

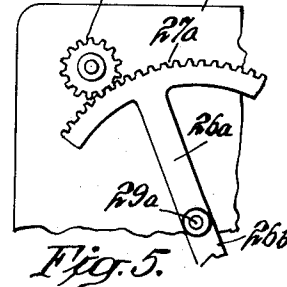
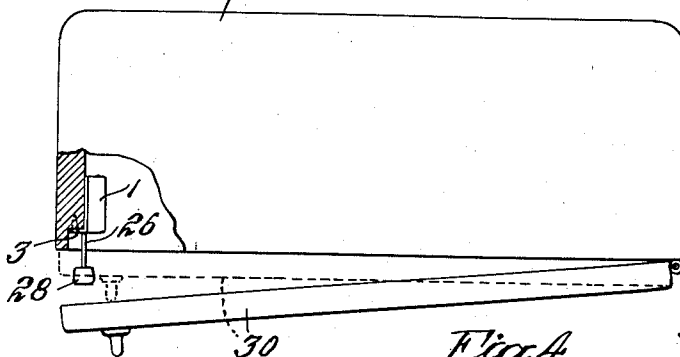
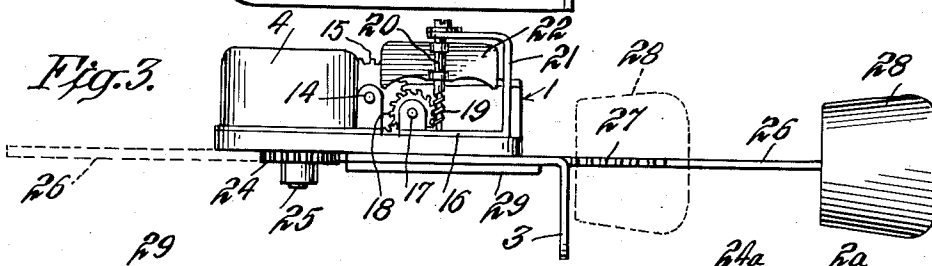
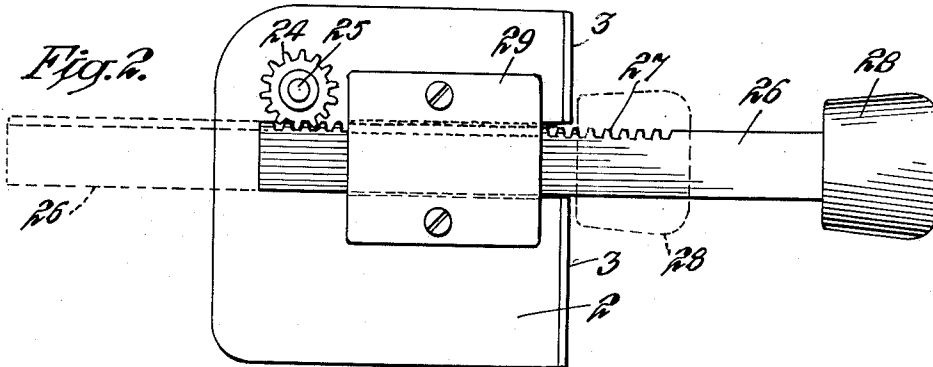
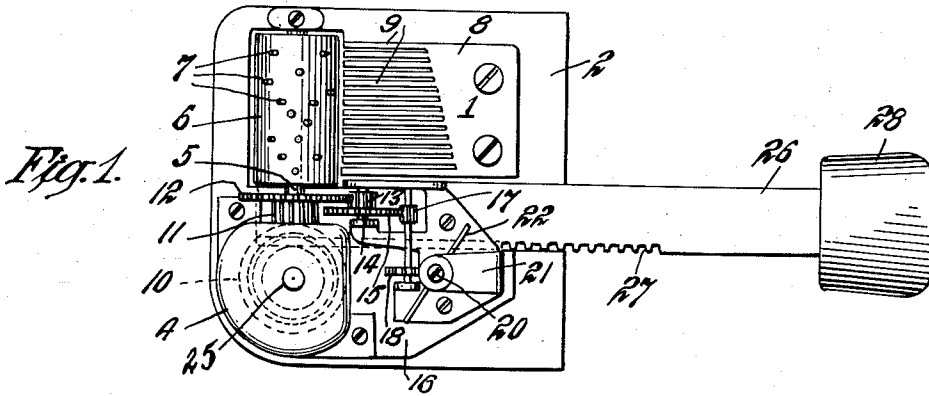
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MUSIC BOX ASSEMBLY

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MUSIC BOX ASSEMBLY

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The present invention relates to new and useful improvements in music box assemblies comprising motive means adapted to actuate conventional music box components to effect music play.

