United States Patent

Green

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[45] Dec. 5, 1972

[54] **BOLTLESS GYM SET**

[72] Inventor: **Martin Green,** 243 Franklin Turnpike, Mahwah, N.J. 07430

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[21] Appl. No.: **860,250**

[52] **U.S. Cl.** .....**248/165,** 287/54 B, 248/370

[51] **Int. Cl.** **F16m 11/32**

[58] **Field of Search**.....248/163, 165, 370, 440, 340, 248/341; 287/54 A, 54 B

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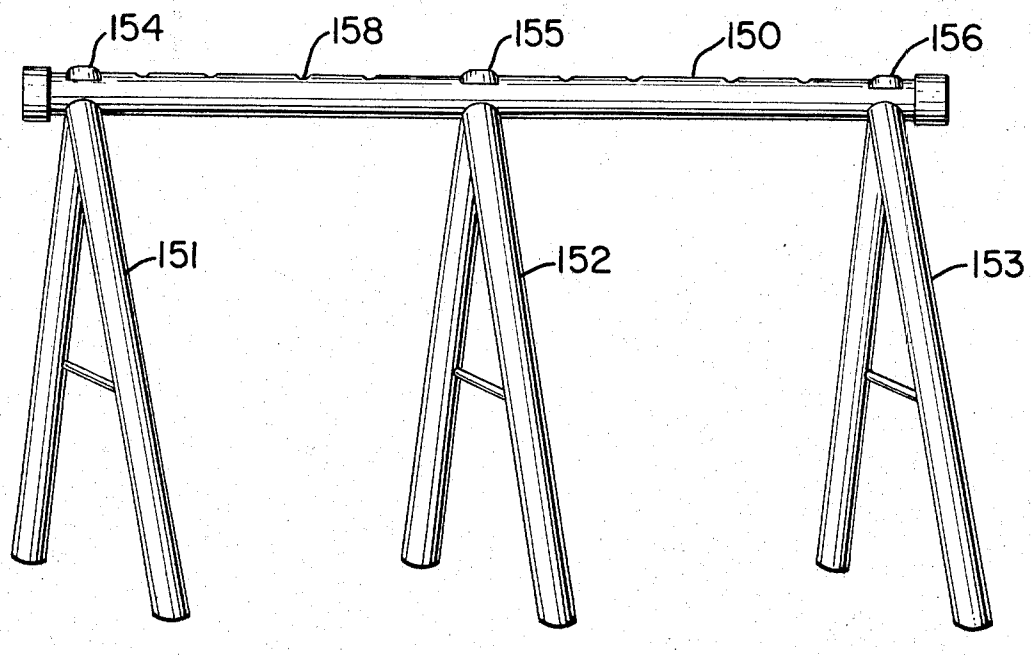
Primary Examiner—Marion Parsons, Jr.

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[57] **ABSTRACT**

A gym set having boltless joining members wherein one member interlocks into the other through gravity friction. This frame construction has plays that are connected to the top horizontal bar of the frame structure, the top bar of the structure having a minimum number of holes for receiving plays, thus allowing for a lighter gauge tubing while at the same time providing a stronger member. The end of one member of the structure having tapered, reinforced ends for insertion within a complementary opening in another member to provide tightening at the interlocked joint of the two members while in use. The top bar having reinforced members extending from its center to its ends, thus eliminating the need of an additional two legs for center support.

