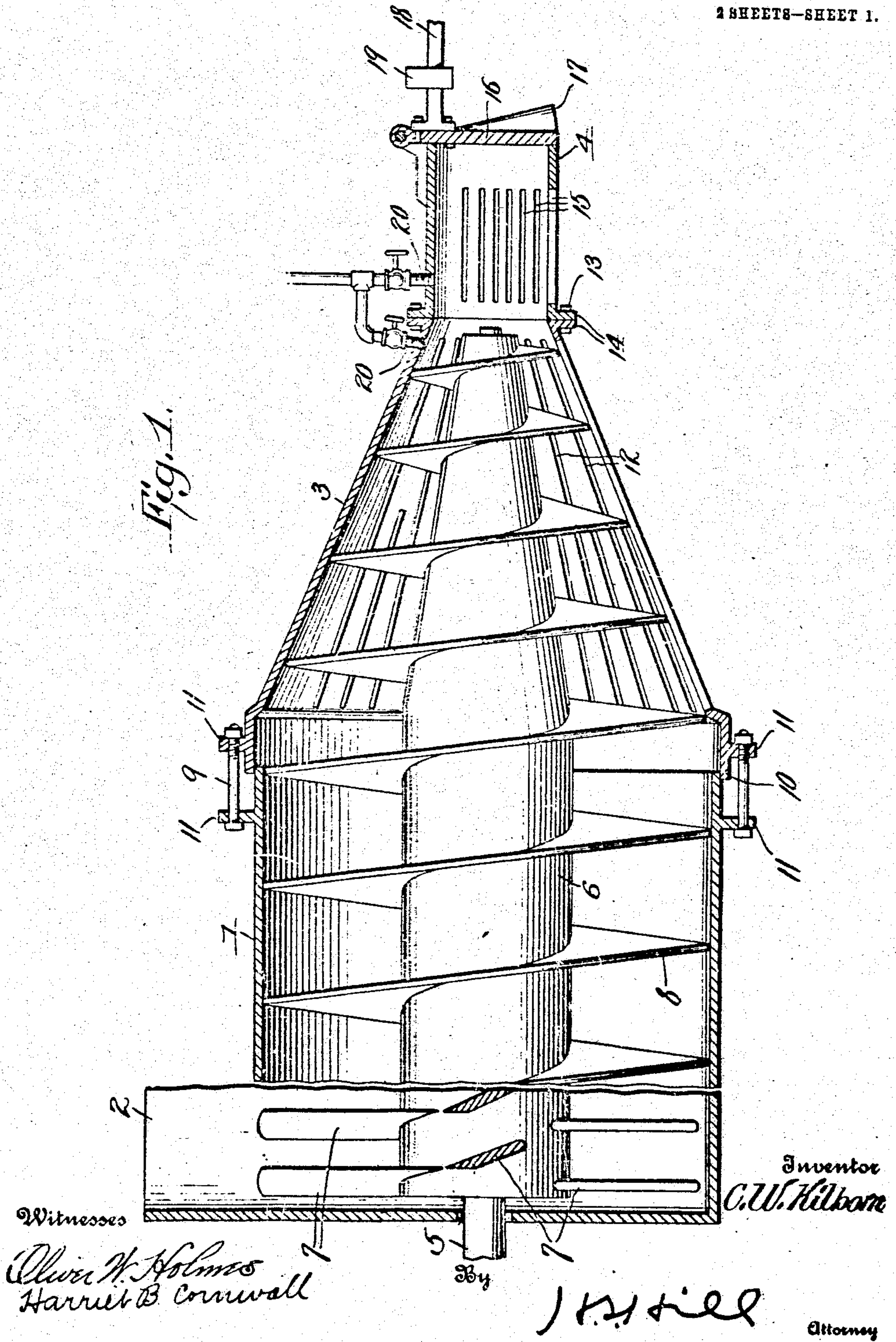


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APPLICATION FILED MAY 23, 1910.

970,240.

Patented Sept. 13, 1910.

