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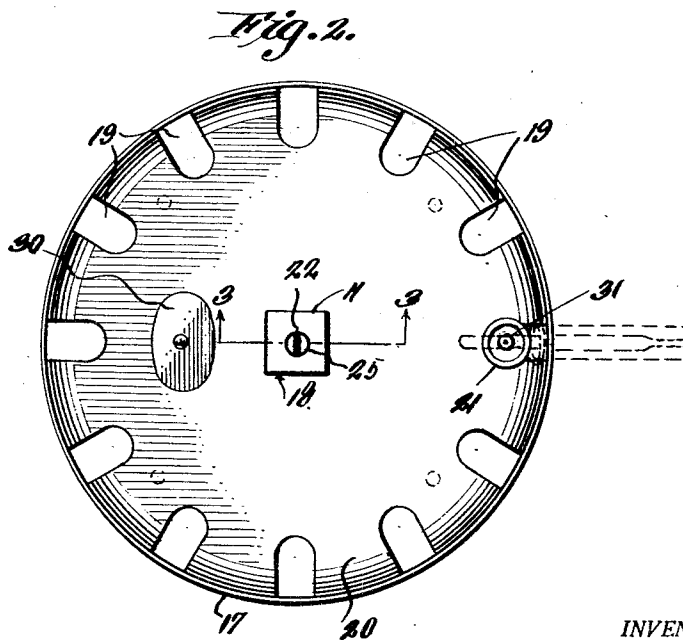
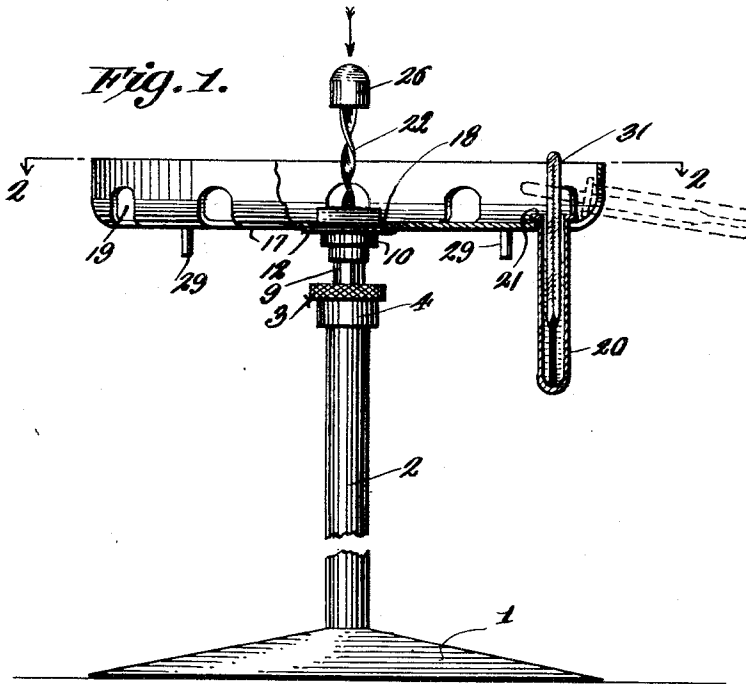
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1,839,944

THERMOMETER SHAKER

Filed July 21, 1928

2 Sheets-Sheet 1



WITNESSES
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2 Sheets-Sheet 2

Fig. 3.

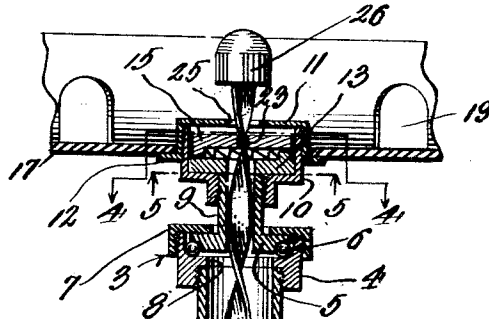


Fig. 4.

