Sept. 10, 1957 R. C. RUDE 2,805,859

METAL SPRINGBOARD

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FIG. 1.

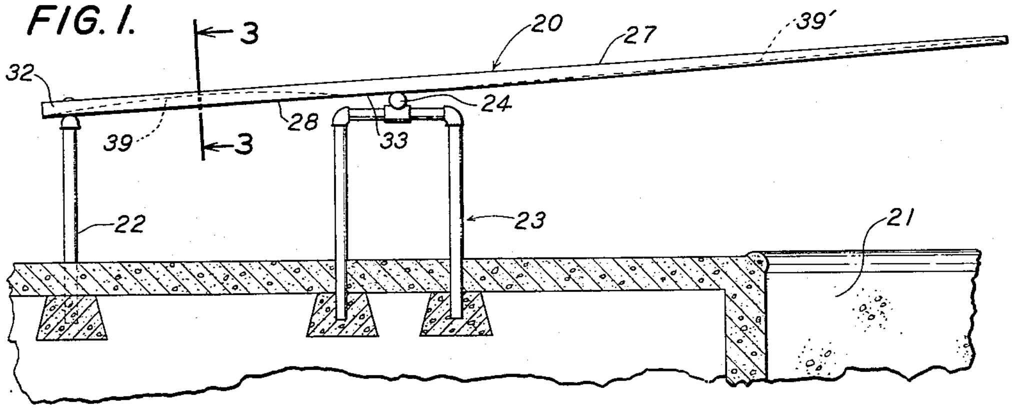

FIG. 2.

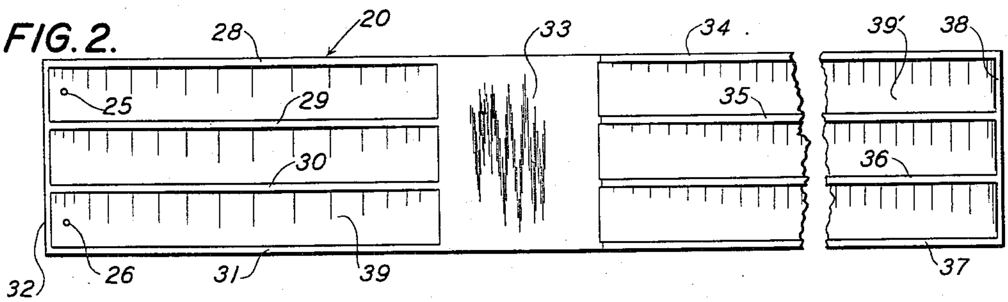

FIG. 3.

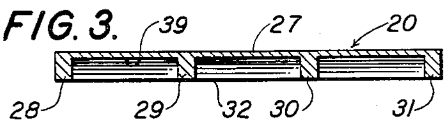

FIG. 4.

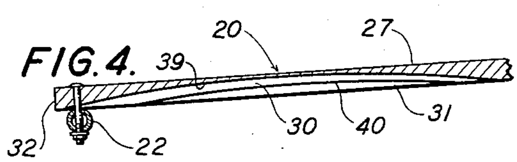

FIG. 5.

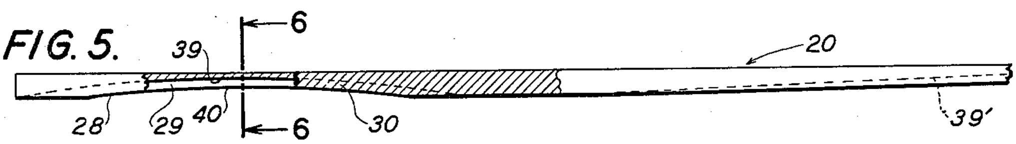

FIG. 7.

