(No Model.)

3 Sheets—Sheet 1.

C. L. TRUSLER.

TRITURATOR.

No. 605,302. Patented June 7, 1898.

Fig. 1.

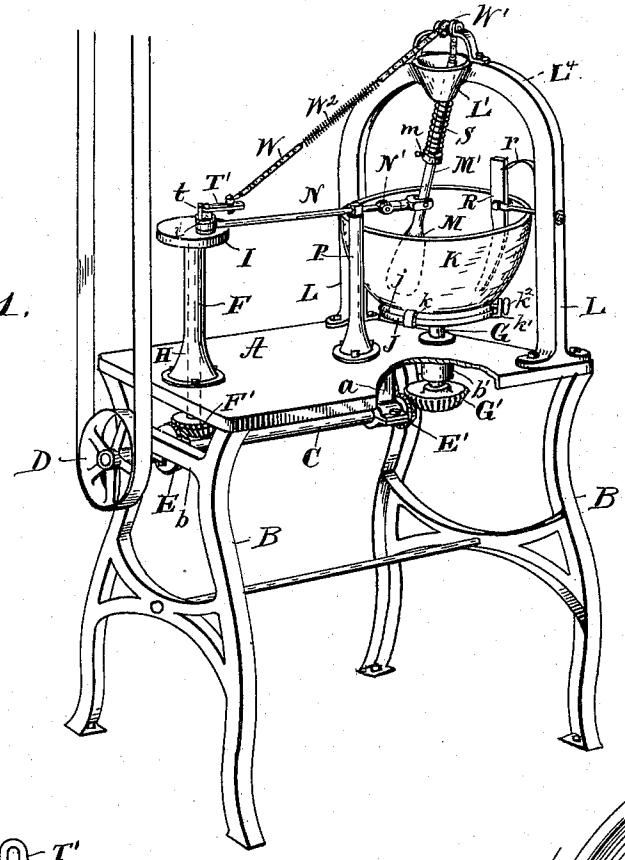


Fig. 2.

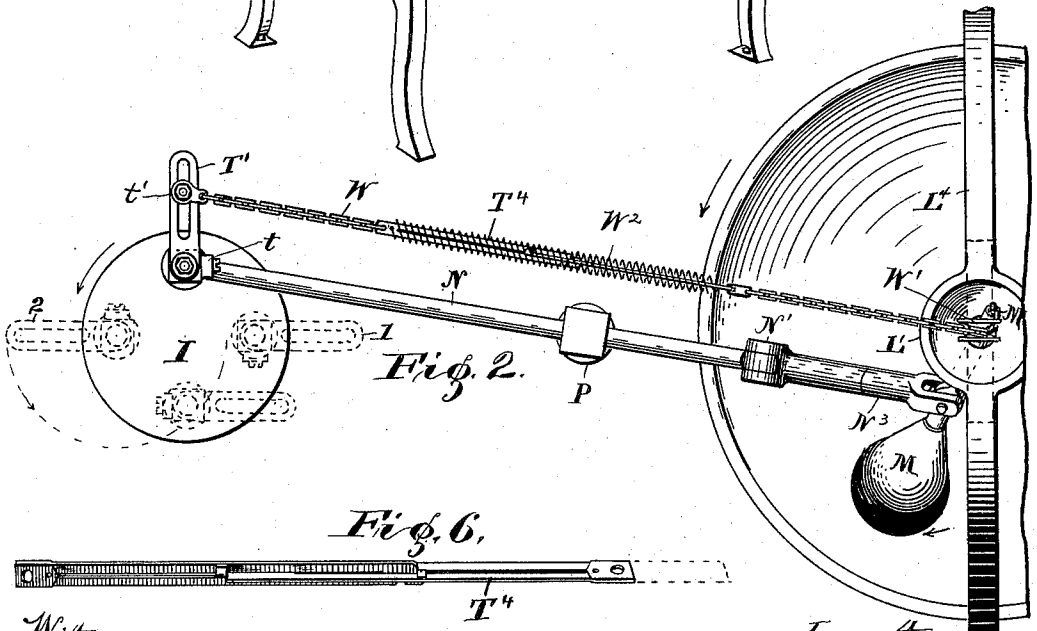


Fig. 6.

