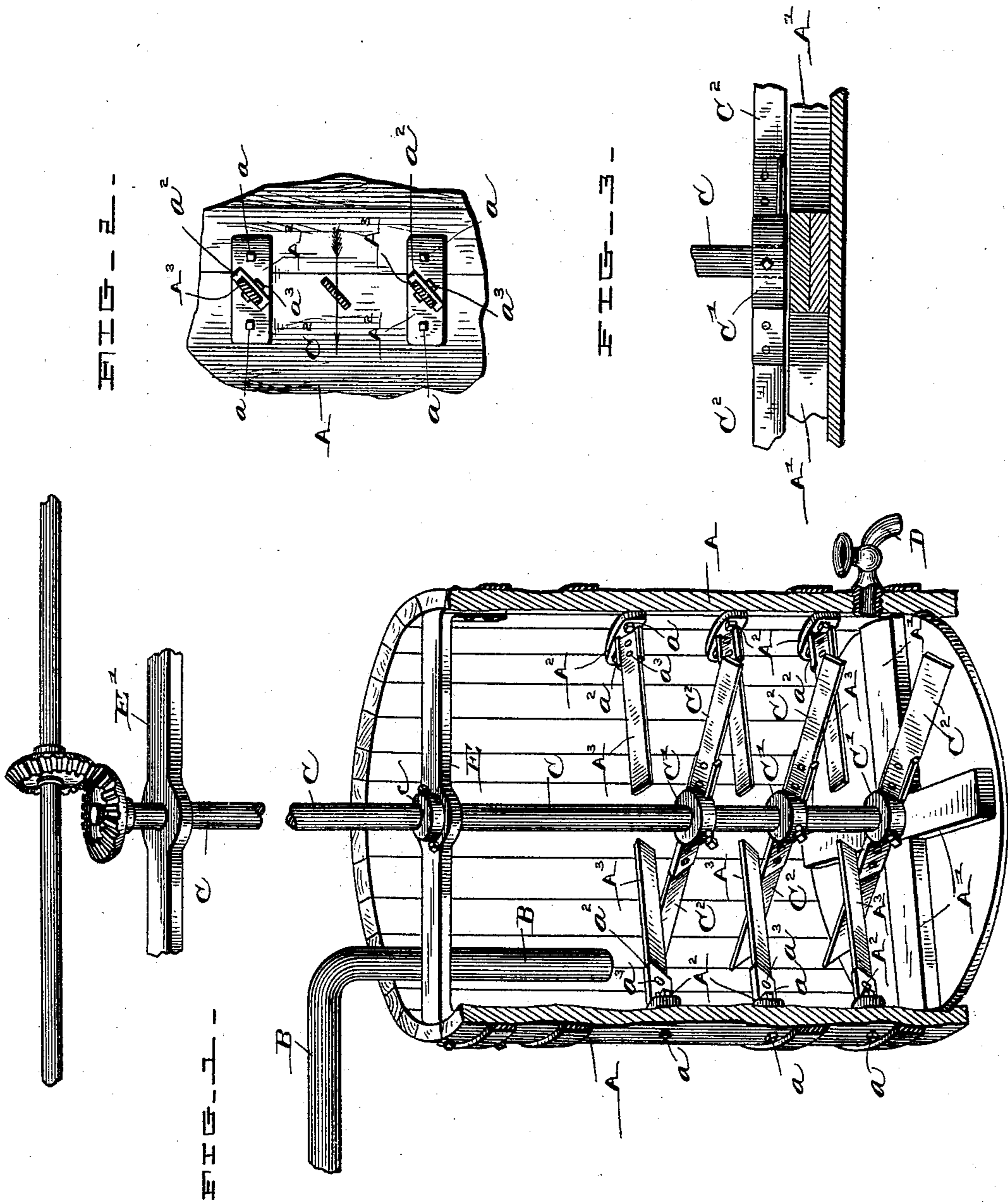


(No Model.)

L. W. NUEBLING.  
PUG MILL.

No. 452,147.

Patented May 12, 1891.



WITNESSES:

H. W. Neely.  
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INVENTOR

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# UNITED STATES PATENT OFFICE.

LOUIS W. NUEBLING, OF INDIANAPOLIS, INDIANA.

## PUG-MILL.

SPECIFICATION forming part of Letters Patent No. 452,147, dated May 12, 1891.

Application filed December 9, 1890. Serial No. 374,058. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS W. NUEBLING, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Blunger-Mills, of which the following is a specification.

