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WATCH WINDING MACHINE
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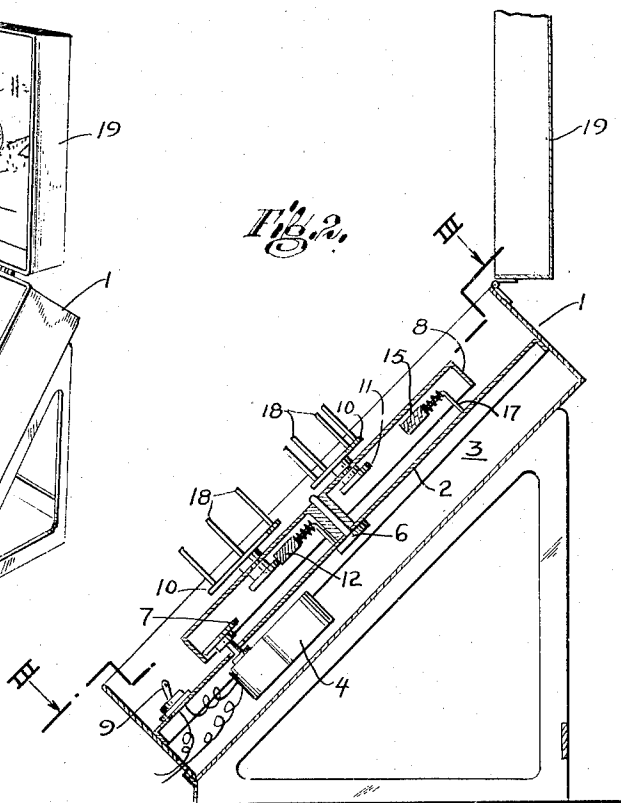
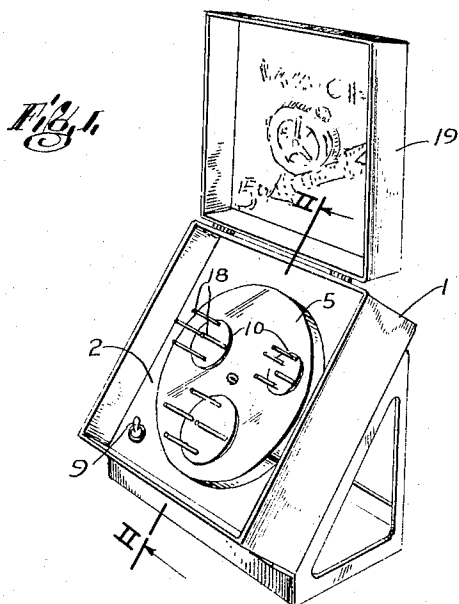


Fig. 3.

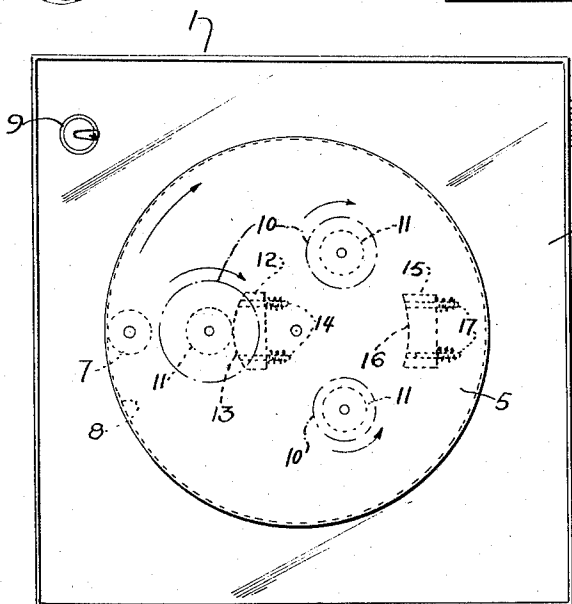


Fig. 4.

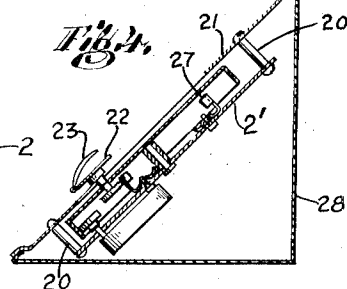
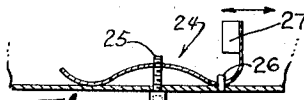


Fig. 5.



