July 8, 1941. B. S. FRANKLIN 2,248,473

SOUND PRODUCING TRACK AND WHEELED TOY

Filed June 3, 1939

Fig. 1.

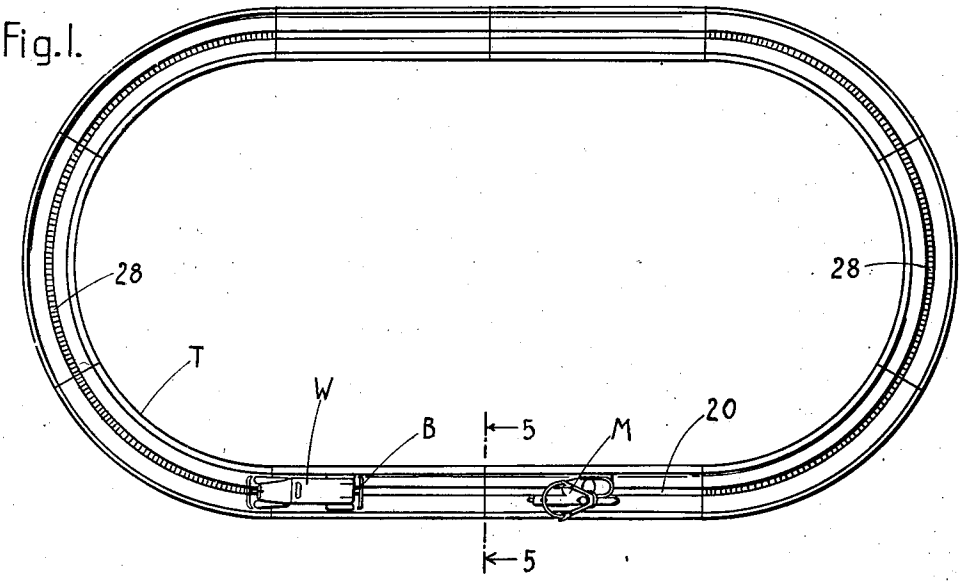
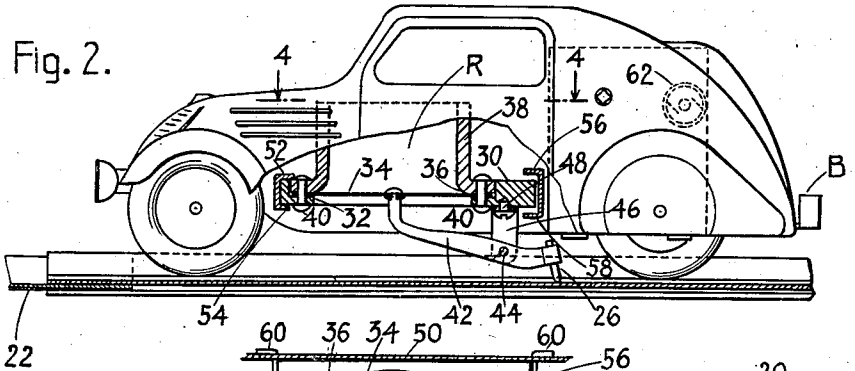


Fig. 2.



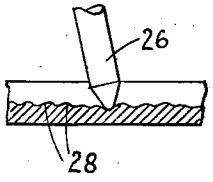


Fig. 3.

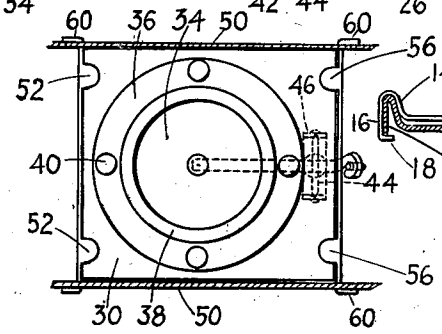


Fig. 4.

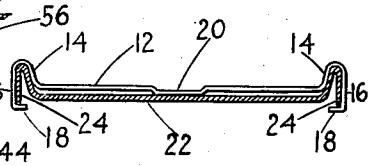


Fig. 5.

INVENTOR
BERNARD S. FRANKLIN
BY James and Franklin
ATTORNEY

Patented July 8, 1941 2,248,473

UNITED STATES PATENT OFFICE

2,248,473

SOUND PRODUCING TRACK AND WHEELED TOY

Bernard S. Franklin, New York, N. Y., assignor to Louis Marx & Company, Inc., New York, N. Y., a corporation of New York

Application June 3, 1939, Serial No. 277,181

6 Claims. (Cl. 46—111)

This invention relates to toys, more particularly track and wheeled toys, and especially to sound producing mechanism therefor.

