Dec. 29, 1959 G. D. EGGERS 2,919,133

DIVING BOARD

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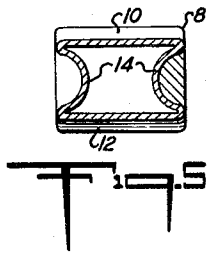


Fig. 5

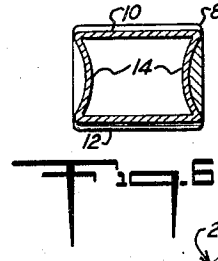


Fig. 6

Fig. 1

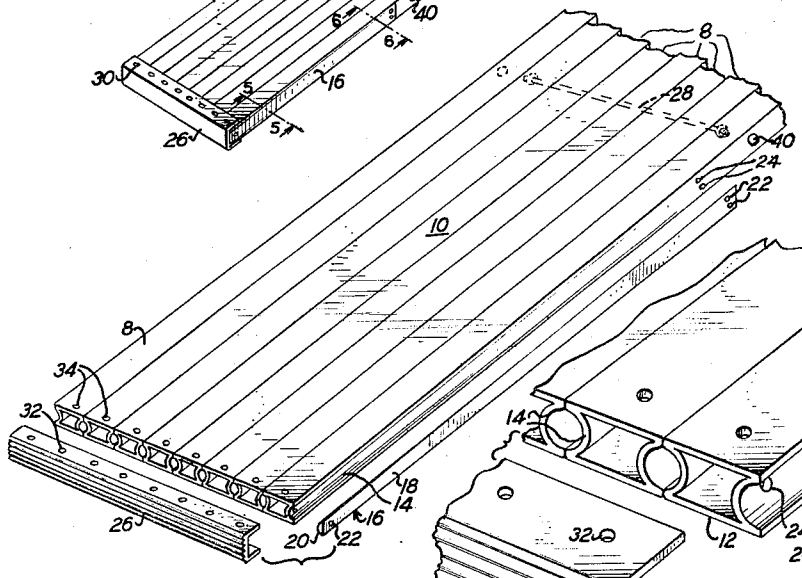


Fig. 2

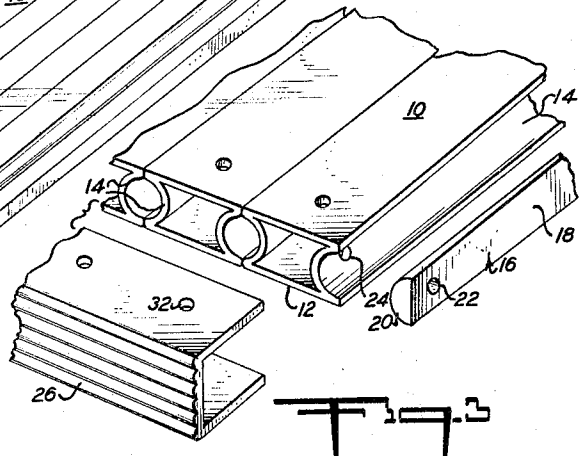


Fig. 3

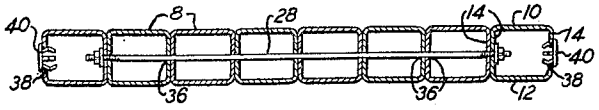


Fig. 4

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DIVING BOARD

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5 Claims. (Cl. 272—66)

This invention relates to a diving board, and more particularly to a lightweight metal diving board for use by aquatic performers.

In recent years considerable attention has been directed to the possibility of using metal diving boards in place of the wood diving boards customarily used by aquatic performers. It has been recognized, for example, that a lightweight aluminum diving board has a potential for a much longer useful life than a wood diving board. Also, it has been recognized that aluminum diving boards can be constructed to provide more spring for the performer than a comparable wood diving board.

Nevertheless, the metal diving boards proposed heretofore have been subject to certain disadvantages. All of the constructions of which I am aware are expensive to produce, and many of them are not durable under service conditions.

Some of the difficulties experienced heretofore have been attributable to the manner in which the forward end portions of the boards are provided with the necessary taper. For example, one of the most widely used aluminum diving board constructions includes a plurality of I-beams extending substantially the full length of the board. In order to provide the appropriate taper at the forward end portion of such a board, the end portions of the webs of the several I-beams are split longitudinally and lapped in side-by-side relation in such a manner as to reduce gradually the heights of the I-beams. This procedure results in a weakening of the I-beams at the tip of the board. After a period of use, the top surfaces of the I-beams become concave, and the beams crack at the ends of the cuts and often break completely.

