July 30, 1957 R. C. McPHILOMY 2,800,952

KNOCK-DOWN FURNITURE CONSTRUCTION

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Fig. 1.

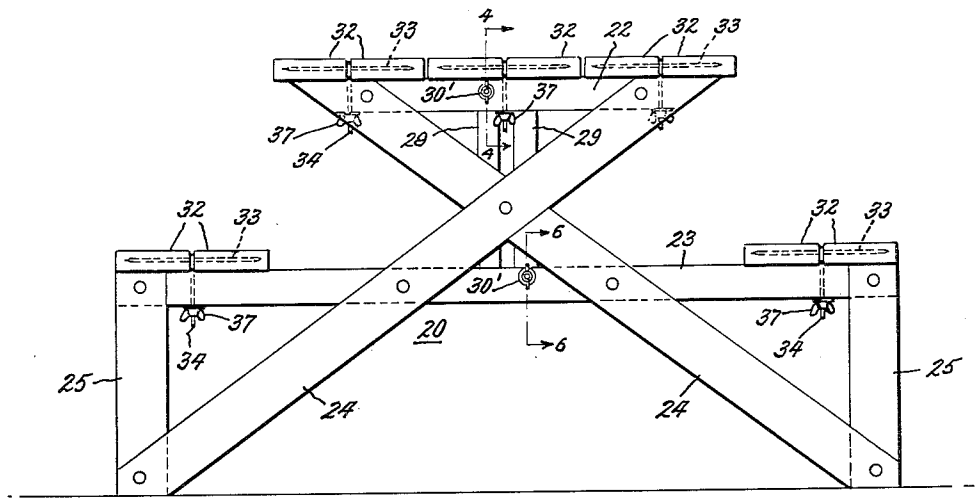
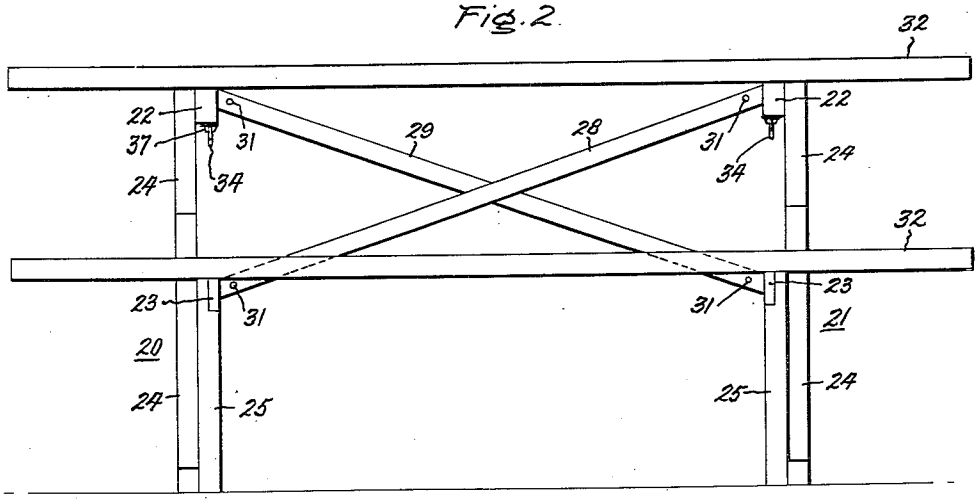


Fig. 2.



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Fig. 11.

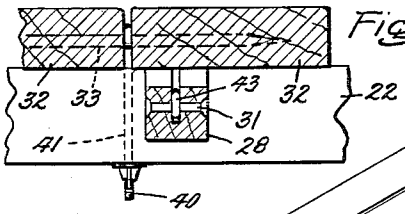


Fig. 3.

Fig. 8.

Fig. 5.

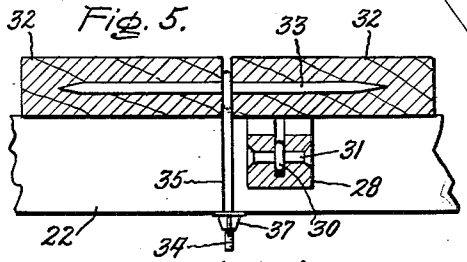


Fig. 4.

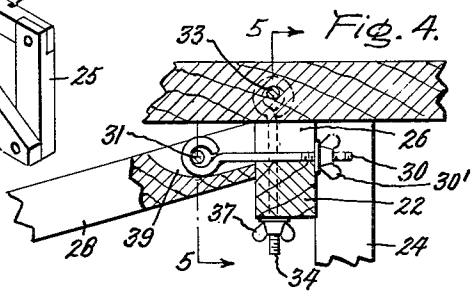


Fig. 7.