2 SHEETS—SHEET 1.



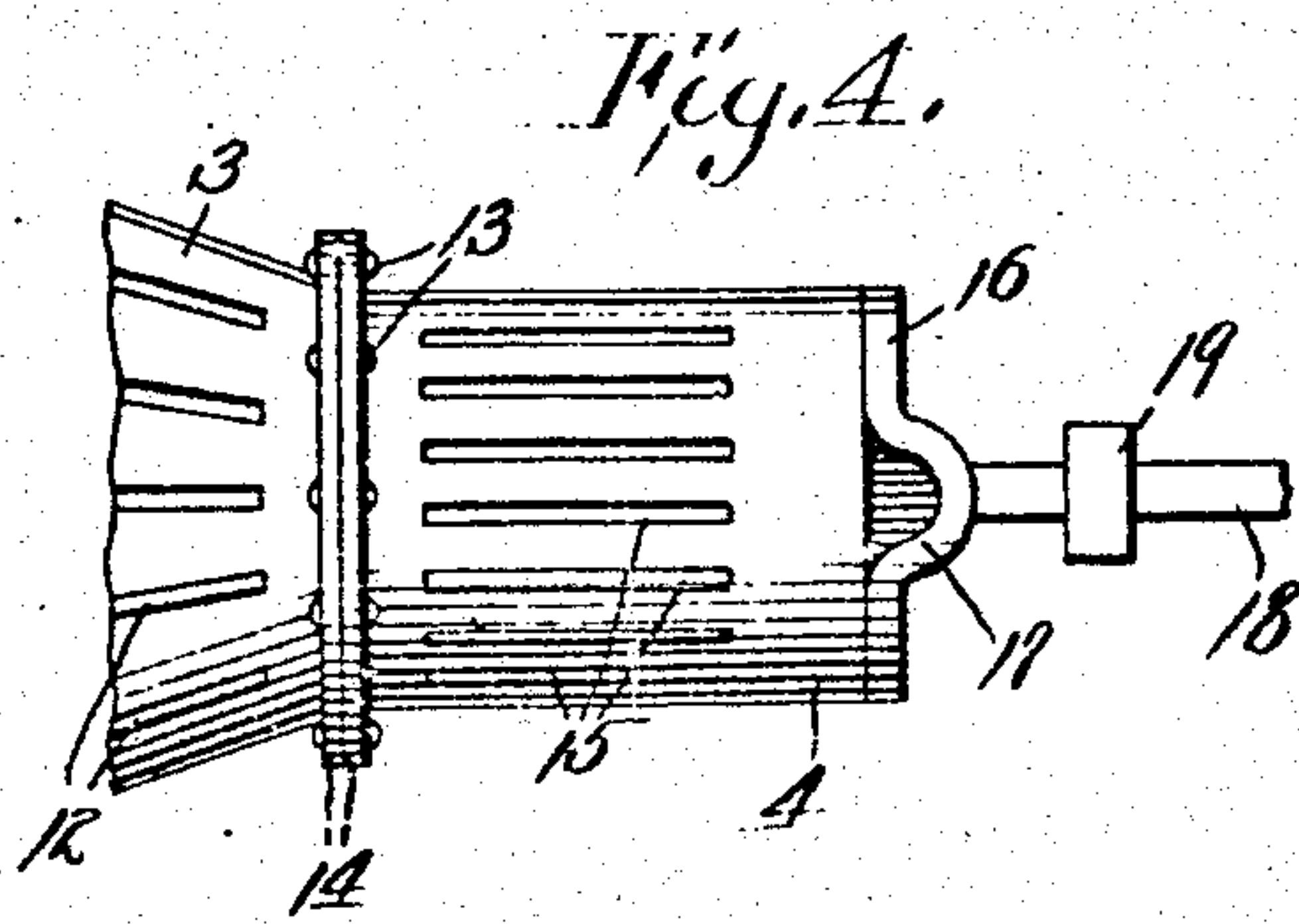
