Jan. 6, 1953 F. PLAWNER 2,624,154

WHEELED SOUNDING TOY

Filed Oct. 20, 1950

Fig. 1

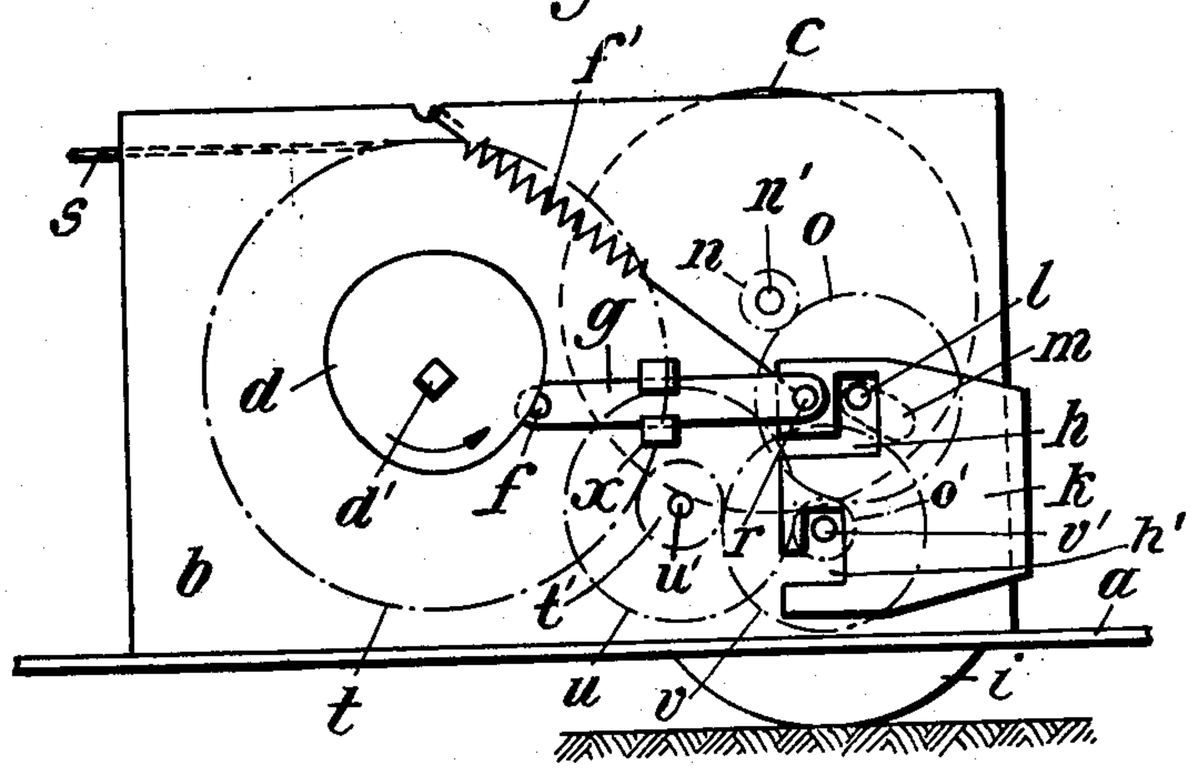
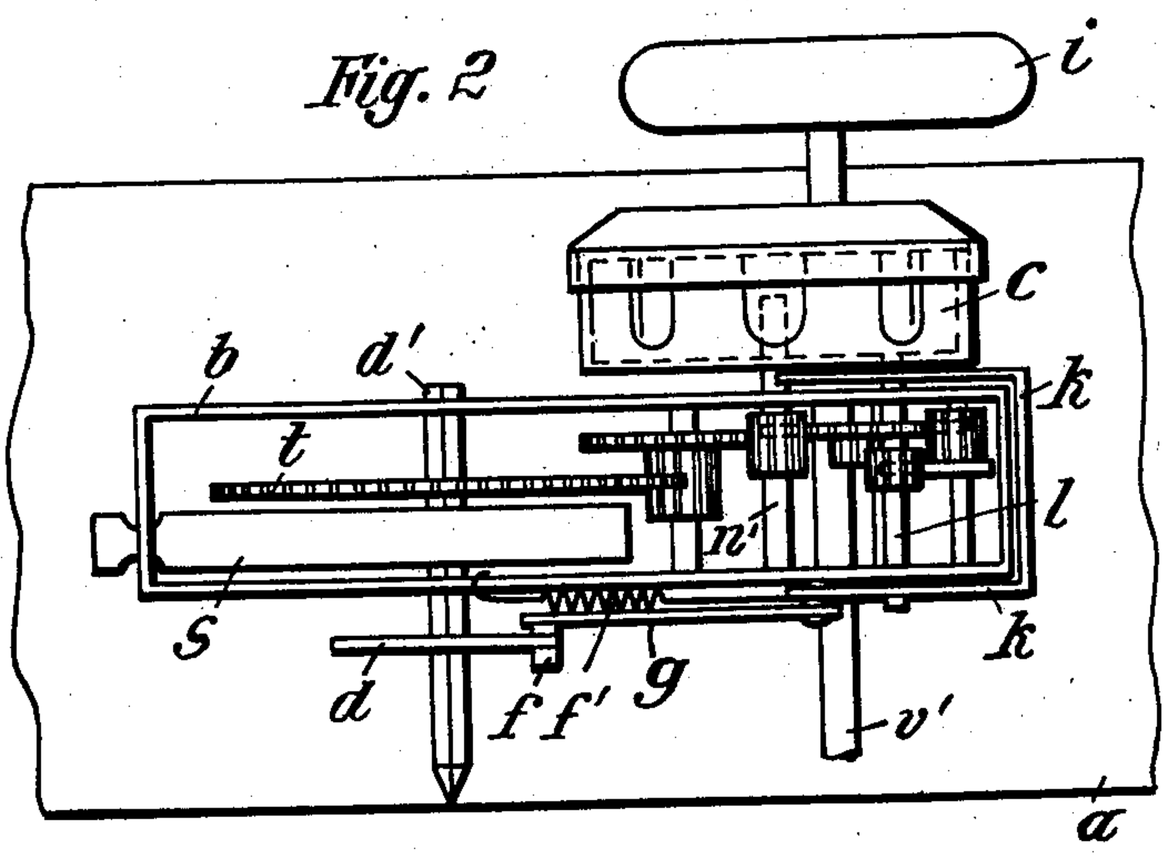


