United States Patent [19]

McNeil

[11] E . **Re. 30,344**

[45] Reissued **Jul. 22, 1980**

[54] **ROUND TRAMPOLINE**

[75] Inventor: **Harold L. McNeil,** Tallahassee, Fla.

[73] Assignee: **Temple Baptist Church,** Tallahassee, Fla. ; a part interest

[21] Appl. No.: **893,350**

[22] Filed: **Apr. 4, 1978**

Related U.S. Patent Documents

Reissue of:

[64] Patent No.: **3,948,515**
Issued: **Apr. 6, 1976**
Appl. No.: **457,555**
Filed: **Apr. 3, 1974**

[51] **Int. Cl.**[2] **A63B 5/00**

[52] **U.S. Cl.** **272/65;** 182/139

[58] **Field of Search** 272/65, 136, 138, 142, 272/109, 76, 134; 182/139

[56] **References Cited**

U.S. PATENT DOCUMENTS

2,370,990	3/1945	Nissen	272/65
2,991,841	7/1961	Sampson et al.	272/65
3,767,192	10/1973	Ericksson	182/139 X

FOREIGN PATENT DOCUMENTS

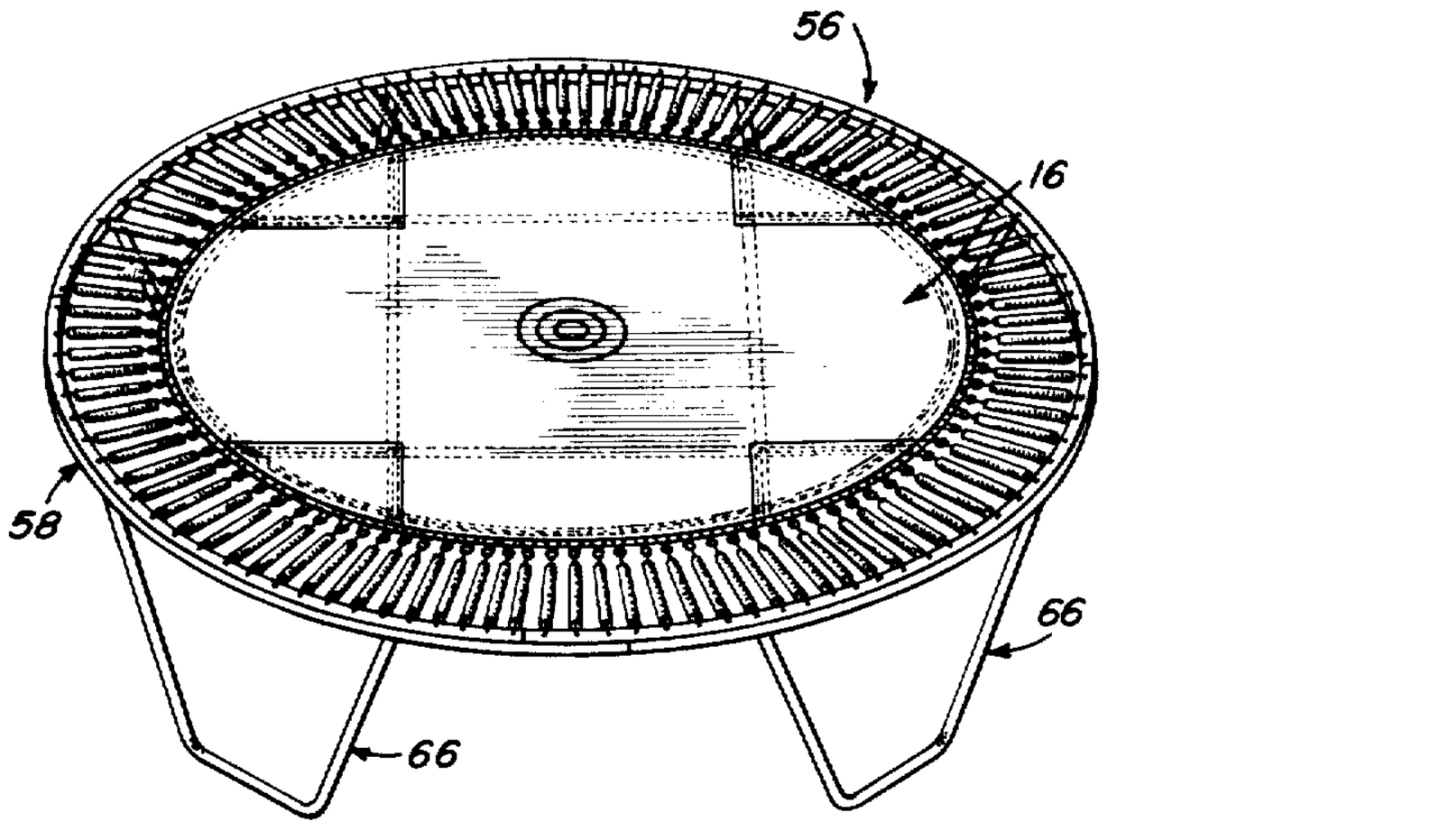
638735	3/1958	Canada	272/65

Primary Examiner—William R. Browne
Attorney, Agent, or Firm—Harvey B. Jacobson; Clarence A. O'Brien

[57] **ABSTRACT**

A round trampoline having a sectional, substantially circular frame to which a circular mat is resiliently attached to the frame by a plurality of radially arranged springs. The mat comprises a pair of strips arranged perpendicularly to one another to form a reinforced center jumping area. The frame sections advantageously fit together in a double joint arrangement which affords great rigidity to the structure. *The trampoline has sections forming the annular frame which are detachably connected to each other. At the ends of each section there is a portion of a generally U-shaped support member attached thereto and which extends downwardly below the frame rail. The portions of the generally U-shaped support that extend below the frame are detachably connectable with each other and secure the connection of the sections when joined with each other.*

