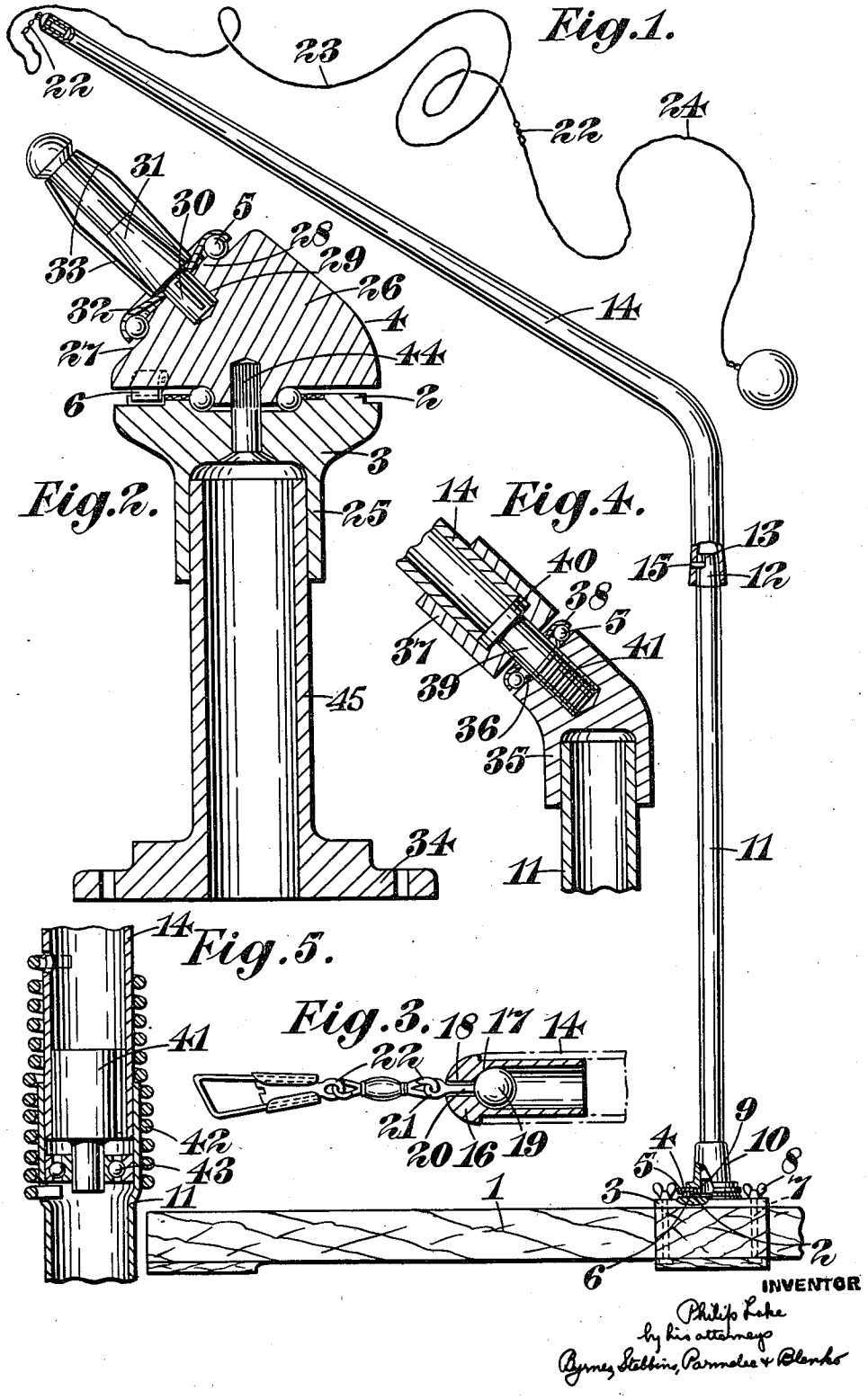
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APPARATUS FOR PRACTICING BALL GAMES

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APPARATUS FOR PRACTICING BALL GAMES

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This invention is for improvements in or relating to apparatus for practicing ball games played with a racquet or bat, and has for an object to provide an arrangement in which the ball is projected back towards the player from unexpected directions after successively hit with the racquet or bat.

According to this invention, apparatus for practicing a ball game comprises a supporting stand, an arm mounted on said stand to rotate about an axis transverse to the length of said arm, a ratchet mechanism adapted to permit the arm to rotate continuously in one direction of rotation only, a cord attached at one end to said arm and means for attaching a ball to the other end of said cord. The term "cord" is intended to include any flexible, tethering means, such as whipcord, gut, flexible wire or elastic cord formed from rubber and the tethering means may partly comprise an inextensible cord and partly an elastic cord.