Generally, music box assemblies comprise a spring wound motor which is adapted through the cooperation of a train of gears to turn a cylindrical drum which has protruding radially from its surface small spikes or hammers which strike the elements of a reed to produce music depending upon predetermined positions of the spikes on the drum. Such assemblies are designed to be positioned in a small box or other small containers or objects so that when an object containing the music box assembly is handled, that is by lifting it from a supporting surface or by opening the lid of a box, be it a cigarette box, a powder box, or other types of utility boxes, it immediately plays music until the lid is closed or the object or container is placed back on the supporting surface. An actuating element is generally used in combination with the assembly to start the playing of music, the element being designed so that, depending upon the object, it can cooperate with a supporting surface or the lid of a box to prevent musical play until the object is either raised to release the element or the lid of the box opened. The assembly must be maintained in a continually wound condition, and since this is done by hand, the assembly plays itself out after several handlings unless one remembers to wind the spring motor.

I have now discovered a new assembly combination that enables a broader use of music box assemblies for such applications as refrigerators, hope chests, closets, or any other types of enclosures having a closure element. Depending on its use, the assembly need not be manipulated by hand to keep it in the wound condition, although with the new combination, hand winding is greatly simplified.

The nature of the invention will more clearly appear from the following detailed description of a preferred embodiment of the invention which is illustrated in the drawings, wherein:

Fig. 1 is a top view of the music box assembly showing a rack which cooperates with a pinion to wind the spring motor;

Fig. 2 is a view of the assembly looking at its underside and showing more clearly the pinion and rack combination;

Fig. 3 is a front view of the assembly shown in Fig. 1;

Fig. 4 illustrates an end view, a portion of which is in partial section, showing how the assembly can be utilized in combination with a closure element, such as the door of a refrigerator, of a closet, of a hope chest and the like; and

Fig. 5 shows another embodiment of the rack and pinion combination used in conjunction with the assembly.

Referring to a preferred embodiment illustrated in the figures, a music box assembly indicated generally as 1 is shown mounted to backing plate 2 having a bent flange 3 by means of which the whole assembly can be mounted,

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if desired, in an enclosure as shown in Fig. 4. The music elements making up the music box assembly comprise a spring motor mounted within casing 4 which through a shaft 5 rotates drum 6 provided with spikes or hammers 7 which operate a reed 8 by striking reed elements 9. The spring motor, which is normally wound by a key, is wound by a novel means which will be described later.

When the motor is wound and then allowed to unwind, shaft 5 is caused to rotate through ring gear 10 which meshes with pinion 11 fastened to shaft 5. The shaft carries, adjacent the pinion 11, a large gear wheel 12 which engages a pinion 13 mounted on a rotatable shaft 14 carrying a gear wheel 15. The motor as well as the support for the bearing of drum 6 and the supports for shaft 14 are mounted on a metal frame 16 which in turn is fastened to backing plate 2. The gear 15 transmits the rotary motion of the motor shaft to a splined shaft 17, also rotatably mounted on supports projecting from frame 16.

Splined shaft 17 carries a pinion 18 which engages the screw threaded portion 19 of a vertical shaft 20 rotatably supported in bracket 21 projecting from frame 16 (see Fig. 3). The shaft 20 carries a rotatable vane or governor 22 above its screw threaded portion. If desired, the rotation of motor shaft 5 can be stopped by restraining the movement of the governor by utilizing means projectable within the path of rotation of the governor.

The foregoing elements constitute the basic parts making up the music box assembly. Of course, other elements can be added to meet a particular need for a particular situation. As has been mentioned before, the spring wound motor is generally wound by hand with a key, much as a clock is wound. However, because of the limitations imposed in the use of such winding means, an improved winding means is employed in its stead comprising a gear and rack combination which is adapted to cooperate, when so desired, with closure elements adapted when closed to maintain the motor in wound condition (for example, as indicated in Fig. 4).

The improved combination comprises a gear 24 mounted at one end of shaft 25 of the spring wound motor in casing 4 and a rack or plunger 26 with teeth 27 with a suitable handle 28 at one end as shown. The rack passes through backing plate 2 along its plane and is held in sliding engagement with gear 24 by means of slide support 29 attached to the bottom of the backing as shown in Fig. 2. Of course, other means for holding the rack in operable engagement with the gear can be employed and the embodiment shown in the drawing is not to be construed to limit the invention thereto.

