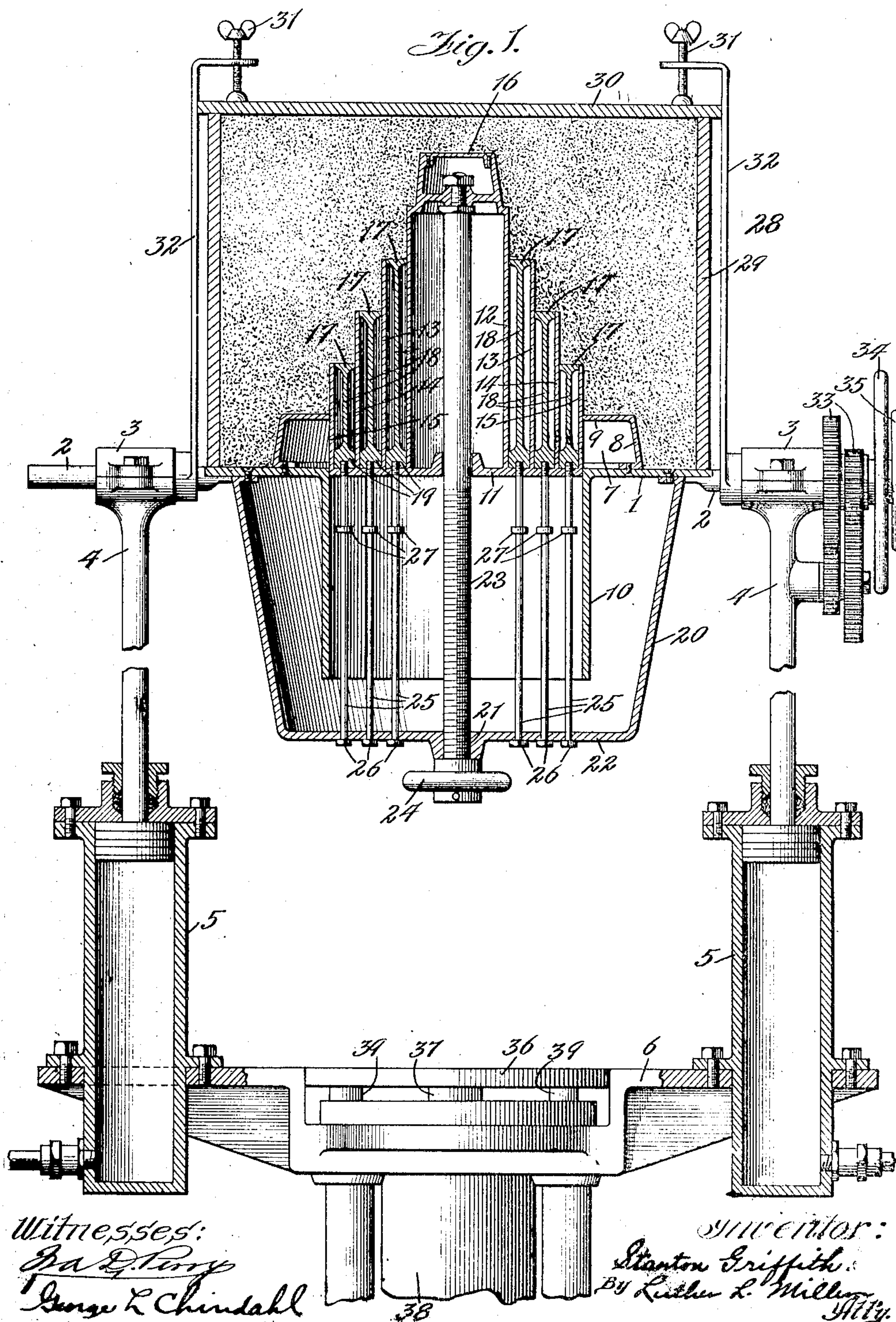


S. GRIFFITH.
MOLDING APPARATUS.
APPLICATION FILED NOV. 25, 1907.

913,126.

