May 20, 1958 R. W. CRAWFORD ET AL 2,835,074

ACTION TOY

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FIG. 1.

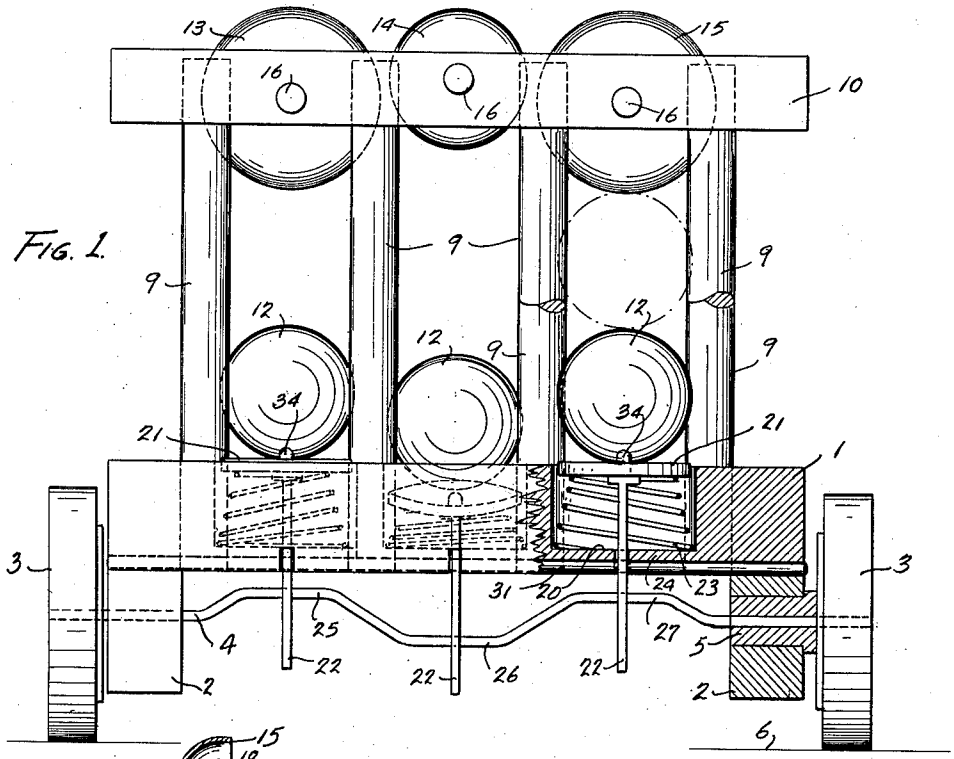


FIG. 2.

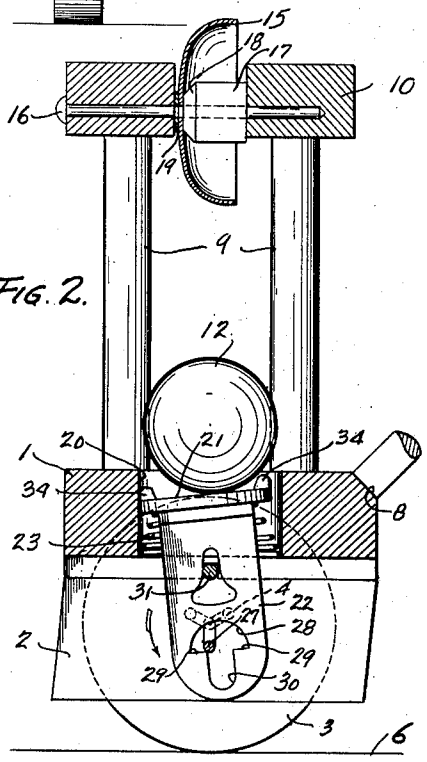
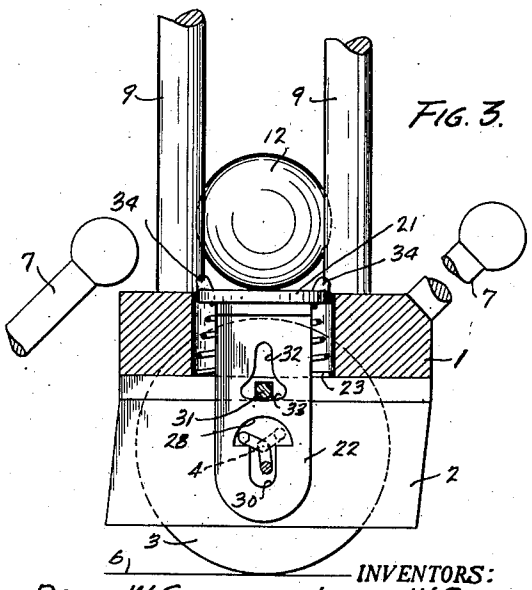