7 Claims, 15 Drawing Figures



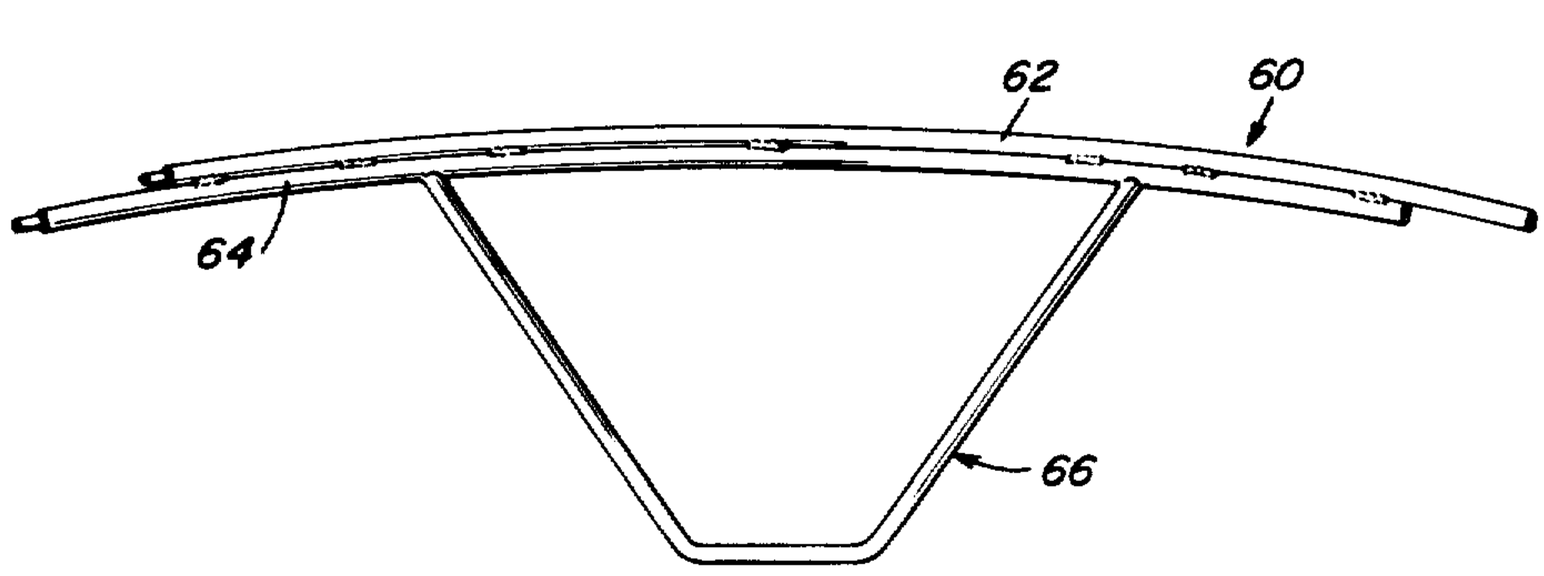


Fig. 1

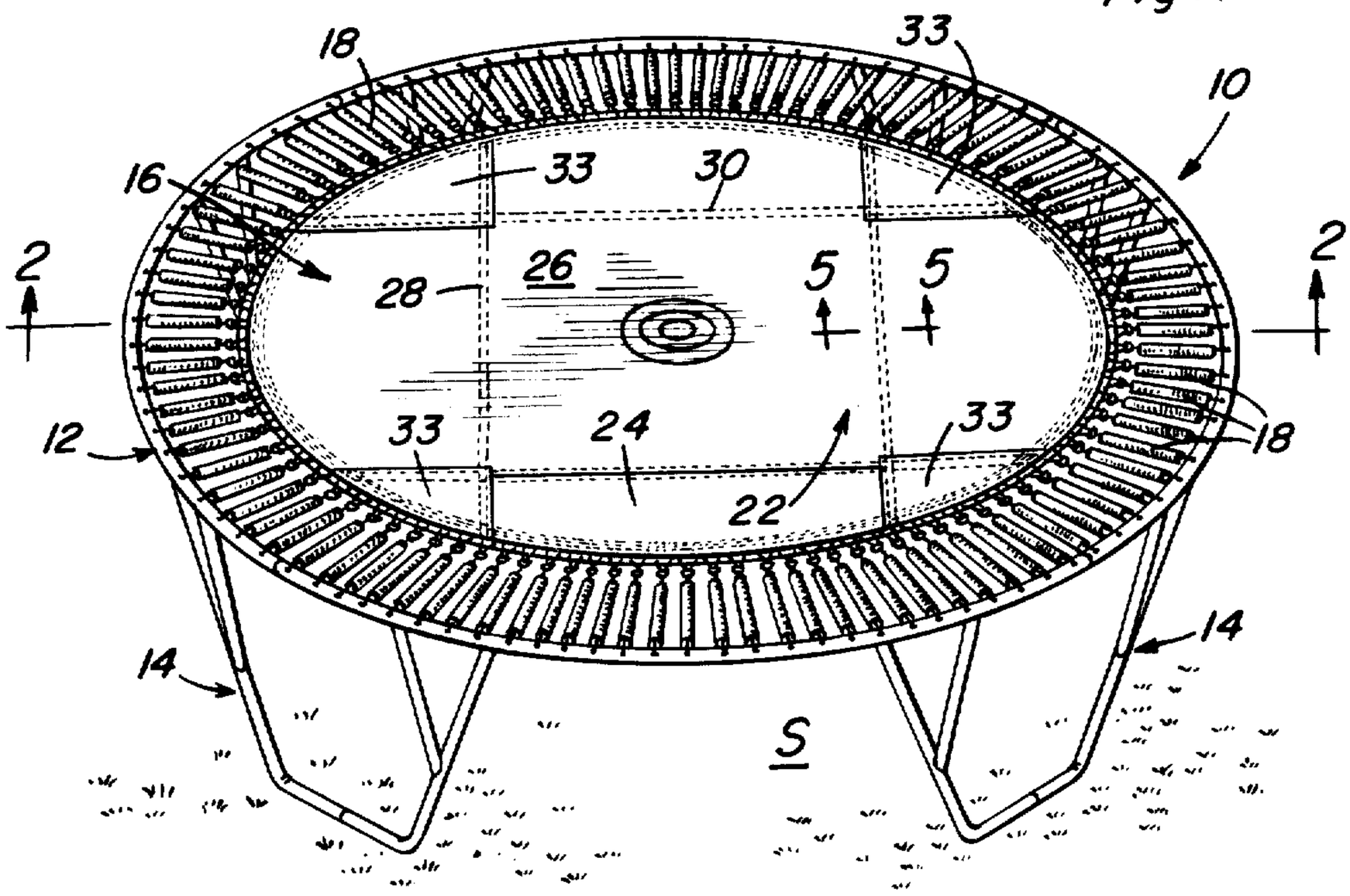


Fig. 2

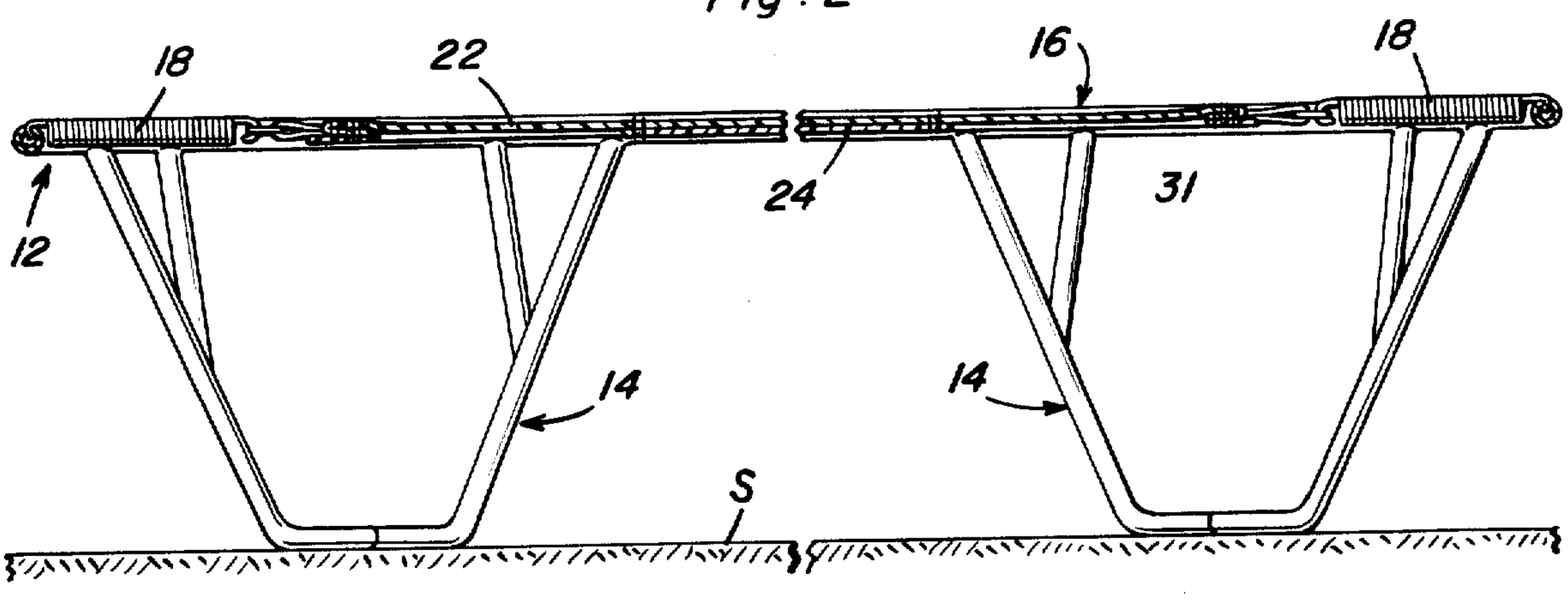


