PATENT SPECIFICATION

598,788

Convention Date (France): April 6, 1945.

Application Date (in United Kingdom): Sept. 10, 1945. No. 23278/45.

Complete Specification Accepted: Feb. 26, 1948.

COMPLETE SPECIFICATION

Improvements in Acoustic Signal Producing Devices for Toys

We, GEORGES GERAUD HUARD, a French citizen, of 37, rue Quincampoix, Paris, Seine, France, and RAYMOND JEAN ERNEST ROGER, a French citizen, of 3, Chemin du Tertre, Suresnes, Seine, France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of the present invention is a device serving to produce intermittent acoustic signals on a toy.

Conformably to the invention, a rotary component rotating rapidly, carried by the toy, drives a clapper normally rotating at a distance from a co-operating gong, then another component of the toy actuated with a slow rotational motion acts by one or several cams, at each one of its rotations, on the gong or on the support of the clapper to cause the latter to strike the gong for a short interval of time.

The slow rotation component bearing a cam intended to ensure intermittently the bringing nearer together of the gong and of the clapper is advantageously a rotating part of the propulsion motor of the toy, but said component may just as well be a separate part driven by this motor or by a special motor. Likewise, the drive of the rotary clapper is advantageously ensured by the propulsion motor of the vehicle, for instance from the driving axle, with the interposition of stepping-up gears.

When the gong is movable, it may be moved by the cam borne by the slow rotation component with the help of any suitable transmission, for instance by a prolongation of said gong which is engaged by said cam or by a bell-crank lever subjected to the action of the latter.

When it is the clapper which is moveable so as to move nearer the stationary gong intermittently, said clapper is advantageously supported at the end of a bell-crank lever pivoting on the axis of rotation of one of the pinions of the transmission, in such a manner that the pinion solid with said clapper and coaxial with the latter may roll on the periphery of said transmission pinion when the clapper moves; in this manner no interruption in the transmission of the rotational movement of said clapper occurs.

A return component is advantageously provided to return the movable gong or clapper to its idle position when the actuating cam has ceased to act on said moving member.

Further features and advantages of the invention will be gathered from the following specification and from the drawings, in which the invention is illustrated by way of example:

Figure 1 is a side elevation of an acoustic signal production mechanism for automobile toys conformable to the invention.

Figure 2 is a side elevation of the casing enclosing the device.

Figure 3 is a corresponding plan view.

Figures 4 and 5 are side elevations of modifications of the device.

According to figures 1 to 3, a spring-motor for automobile toy has been represented, 1 indicating the winding spindle of the spring, 2 and 3 the axle of the rolling wheels. The cogged plate 4 drives said axle by a step-up gear comprising pinions 5, 6, 7, 8, the pins of which are supported by lateral cheeks 9, 10 of a casing.

A clapper constituted by a small bar 11 rotating about a pin 12 is permanently driven during the functioning of the spring motor of the vehicle by means of a step-up gear comprising the pinions 13, 14, 15. Said rotating clapper at the same time forms a governor and is advantageously constituted by two parallel blades 11^1, 11^{11}. A washer 16 is preferably placed between said two blades at one of the ends of said small bar. Said washer presents a hole permitting it to play very freely on its axis and serves as a bob ensuring the unbalancing of the clapper.

Further, a gong 17 is supported in a movable manner on the casing. Said gong 17 rests on the casing by a prolongation 18 in the shape of a small plate presenting wings 19, 20, 21 coming to bear

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on the upper edge of notches 22, 23 of the casing. The small plate 18 solid with the gong 17 ends in a hook 24 which is engaged at each rotation of plate 4 by a cam 25 solid with said plate.

When the toy runs driven by its spring motor, at each revolution of the plate 4 rotating very slowly, the cam 25 comes at a given moment and pulls the hook 24 formed at the end of the small plate 18 drawing along the gong 17 which is brought into the position shown in continuous lines in figure 1 from its idle position 17^1. While the cam maintains the gong 17 thus advanced, the clapper 11 strikes, by its washer 16, against said gong, producing the sound signal. As soon as the cam 25 has escaped the hook, 24, a spring 26 secured to a fixed point 27 returns the gong 17 backwards to the position 17^1, so that the clapper 11 no longer touches said gong during its rotation, the sound signal not occurring again until the plate 4 has made one revolution. At this moment the cam 25 again acts on the hook 24 to make it advance the gong 17 and produce a new sound signal. The spring 26 is for instance a simple steel wire solidly maintained at 27 by its lower end and introduced at its upper end into a hole 28 of small plate 18.