Fig. 2



Inventor:

Felix Plawner

by Bryant & Lowry

Attorneys.

Patented Jan. 6, 1953 2,624,154

UNITED STATES PATENT OFFICE

2,624,154

WHEELED SOUNDING TOY

Felix Plawner, Nuremberg, Germany

Application October 20, 1950, Serial No. 191,146
In Germany December 5, 1949

4 Claims. (Cl. 46—111)

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My invention relates to wheeled sounding toys, and more especially to improvements in toy vehicles, such as toy motor cars, or imaginary fire engines on wheels, propelled by a spring actuated clockwork motor and having a sound producer of the siren type on board for emitting alarm signals.

It has been found that a rather high or excessive proportion of the propelling energy stored in the spring of the clockwork motor is consumed in the siren, directly coupled with the vehicle driving motor and sounding all the time while the vehicle runs, and that the running radius or distance covered by the toy vehicle and its total running time are shortened and reduced accordingly, or else that a bigger motor than heretofore should be put in service, which would be out of proportion with the chassis and body of the vehicle.

The principal object of this invention is to economize with the rotary mechanical energy supplied to and consumed by the siren of the redesigned toy motor vehicle; another object being to split up and distribute the energy production means required respectively for driving the vehicle wheels and sounding the siren within the space available on the vehicle's chassis and to put into service energy producers of reduced size.

Still other objects of the invention and advantages obtained are set forth in the following specification and will be better understood from the accompanying drawings, wherein

Fig. 1 is a side elevation, and

Fig. 2 is a plan, showing diagrammatically and by way of examples the relevant mechanical energy and sound producing elements of a toy motor vehicle or imaginary fire engine on wheels, redesigned according to this invention.