The primary object of the present invention is to generally improve toys of known character comprising a track, with a wheeled toy, such as a vehicle simulation running on said track. A more particular object is to provide the same with sound producing means. A still further object is to provide sound producing means of simple and inexpensive character. Still another object is to provide sound producing means capable of producing a desired sound, regardless of whether intermittent or continuous, and regardless of whether monotone or multiple tone. In fact, the invention may be used to produce complex sounds, such as imitations of animals when dealing with a wheeled toy simulating an animal, and as an extreme example, even speech may be reproduced.

To the accomplishment of the foregoing, and such other objects as will hereinafter appear, my invention consists in the track and wheeled toy and sound producing elements, and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by the drawing, in which:

Fig. 1 is a plan view of a toy embodying features of my invention;

Fig. 2 is a partially sectioned side elevation of the sound producing vehicle;

Fig. 3 is a longitudinal section taken in elevation through a section of track at the stylus, this view being a fragmentary view drawn to enlarged scale;

Fig. 4 is a horizontal section looking in the plane of the line 4—4 of Fig. 2; and

Fig. 5 is a transverse section between track sections as, for example, in the plane of the line 5—5 in Fig. 5.

Referring to the drawing, and more particularly to Fig. 1, the toy, as here exemplified, comprises a track T and a wheeled toy W simulating an auto and adapted to run on the track T. The specific toy here disclosed is generally like that disclosed in a co-pending application of John Bonnett and Anthony Schillace, Serial No. 183,439, filed January 5, 1938, and entitled "Pursuit toy." In that toy the auto is supposed to be a speeding car which is pursued by a motorcycle policeman M. The latter is geared to run slightly faster than the vehicle W and catches up to the same, whereupon it strikes one side of the bumper B of vehicle W. This is pivotally mounted and when tilted it operates to stop the motor of the auto, thus bringing both vehicles to a stop, as though the auto had been stopped by the motorcycle policeman.

The track T is made up of a plurality of sections. In the present case there are four straight sections and six curved sections. As here illustrated, the track simulates a road, and the vehicles running thereon have plain or unflanged wheels. Referring to Fig. 5, it will be seen that the track comprises a main road portion 12 enclosed at both sides by suitable walls or flanges 14. The metal is then bent downwardly at 16 and inwardly at 18. The center portion of the track is depressed to form a comparatively wide, shallow sound track 20.

The track sections are held in end to end relation in any suitable manner. As here exemplified, a connector plate 22 is provided (Figs. 2 and 5), this being reversely bent at the sides, as is indicated at 24 (Fig. 5). The bent side portions are so dimensioned as to just fit snugly within the bent side portions of the track. It will be seen that the adjacent ends of two track sections may be frictionally slid over one of the connector plates 22 until they abut in end to end relation, the connector plate functioning to hold the ends of the track sections in alignment. There are as many connector plates 22 as there are connections between sections. In the present case, for example, the system requires ten connector plates.

In the present disclosure the sound producing means is carried by the vehicle W. It comprises a sound reproducer generally designated R, said reproducer being operated by a stylus 26 which is adapted to rest on the track T, and more specifically in the shallow sound track portion 20 thereof. The specific reproducer, which is here shown, is intended to function in response to hill and dale recording, said recording consisting of a series of grooves and ridges disposed transversely of the track, as is clearly shown at 28 in the drawing. An advantage of this construction is that the grooves and ridges may be made substantial in length, or in other words, the sound track 20 may be made substantial in width, so that the stylus 26 need not be in exact central position as the vehicle runs on the track. This is particularly helpful when the vehicle runs around a curve or loop of track, as here illustrated.

Inasmuch as the height or distance between the sound reproducer and the track may be somewhat variable, and inasmuch as the reproducer itself should, for reasons of economical manufac-

ture, have large tolerance in dimension, the engagement between the stylus and the track is preferably made self-adjustable, the stylus bearing gravitationally against the track. More specifically, the reproducer comprises a weighty member 30 (Figs. 2 and 4), which may conveniently be made rectangular, and which is provided with a circular opening and a circular flange 32 (Fig. 2) for carrying a thin, flexible diaphragm 34. The edge of the diaphragm is secured in position by a ring 36, and the latter may be formed integrally with a vertically directed sound conduit 38. The length of the conduit may be selected according to the size of the toy. Flange 36 is fastened over diaphragm 34, as by means of the rivets 40.

