

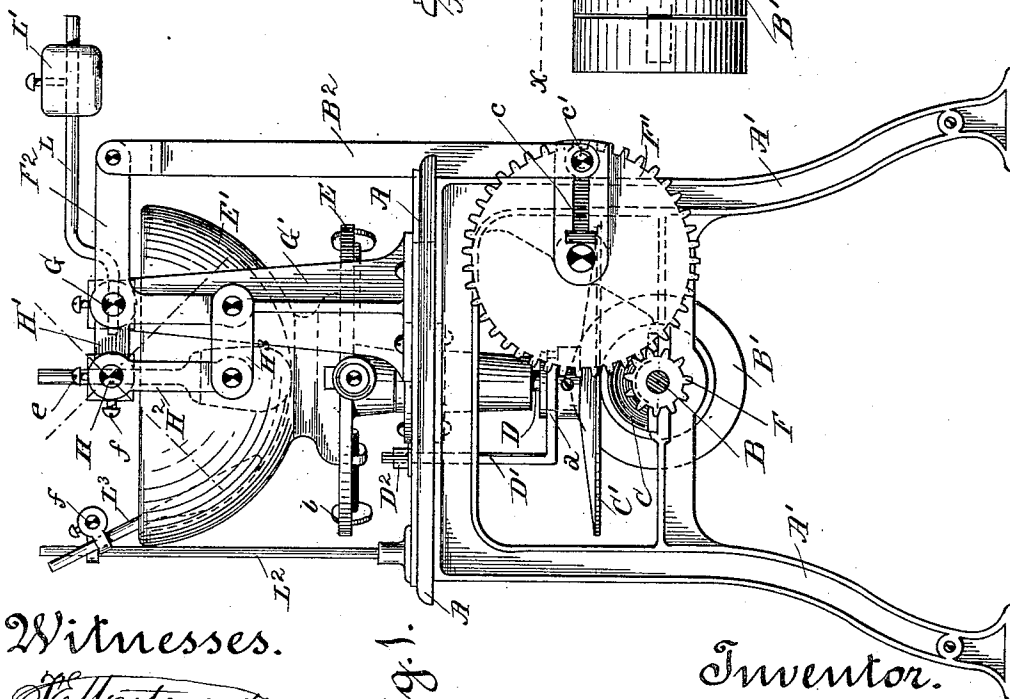
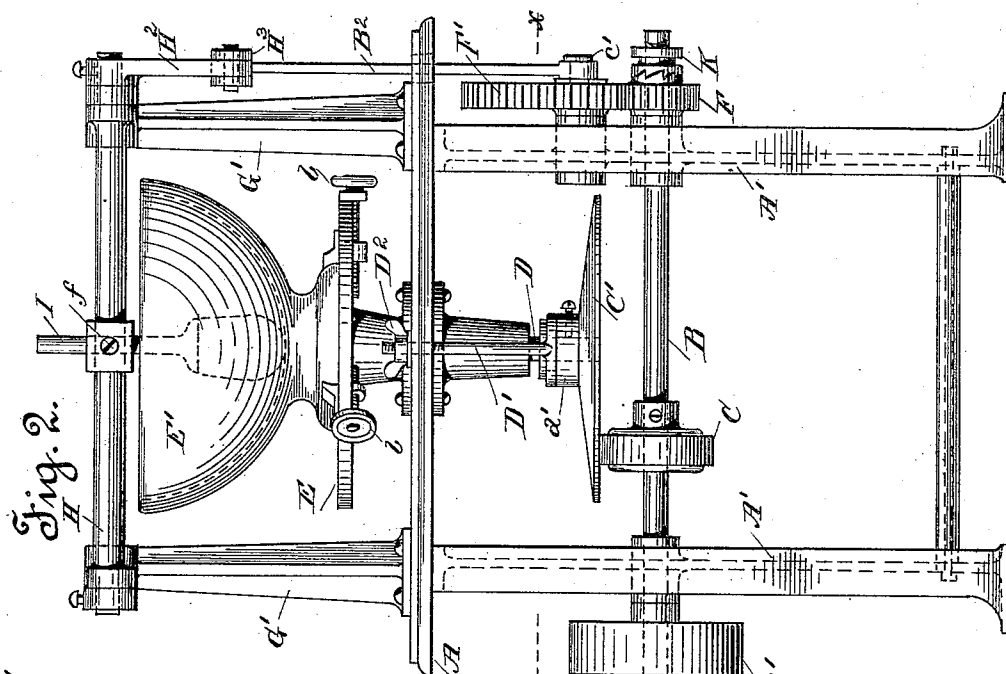
(No Model.)

