ABSTRACT

The invention concerns a basketball goal which can be folded into a compact unit and lowered into a well-like cavity in the floor of a gymnasium or arena. The cavity may then be closed by a trap door to present a continuous, uninterrupted floor surface at the goal structure location.

The basketball goal structure is carried upon an upright post and includes an arm cantilevered from this post which, in turn, carries the backstop and goal ring. When this basketball goal structure is to be retracted into the wall, the arm, the backstop and the goal ring fold together and against one side of the post. Thus, the well into which this structure is lowered includes a shaft to receive the post and a slot-like pocket at the well opening to receive this folded assemblage of other components. Electrically or hydraulically operated mechanisms and mechanical linkages effect the folding and extension of the arm, backstop and goal ring. Other mechanisms are provided to lower or raise the post into and out of the well.

14 Claims, 27 Drawing Figures
RETRACTABLE BASKETBALL GOAL

This invention relates to game equipment, and more particularly to basketball goal structures. A primary object of the invention is to provide a novel and improved construction of a retractable basketball goal and the invention will be designated as such.

Many sports arenas are designed for multi-purpose uses, such as gymnastic displays, track events and games, such as basketball and volleyball. In each instance, the arena must be prepared for a selected event or game by providing suitable field equipment. In the case of basketball, the goal structures, that is, the backboards and baskets, will be the necessary field equipment. Both portable and retractable goal structures are commonly used for basketball goals. The portable goals, such as wheel mounted types, can be quite bulky and retractable goal structures are preferred. Retractable goal structures are often suspended above the floor of a gymnasium or on the walls thereof, to be lowered into place when they are needed.

However, where a basketball court is to be located in a large gymnasium or an open air arena, it may not be possible to suspend the goal structures in any practical manner and considerable difficulty may be encountered in providing suitable goal structures which can be easily moved into place when they are needed, and quickly and easily removed when not needed. It has been proposed to tip a basketball goal structure into a pit below the floor of the gymnasium, as in U.S. Patent No. 3,018,102, by providing trap doors over the pit which become part of the floor structure of the gymnasium when they are closed. However, a pit which is proportioned to receive the backboard, the net and the supporting post structure forming the basketball goal, must be quite large and require a large, heavy trap door, and such is usually undesirable.

The present invention was conceived and developed with the above and other considerations in view, and the invention comprises, in essence, a retractable goal structure for basketball which will drop into a well in the floor of the gymnasium, or arena. The well may then be covered by a trap door at the floor so the floor may be used for other purposes, which;

It follows that another object of the invention is to provide a novel and improved construction of a retractable basketball goal structure which is supported upon a post extending from a well in the floor of the gymnasium, and which may be retracted into this well when ever the basketball goal structure is not needed. Another object of the invention is to provide a novel and improved basketball goal structure, including a post, which upstands from and is retractable into a well in the floor of the gymnasium, which carries a cantilevered arm which, in turn, carries the backstop and goal ring at its extended end so the well from which the post extends may be located away from the edge of the basketball court and out of the way of players.

Another object of the invention is to provide a novel and improved retractable basketball goal structure including a post which upstands from and is retractable into a well in the gymnasium floor, and including other components which fold against the post when the goal structure is to be retracted, to thereby permit the entire structure to fit into a comparatively small well.

Another object of the invention is to provide the unique design of a basketball goal structure which may be withdrawn into a well when not in use, and which provides a trap door to cover the well as a continuous floor surface when the goal structure is not needed.

Another object of the invention is to provide a novel and improved basketball goal structure which is mounted upon a post extending from a well in the floor of a gymnasium, and which is easily adjusted in height by varying the extension of the post from the well.

Other objects of the invention are to provide a novel and improved retractable basketball goal which is a simple, neat appearing, easily operated and economical structure and which permits the installation of equipment for basketball games at areas where the same is not feasible at the present time.