Witnesses;
F. W. Hoerner
L. A. Mauterer

Inventor,
Charles L. Trusler,
By Joseph A. Mauterer
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

3 Sheets—Sheet 2.

C. L. TRUSLER.

TRITURATOR.

No. 605,302. Patented June 7, 1898.

Fig. 3.

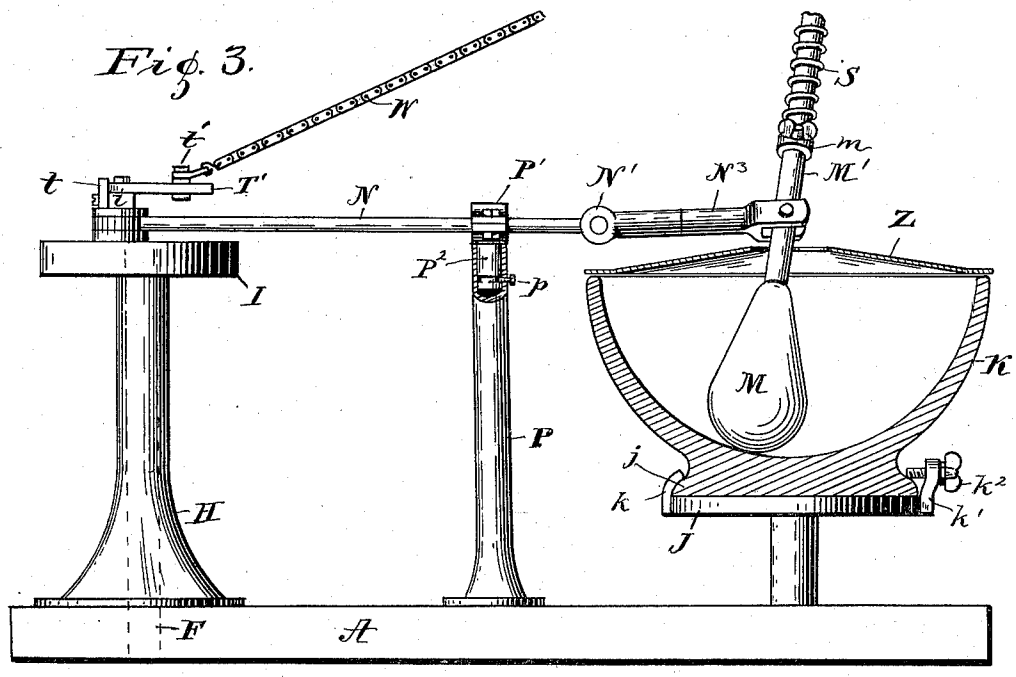


Fig. 4.

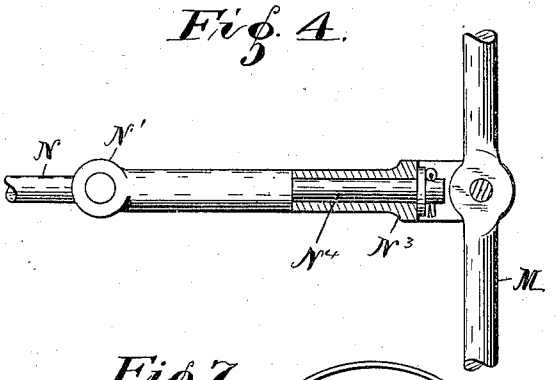


Fig. 5.