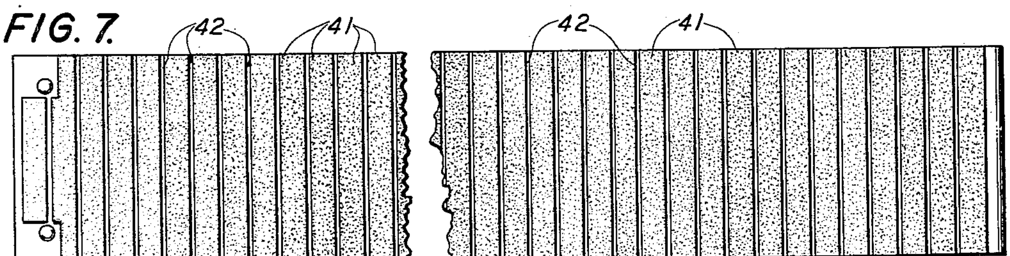

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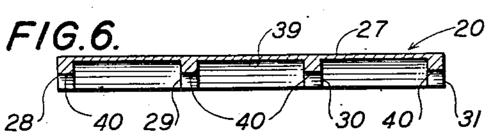
FIG. 6.



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METAL SPRINGBOARD

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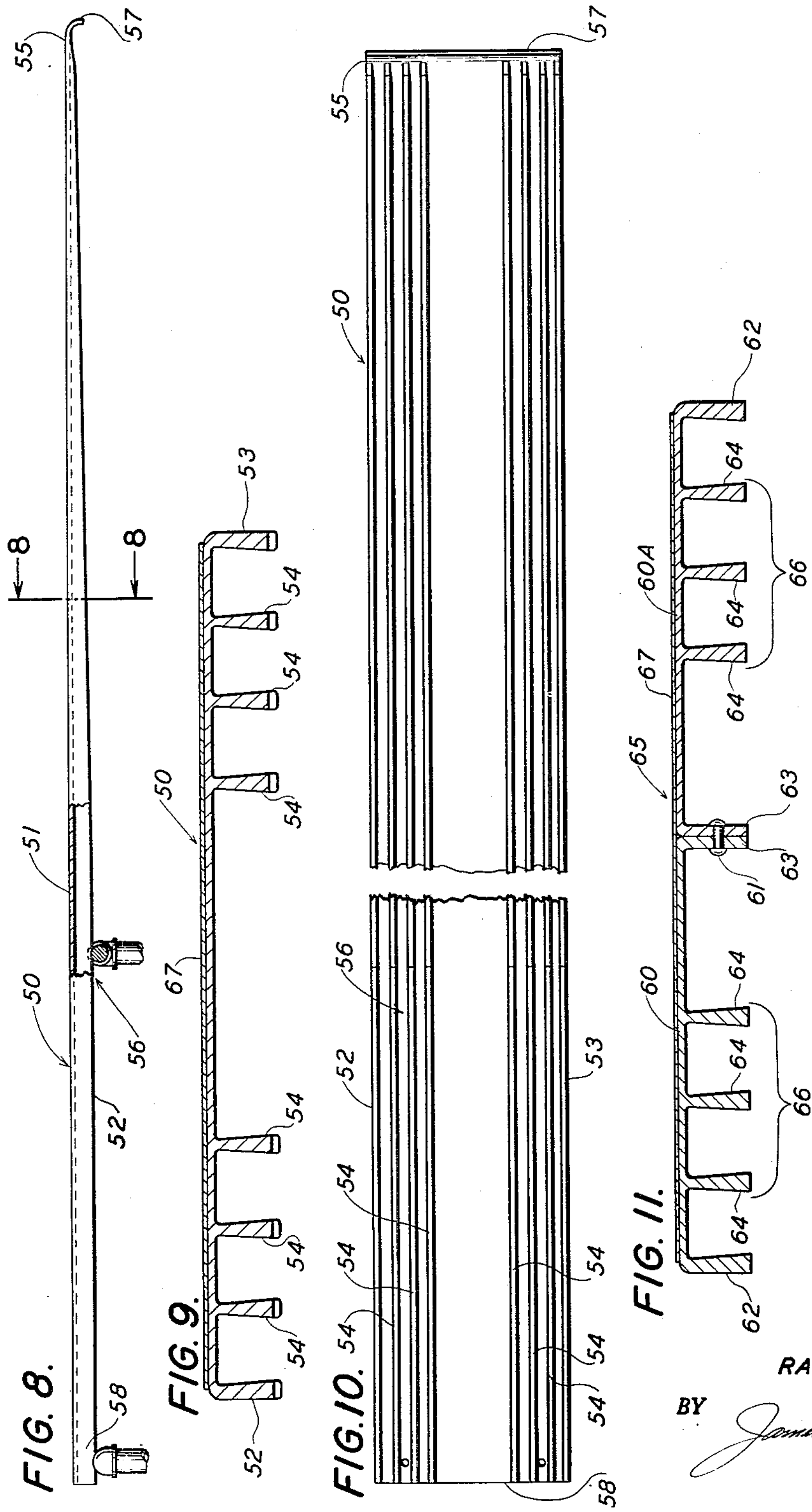

