Nov. 8, 1938. R. LOHR 2,135,584

TOY FIRE HOUSE

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Fig. 1.

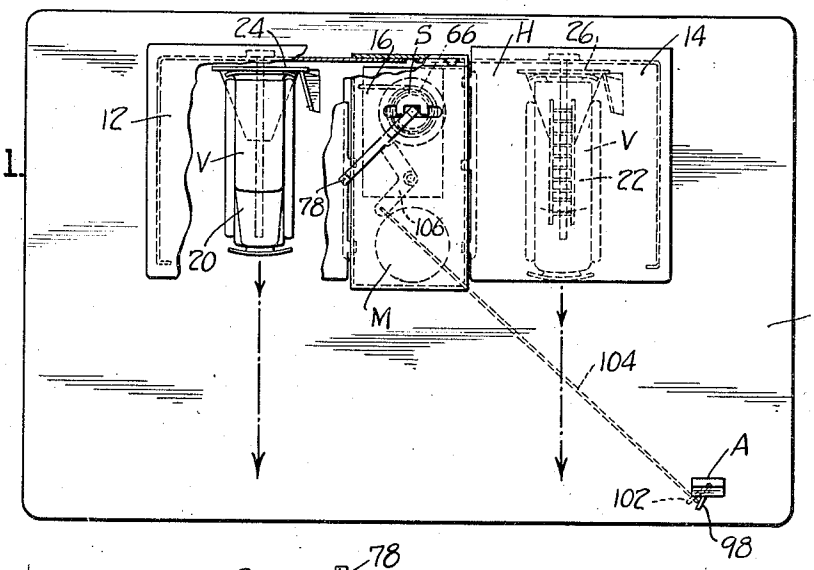
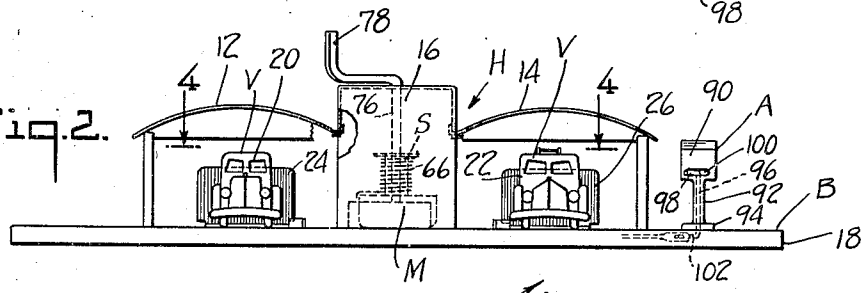


Fig. 2.



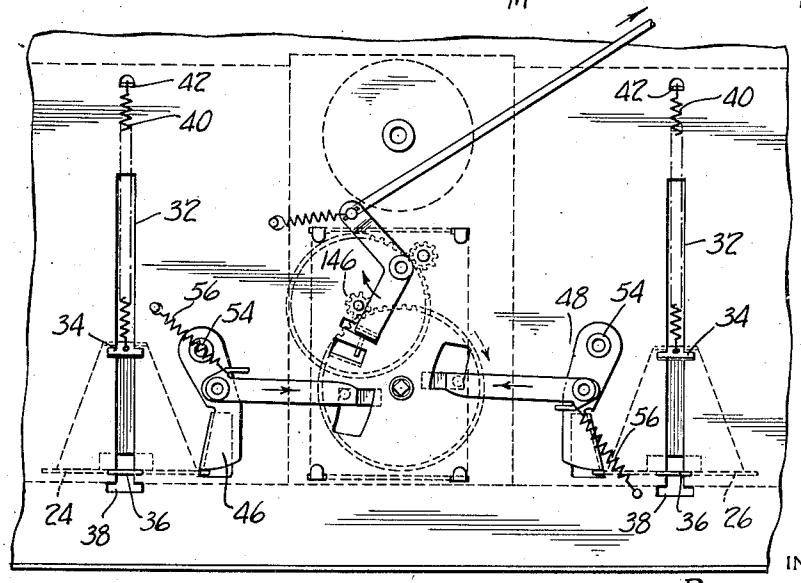


Fig. 3.

