Jan. 10, 1939. C. V. GIAIMO 2,143,513

SOUND-PRODUCING TOY

Filed July 8, 1936

Fig. 1.

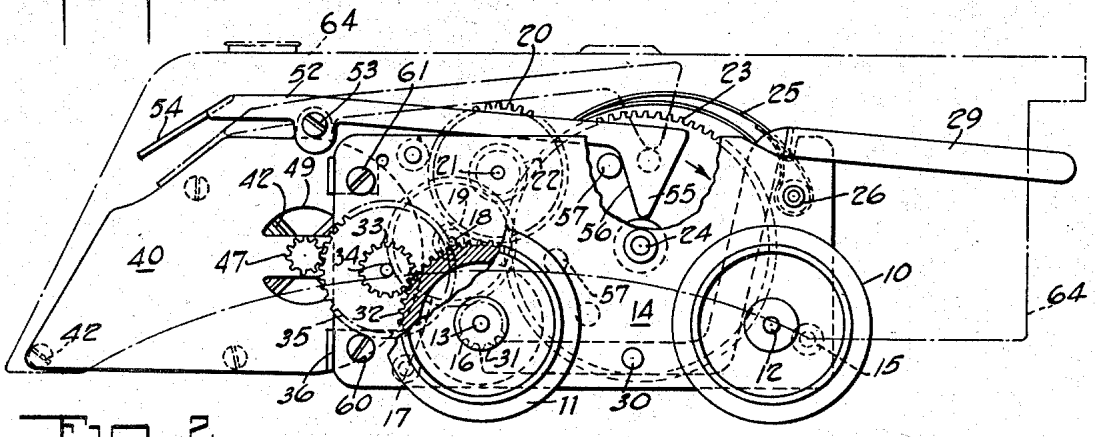
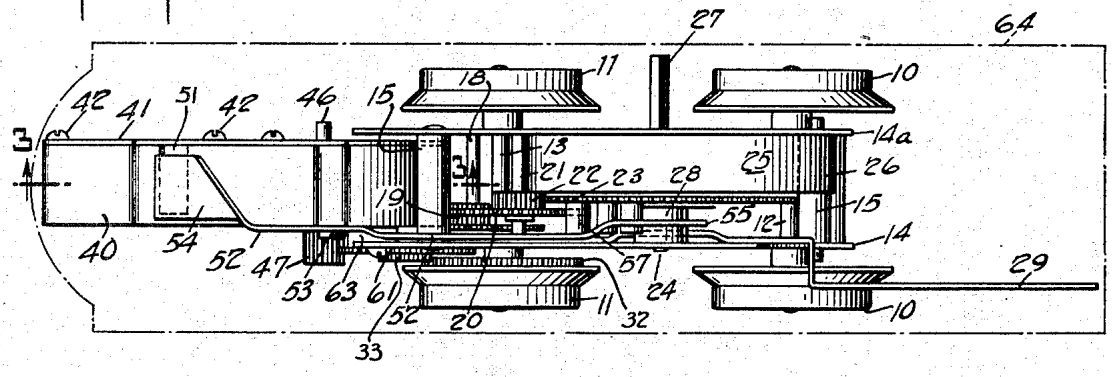



Fig. 2.



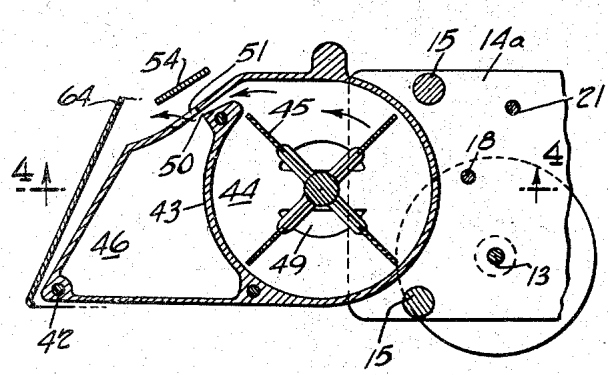




Fig. 3.