With such an arrangement, the direction in which the ball is returned to the player is indeterminate and thus the player may experience an infinite variety of strokes. For example, if the ball is struck so as to effect rotation of the arm, the direction of the arm will be determined by whether or not the pull of the ball on its return flight still effects rotation of the arm. If the pull on the return of the ball is in a direction against rotation of the arm, the direction of the ball would be determined by the extent of the initial rotation of the arm on the outward flight of the ball. Similarly, if the ball is struck in a direction against rotation of the arm, the return flight of the ball will cause the arm to rotate and thus the ball will return in a different direction from that in which it is struck.

Another feature of the invention consists in that the arm is so constructed as to be flexibly resilient transversely to its length. It is found with this arrangement that when the ball is hit in a direction such as would not normally rotate the arm, towards the end of the outward flight of the ball a flick is given to the arm by reason of its springiness, which tends to rotate the arm, and thus on the return journey of the ball it approaches the player from an unexpected direction.

Other features of the invention will be apparent from the following description which relates to a number of embodiments of the invention and provides an apparatus for practicing tennis, reference being made to the accompanying drawing, in which—

Figure 1 is an elevation of a preferred form of the apparatus, certain parts thereof being shown in section;

Figure 2 is a section of an alternative arrangement for mounting the arm on the standard, in which arrangement the standard itself does not rotate;

Figure 3 shows a device which may be employed for attaching the cord to the free end of the arm;

Figure 4 shows a section of an alternative arrangement to that shown in Figure 1 for attaching the arm to the standard, whereby rotation of the arm about its longitudinal axis is permitted;

Figure 5 is an alternative arrangement to that shown in Figure 4 and provides for limited rotational movement between the arm and the standard.

Like reference numerals indicate like parts throughout the drawing.

The apparatus shown in Figure 1 comprises a heavy cruciform base member 1 to the centre of which is secured a free-wheel bearing 2. The free-wheel is of a known type comprising two races 3 and 4 separated by balls 5 and between which is mounted a ratchet mechanism 6. The race 3 is secured to the base by bolts 7 and thumb-screws 8. The other race 4 is internally threaded at 9 to receive an externally threaded pocket 10. A standard 11 is detachably mounted in said pocket and comprises a length of steel tubing formed from eighteen-gauge metal and which is three-quarters of an inch in external diameter. The length of the standard is about twenty-six inches and at its upper end it tapers to a smaller diameter and the tapered part 12 is provided with bayonet grooves 13.

An arm 14 is attached to the standard and is formed from eighteen-gauge tubing which tapers from three-quarters of an inch at one end to half an inch at its free end. The arm is bent near its larger end so that the remaining stretch is at an angle of about 60° to the vertical. The length of the inclined part of the arm is about twenty-six inches. The large end of the arm is so shaped internally as to fit around the tapered end of the standard and is provided with cross-pins 15 for engaging the aforesaid bayonet groove 13.

A swivel joint is secured to the free end of the aforesaid arm and comprises, as best seen in Figure 3, a tubular element 16 which is forced into the end of the arm so as to be a tight fit and is provided at its outer end with a hemispherical socket 17. The socket is provided with a central

hole 18 and located within the socket is a ball 19 through which extends a split pin 20. The eye 21 of the split pin extends out through the aforesaid hole. Attached to the said eye is a swivel clasp-hook 22 to which a length of cord 23 is secured. The cord is formed partly of elastic material 24 and partly of a flexible but inextensible material 23 which is attached to the clasp-hook.

In the construction shown in Figure 2, the free-wheel bearing 2 is mounted on top of a fixed standard 45; the lower ball race 3 has formed integral with it a socket 25 which engages the top of the standard 45. The upper ball race 4 is formed on a block 26 having a face 27 inclined to the vertical. Said inclined face is formed with another ball race 28 and is also provided with a central bore 29 for receiving a pin 30. Mounted on the pin is a sleeve 31 having secured at its lower end a ball race 32 which co-operates with the ball race 28. Secured to said sleeve are spring strips 33. A tubular arm, not shown, is arranged to encircle the aforesaid sleeve and is held in position by said spring strips. The lower end of the standard is provided with a flange 34 which may be rigidly attached to the base member.

In place of the bayonet joint shown in Figure 1, the upper end of the standard 11 may be provided with a socket 35 having a face 36 inclined to the vertical, which face comprises a ball race. Another socket 37 is provided for engaging the end of the arm 14, the end face 38 of which socket forms the other ball race. A stud 39 extends through a hole in the bottom of a socket. A head 40 on the stud engages a shoulder in the socket 37, while the screw-threaded end 41 engages a threaded bore in said socket 35.

In place of the double socket arrangement as last described above in which two sockets are rotatably mounted one upon the other, the two sockets might be formed integral.

In Figure 5 is shown an alternative method to that shown in Figure 1 of fixing the arm 14 to the standard 11 in which the upper end of the standard is flared to accommodate a ball race 43, into the inner race of which fits a plug or spindle 41 which is rigidly attached to the arm 14. A spring 42 encircles the arm and standard in the region of the joint and is fixed at the ends to the aforesaid parts. With this arrangement, on the outward flight of the ball the tension in the cord will cause the spring to be wound up to a certain degree owing to the inertia resistance of the standard and the energy stored up in the spring will be given back at the commencement of the return flight of the ball so as to give the aforementioned flick to the arm which under certain circumstances will carry it beyond a dead-centre position.