Patented Feb. 23, 1909.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

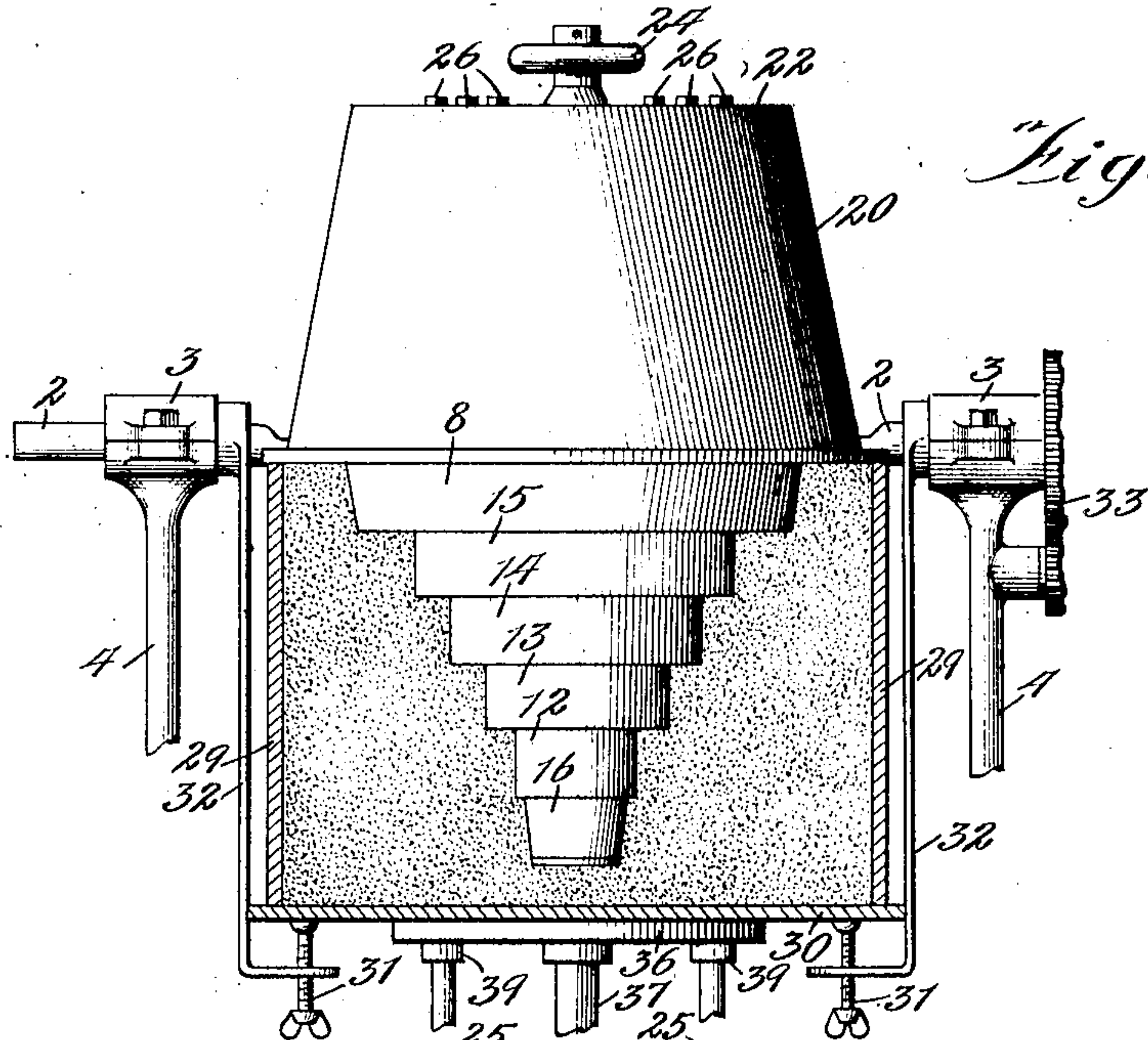


Fig. 2.