With the foregoing and other objects in view, my present invention comprises certain constructions, combinations and arrangements of parts and elements as hereinafter described, defined in the appended claims and illustrated in preferred embodiment by the accompanying drawings, in which:

FIG. 1 is a perspective frontal view of a preferred embodiment of a retractable basketball goal constructed according to the invention, the goal being in an extended position as for use;

FIG. 2 is a perspective view looking toward the rear of the basketball goal;

FIG. 3 is a right side elevational view of the extended basketball goal structure, as taken from the indicated arrow 3 of FIG. 2, with the well wherein the unit is contained being shown in section and with broken lines showing the basketball goal in its retracted position;

FIG. 4 is a rear view of the goal structure at the top of the support post, that is, the support arm and the backboard, as taken from the indicated arrow 4 of FIG. 3;

FIG. 5 is a plan view of the goal structure at the top of the support post;

FIG. 6 is a left side elevational view of the upper portion of the post and of the support arm and the goal structure at a partially folded position;

FIG. 7 is a left side elevational view of the backstop and ring folded against the post and retracted into the well, with the well being shown in section, and with the lower portions of the well and post being broken away to conserve space;

FIG. 8 is a fragmentary sectional as taken from the indicated line 8—8 of FIG. 3, but on an enlarged scale;

FIG. 9 is a fragmentary sectional detail as taken from the indicated line 9—9 of FIG. 8;

FIG. 10 is a fragmentary sectional detail as taken from the indicated line 10—10 of FIG. 4, but on an enlarged scale and with portions broken away to show parts hidden from view;

FIG. 11 is a fragmentary sectional detail as taken from the indicated line 11—11 of FIG. 10;

FIG. 12 is a fragmentary side view of hinge connector portions of a pair of struts which hold the backstop in position;

FIG. 13 is a fragmentary side view similar to FIG. 12, but showing the strut folded about the hinge;

FIG. 14 is an end view of the folded struts as taken from the indicated arrow 14 of FIG. 13, but on an enlarged scale;

FIG. 15 is a plan view of the floor section where the goal post is located, but with the pit closed by trap doors from line 15—15 of FIG. 7, with portions of the struc-
ture broken away and other portions in broken lines to show parts otherwise hidden from view;

FIG. 16 is a sectional detail as taken from the indicated line 16–16 of FIG. 7, but on a reduced scale;

FIG. 17 is a fragment of the showing of FIG. 16 but on an enlarged scale;

FIG. 18 is a perspective frontal view similar to FIG. 1 but showing the well in section and illustrating a modified embodiment of the invention where the relocatable basketball goal is carried upon a telescopic post;

FIG. 19 is a left side elevational view with the well in section, similar to FIG. 3, but with the backstop and ring being folded against the post preparatory to retracting the same into the well and with portions of elements broken away to show parts otherwise hidden from view;

FIG. 20 is a vertical sectional view through the post as taken from the indicated line 20–20 of FIG. 18 but on an enlarged scale and with portions broken away to conserve space;

FIG. 21 is a transverse sectional view as taken from the indicated line 21–21 of FIG. 19 but on an enlarged scale;

FIG. 22 is a fragmentary sectional detail as taken from the indicated line 22–22 of FIG. 21 but with portions broken away to conserve space;

FIG. 23 is a perspective frontal view similar to FIG. 1 but showing a second modified embodiment where the components are actuated by hydraulic means;

FIG. 24 is a left side sectional elevational view of the post and well portion of the structure as taken from the indicated line 24–24 of FIG. 23, but on an enlarged scale;

FIG. 25 is a transverse sectional view as taken from the indicated line 25–25 of FIG. 24 but on an enlarged scale;

FIG. 26 is a fragmentary sectional portion as taken from the indicated line 26–26 of FIG. 25 but with portions broken away to conserve space;

FIG. 27 is a left side sectional elevational view similar to a portion of the showing of FIG. 24 but illustrating a third modification of the post structure where a telescopic post is combined with a hydraulic jack.