FIG. 3.



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ACTION TOY

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This invention relates generally to the amusement device art, and more particularly to a new and useful wheeled action toy for young children.

It is an object of this invention to provide an action toy producing one or more pleasant musical sounds and imparting a popping action to one or more gaily colored balls, all in an intriguing and highly entertaining manner, as the toy is rolled along a supporting surface.

It is also an object of this invention to provide the foregoing in an attractive, durable toy constructed of relatively inexpensive components which are easily assembled.

In addition, it is an object of this invention to provide a novel popping mechanism having a uniform, dependable action and which is readily varied to change the sharpness of its stroke.

Another object of this invention is to provide a toy as aforesaid which has no sharp projections or other potentially dangerous parts and therefore is safe for use by very young children.

Still another object of this invention is to provide a toy having the foregoing characteristics wherein the action is reversible, and which in all other respects adapts itself for use by the very young.

A wheeled action toy in accord with this invention is characterized in one aspect thereof by the provision of ball confining means mounted for movement along a supporting surface, a ball movably carried thereby, a musical sound producing device positioned so as to be struck by the ball, and means for popping the ball against the musical device upon movement of the toy over a supporting surface.

In another aspect thereof, a toy in accord with this invention is characterized by the provision of a popping mechanism including a member having a springbacked head portion adapted to engage a ball member or the like for moving the same and a stem extending therefrom, the stem having a shouldered part, and means periodically engaging said shouldered part and alternately retracting the head portion against its backing spring and then releasing the same as the toy is moved along a supporting surface.

The foregoing and other objects, advantages and characterizing features of a toy in accord with this invention will become clearly apparent from the ensuing detailed description of a presently preferred embodiment thereof, reference being made to the accompanying drawing illustrating such embodiment and forming a part hereof wherein:

Fig. 1 is a front elevational view of the toy with certain parts broken away for greater clarity;

Fig. 2 is a transverse sectional view thereof showing the snap-action popping mechanism in cocked position just prior to driving the ball against the bell, the handle of the toy being broken away for ease of illustration; and

Fig. 3 is a fragmentary view similar to Fig. 2 but illustrating the normal position of rest assumed by the snap-acting mechanism after popping the ball against the bell, the ball having returned from striking the bell and assumed its position of rest.

In the presently preferred embodiment thereof, a toy constructed in accord with this invention is in the nature of a cart comprising a carriage formed by an elongated, generally rectangular base plate 1 having bearing blocks 2 depending therefrom adjacent the opposite ends thereof, and supported by a pair of wheels 3 mounted on an axle comprising a crank shaft 4 journalled in bearings 5 carried by the blocks 2. Thus, the toy is adapted to be rolled across a floor or other supporting surface 6, and for manipulating the toy a handle 7 is provided which can be screwed into or otherwise secured to the base plate 1 as against the beveled upper rear edge 8 thereof.

This carriage construction supports and forms a part of a number of ball confining means in the form of cages defined by spaced rows of spaced vertical dowels or posts 9. Posts 9 are fitted in sockets in base plate 1, and the posts of each row are joined at their upper ends by a top rail or plate 10 having sockets in which the upper ends of the posts are fitted. The two plates 10 being interconnected to form a top rail assembly in a manner to be described.

