June 13, 1939. E. L. CHOTT 2,161,998

MORTAR AND PESTLE

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Fig. 1.

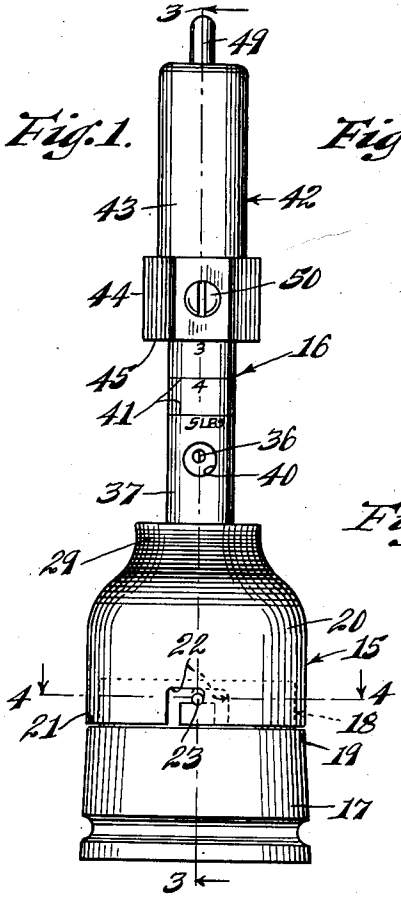


Fig. 5.

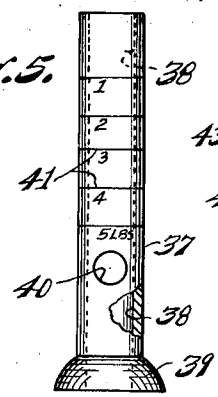


Fig. 7.

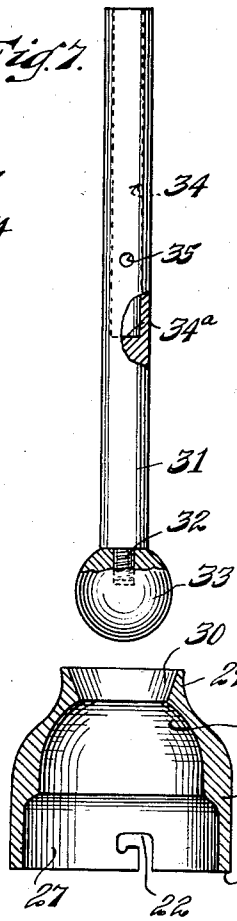


Fig. 3.

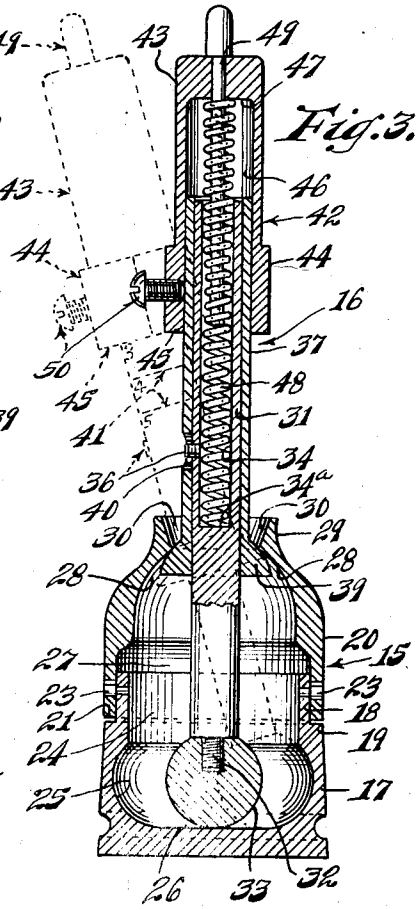


Fig. 4.

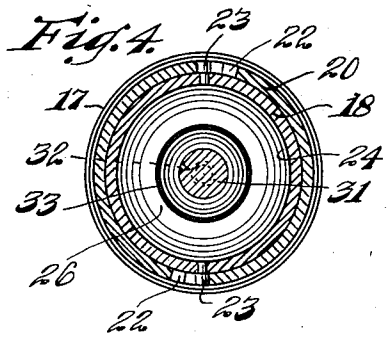
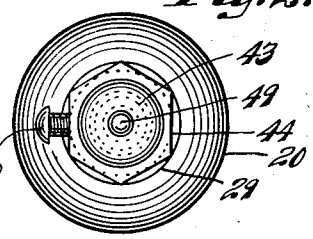


Fig. 6.