Referring first to the embodiment of the invention shown in FIGS. 1–17, the retractable basketball goal G includes a backstop B with a net supporting goal ring R outstanding from the lower edge of the backstop, as in FIGS. 1–3. These members are carried upon the extended end of a foldable arm A which, in turn, is cantilevered from the top of an upright standard or post P. The post P, in turn, upstands from a well W in the floor F of a gymnasium or arena where the basketball game is to be played. The well W is offset from the boundary line L of the basketball court so that the post is out of the way of the players. Thus, the reach of the arm A places the backstop B and the goal ring R at a proper position with respect to the boundary line L.

The post P is adapted to be retracted into the well W and the well is closed by trap doors or a cover C, as will be hereinafter described, but first the cantilevered arm A will swing downwardly and alongside the post P. At the same time, the backboard B and basket ring R will be folded against the arm into a compact package to fit into an enlarged pocket S at one side of the well, all as hereinafter described in detail.

The post P is square sectioned, and is preferably a tubular member 30 of aluminum or the like. The length of this post P is such as to permit it to be extended to a height sufficient to hold the backstop B and goal ring R at a maximum desired elevation. The post P also extends into the well W a depth which is sufficient to be securely held in a vertical position by guides 31 within the well, as hereinafter further described. The post P is also adjustible in the well to vary the elevation of the backstop B and goal ring R, as from a minimum of, say for example, 6 feet to a maximum of 12 feet.

The base end of the arm A is pivotally connected to the top of the post P through a U-shaped yoke 32, which is attached to the underside of the base end of this arm. The legs of this yoke 32 terminate as bearings which connect with shaft members 33 extending from opposite sides of a crown plate 34 at the top of the post P. Accordingly, the arm is offset from its pivotal connection at the shaft members 33, and thus, it may swing downwardly from its extended, cantilevered position to a retracted position alongside and parallel to the post.

The yoke 32 spaces the arm A a short distance from the post P when retracted to accommodate components which will lie between the arm and the post, as will be described.

The shaft members 33 lie in a common axial alignment to extend from each side of the post to connect with the legs of the yoke 32. However, the shaft members 33 are spaced apart at the center of the crown plate 34 to permit a reversible motor 35 to be mounted upon this crown plate 34 directly above the post. This motor, which will include a speed reducer, will rotate a lead screw 36 which extends downwardly alongside the post. A strut 37 connected to this lead screw, connects with the arm A and thus the lead screw will hold, and will lower and raise the arm A as now described.

The cantilevered arm A is formed as a pair of rectangular, tubular telescopic members with a smaller base tube 38 connecting to the yoke 32, as heretofore described, and a larger extension tube 39 telescopically fitted upon the base tube 32. This extension tube 39 will reach from the base tube 38 when the arm is extended to its cantilevered position and will be retracted upon the base tube when the arm is swung downwardly alongside the post, as illustrated in FIG. 7. A suitable stop, such as hereinafter described, is provided to limit the extension of the extension tube 39 upon the base tube 38 of the arm. The arm A is supported by the strut 37, and the upper end of the strut 37 is pivotally connected to a pair of ears 40 at the underside of that end of the extension tube 38 nearest the base end of the arm. The lower end of the strut is pivotally connected to a clevis nut 41 on the lead screw 36.

This clevis nut 41, carried upon the lead screw, is formed with a pair of lateral flanges 42 at its backside which slidable fit into grooves 43 of a guideway 44 connected to the post, as best shown in FIGS. 8 and 9. The guideway 44 restricts the movement of the nut to a path upward and down the post and the movement of the nut is effected by rotation of the lead screw 36. Thus, when the lead screw moves downwardly along the track, the arm A will be lowered, and at the same time, the extension tube 39 will telescopically retract upon the base tube 38 of the arm, as to the position shown in FIG. 7. Upward movement of the nut along the guideway 44, by reverse rotation of the lead screw, will swing the arm upwardly to its cantilevered position and at the same time, the extension tube 38 will telescopically extend upon the base tube 37, as best shown in FIG. 3.
When the goal is at its extended position, as shown in FIGS. 1 and 3, the backstop B will be in a vertical plane and the basket ring R, carried upon a short arm 45, will lie in front of the backstop in a horizontal plane near the base of the backstop. At the same time, the cantilevered support arm may extend horizontally from the post or, preferably, be inclined about 15° to 30°, upwardly towards the backstop as illustrated in FIG. 3. When the arm A is to be folded alongside the post P, it is necessary that the backstop be rotated about its connection to the arm A to lie alongside the arm. Accordingly, the backstop is pivotally connected to the arm by a shaft 50, as in FIGS. 4 and 6, secured to lugs 51 outstanding from the backstop backwall. The shaft 50 connects with ears 52 upstanding from opposite sides of the end of the extension member 39 of the arm A, as illustrated in FIG. 10.