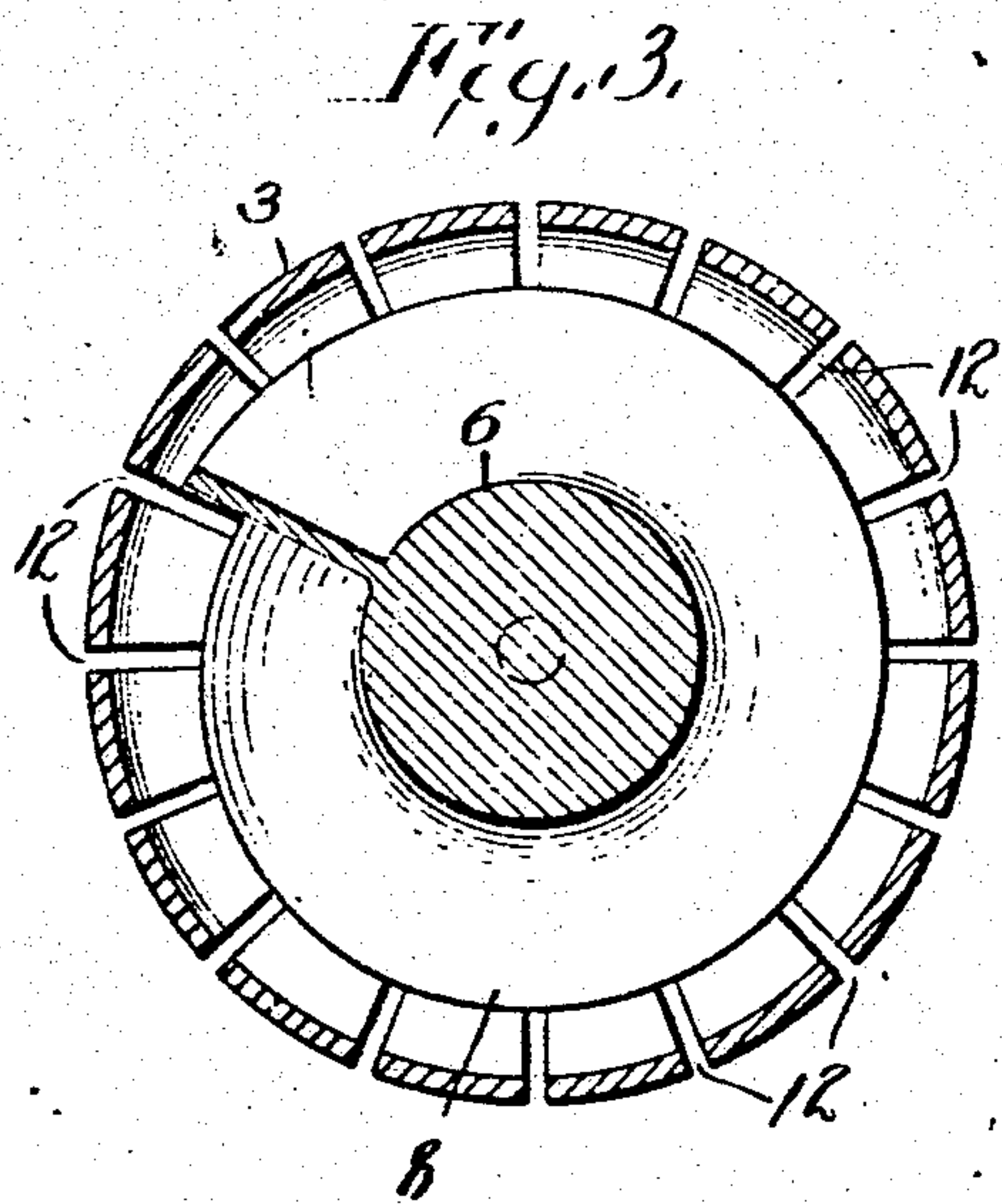
