

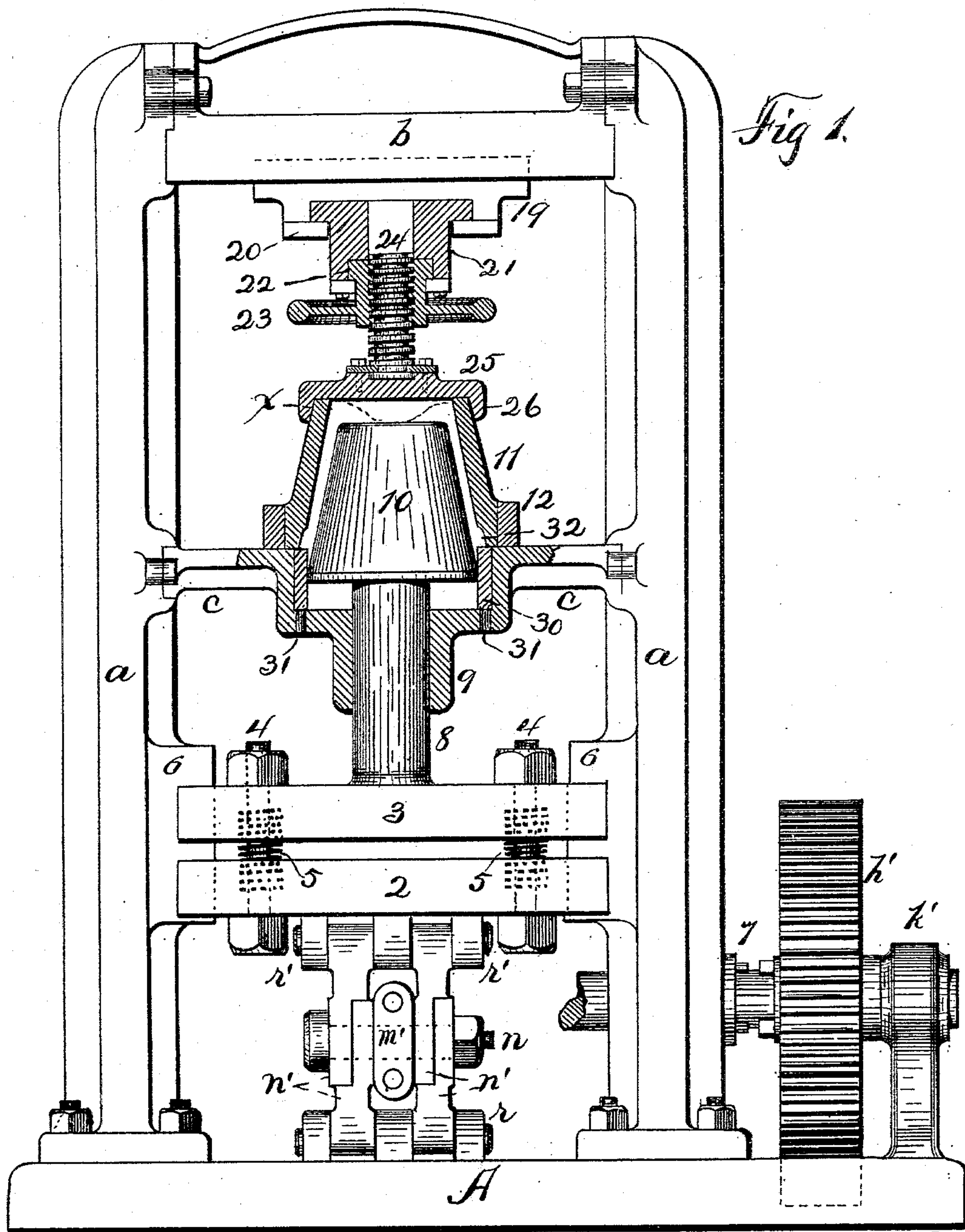
(No Model.)

