Jan. 19, 1960 KANAME ICHIKAWA 2,921,495

LIGHTER WITH BUILT-IN MUSIC DEVICE

Filed Feb. 11, 1958

Fig. 2

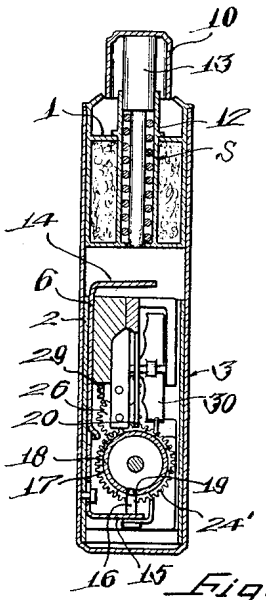


Fig. 1

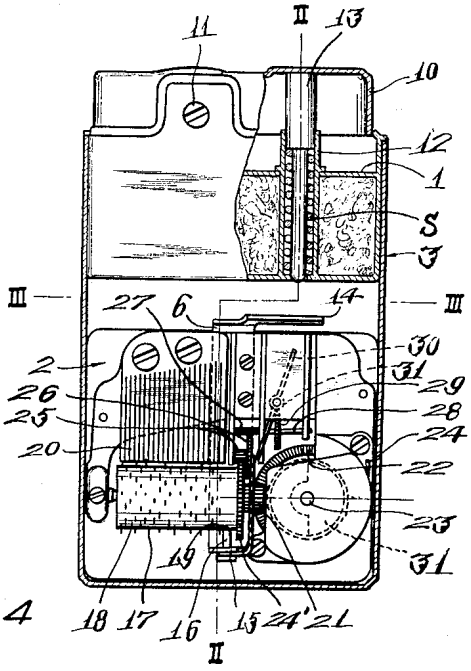


Fig. 4

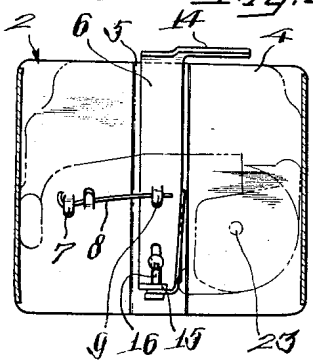


Fig. 3

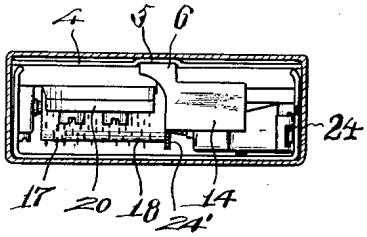
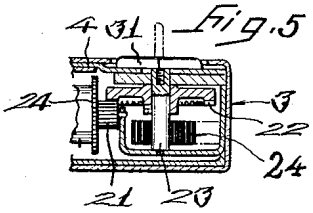


Fig. 5



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LIGHTER WITH BUILT-IN MUSIC DEVICE

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2 Claims. (Cl. 84—95)

The present invention relates to an improved lighter with built-in music device, and it has for its object to construct a casing of the ignition apparatus of a lighter and a casing of the operating mechanism of a music device, each separately, said two casings being adapted to be inserted in a container of a lighter so as to be freely detachable, thereby facilitating repair in case of failure of the works and simplifying its assembly and disassembly, thus assuring long serviceability of a lighter.

It is one object of the present invention to provide a lighter which is arranged in such a manner that a casing of the ignition apparatus of a lighter and a casing of the operating mechanism of a music device are constructed separately and said two casings are inserted separately in a container of a lighter, and after being assembled in this way, the casing of the operating mechanism of a music device is rigidly fastened to said container by means of a working screw provided at the outer side of the container, whereupon a spiral spring is wound up therein, thus completing the assembly. The music device is caused to play music each time at the ignition of the lighter, continuing said play while a music drum is making one turn and then halting automatically and punctually thereat.

It is yet another object of the present invention to provide a lighter which is further arranged in such a manner that, in correspondence with the upward and downward movements of a lighter-operated rod, an L-shaped sliding control member is adapted to be actuated to like movements, upwardly and downwardly, along a recess provided longitudinally on the casing of the operating mechanism of the music device, and when the music play is over after performing for a definite time, said sliding control member will regain its initial position so as to be ready to respond immediately to the next operation.

With these and other objects in view, which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

Figure 1 is a longitudinal sectional view of a container of the lighter according to the present invention, showing a part thereof in action;

Fig. 2 is a section along the lines 2—2 of Fig. 1;

Fig. 3 is a section along the lines 3—3 of Fig. 1;

Fig. 4 shows, with a casing of the operating mechanism of a music device being removed, an associated state of a recess formed at the inner wall thereof, a sliding control member moving upwardly and downwardly in the engagement with said recess, and a leaf spring functioning to return said sliding control member to its initial position; and

Fig. 5 is a sectional view of Fig. 1 substantially along the lines 5—5.

Referring now to the drawings, a casing 1 of the ignition apparatus is inserted in a container of the lighter, after a casing 2 of the operating mechanism of a music device has been inserted therein. The construction of the casing 1 is substantially similar to the conventional

casing structure and, accordingly, a detailed description thereof is omitted herein.

