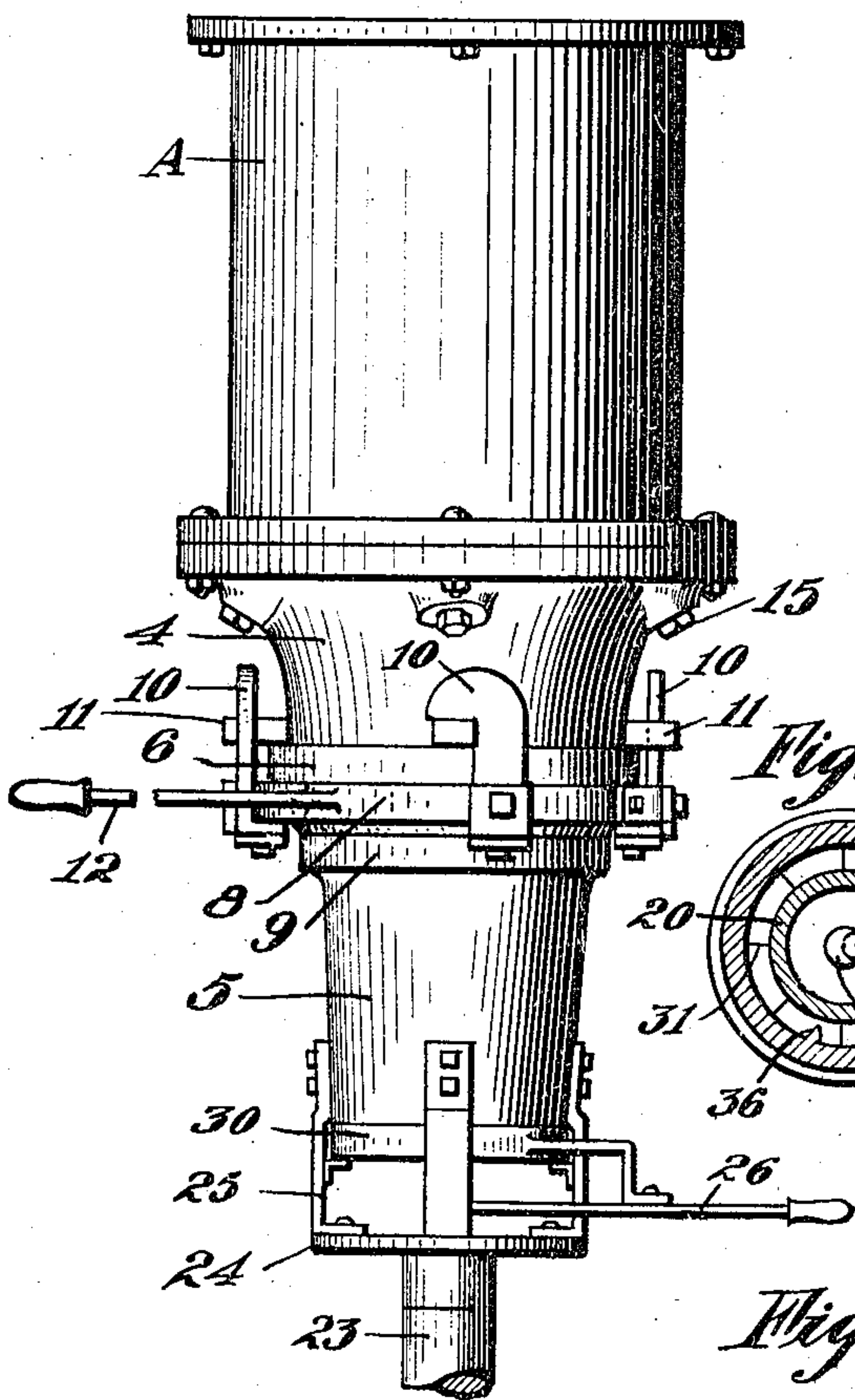


G. F. PEMBERTON.  
 APPARATUS FOR MAKING TAPERING PLASTIC FORMS.  