2 Sheets—Sheet 1.

L. A. BUCHANAN.
TRITURATOR.

No. 529,361.

Patented Nov. 20, 1894.



Witnesses.

St. Montenero
W. H. Cobb

Fig. 1.

Inventor.

Louis Alexander Buchanan.

By W.A. Ackers
att_y

(No Model.)

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Fig. 3.

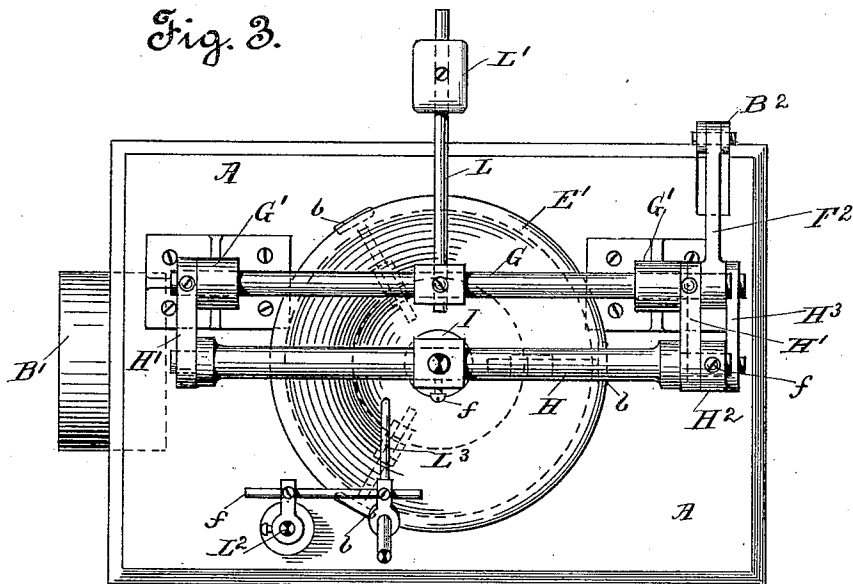
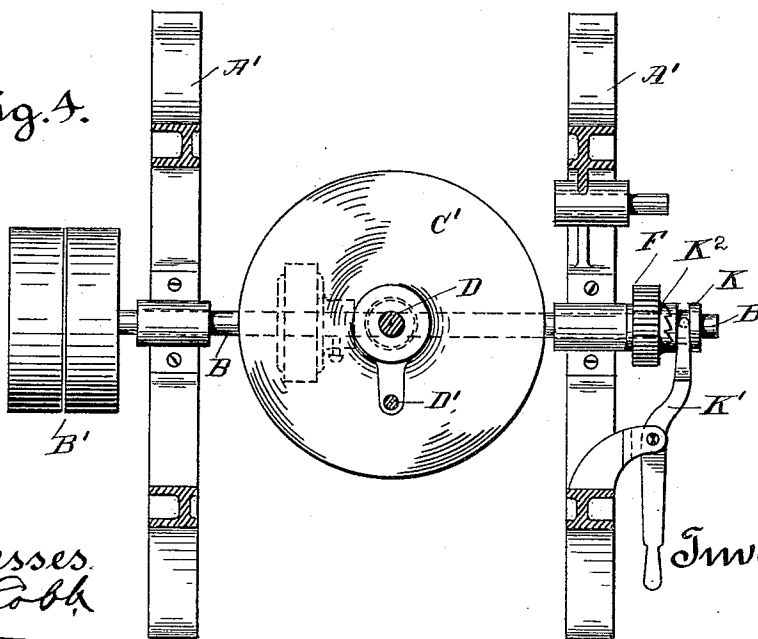


Fig. 4.