INVENTOR
Raymond Lohr
BY
James & Franklin
ATTORNEYS

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Fig. 4.

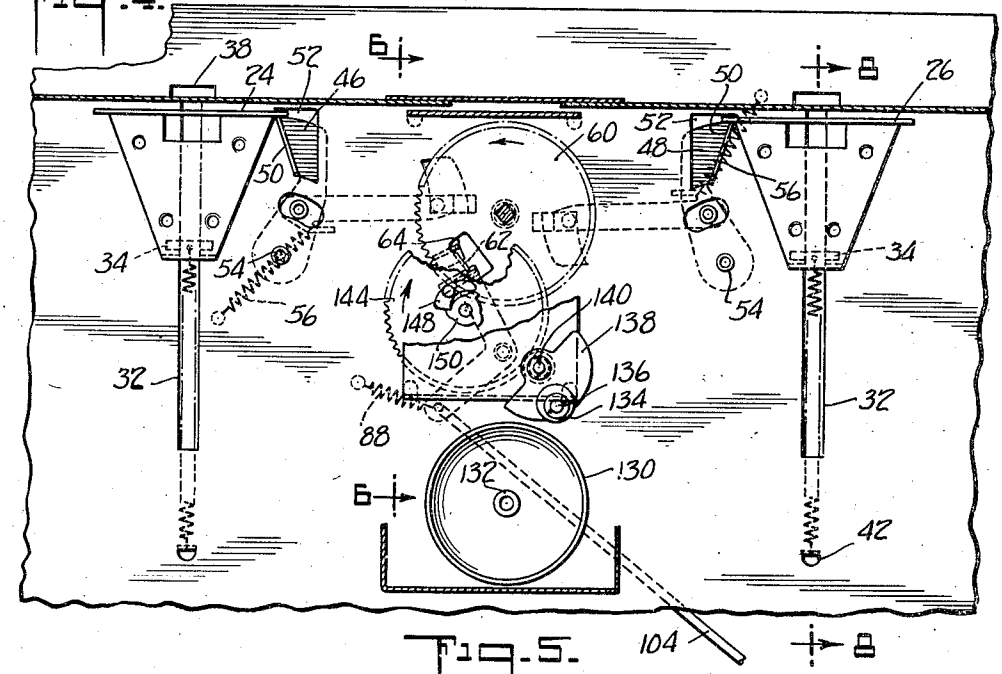


Fig. 5.