3 Sheets—Sheet 1.

C. BREITSCHWERTH.  
POTTERY MACHINE.

No. 546,297.

Patented Sept. 17, 1895.



INVENTOR

WITNESSES:

Chas. W. Marvin.

E. S. Borst,

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BY

Smith & Denison  
his ATTORNEYS.

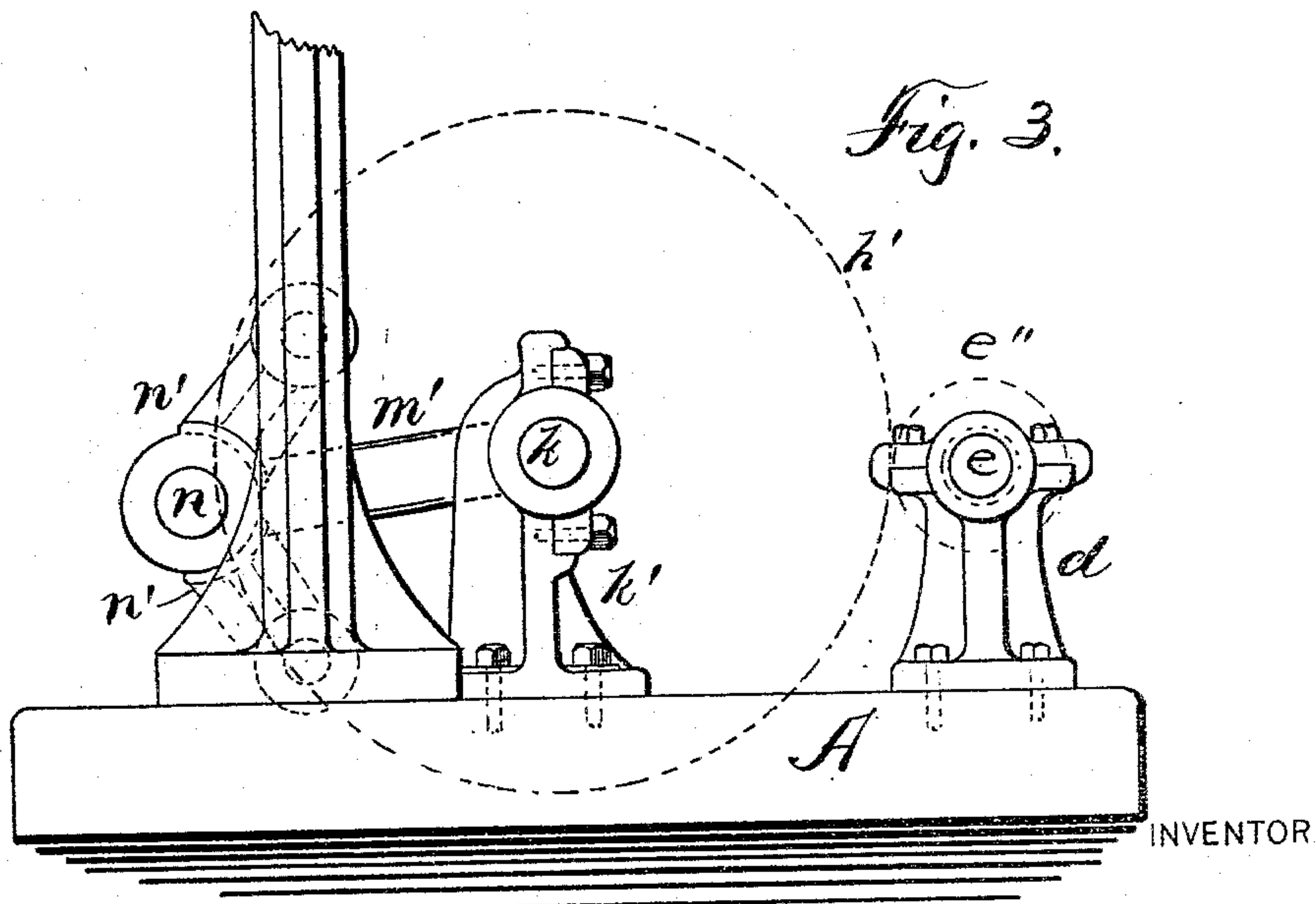
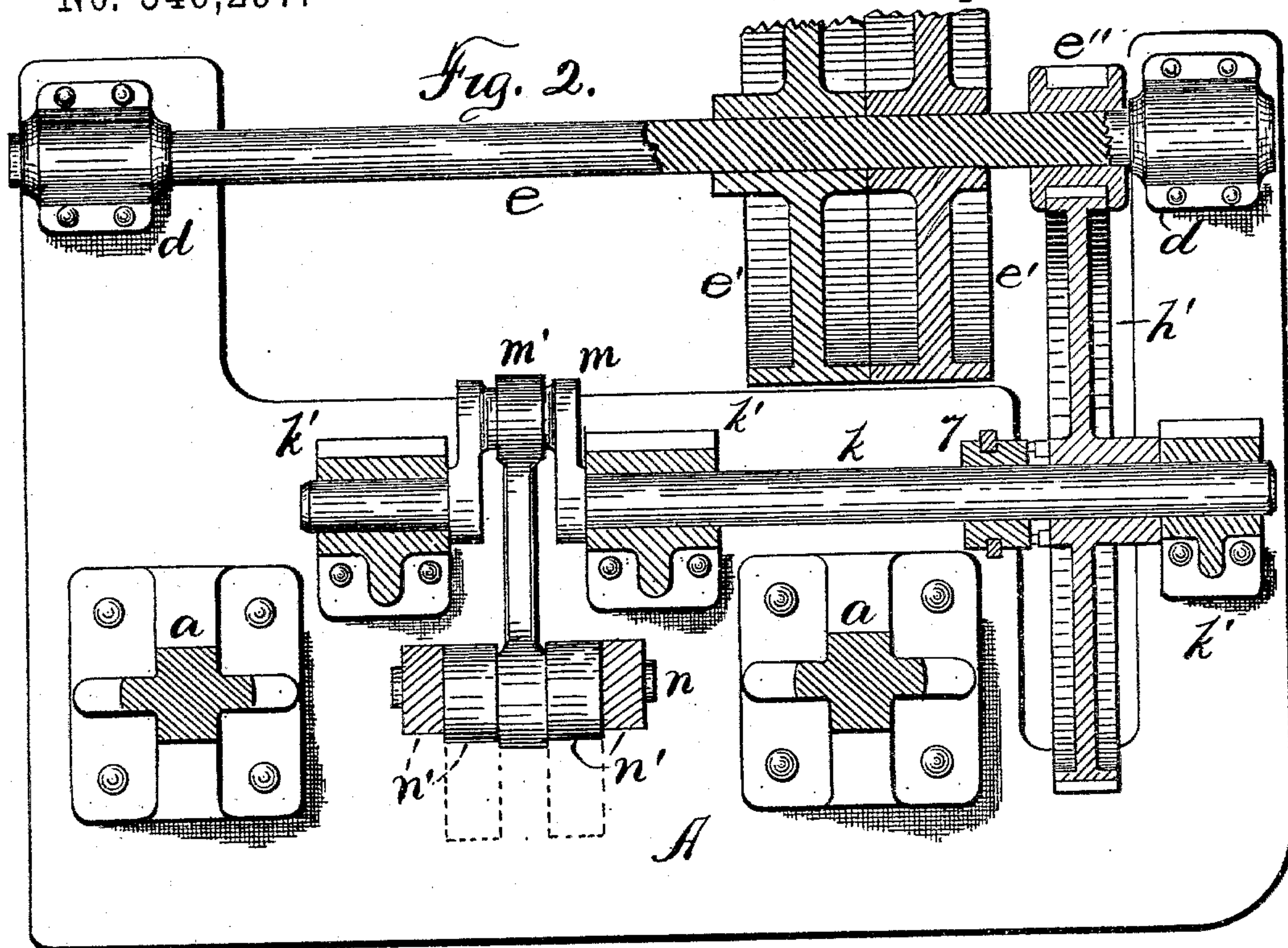