Fig. 3

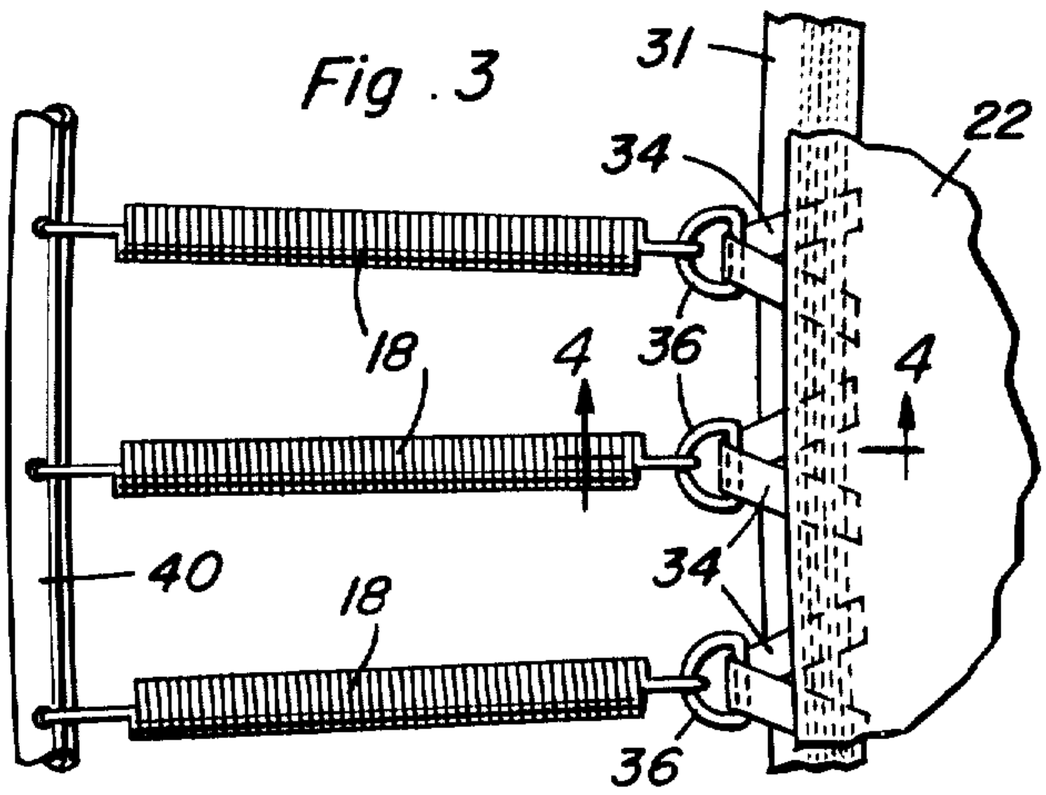


Fig. 4

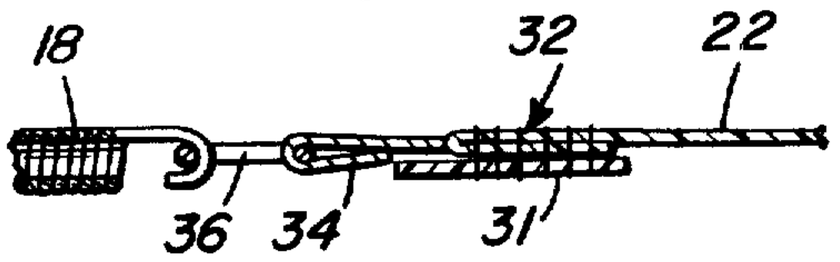


Fig. 5

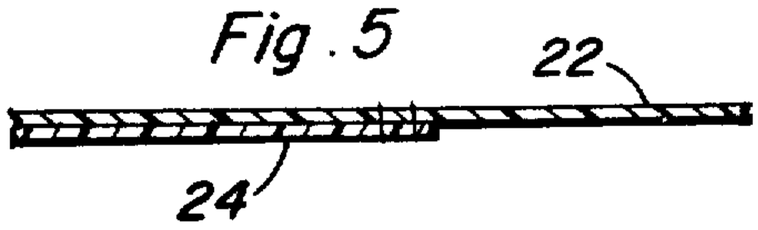