 APPLICATION FILED OCT. 21, 1909.

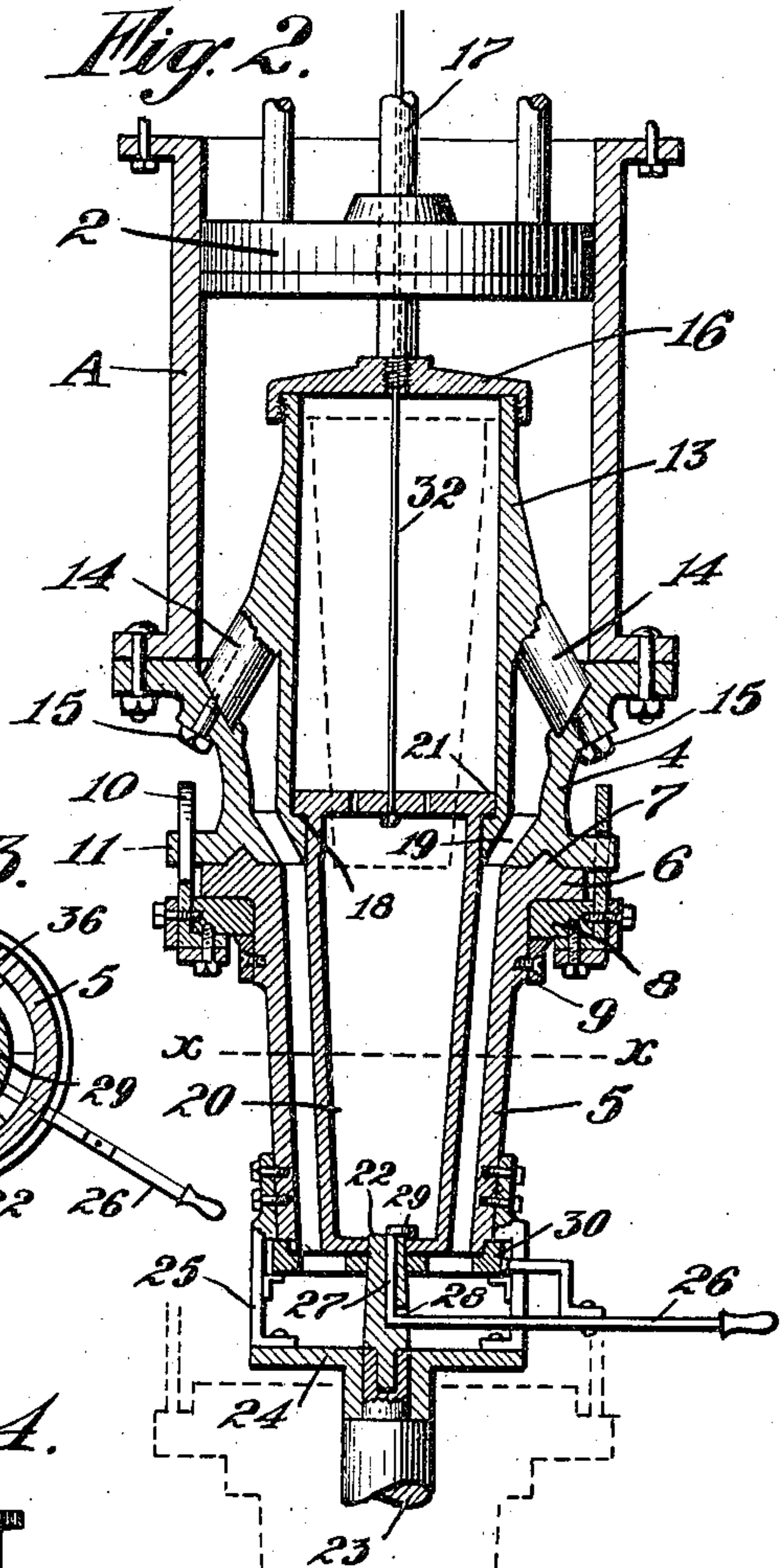
952,684.

Patented Mar. 22, 1910.