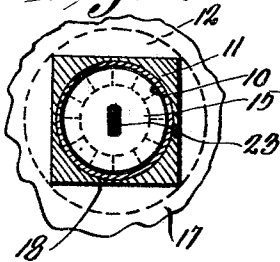


Fig. 5.

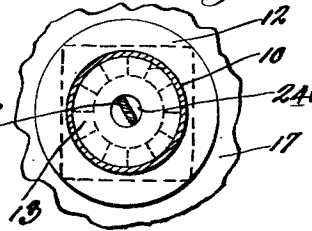


Fig. 7.

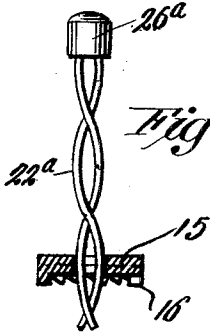
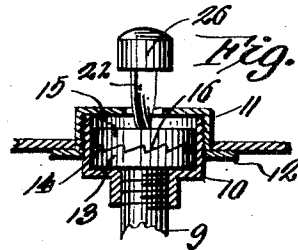


Fig. 6.



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UNITED STATES PATENT OFFICE

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THERMOMETER SHAKER

Application filed July 21, 1928. Serial No. 284,444.

This invention relates to a machine for replacing the mercury of clinical thermometers in the bulb after the thermometer has been used.

5 The primary object of the present invention is to provide a device whereby a number of clinical thermometers may be restored to condition for further use, quickly, positively and safely, all in one operation.

10 The present invention contemplates the provision of a rotatably mounted tray having means for the support of a number of receptacles in each of which a thermometer may be placed, and means for rapidly rotating the tray so that the thermometer holding receptacles will be swung outwardly and the mercury in each thermometer forced back into the bulb thereof through the centrifugal force thus produced.

20 This invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of the present application, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings but may be changed or modified, so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

35 Figure 1 shows the machine embodying the present invention, in side elevation, a portion thereof being broken away to show certain details of construction.

Figure 2 is a horizontal section taken upon the line 2—2 of Figure 1.

40 Figure 3 is a vertical section taken on the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on the line 4—4 of Figure 3 and showing one of the ratchet members of the machine.

45 Figure 5 is a sectional view taken on the line 5—5 of Figure 3 and showing the other ratchet member of the machine.

50 Figure 6 is a sectional view illustrating the relation between the ratchet member and the operating screw of the machine, and

Figure 7 is a similar view of a slightly modified form of the operating screw.

Referring in detail to the drawings, wherein like numerals of reference indicate corresponding parts throughout the several views, 1 designates the base and 2 the tubular standard of the machine. These parts may be connected together in any well known or appropriate manner. A bearing 3 is carried by the upper end of the standard 2, and comprises a fixed member or block 4 which is screw threaded to the standard, a rotatable member or cone 5 which is supported within the block upon balls 6, and a retaining member or cap 7 which is screw threaded to the block and maintains the cone within the block 4 and is provided with an opening 8 which registers with the interior of the standard 2. The cone 5 is provided with a tubular stem 9 which communicates with the interior of the standard 2 and passes upwardly and freely through the cap 7.

A housing 10 of cylindrical formation is screw threaded to the upper end of the stem 9, and screw threaded thereto is a cap 11 which has a polygonal outer surface and is provided at its lower end with an outstanding flange 12. A disc 13 is fixedly secured within the housing 10, and is provided at its upper side with an annular series of ratchet teeth 14. A disc 15 is arranged within the housing 10 upon the disc 13, and is provided at its lower side with an annular series of ratchet teeth 16 for engagement with the ratchet teeth 14. The ratchet disc 13 constitutes a driven member, and the ratchet disc 15 constitutes a driving member. When the ratchet disc 15 is turned in one direction it imparts movement to the ratchet disc 13 and the parts connected therewith, while when the ratchet disc 15 is turned in the opposite direction it moves upwardly and rotates independently of the ratchet disc 13.

