United States Patent

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[54] **PROJECTILE THROWING DEVICE**
9 Claims, 9 Drawing Figs.

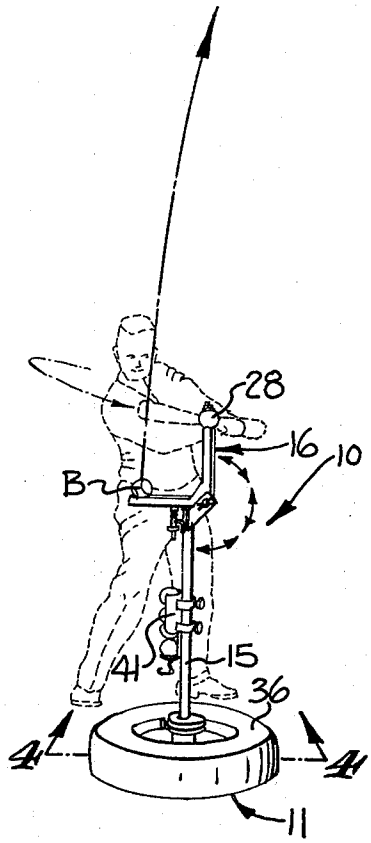
[52] **U.S. Cl.** **273/26,** 124/4, 124/6
[51] **Int. Cl.** **A63b 69/40**
[50] **Field of Search** ..... 273/26, 95(6); 124/1, 4, 6

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ABSTRACT: A device for throwing a projectile such as a baseball wherein the trajectory arc and direction of the projectile may be closely controlled, as in simulation of a fly ball, by controlling the disposition of the arms of an L member adapted to be struck by an instrument swung in a horizontal plane by an operator of the device.



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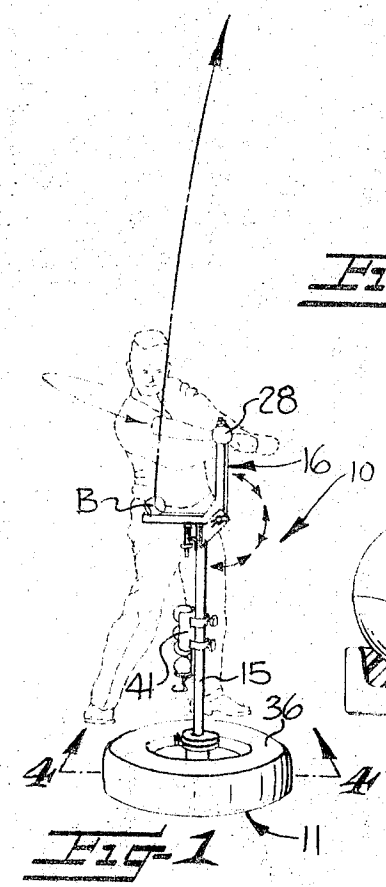