6 Claims, 30 Drawing Figures



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SHEET 1 OF 6

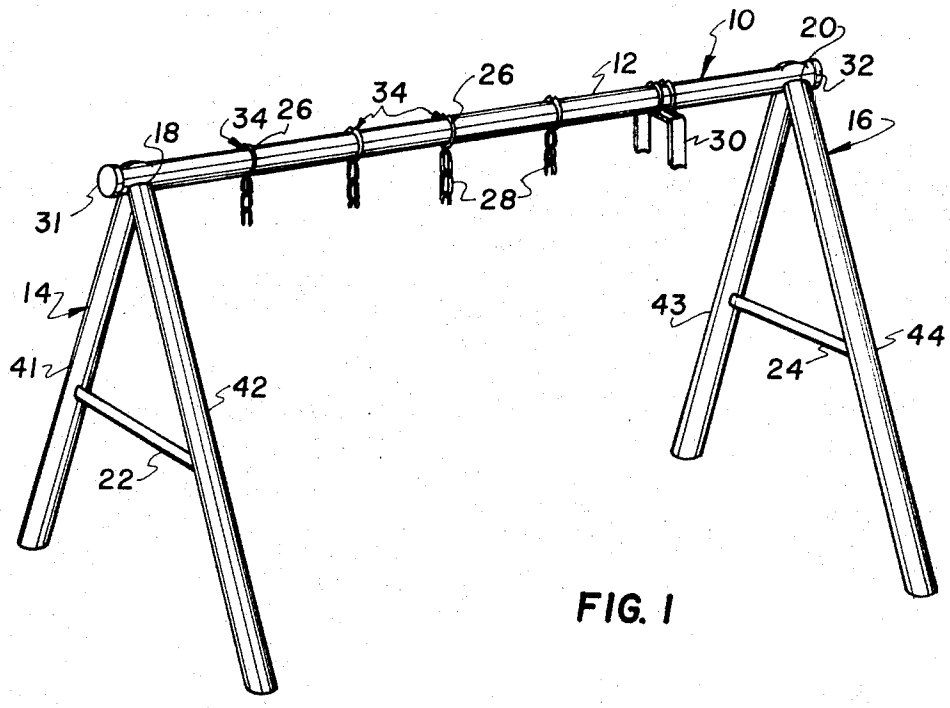


FIG. 1

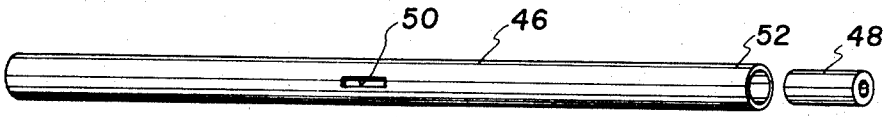


FIG. 2

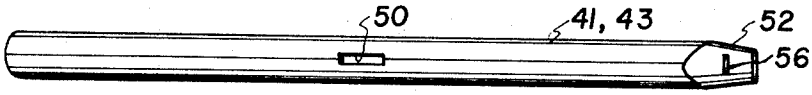


FIG. 3

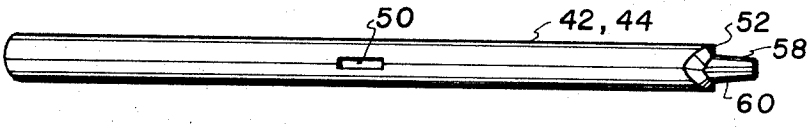


FIG. 4

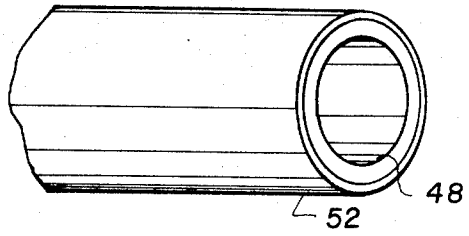


FIG. 5

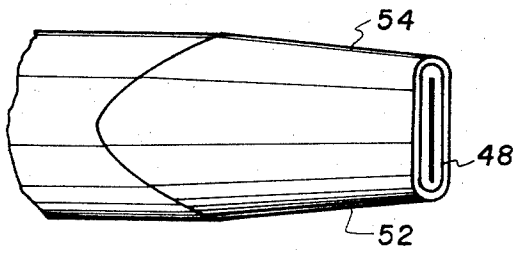


FIG. 6

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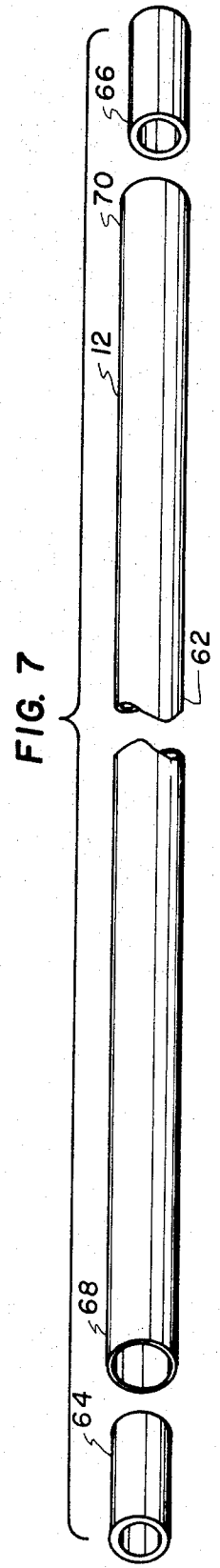