Fig. 6

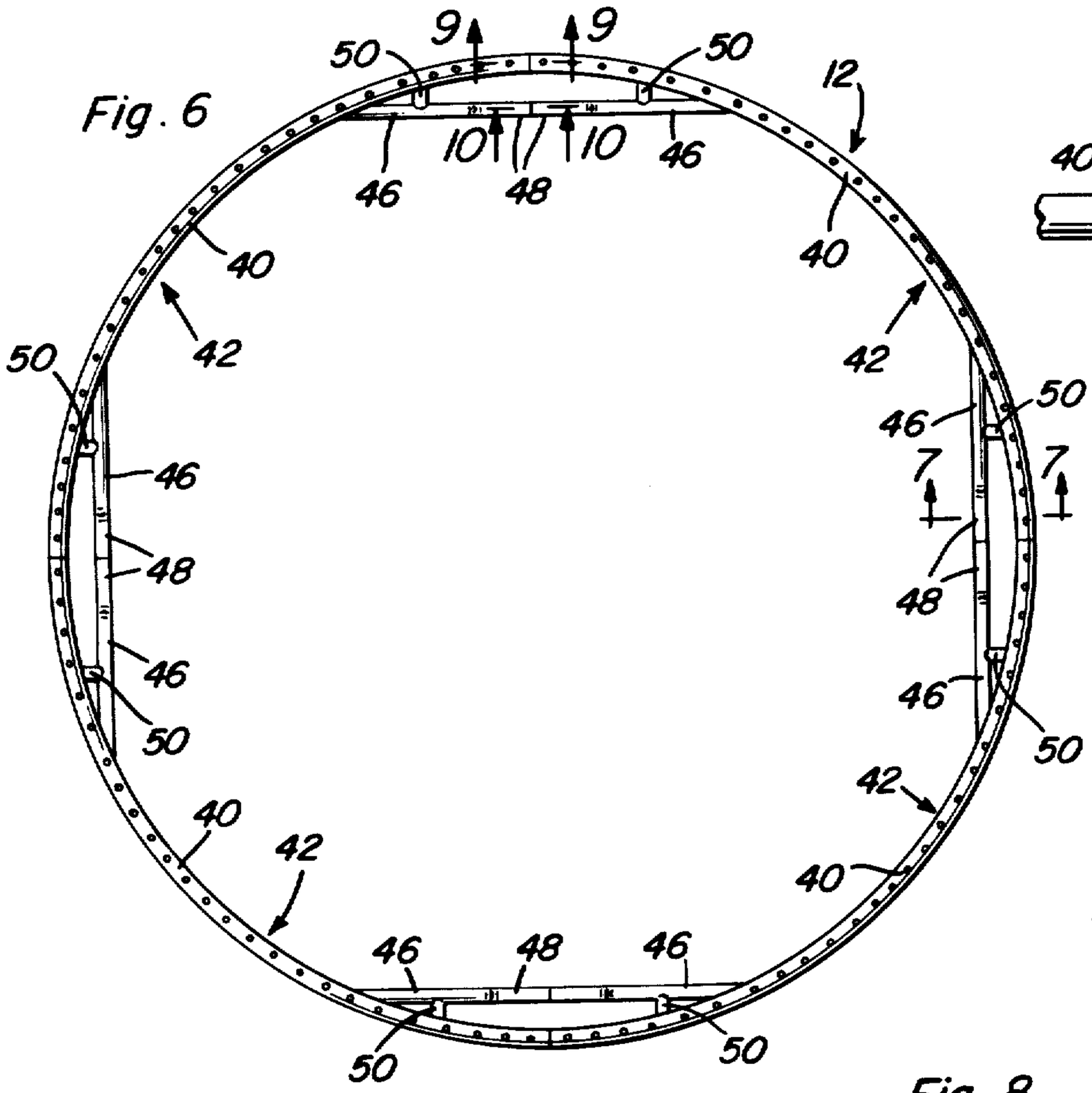


Fig. 7

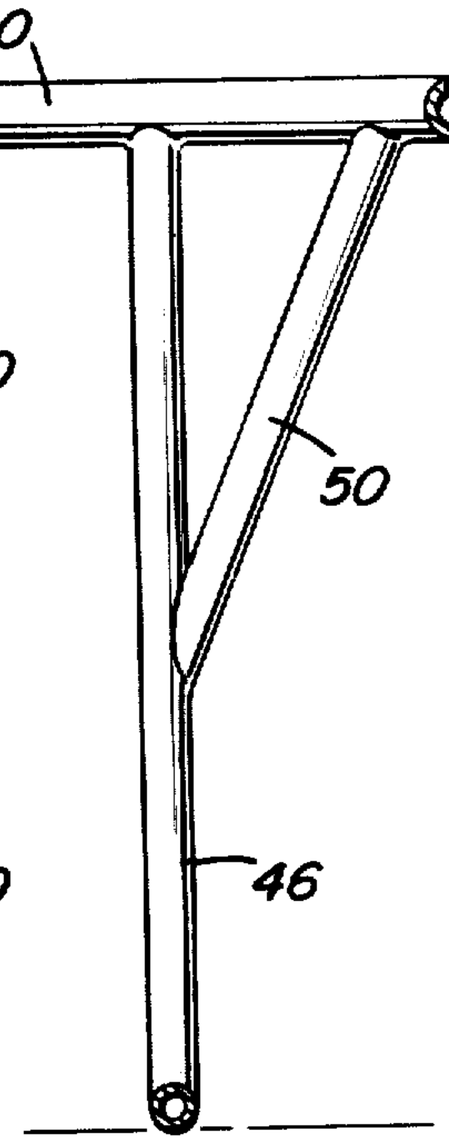


Fig. 8

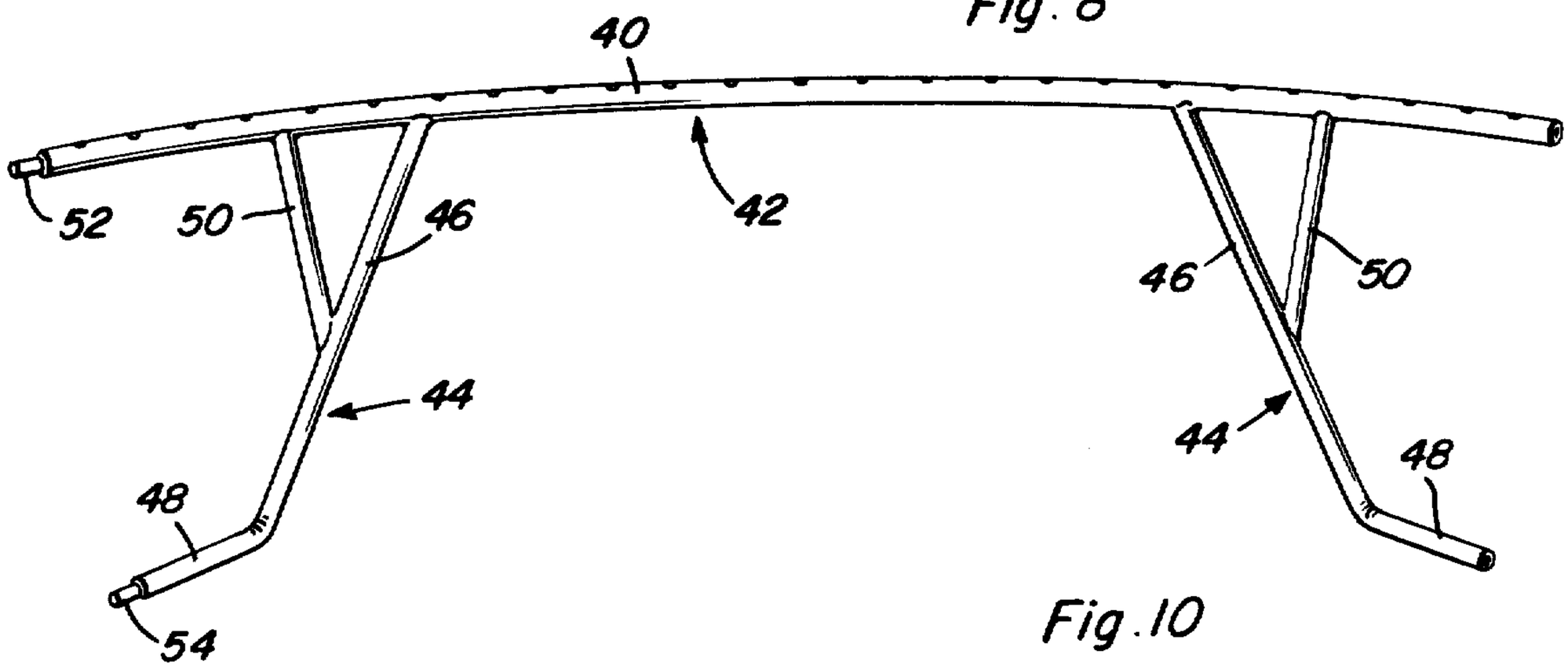