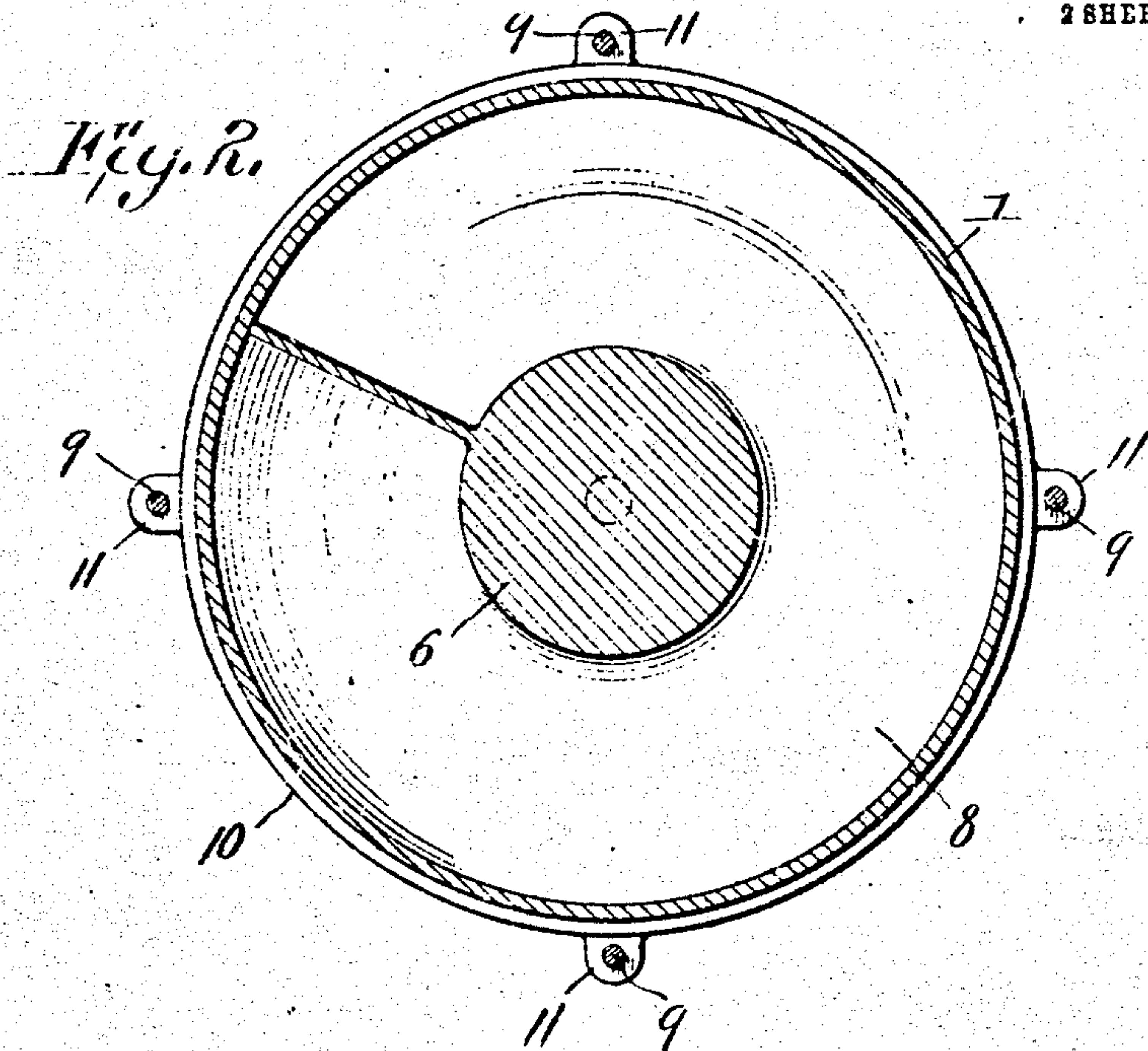