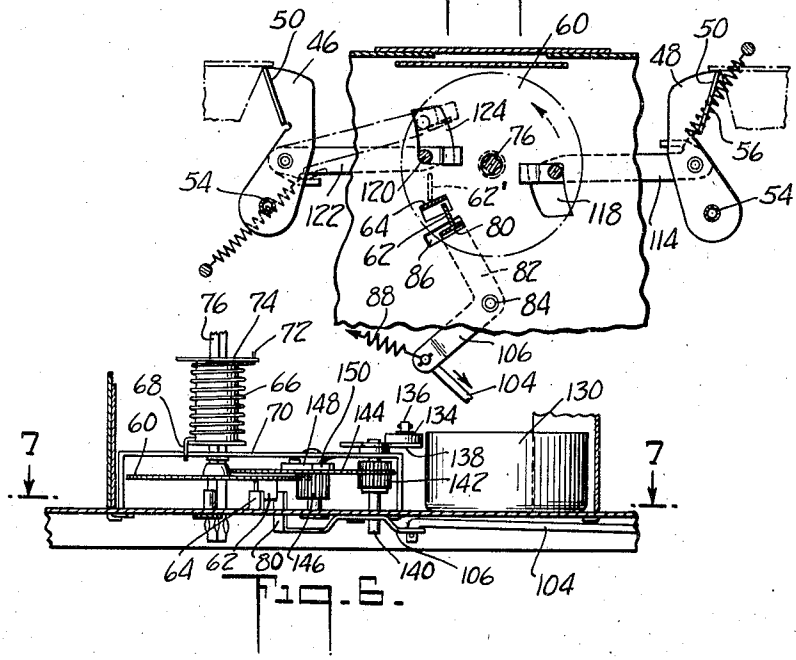


Fig. 6.

INVENTOR
Raymond Lohr
BY
Janeway & Franklin
ATTORNEYS

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Fig. 7.

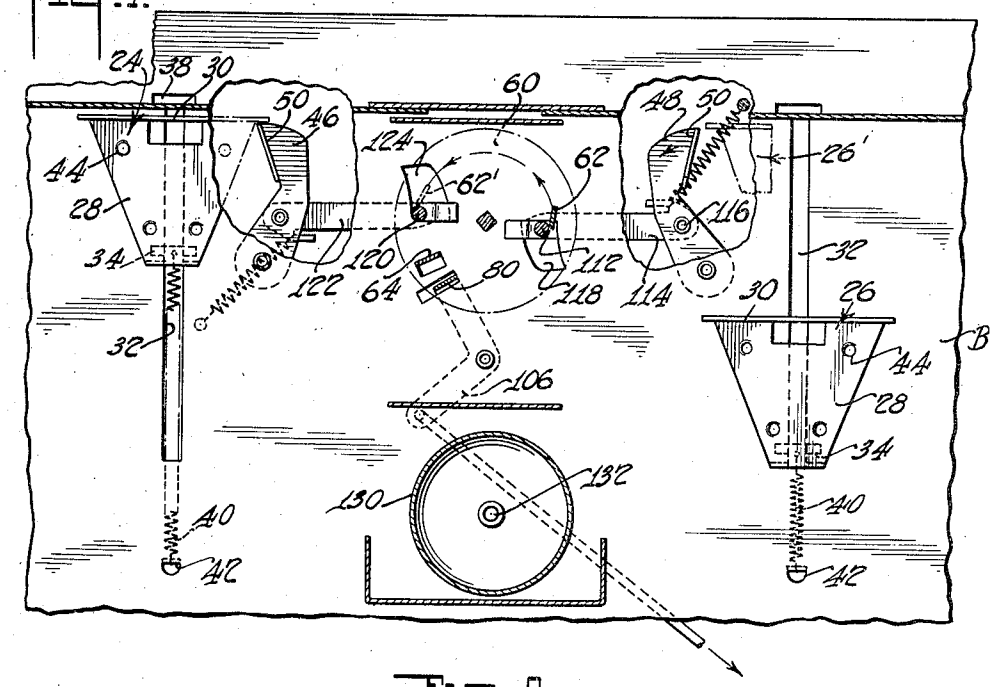


Fig. 8.

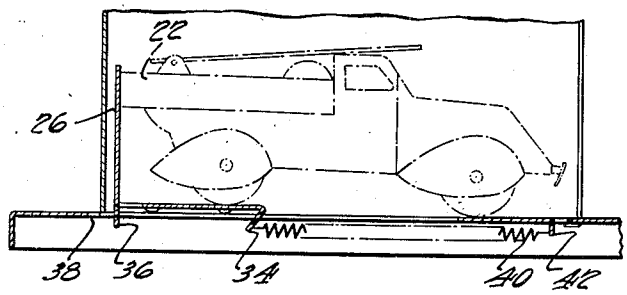
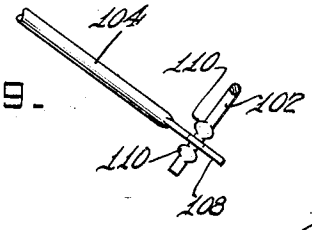


Fig. 9.