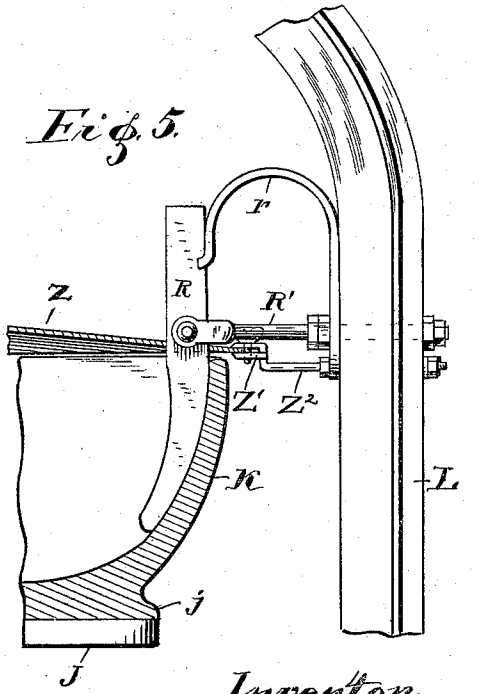
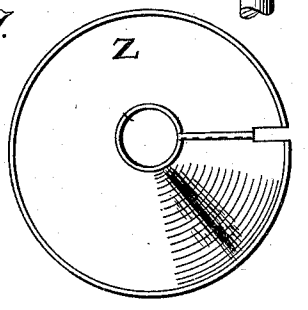


Fig. 7.



Witnesses:
F. W. Woemer.
L. A. Minturn

Inventor,
Charles L. Trusler,
By Joseph A. Minturn
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

3 Sheets—Sheet 3.

C. L. TRUSLER.

TRITURATOR.

No. 605,302. Patented June 7, 1898.

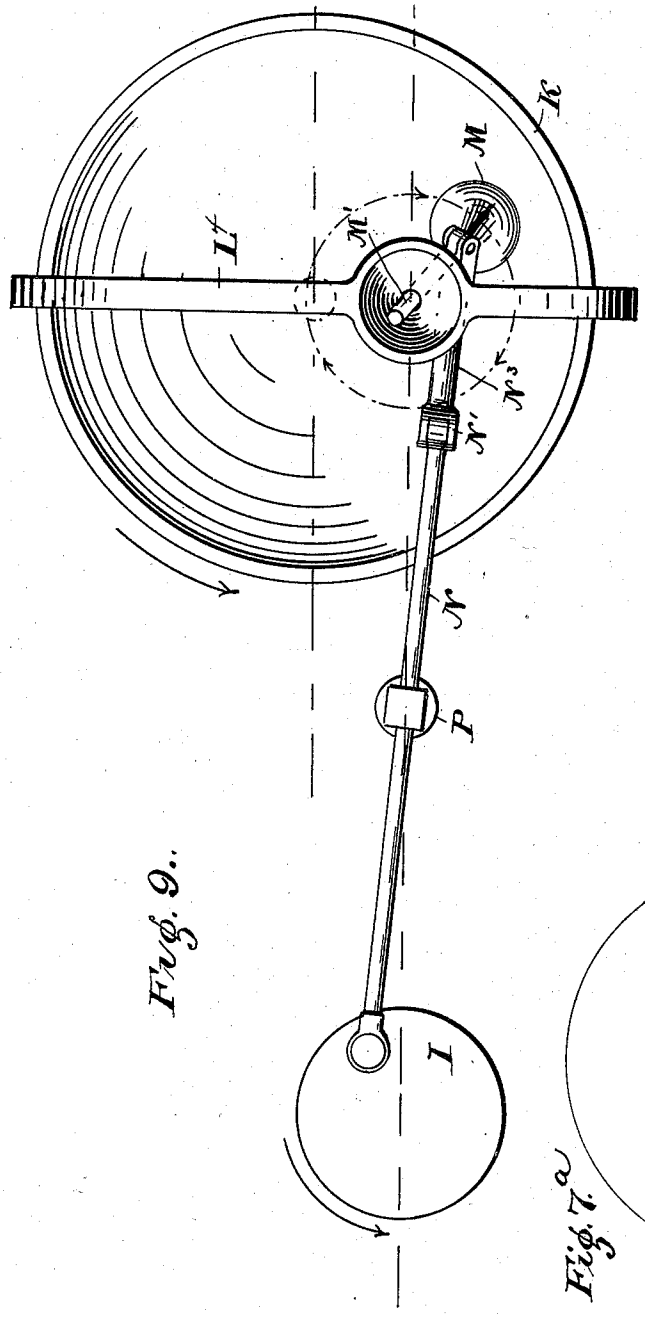


Fig. 9.