FIG. 7

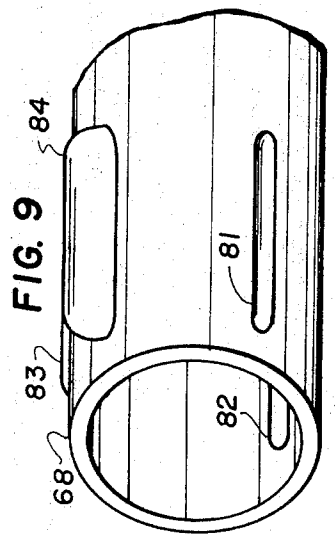


FIG. 9

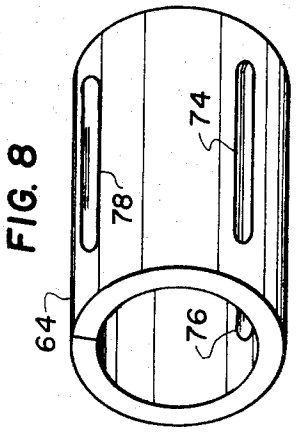


FIG. 8

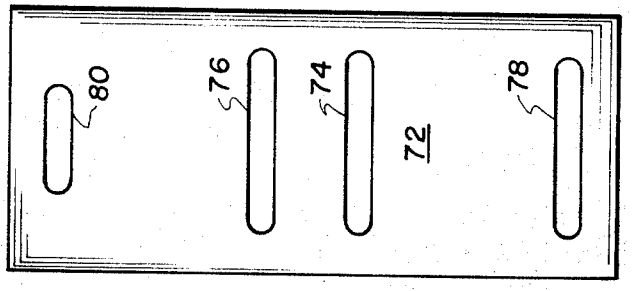


FIG. 10

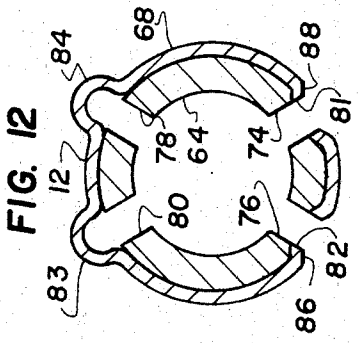


FIG. 12

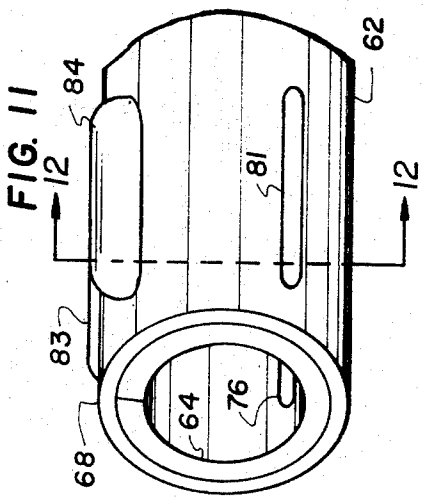


FIG. 11

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FIG. 13

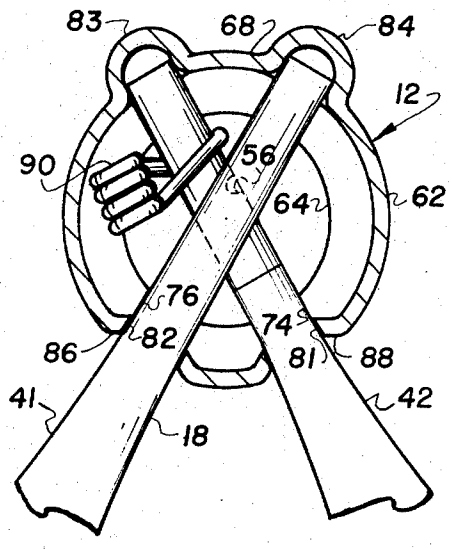


FIG. 14

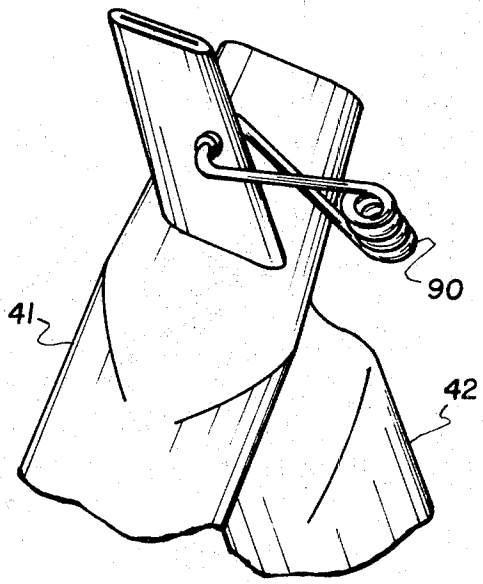
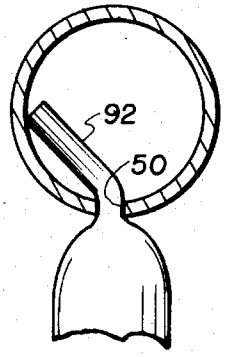


FIG. 15



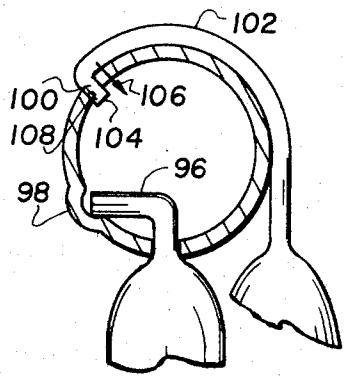


FIG. 16

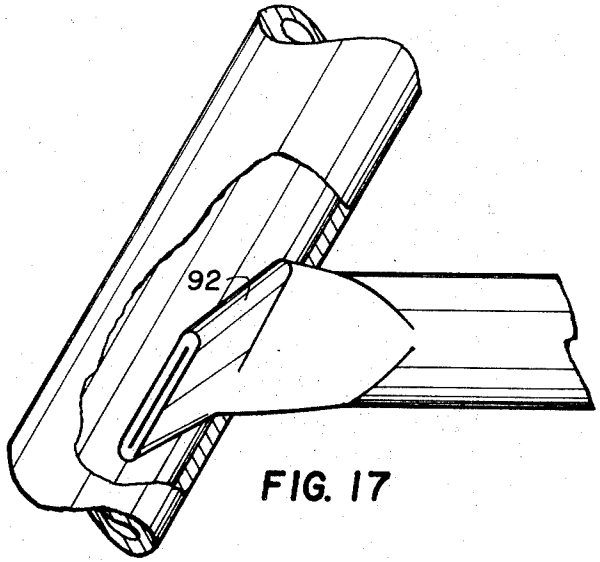


FIG. 17

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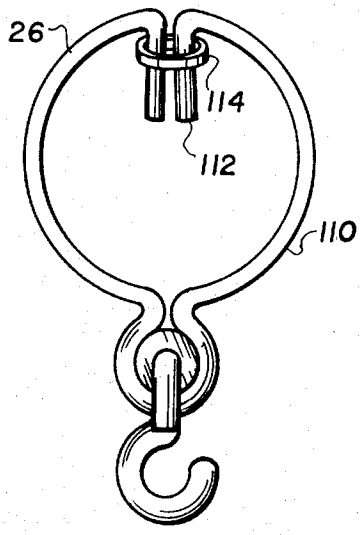