The stylus 26 is fixedly secured at one end of a lever 42, the other end of which is fastened to the center of the diaphragm 34. The lever is mounted on a rod or spindle 44 which is oscillatably carried in an inverted U-shaped frame or bearing 46, the horizontal or connecting part of which is secured to the bottom face of the rectangular member 30, as by means of one or more screws 48. The ends of spindle 44 are preferably pointed or conical and are received in mating seats struck into the inner faces of the vertical arms of bearing member 46. This provides a bearing of minimum friction. It will be evident that vertical vibration of stylus 26 produces a corresponding vibration of diaphragm 34, which in turn may be used to reproduce the sound recorded on the track.

It will also be evident that the inertia of the moving parts is very small, while that of the stationary parts 30 and 38 is very large; hence the reproducer R may be movably mounted without appreciable loss of sound volume. This feature is taken advantage of to provide a floating mounting for the reproducer. Specifically the side edges of the rectangular member 30 just fit between the side walls 50 of the vehicle body, as is clearly shown in Fig. 4. The forward edge of member 30 is oscillatably received between top and bottom support tongues 52 and 54, as is best shown in Figs. 2 and 4 The rear edge of rectangular member 30 is similarly received between top and bottom support tongues 56 and 58, but in this case the support tongues are spaced well apart to provide clearance for oscillating movement of the reproducer, as will be clear from inspection of Fig. 2. The tongues are formed on transverse strips, which in turn are secured at their ends to the vehicle body by appropriate bent tongue connections 60 (Fig. 4). It will be evident that under normal conditions the engagement of the stylus with the sound track keeps the reproducer approximately in mid-position between the top and bottom tongues 56 and 58. Any variation in the elevation of the track is compensated for by appropriate movement of the rear edge of the reproducer between the supports 56 and 58, the forward edge of the reproducer oscillating between the supports 52 and 54. When the vehicle is picked up from the track, the reproducer falls to the lower support 58, but is raised therefrom by the stylus when the vehicle is replaced on the track.

The tranverse ridges need not be employed throughout the track system. In the present case, for example, sound is produced as the vehicle runs around the curved sections, and is not produced when the vehicle runs on the straight sections. In other words, the sound track here provided is an intermittent or interrupted one, although the shallow groove 20 may be made continuous around the entire loop of track. In many cases the sound to be reproduced is more realistic when intermittent Thus, in the present case, the signal may simulate the horn of the automobile or the siren of the motorcycle policeman, the latter adding greatly to the realism of the toy as the policeman pursues the speeding auto.

Of course the transverse sound grooves are preferably stamped into the sheet metal either at the time the track sections are being made, or subsequently, by means of a separate die. The latter procedure has the advantage that different sound grooves may be applied to the same kind of track. It will also be understood that the sound grooves may be impressed in the straight sections of track, instead of in the curved sections as shown. In fact, many manufacturers may prefer to use the straight sections because it makes the construction of the die simpler.

For some purposes, a sound of uniform pitch may be satisfactory. For others, a variable pitch may be needed. This is obtained by varying the spacing between the transverse sound grooves in the sound track. In fact the wheeled toy running on the track may simulate an animal, instead of a vehicle, in which case the track may be so designed as to produce the appropriate animal sound. Even speech may be reproduced, if a suitable record is first made from which a die is made for impressing the proper hill and dale ridges on the track.

It will be understood that the absolute pitch of the sound reproduced depends on the speed of the vehicle, as well as the spacing of the cross ridges along the sound track. If pitch is of any importance, the wheeled toy is preferably provided with a suitable governor, so that the speed may be maintained reasonably constant. Such governors are already known, and a conventional governor is schematically indicated at 62 in Fig. 2. Ordinarily, it will be found desirable to design the vehicle toy for high-speed travel, because this greatly simplifies the problem of providing the necessary number of hill and dale ridges in the sound track without necessitating the same to be excessively crowded together to obtain the desired pitch or tone.

It is believed that the construction and operation, as well as the many advantages of my improved sound producing mechanism for track and vehicle toy will be apparent from the foregoing detailed description thereof. It will also be apparent that while I have shown and described my invention in one preferred form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention defined in the following claims.

I claim:

1. A toy comprising a continuous track, a wheeled toy adapted to run on said track, a motor in said toy for driving the wheels and thereby propelling the toy along the track, a sound reproducer mounted in said toy, said reproducer comprising a weighty head carrying a thin flexible diaphragm, a stylus lever oscillatably mounted on said head and connected at one end to said diaphragm, a stylus secured to said lever, means in said vehicle for floatingly mounting said head whereby it tends to move downwardly with the stylus under gravitational influence in order to keep the stylus in engagement with a

sound track, and a sound track forming a part of said toy track.