Fig. 10

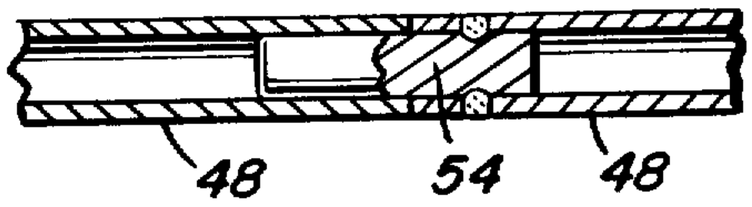


Fig. 9

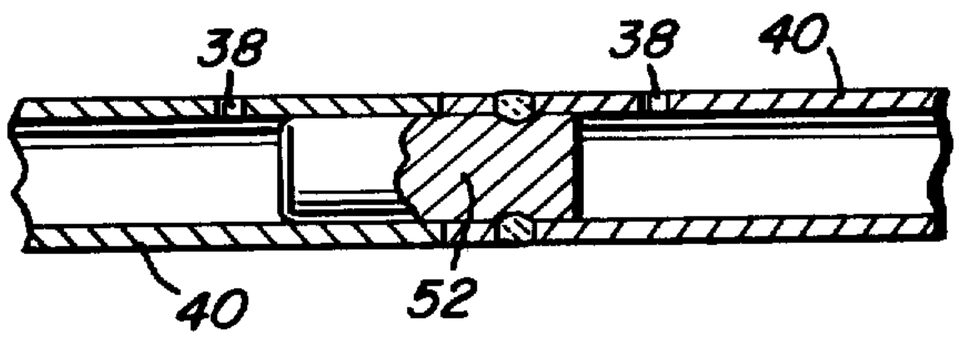
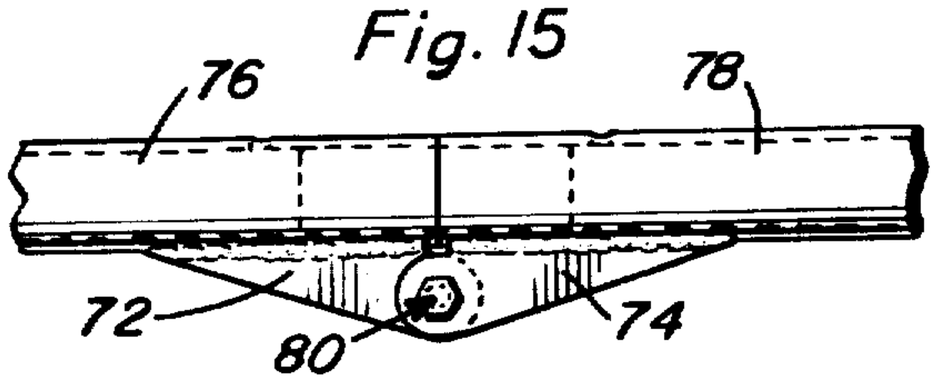