INVENTOR
Raymond Lohr.
BY
James & Franklin
ATTORNEY

Patented Nov. 8, 1938 2,135,584

UNITED STATES PATENT OFFICE

2,135,584

TOY FIRE HOUSE

Raymond Lohr, Erie, Pa., assignor to Louis Marx & Company, Inc., New York, N. Y., a corporation of New York

Application November 13, 1937, Serial No. 174,362

18 Claims. (Cl. 46—12)

This invention relates to toys, and more particularly to a toy simulating a building with a plurality of vehicles which leave the building sequentially. In the typical example here disclosed, the building simulates a fire house and the vehicles simulate fire-fighting vehicles.

The primary object of my invention is to generally improve toys of the character specified above. A more particular object is to obtain successive or sequential departure of the vehicles from the building with a time interval therebetween while controlling the toy by means of a single operation of a single control device. This control device is preferably located remotely from the building and is connected thereto by simple means such as a wire link. In accordance with a further object of my invention, the toy is provided with an alarm signal which preferably functions continuously over a substantial period of time and during the departure of all of the vehicles.

To the accomplishment of the foregoing and other objects which will hereinafter appear, my invention consists in the toy building and vehicle and alarm 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 drawings, in which:

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

Fig. 2 is a front elevation thereof;

Fig. 3 is an inverted plan view showing the operating mechanism of the toy;

Fig. 4 is a horizontal section taken in the plane of the line 4—4 of Fig. 2 with the vehicles removed;

Fig. 5 is a detail explanatory of the operation of the mechanism;

Fig. 6 is a section taken in the plane of the line 6—6 of Fig. 4;

Fig. 7 is a horizontal section taken in the plane of the line 7—7 of Fig. 6;

Fig. 8 is a section taken in the plane of the line 8—8 of Fig. 4; and

Fig. 9 is a detail of the alarm box mechanism.

Referring to the drawings, and more particularly to Figs. 1 and 2, the toy here illustrated comprises an enlarged flat base B on which is mounted a simulated fire house H. Simulated fire-fighting vehicles V are placed in the fire house H, these vehicles being adapted to leave the fire house in the direction of the arrows. The operation of the toy is controlled by a simulated alarm box A. This alarm box more immediately controls spring operated mechanism S which in turn drives alarm signal mechanism M and causes sequential departure of the vehicles from the fire house.

Considering the arrangement in greater detail, the building H may be made to simulate a fire house or police garage, or army depot, or the like. It comprises end portions 12 and 14 which act as individual garages for the vehicles, and a center portion 16 which houses the operating mechanism. In the present case the building is enclosed by rear and side walls, but the front wall is open except at the center part 16. This dispenses with the necessity for using doors. The parts of the building H are made of sheet metal, and are secured together by the usual tongue and slot connections. The base B is also preferably made of sheet metal having a downturned peripheral flange 18, and the building and base are secured together by tongue and slot connections.

The vehicles V may simulate fire-fighting vehicles, police cars, army trucks, or the like, depending upon the nature of the particular toy simulation. As here illustrated, the vehicle 20 simulates a chief's car, and the vehicle 22 simulates a fire engine or ladder and hose truck. In the present toy, the vehicles are motorless, and are therefore arranged to be forcibly ejected from the building in order to set them into motion.

