Dec. 25, 1962 J. C. CIRAFESI 3,069,804

CARTWHEELING STICK

Filed Nov. 17, 1958 2 Sheets-Sheet 1

Fig. 1

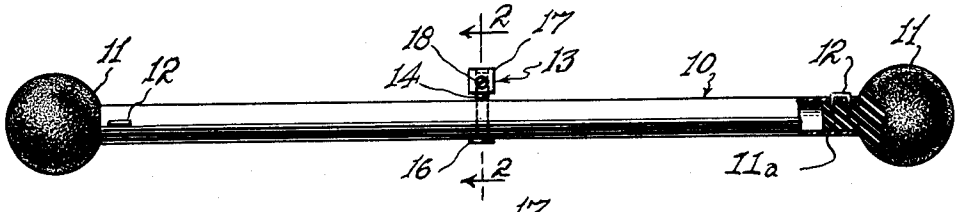


Fig. 2

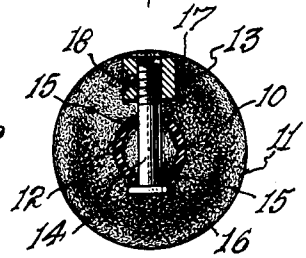


Fig. 3

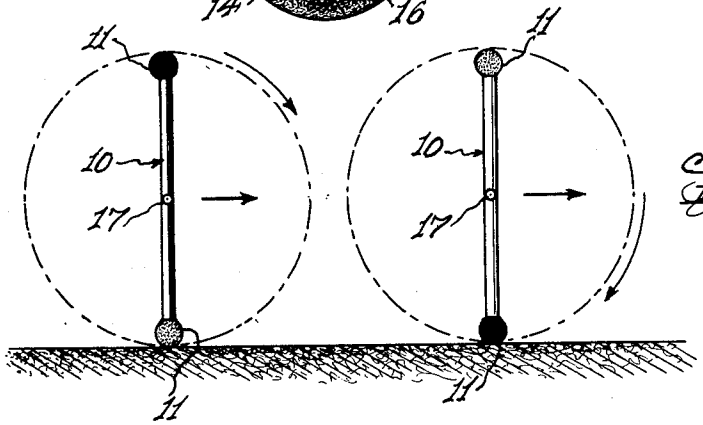
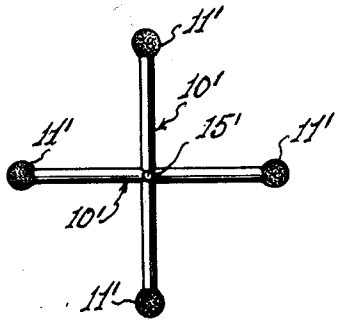


Fig. 4



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Filed Nov. 17, 1958 2 Sheets-Sheet 2

Fig. 5

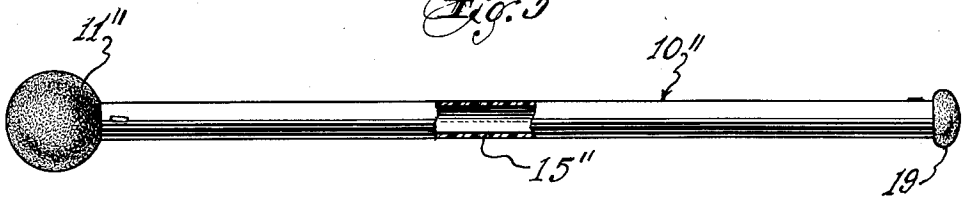


Fig. 6

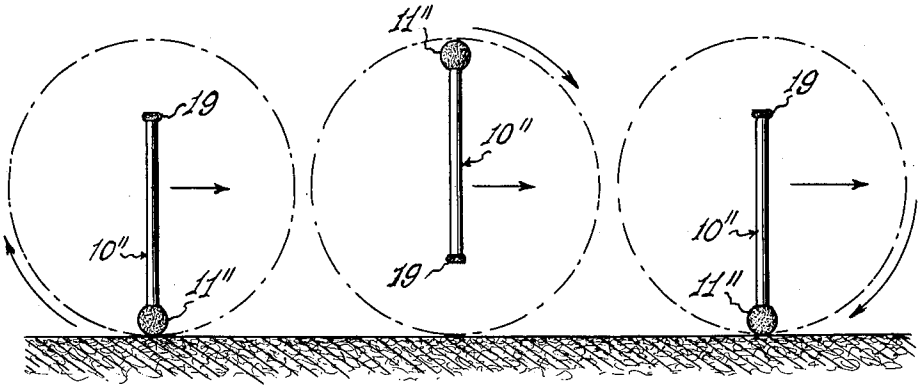
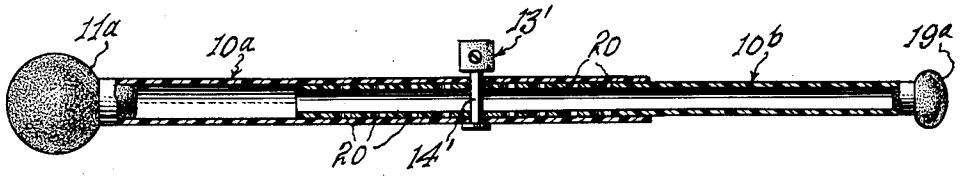


Fig. 7



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CARTWHEELING STICK

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5 Claims. (Cl. 46—1)

The invention relates in general to amusement devices and has particular reference to the class of such devices that includes hoops and the like which may be projected or propelled in rolling or bouncing motion along the ground.