FIG. 18

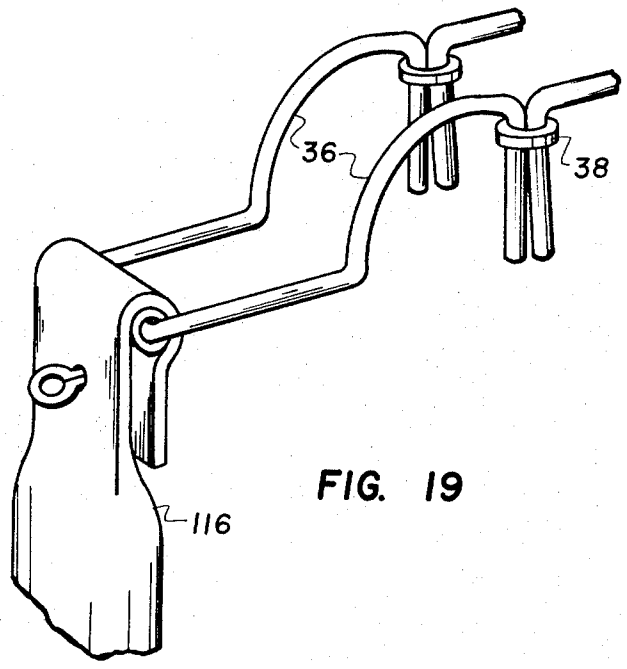


FIG. 19

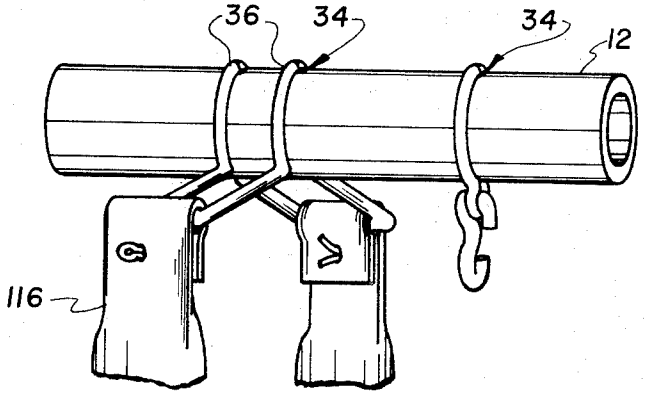


FIG. 20

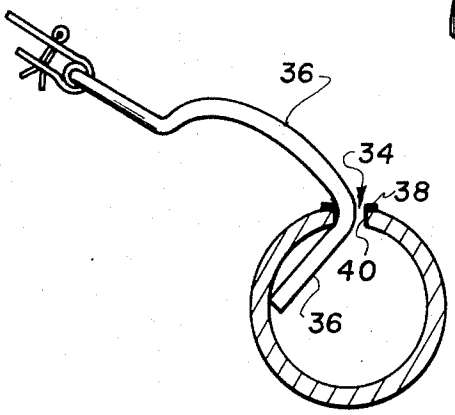


FIG. 21

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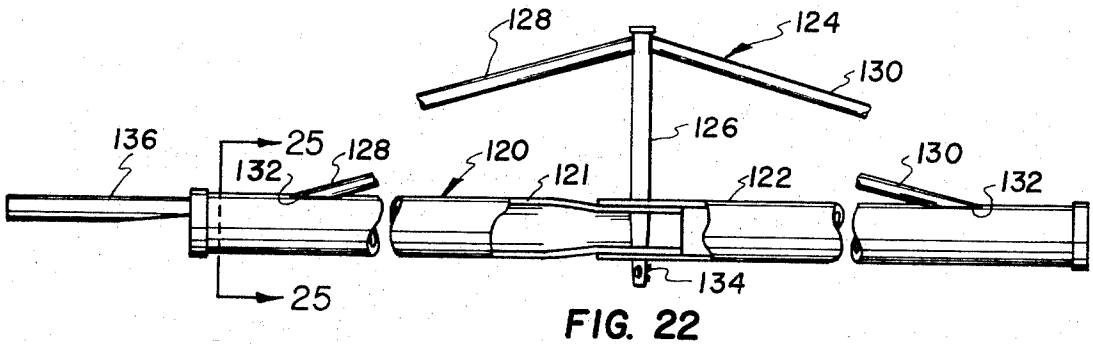