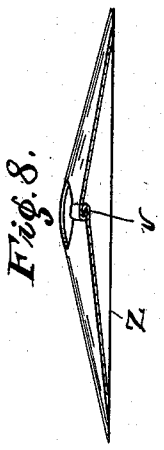


Fig. 8.

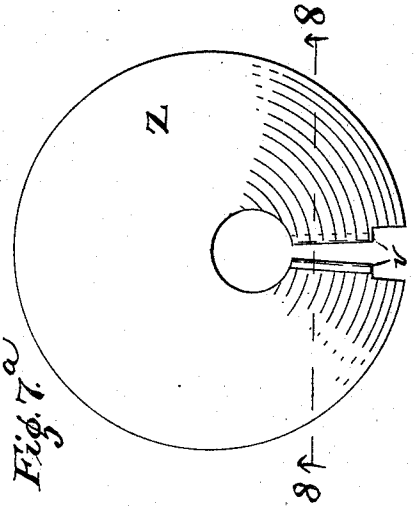


Fig. 7.

Witnesses
F. W. Woerner.
L. A. Minturn.

Inventor
Charles L. Trusler,
By Joseph A. Minturn
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES L. TRUSLER, OF INDIANAPOLIS, INDIANA.

TRITURATOR.

SPECIFICATION forming part of Letters Patent No. 605,302, dated June 7, 1898.

Application filed November 14, 1896. Serial No. 612,092. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. TRUSLER, 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 Triturators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in triturators, and has for its object the construction of mechanism which will give a rotary movement to the mortar and at the same time will impart a universal movement to the pestle, whereby it will be made to traverse equally the inside central surface of the mortar, and the point of contact on the pestle will be approximately in alinement with the longitudinal axis of the pestle, so as to make the direction of the pressure on the concave surface of the mortar always nearly at right angles to same, which will insure the greatest efficiency.

A further object is to provide means for increasing and decreasing the force of the pressure of the pestle against the mortar.

A further object of the invention is to provide means for raising the pestle and dropping it suddenly, so as to produce a pounding effect, which will disintegrate larger lumps of harder material than could be otherwise handled.

The object also is to provide means for removably securing the mortar and pestle to their respective supports and to provide means for actuating same and to prevent the contents of the mortar from being thrown out or impurities from dropping into the mortar.

With these ends in view my invention consists in certain features of construction and combination of parts, as will be described hereinafter and pointed out in the claims.

Referring to the accompanying drawings, throughout which like letters of reference indicate like parts, Figure 1 is a view in perspective, showing all of my improved mechanism except the cover of the mortar. The bed-plate is broken away to expose the gears underneath same. Fig. 2 is a detail in plan view of the mortar and pestle and arm for operating the pestle. Fig. 3 is a detail in side elevation, partially in vertical section, of the mortar and pestle and mechanism for operating the pestle. Fig. 4 is a detail in side elevation of a portion of the pestle-arm and pestle-handle. The arm is partially sectioned to show the construction of the joint. Fig. 5 is a detail in side elevation, showing the construction and attachment of the scraper for scraping the sides of the mortar. Fig. 6 is a view in perspective of the slide which I use on the chain for lifting the pestle. Fig. 7 is a top or plan view of the cover of the mortar removed therefrom. Fig. 7^a is a top view of the cover of the mortar, showing the radial joint in its disconnected or open position; Fig. 8, a section on the line 8 8 of Fig. 7^a; and Fig. 9, a top or plan view of the mortar and arm for operating the pestle, showing the location of the center of the crank-wheel and fulcrum-post out of alinement with the center of the mortar.

A represents the table or bed-plate of my improved triturator, and B the legs which support the bed-plate. A hanger a is secured to the under side of the table and the near pair of legs B have the cross-bar b. In the hanger a and the journal-box b turns the shaft C, carrying the belt-pulley D, which is connected with a source of power in the usual manner. Mounted on the shaft C are the two beveled cog-wheels E and E′, which engage the cogs on the beveled wheels F′ and G′, respectively. The beveled wheel F′ is mounted on the lower end of the vertical shaft F, (shown in dotted lines in Fig. 1,) and the beveled wheel G′ is mounted on the lower end of the vertical shaft G.