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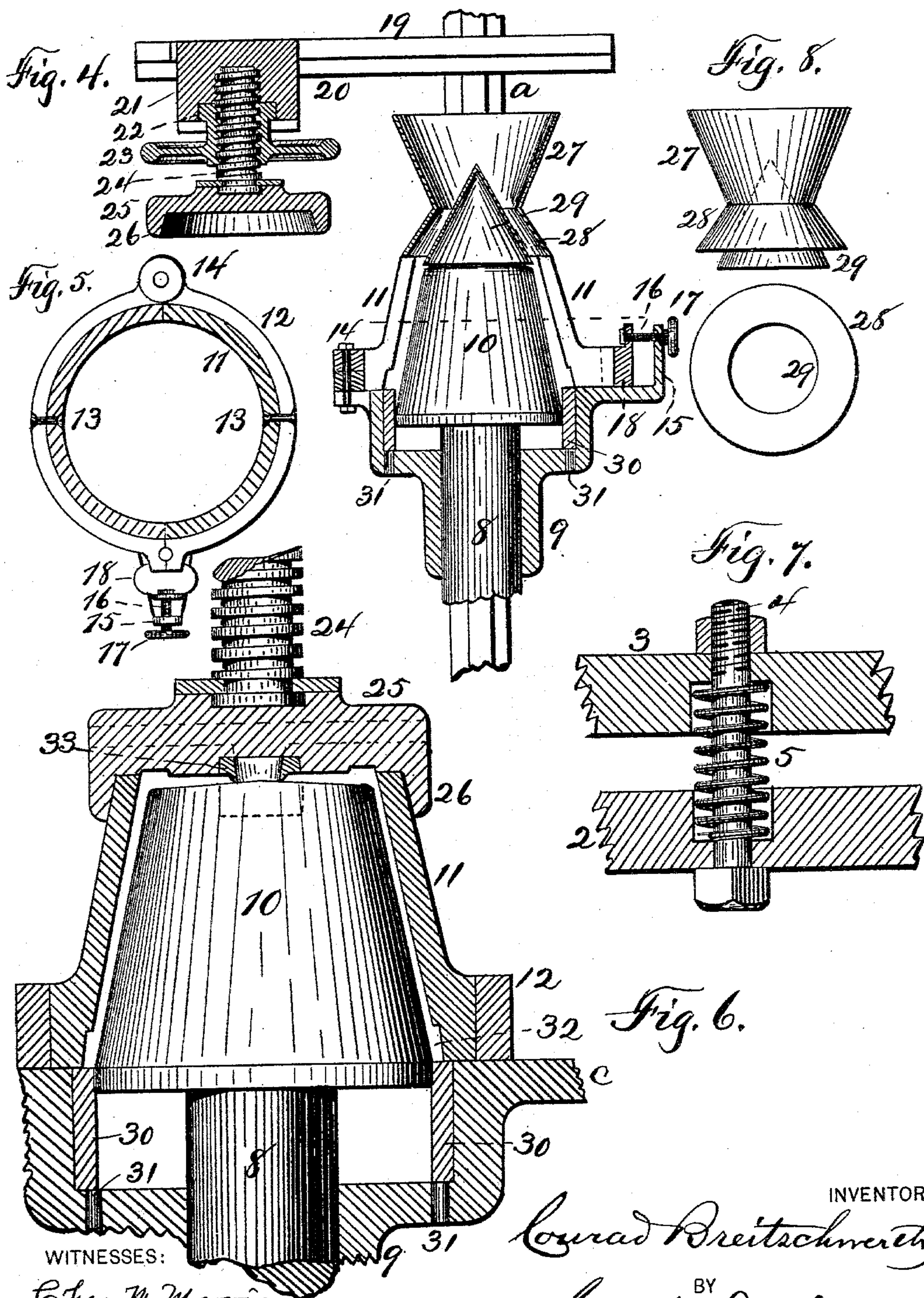
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# UNITED STATES PATENT OFFICE.