FIG. 22

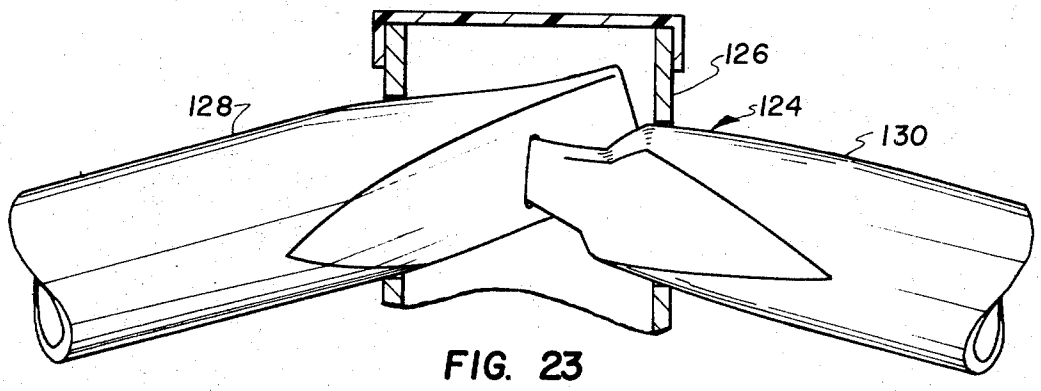


FIG. 23

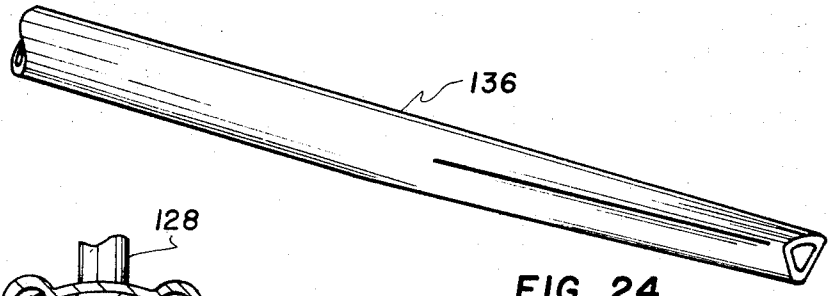


FIG. 24

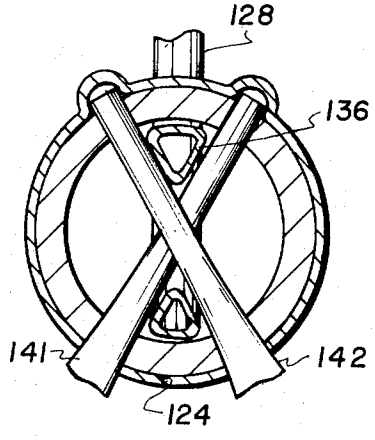


FIG. 25

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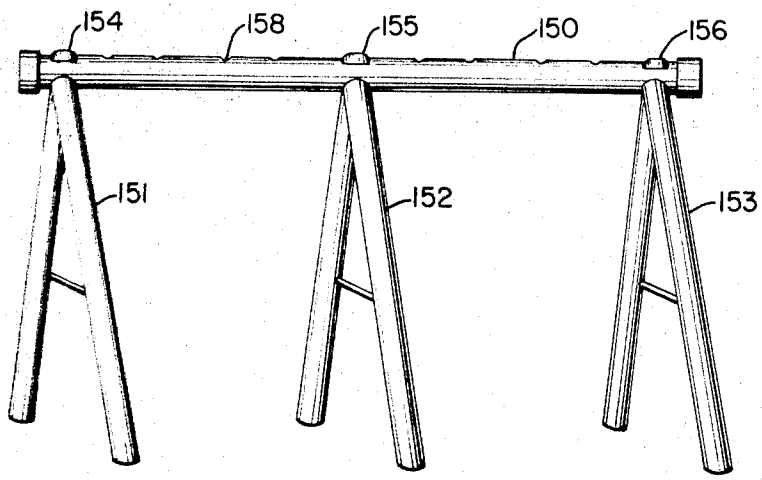


FIG. 26

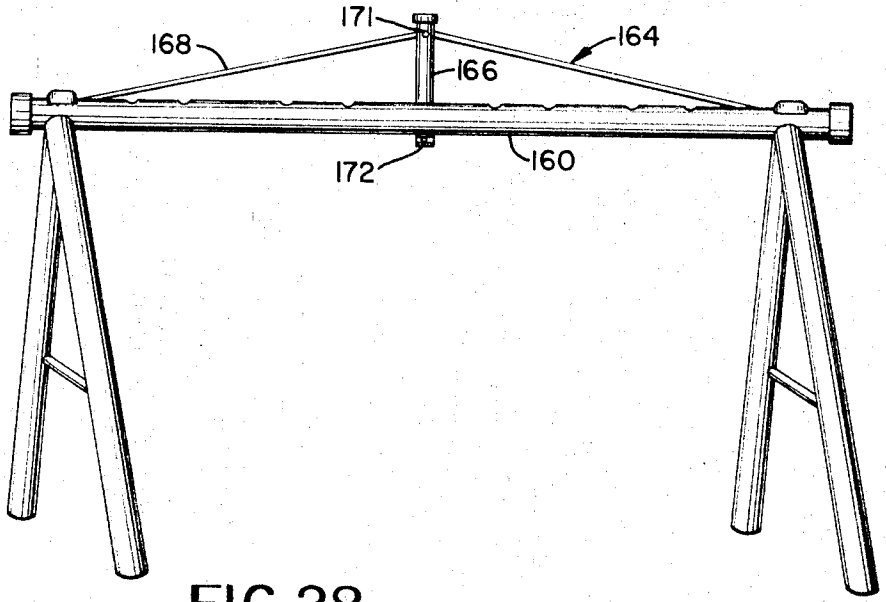


FIG. 27

FIG. 28

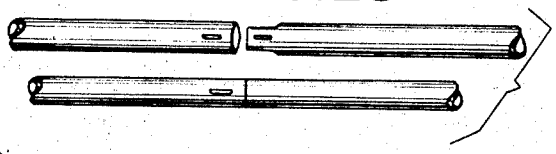


FIG. 29

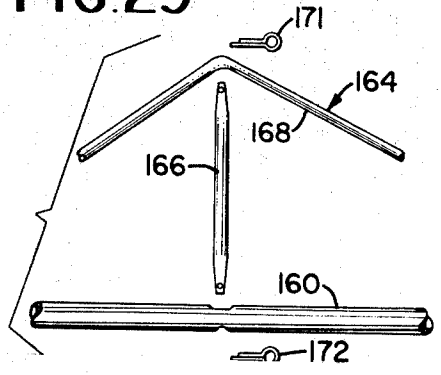
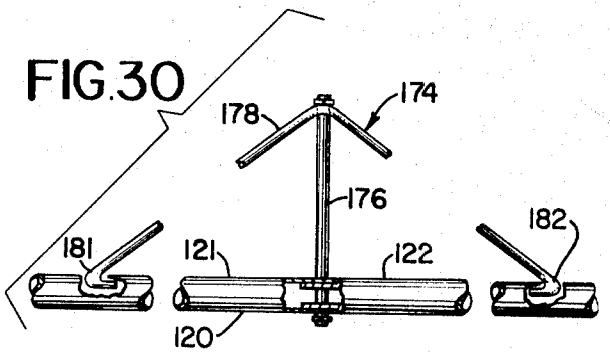


FIG. 30



BOLTLESS GYM SET

BACKGROUND OF THE INVENTION

Heretofore gym sets necessitated the use of a multiplicity of nuts and bolts in the assembly of the structure and the plays on said structure. In addition, it necessitated drilling through the members of the structure to connect them to each other and to connect the plays thereon, which, in turn, necessitated the use of heavier gauge members.