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Inventor.

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UNITED STATES PATENT OFFICE.

LOUIS ALEXANDER BUCHANAN, OF STANFORD UNIVERSITY, CALIFORNIA.

TRITURATOR.

SPECIFICATION forming part of Letters Patent No. 529,361, dated November 20, 1894.

Application filed May 17, 1894. Serial No. 511,529. (No model.)

To all whom it may concern:

Be it known that I, LOUIS ALEXANDER BUCHANAN, a citizen of the United States, residing at Stanford University, in the county of San Mateo and State of California, 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 said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

The present invention relates to an improved triturator for pharmaceutical purposes, and consists in the arrangement of parts and details of construction as will be hereinafter more fully set forth in the drawings and described in the specification.

The object of my machine is to perform mechanically the trituration of drugs and chemicals, so as to more thoroughly and rapidly triturate the compounds than can be successfully accomplished by hand; and to give to the pestle and mortar such a movement that the motion of the pestle as to the grinding and mixing, will be the same as that accomplished by hand.

Referring to the drawings forming a part of this application, wherein similar letters of reference are used to denote corresponding parts—

Figure 1 is a side elevation of the triturator. Fig. 2 is a front elevation of the machine illustrated by Fig. 1. Fig. 3 is a top plan of the machine. Fig. 4 is a top plan view taken on line $x-x$ of Fig. 2.

The letter A indicates the platform or table of the machine frame, which is supported by the upright A'. Through the upright A' extends the shaft B, which has motion imparted thereto through the medium of pulley wheel B', said wheel being driven by suitable machinery.

Upon the shaft, between the uprights, is rigidly secured the friction wheel C, the periphery of which wheel is covered with leather. This wheel is normally in contact with the under face of the friction plate or disk C'; keyed to vertical shaft D. Consequently as the shaft B is revolved the motion thereof is transmitted to the vertical shaft D. Inasmuch as said disk or plate is keyed to the vertical shaft, it is obvious that the

same may be given a vertical movement upon the shaft which permits of the disk or plate being thrown in or out of contact with the friction wheel C. This vertical movement of the friction plate or disk C' is accomplished through the medium of the rod D', the upper end of which is screw-threaded and extends above the platform or table A, and is raised or lowered by means of the thumbscrew D². The lower end of said rod is bent at a right angle and fits within the annular groove, a , cut within the hub a' of the friction plate or disk C'. As the thumb screw D² is tightened or loosened the rod D' is raised or lowered which throws the same in or out of contact with the friction wheel C.

The upper end of the vertical shaft D projects above the platform or table and has rigidly secured thereon the face plate E, upon which fits the mortar E'. This mortar is secured in place by the set screws b , which embrace the lower edge of the mortar and hold the same in place. Hence the same is carried around with the rotation of the face plate E, which is rotated through the medium of the vertical shaft.

Upon the end of the shaft B, opposite that to which the drive pulley is secured, I loosely fit the gear or pinion F, which intermeshes with large gear wheel F'. This gear wheel F' has a radial slot c , cut therein, within which works the crank pin c' which connects the pitman B² therewith. By thus securing the crank pin within a radial slot, I am enabled to adjust it toward or away from the center of the gear wheel and thereby diminish or increase the length of stroke of the pitman, consequently varying the stroke of the pestle. The operator can consequently regulate the throw of the pestle so as to adapt it to a large or small mortar. The upper end of this pitman is connected to the outer end of the upper arm of bell crank lever F², which lever is rigidly secured to the cross shaft G, which works within bearings of the standards G' extending upwardly from the platform or table A.

In front of the shaft G, I locate the shaft H, which is connected to the shaft G and held in place by straps H'. These straps serve to maintain the shaft H in position but at the same time permit the said shaft to freely oscillate. From this shaft downwardly extends

the arm H², which is fastened to the shaft by set screw e. The lower end of this arm is connected to the lower end of bell crank lever by link H³. As this arm is thrown in or out, by the movement of the crank lever, the rod or shaft H is oscillated.