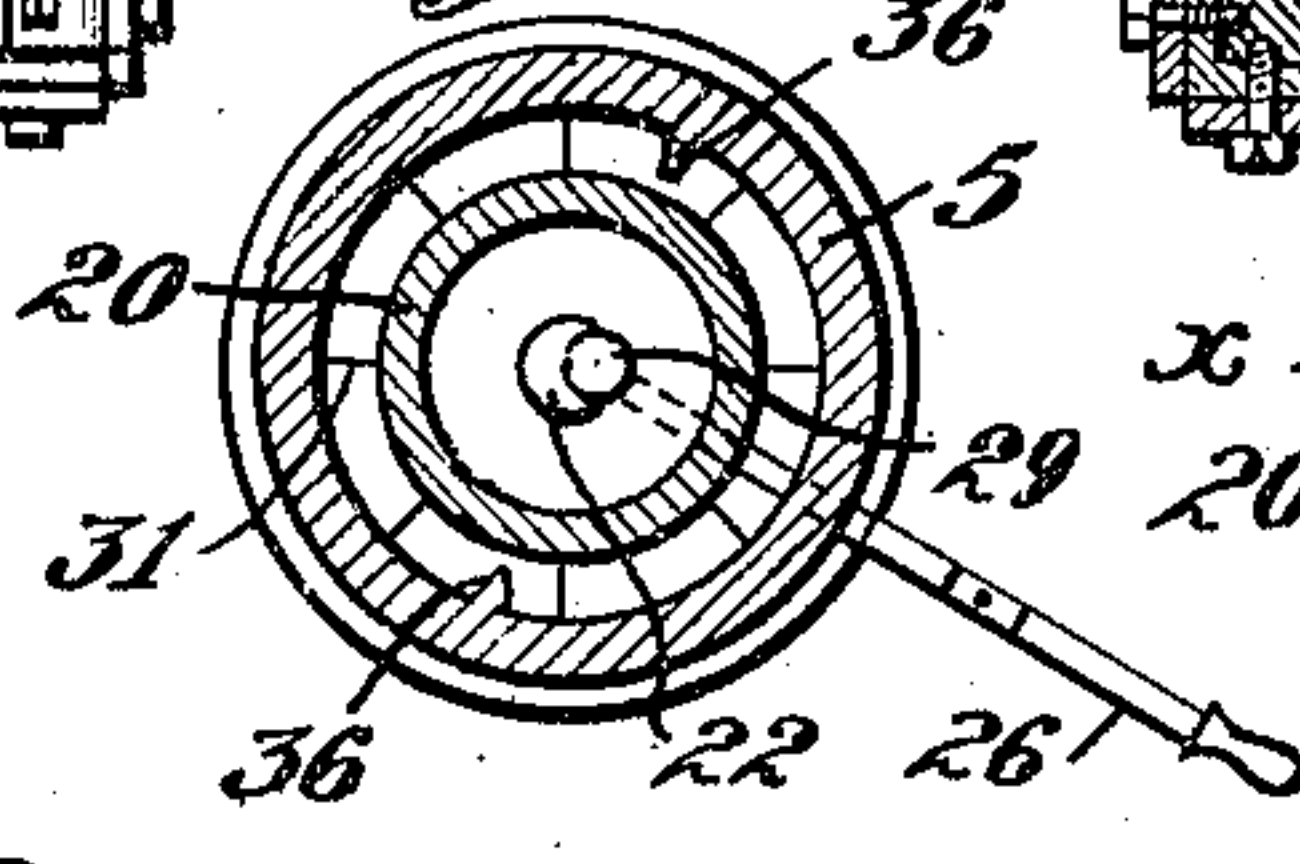
*Fig. 1.*



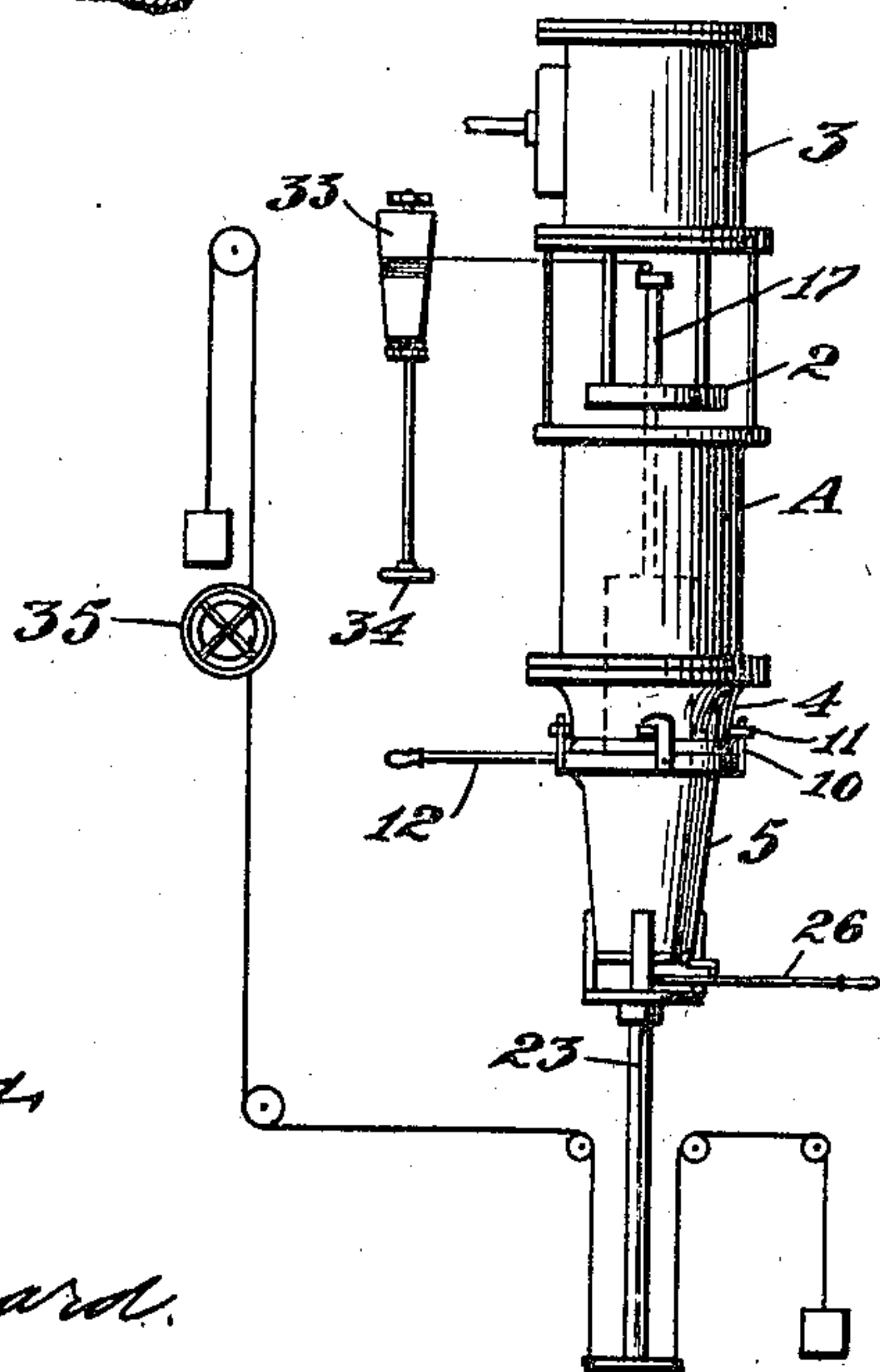
*Fig. 2.*



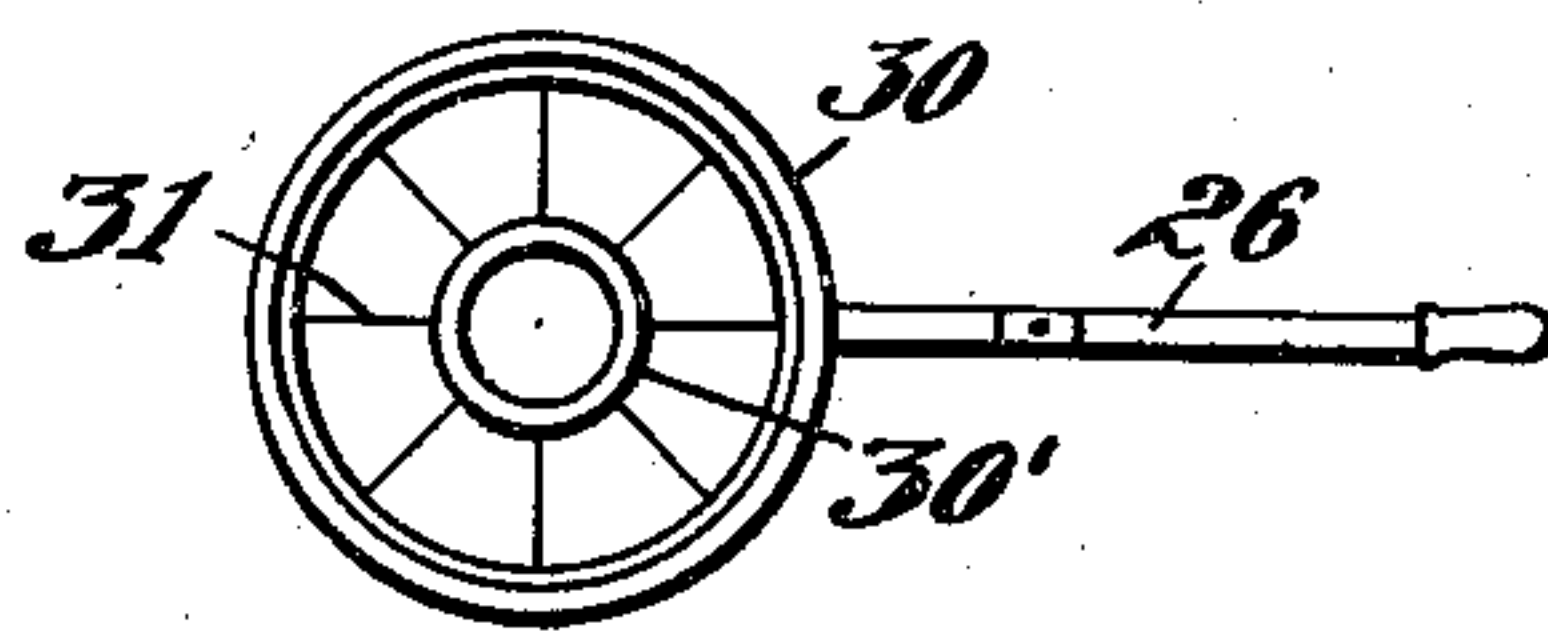
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



WITNESSES;

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 GEORGE F. PEMBERTON  
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# UNITED STATES PATENT OFFICE.

GEORGE F. PEMBERTON, OF LINCOLN, CALIFORNIA.

## APPARATUS FOR MAKING TAPERING PLASTIC FORMS.

952,684.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed October 21, 1909. Serial No. 523,751.

*To all whom it may concern:*

Be it known that I, GEORGE F. PEMBERTON, a citizen of the United States, residing at Lincoln, in the county of Placer and State of California, have invented new and useful Improvements in Apparatus for Making Tapering Plastic Forms, of which the following is a specification.

My invention relates to an apparatus for making tapering tubes, or solid blocks; and is especially designed for making up tubular sections which may be afterward separated to form tiles which are tapered so that they may be telescoped one into the other.

It consists in the combination of parts and details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of the invention. Fig. 2 is a vertical section. Fig. 3 is a cross section on the line  $x-x$  Fig. 2. Fig. 4 is a diagrammatic view showing the invention as applied. Fig. 5 is a plan of the cutting wheel.

My invention is especially designed for the manufacture of circular, elliptical, polygonal, quadrilateral, or other tubes, which are tapered from end to end, and are especially designed for the ultimate formation of segmental tiles which are made tapering, so that they may be telescoped or laid in overlapping series.

In the drawings, A is a clay cylinder such as is used in ordinary clay-pressing machinery, and provided with a pressing piston 2 connected with a steam cylinder 3 in the usual manner.

