No. 861,506. PATENTED JULY 30, 1907.

J. F. DOYLE.

CAPTIVE BALL APPARATUS.

APPLICATION FILED OCT. 12, 1906.

Fig. 1.

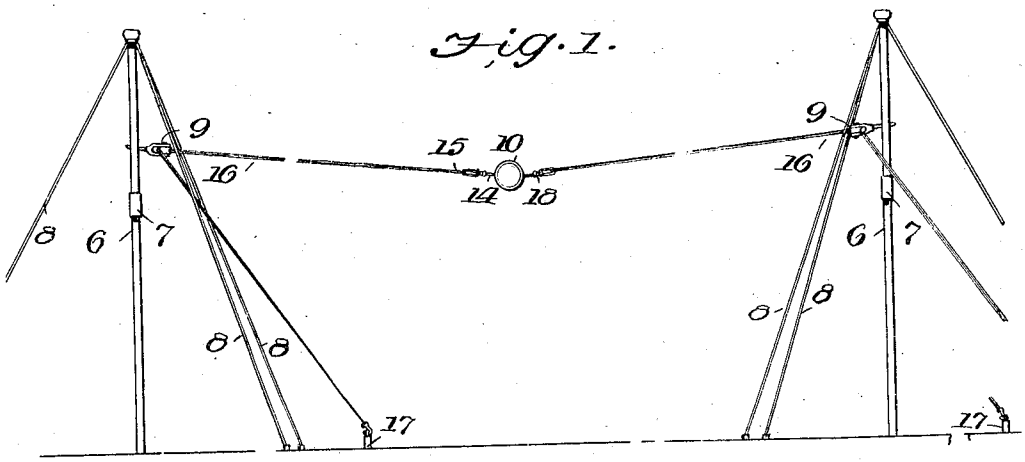


Fig. 2.

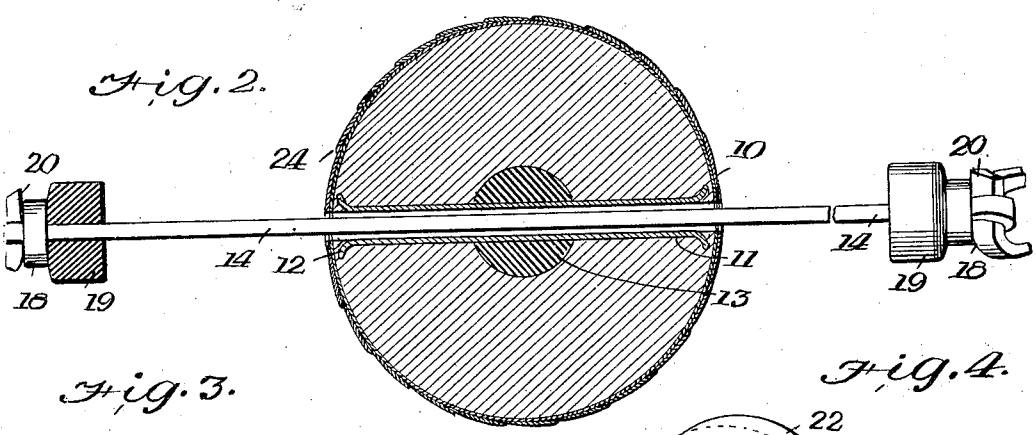


Fig. 3.

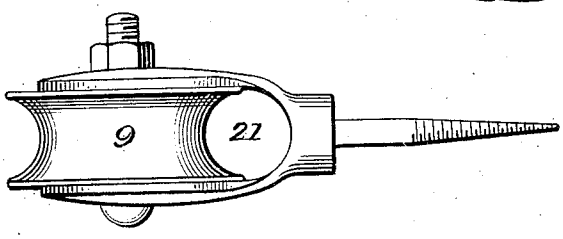


Fig. 4.

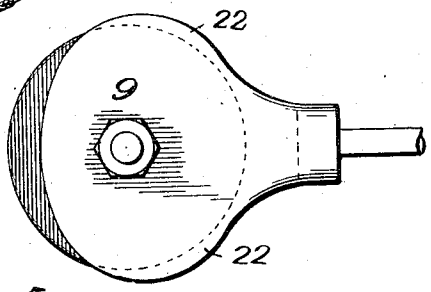
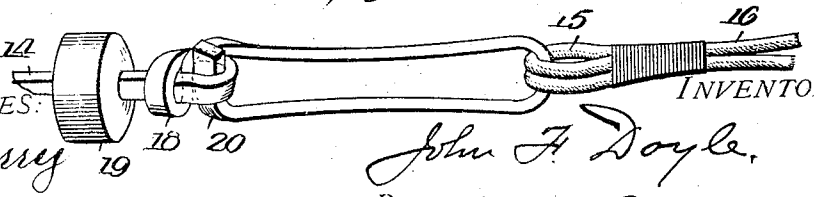


Fig. 5.



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CAPTIVE-BALL APPARATUS.