In the modification of figure 4, plate 4 mounted on shaft 1 presents a cam 29 acting on one end of bell crank lever 30 pivoting about an axis 31 and bearing at its end 32 the gong 33. The clapper mounted on shaft 12 is here constituted by a disk 34 bearing striking components on its periphery and driven from shaft 1 by a set of pinions 35, 36, 37, 38, 39, 40. A spring 41 pulls arm 30 of the bell crank lever towards the periphery of plate 4.

With this construction, when the cam 29 of plate 4 raises arm 30 of the bell crank lever, the latter pivots about its axis 31 bringing the gong 33 of disk 34, so that the latter projects its striking components on said gong:

In the modification in figure 5, the plate 4 driven by shaft 1 acts, by its cam 29, on the end 42 of a bell crank lever pivoting about an axis 43. At the end of its other arm 44, said lever bears a pin 45 about which rotates a disk 46 forming a clapper co-operating with a stationary gong 47.

The clapper 46 is set in continuous rotation from shaft 1 by the meshing of the pinions 48, 49, 50, 51, 52. A spring 53 keeps the end 42 of the bell-crank lever in engagement with the periphery of cam plate 4.

Plate 4 rotates slowly. Each time its cam 29 comes to bear on the end of arm 42, the bell-crank lever pivots about its axis 43 and clapper 46 comes and strikes the fixed gong 47 reproducing the acoustic signal.

When it is not necessary to unbalance the clapper, such as 11, a washer 16 playing freely can be arranged at both its ends.

Moreover, it is evident that instead of providing one cam 25 only on the slow rotation member, two or several cams might be arranged there producing two or several acoustic signals at each rotation of said member. Said signals may be of different spacings and durations according to the arrangement and length of the cams.

Although in the forms of embodiment represented the acoustic device is actuated by a spring motor, it is evident that it might be combined with any other motor, such as an electric motor or an internal combustion motor. It is indeed sufficient that a rotating member of the motor or a rotating member driven by said motor should act on the displacement device of the gong or of the clapper.

A special motor might even be provided, for instance a spring clockwork movement independent of the motor driving the vehicle, to actuate the acoustic device.

The invention is not limited, moreover, to the examples of embodiment represented, for different modifications can be embodied without exceeding its scope.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An acoustic signal producing device for toys, characterised by the feature that a rotating component turning rapidly, borne by the toy, drives a clapper normally rotating at a distance from a co-operating gong, then another component of the toy, actuated in a slow rotational motion, acts by one or several cams, at each one of its rotations, on the gong or on the support of the clapper to cause the latter to strike the gong for a short interval of time.

2. An acoustic signal producing device for toys as claimed in claim 1, characterised by the feature that the slow rotating component bearing the cam ensuring the bringing nearer of the gong or of the clapper forms part of the propelling motor of the vehicle, or is a component driven by said motor, or is driven by an independent motor.

3. An acoustic signal producing device for toys as claimed in claims 1 and 2, characterised by the feature that the clapper is constituted by a small bar

mounted at its middle on a shaft which drives it rotationally.

4. An acoustic signal producing device for toys as claimed in claims 1 to 3, characterised by the feature that the small bar presents at one of its ends or at both its ends a bob constituted for instance by a washer playing about its axis by a comparatively large hole.

5. An acoustic signal producing device for toys as claimed in any of the preceding claims, characterised by the feature that the clapper is driven by means of a system of gearing up pinions from the shaft driving the driving wheels of the self-propelling toy.

6. An acoustic signal producing device for toys as claimed in any of the preceding claims, characterised by the feature that the slow rotation component bearing the cam displacing the cam or the clapper is the initial toothed plate of the motor which transmits its rotation to the axle by a reduction gear, the axle then transmitting its rotation to the clapper by means of a step-up gear.

7. An acoustic signal producing device for toys as claimed in any of the preceding claims, characterised by the feature that the gong presents a prolongation terminating in a hook which is operated at determined intervals of time by the cam or cams arranged on the slow rotation component, such as the plate mounted on the winding up shaft of the spring of a spring motor.

8. An acoustic signal producing device for toys as claimed in any of the preceding claims, characterised by the feature that the prolongation of the gong is supported on the edges of the cheeks of the housing of the spring motor, preferably in notched portions of the upper edge of said cheeks.

9. An acoustic signal producing device for toys as claimed in any of the preceding claims, characterised by the feature that a peripheral projection of a rotating component of the motor operates one of the ends of a bell-crank lever pivoting about a fixed axis the other end of which bears a movable gong which is brought into engagement with a rotating clapper when the cam acts on said bell-crank lever.