To rotate the backstop from its vertical position to a position against the arm, a foldable linkage is provided which responds to the telescopic movement of the extension tube 39 upon the base tube 38 of the arm, as best shown in FIG. 6. To maintain lateral stability of the apparatus, this linkage consists of two sets of struts in mirror opposition to each other from the vertical center plane of the unit. These strut members may be structural channels or tubes which can resist both compression and bending forces. Each set includes a strut 54 having one end pivotally connected to the base ends of the base tube 38, as at pivot 55 of FIGS. 3 and 6. One end of an intermediate rocker strut 56 is pivotally connected to the extended end of the base strut, as at pivot 57. The central portion of the intermediate rocker strut is pivotally connected to a shaft 58 at the top of the extension tube 39 of the arm A. To complete a strut set, one end of an extension strut 59 is pivotally connected to the extended end of the intermediate strut 56 as at pivot 60 and the opposite end of this extension strut 59 is pivotally connected to a shaft 61 held at the backside of the backstop by ears 62, as in FIG. 3.

To better obtain lateral stability of the backstop B, each extension strut 59 is angled so that it will flare outwardly, so the opposing struts 59 will connect to the backstop at spaced apart positions, as best illustrated in FIGS. 4 and 5. The length of the struts 54, 56 and 59 are proportioned to cause the intermediate rocker strut to rock about its shaft 58 when the extension tube 39 telescopes over the base tube 38 of the arm A, as shown in FIG. 6. This pulls the extension strut 59 toward the base end of the arm to commence folding the backstop upon the arm. At the same time, the extension strut 59 folds against the intermediate strut 56, about the pivot 60, as illustrated in FIGS. 7 and 13. It is to be noted that each intermediate strut 56 and its extension strut 59 will fold together at a comparatively tight angle when the structure is fully retracted, as shown in FIG. 7, and accordingly, the strut 56 must be formed as a channel-like member, at least adjacent to the pivot 60, to permit the strut 69 to fold into the strut 56 as shown in FIGS. 13 and 14.

When the goal structure moves from its retracted position to the extended position by upward movement of the arm A, the extension tube 39 will extend on the base tube 38, as heretofore described. At the same time, the intermediate strut 56 will rotate to push the backstop B to its upright vertical position. The limit of this rotation will be when the intermediate strut 56 and the extension strut 59 move into alignment, as shown in FIG. 12. This limiting movement is established by a channel-shaped stop 63 secured to the intermediate strut 56 to engage the extension strut 59, as best shown in FIG. 12. At the same time, the backstop B will swing about the shaft 50 until the lower corner of the end of the extension tube 39 is contacted. A toothed lug 64 is provided at this lower corner of the arm tube 39 to intermesh with a mating lug 65 on the backboard at this limiting position, as best shown in FIG. 10.

When the backstop swings against the arm A, the basketball goal ring R will swing in the opposite direction to also lie against the arm A and this swinging movement is effected responsive to the rotation of the backstop with respect to the arm A. As illustrated in FIG. 10, the goal ring arm 45 extends underneath the backstop to pivotally connect with ears 66 depending from each side of the extension member 39 of the arm A. The end of the basket ring arm 45 carries a shaft 67 which is locked thereto, as by a pin 68, and this shaft extends through the ears 66 to carry a gear sector 69 at each side of the arm A. Each gear sector is locked to the shaft 67 by a key 70, as illustrated in FIG. 11.

