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MIRROR SYSTEM FOR GOLF ANALYSIS

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2 Sheets-Sheet 1

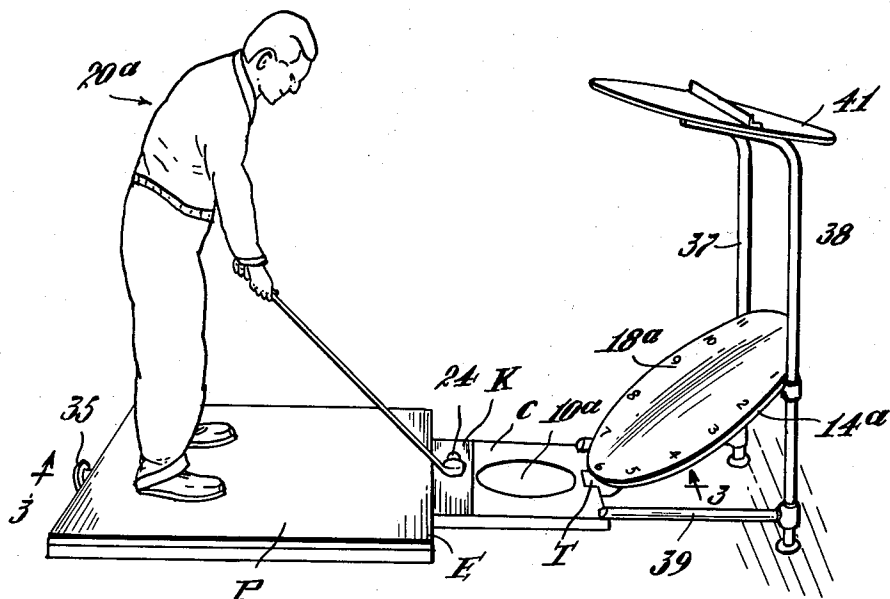


Fig. 1

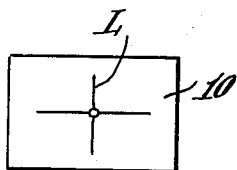


Fig. 6

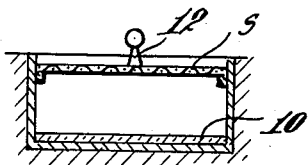


Fig. 7

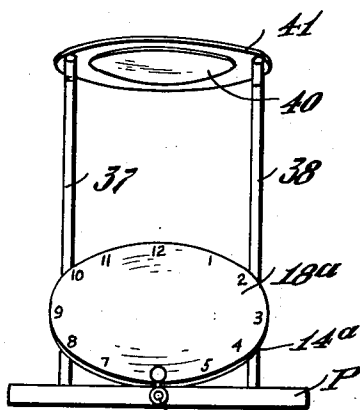


Fig. 2

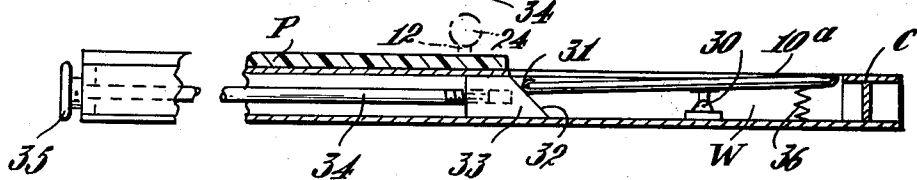


Fig. 3

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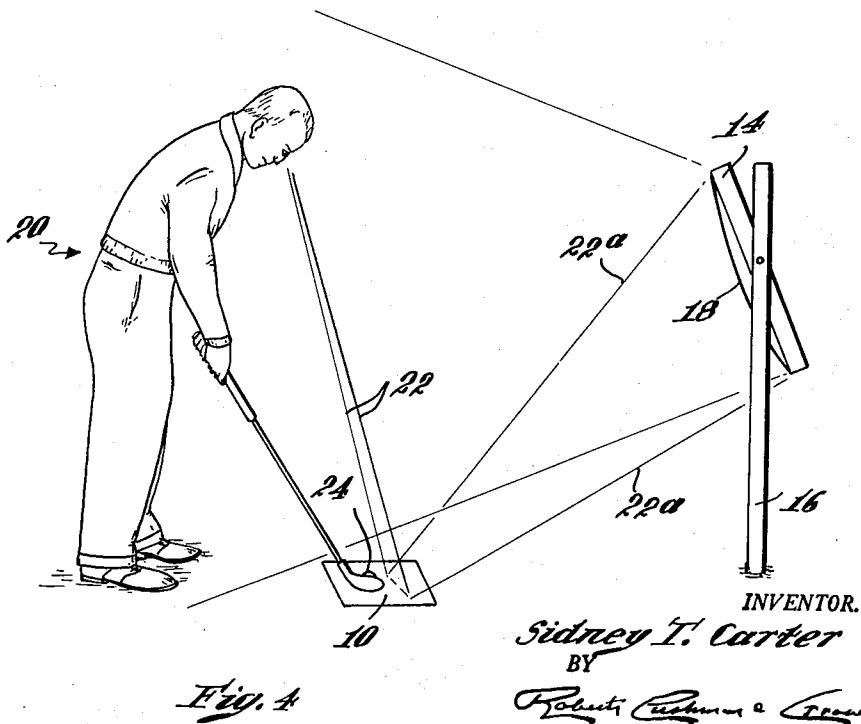
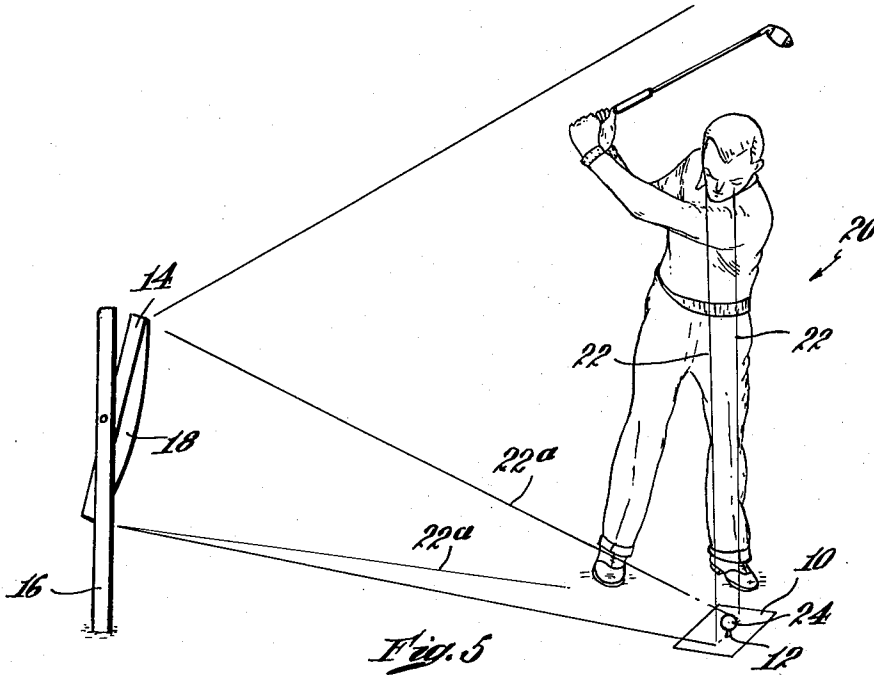
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2 Sheets-Sheet 2



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MIRROR SYSTEM FOR GOLF ANALYSIS

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6 Claims. (Cl. 273-35)

This invention relates to the game of golf and relates more particularly to practice apparatus whereby a golfer can easily observe his position of stance and his movements as he hits the ball.

A person who plays golf usually tries to improve his game by instruction or by continued practice, or both. Much of this improvement is achieved by correcting his swing, grip, stance, etc. Most of the motions which an instructor tries to correct cannot be seen by the golfer himself who must try to visualize his mistakes. Such visualization is difficult. Motion pictures are occasionally taken to obviate this difficulty, but such pictures are too expensive and time-consuming to be generally practicable. It is, accordingly, most desirable that means be provided whereby a golfer can observe his movements while addressing and in actually hitting a ball, and so that he may, at the same time, keep his eyes focused on the ball, which is a basic tenet of good golfing.

The main object of this invention is, therefore, to provide apparatus for golf stance and swing analysis whereby a golfer can observe his movements and still focus his eyes on the ball during the swing as required by good practice.