FIG. 8. FIG. 9. FIG. 10. FIG. 11.

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METAL SPRINGBOARD

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6 Claims. (Cl. 272—66)

This invention relates to improvements in spring boards and particularly to metal springboards for private and public swimming pools.

The average wooden springboard has a maximum life of two years with normal maintenance attention, but may be useable for only six months if neglected or used in a very arid region.

The preferred board of my invention is made from aluminium alloy or similar metal stock and therefore presents no maintenance problems. Deflection tests indicate a minimum life of ten years for a board formed from 24 ST aluminum alloy material. Similar longevity can be expected of boards made from suitable allied alloys like 61 ST, 75 ST or 75 ST–6.

A conventional wooden board must be from 12 feet to 16 feet long to provide competent divers with the desired deflection and resilience for good diving. Boards of this length are very difficult to accommodate in the relatively small area usually allocated for private home pools. A ten foot board made according to my invention provides the diving qualities of a sixteen foot board of conventional design, and is therefore better adapted to home pool use.

The preferred form of the invention is a metal springboard which is adapted to be supported by conventional anchoring means at one end. Between its ends the board is supported by fulcrum means in the usual manner. The board comprises a top plate having a flat upper surface extending from end to end of the board. A plurality of longitudinally extending spaced parallel ribs are formed integrally with the top plate on the under side of the plate.

Preferably the top surface of the board is made slipproof by covering its surface, which may be painted, with transverse closely spaced, narrow abrasive strips. Such strips are commercially available with adhesive backing, or may be applied with a suitable binding agent. An alternate method of slip-proofing the board is to paint its upper surface with a sand-filled paint.

A board of the above described configuration may be extruded by means of suitable dies, or may be milled from flat stock in a milling machine capable of handling the average 18″ board width. In accordance with preferred practice the board is fabricated from a single piece of metal.

An alternate means of fabrication is to form substantially similar ribbed portions which are assembled to form a top plate comprising two sections which abut and are held together along a line parallel to the longitudinal center line of the board, extending from end to end. It is important that the board be free of any transverse joints.

The ribbed configuration achieved by any of the above methods has advantages not found in previous boards.

The vertical thickness of selected ribs can be reduced to increase the deflection of the board. This makes possible a wide range of pre-selected deflections. Any chosen degree of deflection will remain substantially constant throughout the life of the board because of its design and material.

A very high safety factor is inherent in such a metal board because the board will bend almost to the water before faulting, while the conventional board heretofore had an average safety factor of only 2.

The strength of the ribbed board makes possible a slimmer, clean-lined board of more than usual esthetic appeal.

These and other advantages of the invention will be apparent from the following detailed description and drawing, in which:

Fig. 1 is an elevation of a typical installation of a board made according to the invention;

Fig. 2 is a fragmentary bottom plan view of the board of Fig. 1;

Fig. 3 is a sectional elevation taken along the line **3—3** of Fig. 1;

Fig. 4 is a fragmentary longitudinal section of a modified form of the board of Fig. 1;

Fig. 5 is an elevation partly in section of a further modification of the board of Fig. 1;

Fig. 6 is a transverse section taken along line **6—6** of Fig. 5;

Fig. 7 is a plan view of a board with the preferred form of non-slip surfacing;

Fig. 8 is a side elevation of the preferred embodiment of the invention;

Fig. 9 is a sectional elevation taken along line **8—8** of Fig. 8;

Fig. 10 is a fragmentary bottom plan view of the board of Fig. 8; and

Fig. 11 is a sectional elevation of a board in accordance with the invention fabricated from two formed longitudinal sections.