Secured to the annular flange on the lower end of the cylinder A, is an inwardly converging ring or section 4, having its inner periphery at the top coinciding with the inner surface of the cylinder A, and its inner periphery at the bottom adapted to fit the inner edge of a hollow tapering shell 5.

The upper end of the shell 5 is provided with an annular flange 6, on the upper face of which is formed a ridge 7 adapted to coincide or register with a corresponding groove or channel on the under edge of the convergent ring 4, for the purpose of insuring an exact juncture of the inner surfaces of the members 4 and 5.

A movable ring 8 is mounted on the shell 5 beneath the flange 6, and is held in place

and supported by means of a collar 9 secured to the shell 5. Rigidly secured to the movable ring 8, are dogs or hooks 10 which are adapted to be engaged with lugs 11 on the section 4, so as to securely clamp and sustain the shell 5 in close contact with the section 4. A handle 12 is secured to the ring 8, by means of which the ring may be moved from side to side so as to engage or disengage the dogs or hooks 10 from the lugs 11.

Extending upwardly within the cylinder A is an inner cylinder 13 which is supported upon and connected with the converging ring 4. Legs 14 are formed at intervals around the cylinder 13, and set in pockets in the ring 4, and are secured therein by bolts 15. The upper end of the cylinder 13 is closed by a head or cap 16 threaded thereon. A tubular shaft 17 connects with the cap 16 and extends upward through the pressing piston 2, terminating at a point near the steam cylinder 3, as shown in Fig. 4. The lower end of the cylinder 13 is provided with a flange or shoulder 18 on its inner periphery, and is tapered on its outer surface to correspond with the inner surface of the section 4, thus forming a narrow converging annular passage 19 between the cylinder 13 and the section 4.

20 is a tapered core, which forms the inner portion of the mold, and is tapered to correspond with the outer shell 5, and with a sufficient distance between its outer surface and the inner surface of the shell, to allow the introduction of plastic material to make a product of the desired thickness and shape. The upper end of the core 20 is closed, and fits within the inner cylinder 13, and is provided with a flange 21 which is adapted to rest upon the shoulder 18 to limit the downward movement of the core. The lower end of the core 20 is designed to fit over an upwardly extending tapered pin 22 when in its lowermost position. The centering pin 22 is centrally mounted in the end of a vertical shaft 23 which is secured to the lower end of the shell 5 by means of a disk 24 and brackets 25.

A handle 26 is attached to a stem 27, extending upwardly within the pin 22, the pin being slotted transversely at 28, to permit of sidewise movement of the handle 26. The stem 27 is mounted eccentric to the axis of the pin 22 and has a cam 29 on its upper end which is adapted to engage the bottom



of the core 20, and thus clamp it to the shaft 23 and its connections. This prevents the core being forced upward by the pressure brought to bear on the plastic materials surrounding it, during the molding operation.

Mounted on the brackets 25, and contacting the lower edge of the shell 5, is a cutter for severing the ragged and uneven material which projects below the mold. The cutter consists of outer and inner rings 30—30', with wires 31 radially extending from one to the other across the lower opening of the mold. The cutting wheel connects with the handle 26, so that as the latter is moved side-  
wise to release the clamp 29, the wheel 30 moves therewith around the pin 22, the wires 31 severing the material projecting below the mold.

The core 20 is drawn up into the cylinder 13 by means of a cable 32 which passes through the shaft 17, and is wound around a drum 33 by a hand-wheel 34.

In operation, the materials of which the tile or other products are to be formed, are introduced into the clay cylinder A, below the pressing piston 2 in any suitable manner common to the art. Downward movement of the pressing piston 2, forces the plastic substance through the passage 19 into the space between the shell 5 and core 20, the parts being in the position shown in full lines in Fig. 2. Continued pressure fills the mold, which is indicated by the oozing of the material out through the bottom. The piston 2 is then stopped, and the lever 26 moved so as to unclamp the core 20, and remove the surplus material on the end of the mold as before described. The clamps 10 are then released from the lugs 11, by the handle 12, which allows the shell 5 to drop downward with the counterweighted shaft 23, as shown in dotted lines, which is operated by a hand-wheel 35 in the usual manner. The core 20 is simultaneously drawn upward into the cylinder 13 as before described, leaving the article suspended by its own adherent strength, from the mouth of the passage 19, to be readily removed and afterward dried, baked, and burned, in the usual manner for forming pottery ware. The mold in this case is shown as circular in cross section, however it is obvious that any other form desired can be employed, in which case the section 4 would converge from a circular inner periphery at its top, to such form at its bottom edge as would correspond with the mold below.