Fig-1

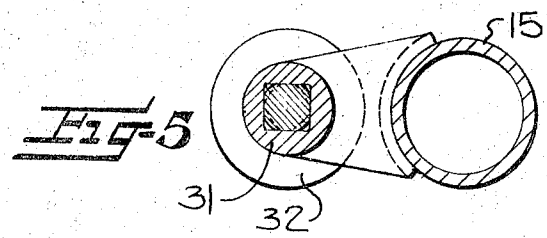


Fig-5

Fig-2

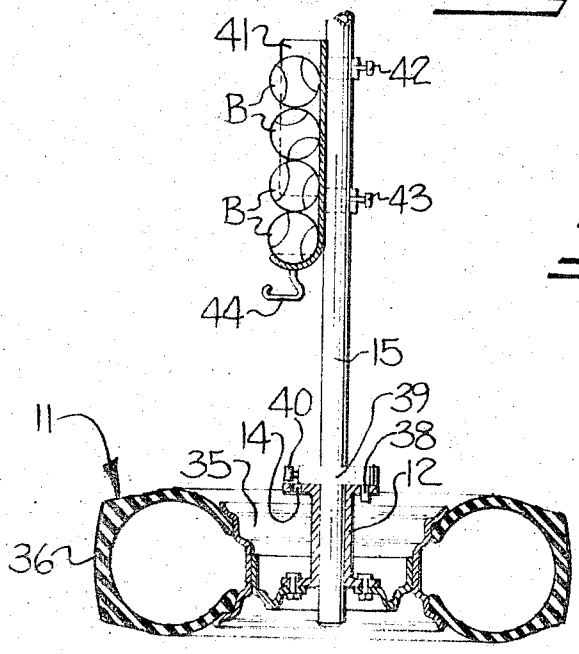


Fig-4

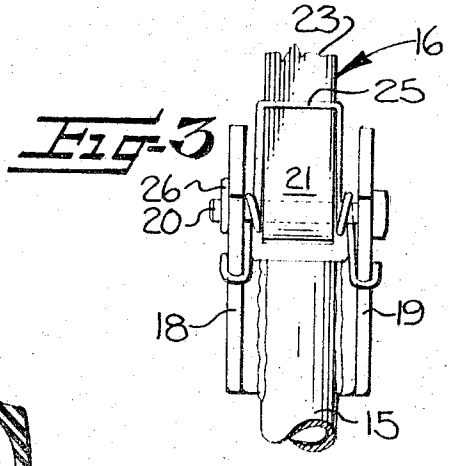


Fig-3

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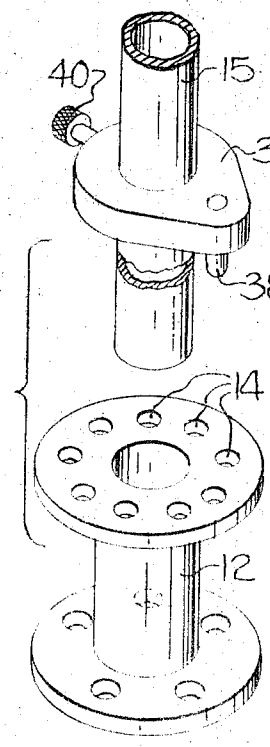