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Witnesses

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# UNITED STATES PATENT OFFICE.

CHAUNCEY W. KILBORN, OF ROSENHAYN, NEW JERSEY.

PUG-MILL AND STONE-SEPARATOR.

970,240.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed May 23, 1910. Serial No. 562,873.

*To all whom it may concern:*

Be it known that I, CHAUNCEY W. KILBORN, citizen of the United States, residing at Rosenhayn, in the county of Cumberland and State of New Jersey, have invented certain new and useful Improvements in Pug-Mills and Stone-Separators, of which the following is a specification.

The present invention relates to a combined pug mill and stone separator, and has for its primary object to provide a device of this character by means of which the desired homogeneity of the clay is attained by only one simple process between the clay as dug and the molding of the ware.

The invention further contemplates a pug mill and stone separator which is simple in its construction, which will operate in an effective manner to work the clay and remove all stones and hard substances thereof while in a plastic condition, and which comprises few and durable parts capable of withstanding the wear and tear to which such devices are subjected when in use.

With these and other objects in view, the invention consists in certain combinations and arrangements of the parts as will more fully appear as the description proceeds, the novel features thereof being pointed out in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:—

Figure 1 is a longitudinal sectional view through a pug mill and stone extractor constructed in accordance with the invention. Fig. 2 is a transverse sectional view through the cylindrical casing. Fig. 3 is a similar view through the frusto-conical shell, and Fig. 4 is a bottom plan view of the cylindrical pocket at the small end of the frusto-conical shell.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates a cylindrical casing which is arranged in a substantially horizontal position and which communicates at one end thereof with a hopper 2 through which the clay or other material to be acted upon is fed into the casing. The opposite end of the casing is open and communicates with the large end

of a frusto-conical shell 3, the small end of the said shell having a cylindrical pocket 4 applied thereto. A longitudinally disposed shaft 5 which may be journaled within any suitable bearings extends through the center of the cylindrical casing 1 and the frusto-conical shell 3 and has a core 6 applied thereto, the portion of the core within the frusto-conical shell 3 being tapered toward the small end of the said shell. A series of radial blades or knives 7 project from the core 6 at that end of the cylindrical casing 1 which receives the clay from the hopper 2, and these blades 7 act upon the clay in the same manner as the blades of an ordinary pug mill to mix and work the same. From these blades 7 the clay is fed to a worm or Archimedean screw 8 which surrounds the core 6 at the opposite end of the cylindrical casing and also extends through the frusto-conical shell 13 where it is tapered to correspond with the same. The edges of this Archimedean screw 8 preferably bear against the inner surface of the casing 1 and shell 3, and the said shell 3 is shown as adjustably mounted so that by tightening the bolts 9 it can be drawn against the screw. For this purpose the large end of the frusto-conical shell 3 is formed with a flange 10 which telescopes over the end of the casing 1, both the said casing and the flange 10 being provided with lugs for engagement with the bolts 9.

The lower portion and sides of the frusto-conical shell 3 are formed with a series of longitudinally disposed slots 12 through which the clay is forced by the action of the Archimedean screw 8, the stones and other solid particles being retained within the shell and finally entering the cylindrical pocket 4. The fineness of the finished product is regulated by the slots or openings 12, and in the present instance alternate slots are shown as extending substantially the entire length of the frusto-conical shell, while the intermediate slots merely extend from the large end thereof to substantially the middle portion thereof. The cylindrical pocket 4 is shown as secured to the small end of the frusto-conical shell by means of the bolts 13 connecting the corresponding flanges 14 upon the two members; and a series of longitudinally disposed slots 15 is formed in the bottom and sides of this pocket through which any clay still remaining with



the stones may be expelled. The end of the cylindrical pocket 4 is normally closed by an upwardly swinging gate 16 having the lower edge thereof crimped as indicated at 17 to provide an outlet for the stones. An arm 18 projects outwardly from the upper end of the gate and has a weight 19 applied thereto, the said weighted arm serving to maintain a sufficient pressure within the cylindrical pocket to force through the slots 15 any remaining clay except that which fills the voids between the stones. Should too much clay pass out with the stones, a jet of steam or water may be introduced through the pipes 20 into the small end of the frusto-conical shell and the adjacent end of the cylindrical pocket for the purpose of softening the clay.

This machine, as will be apparent from the foregoing is continuous in its action and thoroughly works the clay and separates the stones therefrom in one simple operation.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, the combination of a frusto-conical shell having openings in the sides thereof, means for feeding plastic material into the large end of the said shell, a tapered worm mounted within the shell and engaging the interior of the shell so as to act upon the plastic material and force it through the openings, a pocket communicating with the small end of the frusto-conical shell for receiving the solid particles which will not pass through the openings of the shell, the said pocket also having openings therein, and means for maintaining a sufficient pressure within the pocket to force any plastic material therein through the openings.