Fig. 15



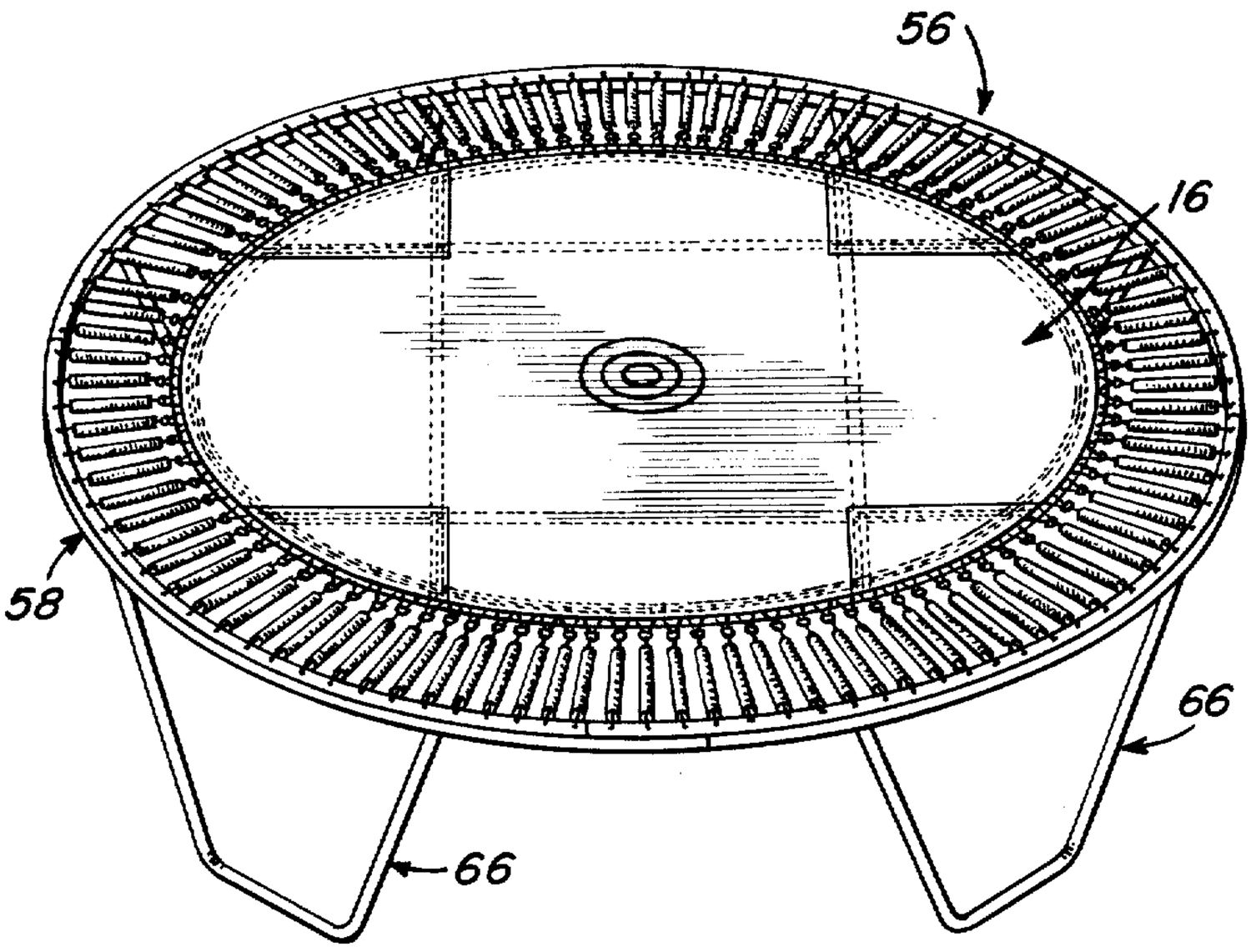


Fig. 11

Fig. 12

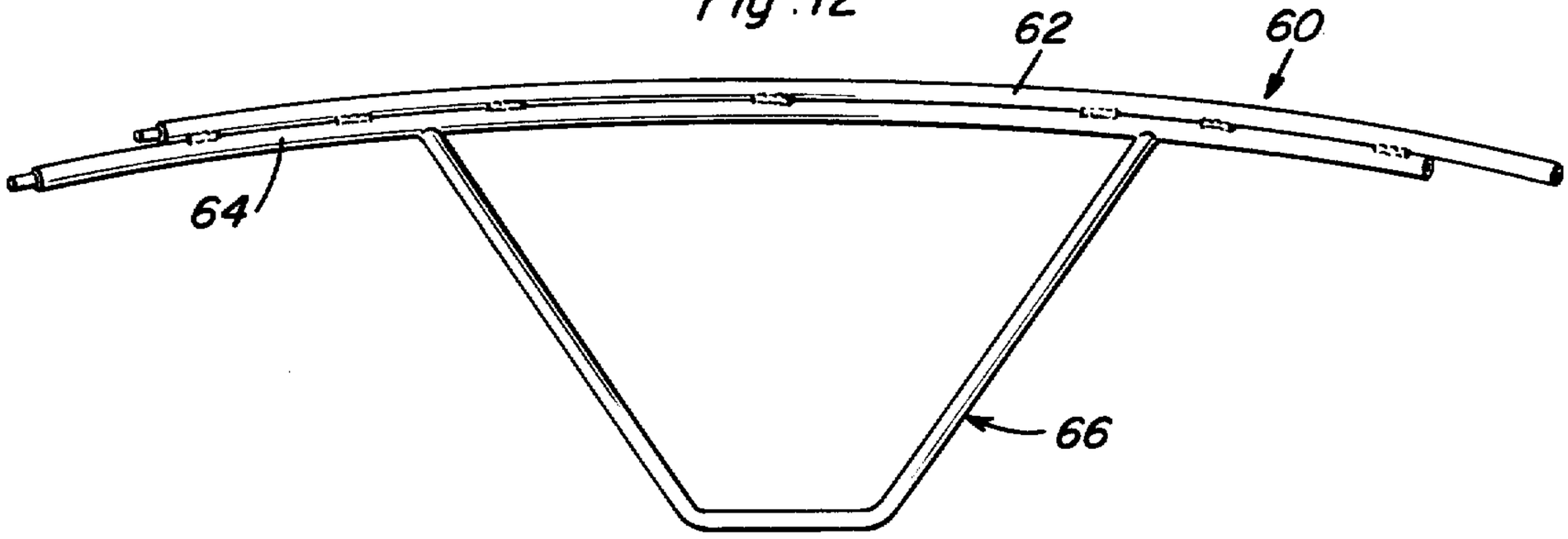


Fig. 13

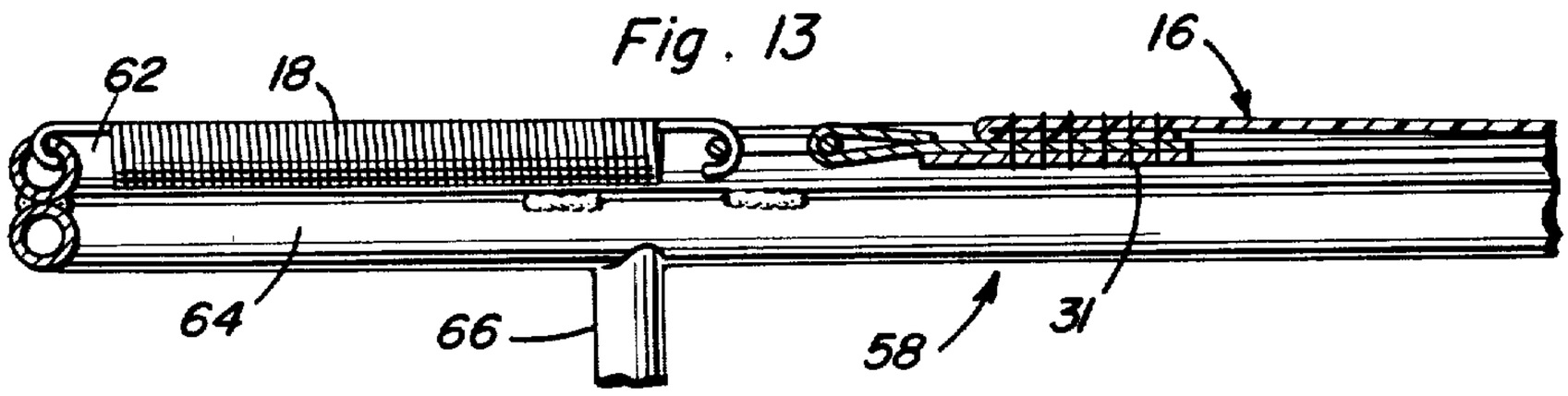
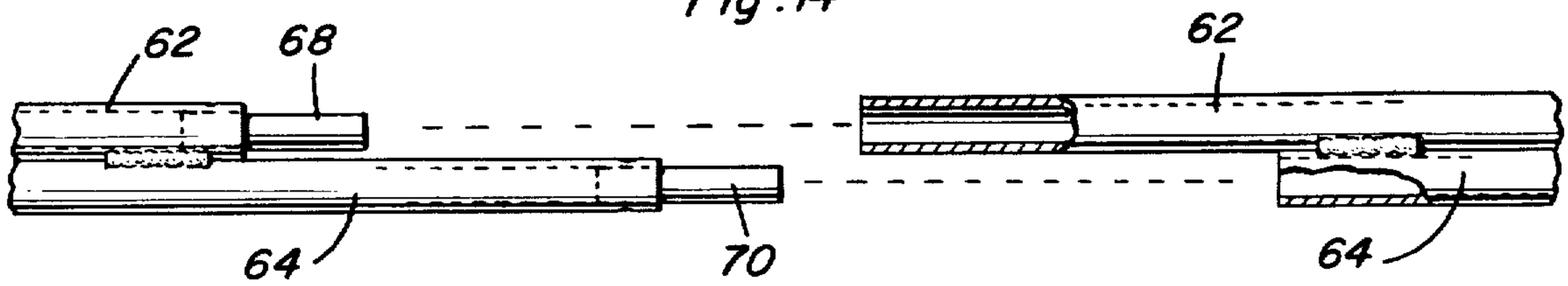


Fig. 14



ROUND TRAMPOLINE

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to play and gymnastic appliances, and particularly to a round trampoline.