Fig. 2.



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Fig. 8.

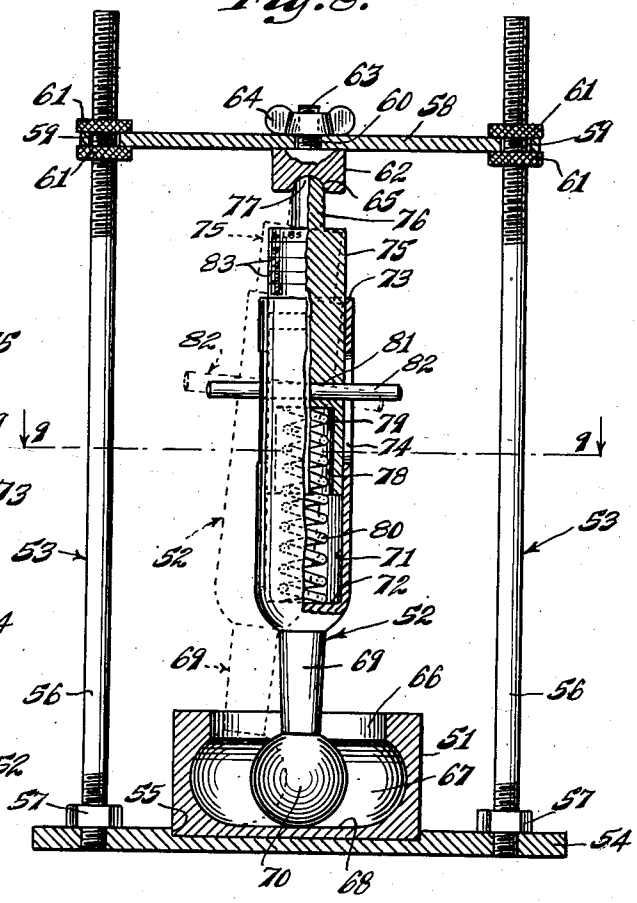


Fig. 10.

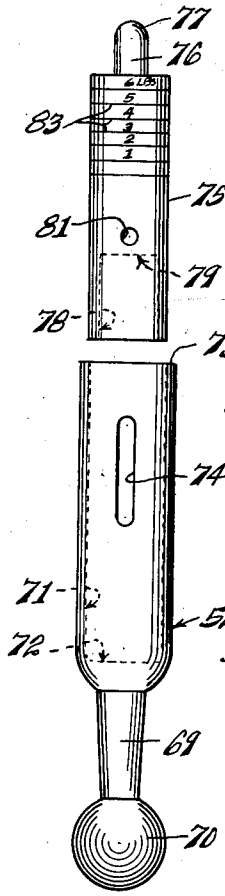
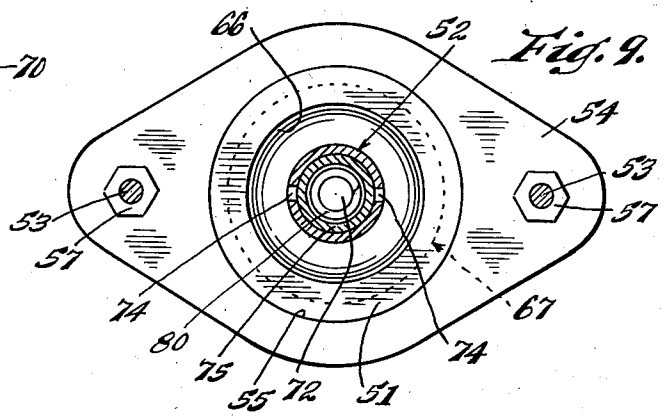


Fig. 11.

Fig. 9.



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UNITED STATES PATENT OFFICE

2,161,998

MORTAR AND PESTLE

Edward L. Chott, Chicago, Ill.

Application April 21, 1937, Serial No. 138,077

6 Claims. (Cl. 83—10)

This invention relates to mortars and pestles and more particularly to devices of this character for prepared dental amalgams and other characteristically similar mixtures.

As is well known, dental amalgams usually comprise a triturated mixture of a characteristic metal alloy and mercury. According to the customary practice and owing to the peculiar nature of the work in which it is used, only a relatively small quantity of the amalgam is prepared at any one time and in its preparation, accuracy in the proportioning of the respective ingredients, and thorough mixing and amalgamation thereof under selective predetermined pressures are essential in order to achieve proper results.