Because of a large number of parts, complicated instructions had to be followed by the consumer which made it difficult to assemble a gym set. The large number of different size nuts and bolts resulted in the improper fitting of the structure members and the plays upon them. More difficult was the fact that if any of the parts were missing a large percentage of users wasted the jobber's time in requests for delivery of these parts and further, the large number of different sizes of nuts and bolts presented the problem of misfits, thereby causing dissatisfaction among customers which resulted in the factory receiving many complaints, which again caused loss of time for the jobber in replacing parts.

Further, gym sets heretofore presented insurance problems since the exposed edges of the bolt ends would scrape children's bodies. Additional problems were encountered when, in tightening the bolts, the top bar would flatten in the direction of loading, thus reducing its strength.

Further, a conventional gym set frame holding, for example, six plays necessitated a longer top bar, thereby requiring two additional legs for center support. The two extra legs for support of the longer top bar produced an obstruction in the use of the gym set. Eliminating these two legs would permit an additional play to be installed in their place.

BRIEF SUMMARY OF THE INVENTION

This invention relates to physical fitness frame structures and, more specifically, to a gym set having boltless joining members wherein one member interlocks into the other through gravity friction. The present invention is basically constructed to provide a boltless frame structure and, in addition, it presents a means of attaching a plurality of plays to the top bar of the frame structure.

Therefore, an object of this invention is to provide a frame structure that can be constructed with lighter gauge tubing while, at the same time, providing a stronger member.

Another object of this invention is to provide a boltless structure that includes interlocking joints that are tightened while in use through gravity friction.

Another object of this invention is to provide a frame for a gym set that can be manufactured with fewer parts inexpensively and can be readily assembled and disassembled.

A further object of this invention is to provide for a gym set having a top bar that is longer than the top bar of a conventional gym set while eliminating the two center legs.

An additional object of this invention is to provide for a gym set having component parts with fewer holes punched or drilled through so that lighter gauge metal tubing can be used.

Other objects and features of the invention will appear as the description of the particular physical embodiment selected to illustrate the invention progresses. In the accompanying drawings, which form a part of the specification, like characters of references have been applied to corresponding parts throughout the several views which make up the drawings.

DRAWINGS

FIG. **1** is a perspective view of a preferred embodiment of the invention;

FIGS. **2**, **3**, **4**, **5**, and **6** are side views of members of the invention in the process of their manufacture;

FIG. **7** is a side view of another member of the invention;

FIG. **8**, **9**, and **10** are views showing the end of the top bar in the process of its manufacture;

FIG. **11** is a perspective view of the end of the top bar in its assembly;

FIG. **12** is a sectional view taken along lines **12—12** of FIG. **11**.

FIG. **13** is a sectional view of the interlocked joint of the top bar and the interlocked legs of the invention;

FIG. **14** is a perspective view of FIG. **13** with the top bar removed;

FIG. **15** is a sectional view of the chin bar interlocked joint;

FIG. **16** is a sectional view of another embodiment of FIG. **15**;

FIG. **17** is a side view of the joint of FIG. **15** with the leg partially broken to show details;

FIG. **18** is a side view of an attaching means of one of the plays;

FIG. **19** is a perspective view of an attaching means for another play;

FIG. **20** is a side view showing the attaching means of FIGS. **18** and **19** assembled with the top bar of the invention;

FIG. **21** is a side sectional view showing one of the plays in operation;

FIGS. **22** to **24** show a second embodiment of the invention;

FIG. **25** is an end sectional view showing details taken along lines **25—25** of FIG. **22**;

FIG. **26** shows a further embodiment of the invention;

FIG. **27** shows an additional embodiment of the invention; and,

FIGS. **28** to **30** show embodiments of the invention with slight variations.

DETAILED DESCRIPTION

In the drawing, typical applications of the present invention are shown. It is to be understood that the present invention has application to any structures wherein the members are interlocked and held by gravity friction and further, in that the members are joined closer together while in use.

Referring to FIG. **1**, a gym set **10** is shown having a top rail or bar **12**, a pair of legs **14** and **16** supporting the top bar **12** at each end and interlocked therein at joints **18** and **20**. The legs **14** and **16** are reinforced by chain bars **22** and **24** respectively to form an "A-frame" configuration. Suspended from the top bar **12** are a plurality of play supports **26**, which plays may be

of the type that are supported by chains **28** such as swing seats or by uprights **30**, which support plays such as lawn swings. The ends of the top bar **12** are covered by plastic tips **31** and **32** to prevent water from being accumulated within the top bar.

Although the instant invention is basically directed to providing a boltless frame structure, the present frame construction is particularly useful in the plays that are connected to the top bar of the frame structure. At least, the broad concepts of this invention are equally applicable for use with all plays connected to the top bar. As shown in FIG. **20** and FIG. **21**, the plays are connected at uppermost points **34** of the top bar **12** by means of hooks **36** inserted within washers **38** and single holes **40** of the top bar **12**. Therefore by this method, in using a single hole for attaching the play support, the present invention is provided with a frame structure that can be produced with lighter gauge tubing, yet remains stronger because the holes **40** are not punched or drilled through the tubing, but are drilled only at the upper portion of the tubing.

It may be noted in FIG. **21** that for safety reasons hooks **36** are so designed as to limit its rotating motion and thereby limits the height the play can be propelled.

Referring further to FIGS. **2** to **6**, the drawing shows the method the end portions of legs **14** and **16** are constructed to produce a reinforced taper for insertion within a complementary opening in the top bar **12** as shown in FIGS. **13** and **14** to provide, through gravity friction, tightening at the interlocked joints **18** and **20** of the legs **14** and **16** within the top bar **12** while the gym set is in use. That is, as hereinafter more fully described, the boltless gym structure becomes tighter in use since the weight of the plays directing a force downwardly will cause the legs **14** and **16** at joints **18** and **20** to be inserted further within the top bar **12**. Therefore, in this manner, the boltless structure becomes tighter while in use since the weight of the users causes the joints **18** and **20** to be more firmly connected.