Fig-6

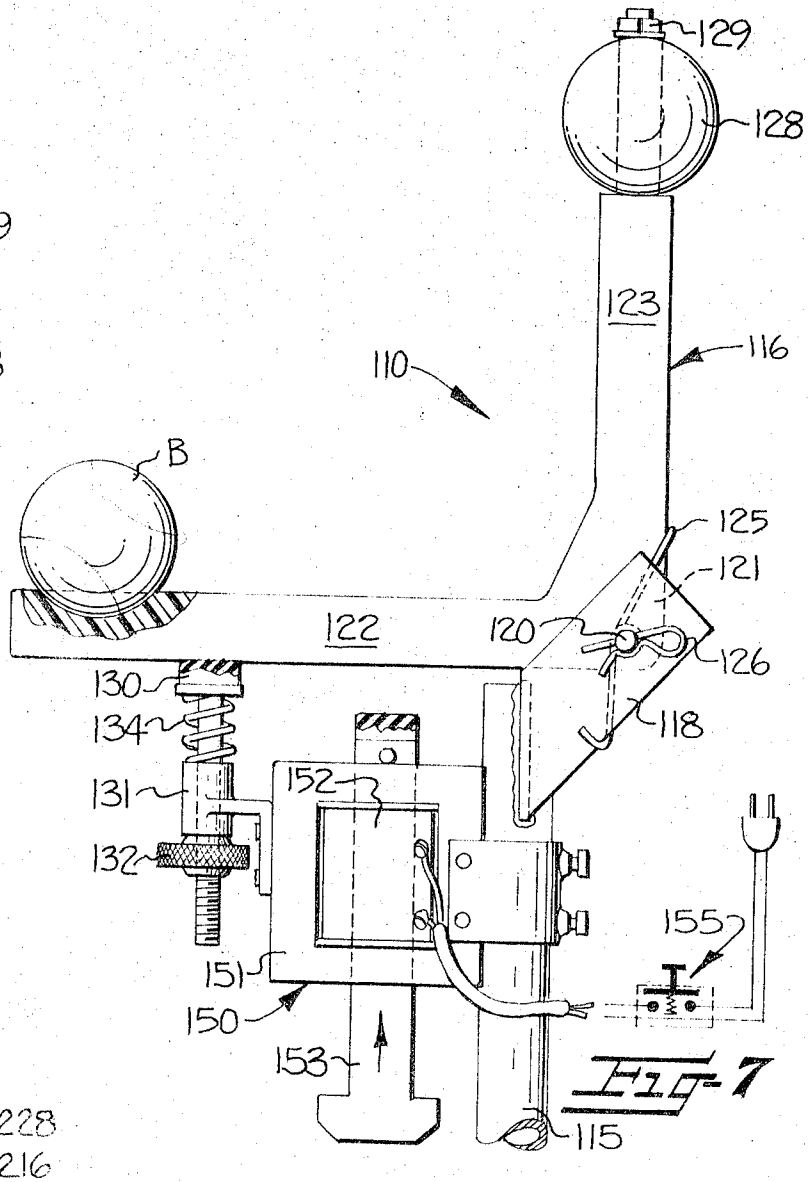


Fig-7

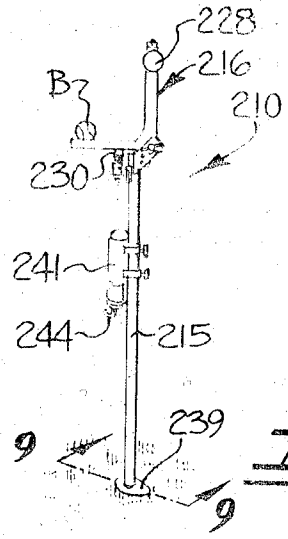


Fig-8

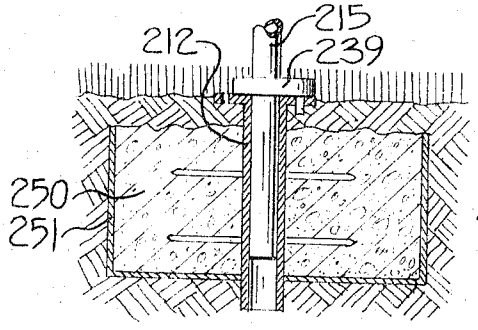


Fig-9

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PROJECTILE THROWING DEVICE

One of the skills required of a baseball player, at any level of competition, is the ability to catch a flyball. Heretofore, this has been one of the more difficult skills for a player to obtain through practice, particularly as the characteristic trajectory arc of a flyball (from which that colloquial name is derived) could only be obtained through the cooperation of a number of players or by the exertion of considerable effort on the part of one player. More specifically, a batter might strike balls in such a manner to hit flyballs into the air, or a person having a strong arm might throw a ball into the air in simulation of a flyball. Neither of these approaches have proven entirely satisfactory, particularly where only one or two players are to be trained.

In particular, a large area is required in order for training of any player to catch flyballs, due to an inherent inaccuracy in the approaches heretofore used to obtaining the characteristic trajectory arc of a flyball. Even when sufficient space is provided to accommodate such an inherent inaccuracy, the practice required for catching flyballs interferes with the practice of any other players on the field. Should all the players practicing on the field become occupied with the catching of flyballs, it will be found that a distribution of a practice among the various players is difficult to achieve as placement of a flyball in a particular target area is dependent entirely upon skill of the batter or thrower.

Specifically in the instance of fly balls struck by a batter, it is the usual practice to obtain the effect of a flyball by using a special bat known as a fungo bat and swinging the bat in a particular manner. As the characteristics of the bat and swing differ from those normally used by a player during a game, most coaches prefer that players not become involved in hitting practice flyballs (known as fungo), and assume for themselves the responsibility of acting as batter during flyball practice. Thus, flyball practice with batted balls requires the personal participation of a coach.

Should the alternative manner of obtaining simulation of a flyball be adopted, the effort required to throw a ball high into the air becomes obvious on one or two attempts and makes clear the fact that such training procedure cannot be followed for any extended period of time.

With the foregoing difficulties in mind, it is an object of my invention to provide a device which will permit a single person to throw a projectile such as a baseball into the air in such a manner as to simulate the flight path of a flyball hit in a game, while at the same time providing quite accurate control over the trajectory arc on which and the target zone into which the projectile is thrown. In accomplishing this object, the device of my invention not only does not require the personal participation of a fungo hitter but instead provides valuable batting practice for the operator, and permits obtaining a more satisfactory training procedure in acquiring skill in catching flyballs with a reduced expenditure of energy as compared with those procedures previously followed.