2. In a device of the character described, the combination of a frusto-conical shell having openings in the sides thereof, means for feeding plastic material into the large end of the said shell, a tapered worm mounted within the shell and engaging the interior thereof for acting upon the plastic material to force it through the openings, a pocket communicating with the small end of the shell and designed to receive the solid particles which will not pass through the openings of the shell, the said pocket being also provided with openings and being formed with an open end, an outwardly swinging gate for the open end of the pocket, and means for normally holding the said gate yieldingly in a closed position.

3. In a device of the character described, the combination of a cylindrical casing, means for feeding clay into one end of the cylindrical casing, a frusto-conical shell having the large end thereof applied to the opposite end of the cylindrical casing, the said shell having openings therein, a worm extending through the cylindrical casing and

frusto-conical shell and constructed to engage the inner walls so as to act upon the plastic material to force it through the cylindrical casing into the frusto-conical shell and through the openings of the shell, and means at the small end of the frusto-conical shell for collecting the solid particles.

4. In a device of the character described, the combination of a cylindrical casing, means for feeding plastic material into one end of the cylindrical casing, a frusto-conical shell having openings in the sides thereof and having the large end thereof applied to the opposite end of the cylindrical casing, a worm passing through the cylindrical casing and frusto-conical shell, the portion of the worm within the frusto-conical shell being tapered to correspond with the same, an adjustable connection between the frusto-conical shell and the casing for holding the shell in engagement with the edges of the worm, the said worm acting upon the plastic material to force it into the frusto-conical shell and through the openings thereof, and means at the small end of the frusto-conical shell for collecting the solid particles.

5. In a device of the character described, the combination of a cylindrical casing, means for feeding clay into one end of the casing, a frusto-conical shell formed with openings in the sides thereof and having the large end thereof applied to the opposite end of the cylindrical casing, a shaft extending through the cylindrical casing and shell, a series of arms carried by the shaft at that end of the cylindrical casing where the plastic material enters the same, a worm carried by the shaft and arranged within the opposite end of the cylindrical casing and the frusto-conical shell, the said worm receiving the plastic material after it has been acted upon by the before mentioned arms and serving to force the plastic material into the frusto-conical shell and through the openings therein, and means at the small end of the frusto-conical shell for collecting the solid particles.

6. In a device of the character described, the combination of a cylindrical casing, means for feeding clay into one end of the casing, a frusto-conical shell formed with openings in the sides thereof and having the large end thereof applied to the opposite end of the cylindrical casing, a shaft extending through the cylindrical casing and shell, a series of arms carried by the shaft at that end of the cylindrical casing where the plastic material enters the same, a worm carried by the shaft and arranged within the opposite end of the cylindrical casing and the frusto-conical shell, the said worm receiving the plastic material after it has been acted upon by the before mentioned arms and serving to force the plastic material into the frusto-conical shell and through the



openings therein, and a pocket at the small end of the frusto-conical shell within which the solid particles are collected.

7. In a device of the character described, the combination of a cylindrical casing, means for feeding clay into one end of the casing, a frusto-conical shell formed with openings in the sides thereof and having the large end thereof applied to the opposite end of the cylindrical casing, a shaft extending through the cylindrical casing and shell, a series of arms carried by the shaft at that end of the cylindrical casing where the plastic material enters the same, a worm carried by the shaft and arranged within the opposite end of the cylindrical casing and the frusto-conical shell, the said worm

receiving the plastic material after it has been acted upon by the before mentioned arms and serving to force the plastic material into the frusto-conical shell and through the openings therein, a cylindrical pocket at the small end of the frusto-conical shell within which the solid particles are received, the said pocket having an open end, and a swinging gate normally closing the open end of the said pocket.

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

CHAUNCEY W. KILBORN.

Witnesses:

M. E. BARNHART,  
Wm. J. BIVINS.