Other constructions have been proposed in which the taper of the forward end portion of the board is achieved by the use of telescoping elements, or by the use of overlapping channel sections bolted together with progressively varying degrees of overlap between the vertical walls of the channels. Such constructions also are expensive to produce and, additionally, it has been found that they are not well suited to the repeated flexures required of diving boards.

Another important deficiency in the metal diving boards heretofore proposed has been that after a period of use, they develop a tendency to twist upon being flexed. It is believed that such tendency is due in part to a lack of transverse rigidity in the longitudinal components of the board and in part to maintenance difficulties.

In connection with the latter, it is pointed out that the operators of swimming pools are accustomed to wood diving boards which require almost no maintenance. Such boards wear out after a relatively short period of time and must be discarded. in dealing with metal diving boards, however, some maintenance activity is essential if the boards are to realize their full potential life. Bolts must be tightened regularly, for example, in order to prevent the development of looseness in the board. In the constructions heretofore proposed, such maintenance

activities have been difficult to perform, and in many instances they have been neglected.

It is a general object of this invention to provide an improved metal diving board which can be constructed economically, which can be maintained easily, and which will be durable under service conditions.

A more specific object of this invention is to provide a metal diving board made up of a group of one-piece longitudinally extending elements of sufficient transverse rigidity to prevent twisting of the board, and of sufficient longitudinal resiliency to provide the necessary spring action required by the aquatic performers.

Still another object of this invention is to provide a metal diving board in which the means for connecting the major components together are concealed normally to prevent access to them by playful children and other unauthorized persons, but in which access to such connecting means may be achieved readily by the maintenance personnel.

The foregoing objects are realized, according to a preferred embodiment of the invention, in a diving board made up of a group of elongated aluminum tubes secured together in side-by-side relation and extending substantially the full length of the board. Each of the tubes is generally rectangular throughout a major portion of its length, but is gradually tapered vertically at its forward end portion by bending its side walls inwardly in such portion to reduce the vertical distance between its top and bottom walls. Filler strips, preferably of aluminum, also are secured to the outermost ones of the aluminum tubes so as to fill in the bowed portions thereof near the forward end of the board. These filler strips not only give the sides of the board a finished appearance but also serve to protect the performers against injury upon contact with the deformed portions of the side walls of the outermost tubes.

The several longitudinally extending tubes are provided with one or more series of laterally aligned apertures in their side walls at locations disposed rearwardly of the tapered forward end portion of the board. Each series of laterally aligned apertures receives a bolt means for securing the tubes together. Such bolt means extends from the interiors of the outermost tubes of the group through the aligned holes so that, when the bolt means is tensioned properly, the tubes are held rigidly together. Access to the ends of the bolt means may be had through the apertures in the outermost side walls of the outermost tubes of the group. However, such access normally is restricted by the disposition of removable closure devices in these apertures. Hence, the operator of the pool may be reasonably sure that the bolt means will not be tampered with by unauthorized persons.

A better understanding of the invention and its many advantages will be gained from a consideration of the following detailed description of the embodiment illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of a diving board according to the present invention;

Fig. 2 is an enlarged exploded perspective view of the tapered forward end portion of the diving board illustrated in Fig. 1;

Fig. 3 is a further enlarged exploded perspective view illustrating the relationships between the several parts located at one side of the forward end of the diving board;

Fig. 4 is a vertical cross sectional view taken along the line 4—4 in Fig. 1;

Fig. 5 is a detail vertical cross sectional view taken along line 5—5 in Fig. 1; and

Fig. 6 is a similar detail vertical cross sectional view taken along the line 6—6 in Fig. 1.

The illustrated diving board has been designated gen-

erally by the numeral 2 in the drawings. As is customary, the diving board 2 has a tapered forward end portion 3, is rigidly secured at its rear end to a suitable support 4, and is supported intermediate its ends upon a fulcrum bar 6. These support elements form no part of the present invention and they need not be described in detail here. It will be understood that the connection of the board 2 to the support 4 may be accomplished by any suitable means, such as bolts, and that the fulcrum bar 6 may be padded in any desired manner at the zone where it comes in contact with the board 2 to minimize abrasion. It will be understood that the position of the fulcrum bar 6 relative to the support 4 may be adjusted as desired to give the board 2 varying spring characteristics.