10. An acoustic signal producing device for toys as claimed in any of the preceding claims, characterised by the feature that a cam provided on the periphery of the slow rotation component of the motor operates a bell-crank lever supporting a movable clapper which is brought into engagement with a fixed gong when said cam acts on the bell-crank lever.

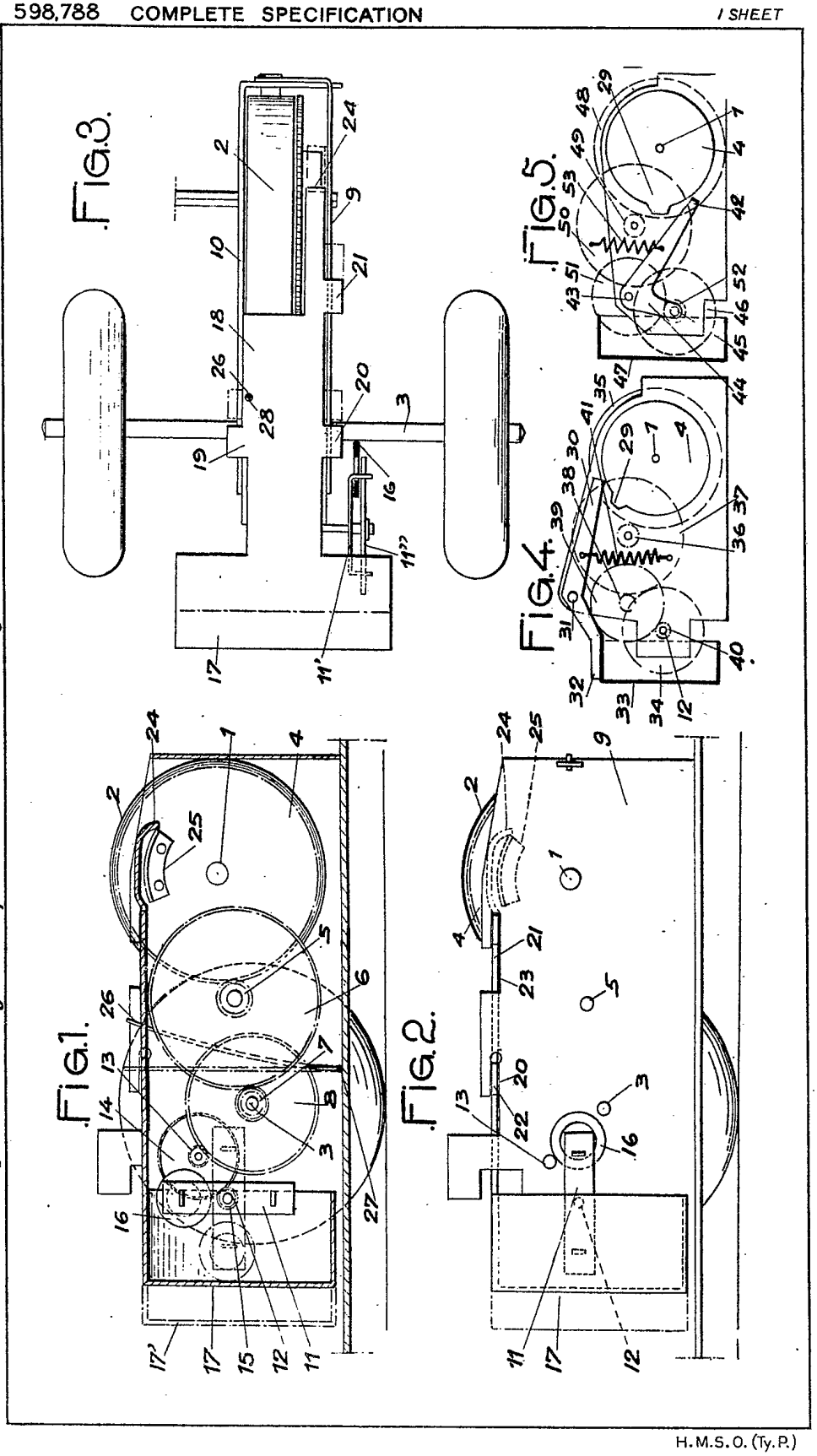
11. The improved acoustic signal producing device for toys, substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 10th day of September, 1945.

MEWBURN, ELLIS & CO.,
70 & 72, Chancery Lane, London, W.C.2,
Chartered Patent Agents.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1948.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies, price 1s. 0d. each (inland) 1s. 1d. (abroad) may be obtained.

[This Drawing is a reproduction of the Original on a reduced scale.]



H.M.S.O. (Ty. P.)