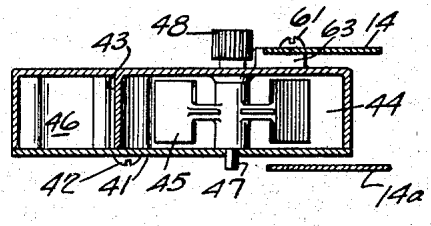



Fig. 4.

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## SOUND-PRODUCING TOY

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Application July 8, 1936, Serial No. 89,491

7 Claims. (Cl. 46—113)

The present invention relates to sound producing toys and is more particularly directed toward sound producing toys adapted to be operated by energy storing springs.

The present invention contemplates a toy locomotive or other wheeled toy having means generally in the form of a spring motor for propelling the toy and provided with a sound producing device adapted to produce sustained sounds when the propulsion unit is operated.

When the sound producing device is employed on propulsion units of the wind-up spring type, the sound producing unit may be designed so as to function as the governor for the spring motor. According to the present invention, the spring motor driven propulsion unit employs driving wheels actuated through a speed increasing gear train driven from the wind-up spring and additional speed increasing gearing is provided for operating an impeller of an air blower. Owing to the high speed which may be given the impeller, the impeller has considerable air friction and may readily function to limit the speed at which the wind-up spring is permitted to unwind.

In the preferred construction, the complete toy employs a propulsion unit capable of complete assembly, and a sound producing unit capable of complete assembly, these two units being secured together in operative relation.

A blower operated whistle is adapted for producing sustained sounds so long as the blower is operated, and these sounds more nearly simulate the whistle of a locomotive than any sound which can be produced by such mechanisms as a bellows, siren friction operated device, or mechanical rattle.

The present invention also contemplates the interruption of the sound by mechanism operated by the propulsion motor and designed to intermittently open and close the air passage so that sustained sounds may be interrupted in the same way that one interrupts the sounding of a locomotive whistle.

Other and further objects of the invention will appear as the description proceeds.

The accompanying drawing shows, for purposes of illustrating the present invention, one of the many embodiments in which the invention may take form it being understood that the drawing is illustrative of the invention rather than limiting the same.

In the drawing,

Figure 1 is a side elevational view of a toy locomotive embodying a propulsion unit and sound producing unit,

Figure 2 is a top plan view of the structure shown in Figure 1,

Figure 3 is a vertical sectional view on the line 3—3 of Figure 2, and

Figure 4 is a horizontal view on the line 4—4 of Figure 3.

The toy locomotive is supported on the track by pairs of wheels indicated at 10 and 11, the wheels 11 being the driving wheels which actuate the locomotive.

The supporting wheels are mounted on axles 12 and 13 supported in side plates 14 and 14a, held together by spacers 15. The axle 13 carries a driving pinion 16 in mesh with a gear 17 carried by a shaft 18. This shaft 18 carries a pinion 19 in mesh with a gear 20, carried on a shaft 21, and the shaft 21 carries a pinion 22, in mesh with a large gear 23 carried on a shaft 24. These gears and shafts are mounted between the side plates 14 and 14a. The shaft 24 also carries the wind-up spring 25 having one end anchored as indicated at 26. When this spring is wound up by a key operating on the squared end 27 of the shaft 24, energy is stored in the spring, the gearing not being driven, as the one-way clutch 28, commonly used in such spring propelled devices, is provided. When the spring unwinds, however, the large gear 23 is driven in a clockwise direction as indicated. This gear operates the gear train above described, so as to propel the toy along the track or roadway.

The gear train may be locked against unwinding by a brake lever 29 pivoted at 30 and having a tooth 31 engaging with the gear 13.

The inner face of one of the driving wheels 11 is provided with a large diameter gear indicated at 32, and this gear meshes with a pinion 33 mounted on a laterally projecting stud 34 carried by the frame plate 14. This pinion is secured to a larger gear 35 which projects beyond the left edge 36 of the side plate 14.

The sound producing unit includes a casting 40 and a cover plate 41 secured to it by screws 42 to form a casing or housing. The casting 40 has a partition forming member 43 which forms an involute shaped housing 44 for the impeller, indicated at 45, and a resonating chamber to the left, as indicated at 46. The impeller 45 is mounted on a shaft 47 which carries a pinion 48 and this pinion is in mesh with the gear 35 so that the impeller is driven at a very high speed during the unwinding of the propulsion spring. The impeller acts to draw air in through the openings indicated at 49 and force it out through a throat indicated at 50, from which the air

passes through an outlet indicated at 51. The throat is in communication with the resonating chamber 46 so that a continuous or sustained sound may be produced whenever the blower is operated.