CONRAD BREITSCHWERTH, OF SYRACUSE, NEW YORK.

## POTTERY-MACHINE.

SPECIFICATION forming part of Letters Patent No. 546,297, dated September 17, 1895.

Application filed August 27, 1894. Serial No. 521,387. (No model.)

*To all whom it may concern:*

Be it known that I, CONRAD BREITSCHWERTH, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Pottery-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to machines for making pottery by compression of dry or substantially anhydrous pulverized material or clay in a suitable mold and a reciprocating plunger.

My object is to produce pottery, as flower-pots or other hollow or concave ware, from dried and pulverized material, as clay, by pressure in an inverted mold by means of a vertically-reciprocating plunger and die or former thereon, said mold being sectional, adapted to be filled from the bottom when opened, and then closed, means being provided whereby the length of the stroke of the plunger may be varied according to the size of the pot being constructed, also to vary the pressure, starting with light force and gradually increasing in strength until the maximum is reached, such pressure being exerted by toggle arms or levers actuated by a pitman-rod actuated by a crank, means being also provided whereby the mold-sections are adapted to be opened, and when closed are clamped together, and, further, means being provided to close the upper end of said mold by a vertically-reciprocated clamp and closure combined, and when the same is raised clear from the mold, whereby said closure can be shifted to one side in order that the mold may be refilled, and means being provided whereby the pressed pot is left upon the table when the plunger is withdrawn from within it and the mold is opened for the removal of the pot, said pot being then in proper condition and ready for burning in a kiln.

My invention consists in the several novel features of construction and operation hereinafter described, and which are specifically set forth in the claims hereunto annexed.

It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of the machine,

sectional as to part of the table, plunger-chamber and guide, mold and its closure and its mounting. Fig. 2 is a top plan, partly sectional, of the base and the plunger-driving mechanism, the standards being cut off. Fig. 3 is a side elevation of the base and the plunger-driving mechanism. Fig. 4 is a sectional detail of the mold, plunger, and mold-filler, the mold-closure being pushed to one side. Fig. 5 is a transverse section of the mold, showing the lock in top plan. Fig. 6 is an enlarged sectional detail of the mold, its top closure, and the die former or plunger within the mold, as when the pot is fully pressed. Fig. 7 is a sectional detail of part of the bed-plates between the die-stem and the mechanism for vertically reciprocating them and the means for vertically adjusting them with reference to each other to vary the stroke of the die or former, as for pots of different size. Fig. 8 is a side elevation and top plan of the filler.

A is the base upon which the standards *a* are erected. Connected at the top by the beam *b* and *c* is the work-table, mounted upon the standards. Pillow-blocks *d* are also erected upon the base, and in them the drive-shaft *e* is journaled and provided with an ordinary pair of fast and loose pulleys *e'*, and *e''* is a drive-gear engaging with the gear *h'* upon the shaft *k*, journaled in the bearings upon the pillow-blocks *k'* and provided with a crank *m*, upon which one end of the pitman *m'* is mounted, its other end being journaled upon the bar *n*, upon which the toggle-levers *n'* are also pivoted, the lower end of the lower levers being pivoted in bearings *r* upon the base and the upper ends of the upper levers being pivoted in bearings *r'* upon the lower side of the follower. This follower is composed of sections 2 3, which are adjustably connected by bolts 4 and springs 5 around the bolts, and the ends of said sections engage with the guides 6 upon the standards and are adapted to be reciprocated vertically thereon by the operation of the toggle-levers actuated by said pitman and crank and the revolution of the crank-shaft. By an ordinary clutch operated by a foot-treadle in the usual way, and not here shown, the rotation of the crank-shaft is made intermittent at the will of the operator,



