Nov. 24, 1936. K. ARNOLD 2,062,046

MECHANICAL TOY

Filed May 8, 1935

Fig. 4

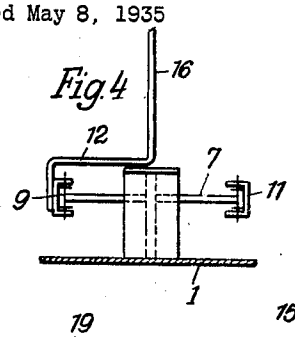


Fig. 1

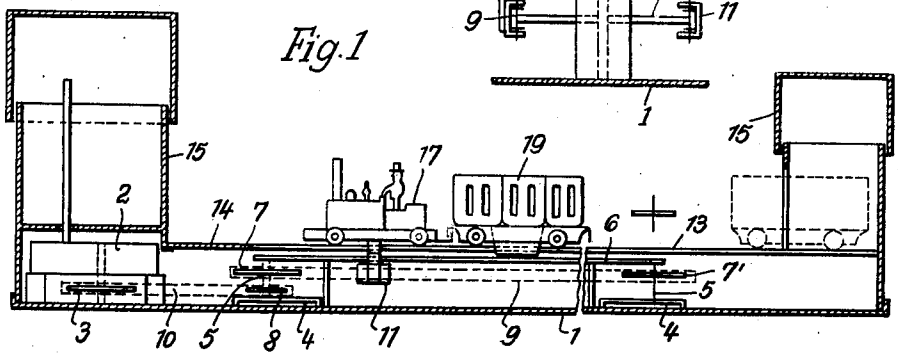


Fig. 2

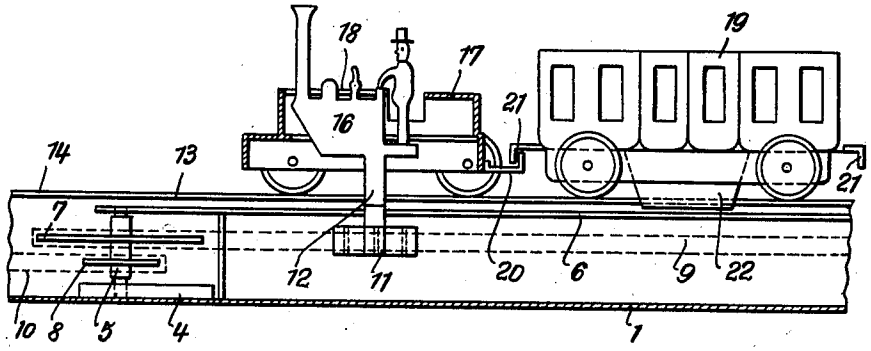
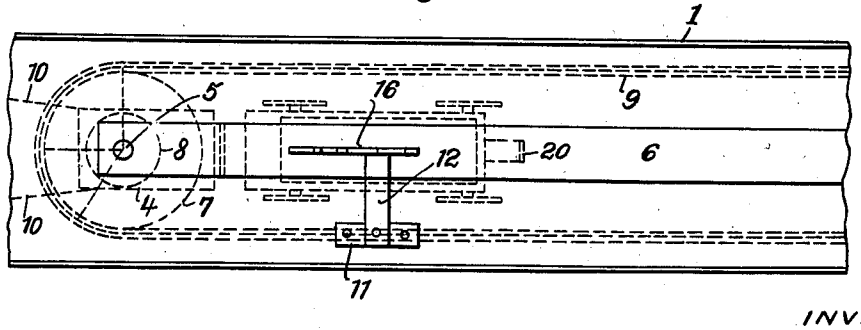


Fig. 3



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MECHANICAL TOY

Karl Arnold, Nuremberg, Germany

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6 Claims. (Cl. 46—217)

This invention relates to a mechanical toy in which any desired facsimiles of toys are moved in a straight line on a track, then turned through 180°, that is about their vertical axis, on reaching the two extreme points of the travel, and run in the opposite direction until they are again turned. At the same time other toys hitched on to the facsimile toy are automatically hooked unto a carrying arm and uncoupled and also drawn along, that is, are moved backward and forward. This is attained by fixing on an endless chain, rubber endless track, endless band or the like driven directly or indirectly by a motor, and supported on a pair of carrying discs, an arm bent twice at right angles, the horizontal part of this arm being of a length extending to midway between the two sides of the endless chain. This arm is at the same time constructed for carrying the facsimile toy.

An embodiment of the invention is illustrated by way of example in the accompanying drawing in which:—

Fig. 1 shows the toy partly in longitudinal section.

Fig. 2 shows a part of the toy on a larger scale, the main parts being in longitudinal section.

Fig. 3 is a top plan view of Fig. 2 with the track removed.

Fig. 4 is a rear elevation showing the position of the arm and its fixation on the chain.