To be more explicit, it is the primary object of my invention to provide an entirely novel amusement device in the form of a stick having resilient reactionary tread members on its respective ends which will cause the device to cartwheel in a predetermined course along the ground when released after being twirled in a vertical or near-vertical plane on a medial transverse spin axis.

Original trials with a plain stick of wood having no terminal resilient tread members were unsuccessful. I then conceived the idea of affixing rubber balls to the ends of the stick. The balls chosen for this purpose were thin-walled hollow balls obtained in a toy store and proved to be unsuitable. The stick would not cartwheel. However, after experimentation with balls and stick-shafts of various kinds, sizes and weights, it was discovered that a certain general, but not precisely critical, size and weight relationship between the principal component parts of the device was essential to the successful performance of cartwheeling action. For instance, the shaft had to be a very light plastic tube and the tread members had to be in the form of comparatively heavy thick-walled rubber balls.

Another object of the invention is to provide a cartwheeling stick that has a simple easily releasable swivelling handle at the midpoint of its shaft which makes special twirling dexterity and skill unnecessary to successful launching of the device on its cartwheeling course.

Further objects, advantages and features of the invention will appear as the following specific description is read in connection with the accompanying drawings, in which:

FIG. 1 is a side elevation, partly in section, of one embodiment of the invention wherein a single shaft has resilient tread members at both ends; FIG. 2 is a cross-sectional view on line 2—2 of FIG. 1; and FIG. 3 is a diagrammatic view showing the manner in which this form of the device operates in practice.

FIG. 4 is a side elevation of a modified form of the device having a pair of the single devices shown in FIGS. 1 and 2 crossed and integrally united to provide a structure resembling four spokes and the hub of a wheel.

FIG. 5 is a side elevation of a further modification in accordance with which a single shaft has a resilient tread member at one end only; and FIG. 6 is a diagrammatic view showing the manner in which this modified device operates.

FIG. 7 is a longitudinal section of a modified form of the FIG. 5 embodiment, wherein the shaft is changeable in effective length.

Referring now in detail to the drawings, wherein like reference characters designate corresponding parts in the several views, FIGS. 1 and 2 represent the primary embodiment of the invention, which will be referred to in its entirety as a "stick" or "cartwheeling stick" but which comprises a single shaft **10** having resilient reactionary tread members **11** affixed to the opposite ends thereof. Each tread member **11** preferably is spherical in shape and has for its primary function the reactionary effect when it strikes the ground of imparting upward bounce or rebound to the stick as a whole. For reasons explained later herein, shaft **10** is tubular in construction, so it is

convenient to provide each tread member with a radial attaching shank **11***a* of suitable diameter to fit snugly in the corresponding end of shaft **10**. Staples **12** are used to secure the shanks **11***a* of the respective tread members **11** in assembled relation to shaft **10**, but other equivalent means, such as adhesive material, may be used instead within the scope of the invention.

In reduction of my invention to practice, it was found that satisfactory cartwheeling action resulted when officially approved rubber balls used in the game of "handball" were applied to the ends of a shaft **10** constituted by a light plastic tube. Each such handball is made of tough black rubber and is one and seven-eighths inches in outside diameter. It is hollow but has a comparatively thick wall, i.e. one-quarter of an inch in thickness. The weight of each ball is two ounces. Tubular plastic shaft **10** is eighteen inches long and weighs two and one-quarter ounces, its outside diameter being three-quarters of an inch and its inside diameter being five-eights of an inch. Although tread members **11** are shown with attached separate shanks **11***a*, which have been cemented to the handballs utilized for my purposes, it may be found to be more expedient in quantity production to mold each ball and shank in one piece of rubber, so that each tread member will be substantially bulb-shaped. Each shank **11***a* is three-quarters of an inch in length and five-eights of an inch in diameter to match the inside diameter of the bore of tubular shaft **10**.

At the medial point of shaft **10**, a swivel handle **13** is located in a manner to permit the thrower to twirl the stick as a whole on a substantially fixed pivot preparatory to releasing it for projection along its desired course of movement along the ground. This swivel handle **13** includes a stem **14** that loosely penetrates a central cross-hole **15** at the center of shaft **10**. At one end of stem **14**, there is a fixed retaining head **16**, whereas, a manipulating knob **17** is screwthreaded onto the opposite end of the shaft and secured detachably thereto by suitable means, such as setscrew **18**.

