

(No Model.)

C. H. MYERS.
TRITURATING AND MIXING MACHINE.

No. 580,886.

Patented Apr. 20, 1897.

Fig. 2

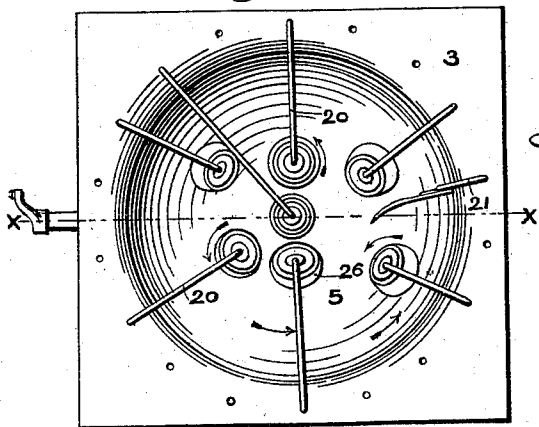


Fig. 3

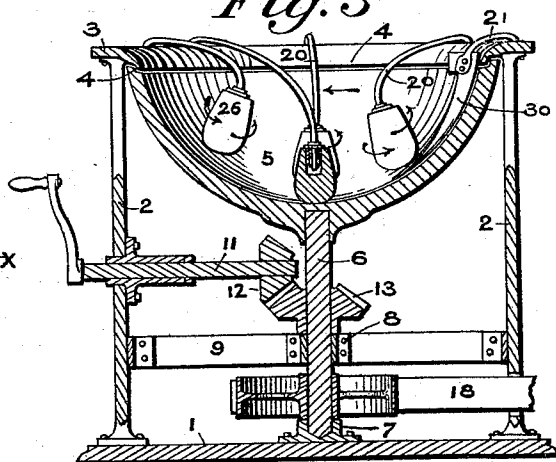


Fig. 1

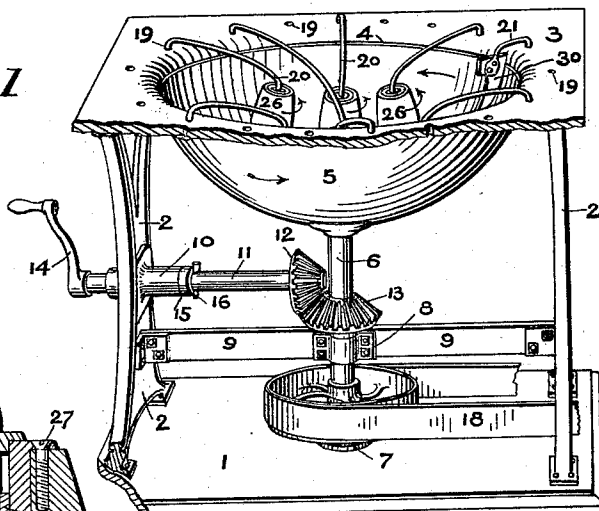


Fig. 4

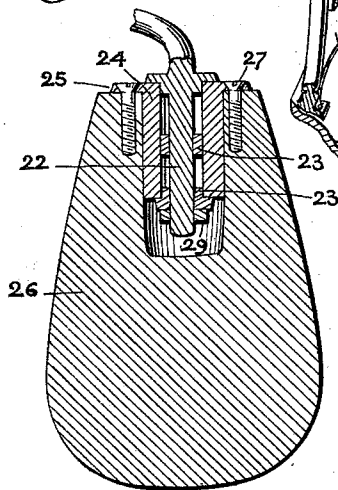
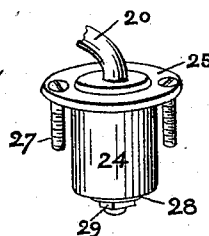


Fig. 5



Witnesses:

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Inventor:-

Cornelius H. Myers.
By his Atty. C. B. Reichelt.

UNITED STATES PATENT OFFICE.

CORNELIUS H. MYERS, OF SOUTH BEND, INDIANA.

TRITURATING AND MIXING MACHINE.

SPECIFICATION forming part of Letters Patent No. 580,886, dated April 20, 1897.

Application filed January 27, 1896. Serial No. 576,931. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS H. MYERS, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Triturating and Mixing Machines, of which the following is a specification.

My invention relates to triturating-machines wherein a rotary mortar and pestles suspended therein grind and pulverize the material placed within the mortar, a series of pestles being thus suspended each to act independently upon the material. In machines of this class heretofore employed the pestles have been non-rotative, and the mode of suspension and arrangement of the pestles has been defective, the grinding action has been slow and rasping, and the mixing action has been without uniformity and imperfect.

The object of my invention is to provide a rotary-mortar pulverizing and mixing machine which will subject every particle of the material to live frictional contact both with the pestles and with the inner surface of the mortar; and the improvement consists in connecting the pestles to the several stems by journal-bearings to allow the pestles to rotate thereon, and also in so arranging and suspending the said pestles within the rotary mortar that the pestles will each have full and independent action and so deflect and turn the material from one part of the mortar to the other that it will be continuously moved and weaved in wave-like sheets of varying direction around and between the pestles and the mortar until the entire mass is not only finely comminuted, but so thoroughly mixed that drugs and medicines possessing the most active vital principles and which require the utmost care in treatment may be thus handled by automatic machinery in a complete and thorough manner.