On a base plate 1 a driving motor 2 is mounted which carries on its underside a star wheel 3 on an extension of its driving axle. The plate 1 also has two brackets 4 serving as bearings for one end of shafts 5 journalled at their other end in a bar 6 extending longitudinally in the toy. One shaft 5 carries on its upper end a carrying disc 7 and on its lower end a star wheel 8, whereas the other shaft only carries a carrying disc 7'. An endless chain 9, rubber endless track, endless band or the like 9 passes around the periphery of these carrying discs 7 and 7' and the two star wheels 3 and 5 are connected by a chain 10 and driven by the motor 2, thus circulating the endless chain 9 and rotating the carrying discs 7 and 7'. The driving motor 2 can rotate these discs directly or through the intermediary of a bevel wheel gearing instead of by means of the chain drive. A plate 11 is attached to the chain 9 by pins or the like. This plate has an arm 12 bent at right angles to form a horizontal part 12 extending to midway between the two sides of the chain and then bent up at right angles and enlarged to a vertical plate 16. The horizontal part 12 of this arm is so long that its upwardly bent portion travels in the middle of the bar 6. Thus twice in a complete circulation of the chain 9 around the carrying discs 7 and 7' the arm 12—16 will be turned about its own axis through an angle of 180°. If, as shown in the drawing, a facsimile locomotive is fixed on the part 16 of the arm, this locomotive also turns through 180° without travelling beyond the axis of the shaft 5. Thus a natural turning movement of the locomotive is simulated. The whole driving mechanism is covered by a plate 14 forming a track for the locomotive and having a slot 13 and fixed on or pressed in one piece with the base plate. On the two ends of the plate facsimiles of houses 15 are mounted and provided with apertures. The part 16 of the arm forms a part of the locomotive, for example the funnel, dome, whistle and driver. The simulated locomotive 17 provided with a slot 18 is slipped over this part 16.

The toy operates in the following manner:—

The toy represents a true imitation of the first railway. When the driving motor 2 has been wound, the chains 10 and 9 are caused to circulate. The arm 12—16 fixed on the chain 9 participates in this movement with the simulated locomotive removably mounted on part 16 of the arm. The locomotive is turned through an angle of 180° when the chain 9 moves the arm in a circle because the part 16 of which always remains in the central longitudinal plane of the bar 6. During this movement a toy vehicle 19 can be hitched to or unhitched from the locomotive. For this purpose the two vehicles have hook-shaped coupling arms 20 and 21 bent upward and downward respectively. As can be seen from the drawing, the locomotive 17 draws a waggon 19 until the turning movement takes place. During this turning movement the arm 20 unhooks from the arm 21. The waggon remains at a standstill whilst the locomotive is turned through an angle of 180°. At the termination of this movement the locomotive shunts the waggon into its original position. When the locomotive reaches its other turning point, the waggon is left standing still and the locomotive is turned through an angle of 180°. During this movement the coupling arms 20 and 21 are again hooked the one over the other so that the coupling is effected whereupon the locomotive moves forward with the waggon. To ensure a straight guiding of the waggon 19 it has a plate 22 projecting downwards from its underside and engaging in the slot 13 in the cover plate or truck 14. The above described operations are repeated in succession until the motor has run down.

The invention may be employed for all manner

of toys in which a turning through an angle of 180° is required.

I claim:—

1. A mechanical toy comprising in combination a motor driven endless chain, a plate fixed on said endless chain and bent at right angles to form a horizontal part extending to midway between the two sides of said endless chain and then again bent up at right angles to form a vertical plate, a toy imitating a locomotive placed on the said vertical plate, a hook shaped arm at the rear of said toy open in upward direction, a second vehicle and a downwardly directed hook at the front end of said second toy adapted to automatically hitch over said hook shaped arm of the front toy and to unhitch from the same every time said front toy is running over a reversing point of said endless chain.

2. A mechanical toy as specified in claim 1, in which the first toy is an imitation of a locomotive of the first railway and has a slot in its bottom plate to be slipped over the vertical plate.

3. A toy as specified in claim 1, comprising in combination with the endless chain and the toy vehicles to be hitched on and unhitched, a track plate covering said chain and having a slot midway its side edges, and a downwardly projecting plate on the bottom plate of each of said toy vehicles engaging with the slot of said track plate.

4. A toy as specified in claim 1, in which the vertical plate carries a facsimile of a toy and itself forms part of said facsimile having a slot adapted to receive the upper portion of said lever.

5. A toy as specified in claim 1, comprising in combination a facsimile of a toy mounted on said vertical plate, a casing enclosing the circulating endless member, a cover plate of said casing, a longitudinal slot for the passage of the upwardly bent portion of said lever and forming a support for said facsimile, a toy separate from said facsimile movable on said cover plate, a coupling lever on said facsimile, and a counter coupling lever on said separate toy, said levers adapted to alternately engage and disengage during the turning movements of said lever at the two extremities of its movement.

6. A toy as specified in claim 1, comprising in combination a facsimile of a toy mounted on said vertical plate, a casing enclosing the circulating endless member, a cover plate of said casing, a longitudinal slot for the passage of the upwardly bent portion of said lever and forming a support for said facsimile, a toy separate from said facsimile movable on said cover plate, a coupling lever on said facsimile, a counter coupling lever on said separate toy, said levers adapted to alternately engage and disengage during the turning movements of said lever at the two extremities of its movement, and a plate projecting downwards from the underside of said separate toy and adapted to engage in the slot of said cover plate to rectilineally guide said toy during its backward and forward movements.

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