As depicted diagrammatically in FIG. 3, the thrower grasps knob **17** with one hand in operational use of the device and holds it so that the spin, or rotational, axis is horizontal. While retaining the stick in this axial position, shaft **10** is twirled upon the swivel handle **13** as a pivot until the desired speed of rotation has been attained. Thereupon, the thrower releases his grip on the handle and permits the fast-moving tread members **11** to hit the ground. When this occurs, the stick will cartwheel and proceed over the ground like the action of a wheel or hoop. By carefully inclining the swivel axis with respect to the horizontal before twirling and releasing the device, the stick may be caused to cartwheel in a closed course and even may be caused to orbit around the thrower's position. Although FIG. 3 seems to show the stick as rolling smoothly like a hoop, the reactional rebound imparted to each tread member **11** as it hits the ground will cause the center of gravity of the stick to follow a sinuous course above and below a medial horizontal line. Incidentally, in this figure of drawing, one tread member is shown shaded and the other light in tone to make the two successively inverted positions of the stick more readily understandable.

In the embodiment shown in FIG. 4, there are two crossed shafts **10'**—**10'** arranged co-planar at an angle of ninety degrees with a rigid connection to each other. A cross hole **15'** for the swivel handle (not shown) is provided at the point of intersection, or hub, of shafts **10'**—**10'**. With this arrangement, there are four evenly spaced tread members **11'**, so the bouncing action will be reduced and the device will cartwheel with smoother action and less deviation from the horizontal than the embodiment shown in FIGS. 1 and 2.

FIG. 5 discloses a still further embodiment of the invention, in accordance with which shaft **10″** has a tread member **11″** at one end only. The opposite end of shaft **10″** is provided with a comparatively small padded plug **19** to protect the shaft against ingress of dirt whenever the corresponding end of the device lands endwise at the termination of a cartwheeling run. A cross hole **15″** for the swivel handle (not shown) is provided substantially at the midpoint of shaft **10″**.

Surprisingly, it was discovered that this single tread member form of the device will cartwheel quite satisfactorily. The twirling procedure preceding release is the same as in use of either of the previously described embodiments. Thereafter, the action is as represented diagrammatically in FIG. 6. Only the rubber-treaded end of the stick hits the ground during each revolution. The opposite end clears the ground during the intervening period, as shown. It is my theory that centrifugal force acts more strongly in the direction of the heavier, tread end of the stick and thus tends to elevate the latter in the upper reach of each revolution to lift the opposite non-treaded end above the ground.

In FIG. 7, there is shown a modified form of the single-tread device, wherein the effective length of shaft **10*a*** and the consequent location of the center of gravity may be adjusted in successive steps in opposite directions along the axis of the shaft to influence the cartwheeling action. An extension section **10*b*** is telescopically fitted inside main shaft **10*a*** and has a series of equally longitudinally spaced cross holes **20** for interchangeable engagement by the stem **14′** of swivel handle **13′**.

Referring again to the weight and size relationship between the shaft and tread members believed to be essential to successful performance of my cartwheeling device, it may be significant that each tread member is of substantially the same weight as the shaft to which it is affixed in every one of the several embodiments.

It will be understood that it is intended to cover all changes and modifications of the examples of the invention herein chosen for the purpose of illustration which do not constitute departures from the spirit of the invention and scope of the appended claims.

I claim:

1. A cartwheeling stick comprising: a shaft of comparatively light weight; and a reactionary tread member in the form of a comparatively heavy ball of resilient material affixed to at least one end of said shaft, the shaft being adjustable in effective length.

2. A cartwheeling stick as defined in claim 1, wherein the shaft includes a main shaft to which the tread member is affixed and an extension section telescopically engaged with said main shaft, and wherein means is provided to secure the said main shaft and extension section in adjusted positions.

3. A cartwheeling stick as defined in claim 1, wherein the shaft includes a tubular main shaft having a tread member affixed to one end thereof only and an extension section telescopically engaged with said main shaft, and wherein said main shaft is provided medially with a cross hole for a swivel axis and said section is provided with plural axially spaced cross holes for selective registration with the cross hole of the main shaft, and wherein the device also includes a swivel handle having a stem pivotally penetrating the cross hole of the main shaft and a selected cross hole of the extension section to secure the latter in adjusted position, whereby the effective length of the shaft as a whole may be varied.

4. A cartwheeling stick comprising a shaft; a reactionary tread member in the form of a ball of resilient material affixed to at least one end of said shaft; and means to adjust the center of gravity in successive steps in opposite directions axially with respect to the shaft.

5. A cartwheeling stick as defined in claim 4, wherein the center of gravity adjusting means is a tubular section telescopically engaged with the shaft and adjustable axially thereon.

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