No. 861,506. Specification of Letters Patent. Patented July 30, 1907.

Application filed October 12, 1906. Serial No. 338,596.

To all whom it may concern:

Be it known that I, JOHN F. DOYLE, a citizen of the United States, residing at Washington, District of Columbia, have invented new and useful Improvements in Captive-Ball Apparatus; of which the following is a specification.

This invention is a captive ball apparatus, designed particularly for practice and instruction in base ball batting, and to provide an apparatus in which the various curves used in ball pitching will be simulated so that by the use of the apparatus the eye and hand of the batsman will become skilled in meeting or hitting such curves in actual ball play. In my Patent No. 831,605, dated September 25, 1906, there is described an apparatus for the same purpose, in which the ball is suspended by a vertical cord and provided with an elastic return cord at the lower end. This apparatus is found to have the objection that if the batsman misses the ball he may strike the suspension cord, with the result that the ball will tend to fly around the bat and wrap the cord around the same, resulting sometimes in breaking the cord.

To overcome this defect the present invention provides a ball supported by horizontal elastic cords, so that if the ball is missed the bat will go either under or over the cords and not become tangled therewith.

The present invention also provides improved means for supporting the ball and attaching the same to the ends of the elastic, and improved means for insuring a proper return of the ball to the batsman in a substantially direct manner, even should the ball be "fouled" or struck high or low.

Other improved features will appear from the following description.

The invention is illustrated in the accompanying drawings, in which

Figure 1 is a front view of the apparatus as set up ready for use. Fig. 2 is a detail in section through the ball. Figs. 3 and 4 are details in edge and top views of a pulley constituting an important feature of the apparatus. Fig. 5 is an enlarged view of one of the loops used for connecting the ball to the elastics, the loop being provided with an especial form of knot.

In Fig. 1, devices are shown whereby the apparatus can be set up in a field or elsewhere, said devices consisting of standards 6 which are preferably made in two sections united by a sleeve coupling 7. These standards are driven in the ground and stayed by guy ropes 8 connected to the top thereof. The purpose of having the standards jointed is to allow them to be separated and packed in small space. These standards support pulleys 9, to be hereinafter more particularly described. The ball, 10, may be an ordinary base ball which, as well known, is built up of several different materials, or it may be of leather, rubber, or other material, but inasmuch as the wear incident to the continuous hitting is great it should be as strongly and stoutly constructed as possible. It is preferably covered with a winding of tire tape, as indicated at 24, which will prevent the ball wearing out and which may be renewed as often as necessary. The ball has a diametrical hole bored therethrough, and in this hole is placed a tube 11 of metal, preferably brass or copper. The tube is somewhat less in length than the diameter of the ball, and after being put in place the ends thereof are expanded into the adjacent body of the ball, as indicated at 12. This holds the tube securely in place, and when a regulation ball is used the tube prevents collapse of the rubber core 13 found at the center of such balls. The tube also prevents wear on the inside of the ball and is essential to the practical use of the device in view of the severe pounding given a ball by players in practice.

The ball is directly supported by a piece of rawhide 14, inserted through the tube. Rawhide is preferable over an ordinary cord or other material because of its wearing qualities. The ends of the piece of rawhide are looped through loops 15 at the ends of elastic return cords 16 which extend oppositely from the ball and through the pulleys 9, and thence are attached to the ground by stakes 17 or otherwise located several feet back of the line between the posts or standards. For indoor use the ends of the elastic cords may be fastened to hooks in the floor, and instead of the posts 6 the pulleys can be attached to the side walls of the room. The cords are preferably doubled cords of small diameter, because I have found by experience that doubled cords of small diameter will give a better return than a single large cord of the same strength, the reason apparently being that the woven covers found on such cords will not yield or lengthen as much on a single large cord as it will on the smaller cords. And I have found by experience that about twenty feet of each of the elastic cords is a good quantity, with the posts placed twenty feet apart, which will give ten feet of cord on each side between the ball and the pulleys and ten feet between the pulleys and the ground. The pulleys may be placed at any desired height, and are screwed in the posts or otherwise fixed so that they will not turn, a rigid or non-swiveling pulley being essential to a proper return of the ball as will be hereinafter explained.

The rawhide thong 14 is looped through the loops 15 at the ends of the elastic cords and secured by means of knots 18, and rubber blocks or washers 19 are placed upon the rawhide against the knots on opposite sides of the ball and act as stops for the ball and prevent wear on the knots. The length of the loops may be varied to change the distance between the washers 19, and to allow more or less play of the ball along the rawhide strip. Preferably, several inches play is given to allow or assist a certain amount of lateral movement or curve

to the ball as it returns to the batsman, as in "out" or "in" curves.

The knot and loop in the rawhide are of special construction, and will be described.