2. Description of the Prior Art

The conventional rectangular trampoline creates difficulties in that the unequal distributions of stress on the periphery of the mat makes it almost impossible to maintain the mat in proper tension. Not only does this improper tension make the balance of the mat unpredictable and dangerous, but increases the wear and shortens the life of the mat as well.

In order to overcome the inherent drawback to the rectangular trampoline, round or circular trampolines have been proposed. See, for example, U.S. Pat. Nos. 3,767,192, issued Oct. 23, 1973 to M. E. Eriksson, and 3,031,688, issued May 1, 1962 to D. R. Southwood.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a round trampoline having an improved frame affording simple yet rigid construction.

It is another object of the present invention to provide a round trampoline having a frame formed by a plurality of sections so that the frame may be broken down into its sections for facilitating handling and storage of the frame.

It is still another object of the present invention to provide an improved mat for a round trampoline which will afford optimum stress distribution and reinforcement.

These and other objects are achieved according to the present invention by providing a round trampoline having: a sectional, substantially circular frame; leg sections associated with the frame section for supporting the frame on a support surface; coupling arrangements for connecting the sections together; a mat; and a plurality of springs for connecting the mat to the frame.

One preferred frame according to the present invention is formed by a plurality of sections including a single rail adjacent the ends of which is attached one leg and a portion of the base of a leg section. These leg section halves are arranged to cooperate when the rail of a respective frame section is connected to the rail of another frame section so as to form a complete U-shaped leg section. Connection of the frame sections both at the adjoining rails and at the adjoining base portions of the leg section provides for a rigid structure resistant to rotation about the bases of the leg sections.

Another preferred frame construction according to the present invention includes a plurality of frame sections each formed by a pair of arcuate rails connected together to form a double rail frame. One of the rails is staggered with respect to the other rails in order to form a staggered joint with the rails of an adjoining frame section. This arrangement will lock the joint and prevent rotation or flexation of adjoining frame sections. The leg sections of this embodiment may be in the form of complete U-shaped structures provided one or more to each frame section.

An advantageous feature of the present invention is the provision of a mat which includes a pair of perpendicular strips. The perpendicular arrangement of the strips forms a heavily reinforced jumping area in the center of the mat.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view showing a preferred embodiment of a round trampoline according to the present invention.

FIG. **2** is a sectional view taken generally along the lines **2—2** of FIG. **1**.

FIG. **3** is a fragmentary, top plan view of the trampoline of FIGS. **1** and **2**.

FIG. **4** is a fragmentary, sectional view taken generally along the lines **4—4** of FIG. **3**.

FIG. **5** is a fragmentary, sectional view taken generally along the lines **5—5** of FIG. **1**.

FIG. **6** is a top plane view showing the frame of the trampoline of FIG. **1**.

FIG. **7** is a fragmentary, sectional view taken generally along the lines **7—7** of FIG. **6**.

FIG. **8** is a perspective view showing a single section of the frame shown in FIG. **6**.

FIG. **9** is a fragmentary, sectional view taken generally along the lines **9—9** of FIG. **6**.

FIG. **10** is a fragmentary, sectional view taken generally along the lines **10—10** of FIG. **6**.

FIG. **11** is a perspective view showing another preferred embodiment of a trampoline according to the present invention.

FIG. **12** is a perspective view showing one section of the frame of the trampoline shown in FIG. **11**.

FIG. **13** is a fragmentary, vertical sectional view showing a section of the frame of FIG. **11**, drawn to a larger scale.

FIG. **14** is an exploded, side elevational view, partly cut away and in section, showing the manner of coupling adjacent sections of the frame shown in FIGS. **11–13**.

FIG. **15** is a fragmentary, sectional view similar to FIG. **9** but showing a modified frame connection.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to FIGS. **1** and **2** of the drawings, a trampoline **10** according to the present invention has a sectional, substantially circular frame **12** provided with leg sections **14** which support frame **12** on a suitable support surface S. A substantially circular mat **16** is resiliently mounted within frame **12** as by a plurality of coiled springs **18**. Proper placement of springs **18** radially around frame **12** causes a jumper's (not shown) weight to be evenly distributed to all of the springs **18** with resulting longer spring life and the elimination of over stretching at the sides of mat **16**. Further, this arrangement will provide a natural physical action for moving a jumper toward the center of mat **16** due to the spring tension in all springs **18** being less when the bias on mat **16** is closest to the center thereof. Because

of this arrangement, a jumper has better body control due to the even distribution of a jumper's weight to all of the springs **18**.

Mat **16** includes a pair of strips **22** and **24** each having ends thereof curved to the same radius of the mat. The strips **22** and **24** are arranged perpendicular to one another for providing center jumping area **26**. Those edges of strips **22** where same is either adjacent to or traverses the other of the strips are advantageously stitched as shown at **28** and **30** in order to stabilize the mat. Advantageously, stitching **28** and **30** is a double stitching made with, for example, heavy duty nylon thread, and the like. As can be readily appreciated from FIG. **1**, jumping area **26** is thus reinforced by a double thickness of strips **22**, **24**.

Referring now to FIG. **5** of the drawings, the perimeter of mat **16** is advantageously a backing ring **31** arranged around the periphery thereof and is anchored to the end portion of strips **22**, **24** as by suitable stitching **32**. This stitching **32** may be, for example, six rows of high density nylon thread, and the like. Filler pieces **33** are stitched to the strip and ring to complete the mat. About ring **31** is arranged a plurality of straps **34** each provided with a conventional D-ring **36** arranged for receiving one hook-end of springs **18**. Ring **33** helps hold straps **34** in place. The other hook-end of springs **18** is arranged in a respective hole **38** provided in rail **40** of frame **12**. Although it is to be understood that the materials used may vary in dependence on specific circumstances, vinyl covered nylon of 22 ounces per yard combined with strips **22**, **24** constructed from mesh polypropalene 8.40 rated at 1220 pounds per square inch has been found satisfactory for a mat **16** having a diameter of approximately 11 feet.

Frame **12** is the rail **20** advantageously formed from, for example, four equal, arcuate sections **42**, which may be referred to as quarter sections. Each section **42** is provided adjacent the longitudinally spaced ends thereof with a part **44** of a leg section **14**. Each part **44** extends substantially vertically downward from frame **12** and has a leg **46** terminating in a base portion **48**. A vertical leg brace **50** completes part **44**. These elements are best seen from FIGS. **6–8** of the drawings.

Each leg section **14** is advantageously a U-shaped supporting member which extends substantially vertically, or straight down, from rail **40** of frame **12**. This orientation allows the base of the section **14**, the base being that portion formed by the cooperative mating of a pair of base portions **48**, to be inside the circumference of frame **12** for better support.

Tubes **52** (FIG. **9**) and **54** (FIG. **10**) are retained in the respective open ends of rail **40** and base portion **48** in a suitable manner, such as by the illustrated welds permitted by holes made in the pipe forming the respective rail and base portion. These tubes **52**, **54** will penetrate the open end of a rail and base portion of frame section **42** paired with the frame section **42** provided with the tubes. In this manner, the tubes **52**, **54** provide a coupling which forms a male-female joint. The key to construction of a round frame **12** according to the present invention depends on the ability to stabilize the joint of the top rail **40**. The divided leg union anchors rail **40** and prevents rotation and flexation thereof. The joints are advantageously in a common vertical plane, with the joint formed in the leg section base being substantially midway between the juncture of legs **46** with base portion **48**. The base of the leg sections **14** is substantially planar.