the sliding members thereof 7 engaging with the hub of the gear  $h'$ , which is loose upon said shaft, said clutch member being splined onto said shaft in the usual way. Upon the  
5 follower the stem 8 is erected, passing through the guide 9 below the table and up into the die-chamber, the lower part of said chamber being shown as created by a recess 10 in the top of the table.

10 The die 10 is removably mounted upon the stem and extends up into the inverted mold 11. This mold is sectional, comprising a sectional shell, shown as in two sections, and a sectional reinforcing-ring 12, which is detach-  
15 ably connected to the mold-sections, as by bolts 13, the rear ends of the ring-sections being hinged together at 14, and the front ends are clamped together.

Upon the table is a post 15, through which  
20 the threaded screw 16 passes, provided with a hand-wheel or other shaped head 17, and its inner end is pivoted in the clamp 18, which slides upon the table, its jaws being adapted to engage with the ring-sections and securely  
25 grip them together. The mold-body is open at both ends and reversed, or bottom side up.

Under the beam  $b$  a block 19 is secured, provided with ways 20, upon which the slide  
30 21 is mounted, and 22 is a rotating nut mounted in said slide and being, in fact, the hub of the hand-wheel 23, and which operates to raise and lower the screw 24, which is secured to the mold-closer 25, comprising a body and an interiorly-beveled flange or rim 26, adapt-  
35 ed to fit over the upper end of the mold and close it, and to be raised above it and pushed aside out of the way of the filler when it is desired to fill the mold. This filler consists of a hopper 27, a flanged support 28, which  
40 rests upon the mold, and a conical distributor 29, supported in said flange and hopper in a detached position by any ordinary means, so that when the material, as pulverized or powdered clay, substantially anhydrous, is  
45 poured into the filler it will flow over the distributor and down into the chamber between the interior of the mold and the sides of the die, fill it evenly without any artificial compacting or packing, and up into the filler to-  
50 ward the top of the distributor, so that when the filler is lifted the material will pile up, as at  $x$  in Fig. 1, around and upon the edge of the die, while very little will be upon the central portion of the head thereof.

55 An annular ring 30, or more than one or a thicker one, adapts the recess in the table to fit the lower edge of the die, so that very little of the material will fall into the bottom of the recess; but if it does it can be brushed  
60 out through one or more holes 31 in said bottom. The ring or rings 30 adjust the size of said recess according to the size of the die used and the size of the pot made. The interior of the mold-body is recessed annularly,  
65 as at 32, to create the flange or reinforcement around the top of the pot. When the mold has been filled, as aforesaid, the cap or closer

25 is brought into position and lowered and screwed down tightly onto the mold, tightly closing and locking the mold and its sections. 7c  
Then the clutch is operated to connect the crank-shaft to the driving mechanism and rotate it, such rotation starting with the pitman and toggle-levers in substantially the position shown in Fig. 3. Said pitman will gradu- 75  
ally draw them in toward and to a straight line until, when they are straight, the limit of the stroke is reached. When said pitman starts to move said toggles, the follower is ele- 80  
vated, the lower section first, until the springs are partly compressed, and then both sections rise substantially together, and as the pressure increases the sections are gradually brought together until, prior to the limit of the stroke, they are almost if not actually to- 85  
gether and move as one. This raises or forces the die upward into the mold and presses the pot. When the die starts, the lower edge of the die raises the material in the angle below it and the wall of the recess up into the mold, 90  
furnishing the additional material necessary for properly making the flange on the pot. At the same time the sides of the die are compacting the material around it, and the top of the die, acting upon the material there- 95  
on, compresses it, and as the pressure increases the purposely-created over-plus and heaped material around and upon the edge of the die, when compacted to a certain degree, is squeezed inwardly onto the center of the mold 100  
and die and forms the bottom of the pot, and the top of the die being sloping gives the inward drainage to the pot.