It is necessary in the preparation of clay for fine manufactures that it shall be subjected to a thorough and complete "blunging"—that is, that it shall be thoroughly disintegrated and mixed up by being agitated in water so that the particles shall be completely separated and the mass reduced to "slip," or a smooth even condition entirely free from lumps of even the smallest size. To do this work expeditiously and thoroughly is the object of my present invention, which mainly consists in providing within a suitable tank or cylinder a series of blades extending from the inner side of its circumferential wall toward the center and set at proper angles, and a shaft centrally located in said tank or cylinder, having corresponding blades mounted thereon extending toward said circumferential wall intermediate the blades extending therefrom, the several blades being arranged relatively to each other, as hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a perspective view of a machine embodying my said invention, a portion of the wall of the tank being broken away to show the interior arrangement; Fig. 2, a detail cross-section of one of the blades on the shaft and of adjacent blades secured to the tank at that point in the operation when said blades are in the same vertical plane, the direction of motion of the blade on the shaft being indicated by means of an arrow; and Fig. 3, a detail elevation of the lower end of the shaft and immediately adjacent parts, the frame and bottom being shown in section.

In said drawings, the portions marked A represent the tank or cylinder of the machine; B, a water-supply pipe; C, the central shaft; D, the egress-pipe by which the mixture may be drawn off, and E E' bearings for the shaft.

The tank or cylinder is in itself of substantially an ordinary and well-known form. It

has a closed bottom and an open top. In its bottom is an X-shaped frame A', which leaves angular cavities or compartments below the level of its upper side. Secured to the interior surface at regular intervals are sockets A<sup>2</sup>, which carry the inwardly-projecting blades A<sup>3</sup>. These blades are made of flat bar-iron or steel, and are set at an angle, preferably, of about forty-five degrees, the blades on the two sides set at opposing angles. They are preferably secured to the sockets by a bolt a<sup>3</sup> and a ledge a<sup>2</sup> on the edge of said sockets, and said sockets are secured to the tank, preferably by bolts a.

The pipe B is simply an ordinary water-supply pipe leading down into the tank, by which water is introduced into it.

The shaft C is a vertical shaft and extends up a suitable distance above the tank, where suitable gearing is provided by which it may be driven. It is mounted in and supported by two bearings E E', one of which is located at or near the level of the top of the tank and the other near the top of the shaft. Above one or both of them upon the shaft is a collar c, by which the shaft is supported vertically. Upon said shaft, at regular intervals, are secured hubs C', which have arms or wings thereon, which serve as sockets for blades C<sup>2</sup>, corresponding in general character to the blades A<sup>3</sup>. These blades are so arranged that when they reach a position vertically in line with the blades secured to the tank the angle thereof will be the same, as shown in Fig. 2; but the operation will be opposed to the operation of said stationary blades, as will be readily understood—that is, while the blades on the shaft, when moving in the direction indicated, operate to raise the liquid mixture from the bottom diagonally toward the top, as well as carry it in a whirling mass, the stationary blades, projecting out into the tank between the moving blades, operate to retard the movement and force the liquid downwardly diagonally from the top toward the bottom.

As hereinbefore stated, the X-shaped frame at the bottom leaves angular cavities or receptacles, which serve to hold stones or other foreign substances which may be separated from the clay. The lower blades on the shaft are somewhat wider than the others, and their

inner ends are notched or cut away where they fit into the arms or sockets on said shaft, so that their lower edges come down close to the top surface of said frame-work (see Fig. 3) 5 when they pass over it, thus stirring up the liquid composed of the clay and water from the extreme bottom as defined by the top of said frame.

The egress-pipe D is simply a tube or opening through which the contents of the tank 10 can be drawn off after having been treated to the desired extent. It may be provided with an appropriate valve or gate, as shown.

The bearings E and E' are or may be of an ordinary and well-known construction. They 15 are embodied in or supported by suitable frame work or timbers, one of which may be in the form of a bar across the top of the tank. These matters, however, as well as some other 20 details of construction, may be varied at pleasure.

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

25 1. The combination, in a blunger-mill, of a tank having arms or blades extending inwardly from its sides and set at an angle, and a shaft mounted within said tank and provided with arms or blades extending out in-

intermediate the arms or blades on the tank 30 and set at a corresponding angle, whereby the whirling mass being treated will in operation be driven around and given a vertical or inclined tendency in one direction by the moving arms and retarded and given an oppositely vertical or inclined movement in the 35 other direction by the stationary arms, substantially as and for the purposes set forth.

2. The combination, in a blunger-mill, of a tank having a cross-frame in its lower end 40 above its bottom and inwardly-extending arms or blades along its sides, and a shaft provided with similar arms or blades extending out intermediate the arms or blades on the tank and mounted at its upper end in 45 two bearings, whereby it is held and supported, the lower blades thereon being arranged to move immediately above said cross-frame and in close proximity thereto, substantially as set forth. 50

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 5th day of December, A. D. 1890.

LOUIS W. NUEBLING. [L. S.]

Witnesses:

CHESTER BRADFORD,  
FRANK W. WOOD.