The toy motor vehicle, shown in Figs. 1 and 2, has an underframe or chassis *a*, supported on wheels *i*, a spring actuated clockwork motor enclosed in box *b* and driving the wheels *i*, and a sound producing siren *c*, which is fixed on a rotary shaft *n'*, journalled in the box *b*; the rotary energy storing and reproducing spring *s* spirally surrounds the motor's main shaft *d'*. The wheels *i* and the siren *c* are driven by a train of gearing within the box *b* and said gear train includes a relatively large gear wheel *t* mounted on the motor main shaft *d'* and this gear *t*, as shown in Fig. 1, meshes with a pinion *t'* fixed on the cross shaft *u'* and said pinion meshes with a gear *v* fixed on the axle *v'* for the driving of the wheels *i*. A gear *u* is fixed on the cross shaft *u'* and meshes with a pinion *o'* on the axle *v'* and this pinion *o'* is in mesh with a shiftable gear *o* on the cross shaft *l*, the gear *o* meshing with the pinion *n* on the shaft *n'* that supports the siren *c*.

According to this invention in the redesigned motor vehicle a timing mechanism is provided in

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the motor box *b* limiting the operating of the siren *c* so as to emit signals only periodically and in intervals, thus economizing with the rotary energy stored in the motor spring *s* and lengthening the time while the vehicle runs on duty.

Said timing mechanism consists of means for periodically engaging and disengaging said auxiliary gear wheels *o* from the pinion *n*, namely a pair of arcuate slot guides *m* in the side walls of the motor box *b*, for guiding the axle *l* carrying the gear *o* in a circularly shaped path around the axle *v'* of the vehicle's wheels *i*, and of means for bodily reciprocating said axle *l* and gear wheels *o* which comprise:

1. A U-shaped double armed lever structure *k*, slotted rectangularly at *h* and *h'*, and which snugly and slidingly embraces the motor box *b*, being fulcrumed at *h'* on the vehicle wheel's axle *v'* and engaging the auxiliary gear wheel's axle *l* at *h*,

2. A rotary cam *d* on the vehicle's spring loaded main driving shaft *d'*, and

3. A connecting rod *g*, which is linked at *r* to the U-lever *k*, is loaded there by a spring *f'* and engages at *f* the rotary cam *d*.

Abutment members indicated at *x* in Fig. 1 and projecting from the motor box *b* may be conveniently provided above and below the connecting rod *g* for guiding and retaining it in its proper working position relatively to the cam *d*.

In the operation of the toy, it will be found that upon rotation of the gear wheel *t* under influence of the spring motor S rotation is imparted to the pinion *t'* on the shaft *u'* and this pinion *t'* is engaged with the gear *v* that is fixed to the axle *v'* on which the vehicle wheel *i* is mounted for effecting rotation of the wheel. It will also be observed that the pinion *o'* also fixed to the axle *v'* meshes with the auxiliary gear *o* that is mounted on a shaft *l* and which gear *o* meshes with the pinion *n* on the shaft *n'* that carries the siren *c*. The slots *m* in the side walls of the box *b* are of arcuate formation, as illustrated in Fig. 1, and center on the axle *v'* for the wheel *i* and the ends of the shaft *l* carrying the auxiliary gear wheel *o* project through the arcuate slots *m*. It will also be observed that the slot or notch *h* formed in the upper free edges of the doubled arm lever *k* straddle the projecting ends of the shaft *l* and the lower slot or notch *h'* in the lower ends of the free side legs of the lever receive the axle *v'* and constitute a pivotal mounting for the lever *k*. When the cam *d* that is fixed to the shaft *d'* is rotated, it engages an abutment *f* on one end of the rod *g* that is pivotally mounted at *r* to the upper swinging end of the lever *k*, rotation of the cam moving the lever on the lower pivot and carrying therewith the shaft *l* for the auxiliary gear wheel *o* to disengage said gear wheel from the pinion *n*

of the siren and that the auxiliary gear wheel *o* maintains constant engagement with the pinion *o'* driven from the gear wheel *t*. The spring *f'* maintains the rod *g* engaged with the cam and urges the auxiliary gear *o* in a direction toward the pinion *n*.

Still other structural changes may be made and various complementary features be added to toy motor vehicles, having a siren on board and emitting periodically signals, as described and shown in Figs. 1–2, without substantially departing from the spirit and the salient ideas of this invention.

What I claim is:

1. In a wheeled sounding toy, the combination with a self-propelled toy vehicle on wheels, of a sound producing toy siren, means for driving the vehicle and operating the siren, timing mechanism for limiting the operation of the siren so as to emit signals periodically, said driving and operating means comprising a primary spring-actuated set of gear wheels revolving the vehicle wheels and a secondary set of gear wheels cooperatively associated with the primary set of gear wheels for revolving the siren, said timing mechanism comprising an auxiliary gear wheel intermediate the primary and secondary sets of gear wheels, and means for periodically engaging and disengaging said auxiliary gear wheel from said secondary set of gear wheels.