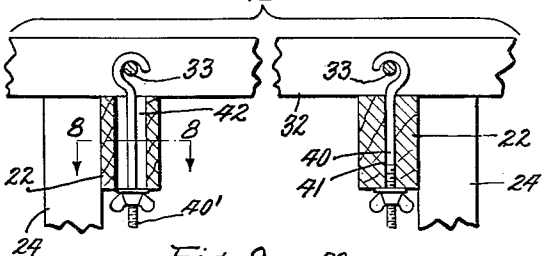


Fig. 6.

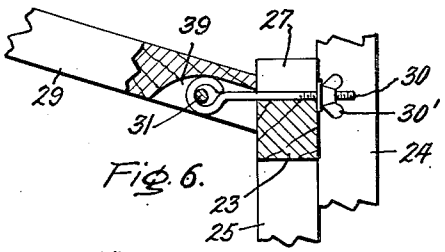


Fig. 9.

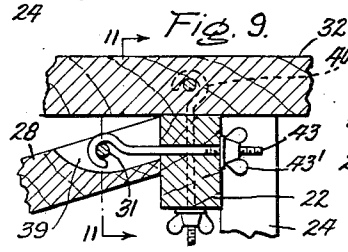
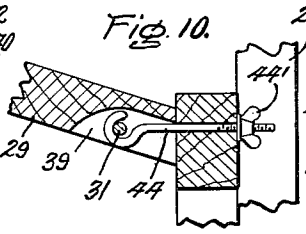


Fig. 10.



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United States Patent Office 2,800,952 Patented July 30, 1957

2,800,952

KNOCK-DOWN FURNITURE CONSTRUCTION

Richard C. McPhilomy, Rexford, N. Y.

Application November 16, 1954, Serial No. 469,117

13 Claims. (Cl. 155—124)

This invention provides an improved knock-down furniture construction for the formation of knock-down furniture which may be easily assembled, disassembled and stacked for storage purposes. While this invention has a wide variety of applications it is particularly suited for application in the construction of a knock-down picnic table and bench combination adapted for easy storage and will be described in that connection.

It is generally desirable to be able to move outdoor lawn furniture, such as picnic tables and chairs, indoors during the winter months and other periods of inclement weather to prevent undue damage due to the effects of the elements; however, an inherent feature of such outdoor lawn furniture is that it is of such a shape and weight as to make it extremely difficult to store in assembled form.

Picnic tables have been made in forms such that they can be folded for storage purposes; however, such folding tables tend to be unstable when unfolded and in use and when folded are often unduly heavy and difficult to carry. Picnic tables have also been designed of completely bolted construction such that the table can be disassembled into a number of pieces by the removal of a large amount of hardware in the form of a number of bolts and nuts. This requires a considerable amount of time and effort and often results in the loss or misplacing of the hardware.

It is therefore an important object of this invention to provide an improved knock-down furniture construction which may be rapidly assembled and disassembled and which in the disassembled form consists of a limited number of easily stored relatively light weight units and no loose hardware.

It is also an object of this invention to provide an improved knock-down furniture construction.

It is the further object of this invention to provide a furniture construction incorporating an improved method and apparatus for removably coupling related portions of furniture to each other.

Another object of this invention is to provide an improved knock-down picnic table and seat combination.

According to an aspect of this invention a collapsible or knock-down piece of furniture is formed which consists of a number of frames which are fitted with slots or recesses to receive and retain releasable attaching means. The working surfaces, such as the table top and seats, are joined together with securing means which are engaged by the releasable attaching means. The releasable attaching means, which in an embodiment of this invention consist of eye bolts, are tightened up thereby removably coupling the top and seats to the frames and forming a strong rigid furniture construction.

Other objects and features of this invention will become more apparent from the succeeding specification and claims when considered in connection with the figures of the drawing in which Figure 1 is an end view of a knock-down picnic table constructed in accordance with this invention; Figure 2 is a front elevation view of the picnic table illustrated in Figure 1; Figure 3 is an exploded perspective view of the table illustrated in Figure 1; Figure 4 illustrates the section along line 4—4 of Figure 1; Figure 5 illustrates a section along line 5—5 of Figure 4; Figure 6 illustrates a sectional view along section 6—6 of Figure 1; Figure 7 illustrates a modification of this invention shown in connection with a fragmentary view of a table construction; Figure 8 illustrates a section along line 8—8 of Figure 7; Figures 9 and 10 illustrate modifications of the releasable attaching means illustrated in Figures 4 and 6 respectively; and Figure 11 illustrates a section along line 11—11 of Figure 9 .

Figures 1 through 3 illustrate a knock-down picnic table constructed in accordance with this invention. The table consists of identical end frames 20 and 21. The end frames include an upper horizontal frame member 22 and lower horizontal frame member 23, diagonal legs 24 and vertical legs 25. The legs and frame members are bolted together in the illustrated fashion to provide upper and lower horizontal frame members which are adapted to receive elongated members which provide the working surfaces of the completed table. The end frames are provided with horizontal slots 26 and 27 in the upper and lower horizontal frame members respectively. Longitudinal brace members 28 and 29 are provided with slots in which eye bolts 30 are retained by pins 31. The bolts 30 are received by slots 26 and 27 respectively so that the longitudinal brace members, which extend from lower horizontal support member 23 of one end frame to upper horizontal support member 22 of the other end frame, can be drawn up snugly against the inner surface of the horizontal frame members.