A more specific object of my invention is to provide a device for throwing projectiles wherein an ell member is supported with one arm thereof disposed in a substantially vertical position for exposure to impact by a striking instrument swung by an operator in a horizontal plane, so that impact with the ell member causes the member to pivot in a predetermined manner and throw into the air a projectile supported on the other arm of the member. In realizing this object of my invention, my projectile throwing device preferably includes a base, a vertically disposed standard supported by the base and in turn supporting the ell member, and means mounting the ell member on the standard and controllably determining the normal disposition of the ell member relative to the standard, for thereby assuring that a projectile is thrown in the desired manner.

Some of the objects and advantages of the invention having been stated, others will appear as the description proceeds, when taken in connection with the accompanying drawings, in which--

FIG. 1 is a perspective view of the device of my invention, as arranged for readily portable use;

FIG. 2 is an enlarged elevation view of a portion of the apparatus of FIG. 1, illustrating in detail the ell member of the projectile throwing device;

FIG. 3 is an end elevation view of a portion of the device of my invention, taken as indicated by the arrows 3–3 in FIG. 2;

FIG. 4 is an enlarged elevation, in partial section, of the lower portion of the device of FIG. 1, taken generally as shown by the line 4–4 in that FIG.;

FIG. 5 is a plan view, in section, through a portion of the device of FIG. 1, taken generally along the line 5–5 in FIG. 2;

FIG. 6 is an enlarged exploded perspective view, of a portion of the base of the apparatus of FIG. 1;

FIG. 7 is a view similar to FIG. 2, of a modified form of the device of my invention;

FIG. 8 is a view similar to FIG. 1, showing the device of my invention as installed in a permanent use location; and

FIG. 9 is a view similar to FIG. 4 of the device of FIG. 8, taken as indicated by the line 9–9 in FIG. 8.

Referring now more particularly to the drawings, my projectile throwing device is there shown in two forms, the first of which is intended for readily portable use and the second of which is intended for permanent installation at a location of use. The description which follows will proceed first with reference to the form of device which is free standing upon the surface of the ground and readily portable FIGS. 1—6). In accordance with the present invention, a projectile throwing device generally indicated at 10 includes a base 11, a vertically disposed standard 15 supported by the base 11, and a throwing member 16 having a pivot location portion and first and second arms extending outwardly from that portion. Preferably, for reasons which will become clear in the discussion which follows, the throwing member 16 is of L-shape configuration and accordingly will be referred to as an ell member.

In order to accommodate the motion necessary to throw a projectile, as pointed out more fully hereinafter, the ell member 16 is mounted on the standard 15 adjacent the upper extremity thereof for pivotal movement about a horizontally extending axis through the corner portion. More specifically, a pair of bearing plates 18 and 19 are secured on opposite sides of the standard 15, as by welding when ferrous metal materials are chosen for the plates and the standard, and a pivot pin 20 is positioned extending through aligned bore holes formed in the two bearing plates 18 and 19 and in the corner portion 21 of the ell member 16. As so mounted, the ell member 16 is substantially freely movable between a normal position wherein a first arm 22 of the ell member 16 is disposed in a substantially horizontal position for receiving and supporting a projectile to be thrown (such as a baseball B) and a second arm 23 of the ell member 16 is disposed in a substantially vertical position for exposure to impact by a striking instrument swung by an operator in a horizontal plane and a projectile thrown position wherein the first arm 22 has been moved violently upwardly toward and beyond a vertically disposed position, to throw a projectile. Movement from the normal position to the projectile-thrown position is accomplished, as hereinafter described, by the delivery of an impact blow against the second arm 23 of the ell member 16.

In order to assure that the ell member 16 is normally disposed in the desired normal position (as shown in FIG. 2), the means mounting the ell member 16 on the standard 15 includes a return spring 25 operatively connected to the ell member 16 for biasing the same to the normal position wherein the first arm 22 is disposed horizontally and the second arm 23 is disposed vertically and directed upwardly. Preferably, the return spring 25 is a wound clothespin type spring, having a generally U-shaped loop portion engaging the forward side of the second arm 23 of the ell member 16, having bights passing about the pivot pin 20, and having hook leg portions engaging the bearing plates 18 and 19 FIGS. 2 and 3). Preferably, the biasing force exerted by the return spring 25 is reduced to substantially zero force when the ell member 16 is disposed in the normal position (as in FIG. 2).