For this purpose there is a pusher 24 behind vehicle 20 and a pusher 26 behind vehicle 22. These pushers are shown in greater detail in Figs. 3 through 8, and refering to Fig. 7, it will be seen that each pusher comprises a bottom plate 28 resting on base B and having bent upwardly therefrom a back or pusher plate 30. The sheet metal base B is slotted within the garages 12 and 14, forming slots 32. Bottom plates 28 have tongues 34 and 36 bent downwardly therefrom and passing through slots 32. These tongues (see Fig. 3) are preferably enlarged beneath the slot to prevent the pushers from coming away from the base B. The slots 32 may be enlarged at one end as shown at 38, thus forming a passage which facilitates mounting the pusher on the base, the tongues 34 and 36 being received through the enlargement 38. The pushers are normally pulled forwardly by pull springs 40, the rear ends of which are connected to tongues 34 and the forward ends of which are anchored on lugs 42 bent downwardly from the base. Rounded teats or projections 44 (Fig. 7) may be struck downwardly on the surface of bottom

plates 28 in order to provide bearing surfaces which ride smoothly over base B during reciprocation of the pushers.

In Fig. 7 the pusher 26 is shown in its forward position. The pusher 24 is shown in its rearward position, and when the pusher is moved from the forward position to the rearward position, it is engaged and held in rearward position by latch 46. A generally similar latch 48 is provided for pusher 26. These latches are mounted beneath the base, but have a lip or flange 50 turned upwardly therefrom and projecting above the base through suitable openings 52 (Fig. 4). The latches are pivoted on eyelets 54 and are normally urged in outward or latching direction by means of springs 56. The slope of flange 50 is such that the latch is readily displaced during rearward movement of the pusher until the pusher passes the latch, whereupon it springs outwardly into holding engagement.

The sequential release of latches 46 and 48 is obtained by means which may, for convenience, be referred to as a cam wheel, although actually, the camming projection is formed on a wheel which, for purposes later described, is preferably a toothed gear wheel. Referring to Figs. 4 through 7, the cam wheel is designated 60, and comprises a wheel of rather large diameter having a camming lug 62 depending therefrom, said lug in the present case being struck downwardly from the body of wheel 60. The movement of wheel 60 is limited to somewhat less than a single rotation by means of a fixed stop or abutment 64 struck upwardly from the base. Wheel 60 is driven by a spring 66 best shown in Fig. 6, the end 68 of the spring being anchored on one edge of motor frame 70, and the end 72 of the spring being anchored on a drum 74 secured to a square winding stem 76 the lower end of which carries wheel 60. Referring temporarily to Figs. 1 and 2, it will be seen that the upper end of winding stem 76 projects through the top of the building, and is bent to form a handle 78 by means of which the spring 66 may be tensioned.

Referring now to Fig. 5, the winding stem 76 and wheel 60 are turned in a clockwise direction to tension the spring. The motion of wheel 60 is limited by reason of camming element 62 reaching stop 64. The spring tends to unwind and to move wheel 60 in a counterclockwise direction, but is prevented from doing so by a detent 80 formed by upwardly bending the end of arm 82 of an angle lever pivoted on the base at 84. The detent arm is mounted beneath the base, but detent 80 projects upwardly above the base through an appropriate slot 86. The detent is normally moved to locking position by a spring 88. It will be noted that camming element 62 is biased or disposed at an angle such that it readily displaces detent 80 outwardly while passing the same during the winding operation.

To set the toy into operation, it is merely necessary to trip or release the detent 80. This is preferably done by a simulated alarm box A located remotely from the fire house, but for structural convenience, located preferably on the base B. Referring to Figs. 1 and 2, it will be seen that the alarm box A comprises an enclosed box-like portion 90 mounted at the upper end of a hollow tubular pedestal 92 the lower end 94 of which is secured to the base. An operating rod 96 extends vertically through the tubular pedestal 92. The upper end of the rod is bent forwardly and forms an operating handle 98 projecting through the slot 100 in box 90. The lower end of rod 96 is bent sidewardly to form an arm 102 which in turn is connected by a link 104 to arm 106 of the detent. Referring to Fig. 9, it will be seen that link 104 is connected to arm 102 by flattening the end 108 of the link and perforating the same to loosely receive arm 102. The latter is excised at 110 to form locating ears on opposite sides of link end 108.