This gear sector 69 engages an opposing gear sector 71 which is centered at the shaft 50, about which the arm A rotates, and is secured to the backstop. The comparative diameters of the gear sectors 69 and 71 is such that, when the backboard rotates from its upright position to a retracted position to lie alongside the upper side of the arm A, the basket ring arm 45 will rotate in the opposite direction from its normal horizontal position outstanding from the arm to a retracted position alongside the underside of the arm, as best shown in FIG. 7.

Once the goal structure is prepared for retraction by swinging the arm A, the backstop B and the goal ring R to their retracted positions alongside the post, the goal structure may then be lowered into the well W. This well W in the floor of the gymnasium or arena where the structure is located may be formed in any suitable structural arrangement. If the arena floor is at ground level, this well may be formed of reinforced concrete, as indicated in the drawings. It may also be formed as a steel sleeve or the like.

The well W includes a shaft 75 which extends into the ground a depth sufficient to receive the post P, as in FIG. 7. The guides 31 are formed as pairs of opposing U-shaped plates secured in the shaft to slidably embrace the sides of the post. One pair of guides 31 is located near the top of the shaft and another pair of guides 31 is located at a greater depth within the shaft, at a position near the lower end of the post when the post is extended upwardly. The well W also includes the side pocket S to receive the arm, backstop and goal ring when these members are folded to a retracted position alongside the post. The pocket S is sufficiently deep to also provide a base 76 for mounting a motor 77 for lifting the post out of the well. The motor 77 is preferably a high torque electrical type which incorporates a speed reducing head geared for comparatively slow speed rotation. In the arrangement illustrated, the motor carries a drive pinion 78 which engages an idle gear 79 carried upon the motor framework. The idle gear, in turn, engages a rack 80 affixed to the post P, as in the manner illustrated in FIG. 7. The power sources, switch controls and limit switches for the post lifting motor 77 and the arm lifting motor 35, heretofore described, are not shown, since they are conven-
tional arrangements, connected to the motors and apparatus in any conventional manner. These motors will be turned off and on by the switch controls. The limit switches will not permit the goal structure to move beyond the fully extended or fully retracted position, nor the post to move beyond its fully extended or fully retracted positions from and within the well. Other manual switches may be used to vary the height of the goal, when it is desired to use the same height less than the fully extended position. Switching systems for such operations are entirely conventional and hence need not be described.

The well shaft 75 and pocket 8 are closed by trap doors 81 and 82. When the apparatus is fully retracted as shown in FIG. 7, these doors lie upon a rabbeted shelf 83 at the entrance of the well and pocket, and are flush with the floor when they are closed to form a continuation of the floor. The shaft door 81 is hinged as at 84, at the edge opposite its juncture with the pocket door 82 and the larger pocket door is hinged at 85, at the edge opposite the juncture with the shaft door, as indicated in FIGS. 7 and 15. Various means for latching the doors in their closed position are possible and a preferred mode of connection is shown in FIG. 15, where a compound drawbolt structure 86 includes bolts 87 extending to opposite sides of the pocket door 82 and a short bolt 88 extending into the end of the shaft door, as illustrated. This bolt structure 86 is formed with a key operated, rotateable head 89 to permit these bolts 87 and 88 to operate simultaneously to extend or retract to open whenever the goal structure is to be used.

In use, the retracted goal structure is first raised out of the well. The arm and backboard are then lifted to their extended positions. The next step is to close the pocket door 82, as shown in FIG. 1. The shaft door 81, however, must necessarily remain open to permit the post to reach upwardly through the floor structure. Thus, when the basketball goal is in use, the only opening through the floor will be at the small shaft gate 81.