For assuring that the elements of my projectile throwing device remain assembled during use, while accommodating freedom of disassembly if such is desired, I prefer that the pivot pin **20** be retained in position penetrating the return spring **25**, bearing plates **18** and **19** and ell member **16** by a hairpin clip **26**. Such a clip will permit ready removal of the pivot pin **20** and disassembly of the elements of the portable device **10** if so desired.

In order to provide batting practice for a player using the device **10**, I prefer that the second arm **23** include impact receiving means secured thereto which simulates the appearance of a baseball. More particularly, an actual or simulated baseball **28** may be bored through and secured in place on a reduced diameter extremity portion of the second arm **23** by a suitable fastener means such as a nut **29**. An operator (indicated in phantom lines in FIG. **1**) may then swing a baseball bat or similar instrument at the impact receiving means **28** in the same manner as at a pitched ball, and thereby throw a baseball B supported on the first arm **22** into the air as a fly ball (as along a trajectory as indicated in FIG. **1**). The swing plane thus used by an operator of my device is to be contrasted with that used by a fungo batter, and contributes an important secondary usefulness to my device, by providing satisfactory practice for both batters and fielders.

In order to assure that the trajectory path of a flyball thrown by the device **10** of the present invention is controlled in the desired manner, the device further includes means for controllably determining the normal disposition of the ell member **16** relative to the standard **15** and for governing thereby the trajectory arc of the projectile initially placed on the first arm **22** and thrown into the air as the second arm **23** is struck by a striking instrument. More specifically, a bumper **30** is provided for engaging the first arm **22** and supporting the first arm in orientation determined by the elevation of the bumper relative to the horizontal pivotal axis defined by the pivot pin **20**. The bumper **30** is mounted from the standard **15** for adjustment of elevation relative to the pivot pin **20**, and a resilient means is provided for normally biasing the bumper toward an elevated position while permitting depression thereof to cushion return movement of the ell member **16** to the normal position, under the biasing force of the return spring **25**.

More particularly, a bracket **31** is secured to the standard **15** by suitable means, as by welding, and is provided with a square or rectangular bore therethrough. The bumper **30** includes an elongate portion which is of corresponding square or rectangular cross-sectional configuration throughout a major portion of its length. Adjacent the lower extremity of the elongate portion of the bumper **30** is provided a threaded portion, engaged by an adjusting hand nut **32**. A spring member **34** is interposed between the enlarged head of the bumper **30** and the upper surface of the bracket **31**, to provide a resilient force normally biasing the bumper **30** upwardly. By adjustment of the position of the hand nut **32** along the length of the elongate portion of the bumper **30**, the normal elevation of the bumper **30** relative to the pivot pin **20** may be determined.

I have found that, for a particular impact force exerted upon the second arm **23** of the ell member **16**, raising the bumper **30** relative to the pivot pin **20** will result in the thrown ball following a trajectory arc which returns the ball to earth farther away from the location of the device **10**. Lowering the elevation of the bumper **30** relative to the pivot pin **20** will result in the trajectory arc of the ball being steeper, with the ball coming to ground closer to the location of the device of the present invention. By maintaining the adjustment of the bumper **30** the same and applying a consistent impact force to the second arm **23**, projectiles may be placed into a particular target area with consistent accuracy.

In order to assure that the impact receiving means **28** of the ell member **16** is properly positioned to accommodate the height of the operator, and additionally to provide the operator with a choice to target zones extending in a number of directions radially outwardly from the location of the device **10** of this invention, the base **11** and standard **15** are joined together in such a manner that the standard is rotatable relative to the base about a vertically extending axis and is vertically adjustable relative to the base. In the portable apparatus to which the present description is directed, portability as well as the adjustability features are obtained by the use of a base adapter **12**, configured to receive the standard **15** therewithin and to be secured to an automobile wheel **35**. Preferably, when the device **10** is in use, the wheel **35** has an automobile tire **36** mounted thereon, to provide a large base area and an adequate weight to maintain the device against shifting movement. The base adapter **12** is configured somewhat as a spool member (FIG. **6**) having a lower disc portion adapted to be bolted to the center disc of the wheel **35** and an upper disc portion having a predetermined number of bores **14** spaced circumferentially thereabout. The openings **14** formed in the upper disc of the base adapter **12** are sized to receive therewithin a locking pin **38**, carried by a collar **39** penetrated by the standard **15** and secured thereto by a locking screw **40**. By loosening the locking screw **40** and moving the collar **39** up and down the standard **15**, the necessary height adjustment for desired positioning of the impact receiving means **28** may be achieved. Thereafter, by lifting the standard **15** relative to the base **11** and rotating the standard about a vertically extending axis until the locking pin **38** enters into a selected one of the bores **14**, the particular direction in which the projectile is to be thrown may be predetermined.