The principal object of the present invention is to provide a mortar and pestle having the advantageous features set forth and described in Patent No. 1,878,263, issued to me on September 20, 1932, and in addition provided with novel means for making certain that the trituration is accomplished at a definite pressure such as 1, 2, 3, 4, or 5 pounds, these limits being the usual ones used. However, other pressures may be used if desired, as will be apparent from the following description, reference being had to the accompanying drawings wherein:

Fig. 1 is a side view of an embodiment of my invention.

Fig. 2 is a top view of the same.

Fig. 3 is a sectional elevation taken along the line 3—3 of Fig. 1.

Fig. 4 is a plan section along the line 4—4 of Fig. 1.

Fig. 5 is a separate view of the bearing sleeve.

Fig. 6 is a view in central section showing the cooperating bearing member.

Fig. 7 is a view of the pestle proper.

Fig. 8 is an elevation partly in section of a modified form of my invention.

Fig. 9 is a plan section of the same taken along line 9—9 of Fig. 8.

Fig. 10 is a separate view of the bearing and indicating member of Fig. 8; and

Fig. 11 is a view of the pestle proper shown in Fig. 8. Referring more particularly to the drawings and especially to Figs. 1 to 7 inclusive, I show a mortar 15 substantially of the type shown and described in my Patent No. 1,878,263, referred to above, and pestle 16, the mortar having a base 17, a reduced neck portion 18 forming a shoulder 19 for cooperative attachment of a cover 20, which in turn, is hollowed out to fit on neck portion 18 and has a circular seat 21 adapted to rest on shoulder 19. A pair of bayonet slots 22 are formed in the sides of cover 20 and cooperate with a pair of pins 23 secured in neck 18 of base 17 in the well-known manner to lock cover 20 to the base 17. Base 17 is provided with a cylindrical bore 24 and a spherical bore 25, which merges with a base portion 26, the spherical bore 25 and the base forming the principal triturating or mixing chamber. The cover is further provided with a cylindrical bore 27 adapted to encompass the reduced neck 18 of base 17, and is provided with a spherical bore 28 in a reduced neck 29 in which is formed a flared bore 30.

A cylindrical rod or tube 31 constituting one of the elements which make up the pestle 16 is provided with a threaded stud screw 32 by which a crusher ball 33 is attached thereto and is further provided with a bore or tubular upper portion 34 which, in turn, terminates in a spring seat 34a. A small aperture 35 is formed in a wall of bore 34 and suitably threaded to receive a limit stud screw 36, for a purpose to be explained more fully hereinafter. The sleeve member 37 is provided with a bore 38 adapted to receive movably or in which telescopes rod 31 and at one end terminates in a spherical bearing seat 39, the latter being arranged to cooperate with and engage bearing seat 28 formed by the spherical bore in neck 29 of the cover member 20. A circular aperture 40 is formed in a side wall of sleeve 37 and is for the purpose of permitting the stud screw 36 to be secured in aperture 35 after rod 31 has ben inserted in sleeve 37, such that the rod is permitted to reciprocate in the sleeve by only the amount the stud screw 36 can move within the limits of aperture 40 and the excess diameter of the aperture over the screw to accommodate the material being treated. A plurality of gauge lines or calibrations 41 are described on the outer surface of sleeve 37 and may be suitably marked with indicia such as 1, 2, 3, 4, and 5, as shown representing the pressure in pounds exerted by the pestle in the mortar, as will be more fully apparent hereinafter. A cap member 42 is provided for sleeve 37 and consists of a cylindrical portion 43 and an hexagonal portion 44 having its bottom forming an indicator edge 45 normal to the axis coacting with calibrations 41 and a counterbore 46 which in turn is provided with a spring seat 47 having one end of a compression spring 48 located therein, and which extends into bore 34 of rod 31, the opposite end of the spring resting on seat 34a. If desired, a circular pin 49 may be suitably located in cap 42 and adapted to retain the upper end of spring 48 in the proper position. A stud or set screw 50 is located in the

hexagonal portion of 44 of cap 42 and serves to lock the same on sleeve 37, by which arrangement it is apparent that indicating edge 45 may be selectively aligned with any of the gauge lines 41 and the pressure exerted by the spring 48 under these circumstances will be that indicated by the particular line 41 which is in alignment with edge 45. It will be apparent that spherical bore 28 and its cooperating bearing seat 39 together comprise a substantially universal or a ball and socket connection, by which the ball 33 may be actuated to any part of bore 25 and that the pressure during trituration will be that indicated by the particular gauge line setting.