The board 2 includes a group of one-piece tubes 8, each of which extends throughout the entire length of the board 2. Although it is preferred that the tubes 8 be made of aluminum, it will be evident that plastics and other metals having the requisite strength and resiliency characteristics might be employed if desired.

These tubes 8 are disposed in side-by-side contact with their upper surfaces aligned to provide the board 2 with a level upper surface upon which the performers may walk. Usually it is desirable to provide this surface with some means to prevent the performers from slipping as they walk or run along it. An abrasive coating is preferred for this purpose, because of the ease with which such a coating may be applied. However, a mat may be used if desired.

Each of the tubes 8 is substantially rectangular throughout a major portion of its length, as illustrated in Fig. 4. It includes substantially parallel top and bottom walls 10 and 12, and straight side walls 14 extending perpendicularly with respect to the top and bottom walls 10 and 12, and connecting the lateral edges of the top and bottom walls together. This shape is a particularly advantageous one in that it is quite rigid in a transverse direction. As a result, the diving board of this invention has substantially no tendency to develop a twisting action, even after long periods of use.

The taper of the forward end portion 3 of the board 2 is achieved without sacrificing the transverse rigidity of the board, by bending inwardly the side walls 14 of each of the tubes 8. This bending may be accomplished easily and quickly by forcing an end portion of each tube 8 into a suitably tapered die.

As the side walls 14 are crimped inwardly, the vertical distance between the top and bottom walls 10 and 12 of each tube decreases, and by gradually increasing the degree of crimp in the side walls 14, it is possible to achieve a gradual convergence of the top and bottom walls 14. This relationship is perhaps best illustrated in Figs. 5 and 6 which are cross sectional views of the same tube 8 taken along different vertical planes in the tapered end portion 3 of the board 2. In Fig. 5, the side walls 14 are bowed inwardly toward the axis of the tube 8 to a greater extent than in Fig. 6, with the result that the vertical distance between the top and bottom walls 10 and 12 in Fig. 5 is less than in Fig. 6.

As will be apparent from Figs. 2 and 3, the procedure just described for tapering the forward end portions of the tubes 8 leaves the sides of the board 2 with a configuration which is not uniform and which presents edges near the upper and lower faces of the board. It is desirable that these edges be eliminated and this is accomplished, according to the present invention, by the use of filler strips such as that designated by the numeral 16, on each side of the forward end portion 3 of the board 2. Each of the filler strips is tapered in a lateral direction so that its forward end is much thicker than its rear end. Moreover, the outer face 18 of each filler strip is flat and its inner face 20 preferably conforms in curvature to the inwardly bowed portions of the side walls 14 of the tubes 8. Thus, when the filler strips 16 are positioned adjacent the outermost side walls of the outermost tubes 8 of the board 2, the side of the board 2 is smooth and uniform throughout its entire length. The filler strips 16 may be secured in position by means of screws, or the like, passing through holes 22 in the filler strips and cooperating with threaded holes 24 in the adjacent tubes 8.

The tubes 8 are connected together by an end cap 26, and by one or more bolts or rods 28. The end cap 26 fits over the forward ends of the tubes 8 and is secured to the tubes by screws or bolts 30 which pass through holes 32 in the end cap 26 and through holes 34 in the tubes 8. As will be apparent, the end cap 26 serves the additional function of covering the exposed outer edges of the tubes 8 and the filter strips 16 so as to minimize the likelihood that a performer might be injured by such edges.

As shown in Fig. 4, each of the elongated bolts 28 extends through aligned openings 36 in the side walls 14 of the several tubes 8, and its ends are disposed to bear against the inner side walls of the outermost ones of the tubes 8 in the board 2. One or both of the ends of the bolt 28 may be in the form of a nut, or the like, which may be adjusted so as to clamp the tubes 8 together so that they will act as a unitary structure.