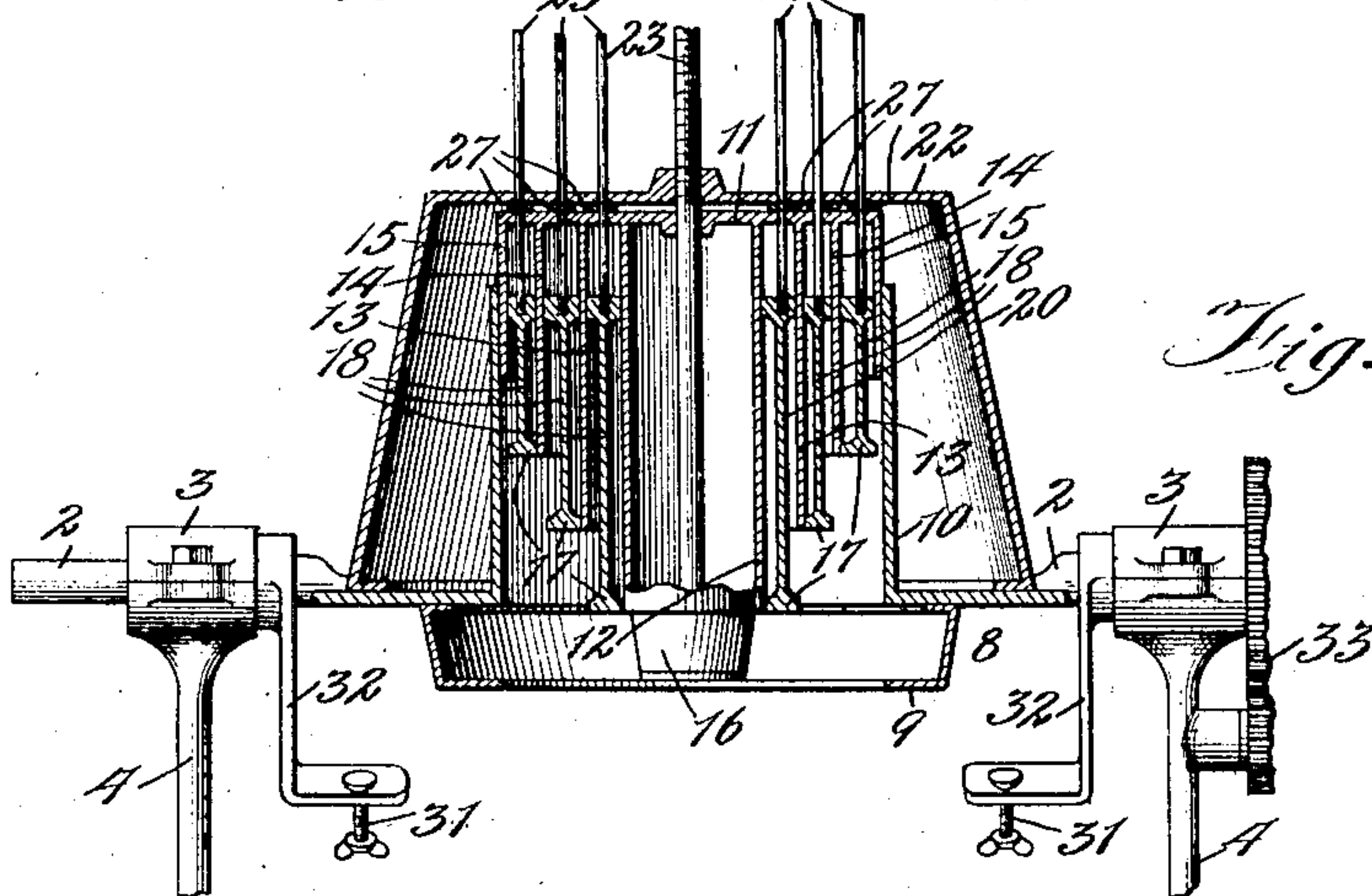