The modified embodiment of the basketball goal structure shown in FIGS. 18-22 is, in many respects, similar to the goal structure hereinbefore described. However, the post P' is formed as a series of tubular members which telescope together when retracted and thus reduce the depth of the well W' and, as shown in the drawings, the depth of this well W' may be the same as the depth of the pocket S'. The number of the telescopic members making up this post P' is not critical, and the drawings illustrate four such members, including a base tube 100 which is rigidly secured in place in the well W'. This securement will include a plate 101 which is welded to the bottom of the tube 100 and bolted to the floor of the well W', as at 102. To resist vibration and tipping forces when the post is extended, the top of the base tube is secured to the wall of the well, as by a connector 103.

A first extension tube 100a extends from the base tube, a second extension tube 100b extends from the first, and a third top extension tube 100c extends from the second and carries a crown plate 34' at its top. The crown plate 34', in turn, carries shaft members 33 to hold the yoke 32 of the arm structure A. The arm A supports the backstop B, a goal ring R, and the linkage which folds the backstop and ring against the arm when the arm is retracted to lie alongside the post. These components are the same as heretofore described.

The crown plate 34' is extended from the top section of the post to support a modified guide 44' which is connected to and descends from the crown plate 34', rather than being connected to the post, as heretofore described. This is necessary because the guideway 44' cannot be connected to the top extension tube 100c of the post. Instead, when the post is extended, this guide 44' will extend downwardly to the top the first extension tube 100a to be slidably carried upon a clip 104 outstanding from the top section of 100c. The guideway 44' has grooves 43 at its face to slidably hold a clevis nut 41 of the arm lifting strut 37, as heretofore described. Also, the backside of the guideway 44' is formed with opposing grooves 105 which embrace outstanding fingers 106 on the clip 104. The lead screw 36 is rotated by a motor 35 is mounted upon the crown plate 34' and functions to raise and lower the clevis nut 41, the same as heretofore described.

Accordingly, whenever the arm A, backstop B and ring R are retracted to lie alongside the post, the post may be telescopically withdrawn into the well W' and the other components will be lowered into the pocket S. When so lowered, the guideway 44' will slide downwardly along the clip 104 to lie alongside the base section of the post when the post is fully retracted. Abutment members 107 are provided on this base section of the post to engage the guide when the post is collapsed, to stabilize the guide which is otherwise held only by the connection at the crown plate 34'.

This telescopc post is raised and lowered by a compound screw jack 108 within the post which consists of several threaded tubular sections which telescope together when the jack is lowered. The jack includes a cylindrical base section 109 which is secured to the plate 101 at the bottom of the post. A smaller intermediate section 110 is formed as an externally threaded cylinder which turns into a nut 111 at the top of the base section 109 to extend thereinto. A smaller upper section 112 is formed as a threaded rod which turns into a nut 113 at the top of the intermediate section to extend thereinto. The top end of the upper section 112 extends upwardly through a thrust bearing 114 and thence through an opening in the crown plate 34' to connect with a motor reducer drive 115. Blocks 116 and 117 are at the base of the threaded reaches of the respective intermediate section 110 and upper section 112 to limit their upward movement from their respective nuts 111 and 113.

The screw jack structure is essentially conventional and may best be described through its mode of operation. Whenever the motor reducer unit 115 commences to rotate, as to raise the unit, the upper section screw is first rotated and extended to its limit and stopped by the block 117. Next, the intermediate section rotates to its extended limit and when the post is fully extended, the intermediate section is stopped by its block 116. It is contemplated that this movement will also be correlated with limit switches to halt the action of the motor reducer unit 115 at the fully extended and fully retracted positions of the post. Lowering the post into the well W' will be effected by opposite rotation of this screw jack. Suitable limit and safety switches, not shown, are provided to require the arm A, the backstop B and the goal ring R to be folded against the post before lowering begins, and also to require the trap doors 81 and 82 at the floor to be open to permit
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the assembly to be lowered into the well W' and pocket S'.