2. A toy comprising a plurality of toy track sections adapted to be detachably secured in end to end relation to form a continuous track, a wheeled toy adapted to run on said track, a motor in said toy for driving the wheels and thereby propelling the toy along the track, a sound reproducer mounted in said toy, said reproducer comprising a weighty head carrying a thin flexible diaphragm, a stylus lever oscillatably mounted on said head and connected at one end to said diaphragm, a stylus secured to said lever, means in said vehicle for floatingly mounting said head whereby it tends to move downwardly with the stylus under gravitational influence in order to keep the stylus in engagement with a sound track, and a sound track on said track sections, said sound track being of the hill and dale type and comprising a series of closely spaced transverse grooves and ridges, said grooves and ridges extending for a substantial distance transversely of the track whereby the stylus need not be in exact central position as the wheeled toy runs on the track.

3. A toy comprising a plurality of toy track sections adapted to be detachably secured in end to end relation to form a continuous track, a wheeled toy adapted to run on said track, a motor in said toy for driving the wheels and thereby propelling the toy along the track, a sound reproducer mounted in said toy, said reproducer comprising a weighty head carrying a thin flexible diaphragm, said head and diaphragm being disposed in generally horizontal position near the bottom of the vehicle, a sound conduit secured to and forming a part of said head and extending upwardly above said diaphragm, a stylus lever oscillatably mounted on said head and connected at one end to said diaphragm, a stylus secured to said lever, means in said vehicle for floatingly mounting said head whereby it tends to move downwardly with the stylus under gravitational influence in order to keep the stylus in engagement with a sound track, and a sound track forming a part of said track sections.

4. A toy comprising a plurality of toy track sections adapted to be detachably secured in end to end relation to form a continuous track, a wheeled toy adapted to run on said track, a motor in said toy for driving the wheels and thereby propelling the toy along the track, a sound reproducer mounted in said toy, said reproducer comprising a weighty head carrying a thin flexible diaphragm, said head and diaphragm being disposed in generally horizontal position near the bottom of the vehicle, a sound conduit secured to and forming a part of said head and extending upwardly above said diaphragm, a stylus lever oscillatably mounted on the lower side of said head and connected at one end to said diaphragm, a stylus secured to said lever, means in said vehicle for floatingly mounting said head whereby it tends to move downwardly with the stylus under gravitational influence in order to keep the stylus in engagement with a sound track, and a sound track forming a part of said track sections, said sound track being of the hill and dale type and comprising a series of closely spaced transverse grooves and ridges, said grooves and ridges extending for a substantial distance transversely of the track whereby the stylus need not be in exact central position as the wheeled toy runs on the track.

5. A toy comprising a continuous track, a wheeled toy adapted to run on said track, a motor in said toy for driving the wheels and thereby propelling the toy along the track, a sound reproducer mounted in said toy, said reproducer comprising a weighty head carrying a thin flexible diaphragm, said head and diaphragm being disposed in generally horizontal position near the bottom of the vehicle, a sound conduit secured to and forming a part of said head and extending upwardly above said diaphragm, a stylus lever oscillatably mounted on the lower side of said head and connected at one end to said diaphragm, a stylus secured to said lever, means in said vehicle for floatingly mounting said head whereby it tends to move downwardly with the stylus under gravitational influence in order to keep the stylus in engagement with the track, and a sound track on said track, said sound toy track being of the hill and dale type and comprising a series of closely spaced transverse grooves and ridges, said grooves and ridges extending for a substantial distance transversely of the track whereby the stylus need not be in exact central position as the wheeled toy runs on the track, the sound track in the track being intermittent and being so selected as to provide a sound which is appropriate for the particular thing being simulated by the complete toy.

6. A toy comprising a plurality of toy track sections adapted to be detachably secured in end to end relation to form a continuous track, a wheeled toy adapted to run on said track, a motor in said toy for driving the wheels and thereby propelling the toy along the track, a sound reproducer mounted in said toy, said reproducer comprising a weighty head carrying a thin, flexible diaphragm, a stylus lever oscillatably mounted on said head and connected at one end to said diaphragm, a stylus secured to said lever, means in said toy for floatingly mounting said head whereby it tends to move downwardly with the stylus under gravitational influence in order to keep the stylus in engagement with a sound track, and a sound track on the toy track sections for vibrating said stylus at audio frequency and thereby causing said sound reproducer to function, the sound track being so selected as to provide a sound which is appropriate to improve the outward simulation of the particular thing being simulated by the complete toy.

BERNARD S. FRANKLIN.