I claim:—

1. An apparatus for practicing a ball game comprising a supporting stand, an arm mounted on said stand to rotate about an upright axis which is transverse to the length of the arm, means for constraining the arm to rotate in one direction of rotation only, a cord attached at one end to said arm and means for attaching a ball to the other end of said cord.

2. An apparatus for practicing a ball game comprising a supporting stand, an arm contracted so as to be flexibly resilient transversely to its length, which arm is mounted on said stand to rotate about an upright axis transverse to the length of the arm, means for constraining the arm to rotate in one direction of rotation only, a cord attached to one end of said arm and means for attaching a ball to the other end of said cord.

3. An apparatus for practicing a ball game comprising a supporting stand, an arm mounted on said stand so as to be inclined to the vertical at an angle between 30° and 60° and so as to be rotatable as a whole about an upright axis, means for constraining the arm to rotate in one direction of rotation only, a core attached to the upper end of said arm and means for attaching a ball to the other end of said cord.

4. An apparatus for practicing a ball game, comprising a supporting stand, an arm mounted on said stand to rotate about an upright axis transverse to the length of said arm, a ratchet mechanism adapted to permit the arm to rotate continuously in one direction of rotation only, a cord attached at one end to said arm and means for attaching a ball to the other end of said cord.

5. An apparatus for practicing a ball game comprising a supporting stand, an arm mounted on said stand to rotate about an upright axis transverse to the length of the arm, a ratchet mechanism adapted to permit the arm to rotate continuously in one direction of rotation only, a swivel joint attached to a free end of said arm, a cord attached to said swivel joint, and means for attaching a ball to the other end of said cord.

6. An apparatus for practicing a ball game comprising a supporting stand, an arm mounted on said stand to rotate about an upright axis transverse to the length of the arm, means adapted to permit the arm to rotate continuously in one direction of rotation only, a cord attached to the free end of said arm and comprising a length of elastic material and a length of inelastic material, and means for attaching a ball to the other end of the cord.

7. An apparatus for practicing a ball game, comprising a supporting stand, an arm mounted on said stand to rotate about an upright axis which is transverse to the length of the arm, means to permit the arm to rotate in one direction only, flexible means attached at one end to said arm, and means for attaching a ball to the other end of said flexible means.

8. An apparatus for practicing a ball game comprising a supporting stand, an arm mounted on said stand so as to rotate as a whole about an upright axis transverse to the length thereof, and also to rotate about its own axis, a ratchet mechanism adapted to permit the arm as a whole to rotate continuously in one direction of rotation only about said transverse axis, a cord attached at one end to said arm and means for attaching a ball to the other end of said cord.

9. An apparatus for practicing a ball game comprising a base, an upright standard, a free wheel bearing fixed to said base and carrying said standard and embodying a ratchet mechanism adapted to permit said standard to rotate continuously about an upright axis in one direction of rotation only, an arm fixed to the upper end of said standard and extending transversely thereto, a cord attached to the free end of said arm, and means for attaching a ball to the other end of said cord.

10. An apparatus for practicing a ball game comprising a base, an upright standard fixed to said base, an arm extending transversely to said standard, a free wheel bearing mounted on the upper end of said upright standard and carrying said arm, embodying a ratchet mechanism adapted to permit said arm to rotate continuously about an upright axis in one direction of

rotation only, a cord secured to the free end of said arm, and means for attaching a ball to the other end of said cord.

11. An apparatus for practicing a ball game comprising a base, an upright standard, a free wheel bearing fixed to said base and carrying said standard and embodying a ratchet mechanism adapted to permit said standard to rotate continuously about an upright axis in one direction of rotation only, an arm detachably secured to the upper end of said standard and extending transversely thereto, a cord attached to the free end of said arm, and means for attaching a ball to the other end of said cord.

12. An apparatus for practicing a ball game comprising a base, an upright standard, a free wheel bearing mounted on said base and carrying said standard, embodying a ratchet mechanism adapted to permit said standard to rotate continuously about an upright axis in one direction of rotation only, a bearing mounted on the upper end of said standard, a crank arm mounted in said bearing so that a part of the arm extends transversely to the axis of said standard, and resilient means to permit a limited relative rotation between the arm and the standard which rotation is additional to that allowed by said freewheel bearing, a cord attached to the free end of said arm, and means for securing a ball to the other end of the cord.

13. An apparatus for practicing a ball game comprising a base, an upright tubular standard, a free wheel bearing secured to said base in which said standard is detachably mounted, embodying a ratchet mechanism adapted to permit said standard to rotate continuously about an upright axis in one direction of rotation only, a cranked tubular arm detachably secured to said standard and arranged so that a part of the arm extends transversely to said standard, a cord attached to the free end of said tubular arm, and means for attaching a ball to the other end of said cord.

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