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WATCH WINDING MACHINE

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7 Claims. (Cl. 81-75)

The invention relates to a machine for winding so-called "self-winding" watches and the like. Such instruments are characterized by the provision of a rotor having sufficient mass so that normal in-use movements of the instrument cause oscillation of the rotor relative to other parts and effect the winding of the main spring, through mechanism which need not here be described.

When such a self-winding watch is left with a jeweler for adjustment and/or repair it is usually desirable or necessary for the watch to be moved at least long enough and often enough to keep it wound up. This means either wearing the watch or spending some 25 minutes a day shaking it, either of which is out of the question when a jeweler has a dozen or more watches on hand at the same time. The same problem is solved by watch manufacturers through the use of large machines, capable of handling some 200 watches at a time and costing several hundred dollars.

It is the object of the present invention to provide a machine which is inexpensive to manufacture, simple to operate and capable of winding some 30 or 40 watches at a time, for the convenience of the many jewelers whose needs for a watch-winding machine fall within that limit.

A practical embodiment of the invention is shown in the accompanying drawings, in which:

Fig. 1 represents a perspective view of the machine with the lid open;

Fig. 2 represents a vertical section taken on the line II—II of Fig. 1, the motor being indicated diagrammatically;

Fig. 3 represents a section taken on the line III—III of Fig. 2, looking in the direction of the arrows;

Fig. 4 represents a vertical section, similar to Fig. 2, but showing somewhat diagrammatically a modified form of the machine; and

Fig. 5 represents a vertical detail section showing a modified form of bumper.

Referring to the drawings, the machine can most conveniently be made by the use, with suitable modifications, of certain parts normally present in a portable record player, comprising the box 1 having a horizontal partition 2 which encloses the compartment 3 containing the motor 4. A turntable 5 is centrally mounted on the spindle and bearing 6, and is driven by the friction drive wheel 7 resting against the inner surface of the turntable flange 8. A switch 9 in the motor circuit starts and stops the motor. No tone arm or sound reproducing means is provided. A spring-wound motor could be substituted for the electric motor shown.

Journalled in the turntable, equidistant from the center thereof and uniformly spaced circumferentially, are the spinning stands 10, the axes of which bear friction wheels 11 on their lower ends. A bumper 12 having a convex arcuate surface 13 is resiliently connected to supports 14 on the partition 2, the bumper being so located that its surface 13 can engage the periphery of each wheel 11 at its innermost point as the turntable is rotated.

Diametrically opposite the bumper 12 is a second

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bumper 15 spaced farther from the center, having a concave arcuate surface 16 and resiliently connected to supports 17, this bumper being so located that its surface 16 can engage the periphery of each wheel 11 at its outermost point as the turntable rotates.

Each of the spinning stands 10 is provided with posts 18 so disposed as to enclose adequately a watch or pile of watches. While the machine could be made with only one or two stands 10, it is shown here as having three, each of which has four posts 18 and the spacing of the later being different in order to accommodate different sized watches. Since as many as a dozen (or more) watches can be piled pancake-wise on each stand, it is evident that the machine shown has a capacity of 35 to 40.

In operation, the self-winding watches are loaded onto the stands 10, the motor is turned on and the turntable rotates, preferably at about 45 R. P. M. (or at such speed as seems best in the event that the number of pairs of bumpers is increased). As each friction wheel 11 passes the bumper 12 its stand is given a rotation movement in the same direction as that of the turntable. As each friction wheel 11 passes the bumper 15 its stand is given a rotation movement in the opposite direction. The bumpers and friction wheels constitute a sort of rack-and-pinion device, but operate with somewhat less abruptness so that the watch mechanism is not likely to suffer from shock. These rapid reversals of movement cause the inertia mechanism in the watches to wind them and a treatment of about 25 minutes duration will generally be found adequate.

The machine should, for most efficient operation, be tilted up to an angle of 45° in order to create a closer simulation of the natural movements to which the winding mechanism is designed to be responsive. A simple form of stand for supporting the machine in a tilted position is shown in the drawing but is not to be deemed part of the invention. The winding operation takes much longer when the machine is not tilted. The box 1 is preferably provided with a lid 19, hinged along the back and having a depth sufficient to accommodate the posts 18. The machine has, whether at rest or in operation, a certain advertising value in that it is likely to attract attention, and further benefit for the user can be obtained by placing appropriate advertising material on the inside of the lid where it can be seen when the lid is opened (Fig. 1).