Three ball confining cages are provided in the illustrated embodiment, although obviously any number thereof could be provided, and therefore there are four posts 9 in each row thereof. The cages defined by posts 9, top plates 10 and base plate 1 are vertically elongated and each loosely confine a ball member 12 vertically movable therein. Therefore, the posts 9 of each row thereof are spaced apart from each other a distance less than the diameter of the balls 12, and the posts of each row are spaced a similar distance from the corresponding posts of the other row, the spacing of the posts being such that the balls 12 are confined by the cages while being loose and movable therein. The cages are substantially square, and each cage is defined by four posts 9 positioned at the corners thereof with adjacent cages being defined in part by common corner posts.

In the toy according to this invention the balls 12, which will be gaily colored, are caused to be popped upwardly against musical sound producing devices upon wheeling the toy along a supporting surface. In the illustrated embodiment the musical devices comprise three musical bells 13, 14 and 15, one for each cage, the bells being positioned at the top of the ball confining cages defined by the posts 9. Thus, the bells 13, 14 and 15 are mounted between the top plates 10 so as to be confined therebetween with the lower end of each bell extending into the race provided for the ball 12 confined in the associated cage, for being struck by such ball.

Accordingly, the bells 13, 14 and 15 are mounted on pins 16 extending completely through one top plate 10 and into the other, as clearly shown in Fig. 2, each bell being centrally apertured to receive the pin 16 therethrough. Spacing members 17 carried by pins 16 and each having a tapered end 18 extend between one plate 10 and each bell, and washers 19 are carried by pins 16 between the other plate 10 and the bells, whereby the bells are held firmly in position without dampening the musical tone thereof. Instead of the separate washers 19, the apertured central portion of each bell 13, 14 and 15 can be stamped or otherwise formed to project outwardly and in that manner spaced the main body part of each bell from the top plate 10.

The balls 12 can be of many different materials such as wood and the like, but preferably are formed of a synthetic plastic material in the nature of "Ping-pong" balls, and when snapped against the bells produce a pleasant musical note.

Base plate 1 is formed to provide a socket 20 at the bottom of each ball confining cage, and each socket contains a novel popping mechanism including a poppet member comprising a disc-like head 21 and a flat, centrally depending push rod stem 22. The head 21 of each poppet member provides a base or platform against which the associated ball 12 normally rests and each poppet member is urged to a normal position with the head 21 thereof substantially flush with the top of base plate 1, as illustrated in Figs. 1 and 3, by a coil spring 23 carried within the socket and bearing at one end against the bottom 24 thereof and at the other end against the under side of the head 21. Base plate 1 is transversely slotted on its under side through the bottom 24 of each socket 20 to accommodate the poppet member stems 22 in freely sliding relation therethrough.

The different poppet members are retracteed to load the springs 23, and then suddenly released to snap the various balls 12 against the bells, all in a predetermined, alternating sequence, and this is accomplished by means including the axle-crankshaft 4 which is formed to provide three angularly related cranks 25, 26 and 27. Each stem 22 is formed to provide a generally keyhole shaped opening therethrough comprising a semi-circular portion 28 having a normally substantially horizontal shoulder 29 at each end thereof, the shoulders 29 being separated by a relatively deep, vertical groove or passage 30, and the crankshaft 4 extends through the stem openings with the crank portions 25, 26 and 27 aligned therewith.

As the toy is rolled across the supporting surface 6 in the direction indicated by the arrow in Fig. 2 the crankshaft 4 is rotated and causes the cranks 25, 26 and 27 to swing through an arc within the portion 28 and then against a horizontal shoulder 29 whereby, as the cranks continue their downward swinging movement they pull the poppet members downwardly against the springs 23 to load the same and thereby cock the poppet member as illustrated in Fig. 2. Then, the cranks 25, 26 and 27 slide over the shoulder 29 and into the grooves 30 thereby suddenly releasing the energy stored up in springs 23 and causing the poppet members to snap the balls 12 upwardly against the bells 13, 14 and 15 to strike the same. The cranks 25, 26 and 27 are angularly related, being 120° apart in the instant case, whereby one ball after the other is caused to strike its associated bell to produce a succession of pleasant musical sounds, preferably of different pitch, with the gaily colored balls popping up from the base plate 1 at periodic intervals. It will be noted that because shoulders 29 are provided at each end of the portion 28, whereby the mechanism is symmetrical, the toy works as well in a reverse direction as when it is wheeled in the forward direction indicated by the arrow in Fig. 2.