A circular pan 17 which is provided at its center with a polygonal opening 18 for the reception of the cap 11, rests upon the flange 12 of the cap, and is thus connected to the ratchet disc 13 for rotation therewith. The bottom of the pan 17 is provided adjacent to the rim of the pan with openings 19 which ex-

tend into the rim, as best shown in Figure 1. The openings 19 are designed to receive thermometer holders of which only one is shown. The thermometer holder 20 is of hollow cylindrical formation, has its lower end closed, and is provided at its upper end with an outstanding flange 21 which engages the inner surface of the pan 17 and prevents the holder from becoming accidentally detached from the pan.

While a relatively small number of the openings 19 are shown in the present pan structure, it is of course to be understood that the machine may be constructed to handle 50 or 100 thermometers at one time.

In order to impart rotation to the pan 17, there is provided an elongated screw 22 which passes through and engages the wall of a slot 23 in the ratchet member 15. The screw 22 passes freely through an opening 24 in the ratchet disc 15, it passes freely through the stem 9 of the cone 5, and it also passes freely through an opening 25 in the cap 11. A knob or hand grip 26 is secured to the upper end of the screw 22 and a plunger 27 is secured to the lower end of the screw and works freely in the standard 2. The plunger 27 rests upon a compression spring 28 within the standard 2 when the screw 22 is in its lowered position. This screw 22 is held against rotation by the operator firmly gripping the knob 26 while reciprocating the screw 22 through the slot 23, thereby causing the pan 17 to rotate.

The pan 17 may be provided with legs 29 for supporting it when it is removed from the machine, and in addition thereto it may be provided with a receptacle 30 for cotton or the like. The holders 20 may be provided with an antiseptic fluid as suggested in Figure 1, for the purpose of sterilizing the thermometers.

The screw 22 is made from a strip of metal twisted about its longitudinal axis. If desired this part of the machine may be made from twisted wires, as shown in Figure 7. The wires of this screw 22a have their lower ends anchored in a plunger, not shown, similar to the plunger 27, and have their upper ends anchored in a knob or hand grip 26a.

From the foregoing description, taken in connection with the accompanying drawings, it will be readily seen that, due to the manner in which the engaging teeth of the ratchet discs 13 and 15 are formed and positioned in association with the twist of the screw 22, upon drawing the screw upwardly the ratchet disc 15 will turn without imparting movement to the ratchet disc 13 and the parts fixed to this ratchet disc. When the screw 22 is forced downwardly the consequent rotation of the ratchet disc 15 will be imparted to the ratchet disc 13, with the result that the pan 17 will be rotated at a high speed. The pan 17 will rotate freely on the standard 2

due to the fact that it is carried by the cone 5 and is supported by the bearing balls 6. During the rotation of the pan 17 the holders 20 and the thermometers 31 carried thereby will move from their normal vertical position into a substantially horizontal position, the holders and their thermometers extending radially outward from the pan when in said latter position. The rapid rotation of the thermometers 31 causes the mercury in the thermometers to recede into the thermometer bulbs. The spring 28 cushions the downward thrust of the screw 22. After the plunger 27 contacts with the spring 28, the screw 22 may be released, or further downward movement imparted thereto, such movement carrying the grip 27 into contact with the cap 11 with the result that the pan 17 is brought to a stop.

Having thus described my invention what I claim is:

1. A centrifugal machine for shaking down clinical thermometers comprising a supporting standard, a bearing mounted at the upper end of said standard, a rotatable element mounted in said bearing, a pan carried by said element and adapted to receive the thermometers, and a screw device designed to be reciprocated and the threads thereof coacting to produce rotation of said element.