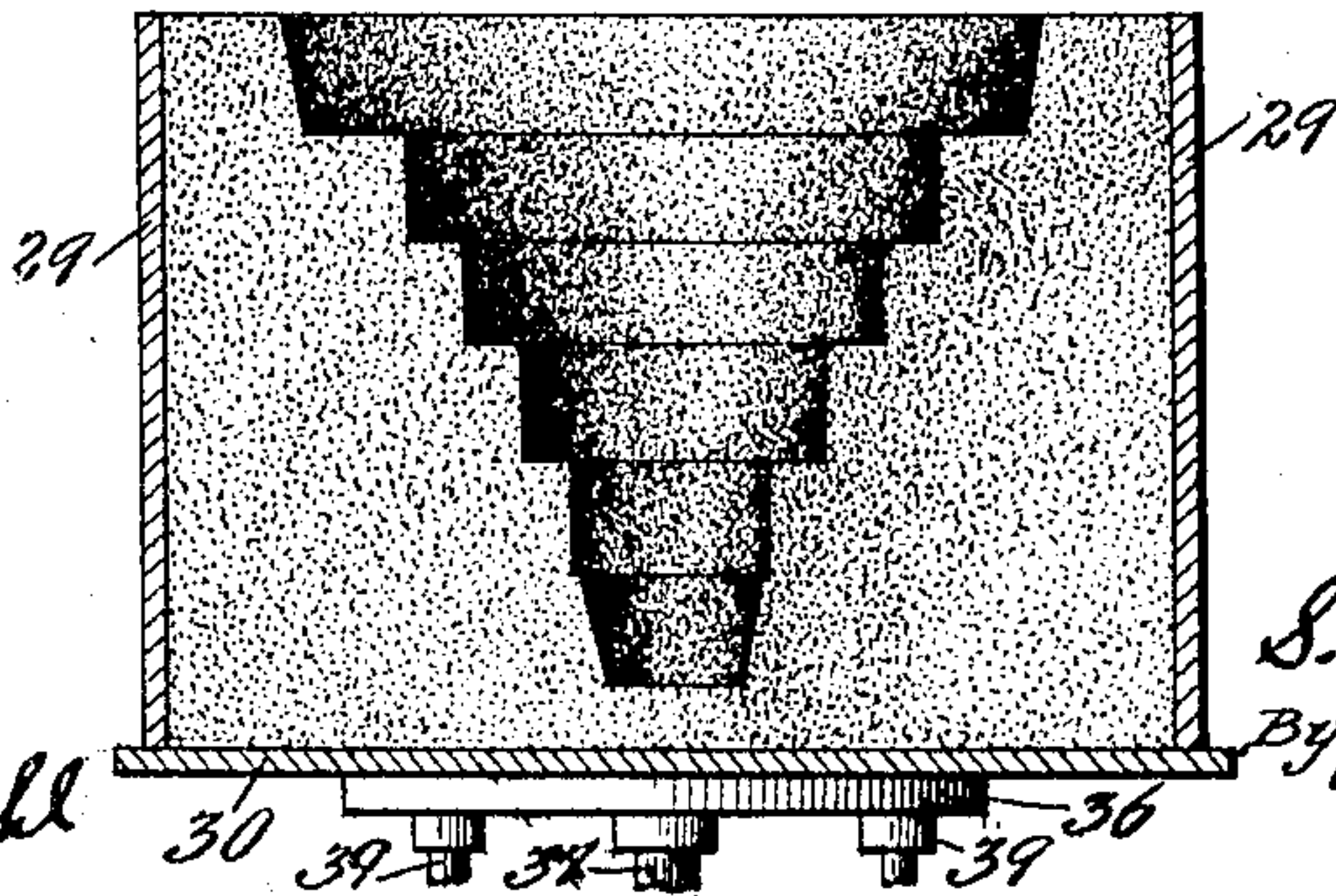