FIGS. **11–14** of the drawings show an alternative embodiment of a trampoline according to the present invention. This trampoline, designated **56** has a frame **58** divided into a plurality of frame sections **60**, each formed by a pair of adjacent and co-extending rails **62** and **64**. There are, for example, four sections as in frame **12**, with the arcuate rails **62**, **64** connected together to form a double rail. One of the rails **62**, **64** is staggered with respect to the other of the rails **64**, **62** in order to form a staggered joint with an adjoining frame section **60** and to lock the joint and prevent rotation or flexation of the adjoining section. Each frame section **60** is advantageously provided with a U-shaped leg section **66** affixed to the frame section in a suitable commonly known manner.

Frame sections **60** are advantageously connected together by malefemale couplings formed by tubes **68** and **70** in a manner similar to the formation of couplings by tubes **62** and **64**. This double rail coupling arrangement with staggered joints prevents rotation of the quarter sections **60** and accordingly of the entire frame **58**. The design and placement of leg section **66** given balance support to the quarter section **60**, and once again to the frame **58**. Frame **58** permits heavier construction than frame **12**, providing a trampoline **56** better suited for commercial applications and the like.

FIG. **15** shows a modification, which may be used with either frame **12** or **58**, having a pair of lugs **72** and **74** affixed to frame rails **76** and **78** in a conventional manner, such as welding, and provided with mating holes arranged for receiving a, for example, bolt and nut **80** to lock together rails **76**, **78** in such a manner as to ensure prevention of rotation of the frame section.

As can be appreciated from the above description and the drawings, a round trampoline according to the present invention is much safer than conventional rectangular trampolines because the side rails have been moved but to the full diameter of a circle. Accordingly, the mat will last longer due to a more even distribution of stresses at the edge thereof. Further, the round design of the trampoline frame makes bracing and reinforcing unnecessary. The even pull to the center of the mat during stress thereon allows the frame to remain still or steady. The spring tension on the round frame pulls together the joints coupling the frame sections so tightly that it practically eliminates squeaks and frame noise. While the trampoline may be set up for a full number of springs around the circumference thereof, as shown in FIGS. **1** and **11**, it is possible to eliminate by selective removal certain diametrically opposite springs in order to decrease the resilient force acting on the mat. While the number of springs employed may vary with the size and desired resiliency of the trampoline, for example, 100 springs have been found satisfactory for use with a trampoline having a diameter of approximately 13 feet.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A round trampoline, comprising, in combination:

a. a sectional, substantially circular frame, the frame including a plurality of sections each formed by a

pair of arcuate rails connected together to form a double rail, one of the rails staggered with respect to the other of the rails in order to form a staggered joint with an adjoining frame section and to lock the joint and prevent rotation or flexation of the adjoining sections;

b. leg means provided on the sections of the frame for supporting the frame on a support surface;

c. fastener means connecting the sections of the frame together;

d. a mat; and

e. resilient means for connecting the mat to the frame.

2. A structure as defined in claim 1, wherein the leg means includes U-shaped leg sections, with each frame section having a one of the leg sections affixed thereto.

3. A structure as defined in claim 2, wherein the fastener means includes a male-female coupling at each meeting point of adjacent rails.

4. A substantially round trampoline comprising a sectional, substantially annular frame including a frame rail formed by a plurality of sections, means joining the ends of adjacent sections, each section being detachably connected to the adjacent section and having depending therefrom leg portions, one leg portion detachably connected to a leg portion of the adjacent section so as to form a generally U-shaped trampoline support underlying the frame, a mat attached to the frame for projecting a person, the depending leg portions having upper ends rigidly connected with the frame rail sections in substantially equal longitudinally spaced relation to the joint between adjacent sections of the frame rail for preventing relative rotation between adjacent sections of the frame rail and preventing lateral bending of the frame rail the lower ends of the leg portions being detachably connected to one another; said U-shaped support bridging the joint between adjacent rail sections, bight portions of the legs forming the sole support for the trampoline and being generally in alignment with the frame rail, and means releasably joining the sections of the legs to enable assembly and disassembly of the frame rail sections and the leg portion so that when disassembled each section will have rigidly attached thereto a leg portion at each end thereof.

5. The structure as defined in claim 4 said mat being supported within said annular frame, said mat being substantially concentric with respect to the frame, a plurality of radial springs of equal length and equally spaced circumferentially between the mat and frame, said mat being constructed of a pair of perpendicular intersecting strips of flexible, fabric like material, thereby providing a dual thickness central jumping area, said springs exerting an inward force on said frame rail sections forming the sole means to retain the sections in assembled relation, said upper ends of the U-shaped leg being rigid with adjacent rail sections of the frame rail for preventing outward expansion of the frame rail.

6. The structure as defined in claim 4 wherein bight portions of the legs are spaced from each other circumferentially of the frame rail with bight portions being completely independent of each other and unconnected with the area circumferentially between and transversely between bight portions of the legs being devoid of obstructions.

7. A round trampoline comprising a sectional, substantially circular frame including a frame rail formed by a plurality of arcuate sections, means joining the ends of adjacent sections, a substantially rigid U-shaped leg underlying the frame rail and bridging the joint between each pair of adjacent sections with the U-shaped leg including upper ends rigidly affixed to adjacent sections of the frame rail in longitudinally spaced relation to the joint between adjacent sections of the frame rail for preventing relative rotation between adjacent sections of the frame rail and preventing lateral bending of the frame rail, each U-shaped leg including a pair of downwardly converging leg portions extending rigidly from the frame rail with the lower ends of the leg portions being interconnected by a bight portion bridging the joint between adjacent rail sections, the bight portions of the legs forming the sole support for the trampoline and being generally in alignment with the frame rail, said frame rail sections and legs being tubular, said means joining the ends of adjacent arcuate sections including a plug rigid with one of said frame sections and snugly telescoped into the end of an adjacent frame section, and a mat supported within said circular frame, said mat being substantially circular and concentric with respect to the frame, a plurality of radial springs of equal length and equally spaced circumferentially between the mat and frame, said mat being constructed of a pair of perpendicular intersecting strips of flexible, fabric like material, each strip having a width of approximately one-half of the diameter of the frame rail thereby providing a dual thickness central jumping area, the portion of the mat exteriorly of the central jumping area being of mesh construction to enable passage of air therethrough to prevent ballooning of the mat, and filler pieces of fabric like material connected to the side edges of the strips outwardly of the jumping area and combining with the strips to form a circular mat, said strips being of mesh polypropylene and the filler pieces and strips being stitched together along the side edges thereof, said springs exerting an inward force on said frame rail sections forming the sole means to retain the sections in assembled relation, said upper ends of the U-shaped leg being rigid with adjacent rail sections of the frame rail for preventing outward expansion of the frame rail.

* * * * *