In the modified, and somewhat simplified, machine shown in Fig. 4, the partition 2', bearing the motor, bumpers and turntable, is mounted by means of legs 20 on the underside of a face plate 21. The latter is provided with a circular opening, concentric with, and smaller than the turntable but large enough to permit free rotation of the spinning stands 22 (only one of which is shown). The mechanism of this type of machine differs from that shown in Figs. 1 to 3 in that the stands 22 are provided with spring clips 23, adapted to hold only one watch (instead of a stack of watches) on each stand; and in that the bumpers 24 are of a type somewhat different from those described and shown at 12 to 17. The bumper 24 comprises a resilient supporting strip of metal, bent as best shown in Fig. 5, threaded at the top of its "hump" to receive an adjusting screw 25, perforated near one end to receive a registering pin 26 and provided at its upturned end with an arcuate, laterally extending part 27 constituting a friction surface which corresponds exactly in form, location and function to the surface 13 or 16 of Fig. 3. Such bumpers can be formed with the parts 27 concave inwardly or outwardly and may, in either case, be so mounted on the partition 2' as to constitute the inner bumper (like 13) or the outer bumper (like 16). A fine adjustment of the position of each part 27, to engage precisely and resiliently

with the peripheries of the spinning stand friction wheels, can be made by tightening or loosening each screw 25 thus swinging the upwardly projecting parts laterally, e. g., approximately around pin 26 as a pivot.

The face plate 21 is shown as being mounted, at the desired 45° angle, on the diagonal of a half-cube shaped case 28 at the top edge of which is hinged a lid 29. Since the posts 18 (Figs. 1 to 3) are here replaced by the clips 23, the lid 29 can be relatively shallow. In this form of the machine no moving parts are visible except the spinning stands 22 and the middle part of the turntable, so that the machine has a very neat appearance. The surface of the plate 21 is available for decoration or advertising, as desired. The motor switch (not shown) is, of course, preferably mounted on the plate 21.

The number of spinning stands may be varied from one up to the physical capacity of the turntable, and the number of alternating inner and outer bumpers can be increased so as to provide, for instance, a total of 4 or 6 spaced at 90° or 60° angles, instead of two at 180° intervals as shown.

The motor used in such a machine may have a rating of 1200 H. P., running at 3000 R. P. M. on normal 110 v., 60 cycle current and thus being very economical to operate. With three stands 10 and two bumpers, as shown, there will be frictional engagement on one side or the other at six equally spaced points during each rotation of the turntable, and the motion of the latter will tend to be quite smooth, particularly when the turntable is relatively heavy as is usually the case.

It will be understood that various changes may be made in the form, construction and arrangement of the several parts without departing from the spirit and scope of the invention.

What I claim is:

1. A machine of the character described comprising a rotatable support, driving means for rotating said support continuously in a single direction about its axis, an article-supporting stand rotatably mounted on said support through an axle parallel to the axis of said support and radially spaced therefrom, a friction wheel secured to said axle, a relatively fixed surface mounted in position to be frictionally engaged by said friction wheel at a point between the axle of said wheel and the axis of the support and another relatively fixed surface mounted in position to be frictionally engaged by said wheel at a

point farther from said axis than the distance from said axis to said axle, said fixed surfaces being angularly spaced apart around said axis and said friction wheel being disengaged from said surfaces through a substantial part of its path of travel, whereby said wheel and stand are free to rotate about said axle while so disengaged.

2. A machine according to claim 1 in which there are a plurality of article-supporting stands equi-angularly disposed around the axis of the rotatable support.

3. A machine according to claim 1 in which the relatively fixed surfaces are, respectively, convex and concave, and are so mounted as to be resilient in the axial direction.

4. A machine according to claim 2 in which each stand includes article-retaining means for preventing articles supported on said stands from escaping therefrom.

5. A machine according to claim 4 in which the article-retaining means are posts, and in which the spacing of the posts differs on different stands, whereby said stands are enabled to support and retain articles of different sizes.

6. A machine according to claim 4 in which the article-retaining means are spring clips.

7. A planetary mechanical movement comprising, a carrier rotatable around an axis, at least one element rotatable around an axis carried by, parallel to, and spaced from the carrier axis, a friction wheel secured coaxially to said element, an arcuate surface of less than 180° centered on the first-named axis and fixed in a position to engage the periphery of the friction wheel at a point between said axes, and another arcuate surface of less than 180° centered on the first-named axis and fixed in a position to engage the periphery of the friction wheel at a point spaced from said first-named axis by a radius equal to the distance between said axes plus the radius of the friction wheel, the angles subtended by said arcuate surfaces lying wholly on opposite sides of a given diameter.

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