Referring to Fig. 6, it will be seen that the other end of link 104 is turned at right angles and passes directly through detent arm 106. From a consideration of Fig. 1, it will be understood that by moving the control handle 98 at the alarm box to the right, the detent is released, thus freeing the cam wheel for movement under the influence of motor spring 66.

Referring now to Fig. 7, during the resulting counterclockwise movement of cam wheel 60, the camming element 62 passes and moves inwardly a cam follower pin 112. This cam follower pin projects upwardly from a link 114 extending sidewardly to latch 48, it being pivotally connected thereto by eyelet 116. Link 114 is disposed beneath the base, but the inner end is stepped upwardly somewhat to overlie the base, it passing through an appropriate opening 118. It will be understood that the inward movement of arm 114 moves latch 48 from the locking position shown in Figs. 4 and 5 to the unlocked position shown in Fig. 7, thus freeing the pusher 26 to move from the broken line position 26′ to the solid line position 26. The movement of the pusher is, of course, an abrupt one, it being under the influence of spring 40, and the pusher ejects the toy vehicle from the garage and imparts considerable speed to the vehicle.

The cam wheel 60 continues its movement and after traveling approximately 180 degrees, the cam element 62 reaches the broken line position 62′ shown in Fig. 7, whereupon it bears against the cam follower pin 120 of a link 122 extending to latch 46. The resulting inward movement of the latch causes release of pusher 24 with consequent forcible ejection of the other vehicle. Link 122 underlies the base except for its inner end which comes above the base through an appropriate opening 124.

The openings 118 and 124 are enlarged and shaped as shown to facilitate the winding movement of the cam wheel. Thus, referring to Fig. 5, it will be seen that during clockwise movement of the cam wheel the camming element 62′ on leaving the stop 64 bears against follower pin 120, but passes the follower pin without difficulty because link 122 oscillates, as shown, from the solid to the broken line positions, this oscillation being accommodated by opening 124. A similar oscillation of link 114 is accommodated by opening 118.

The toy is additionally provided with signal alarm mechanism. Referring to Figs. 4, 6 and 7, the alarm in this case comprises a bell 130 mounted on the base at 132. This bell is arranged to be repeatedly, rapidly struck by a bell striker 134, said striker being mounted on a pin 136 carried by an arm 138 mounted at the upper end of a pinion shaft 140. Shaft 140 carries a pinion 142 which is driven by a gear 144 carrying pinion 146 which in turn is driven by the gear teeth on the periphery of camming wheel 60. Because of the large step-up gear ratio and because of the eccentric load of the bell striker, the cam wheel 60 is held down to a slow speed of rotation while the bell is rapidly struck a large number of times. The bell is continuously struck

throughout the operation of the toy and the successive departure of the vehicles from the fire house.

In order to avoid ringing of the bell during winding of the cam wheel drive spring 66, the gear train leading to the bell is preferably provided with a unidirectional clutch. Referring to Figs. 4 and 6, this clutch comprises a dog 148 mounted on gear 144 and operating upon a ratchet wheel 150 secured to pinion 146. During unwinding of the cam wheel drive spring, the ratchet 150 engages dog 148 and causes rotation of gear 144 with consequent operation of the bell. However, during winding of the spring, the ratchet wheel 150 turns in counterclockwise direction and the teeth simply pass dog 148 without rotating gear 144.

It is believed that the construction and operation, as well as the many advantages of my improved toy will be apparent from the foregoing detailed description. To prepare the toy for operation, it is merely necessary to push a vehicle rearwardly into each of the garage compartments. This forces the pushers back until they are engaged by the latches. The motor spring is then wound by turning the crank at the top of the building. This may be done either before or after pushing the vehicles into the building. The control device or alarm box is then used to release or trip the detent holding the motor spring in wound condition, whereupon the motor spring functions first to set the signal alarm into operation and at the same time to sequentially discharge the vehicles from the building. The alarm operates for an appreciable time before the first vehicle leaves the building, and then continues operating during the time interval prior to departure of the second vehicle from the building.