To better guide and confine the poppet members a dowel 31 extends between the bearing blocks 2 and through openings in the stems 22 which openings generally are the reverse of the portions 28 and 30 but without shoulders 29. Thus, each dowel receiving opening has a relatively narrow, vertically elongated top portion 32, and a laterally enlarged, arcuate bottom portion 33. As the poppet member is retracted against spring 23 the dowel 31 enters the relatively narrow portion 32 and tends to maintain the poppet member in proper vertical alignment and ensure proper operation thereof. When the poppet member has been released the arcuate portion 33 permits swinging thereof to accommodate the swinging motion of the cranks 25, 26 and 27 in the recesses 30. The bottom of base plate 1 is longitudinally grooved, from end to end, to accommodate the dowel 31.

To further ensure against the poppet member heads 21 catching in the walls of sockets 20 diametrically opposed, upright tabs 34 are provided on the heads 21 in a fore and aft direction aligned with the stems 22, which tabs have a rounded upper edge and provide a vertically elongated bearing surface adapted to slide freely on the inner wall of the sockets 20.

It will be appreciated that the generally horizontal shoulders 29 provide the poppet member with a very sharp stroke and that the action of the popping mechanism is dependable and uniform. The sharpness and pattern of the stroke can be varied by changing the contour of the keyhole shaped opening comprising portion 28, shoulders 29 and passage 30, as desired.

Thus, it will be seen that the toy of this invention fully accomplishes the aforesaid objects, and while only a presently preferred embodiment thereof has been disclosed in detail herein, the invention is not necessarily limited to such details and modifications and variations will occur to those skilled in the art without departing from the spirit of the invention and the scope of the appended claims.

Having fully disclosed and completely described our invention, together with its mode of operation, what we claim as new is:

1. A wheeled action toy comprising, a base plate, normally generally upright ball confining means carried by said base plate, a ball loosely confined by said confining means for vertical movement therein, a musical sound producing device positioned adjacent the upper end of said confining means for being struck by said ball, said base plate having a socket therein at the lower end of said confining means, a poppet member vertically movable in said socket, said poppet member having a disc-like head forming a ball supporting platform at the bottom of said confining means and a stem depending therefrom through the bottom of said socket, spring means carried in said socket and urging said poppet member vertically upwardly, bearing block means depending from said base plate, axle means journaled in said bearing block means, wheel means carried by said axle means and supporting said toy for rolling movement along a supporting surface, a generally keyhole shaped opening in said poppet member stem, and crank means movable with said axle means and extending into said opening, said opening having a pair of generally horizontal shoulders against which said crank means bears to momentarily depress said poppet member against said spring means upon rolling said toy along a supporting surface both forwardly and rearwardly.

2. A toy as set forth in claim 1, together with a pair of upright tabs carried by said poppet member head adjacent the periphery thereof in generally diametrically opposed relation transversely of said axle means, said tabs having rounded upper edges and being adapted to bear against the inner wall of said socket and facilitate vertical movement of said poppet member therein.

3. A toy as set forth in claim 1, wherein said poppet member stem has another opening therein comprising a relatively narrow upper portion and a concavely arcuate lower portion, together with dowel means carried by said bearing block means and extending into said other opening.

4. In an action toy, a popping mechanism comprising, a poppet member having a disc-like head part and a stem extending therefrom at generally a right angle thereto, means loosely confining said poppet member for reciprocating movement between predetermined limits, spring means urging said poppet member toward one of said limits, a generally keyhole shaped opening in said stem, crank means extending into said opening, means mounting said toy for movement along a supporting surface, and means rotating said crank means in response to such movement of said toy, said opening having generally opposed shouldered portions against which said crank means bears alternatively upon rotation in opposite directions to momentarily depress said poppet member against said spring means.