In order to provide for the possibility of rapid repeat throwing of projectiles, I contemplate that the device **10** of the present invention may include a projectile rack means mounted on the standard. More particularly, a generally tubular magazine device **41** adapted to receive and retain a plurality of projectiles such as baseballs is preferably secured on the standard **15** by a pair of thumbscrews **42** and **43** FIGS. **1** and **4**). By adjusting the ball magazine **41** to an appropriate height, an operator using the device of the present invention to train ball players may easily remove balls from the magazine and throw a number of fly balls in quick succession, to occupy a number of players substantially simultaneously. Further, should it be desired that a single player obtain training use of the device of the present invention both as to batting practice and as to the catching of flyballs, a glove may be hung from a hook **44**, at the lower extremity of the ball magazine **41**, during the time that the projectile is thrown into the air. Thereafter, the operator may drop the bat or other instrument with which a blow is struck to throw a projectile into the air, grab the glove from the hook **44**, and run to the target area to catch the flyball.

While discussed above with particular reference to a portable or semiportable apparatus wherein the delivery of the impact blow is achieved by swinging a bat or other instrument in a horizontal plane, my invention contemplates that the device may be adapted for remote actuation and for permanent installation at a point of use. As described hereinafter with regard to these additional features, portions of the modified forms of the device corresponding with portions identified in the discussion above are identified by similar reference characters in the one hundred order series as to the remotely actuated device and in the two hundred order series as to the permanently installed device.

With reference to a device **110** (FIG. **7**) wherein the delivery of an impact to the ell member **116** may be controlled remotely, a suitable remotely actuable motive force means is mounted on the standard **115** positioned for operative engagement with the ell member **116** upon actuation thereof. In the particular embodiment shown, the remotely actuable motive force means is an impact delivering means in the form of an electrical solenoid **150**, having a stationary magnetic structure frame **151**, a winding **152** secured in that frame and a movable core **153** which may be driven upwardly from its normal rest position upon energization of the core **152** (as indicated by the arrow in FIG. **7**). Preferably, the solenoid device **150** is

positioned beneath the first arm **122** of the ell member **116** and has a padded upper extremity for engaging the lower surface of the first arm **122**. By connection of the winding **152** of the solenoid device **150** to an appropriate source of electrical energy, through a normally open switch **155**, an operator may throw a projectile such as a baseball B into the air by closing the electrical switch to energize the coil and drive the core **153** into engagement with the ell member **116**. It is to be understood that other remotely actuable power means may be found appropriate for substitution for the electrical solenoid **150**, including such power means as a motor driving the ell member through a single revolution clutch and a gear train or a fluid pressure device such as a cylinder.

The principal distinction between the permanently installed device **210** of FIGS. **8** and **9** in the portable device **10** of FIGS. **1** through **6** lies in the sinking of a base member **212** beneath the surface of the ground. Preferably, the base member **212** is open at the lower end thereof to permit drainage and to accommodate vertical movement of the standard **215** for purposes of height adjustment and is installed at a sufficient depth to accommodate normal turf growth. The base member **212** is secured in position by being cast into place within a body **250** of concrete or cement which, for purposes of convenience and installing the device **210** of the present invention, is contained within a bucket or tub **251**. In order to accommodate the penetration of the base member **212** into the ground, the bucket **251** is formed with a central opening to be penetrated by the base member **212**. In similarity to the base adapter **12** discussed above, provisions are made in the base member **212** for accommodating aiming of the thrown projectiles in a desired direction. It is contemplated that the materials used in constructing the projectile throwing device of the present invention may be chosen from any known materials, with emphasis to be placed on considerations of durability, ease of manufacture, and cost. For purposes of durability, it is preferred that the ell member **16** be formed of a material highly resistent to impact loads, such as certain high-density plastics. Where a high-density plastic is chosen, the ell member **16** may be either injection molded or fabricated from sheet stock, as may be appropriate for the particular plastic material chosen. For purposes of ease of fabrication, it is preferred that the standard **15**, portions of the supporting base, the bearing plates **18** and **19** and the bracket **31** for the bumper **30** be made of ferrous metal materials, painted to provide protection against the elements. However, it is recognized that the material choices for these elements of the device of my invention may be reversed, with the ell member **16** being formed from metal and the standard being molded from plastic material so that the bracket **31** and bearing plates **18** and **19** are integral and unitary with the standard **15**.