When the toggles reach the limit of their stroke, the dry clay has reached the limit of 105  
compression and the pot is formed. Then when the crank passes the center the toggles begin to become angular to each other. This first retracts the lower follower-section, aided by the springs, and at the same time the 110  
springs hold the die in the mold for a little while, with the material under full pressure. Then the die is drawn down out of the mold. When the die starts, the flange of the pot operates to destroy all the strong cohesion and 115  
adhesion of the mold to pot and releases the die, and when it is fully retracted the release of pressure upon the treadle shifts the clutch and stops the rotation of the crank-shaft. Then the cap is raised from the mold, the 120  
mold is opened, and the pot so made from dry clay is removed, all ready for burning. When desired, the hole in the bottom of the pot is made by means of the auxiliary or punching die mechanism 33, Fig. 6, which is fully shown 125  
and described in the Letters Patent granted to me March 29, 1892, No. 471,807, for a pottery-machine. Then the mold is shut up, re-filled and reclosed, ready to press another pot.

My process, based upon and employing sub- 130  
stantially the above-described apparatus, consists, first, in the making of pottery from dry pulverized material; second, in making it from such material in an inverted mold hav-



ing a removable closure and a vertically-reciprocated die or former within the mold; third, in filling the mold so that the uncompacted material is thicker at or adjacent to the edge of the top of the die than it is in or upon the center thereof, whereby at least part of the bottom of the pot is created from material squeezed inwardly from the edge of the die.

It will be readily seen that while heretofore articles have been produced by the compression of wet and plastic materials in a mold by a reciprocating die the process is very different, because where wet and plastic clay has been used it has not been possible to feed it evenly, if at all, in between the die and the mold, so that it has been usually fed onto the mold in the form of a ball and the pressure has been wholly relied upon to force the material around over the sides of the die and mold to form the sides of the pot, and where liquid or semi-liquid material or pulp is used the mold must be provided with means for drainage of the water which is expressed from the material, and the die is usually also perforated for the same purpose.

It will also be seen that by my process there is no necessity of oiling or greasing the interior of the mold or exterior of the die to aid in the expansion of the material under pressure to cause it to fill the chamber and become expanded into a pot by rendering the sides of the chamber slippery, and whereby the oil or grease becomes incorporated into or more or less absorbed by the clay and causes seams and checks and weak spots in the pot when it is burned, as is the case where plastic clay is used.

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

1. The hollow stationary portion of the mold, the removable cap piece applied to the upper end of the mold, a screw for operating the cap, a rotating nut for the screw, a slide in which the nut is supported, and tracks on which the slide is moved laterally, substantially as described.

2. In a pottery machine, the mold, a vertically moving cap piece, a screw for vertically operating the cap piece, and a laterally moving slide to which the screw is connected, whereby the cap piece can first be moved over the mold, and then adjusted vertically, substantially as set forth.

3. In a pottery machine, the combination with a sectional mold, of a lock consisting of a sectional ring around the mold, a sliding jaw, engaging with said ring sections adjacent to their meeting edges to clamp it around said mold.

4. In a pottery machine, the combination with a sectional mold, of a lock consisting of a sectional ring around the mold, a horizontally sliding jaw engaging with said sections adjacent to their meeting edges to clamp the mold sections, and a flanged cap adapted to be mechanically lowered to close and lock the top of the mold and to be mechanically raised to open it for filling.

In witness whereof I have hereunto set my hand this 23d day of August, 1894.

CONRAD BREITSCHWERTH.

In presence of—

C. W. SMITH,

HOWARD P. DENISON.