H is a standard which is bolted to the upper side of the bed-plate and supports the shaft F. The upper end of the shaft F terminates with the crank-wheel I, which has the wrist-pin i.

The vertical shaft G is mounted in suitable bearings b' and projects above the table, where it terminates with the horizontal rotary platform or plate J, upon which the mortar K will be removably secured by means of the hooks k and the post k', having the set-screw k^2, which engages the bottom flange j on the mortar. By screwing the set-screw in the mortar will be fastened to the plate J, so as to revolve with the plate, and by loosening

up the screw the mortar can be removed from the plate.

L are standards, two in number, one of which is bolted to the top of the bed-plate on opposite sides of the shaft G. These standards extend above the top of the mortar and are connected by means of the arched cross-bar L^4. Near the top and middle of the arch is the funnel L′, into the small lower open end of which the handle M′ of the pestle M is projected and forms the fulcrum, around which the pestle is given a rotary swinging movement by means of the pestle-arm N, which is hinged at one end to the handle of the pestle and is connected with the wrist-pin *i* on the crank-wheel I. The sloping sides of the funnel L′ give the necessary freedom and play to the upper end of the pestle-handle.

The post P is bolted to the top of the table between the shaft F and the shaft G, and is provided with the eye P′ at its upper end, having free horizontal rotary movement. The pestle-arm N is projected through this eye, which permits of the longitudinal movement of the arm, and by acting as a fulcrum gives a horizontal rotary movement to the pestle end of the arm in a contrary direction to the end attached to the crank-pin. To permit the pestle to rise and fall to suit the contour of the concave mortar, the pestle-arm will have the hinge-joint N′, and to allow free lateral movement of the pestle and to cause the pressure from it to be delivered at right angles to the concave surface in all positions of the pestle in the mortar the end of the arm will be provided with a swivel-joint, as illustrated in Fig. 4, whereby the end section N^3 will have rotary adjustment on the reduced end N^4 of the arm. If the weight of the pestle is not sufficient to give the required pressure against the mortar, I will add to the force by means of a spiral spring S, which is placed around the handle M′ of the pestle and made to press against the funnel L′ above and against an adjustable collar *m* on the handle below the spring. The position of the collar on the handle will regulate the pressure.

The eye P′ on top of the post P will preferably be made in two parts, which are bolted together to permit of the ready insertion of the pestle-arm. The lower section of the eye-piece will have the stem P^2, which will be projected into the opening in the top of the post. The stem will have a circumferential groove, which will give engagement to a set-screw *p*, which will prevent the removal of the stem from the post, but will permit of free horizontal movement. The center of the crank-wheel I, post P, and mortar K, or opening in the funnel above the mortar, will not be in alinement with each other—that is, all in the same vertical plane—but will be out of alinement enough to cause the pestle to move across or near the center of the mortar at each sweep of the pestle. This path of the pestle will keep the material in the mortar from accumulating at the center or sides out of reach of the pestle, which thus moves in an epicycloidal path around the mortar.

R is a scraper, made of rubber, steel, or other suitable material, according to the character of the material being triturated. It is pivoted to an arm R′, which is bolted to the standard L and has a hinged movement in a vertical plane. It is pressed close against the inside of the mortar by means of the spring *r*.