In the accompanying drawings, Figure 1 is a perspective view of my improved machine, showing part of the table and base broken away; Fig. 2, a plan view of the machine; Fig. 3, a vertical sectional elevation thereof in line *xx* of Fig. 2; Fig. 4, a full-size view of one of the pestles and the journal end of its supporting-stem, and Fig. 5 a perspective view of the journal end of the said stem and

the bearing or box thereof detached from the pestle.

The base 1 has standards 2 secured thereto which support a table 3, having a circular opening the rim edge of which is rounded to form an entrant curb 4 to fit snugly inside the rim of the mortar-bowl 5 and form a smooth unbroken rounded surface with the inner face thereof to offer no obstruction for the accumulation of dust or other material, and thus steady the rim of the mortar-bowl should it vibrate in its rotations.

The mortar 5 is supported upon and secured to a vertical shaft 6, stepped in a block 7, secured to the base of the machine and carried by a bearing 8 upon a cross-bar 9, secured to the standards 2, and extending across the lower part of the frame. A long bearing-sleeve 10, also secured to one of the standards 2, carries a counter-shaft 11, fitted at its inner end to a cog-gear 12, which engages with a similar gear 13 upon the vertical shaft 6 and by means of a crank 14, secured to said counter-shaft, serves to revolve the mortar by hand. A collar 15 and a pin 16, fitted upon the shaft 11, allow the latter to be moved endwise in the sleeve-bearing 10 to disengage the gear 12 from the gear 13, and a band-pulley 17, carrying a belt 18, will when the counter-shaft is thus displaced allow the machine to be connected with suitable power, such as the pulley of an electric motor.

The table 3 has socket-holes 19 to receive the outer fixed ends of pestle-stems 20 and scraper-stem 21, the holes 19 being circumferential and concentric with the rim of the mortar and of sufficient number to admit of any required number of pestles and scrapers to be attached at any suitable point around the rim of the mortar. The pestle-stems 20 are of unequal lengths and may thus be adjusted at any desired point within the mortar. The inner ends of the stems are also made at any required angle to hold the pestles at varying angles within the mortar to act upon the material over the entire inner surface of the mortar. The inner journal end of the stems 20 have journals 22, smoothly turned, fitted with hardened-steel journal-rings 23, which snugly fit the smooth central bore of a cylinder-box 24, having an outer flange 25, secured to the flat upper surface of marble-

ized metal or Wedgwood pestles 26 by screws 27. The ends of the journals 22 have a washer 28 and nut 29 fitted thereon, by which means the pestles may be held upon the ends of the stems securely and also with sufficient freedom to admit of the free rotation of the pestles upon the journals by the slightest contact of the pestle against the inner surface of the rotating mortar.

10 The stems 21 have scrapers 30 secured to them, which consist of curved blades which conform at their forward edge to closely fit the inner surface of the mortar and continually clear said surface of powder caking thereon or adhering thereto and pass it back into the mortar to be subjected to the further triturating action of the pestles. The stems 20 are sufficiently elastic to impart to the pestles a slight swaying and tremulous motion which greatly improves their triturating action. The pestles thus arranged at varying angles and distributed within the mortar at unequal distances from the center thereof are caused to rotate upon their stem-journals and thus catch the material as it is carried around by the mortar and pass it from one pestle to another as they rotate in sheets of pulverulent material to thoroughly triturate and commingle the particles until the finest powder minutely divided will carry with it equal proportions of like material without further manipulation.

The pestles, being suspended by elastic arms or rods and adapted to revolve freely within the mortar, will be allowed to roll or ride over any mass of caked or hardened material adhering to the sides of the mortar without undue abrasion, which with some materials would be seriously deleterious and would be less effective under all conditions than the free rolling and yielding action of the pestles suspended from spring-stems and freely journaled thereon. Should the material become caked or hardened upon the surface of the mortar, the scraper, also fitted upon one of the spring-stems, will clear the inner surface of the mortar in a simple and effective manner.

I am aware that non-rotary pestles have been suspended within a rotary mortar and

that revolving rollers in ore-crushing machines have been fitted upon the journals of spring-arms to rotate thereon and by centrifugal force press against an inner non-rotating wall and be rotated thereby, but such action is not adapted for triturating and mixing fine powder.

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

1. The combination in a triturating-machine of a fixed curbing, a rotary mortar, a pestle suspended therein and fixed upon the journal of a non-rotating vibratory arm affixed to the curbing, and the pestle adapted to bear upon and rotate within the mortar by frictional contact with the rotary inner surface thereof, substantially as described.

2. A triturating-machine comprising a mortar fitted to rotate upon a stationary stand, vibratory arms supported upon said stand and extending over the mortar at divergent angles and having different lengths, secured at their fixed ends to admit of vibration, and having journals at varying angles at the overhanging ends, and pestles journaled thereon to be rotated by the rotation of the mortar, substantially as described.

3. The combination in a triturating-machine, of a table, a rotating mortar supported thereon, one or more pestles supported upon the journals of vibratory arms, to rotate therein and a scraper secured to the table by a pendent spring-arm affixed to the table and held thereby against the inner surface of the rotary mortar, substantially as described.

4. A pestle adapted to rotate by frictional contact with the inner surface of a rotating mortar, comprising a body portion having a bored upper end, and a box 24 fitted therein, a supporting-arm 20, a journal 22, hardened-steel journal-rings fitted thereon and a nut upon the end of the arm to hold the pestle thereon, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in the presence of two subscribing witnesses.

CORNELIUS H. MYERS.

Witnesses:

OLIVER P. MYERS,
WM. H. ROWE.