FIGS. 23–26 show yet another embodiment of the retractor basketball goal which essentially the same construction as the embodiment shown in FIGS. 1 through 17, excepting that the unit shown in FIGS. 23–26 is operated by a hydraulic system. As shown in FIG. 23, the basketball goal structure G includes a backstop B and a goal ring R carried upon an arm A. The arm A cantilevers from the top of a post P to support the backstop and goal ring when the post, arm and goal structure are at their extended position. The post P stands from and may be retracted into a well W'. When the post is to be retracted into the well W', and the arm and goal structure G are to be retracted into the pocket S' alongside the well, the arm A swings downwardly to lie alongside the post. At the same time, the goal ring R swings to lie alongside side the arm A. The assembly may then be lowered into the well W' and pocket S', all as heretofore described. However, the movements of these components are effected by hydraulic cylinders instead of electrical motors.

A first cylinder 120 is mounted upon a support 121 at the base of the guideway 44 and the piston of that cylinder connects with one side of a clevis 41' which slides in the grooves 43 of the guideway 44. The hydraulic cylinder 120 is preferably a two stage or a three stage unit, as shown, and suitable hydraulic lines are indicated as connecting with this cylinder at 122 to operate this cylinder to raise and lower the backstop, as such becomes necessary. The lines to a hydraulic cylinder are not shown in detail, since they are conventional. These lines will connect with suitable control valves 123 which may be conveniently mounted in the pocket S', as shown in FIG. 24. The lines also extend in any suitable manner, not shown, from a control valve 123 to a pump and reservoir indicated diagrammatically at 124 to complete a hydraulic circuit, in a conventional manner.

A second cylinder 125 is mounted within the post P' with its base at the bottom of the well W' and the end of its piston being at the crown plate 34 at the top of the post. This cylinder may be a single stage, or a multiple-stage unit, as illustrated. A single pressure line 126 connects into the base of the cylinder 125 to extend to a line form a control valve 127 and thence to the pump and reservoir 124. The raising and lowering of this post P' by operating control valve 127 may be correlated with the action of valve 123 to require that the goal structure be lowered to its retracted position alongside the post before the post can be lowered into the well. Other restrictive means, such as limit switches, may also be used in a conventional manner to assure proper operation of the apparatus when it is being extended from the retracted into the well.

FIG. 27 illustrates a telescopic post P' which is mounted within a shaft 75' alongside a pocket S' much in the same manner as illustrated in FIG. 18. This post is provided with a crown plate 34' wherein the arm A of a goal structure may be attached. The structural details of the arm A and of a guideway 44' which will be suspended from the plate 34' are not shown herein, since they may also be the same as the arrangement illustrated in FIGS. 18 through 22. In lieu of a screw jack 108 within the telescopic post, as heretofore shown, this telescopic post shown in FIG. 27 is raised and lowered by a hydraulic cylinder 125' which is mounted within the post with its base being at a plate 101' securing the bottom of the post to the bottom of the well W'. The hydraulic cylinder is operated in the same manner as heretofore described, as by a pressure line 126' at the bottom of the cylinder which extends to a suitable control valve, pump and reservoir arrangement, such as heretofore described.

I have now described my invention in considerable detail. However, it is obvious that others skilled in the art can build and devise alternate and equivalent constructions which are nevertheless within the spirit and scope of my invention. Hence, I desire that my protection be limited not by the constructions illustrated and described, but only by the proper scope of the appended claims.

What is claimed is:

1. A retractable basketball structure comprising: a post movable between a lower retracted position and an upper, upright extended position; means for moving said post between said retracted and extended positions; an arm pivotally cantilevered from the top of said post; a backstop and a goal ring pivotally connected to the extended end of the arm; extension and retraction means to normally hold said arm at its cantilevered position and to swing said arm downwardly to a retracted position alongside the post; and a linkage means associated with the backstop, ring and arm to rotate the backstop and the ring to a position alongside the arm as the arm is lowered to its retracted position alongside the post, whereby to provide a compact arrangement of components.

2. The organization defined in claim 1, wherein: the retraction means to swing the arm from its cantilevered position to the retracted position alongside the post includes a strut having its upper end connected with the arm and its lower end connecting with a lowering means at the post.