Fig. 1 is an elevation of a metal springboard **20** that is formed from a single plate of lightweight resilient metal such as 24 ST aluminum alloy. The board as illustrated is mounted at the edge of a pool **21** by means of an anchoring support **22** and a fulcrum frame **23** which has a conventional movable transverse fulcrum bar **24**. Two holes **25**, **26** through the end of the board provide means for fastening the board to the anchoring support **22**. The invention is not concerned with refinements of anchor and fulcrum construction.

The bottom of the solid plate has wide arching slots therein so that the board has a top plate **27** of varying vertical thickness strengthened by integral ribs that are parallel and extend longitudinally along the bottom of the plate. There are four ribs **28**, **29**, **30**, **31** between an anchored end **32** of the board and a flat fulcrum surface **33** and four forward ribs **34**, **35**, **36**, **37** extending from the fulcrum surface to the outer unsupported end **38**.

As shown in the dotted lines in Fig. 1, the top plate has a bottom surface **39**, **39′** between the ribs that arches from the anchored end **32** of the board to the fulcrum surface **33** which extends on either side of the fulcrum bar, and then diminishes in vertical thickness from the fulcrum surface to the outer end 38 of the board. The fulcrum surface is parallel to the top surface of the plate 27 and affords a continuous bearing area for the movable fulcrum bar 24.

The forward ribs 34, 35, 36, 37 of the board in Fig. 1 are formed on a uniform taper beginning at the fulcrum surface and continuing to the outer end of the board. The taper of the ribs is less than the taper of the bottom surface 39' of the top plate. The rear ribs are uniform and have bottom surfaces substantially parallel to the upper surface of the top plate. All of the ribs are equally spaced and relatively thin compared to the board width (see Figs. 2 and 3).

In Fig. 4 the board of Figs. 1 to 3 has been modified to provide greater per unit length flexibility. The vertical thickness of the inner pair of rear ribs 29, 30 has been diminished by an arching cut 40 the width of each rib and extending from the anchored end of the board to the fulcrum surface. The arch of the cut is greatest at the midpoint between the anchored end and the fulcrum surface. The reduction in strength at this point is sufficient to give the modified board markedly different performance when compared with the board of Fig. 1.

If still more flexibility is desired, as may be true if lighter divers use the board, or where extremely short boards are required, the thinning cut is milled in both inner ribs 29, 30 and outer ribs 28, 31 as illustrated in Figs. 5 and 6.

Conventional non-slip surfaces such as coco matting are bulky and therefore not in harmony with the trim lines of the metal board. Fig. 7 illustrates the use of a plurality of narrow abrasive strips 41 to provide a safe surface for divers using the board. The strips are fixed transversely to the painted top surface of the board along its entire length. Each strip is separated from the adjoining strips by a small transverse interval 42 to increase the gripping characteristics of the surface. The non-slip qualities of the abrasive surface of the strips 41 is not in itself sufficient guarantee of safe footing. However, when the strips are applied across the width of the board with a relatively narrow interval between the strips, the intervals provide sufficient additional friction to insure safe footing.

The preferred form of the invention is best illustrated in Figs. 8, 9 and 10. Board 50 shown in these figures is made from extruded ribbed stock, which has a top plate 51 of uniform thickness from end to end. Two longitudinal outer ribs 52, 53 form the sides of the board. Adjacent each outer rib and parallel to it are three inner ribs 54 of equal vertical thickness. The ribs are placed nearer the outer edge of the board than they are to the center of the board in order to eliminate any tendency toward canting at the unsupported end 55 of the board.

All ribs taper uniformly from just forward of the fulcrum area 56 to a point adjacent the outer end of the board. At the end 55 of the board the rib portion is cut away and the top plate 51 is bent downwardly in an arc to form a smooth lip 57.

The board is supported in the same manner as the board of Fig. 1 except that the bottom surfaces of the ribs form the fulcrum surface of the board.

The flexibility of the extruded board may be increased by reducing the vertical thickness of one or more of the ribs in the area between the anchored end 58 and the fulcrum area 56 in a manner similar to that shown in Figs. 4 and 5.