An ordinary or simple knot cannot be used because it tends to pull down smaller and will in time pull through the washers 19. Therefore a square end or face of the knot, adjacent the washer 19, is desirable, and to produce this a simple knot is first tied in the rawhide, and then the free end of the piece is inserted through the bight nearest the outer end of the thong, as indicated at 20. This forms a loop, and the piece 20 is gripped in the knot, the pressure increasing with the strain or pull incident to hitting the ball, so that a very simple fastening is provided for the end of the loop, which would pull out of ordinary fastening means. Furthermore, the bight of the knot nearest the washer 19 backs up square and does not tend to pull small or narrow, and consequently there is little or no tendency to pull the same through the washers or to cause the washers to stick upon the knots. Obviously the length of the loops can be readily varied by loosening the knots and shifting the same one way or the other along the thong.

The pulleys are also of special construction, incident to the practical uselessness of ordinary pulleys for the purpose. It will be readily appreciated that when the ball is struck below or above the center it will be either driven off or fouled up or down, and if knocked in the direction of a "pop" fly, say, the ordinary return will be practically straight down; and the return of a ball hit above the center and knocked to the ground a short distance in advance would ordinarily be up straight or at an acute angle. These actions would constitute a defect, because balls so returned would be practically unhittable while in motion. To avoid this defect or condition the pulley shown in Figs. 3 and 4 is provided. This is characterized by the feature that it has a large or wide opening or throat at 21, several times larger than the diameter of the cords, and the sides or ears of the pulley frame are extended as at 22 in a pronounced curve beyond the edges of the pulley wheel. The pulleys are placed and fixed in the posts or standards with their axes substantially vertical. Now, if a ball be hit below the center so as to drive it up in the direction of a "pop" fly the cords will be strained over the extended edges 22 of the pulley frames, and when said cords contract the effect will be to throw the cords out and cause the ball to describe a curve out and down so that by the time it reaches the batter again it will be traveling at a small angle from the horizontal, instead of great angle as would be the case if a swiveling pulley were used, or one without the extended flanges. The large opening 21 is essential to prevent the cords from catching in consequence of the irregular angles at which they are drawn through the pulley, the intent being to give a free and unobstructed run for the cords.

The ball is capable of rotation or spinning on the rawhide piece 14, and inasmuch as the ball is rarely struck at the exact center a spin in one direction or the other is almost invariably produced, and as the return movement takes place this spin often causes a pronounced "drop", or "raise", dependent upon the direction of rotation. The "in" or "out" curves are produced by the different horizontal angles at which the ball returns, and the different tension on the elastic cords incident thereto, and also by the "slide" of the ball on the rawhide, as heretofore referred to.

In the use of the apparatus, the batsman takes position a step or two behind the line between the posts; or two men may take positions on either side and strike alternately. The ball may be batted away about twenty or twenty-five feet or less, with twenty feet of elastic cord on each side, and at this distance will be found to return so quickly that it will be a matter of some difficulty to keep the ball going, particularly as it describes various curves and "breaks" in its return, in consequence of the condition hereinbefore referred to. The speed of the ball when batted hard approaches that of a skilled pitcher, and the particular apparatus described, especially the construction of the pulleys, insures a return approximately within the bounds or limits with respect to angle within which balls delivered by a skilled pitcher will be received.

The device will be found very useful by professional base ball players and others desirous of cultivating skill in batting; and it will also afford an exercising apparatus of general use in consequence of the rapid movements incident to the use described.

I claim:

1. A captive ball apparatus comprising a ball, pulleys attached to supports on opposite sides of the ball, and elastic cords extending oppositely and substantially horizontally from the ball and through the pulleys and connected to the ground at their outer ends.

2. A captive ball apparatus comprising a ball, a pair of spaced posts, pulleys secured to the posts, and elastic cords extending oppositely from the ball and through the pulleys and connected at their ends to the ground at a distance behind a line between the posts.

3. A captive ball apparatus comprising a ball, a pair of spaced supports, pulleys fixed to the supports at substantially the same height and with their axes substantially vertical, and elastic cords suspending the ball between the supports and extending through the pulleys.

4. A captive ball apparatus, comprising a ball, a pair of spaced supports, pulleys fixed to the supports with their axes substantially vertical, and elastic suspension cords connected to the ball and extending through the pulleys, the pulley frames having ears extending laterally beyond the edge of the wheels to give direction to the run of the cords.

5. A captive ball apparatus, comprising a ball, a pair of spaced supports, pulleys fixed to the supports with their axes substantially perpendicular to the normal line of flight of the ball, and elastic suspension cords connected to the ball and extending through the pulleys, the pulley frames having throats of excessive diameter compared to the diameter of the cords and also having ears extending laterally beyond the edge of the wheels.

6. In a captive ball apparatus, a ball having a diametrical hole, and a metal tube therein having ends expanded into the material of the ball.

7. In a captive ball apparatus, the combination of a ball having a hole therethrough, a piece of tough flexible material extending through the hole and knotted on opposite sides of ball and looped beyond the knots, with its ends inserted and held in the knots, and elastic return cords connected to the loops and extending oppositely from the ball.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN F. DOYLE.

Witnesses:
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GEO. E. TEW.