It will be understood that with the motor-driven cam type of latch release used in the present toy, it is readily possible to provide more than two vehicles and to discharge the increased number of vehicles successively from the building. It will also be understood that motor-driven rather than motorless vehicles may be used, in which case the latches, instead of holding and then releasing pushers, are used to hold and then release the wound vehicles.

It will therefore be apparent that while I have shown and described my invention in a 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 simulated building, a plurality of simulated vehicles therein, a single control device, and movable means moved in response to a single operation of said control device, said movable means during its motion causing successive departure of the vehicles from the building.

2. A toy comprising a simulated building, a plurality of simulated vehicles therein, a simulated alarm signal, a single control device, and movable means moved in response to a single operation of said control device, said movable means during its motion causing successive departure of the vehicles from the building and operation of the alarm signal to accompany the departure of each of the vehicles.

3. A toy comprising a simulated building, a plurality of simulated vehicles therein, a simulated alarm signal, a simulated alarm box located remotely from said building, and movable remotely controlled means moved in response to a single operation of said alarm box, said movable means during its motion causing successive departure of the vehicles from the building and operation of the alarm signal to accompany the departure of each of the vehicles.

4. A fire house toy comprising a simulated fire house, a plurality of motorless simulated fire fighting vehicles therein, a simulated alarm signal, a simulated fire alarm box, and a motor started in response to operation of said alarm box, said motor during its ensuing operation causing operation of the alarm signal and successive ejection of the vehicles from the fire house.

5. A toy comprising a plurality of vehicles, a spring motor, means to wind the same, means operated by said spring motor for causing departure of the vehicles successively with a time interval therebetween, a control device, and means whereby operation of said control device releases said spring motor.

6. A toy comprising a plurality of vehicles, a spring motor, means to wind the same, a signal operated by said spring motor, additional means operated by said spring motor for causing departure of the vehicles successively with a time interval therebetween, a control device, and means whereby operation of the control device releases the spring motor for operation.

7. A toy comprising a simulated building, two simulated vehicles therein, a spring motor, means to wind the same, an alarm signal arranged to be operated by said spring motor, additional means operated by said spring motor for causing the departure of first one of the vehicles and then the other of the vehicles, a control device, and means whereby operation of said control device releases said spring motor for operation.

8. A toy comprising a simulated building, two simulated vehicles therein, a spring motor, means to wind the same, an alarm signal arranged to be operated over a substantial period of time by said spring motor, additional means operated by said spring motor for causing the departure of first one of the vehicles and then the other of the vehicles successively, a simulated alarm box located remotely from said building, and means whereby operation of said alarm box releases said spring motor for operation.

9. A fire house toy comprising a simulated fire house, two simulated fire fighting vehicles therein, a pusher in back of each vehicle, a spring motor, means to wind the same, an alarm signal arranged to be operated by said spring motor, additional means operated by said spring motor for causing the operation of first one of the pushers and then the other of the pushers, in order to push the vehicles out of the fire house successively, a control device, and means whereby operation of said control device releases said spring motor for operation.

10. A fire house toy comprising a simulated fire house, two motorless simulated fire fighting vehicles therein, a spring motor, means to wind the same, an alarm signal arranged to be operated over a substantial period of time by said spring motor, additional means operated by said spring motor for causing the ejection of first one of the vehicles and then the other of the vehicles successively, a simulated fire alarm box, and means whereby operation of said alarm box releases said spring motor for operation.

11. A toy comprising a plurality of vehicles,

means tending to set the vehicles into motion, a latch at each vehicle for holding said means in check, a cam wheel having a camming element adapted to release one of the latches at one point in its rotation and to release another of the latches at another point in its rotation, whereby the latches are released successively with a time interval therebetween as the cam wheel rotates, a spring tending to move said cam wheel in one direction, a crank for turning it in opposite direction to wind the spring, a detent to hold the cam wheel in wound position, and means to release the detent.