Fig. 3.



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UNITED STATES PATENT OFFICE.

STANTON GRIFFITH, OF ROCKFORD, ILLINOIS.

MOLDING APPARATUS.

No. 913,126.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed November 25, 1907. Serial No. 403,578.

To all whom it may concern:

Be it known that I, STANTON GRIFFITH, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Molding Apparatus, of which the following is a specification.

One of the objects of this invention is the provision, in a molding machine having a pattern and flask arranged to be inverted for the ramming operation, of means for lowering the pattern and the flask to a position where the workman can conveniently ram the sand.

Another object is the production of a collapsible or telescoping pattern.

The invention also relates to the other improvements hereinafter set forth.

In the accompanying drawings, Figure 1 is a vertical central sectional view through a molding machine and telescoping pattern embodying the features of my invention. In this view the flask is shown in the position it occupies during the ramming operation. Fig. 2 is a fragmental sectional view representing the flask as having been rotated into position for drawing the pattern. Fig. 3 shows the pattern drawn and the flask being removed.

In the illustrative embodiment shown in the drawings, the pattern and the flask are supported upon a circular plate 1 provided at two diametrically opposite points with trunnions 2. Said trunnions are journaled in bearings 3 in the upper ends of two standards 4, which standards, in this instance, constitute piston rods for the pistons of two cylinders 5. Said cylinders are rigidly mounted in a vertical position in a frame 6, are connected with a source of pressure-fluid, and are provided with any suitable valve mechanism.

The pattern herein shown is intended for the formation of molds for a stepped pulley having four steps or belt faces. A member 7 having an annular tapering wall 8 and an annular inwardly extending flange 9, is rigidly secured in any suitable way to one face of the pattern-carrying plate 1, and to the opposite face of said plate is fixed in any desired way a guide cylinder 10. Within the guide cylinder 10 is movably mounted a circular plate 11 to which is fixed four concentric cylinders 12, 13, 14, 15, of differing diameters. A part of each of said cylinders

forms the pattern for one of the belt faces of the pulley. The upper end of the central cylinder 12 is closed by a frusto-conical section 16 intended to form a seat for the core in the mold. The outer ends of the cylinders 13, 14 and 15 are closed, in this instance, by means of stripper rings 17, each of which rings, as herein shown, is rigidly connected to one end of a cylinder 18. Upon the opposite ends of the cylinders 18 is formed guide means 19 for guiding the cylinders in their movements between the cylinders 12, 13, 14 and 15.

To the side of the plate 1 opposite to that upon which the pattern is mounted is fixed a housing 20 having a screw-threaded opening 21 in its end wall 22. An operating screw 23 extends through said opening and is rotatably connected with the section 16 of the pattern. To the outer end of the screw 23 is fixed an operating hand wheel 24. Two rods 25 are fixed to each of the cylinders 18 at diametrically opposite points on said cylinders, and pass freely through openings in the plate 11 and the end wall 22 of the housing 20. Upon the projecting ends of said rods are fixed heads 26 adapted to limit their movement in one direction. When said heads stop against said end wall the stripper rings 17 lie in position to close the outer ends of the cylinders 13, 14 and 15. At a suitable point in the length of the rods 25 are fixed collars 27 adapted to be engaged by the plate 11, as will appear hereinafter. The flask 28, in this instance, comprises a cylindrical section 29 and a bottom board 30, the latter being removably held in position by means of clamping screws 31 carried by two arms 32 rotatably mounted upon the trunnions 2.

Any suitable means may be employed for rotating the pattern and the flask. That herein shown comprises a train of reducing gears 33 operated by a hand wheel 34 and locked against movement by a hand wheel 35. After the sand has been rammed the flask is rotated into the position shown in Fig. 2. I have herein shown a table 36 for receiving and withdrawing the flask, said table being carried by the piston rod 37 of a hydraulic or pneumatic cylinder 38. The table is guided in its movements by the guide rods 39.

Assuming the pattern to be in the position indicated in Fig. 3, the operation is as follows: The pattern is extended into operative position by rotating the hand wheel 24. The

rotation of the screw 23 causes the plate 11, with the cylinders 12, 13, 14 and 15 fixed thereto, to be moved downward to extend beyond the member 9, as shown in Fig. 1. Said cylinders in their movement carry with them the cylinders 18 supporting the stripper rings 17. The movement of said stripper rings is positively limited at the proper time by the heads 26 engaging the end wall 22 of the housing 20. Such engagement also positively limits the extent of movement of the pattern-sections 12, 13, 14 and 15. The pattern is then inverted by rotating the hand wheel 34, and lowered by operating the cylinders 5 to a point where the workman can conveniently handle the flask and ram the sand. The flask-section 29 is then put in place and filled with sand. During the ramming, the plate 11 provides an unyielding support for the stripper rings 17. After the sand has been rammed the bottom board 30 is put in position and secured by means of the clamping screws 31. The pattern and the flask are then elevated by means of the cylinders 5, and the flask rotated into the position shown in Fig. 2. After the table 36 has been placed beneath the flask, the pattern is drawn by rotating the operating screw 23. The rotation of said screw moves the plate 11 through the guide cylinder 10, said plate carrying with it the cylinders 12, 13, 14 and 15. The stripper rings 17 remain in the position they occupied during the molding operation, until the plate 11 engages the collars 27, when said stripper rings are drawn into the guide cylinder 10. As will be seen, the sections of the pattern are positively guided to move in straight lines, and their movement is so firm and steady that the castings made from the mold are smooth and true, consequently greatly lessening the amount of machining necessary in finishing the castings. After the pattern has been drawn, as just described, the clamping screws 31 are loosened, the arms 32 swung to one side, and the table 36 lowered with the flask resting thereon. Said flask is then removed from the machine in any convenient manner.