The casing 2 of the operating mechanism of the music device has in section a rectangular form, as shown in Fig. 4, and is provided with a recess 5 disposed longitudinally at an inner wall 4 thereof. An L-shaped sliding control member 6 engages said recess 5, so as to be movable in upward and downward directions. As shown in Fig. 4, the sliding control member 6 is constantly pushed in the upper direction by the action of a leaf spring 8, one end 7 of which is rigidly fixed to the casing 2 by means of a projection 9 provided on the sliding control member 6.

Now, when an operating cap 10 of the lighter is pressed downwardly in Fig. 1, to effect thereto a rapid rocking movement around a bolt 11, in order to perform the ignition operation, a rod 13 loosely engaged in a vertical cylinder 12 of the casing 1 and lifted upwardly by means of a spring S, is lowered, whereby the extreme lower end of the rod 13 imparts pressure onto an upper bent portion 14 of the sliding control member 6 which correspondingly makes a downward movement. When the sliding control member 6 is lowered, overcoming the force of the leaf spring 8, a lower bent portion 15 thereof is lowered likewise. This lower bent portion 15 is provided with a rigidly fixed pin 16 pointing upwardly, the top end thereof being adapted to engage a hole 19 provided on the periphery of a music drum 18, on which needles 17 for playing music are mounted. As described above, when the lower bent portion 15 is caused to move downwardly, the pin 16 disengages the hole 19 of the music drum 18, thereby permitting the starting of the rotation of the music drum 18, and, as a consequence, the needles 17 will shake successively oscillation plates 20, thus enabling music play as predetermined. The axle of the music drum 18 is carried in the casing 2 so as to be freely rotatable, and a gear 21 provided on one side of the axle meshes with a gear 22, the center part of which is rigidly secured to an axle 23, on which a spiral spring 24 is wound up. One end of the spiral spring 24 is rigidly secured to said axle 23 and the other end thereof is secured to a part of the casing 2. The spiral spring 24 causes constant rotation of the drum 18 by means of the gears 22 and 21. Accordingly, when the pin 16 is disengaged from the hole 19 of the drum 18, the latter will start rotation to play music, and at the termination of revolution of the drum 18, the pin 16 engages again the hole 19 on the periphery thereof, thereby halting the rotation of the drum 18. Thus the play of music will be discontinued, and consequently the above parts constitute a main control device for the music drum.

A gear 24', rigidly secured to the axle of the drum 18, meshes with a gear 25, whose axis is suitably carried by the frame of the casing 2, and a gear 26, rigidly secured to said axle meshes with a gear 27, and further a gear 29, which is rigidly secured to an axle 28 of said gear 27, meshes with a gear 31 rigidly secured to the axle of a fan-like stopper 30. Accordingly, the drum 18, upon rotation, will actuate the fan-like stopper 30 to rotate at a high velocity. The fan-like stopper 30 is adapted to obstruct the rotation of the music drum 18 by co-operating with a part of the control member 6, and this constitutes an auxiliary control device for the music drum 18, however, as the function thereof is well known, any further detailed description thereof is omitted here.

The recess 5 is provided longitudinally at the inner wall 4 of the casing 2 of the operational mechanism of the music device, and the sliding control member 6 is fitted therein so as to move upwardly and downwardly, therefore it will be seen that the function thereof can

be easily and accurately performed. A screw 31, which is to function as a set screw and concurrently as a spring winder, after the casing 2 has been inserted in the container 3, is operationally associated with the axle 23 mounted at the wall 4 of the casing 2 through a hole provided at the container 3, so that said screw 31 serves to fix rigidly the casing 2 in the container 3 at a definite position therein, and also to wind up the spiral spring 24 by rotation thereof.

While I have disclosed one embodiment of the present invention, it is to be understood that this embodiment is given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

What I claim is:

1. A lighter including a music device comprising a first casing receiving an ignition mechanism for said lighter and a second casing receiving an operating mechanism for said music device, a container, said first casing being disposed on top of said second casing in said container, said ignition mechanism including a spring-biased rod mounted for vertical movement in said first casing and disposed completely in the latter in its inoperative position and projecting downwardly towards said second casing in its operative position, vertical guide means in said second casing, and a sliding control member mounted for vertical movement by said vertical guide means in said second casing, said rod engaging said sliding control member in its operative position and moving downwardly said

sliding control member, a leaf spring mounted in said second casing and engaging said sliding control member to urge the latter into its uppermost inoperative position, said sliding control member carrying at its lower end an upwardly directed pin member, and said music device including a drum having a hole aligned with said pin of said sliding control member, said pin entering said hole in the upward, inoperative position of said sliding control member and being withdrawn from said hole in the lowered, operative position of said sliding control member, thereby releasing said drum of said music device for rotation of one revolution, to receive said pin again and to stop rotation thereof, and spring means disposed in said second casing causing rotation of said drum upon release of the latter, and means for manual winding of said spring means.

2. The lighter, as set forth in claim 1, wherein said second casing has a vertical slot constituting said vertical guide means, and said sliding control member has a lateral projection received in said vertical slot.

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