In detail, each leg **41**, **42** and **43** and **44** of the pair of legs **14** and **16** respectively comprises a tube **46** and a heavier gauge sleeve **48**. Each tube **46** has a slot **50** for insertion of the chin bars **22** or **24** by means shown in FIGS. **15** and **16** and hereinafter more fully described.

A reinforced end is produced for each leg by inserting the sleeve **48** within an end **52** of the tube **46** of each leg. The end **52** is then flattened and tapered as best shown in FIGS. **5** and **6**. FIG. **5** shows the sleeve **48** inserted within the end **52** of the tube **46**, and FIG. **6** shows the end **52** with the sleeve **48** flattened and squeezed into a taper **54**.

One leg of each pair of legs **14** and **16**, such as leg **41** or **43** remains as shown in FIG. **3**, with a slot **56** formed therein and the opposite leg of each pair of legs **14** and **16**, such as leg **42** or **44** is cut, as shown in FIG. **4**, having a smaller sized end **58** with a taper **60** for insertion within the slot **56** of the legs **41** and **43**.

Therefore, the initial taper of each leg **41**, **42**, **43** and **44** provides for the interlocked joint and, further, securing of these legs within the top bar **12** as the gym set is used and the taper **60** formed in legs **42** and **44** further secure these legs in legs **41** and **43** respectively as the gym is used and as best shown in FIG. **13**.

FIGS. **7** to **12** show the manner in which the end portions of the top bar **12** are fabricated. The top bar **12** comprises a bar or tube **62** having sleeves **64** and **66** of an outside diameter slightly smaller than the inside diameter of two ends **68** and **70** of the tube **62**. As shown in FIG. **10**, the sleeves **64** and **66** are fabricated of a flat piece **72** with slots **74**, **76**, **78**, and **80** cut through the plate. The plate is then rolled into a sleeve, as best shown in FIG. **8** for insertion within end **68** or **70** of the tube **62**, as shown in FIG. **11**.

The tube **62** is fabricated with slots **81** and **82** cut therethrough and indentations **83** and **84** formed substantially diagonally opposite the slots **81** and **82** respectively.

Referring specifically to FIGS. **11** and **12**, one end **68** is shown. It should be noted that the same arrangement holds true for the other end **70** of the top bar **12**. In FIG. **12**, sleeve **64** is shown inserted within end **68** of the top bar **12** with slots **74** and **76** of the sleeve **64** in line with slots **81** and **82** of the end **68** respectively. The sleeve **64** and the end **68** are indented at **86** and **88**, as best shown in FIG. **12** to permit easy assembly of the tapered ends of legs **41** and **43** within the end **68** of the top bar **12**.

As shown in FIGS. **13** and **14**, the interlocked joint **18** which is the time as the assembly of joint **20**, the tapered end of leg **41** is guided by indentation **86** through slot **82** of end **68** of the top bar **12** to reach the indentation **84** diagonally opposite the slot **82**. The slope of the taper at the end of the leg and the size of the slot **82** determining the depth the end of the leg is inserted within the end **68** of the top bar **12**. The tapered end of leg **42** is then guided by indentation **88** through slot **81** of the tube **62** and through slot **74** of the sleeve **64** through slot **56** of leg **41** to the indentation **83** of the tube **62**.

Here again the slope of the tapers and the size of the slots determine the depth the leg is inserted within the end **68** of the top bar **12** and the depth one leg is inserted within the other.

When the interlocked joint **18** is assembled as hereinbefore described, it is held in place by the tapered end and the slots, but it should be noted that before the application of weight to cause gravity friction connection between the legs **41** and **42**, a spring latch **90** is needed to hold the first joint **18** together until joint **20** is assembled in the same manner as described for joint **18**. Once the joint **20** is connected and the chin bars **22** and **24** are inserted, as hereinafter more fully described, the spring latch **90** can be removed for insertion of the plastic ends **31** and **32**.

FIGS. **15** to **17** show three means of interlocking the chin bars **23** and **24** within the legs **14** and **16** to form the A-frame configuration. FIGS. **15** and **17** show end **92** of the chin bars **22** and **24** flattened and bent so as to be interlocked into slot **50** of the legs. The end **92** is bent at a slight angle downwardly so as to lock in place as the legs are caused to move opposite to each other as the gym set is loaded. The further the legs are moved outwardly the more clamping is caused by this downward angular configuration of the ends **92** of the chin bars **22** and **24**.

FIG. **16** shows two other methods of installation of the chin bars **22** and **24** on to the legs **14** and **16**. The first method of installation shows an end **96** bent at a

90° angle to the body of a chin bar and inserted within indentation **98** of the leg. Another method of installation is the use of a sharp angular configuration **100** at the very tip of end **102** of the chin bars with the end **102** wrapped around the leg to produce a wrapping effect while at the same time as the legs are moved outwardly due to loading of the gym set, the increase of distance between the legs will cause tip **104** of the angular configuration **100** to be further directed inwardly, as shown by arrow **106**, within slot **108** of the legs to more firmly hold the chin bar within the leg.

Referring specifically to FIGS. **18** to **21**, the means of attaching the play supports on to the top bar is shown. FIG. **18** shows the attachment of the chain support **26** wherein a rod **110** is bent in a circle having an inside diameter slightly larger than the outside diameter of the top bar **12** and hooked to form ends **112** for insertion within a washer **144** for further insertion within holes **40** of the top bar **12**, as hereinbefore described.

Another method of attachment of a play such as a lawn swing is by having a lawn swing upright **116** wrapped around hooks **36** as hereinbefore described, which in turn are connected within the washers **38** and within holes **40** of the top bar **12**.