In accordance with this invention, this and other objects are achieved by means of a novel golf practice device which comprises a mirror disposed near a golf tee, said tee and mirror being both within the normal range of vision of a golfer in position to hit a ball from said tee, and means for reflecting said golfer's image onto said mirror, the mirror being so arranged that the entire image is visible to the golfer whereby the golfer can study his position and movements while addressing and actually hitting the ball.

This invention will be better understood by reference to embodiments illustrated in the accompanying drawing wherein:

FIG. 1 is a side elevation illustrating a desirable and practical apparatus according to one embodiment of the invention and showing a golfer in side view;

FIG. 2 is a front elevation as viewed from the position of the golfer showing the large convex mirror and the frame which supports it;

FIG. 3 is a vertical section to larger scale substantially on the line 3-3 of FIG. 1;

FIG. 4 is a diagrammatic side view similar to FIG. 1 illustrating apparatus of simpler form and graphically indicating the direction of the light rays by means of which the golfer is able to check the accuracy of his stance, as he would be observed from in front by an instructor;

FIG. 5 is a view similar to FIG. 4 but with the golfer so positioned as to enable him to see himself in side view;

FIG. 6 is a plan view of one of the mirrors shown in FIG. 4; and

FIG. 7 is a vertical section through a mirror such as that of FIG. 6, but showing a protective screen supporting the tee.

Referring first to FIGS. 4 to 7 of the drawings, the simple embodiment therein diagrammatically illustrated comprises a horizontal flat or plane mirror 10 resting, for example, on the ground and disposed directly below a golf tee 12, and an elevated, second mirror 14 supported by an upright frame 16. The mirror 14 has a convex surface 18 which is of such radius or curvature and so located, relatively to mirror 10 and to the tee, that a golfer, standing, in relation to the tee as illustrated at

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20, may see his full image in the mirror 10 as it is reflected by mirror 14. This image reflection is graphically indicated in the drawings by lines 22 and 22a connecting the golfer's eyes and the mirrors. The lines 22 and 22a are schematic and are provided merely to illustrate the function of the various mirrors which utilize well-known optical principles.

As the golfer stands in a position as shown at 20, in readiness to hit a golf ball 24 placed on a tee, he is enabled by this apparatus, to keep his eye on the ball, as required by good practice, and at the same time to see his image and observe all of his movements in the mirror 10. To aid in positioning himself properly in conformity to that which is theoretically correct, the mirror 10 may be provided with reference lines L (FIG. 6) or other indicia in or on its surface, or such lines can be reflected onto the mirror surface. Such reference lines L (FIG. 6) may be of any desired configuration or arrangement, for example to constitute a grid or a simple pair of axes.

The mirror 10 may, if desired, be located in a shallow chamber in the ground and directly beneath the tee, or it can be located in some other position adjacent to the tee where it is within the normal range of vision of a golfer having his eyes focussed on the ball. If the mirror 10 be located under the tee 12 (as shown in FIG. 7), provision should be made to prevent damage to the mirror. For this purpose, the mirror 10 may be made of speculum metal or other polished and highly reflecting metal, so as to resist fracture, or the mirror may be covered by a protective screen. Thus, as shown in FIG. 7, a coarse-mesh screen S, of fine wire, supports the tee 12. As illustrated in FIG. 4, the golfer is so positioned relatively to the mirrors that, when addressing the ball, he sees himself in front view, while, when standing in the position of FIG. 5, with his side toward the mirror, the mirror 18 reflects that side of the golfer, which is thus exposed to the mirror and thus in the mirror 10 the golfer may obtain a side view of himself.

Referring now to FIGS. 1, 2 and 3, the commercial embodiment of the invention as illustrated comprises a low platform P upon which the golfer may stand while practicing. This platform is designed to rest on the ground or upon the floor of a suitable building and may, for example, be of the order of 3" in height, including a mat covering its upper surface and which may for example be of rubber to insure good footing. Assuming for convenience in description that the edge E (FIG. 1) of the platform, proper, is its front edge, the apparatus also comprises a casing C projecting forwardly from the edge E and fixed to or forming an integral extension of the platform proper and which need not be so wide transversely as the platform and which, if desired, may be slightly less in height than the platform, for example, by the thickness of the mat which forms the upper surface of the platform. As shown in FIG. 1 that portion of the top of the casing C which is next adjacent to the edge E of the platform provides a support for the golf ball and for this purpose may be provided with a mat K, for example, of rubber, or imitation grass, as preferred, or this portion of the casing may be provided with means for receiving a conventional golf tee. Alternatively, the ball may be supported upon the platform proper, just to the rear of edge E. The casing C has an internal cavity or well W (FIG. 3) which is open at the top and within this cavity or well there is arranged a mirror 10a, corresponding in function to the mirror 10 previously referred to. In this commercial arrangement the mirror 10a is pivotally mounted to rock about an axis 30 parallel to the edge E of the platform. This axis is preferably somewhat further from that edge 31 of the mirror which is adjacent to the edge E of the platform than to the opposite edge. The edge 31 of the mirror rests upon an