2. A centrifugal machine for shaking down clinical thermometers, comprising a vertical tubular supporting standard, a bearing rotatably mounted at the upper end of said standard, a rotatable element mounted in said bearing, a pan supported by said element to receive the thermometer, and an operating screw mounted for reciprocable movement in said standard and having its threads coacting with said bearing structure to cause rotation of the same and the supported pan as said screw is reciprocated.

3. A centrifugal machine for shaking down clinical thermometers, comprising a vertical tubular supporting standard, a bearing rotatably mounted in the upper end of said standard, a rotary element mounted in said bearing, a pan supported by said element, an operating screw mounted for reciprocable movement in said standard and having its threads in sliding engagement with said element to cause rotation of the same and the supported pan, and ratchet means associated with said element for permitting movement of the screw in one direction without affecting the rotation of the pan.

4. A thermometer shaker, comprising a rotatably mounted pan having an upturned rim about the periphery thereof and further having a plurality of apertures formed therethrough and extending from the bottom upwardly into said rim, tubular thermometer receiving receptacles each extending through one of said apertures and having a flange at

its mouth for engaging the edge of the aperture, permitting the receptacle to swing therein, a support having a bearing, a supporting element for said pan in said bearing, and a reciprocal screw extending through said element and having sliding engagement therewith to cause the bearing and pan to rotate, when reciprocated.

5. A thermometer shaker, comprising a rotatably mounted pan having an upturned rim about the periphery thereof and further having a plurality of apertures formed there-through and extending from the bottom upwardly into said rim, tubular thermometer receiving receptacles each extending through one of said apertures and having a flange at its mouth for engaging the edge of the aperture, permitting the receptacle to swing therein, a supporting standard, at bearing at the upper end of said standard, a supporting element for said pan in said bearing, a reciprocable screw extending through said element and having sliding engagement therewith to cause the bearing and pan to rotate, when reciprocated, and ratchet means associated with said bearing for permitting movement of the screw in one direction without rotating the pan.

6. A centrifugal machine for shaking down chemical thermometers, comprising a support, a member rotatably connected to the support and provided with ratchet teeth, a ratchet member carried loosely by said first member and engaging the ratchet teeth thereof, a screw engaging the ratchet member, and a thermometer support carried by said first member.

7. A centrifugal machine for shaking down chemical thermometers, comprising a support, a member rotatably connected to the support and provided with ratchet teeth, a ratchet member carried loosely by said first member and engaging the ratchet teeth thereof, a screw engaging the ratchet member, a thermometer support carried by said first member, and means for swingingly supporting a thermometer upon said thermometer support.

8. A centrifugal machine for shaking down clinical thermometers, comprising a hollow support, a hollow member connected to the support and provided with ratchet teeth, a screw reciprocally mounted in the support and passing through the member, a ratchet member engaged with the screw and engaging the ratchet teeth of said first member, and a thermometer support carried by said first member.

9. A centrifugal machine for shaking down clinical thermometers, comprising a hollow support, a hollow member rotatably connected to the support and provided with ratchet teeth, a screw reciprocally arranged in the support and passing through the member, a spring within the support below the

screw, a ratchet member engaged with the screw and engaging the teeth of said first support, and a thermometer support carried by said first member.

10. A centrifugal machine for shaking down clinical thermometers, comprising a hollow support, a hollow member rotatably connected to the support and provided with ratchet teeth, a screw reciprocally arranged in the support and passing through the member, a spring within the support below the screw, a ratchet member engaged with the screw and engaging the teeth of said first support, a handle secured to the upper end of the screw and adapted to contact with said member to serve as a brake therefor, and a thermometer support carried by said first member.

11. A centrifugal machine for shaking down clinical thermometers comprising a support, a thermometer carrying member provided with communicating vertical and horizontal thermometer guiding means, thermometer supporting means mounted within said guiding means for permitting said thermometer supporting means to swing outwardly by centrifugal force, the thermometer supporting means passing from the horizontal to the vertical guiding means as said thermometer carrying member is rotated.

In testimony whereof I affix my signature.
CHARLES F. BARTHELS.

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