As the tapering cast is designed to be separated or divided in halves lengthwise, to form tiles, projecting ridges 36 are formed upon the opposite sides of the interior of the outer shell as shown in Fig. 3. These ridges form indentations in the material of such depth that the complete tubular casts may be readily separated.

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

1. The combination in an apparatus for making plastic forms, of a cylinder and reciprocating plunger, a convergent section attached to the lower end of the cylinder, a tapering mold shell removably connected with said section, an inner cylinder concentric with the outer one, having a convergent flange forming with the convergent section an annular passage to the mold shell, and a tapering concentric core within the mold shell.

2. The combination in an apparatus for making plastic forms, of a compression cylinder and plunger, a convergent section having a flange and means to secure it to the bottom flange of the cylinder, an inner concentric cylinder with downwardly divergent legs, means to secure the legs to the upper part of the convergent section, a tapering core supported and dependent from the inner cylinder, and a mold shell detachably supported from the convergent section.

3. The combination in an apparatus for making plastic forms, of a compression cylinder and plunger, an annular convergent section secured to the open lower end of the cylinder, an inner concentric cylinder having a convergent flange at the lower end, forming with the convergent section, a directing channel, a tapering core suspended from the inner cylinder, a mold shell concentrically inclosing the core, and disengaging locking devices uniting the shell to the convergent section.

4. The combination in an apparatus for making plastic forms, of concentric cylinders, and a compression plunger movable in the outer one, a convergent section dependent from the outer cylinder and a tapering mold core from the inner one, a mold shell concentric with the core, having a flange with an annular ridge, a corresponding grooved flange at the bottom of the convergent section with which the mold shell ridge registers, interlocking lugs and hooks upon the section and the mold shell, and a lever by which they may be engaged or disengaged.

5. The combination in an apparatus for making plastic forms, of concentric cylinders and a compression plunger movable in the outer cylinder, a convergent section fixed to and dependent from the outer cylinder, a mold core having a flange slidable in the inner cylinder and a shoulder at the bottom of said cylinder upon which the core flange normally rests, a mold shell concentric with the core, means for detachably connecting it with the bottom of the convergent section, a hollow plunger rod, a flexible connection with the mold core, extending upward through the rod, and means



acting thereon to withdraw the core into the inner cylinder.

5 6. The combination in an apparatus for making plastic forms, of concentric cylinders and a compression plunger movable in the outer cylinder, a convergent section fixed to and dependent from the outer cylinder, a mold core having a flange slidable in the inner cylinder, and a shoulder upon  
10 the bottom of said cylinder upon which the flange normally rests, a mold shell concentric with the core, means for detachably connecting said shell with the bottom of the convergent section, a closure for the bottom of the mold, means for locking the mold  
15 core to said closure, said means including an upwardly extending tapered pin over which the lower end of the core is fitted, a stem having a cam upon its upper end and eccentric to the axis of the pin, said cam being adapted to engage the bottom of the core  
20 to lock it in position, and a lever by which the stem and cam are turnable.

7. The combination in an apparatus for making plastic forms, of concentric cylinders, a compression plunger movable in the outer cylinder, a convergent section fixed to the lower end of the outer cylinder, a mold shell and concentric core dependent respectively from the convergent shell, and from  
25 the inner cylinder, said core being movable vertically within the cylinder, a locking cam by which the lower end of the core is secured to prevent its being forced up, a lever  
30 by which said cam is turned to engage or disengage a horizontally turnable cutter adapted to trim the lower end of the form, and a lever by which the cutter is moved simultaneously with the movement of the cam.

In testimony whereof I have hereunto set  
40 my hand in the presence of two subscribing witnesses.

GEORGE F. PEMBERTON.

Witnesses:

J. E. WYATT,

A. J. GLADDING.