inclined surface 32 (FIG. 3) of a slidable wedge block 33 which slides in a guideway within the platform P. This wedge block is connected by a screw-thread to the front end of a rotatable rod or shaft 34 which extends to the rear of the platform and has attached to its rear end (externally of the platform) an actuating wheel 35 which, for example, may be provided with a rubber tire or may be of metal with a knurled edge. By placing his foot on the edge of this wheel 35 and moving it in one direction or the other, a golfer, standing on the platform, may rotate the shaft 34 and thus advance or retract the wedge block 33 and so rock the mirror 10a. A spring 36 beneath the mirror tends to turn the mirror in the counter-clockwise direction, as viewed in FIG. 3.

As illustrated in FIG. 1, a mirror 14a corresponding generally in function to the mirror 14 above described, is arranged forwardly of the casing C. This mirror inclines upwardly and forwardly and is attached at its lower edge to the casing C by a suitable bracket T. The forward, upper edge of the mirror is supported by a frame comprising spaced horizontal members 39 extending from the casing C, and which are rigidly connected to the lower portions of two parallel upright legs 37 and 38. The convex surface 18a of mirror 14a is directed upwardly. The upper ends of the legs 37 and 38 are bent rearwardly to form supports for a third mirror 40. This latter mirror is a plane mirror having its lower face inclined upwardly and rearwardly as referred to the forward edge E of the platform. Desirably this mirror 40 is fixed to the under side of a supporting plate 41 of substantially larger diameter than the mirror and of opaque or non-reflecting material, this plate 41 being attached by suitable mechanical connections to the upper portions of the legs 37 and 38. Referring to FIG. 1, the convex mirror, disposed at the angle shown, reflects an upright, full length, front-view image of the golfer to reduced scale, so that it falls on the plane mirror 41. Because this is a plane mirror and inclined as shown, it reflects the same image which it receives from mirror 18 down onto the mirror 10 wherein the golfer sees himself from head to foot, as well as the golf ball, the head of the club relatively to the golf ball, and his hands gripping the club handle. By the use of the three mirrors, relatively arranged as described, the angle of incidence of the light rays is not so acute as in the arrangement shown in FIGS. 4 and 5, and thus there is less distortion and a more lifelike image results. Merely by way of example of a practical arrangement, the plane mirror 10a may be 14 inches in diameter, the convex mirror 14a may be 35.5" in diameter and of a radius of curvature of the order of 8 feet, and its inclination may be such that the plane which is perpendicular to the central radius of the mirror makes an angle of approximately 40° with the horizontal. The plane mirror 40 may be oval, for example 24" x 28" (with its major axis horizontal), and inclined upwardly and rearwardly at an angle of the order of 10° to the horizontal and with its upper edge disposed at an elevation of 58" above the level of the surface upon which the platform rests. The platform P may be of the order of 4 feet square and the casing C may be approximately 27 inches in transverse width and extend forwardly a distance of two feet from the front edge E of the platform proper. The above suggested dimensions have been found to provide a thoroughly practical arrangement without necessitating the mounting of either of the mirrors 14a or 41 for adjustment, the dimensions being such that, regardless of the height of a person desiring to use the apparatus, he may, by moving from front to rear of the platform and by adjusting the inclination of the mirror 10a, find a position such as to obtain a clear full length view of himself and of the ball and tee in the mirror 10a.

While the convex mirror 14a is here shown as fixedly supported, with its lower edge attached to the casing C and by a fixed frame at its rear edge, it is contemplated

that this mirror may be provided with independent legs (not here shown) so that it may be moved about independently of the other mirrors. Thus, for instance, it may be carried out onto a golf course and set up upon a green where the golfer may make use of it in observing his stance and in perfecting his swing, although such a simple mirror without the assistance of the other mirror or mirrors herein described does not provide the same perfection of view as when it is associated with another or other mirrors.