In addition to the wide choice of materials which are available for use in producing the projectile throwing device of my invention, I also can foresee a large number of potential uses for my projectile throwing device in addition to training of baseball players. In particular, the ell member **16** is readily adaptable to throwing any type of athletic game projectile or ball where training procedures for other athletic pursuits are desired. Further, the projectiles thrown by my device are not necessarily limited to balls used in sports, but may range to any type of thrown projectile such as a target for shotgun games or weapons such as hand grenades.

In the drawings and specification, there have been set forth preferred embodiments of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A baseball batting and catching practice device comprising:

a base;

a vertically disposed standard supported by said base;

an ell member having a corner portion, a first arm for receiving and supporting a projectile to be thrown, and a second arm for receiving an impact from a striking instrument swung by an operator and extending at substantially a right angle to said first arm;

means on said second arm presenting an at least part spherical surface simulating the appearance of a baseball;

means for mounting said ell member on said standard for pivotal movement relative thereto about a horizontal axis extending through said corner portion and with said first arm of said ell member normally disposed in a substantially horizontal position; and

means for controllably determining the normal disposition of said ell member relative to said standard and for thereby governing the trajectory arc of a projectile placed on said first arm upon said second arm being struck by a striking instrument to throw the projectile into the air.

2. A device according to claim **1** wherein said base is free standing upon the surface of the ground, said standard is rotatable relative to said base about a vertically extending axis, and further comprising means for locking said base and said standard together so that a projectile thrown by said device is thrown into a predetermined target zone.

3. A device according to claim **1** wherein said base is permanently installed into the ground, said standard is rotatable relative to said base about a vertically extending axis, and further comprising means for locking said base and said standard together so that a projectile thrown by said device is thrown into a predetermined target zone.

4. A device according to claim **1** wherein said standard is vertically adjustable for positioning said impact receiving means in a predetermined swing plane appropriate to the height of an operator.

5. A device according to claim **1** wherein said mounting means for said ell member mounts said member with said second arm normally directed upwardly and comprises a return spring operatively connected to said ell member for biasing the same to a normal position wherein said first arm is disposed horizontally and said second arm is disposed vertically.

6. A device according to claim **1** wherein said control means for determining the normal position of said ell member comprises a bumper for engaging said first arm and supporting said first arm in an orientation determined by the elevation of said bumper relative to said horizontal axis about which said ell member pivots, means mounting said bumper from said standard for adjustment of elevation relative to said horizontal axis, and resilient means for normally biasing said bumper toward an elevated position while permitting depression thereof to cushion movement of said ell member upon return thereof to said normal position.

7. A device according to claim **1** further comprising a remotely actuable motive force means for operative engagement with said ell member and for throwing into the air a projectile placed on said first arm upon actuation of said motive force means.

8. A baseball batting and catching practice device comprising:

a base;

a standard supported by said base in an upright vertical disposition and for rotation about a vertical axis;

means for securing said base and said standard together with said standard in a predetermined rotational disposition relative to said base;

a projectile throwing member mounted on said standard for pivotal movement relative thereto about a horizontal axis and adapted to receive and support a projectile to be thrown and to throw the projectile into the air upon receiving an impact, said member having a projectile receiving seat adjacent one end thereof and an at least part spherical surface adjacent the other end thereof simulating a baseball;

means for controllably determining the normal position of said throwing member relative to said standard and about said horizontal axis and for thereby governing the trajec-

tory arc of a projectile placed thereon and thrown into the air upon said throwing member being pivoted about said axis; and

said means securing said base and standard together and said means for determining the normal position of said throwing member functioning together to permit placement of a thrown projectile into a predetermined target area in a predetermined zone radially outwardly from said

standard and at a predetermined distance therefrom.

9, A projectile throwing device according to claim 8 and further comprising a remotely actuable motive force means mounted on said standard for operative engagement with said throwing member and for pivoting said throwing member about said axis and thus throwing into the air a projectile placed thereon upon actuation of said motive force means.