The foregoing detailed description has been given for clearness of understanding only and is not to be regarded as in the nature of an undue limitation.

I claim as my invention:

1. A collapsible stepped-pulley pattern comprising a set of cylinders and a set of stripper rings, said sets of members being movable with relation to each other.

2. A pattern comprising a guide cylinder; and a plurality of concentric cylinders secured together and movable in said guide cylinder.

3. A pattern comprising a guide cylinder; a set of concentric cylinders secured together and movable into and out of said guide cyl-

inder; stripper rings closing the outer ends of certain of said cylinders; means for moving said cylinders; and members attached to said stripper rings adapted to be engaged by said cylinders in the movement of the latter.

4. A pattern comprising a guide cylinder; a set of concentric cylinders secured together and movable within said guide cylinder; stripper rings for closing the outer ends of certain of said cylinders; means for moving said cylinders; a member attached to each stripper ring adapted to be engaged by said cylinders in the movement of the latter; and means for limiting the movement of said members in one direction.

5. In a molding apparatus, a pattern-carrying plate; a guide cylinder on said plate; a set of concentric cylinders secured together and movable within said guide cylinder; stripper rings for closing the outer ends of certain of said cylinders; a screw for moving said cylinders; a structure secured to said pattern-carrying plate, with which structure said screw has a screw-thread connection; and means attached to said stripper rings adapted to be engaged by said cylinders in the movement of the latter, the movement of said cylinders and stripper rings in one direction being limited by said structure.

6. In a molding apparatus, a pattern-carrying plate; a guide cylinder attached to said plate; a set of concentric cylinders secured together and movable within said guide cylinder; stripper rings for closing the outer ends of certain of said cylinders; a screw for moving said cylinders; a structure attached to said pattern-carrying plate, with which structure said screw has a screw-thread connection; rods attached to said stripper rings and extending through said structure; means on said rods adapted to be engaged by said cylinders in the movement of the latter; and means on said rods adapted to engage said structure for limiting the movement of said cylinders and stripper rings in one direction.

7. A pattern comprising a guide cylinder; a set of concentric cylinders secured together and movable within said guide cylinder; stripper rings for closing the outer ends of certain of said cylinders; guide means attached to said stripper rings and lying between said cylinders for guiding said stripper rings in their movements; and means for moving said cylinders and stripper rings.

8. A pattern comprising a circular plate; a plurality of concentric cylinders of different lengths secured to said plate; guide means for said cylinders; stripper rings for closing the outer ends of certain of said cylinders; and means for moving said cylinders and said stripper rings.

9. A pattern comprising a circular plate; a plurality of concentric cylinders of different lengths secured to said plate; stripper rings

for closing the outer ends of certain of said cylinders; means attached to said stripper rings and extending through said plate and adapted to be engaged by said plate in its movement; and means for moving said plate and the cylinders attached thereto.

10. In a molding apparatus, a pattern-carrying plate; a guide cylinder on said plate; a circular plate; a set of concentric cylinders of different lengths secured to said plate and movable into and out of said guide cylinder; stripper rings for closing the outer ends of certain of said cylinders; guide means attached to said stripper rings and slidably mounted between said cylinders for guiding said stripper rings; rods attached to said guide means and extending freely through said circular plate; a structure se-

cured to said pattern-carrying plate; a screw attached to one of said movable cylinders and having a screw-thread connection with said structure for moving said set of concentric cylinders; means on said rods adapted to be engaged by said circular plate in its movement, said plate being arranged to engage said guide means for moving said stripper rings into operative position; and members on said rods adapted to engage said structure for limiting the movement of said set of cylinders and said stripper rings in one direction.

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Witnesses:

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