3. In the organization defined in claim 2, wherein: the lowering means comprises a screw jack.

4. In the organization defined in claim 2, wherein: the lowering means comprises a hydraulic cylinder.

5. In the organization defined in claim 2, wherein: said arm is formed as a pair of telescoping members, with a first member being pivotally connected to the top of the post and with a second member telescoping from the first member to slidably extend therefrom when the arm is at a cantilevered position: the upper end of the aforesaid strut is connected to the base end of the said second member, whereby the two members will telescope together whenever the arm is lowered to a position alongside the arm; and said linkage means associated with the arm and the backstop includes: a rocker strut connected to the second member, a base strut connecting one end of the rocker strut with the base of the first said arm member and an extension strut connecting the opposite end of the rocker strut with the backstop, whereby the telescopic movement of the aforesaid second arm member into the first said member will effect rocking of the rocker strut and swinging of the backstop against the arm.

6. A retractable basketball structure comprising:
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a post movable between a lower retracted position and on upper, upright extended position; means for moving said post between said retracted and extended positions; an arm pivotally contilivered from the top of said post; a back stop and goal ring pivotally connected to the end of the arm; and said pivotal connections of the backstop to the arm and the goal ring to the arm, at the extended end of the arm, are spaced apart and gear segments interconnect the components for these pivotal connections, whereby movement of the backstop to lie against the arm will effect a corresponding opposite movement of the goal ring to lie against the opposite side of the arm.

7. In combination with a well in the floor of a gymnasium or like arena, a retractable basketball structure mounted upon a post extendable from the well and comprising in combination therewith:

means to raise the post from a shaft of the well to upstand from the gymnasium floor above the well and to lower the post into the shaft to retract the same, said shaft being of a depth sufficient to receive the post and permit it to be lowered below the floor; a pocket in the floor of the gymnasium alongside and contiguous with the shaft to receive the goal structure when the post is lowered into the well whereby the post and goal structure will be below the gymnasium floor when the same is at its retracted position; a telescoping arm pivotally mounted on the upper end of said post; a backstop and a goal ring pivotally mounted at the end of said arm; means extending and retracting said arm and moving said arm between a telescopied retracted position along side said post and an extended position extending from the end of said post; and means for pivoting said backstop and goal ring about the end of said arm is extended or retracted, in order to position said backstop in an upright position and said goal ring in a horizontal position when said arm is fully extended and to position said backstop and goal ring in a folded position against said arm when said arm is retracted to a position along side said post.

8. In the combination set forth in claim 7, wherein the means to raise and lower the post includes a rack upon the post and a drive means including a pinion engaging the rack.

9. In the combination set forth in claim 7, wherein the means to raise and lower the post includes a screw jack means.

10. In the combination set forth in claim 7, wherein said post is a single tubular member, and means in the well to slidably hold the post in vertical alignment when it moves into and out of the well.

11. In the combination set forth in claim 7, wherein said post comprises telescoping tubular members, with the outer member being securely held in the well.

12. In combination with a well in the floor of a gymnasium or like arena, a retractable basketball structure mounted upon a post extendable from the well and comprising in combination therewith:

a. means to raise the post from a shaft of the well to upstand from the gymnasium floor above the well and to lower the post into the shaft to retract the same to a generally upright position, said shaft being of a depth sufficient to receive the post and permit it to be lowered below the floor;
b. an arm pivotally mounted at one end adjacent the upper end of said post, said arm pivotally carrying a backstop and a goal ring adjacent its outer end; c. means for pivoting said arm upwardly to an extended position, when said post is moved upwardly; d. means for moving said backstop and goal ring into perpendicular relationship when said arm is extended; e. means for pivoting said arm downwardly to be disposed alongside said post when said post is retracted; and f. means for pivoting said backstop and said goal ring to positions alongside said arm when in retracted position.

13. In the combination of claim 12, wherein:

the end of said arm pivotally connected to said post is angularly offset.

14. In the combination of claim 13, wherein:

the remainder of said arm is telescopically extensible and retractable.

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