2. In a wheeled sounding toy, the combination with a self-propelled toy vehicle on wheels, of a sound producing toy siren, means for driving the vehicle and operating the siren, timing mechanism for limiting the operation of the siren so as to emit signals periodically, said driving and operating means comprising a primary spring-actuated set of gear wheels revolving the vehicle wheels and a secondary set of gear wheels cooperatively associated with the primary set of gear wheels for revolving the siren, said timing mechanism comprising an auxiliary gear wheel intermediate the primary and secondary sets of gear wheels, and means for periodically engaging and disengaging said auxiliary gear wheel from said secondary set of gear wheels, said last named means comprising a U-shaped double armed lever structure fulcrumed on the axle of the vehicle wheel and engaging the axle of said auxiliary gear wheel, a rotary cam on the main driving shaft of the vehicle and a spring-loaded rod cooperatively connecting said U-shaped lever and said rotary cam so as to bodily shift said auxiliary gear wheel in an arcuate path around the axis of the vehicle wheels for engaging and disengaging the auxiliary gear wheel with respect to the secondary set of gear wheels.

3. In a wheeled sounding toy, the combination with a self-propelled toy vehicle on wheels, of a sound producing toy siren, means for driving the vehicle and operating the siren, timing mechanism for limiting the operation of the siren so as to emit signals periodically, said driving and operating means comprising a primary spring-actuated set of gear wheels revolving the vehicle wheels and a secondary set of gear wheels cooperatively associated with the primary set of gear wheels for revolving the siren, said timing mechanism comprising an auxiliary gear wheel intermediate the primary and secondary sets of gear wheels, and means for periodically engaging and disengaging said auxiliary gear wheel from said secondary set of gear wheels, said last named means comprising a U-shaped double armed lever structure fulcrumed on the axle of the vehicle wheel and engaging the axle of said auxiliary gear wheel, a rotary cam on the main driving shaft of the vehicle and a spring-loaded rod cooperatively connecting said U-shaped lever and said rotary cam so as to bodily shift said auxiliary gear wheel in an arcuate path around the axis of the vehicle wheels for engaging and disengaging the auxiliary gear wheel with respect to the secondary set of gear wheels, the arms of said lever having notches therein and in which notches the ends of the axle for the auxiliary gear wheel are positioned and said axle having slotted bearings permitting movements of the lever and axle when the cam shifts the spring loaded rod and lever to permit movements of the auxiliary gear wheel relative to the secondary set of gear wheels.

4. In a wheeled sounding toy, the combination with a self-propelled toy vehicle on wheels, of a sound producing toy siren, means for driving the vehicle and operating the siren, timing mechanism for limiting the operation of the siren so as to emit signals periodically, said driving and operation means comprising a primary spring-actuated set of gear wheels revolving the vehicle wheels and a secondary set of gear wheels cooperatively associated with the primary set of gear wheels for revolving the siren, said timing mechanism comprising an auxiliary gear wheel intermediate the primary and secondary sets of gear wheels, and means for periodically engaging and disengaging said auxiliary gear wheel from said secondary set of gear wheels, said last named means comprising a U-shaped double armed lever structure fulcrumed on the axle of the vehicle wheel and engaging the axle of said auxiliary gear wheel, a rotary cam on the main driving shaft of the vehicle and a spring-loaded rod cooperatively connecting said U-shaped lever and said rotary cam so as to bodily shift said auxiliary gear wheel in an arcuate path around the axis of the vehicle wheels for engaging and disengaging the auxiliary gear wheel with respect to the secondary set of gear wheels, the arms of said lever having notches therein and in which notches the ends of the axle for the auxiliary gear wheel are positioned and said axle having slotted bearings permitting movements of the lever and axle when the cam shifts the spring-loaded rod and lever to permit movements of the auxiliary gear wheel relative to the secondary set of gear wheels, the slotted bearings for the axle supporting the auxiliary gear wheel being arcuate and centered on the axle for the wheels of the vehicle for maintaining constant engagement of the auxiliary gear wheel with the primary set of gear wheels.

FELIX PLAWNER.

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