The height of the standard G' is sufficient to hold the cross shafts G and H above the level of the mortar and the shaft H is located such a distance in advance of the shaft G, as to bring the same over the center of the mortar.

Within the mortar works the pestle I, the handle of which extends through an opening cut within the shaft or rod H and is held therein by means of the set-screw f, and may be raised or lowered as required for adjustment. As the crank lever is thrown in or out by the operation of the pitman, the pestle has a reciprocating motion imparted thereto by the oscillation of the shaft H. This shaft being connected to the shaft G, through the medium of the connecting straps, the same may be raised or lowered. Consequently the pestle automatically adjusts itself to any irregularity or unevenness which may exist in the surface of the mortar. By dotted lines (see Fig. 1) the throw of the pestle is shown.

It will be noticed that as the pestle is reciprocated by the oscillation of shaft H, a rotary motion is imparted to the mortar, thus causing the trituration and intermixing of the chemicals within the mortar the same as when the pestle is operated by hand.

As before stated, the pinion F sits loosely upon the shaft B. The motion of said shaft is transmitted to the pinion by means of the clutch box K, keyed to the shaft, which is slipped to or from the pinion by means of the lever K'. When moved toward the pinion the projections or teeth of the clutch box K interlock with the projection or teeth of clutch box K² secured to the outer face of said pinion. The two members of the clutch, or clutch boxes, coacting, it is obvious that when the boxes interlock motion of the shaft is imparted to the pinion.

From the foregoing, it will be observed that I am enabled to throw either the mortar or pestle mechanism out of gear, so to speak, consequently may permit the mortar to revolve and pestle to remain stationary, or pestle reciprocate and mortar remain stationary, or by moving the friction wheel to or from the center of the friction plate, the rotary speed of the mortar may be increased or decreased as desired. These features are important owing to the varying condition of different chemicals.

From the shaft G extends the rod L, which has the adjustable weight L' secured thereon. This weight is employed for adjusting the pressure of the pestle upon the ingredients or chemicals to be trituated.

It will be noticed by reference to Fig. 1 that I connect to the platform or table A the upright or standard L². The standard extends above the level of the mortar and has connected thereto in any suitable manner, preferably by means of the rod f and collars, the scraper L³. This scraper projects inside the mortar and serves to prevent the material from banking or adhering to the inner surface of the mortar. By connecting the scraper to the standard as shown, the same may be adjusted as desired and by regulating the set screws which hold the rod within the collars the same may be swung in or out so as to increase or decrease its distance from the surface of the mortar.

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

1. In a triturator, the combination with the frame, of a vertical shaft mounted therein, a mortar secured on the upper end of said shaft, a friction plate on the lower end of said shaft, a driving shaft below the vertical shaft carrying a friction pinion in contact with the friction plate, a pestle, and mechanism for vibrating the pestle.

2. In a triturator, the combination of the mortar, mechanism rotating the same, an oscillatory cross rod above the level of the mortar provided with a lateral arm carrying an adjustable weight, a rock shaft mounted in straps projecting from the cross rod and carrying the pestle, and mechanism for operating the rock shaft.

3. In a triturator, the combination with the frame, of the mortar, the drive shaft having a friction wheel thereon, the vertical shaft for driving the mortar, the friction plate secured to the lower end of the shaft, which plate engages with the friction wheel, device for moving the plate in or out of contact with the said friction wheel, a pinion loosely secured to the outer end of the drive shaft, gear wheel which intermeshes with the pinion, the pitman connected with the gear at its lower end, the crank lever to which the upper end is connected, said lever being secured to a cross shaft working within bearing in the side standards, the pestle held by a second cross shaft which is connected to the former cross shaft by straps, the downwardly extending arm connected to the crank lever by a link connection, and the clutch mechanism for imparting the rotation of the drive shaft to the pestle driving mechanism.

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

LOUIS ALEXANDER BUCHANAN.

Witnesses:

N. A. ACKER,
LEE D. CRAIG.