12. A toy comprising a simulated building, simulated vehicles received in the building, means to move the vehicles out of the building, a latch at each vehicle for holding said means in check, a cam wheel having a camming element adapted to release one of the latches at one point in its rotation and to release another of the latches at another point in its rotation, a spring tending to move said cam wheel in one direction, a crank for turning it in opposite direction to wind the spring, a detent to hold the cam in wound position, and means to release the cam detent.

13. A toy comprising a simulated building, simulated vehicles received in the building, means to move the vehicles out of the building, a latch at each vehicle for holding said means in check, a cam wheel having a camming element adapted to release one of the latches at one point in its rotation and to release another of the latches at another point in its rotation, a spring tending to move said cam wheel in one direction, a crank for turning it in opposite direction to wind the spring, a detent to hold the cam in wound position, a simulated alarm box relatively remote from said building, and means connecting said alarm box to the cam detent.

14. A toy comprising a simulated building, simulated vehicles received in the building, means to move the vehicles out of the building, a latch at each vehicle for holding said means in check, a cam wheel having a camming element adapted to release one of the latches at one point in its rotation and to release another of the latches at another point in its rotation, a spring tending to move said cam wheel in one direction, a crank for turning it in opposite direction to wind the spring, a detent to hold the cam in wound position, an alarm signal mechanism, means including a step-up gear train connecting said cam wheel to said alarm signal mechanism in order to operate the same continuously during the successive release of the latches, and means to release the cam detent.

15. A toy comprising a simulated building, simulated vehicles received in the building, a vehicle-ejecting pusher in back of each vehicle and reciprocable in the direction of movement of the vehicle, a spring at each pusher normally urging the pusher forwardly, a latch at each pusher for holding the pusher in rearward position against the force of the spring a cam wheel having a camming element adapted to release one of the latches at one point in its rotation and to release the other of the latches at another point in its rotation, a spring tending to move said cam wheel in one direction, a crank for turning it in opposite direction to wind the spring, a detent to hold the cam in wound position, an alarm signal mechanism, step-up gearing connecting said cam wheel to said alarm signal mechanism in order to operate the same over a substantial period of time and during the successive release of the pushers, and means to release the cam detent.

16. A toy fire house comprising a simulated fire house building, a simulated fire fighting vehicle received near each end of the building, a vehicle-ejecting pusher in back of each vehicle and reciprocable in the direction of movement of the vehicle, a spring on each pusher normally urging the pusher forwardly, a latch at each pusher for holding the pusher in rearward position against the force of the spring, a cam wheel disposed in the fire house building between the vehicles and having a single camming element adapted to release one of the latches at one point in its rotation and to release the other of the latches at another point in its rotation, a stop to limit the movement of the cam wheel to a single revolution, a spring tending to move said cam wheel in one direction, a crank for turning it in opposite direction to wind the spring, a detent to hold the cam wheel in wound position, an alarm signal mechanism, step-up gearing connecting said cam wheel to said alarm signal mechanism in order to operate the same over a substantial period of time and during the successive release of the pushers, a simulated alarm box relatively remote from said fire house, and means connecting said alarm box to the detent in order to release the cam wheel and to thereby set the signal into continuous operation and the pushers into successive operation.

17. A toy comprising a simulated building, a plurality of simulated vehicles therein, a control device, a motor arranged to be started in response to said control device, and means whereby said motor in the course of its ensuing operation causes successive departure of the vehicles from the building.

18. A toy comprising a simulated building, a plurality of simulated vehicles therein, a simulated alarm signal, a control device, a motor arranged to be started in response to said control device, and means whereby the ensuing operation of the motor causes successive departure of the vehicles from the building and at the same time operates the alarm signal to accompany the departure of the vehicles.

RAYMOND LOHR.