FIGS. **22** to **25** show another embodiment of the invention. In a conventional gym set with six or more plays it was previously necessary to use a central top bar support. That is, the use of an extra A-frame support in the center of the bar. This extra A-frame, while acting as a support, was also an obstruction in the use of the gym set. In addition, the length of the top bar was limited since it was difficult to transport a top bar longer than a prescribed length. In the present embodiment a top bar **120** of substantially twice the length of a conventional top bar is used by separating the top bar at the center into two pieces **121** and **122** connected and supported by an overhead support **124**. In addition, support **124** is used instead of the conventional central A-frame support. The overhead support **124** is shown having a vertical bar **126** extended upward from the center of the top bar **120**. From the top of this vertical bar **126** extend two bars **128** and **130** which lead from the top of the vertical bar to the ends of the top bar **120** and enter into the top bar **120** at slots **132**. The vertical bar **126** is held in position by cotter pin **134**. As shown in FIG. **23**, the bars **128** and **130** interlock in the top of vertical bar **126**. This assembly acts as an overhanging trestle support, thus eliminating the need for the extra central A-frame support.

In addition, this embodiment includes a supporting bar **136** which can extend from either end of the top bar **120** and used to hang an extra play.

As shown in FIG. **25**, supporting bar **136** is held firmly between A-frame legs **140** and **142** which have tapered ends such as the legs **41**, **42**, **43** and **44** of the first embodiment.

The shape of the end of bar **136** which fits into the end of the top bar **120** is triangular as shown in FIG. **24** for firmly wedging between the crossing of the legs, as best shown in FIG. **25**. This is also the shape of the ends of the bars **128** and **130** which fit into slots **128** of the top bar **120**.

FIG. **25** shows the same gravity friction interconnection between the top bar **120** and legs **141**, **142** as that described in the first embodiment and best shown in FIG. **13**.

FIG. **26** shows that the interlocking joint **18** of FIG. **1**, better shown in FIGS. **13** and **14**, can be utilized in a conventional central A-frame support. An overhead bar **150** is shown having three A-frame supports **151**, **152** and **153** connected by interlocking joints **154**, **155** and **156** respectively. Here again, a single hole **158** is used for attaching a play support as hereinbefore described. In this respect, the present invention is provided with A-frame structure having a lighter gauge overhead support yet remaining stronger since the holes supporting the play support are drilled only at the upper portion of the tubing.

FIG. **27** shows how a single overhead bar **160** can be reinforced by an overhead support **164**. Support **164** is used in place of the A-frame support **152** of FIG. **26**. The support **164** includes a vertical bar **166** which extends upward from the center of the bar **160**. From the top of the vertical bar **166** extends bar **168** which leads from the top of the vertical bar **166** to the ends of the overhead bar **160**. The vertical bar **166** is held in position between the bar **168** and overhead bar **160** by cotter pins **171** and **172** shown in FIG. **29** in disassembled position. The structure **164** acts as an overhead trestle support thus eliminating the need for the extra central A-frame **152** of FIG. **26**.

FIGS. **28** and **30** show another method of interlocking the two-piece top bar **120**. The two pieces **121** and **122** are connected and supported by an overhead support **174**. Support **174** is used instead of the central A-frame **152** of FIG. **26**. The support **174** is shown having a vertical bar **176** extending upward from the center of the top bar **120**. On either side of the vertical bar **176** extends a bar **178** which in turn is hooked at its ends **181** and **182** to the top end portions of the pieces **121** and **122** of the overhead bar **120**. The support **174** acts as a trestle to support the overhead bar **120** without the need for an extra central A-from **152** of the embodiment shown in FIG. **26**.

The invention described may therefore be varied in construction within the scope of the claims, for the particular devices selected to illustrate the invention are but two of many possible embodiments of the same. The invention therefore is not to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. A gym set comprising a top bar, leg means for support of said top bar and a plurality of play supports connected to said top bar, said top bar having holes at its upper portion for receiving said play supports, said play supports including hooked ends for insertion within the holes of said top bar and supported thereby, said leg means includes a first leg and a second leg, said first leg having a tapered end and said second leg having a tapered end with a slot formed therein of a complementary predetermined size to receive the tapered end of said first leg and thereby forming a crossing therewith and further, wherein said top bar having slots of a complementary predetermined size to receive the tapered ends of said first leg and said second leg resulting in a gravity friction connection between said first leg and said second leg, and a gravity friction connection between said mentioned legs and said top bar as the gym set is used.

2. The structure defined by claim **1** wherein said first leg and said second leg of said leg means are each formed of an elongated tube having open ends and said

structure further comprises a sleeve for insertion at one end of said first leg and said second leg and wherein said ends are flattened to produce reinforced tapered ends for insertion within the slots of said top bar.

3. The structure of claim 1 wherein said top bar comprises a pair of horizontal pieces coaxially connected at one end thereof at the center of said top bar and an overhanging trestle supporting the center of said top bar at the connection of said two horizontal sections and extending to interconnect the legs at the connection of said legs with said top bar.

4. The structure of claim 3 wherein said trestle comprises a vertical bar threaded through the center of said top bar at the connecting ends of said two pieces and extending upwardly thereof, and a pair of opposed bars extending from the top of said vertical bar to the connection of said legs with said top bar, and inserted within the crossings of said legs and held in place thereby by said trestle structure supports.

5. The structure of claim 4 wherein the ends of said pair of opposed bars are of tapered triangular configuration interconnecting said legs and said top bar at the crossings of said legs.

6. The structure of claim 4 further comprising end bars extending from the free ends of said top bar, and said end bars including ends of tapered triangular configuration for firmly wedging between the crossings of said legs, said end bars being adapted for use with an additional play supports at the ends of said top bar as needed.

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