Thus, the winding of the spring motor is greatly facilitated in that by merely pushing the rack via handle 28, the teeth 27 of the rack moving against the teeth of gear 24, cause the gear to rotate rapidly turning shaft 25 of the spring motor resulting in its being wound. This is accomplished quickly in a one movement operation as compared to the conventional key winding method.

The novel music box assembly thus has increased utility. For example, it can be employed in combination with a closure element, such as a door of a closet or refrigerator. Assuming the view in Fig. 4 to be the top view of a refrigerator or box 29 with door 30 and that the gear and rack operated music box assembly 1 is located in the top corner thereof fastened through flange 3 as shown with the handle 28 of rack 26 extending a suitable distance out of the box, when the door is closed it pushes against handle 28 causing rack 26 to slide inward and wind the spring motor (not shown). Thus, when the door is closed, the assembly is in the wound condition. When the door is opened, music begins and

rack 26 begins to move out of the box due to the rotation of the gear enmeshed therewith. When the door is closed again, the spring motor is rewound.

The rack may be designed so that its full stroke will completely wind the spring without overwinding it or, if desired, the combination may be provided, for safety's sake, with a stop to limit the travel of the rack to prevent overwinding.

The assembly by itself has utility. For example, it can be used as a timing device for the short time cooking of foods, such as soft boiled eggs. Assuming the spring motor has been designed for a total play of about four minutes, the rack can be indexed by means of predetermined stops to produce any time interval ranging from one to four minutes so that when music play stops at a preset time, let us say for example at the end of two minutes, a two-minute egg is obtained. Because the winding of the spring motor has been greatly simplified, the music box assembly finds versatile use in the kitchen.

While the improved winding combination has been described in conjunction with a straight forward moving rack, it will be appreciated that the rack can be designed as a segment of a curve, with the teeth situated along the curved portion as shown in the broken view of Fig. 5. Thus, the rack 26a mounted on back plate 2a instead of sliding can be guided by pivot support 29a so that when the rack is caused to pivot, its teeth 27a while enmeshed with the gear or pinion 24a of the motor, will move in an arc and cause the gear to rotate as before. With this type of combination, the handle of the rack which lies beyond the broken portion 26b may protrude from the assembly at an angle so that when the door strikes it, the rack moves about its pivot causing its teeth to move cooperatively against the teeth of the winding gear of the spring motor, thereby rotating the gear and winding up the motor.

If desired, the handle of the rack can also be used in combination with a supporting surface or an abutting element to effect winding of the spring motor. For example, if the novel combination is employed in a utility box, the handle of the rack may project from the bottom of the box sufficiently so that when the box is placed on a supporting element, the weight or pressure of the box against the handle causes it to move inward and wind the motor. Thus, the spring motor will always be wound when the box is lying on a supporting surface thereby to effect musical play when the box is raised off the surface.

It will be obvious to those skilled in the art that many modifications and variations of the embodiments herein discussed can be effected without departing from the spirit and scope of the invention which is defined in the appended claims.

I claim:

1. A spring motor winding mechanism comprising in combination, a back-up support adjacent which said spring motor is mounted with one end of its shaft terminating at said support, a pinion mounted at said end of the shaft adjacent said back-up support, a movable rack associated with said support and having teeth at one end portion of said rack in meshing engagement with said pinion, means associated with said back-up support for guiding the movement of the rack and for maintaining it in cooperable winding and unwinding relation with said pinion, a handle integral with and extending freely from the other end portion of said rack through which force is applied to move said rack to wind said spring motor, whereby said rack is enabled to wind said motor via the pinion by the single thrust thereof, said rack and handle being adapted to return to home position via said pinion in synchrony with the unwinding of said motor.

2. The winding mechanism of claim 1 wherein the spring motor is mounted adjacent one side of said back-up support with one end of its shaft passing through said back-up support, wherein the pinion on said one end of the shaft is mounted adjacent the other side of said support in meshing engagement with the rack also mounted on said other side and wherein the means for guiding the movement of said rack and for maintaining it in cooperable winding and unwinding relation with said pinion is also associated with said other side of said support.

3. The combination of the winding mechanism defined in claim 1 and a music box assembly comprising a reed and a drum provided with spikes adapted to strike the reed to produce music, the spring motor of the winding mechanism being mechanically coupled to the drum in driving relationship therewith through suitable gearing to effect music play during the unwinding of said spring motor.

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