It may be noted that, in both embodiments illustrated, the various mirrors reflecting the golfer's image to the tee 12 are so disposed that they will not interfere with the swing of the golfer's club.

While certain desirable embodiments of the invention have herein been disclosed by way of example, it is to be understood that the invention is broadly inclusive of any and all modifications falling within the scope of the appended claims and that wherein dimensions or materials have been cited by way of example, such dimensions or materials are not to be regarded as limiting, but only as helpful in the design and use of apparatus embodying the invention.

I claim:

1. Golf practice apparatus comprising a low platform upon which a golfer may stand, a casing projecting forwardly from the forward edge of said platform, means for supporting a golf ball adjacent to the forward edge of said platform in position to be addressed by a golfer standing on the platform, said casing having therein a chamber open at its top within which is housed a plane mirror so positioned as to be in full view of a golfer standing on the platform in position to address the ball, said mirror being pivotally supported to rock about a transverse horizontal axis, means for adjusting the angle of said plane mirror relatively to the horizontal, an inclined convex mirror having its curved reflecting surface uppermost and its lower edge located at a point forwardly of the aforesaid plane mirror, a frame fixed relatively to said casing, and a second plane mirror supported by said frame at an elevation above that of the upper edge of the convex mirror, said latter plane mirror being so inclined that light rays reflected upwardly from the convex mirror are directed downwardly from the elevated plane mirror onto said first-named plane mirror.

2. Apparatus according to claim 1, wherein the convex mirror has a radius of curvature of the order of eight feet and is so inclined that a plane which is perpendicular to its central radius inclines to the horizontal at an angle of approximately 40°.

3. Golf practice apparatus comprising a low platform upon which a golfer may stand, a casing projecting forwardly from the forward edge of said platform, means for supporting a golf ball adjacent to the forward edge of said platform in position to be addressed by a golfer standing on the platform, said casing having therein a chamber open at its top within which a plane mirror is so housed as to be in full view of a golfer standing on the platform in position to address the ball, the aforesaid mirror being pivotally supported to rock about a transverse horizontal axis, and means for adjusting the angle of said mirror to the horizontal, the means for so adjusting the angle of the mirror comprising a slidable wedge member with which the rear portion of the mirror contacts, a spring tending to keep the mirror in contact with said wedge member, and means accessible from the exterior of the platform for moving the wedge thereby to adjust the mirror.

4. Apparatus according to claim 3, wherein the wedge member is connected by screw threads to the end of a rotatable rod, said rod being arranged beneath the platform and extending outwardly beyond the rear of the platform and having fixed thereto a wheel by means of which the rod may be turned, said rod and wheel constituting said means for adjusting the wedge.

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5. Apparatus according to claim 1, wherein the platform upon which the golfer stands is of such dimensions from front-to-rear that regardless of his height he may find a position upon the platform such that he may see a full length image of himself in the plane mirror housed in the casing.

6. A golf practice apparatus comprising an approximately horizontal plane mirror disposed near a golf tee, said tee and mirror both being within the normal range of vision of a golfer positioned with his head bent downwardly and forwardly to address a ball resting on said tee, means for reflecting an image of the golfer, so positioned, onto said mirror, the mirror being so arranged that the image reflected onto the mirror is clearly visible to the golfer whereby the golfer may observe his stance and movements while continuously watching the ball, the means for reflecting an image of the golfer onto the mirror which is adjacent to the tee comprising two other mirrors, the first of said latter mirrors being so elevated

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and located as to reflect light rays falling thereon down onto the mirror which is near the tee at an angle exceeding 45° with the horizontal, the second of said latter two mirrors being convex and being of such curvature and so located as to reflect a full length image of a golfer, positioned to address a ball resting on the tee, upwardly onto the elevated mirror, and wherein the plane mirror is located directly below the tee, and a guard screen is interposed between the mirror and tee.

References Cited in the file of this patent

UNITED STATES PATENTS

1,410,811	Lewis	Mar. 28, 1922
2,494,000	Robertson	Jan. 10, 1950
2,937,875	Mason et al.	May 24, 1960
3,000,261	Frenkel	Sept. 19, 1961

FOREIGN PATENTS

567,546	Canada	Dec. 16, 1958
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