In Figs. 8 to 11 I show a modified form of my invention wherein substantially the same results may be achieved as in the form just described in modified form. An open top mortar 51 is arranged to cooperate with a pestle 52, a frame 53 being employed, which is mounted on a base 54 having a circular recess 55 adapted to receive the mortar 51. A pair of vertical posts or standards 56, threaded at both ends, are secured in threaded sockets or apertures to base 54 by lock nuts 57 and a cross frame member, bar or bracket 58 having vertical end apertures 59 and an intermediate aperture 60 is adjustably secured as by knurled edge nuts 61 to posts 56. A bearing block or pivot seat 62 having a threaded stud 63 adapted to pass through aperture 60 is secured to bracket 58 by wingbolt 64 and has a concaved pivot or bearing seat or socket 65.

The mortar 51 has a circular bore 66 and a spherical bore 67 which merges with the interior bottom surface 68, forming the triturating chamber. Pestle 52 has a shank 69 by which the crushing ball 70 is secured thereto. The upper end of the pestle 52 has a tubular bore 71 the base of which forms a spring seat 72, the upper end of the pestle having an edge 73. A pair of elongated slots 74 are formed diametrically opposite in the tubular portion of the pestle and the bore 71 is adapted to receive movably or in which telescopes a bearing sleeve 75 having a spherical globular or convex bearing stud 76 at one end thereof corresponding to the pin 49 at the top of the cap member 42 so that the structure shown in the Figs. 1–6 inclusive, can be used in the same manner as described in connection with Figs. 8–11, inclusive, the stud being formed as a bearing 77 adapted to bear on seat or socket 65 of the bearing block or pivot seat 62. Sleeve 75 has an internal bore 78 provided with and forming a spring seat 79 therein. A compression spring 80 is adapted to set on spring seats 72 and 79. Member 75 is provided with a cross bore 81 in which a pin or cross bar forming a hand engaging member 82 is located, pin 82 being adapted to extend through slots 74 by which arrangement the movement of sleeve member 75 is limited in bore 71, pin 82 also serving to assist in manipulating the device. Member 75 is provided with a plurality of gauge lines or calibrations 83 adapted to register selectively with the edge 73 also disposed normal to the axis but positioned, operating and reading in a reverse direction or inverse order to the lines 41 and the edge 45 in the form shown in Figs. 1–6, inclusive, by which the pressure exerted by the pestle in the mortar may be indicated, the same being determined by the appropriate adjustment of bracket 58 by adjusting nuts 61.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. A mortar and pestle as described, including a mortar, a pestle, means adapted to maintain said pestle in operative contact with said mortar, said means including a cover for said mortar having a socket, and a spherically shaped member for bearing relationship with said socket resiliently connected to said pestle.

2. A mortar and pestle as described, including a mortar, a pestle, means adapted to maintain said pestle in operative contact with said mortar, said means including a cover for said mortar having a socket, and a spherically shaped member for bearing relationship with said socket resiliently connected to said pestle, and means to indicate the pressure of said resilient connection.

3. A mortar and pestle as described wherein said pestle is adapted to be maintained in contact under pressure with the mortar, comprising pivot means for said pestle, a tubular member forming part of said pivot means, a tubular recess in said pestle, a spring retained in said member and recess and adapted to be compressed therebetween, and means to selectively vary said spring compression, said last means including a variably positioned contact between said tubular member and said mortar and means to register said pressure.

4. A device of the character described comprising a mortar having a cover with a spherical socket at the bottom, a pestle having a tubular recess, tubular member having a spherically shaped member for bearing relationship with said socket and having interfitting engagement with said pestle, a compression spring in said tubular member and recess, means to vary the compression of said spring, and means to indicate the amount of said compression.

5. A device of the character described comprising a mortar, a member bearing a socket supported thereabove, a pestle having a tubular member, another tubular member telescoping with the first tubular member, a compression spring within and between said tubular members, a swiveled bearing for one of said members mounting the pestle for universal movement in the mortar, means to vary said spring pressure and hold the same in adjusted position, and means to register said pressure.

6. A device of the character described comprising a mortar and a pestle, means adapted to maintain said pestle in operative contact with said mortar, said means including a pivot and an adjustable spring connection between said pestle and said pivot, said mortar having a cover with a flared bore and the pestle having a semi-spherical shaped member for bearing relationship with the cover beneath the flared bore, said pestle adapted to move angularly therein and to engage the wall of said bore to limit the relative movement of the pestle to the mortar.

EDWARD L. CHOTT.