It is often very desirable to lift the pestle and let it down suddenly and forcibly, so as to break up larger particles than could be otherwise reduced by the machine. This lift and sudden release of the pestle is accomplished by pivoting a horizontal bar T′ to the top of the wrist-pin *i* and connecting it with the handle of the pestle by means of a cable or chain. A pin *t* is extended up from the wrist-pin, so as to engage the pivoted bar T and push the bar around with it from the position shown by dotted lines No. 1 to that shown by dotted lines No. 2 in Fig. 2. The chain W passes over the fixed pulley W′ after it leaves the arm and before it is fastened to the handle of the pestle, and the arm will pull on the chain, so as to raise the pestle during half of each revolution of the crank-wheel. As this would keep the pestle out of contact with the mortar too much of the time, I prefer to interpose a spring W^2 in the chain, which will allow the arm to reach about the position shown in full lines in Fig. 2 before the lift of the pestle begins. The height of the lift of the pestle will be regulated by providing a slot in the bar T′ for the attachment of an adjustable swivel *t′*, to which the chain is fastened and which can be moved in or out in the slot. The swivel *t′* is necessary in order to keep the chain from becoming tangled. A slide T^4, having a positive stop to allow the spring to act only so far, will be used by inserting it in the length of the chain.

Z is a cover which is held in a stationary position over the mortar to keep particles of the contents of the mortar from flying out under the pounding process and also to keep the foreign matters of all kinds from dropping into the mortar. It has openings for the insertion of the pestle and scraper. The cover is removably secured by means of the clamp Z′ on the end of the arm Z^2. The cover is split from the margin to the middle opening on one side, and the edges V are bent so they will hook into each other and lock when the cover is in place.

I claim—

1. In a triturator, the combination, with a revolving support and a mortar detachably secured thereto, of a rotary swinging pestle adapted to traverse the inner surface of the mortar, the longitudinal axis of the pestle being always approximately at right angles to the surface of the mortar at the point of contact, a crank-wheel and a pestle-lever connected with and actuated by the crank-wheel and provided with a pivotal bearing through which longitudinal movement of the pestle-

lever is permitted and said pestle-lever having a hinge-joint permitting vertical movement and a swivel-joint permitting rotary movement, the axis of revolution of the mortar being out of alinement with the centers of the crank-wheel and pivotal bearings of the pestle-lever, all substantially as described and for the purposes specified.

2. In a triturating-machine, the combination with a revolving mortar and a rotary swinging pestle, of a pulley supported above the pestle, a wrist-pin having a horizontally-pivoted bar and a vertical pin to engage the bar and force it around during part of each circuit of revolution of the wrist-pin and a cable or chain passing over the pulley and having one end connected by means of a swivel with the pivoted bar and having the other end of the chain connected with the top of the pestle-handle, all substantially as described and specified.

3. In a triturating-machine, the combination, with a revolving mortar, a pestle having rotary swinging movement and mechanism for actuating the mortar and pestle, of means consisting of a pulley elevated above the pestle, a cable or chain passing over the pulley and connected at one end to the pestle and at the other end to mechanism substantially as described, which will alternately pull on the chain or cable and then release it, whereby the pestle will be raised and lowered.

4. The combination, with a revolving mortar of a funnel-shaped collar above and at one side of the center of the mortar, a pestle traversing the inner surface of the mortar in an epicycloidal path and having a stem or arm projected up through the funnel-shaped collar, an adjustable collar on the pestle-arm, a spiral spring on said arm between the funnel-shaped and the adjustable collar, and means, substantially as described, for compressing the spring and elevating the pestle and then releasing it suddenly whereby a pounding movement will be imparted to the pestle, all substantially as and for the purposes specified.

5. A cover for mortars having an opening through which the pestle-arm will be projected, said cover being split from its outside edge into the opening for pestle-arm, and having the edges made by said split, bent whereby they can be joined by hooking them together.

6. In a triturating-machine, the combination, with a revolving mortar, a pestle having rotary swinging movement and mechanism for actuating the mortar and pestle, a wrist-pin moving in a circular path, a horizontal bar pivoted to the wrist-pin, and a vertical pin to engage the bar and force it around during part of each circuit of revolution of the wrist-pin, of means consisting of a pulley elevated above the pestle, a cable or chain passing over the pulley and connected at one end to the pestle and at the other end to the horizontal bar, said cable or chain having an elastic portion whereby the length of the cable or chain can be increased within predetermined limits, all substantially as described and specified.

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

CHARLES L. TRUSLER.

Witnesses:

JOSEPH A. MINTURN,

FRANK W. WOERNER.