5. A wheeled action toy comprising, a base plate, normally generally upright ball confining means carried by said base plate, ball means loosely confined by said confining means for vertical movement therein, said base

plate having a socket therein at the lower end of said confining means, a poppet member vertically movable in said socket, said poppet member having a disc-like head forming a ball supporting platform at the bottom of said confining means and a stem depending therefrom through the bottom of said socket, spring means carried in said socket and urging said poppet member vertically upwardly, bearing block means depending from said base plate, axle means journaled in said bearing block means, wheel means carried by said axle means and supporting said toy for movement along a supporting surface, a generally keyhole shaped opening in said poppet member stem, and crank means movable with said axle means and extending into said opening, said opening having a pair of generally horizontal shoulders against which said crank means bears to momentarily depress said poppet member against said spring means upon rolling said toy along a supporting surface both forwardly and rearwardly.

6. In an action toy, a popping mechanism comprising, a poppet member having a disc-like head part and a stem extending therefrom at generally a right angle thereto, means loosely confining said poppet member for reciprocating movement between predetermined limits, spring means urging said poppet member toward one of said limits, a generally keyhole shaped opening in said stem, crank means extending into said opening, and means for rotating said crank means, said opening having generally opposed shouldered portions against which said crank means bears alternatively upon rotation in opposite directions to momentarily depress said poppet member against said spring means.

7. The combination as set forth in claim 6 wherein the means loosely confining said poppet member for reciprocating movement between predetermined limits comprises the stem having a second opening therein, a dowel means carried by said toy and extending into said second opening to limit the spring urged movement of said poppet member.

8. A wheeled action toy comprising, a base structure, normally generally upright ball confining means carried by said base structure, ball means loosely confined by said confining means for generally vertical movement therein, said base structure having a socket therein at the lower end of said confining means, a poppet member generally vertically movable in said socket, said poppet member having a disc-like head forming a ball supporting platform at the bottom of said confining means and a stem depending therefrom, spring means aligned with said socket and urging said poppet member vertically upwardly, axle means journaled in said base structure, wheel means carried by said axle means and supporting said toy for movement along a supporting surface, a generally keyhole-shaped opening in said poppet member stem, and crank means movable with said axle means and extending into said opening, said opening having a pair of generally horizontal shoulders against which said crank means bears alternatively upon rotation in opposite directions to momentarily depress said poppet member against said spring means upon rolling said toy along a supporting surface both forwardly and rearwardly.

9. A wheeled action toy comprising, a base structure, normally generally upright ball confining means carried by said base structure, ball means loosely confined by

said confining means for generally vertical movement therein, said base structure having a socket therein at the lower end of said confining means, a poppet member normally generally vertically movable in said socket, said poppet member having a disc-like head forming a ball supporting platform at the bottom of said confining means and a stem depending therefrom, spring means alined with said socket and urging said poppet member generally vertically upwardly, axle means journaled in said base structure, wheel means carried by said axle means and supporting said toy for movement along a supporting surface, a first generally keyhole-shaped opening in said poppet member stem, crank means movable with said axle means and extending into said first opening, said first opening having a pair of generally horizontal shoulders against which said crank means bears alternatively upon rotation in opposite directions to momentarily depress said poppet member against said spring means upon rolling said toy along a supporting surface both forwardly and rearwardly, an inverted second generally keyhole-shaped opening in said poppet member stem, and dowel means carried by said base structure and extending into said second opening to limit the spring urged movement of said poppet member.

10. In an action toy, a base, a pair of rows of generally upright post members carried by said base and defining a number of ball confining cages, a ball member loosely confined in each of said cages, a pair of top plate members interconnecting the upper ends of the post members of each of said rows thereof, musical sound producing bell members positioned between said top plate members in alignment with said cages, common fastening means interconnecting said top plate members and securing said bells in position therebetween, means mounting said toy for movement along a supporting surface, and poppet means adjacent the lower end of each of said cages for popping said ball members against said musical bell members upon such movement of said toy, each of said poppet means comprising, a poppet member having a disc-like head part and a stem extending therefrom at generally a right angle thereto, means loosely confining said poppet member for reciprocating movement between predetermined limits, spring means urging said poppet member toward one of said limits, and a generally keyhole shaped opening in said stem, crank means extending into said opening, and means rotating said crank means in response to such movement of said toy, said opening having generally opposed shouldered portions against which said crank means bears alternatively upon rotation in opposite directions to momentarily depress that poppet member against its said spring means.

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