Access to the ends of the bolt 28 may be had through openings 38 in the outer side walls of the outermost tubes 8. These openings 38 are sufficiently large to permit the insertion of some suitable bolt engaging element, such as a socket type wrench, into the interior of the outermost tubes 8 for cooperation with the ends of the bolt 28, when it is desired to vary the tension in the bolt 28. Normally, however, the openings 38 are closed by removable plugs 40 which may be snapped into position with respect to the holes 38 when desired. The plugs 40 conceal the bolt ends from view and minimize the likelihood that unauthorized persons will be tempted to tamper with the bolts 28.

Although an embodiment of the invention has been described in considerable detail, it will be apparent that various modifications and alterations may be made by persons skilled in the art without departing from the principles of the invention. It is intended, therefore, that the foregoing description be considered as exemplary only and that the scope of the invention be ascertained from the following claims.

I claim:

1. A diving board having a vertically tapered forward end portion and a rear portion of substantially constant thickness, comprising a group of elongated tubes disposed in side-by-side relation and extending substantially the full length of the board, each of said tubes having spaced apart top and bottom walls and side walls integrally connected with the lateral edges of said top and bottom walls, said top and bottom walls of each tube being disposed in converging relation in the forward end portion of the tube and being substantially parallel along the remaining portion of the length of such tube, said side walls of each tube being substantially straight in said remaining portion of the length of the tube and being bent inwardly in said forward end portion to reduce the height of the tube in conformity with the convergence of said top and bottom walls, and means rigidly connecting said tubes together.

2. A diving board having a vertically tapered forward end portion and a rear portion of substantially constant thickness, comprising a group of elongated metal tubes disposed in side-by-side relation and extending substantially the full length of the board, each of said tubes having spaced apart top and bottom walls and side walls integrally connected with the lateral edges of said top and bottom walls, said top and bottom walls of each tube being disposed in converging relation in the forward end portion of the tube and being substantially parallel along the remaining portion of the length of such tube, said side walls of each tube being substantially straight in

the said remaining portion of the length of the tube and being bent inwardly in said forward end portion to reduce the height of the tube in conformity with the convergence of said top and bottom walls, means rigidly connecting said tubes together, and tapered filler strips secured to the inwardly bent portions of the exposed side walls of the outermost tubes of said group and having external surfaces forming smooth continuations of the straight portions of such side walls.

3. A diving board comprising a group of identical one-piece metal tubes disposed in side-by-side relation and extending substantially the full length of the board, each of said tubes having spaced apart top and bottom walls of constant width and side walls connecting the lateral edges of the top and bottom walls together, said top and bottom walls of each tube being disposed in longitudinally converging relation in the forward end portion of the tube and being substantially parallel along the remaining portion of the length of such tube, said side walls of each tube being substantially straight and perpendicular to said top and bottom walls in said remaining portion of the length of the tube and being bowed inwardly in said forward end portion to reduce the height of the tube in conformity with the convergence of said top and bottom walls, filler strips attached to the bowed portions of the outer side walls of the outermost tubes in said group and having outer faces which form smooth continuations with the straight portions of such side walls, the straight portions of the side walls of all of said tubes having laterally aligned apertures therein, bolt means extending from the interiors of said outermost tubes through said aligned apertures to secure all of said tubes together, and removable closure means cooperating with the apertures in the outer side walls of said outermost tubes to restrict access to said bolt means.

4. An elongated one-piece metal tube having a tapered end portion and adapted to be used in a diving board,

comprising spaced apart top and bottom walls of constant width, and side walls connecting the lateral edges of said top and bottom walls together, said top and bottom walls being disposed in longitudinally converging relation in said tapered end portion of the tube and being substantially parallel along the remaining portion of the length of the tube, said side walls being substantially straight and perpendicular to said top and bottom walls in said remaining portion of the length of the tube and being bent inwardly toward the axis of the tube in said tapered end portion to reduce the height thereof in conformity with the convergence of said top and bottom walls.

5. A tapered diving board comprising a group of one-piece elongated tubes disposed in side-by-side contacting relation and extending substantially the full length of the board, each of said tubes having integral top, bottom and sidewalls, said top and bottom walls of each tube being substantially flat and disposed in longitudinally converging relation in the forward end portion of the tube, said side walls of each tube rigidly connecting the lateral edges of said top and bottom walls together along the entire length of the tube and being bowed inwardly in said forward end portion to reduce the height of the tube in conformity with the convergence of said top and bottom walls, and means rigidly connecting all of said tubes together.

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