In order that the sustained sound produced by the whistle may be interrupted, the device is shown as having a lever 52 pivoted at 53 to the casting 40. The left end 54 of this lever is opposite the orifice 51, while the right hand end 55 of the lever is adjacent the face of the gear 23. It carries a cam face 56 adapted to be engaged by laterally extending pins 57 carried by the gear. The lever 50 is normally in the position shown in full lines in Figure 1, but may be moved to the position shown in dot and dash lines by the pin 57, and may be held there for desired length of time, depending on the camming action of the pins or other devices carried by the main driving gear 23.

The structure shown herein is adapted for easy manufacture and assembly. The propulsion units may be assembled complete and the whistle units assembled complete and then two units may be readily secured together by means of screws 60 and 61 passing through openings in the left end of the plate 14 and entering into lugs 63 carried by the blower casting 40. This automatically aligns the parts, places the pinion 47 in mesh with the gear 35 and locates the lever 42 in operative relation with the cam devices carried by the main gear.

It will be noted that the complete propulsion and sound producing unit shown and described herein utilizes the blower as a speed limiting air governor, thereby making it unnecessary to provide the spring motor with the usual governor of the centrifugal type. By eliminating the former type of speed governor and the sounding bell sometimes employed on spring propelled toy locomotives, one is able to provide a whistling toy locomotive at a cost approximately the same as the cost of the former toy locomotive of the same size provided merely with a sounding bell.

Propulsion and sound units such as herein described may be mounted in any convenient form of enclosure, such for example as the locomotive shell indicated at 64.

It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims and I wish it to be understood that the particular form shown is but one of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

I claim:

1. A spring motor driven wheeled vehicle having a continuously driven blower acting as a speed limiting governor, a whistle actuated by air propelled by the blower, and motor driven means for intermittently interrupting the air stream to stop the sounding of the whistle.

2. A spring motor driven vehicle having a speed increasing gearing continuously connected to an air impeller for operating the same at high speed, driving wheels operated by said gear train, a housing about the impeller provided with an air inlet and an air outlet opening shaped to produce sound vibrations in the escaping air stream, and a resonating chamber controlling the pitch of the sound.

3. A toy vehicle having a propulsion unit connected with driving wheels for actuating the toy vehicle, an air blower including a casing and rotary air impeller, a speed increasing gear train between the driving wheels and the impeller, and a propulsion unit operated silencing device for intermittently silencing the whistle.

4. A toy vehicle having a propulsion unit connected with driving wheels for actuating the toy vehicle, an air blower including a casing and rotary impeller, a speed increasing gear train between the driving wheels and the impeller, a slow moving cam, and a cam operated lever for opening and closing the orifice through which the air passes.

5. In a toy vehicle, a propulsion unit comprising an energy storing spring, driving wheels and a speed increasing gear train driven from the spring for actuating the driving wheels, a second speed increasing gear train driven from the first, an impeller rotated by the second gear train, an impeller housing having an air inlet, and a device intermittently operated from the propulsion unit for interfering with the air flow produced by the impeller for interrupting the sound of the whistle.

6. In a toy vehicle, a propulsion unit comprising an energy storing spring, driving wheels and a speed increasing gear train driven from the spring for actuating the driving wheels, a second speed increasing gear train driven from the first, an impeller rotated by the second gear train, an impeller housing having an air inlet, and a vent closing device actuated by the propulsion unit for interrupting the sound of the whistle.

7. A toy vehicle having a propulsion unit including an energy storing spring, driving wheels, a speed increasing gear train for operating the wheels from the spring, a pinion driven thereby and operating a gear, and a sound producing unit including a casing, an air impeller having a driving pinion in mesh with the last mentioned gear, a resonating chamber, a sound producing orifice, a slow moving cam operated by the spring and a cam operated lever for opening and closing the sound producing orifice.

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