The board of the invention may be made of more than one piece, although unitary construction is preferred for reasons of cost and durability. A two piece board of the extruded type is shown in Fig. 11.

Two extruded sections 60, 60A having opposite, but similar configuration are held together as by rivets 61 shown in Fig. 11. Each section has a pair of parallel longitudinal outer ribs 62, 63 and three inner longitudinal ribs 64 which are parallel to the outer ribs. The inner ribs 64 are spaced equally from each other and are asymmetrically located with respect to the longitudinal center line of their respective extruded section.

The sections are assembled to form a board 65 so that the inner rib cluster 66 of each section is near the outer side 62 of the assembled board. It is important to assemble the component sections of the board on a longitudinal line to obviate the stresses that would bear on the fastening members if the sections abutted transversely. The fastening members of a transverse joint would be subject to the flexure load of the bending board. Since the fastening members of a longitudinally joined board are free from shear stress the board will have a materially longer life. After the extruded sections 60, 60A are assembled, the board 65 is machined to the desired configuration in the manner described for the embodiment of Figs. 8, 9 and 10.

Both of these latter embodiments may be covered with a number of abrasive strips 67 to provide a non-slip upper surface.

The embodiment of Fig. 8 is preferred because of its adaptability to mass production methods, but any board manufactured according to the invention will be superior to conventional wooden or metal boards in flexibility for a given length, durability, maintenance, cost, and safety.

I claim:

1. A metal diving board having an anchoring end, a flexing end and a fulcrum section spaced a substantial distance from both ends, the board comprising a continuous flat plate forming a top and bottom surface of the board, a plurality of longitudinally extending parallel ribs formed integrally with the plate on either side of the longitudinal centerline of the board and on the underside of the plate to project normally from the bottom surface and spaced transversely so that a majority of the plurality of ribs on either side of the longitudinal centerline of the board are at a lesser distance from the sides of the board than from the centerline, the section modulus of the fulcrum section being substantially the same as that of the anchoring end and the vertical thickness of at least a majority of the ribs on each side of the centerline diminishing continuously from the outboard end of the fulcrum section to the flexing end of the board.

2. A diving board in accordance with claim 1 comprised of two substantially identical longitudinal halves fastened together along the longitudinal centerline of the board.

3. A metal diving board having an anchoring end, a flexing end and a fulcrum section spaced a substantial distance from both ends, the board consisting of a continuous flat plate forming a top and bottom surface of the board, a plurality of longitudinally extending spaced parallel ribs formed integrally with the plate on either side of the longitudinal centerline of the board and on the underside of the plate to project normally from the bottom surface, the section modulus of the fulcrum section being substantially the same as that at the anchoring end and the vertical thickness of at least a majority of the ribs on each side of the centerline diminishing continuously from the outboard end of the fulcrum section to the flexing end of the board.

4. A metal diving board having an anchoring end, a flexing end and a fulcrum section spaced a substantial distance from both ends, the board comprising of a continuous flat plate forming a top and bottom surface of the board, a plurality of longitudinally extending spaced parallel ribs formed integrally with the plate on either side of the longitudinal centerline of the board and on the underside of the board to project normally from the bottom surface, the section modulus of the fulcrum section being substantially the same as that of the anchoring end and the vertical thickness of all of the ribs diminishing continuously from the outboard end of the fulcrum section to the flexing end of the board.

5. A diving board in accordance with claim 4 comprised of two substantially identical longitudinal halves

fastened together along the longitudinal centerline of the board.

6. A metal diving board having an anchoring end, a flexing end and a fulcrum section spaced a substantial distance from both ends, the board comprising a plate forming a top and bottom surface of the board, a plurality of longitudinally extending spaced parallel ribs formed integrally with the plate on either side of the longitudinal centerline of the board and on the underside of the board to project normally from the bottom surface substantially from end to end of the board, the plate being of increased thickness in the region of the anchoring end and the fulcrum section so as to merge with the lower edges of the ribs in these regions and to give the board a relatively

high section modulus of substantial equality in these regions, the vertical thickness of all of the ribs diminishing continuously from the outboard end of the fulcrum section to the flexing end of the board.

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