The working surfaces, i. e. the table top and seats, are formed of a plurality of elongated members 32, for example wooden planks, which are formed into units by suitable securing means such as, for example, a plurality of pins or rivets 33. Releasable attaching means, for example, eye bolts 34, engage pins or rivets 33 and are received by vertical slots 35 and 36 in the upper and lower frame members respectively. The eye bolts 34 are tightened by means of wing nuts 37 so as to securely hold the units forming the table top and the seats to the upper and lower frame members and thereby provide a complete table structure.

It is readily apparent that one or more strap members may be utilized as securing means to form elongated members or planks 32 into table top and seat units and that these units can consist of two or more planks. Furthermore, the pins or rivets 33 may be considerably shortened so as to consist of only a short pin which receives the eye of the eye bolt or alternatively the strap members may engage threaded L bolts to thereby secure the table top and seats to the end frames.

In view of the foregoing, it will be readily apparent that a method of construction is provided in which the means for holding together the planks forming the working surface of the furniture, in this instance the table top and the seats, also serves the dual function of acting as a purchase for engaging the releasable attaching means.

The table is rapidly assembled by first erecting the end frames 20 and 21, placing bolts 30 into slots 26 and 27 of one of the end frames and tightening up the wing nuts 30' so that the braces 28 and 29 are securely attached to the end frame. The other end frame is then easily attached to the longitudinal brace members 28 and 29 by placing bolts 30 in slots 26 and 27 and tightening up the wing nuts 30'. The top planks are then placed on upper horizontal frame members 22 and eye bolts 34 are swung into slots 35 and tightened by means of wing nuts 37 so as to securely fasten the planks forming the

top of the table to the upper horizontal frame members. In a similar manner, the planks forming the seats are attached to the lower horizontal frame members by swinging eye bolts **34** into slots **36** and tightening wing nuts **37**. In this manner, the table is rapidly and easily assembled and by reversing the procedure it is knocked down into a number of light easily stored units. It will be noted that when the table is completely disassembled there is no stray hardware, since the wing nuts do not have to be removed from the eye bolts, and that all units can be stored easily and in a flat manner. For example, a table 6 feet long, 30 inches high and 58 inches wide can be packaged for shipping in a convenient size unit 6 feet by 10 inches by 11 inches.

Reference is made to Figures 4, 5 and 6 in describing additional features of this invention. Figures 4 and 6 illustrate longitudinal braces **28** and **29** abutting upper horizontal frame member **22** and lower horizontal frame member **23** respectively. Longitudinal braces **28** and **29** are provided with recesses **39** to permit some latitude in the movement of eye bolts **30** and are further provided with faces which are cut at such an angle that when bolts **30** are drawn up snugly, braces **28** and **29** have end faces which are substantially in the same place as and in contact with the inner face of the respective horizontal frame members thereby resulting in an extremely strong and rigid construction. These figures further clarify the method of assembly and construction wherein the eye bolts are secured to the longitudinal brace members and to the elongated members forming the table top and seat members so that the eye bolts can be swung into recesses or slots in the end frames thereby resulting in a rapidly assembled structure which is inherently rigid and strong.

Figures 7 through 11 inclusive illustrate a modified construction which results in a high degree of rigidity and which is particularly suited to knock-down furniture of the type incorporating this invention. This modified construction differs from that previously described in that the releasable attaching means, for example open ended eye bolts, are all retained in the end frames when the table is disassembled thereby resulting in only two members having loose or swinging eye bolts and thereby simplifying the matter of storage. In this construction, instead of having the eye bolts movably secured to the securing means such as pin **33**, the eye bolts are of an open eye type such as bolt **40** in Figure 7, which is retained in a hole **41** rather than the vertical slot **35** of Figure 3, and a second opposing open eye bolt **40'** retained in elongated slot **42**. Slot **42** permits sufficient movement of one open eye bolt **40'** so that after eye bolt **40** is secured on pin **33** the second eye bolt **40'** can be moved in slot **42** a sufficient amount to engage pin **33**. The longitudinal braces **28** and **29** are in a like manner secured to the horizontal frame members **22** and **23** respectively by means of opposing open end eye bolts **43** and **44** which releasably attach the longitudinal braces to the horizontal frame members when eye bolts **43** and **44** engage pins **31** and are drawn up snugly by tightening wing nuts **43'** and **44'** respectively. It is noted that an enlarged or elongated slot **42** is not necessary if both open end eye bolts **40** face in the same direction; however, the opposed orientation of open end eye bolts **40** results in a particularly rigid table when all parts are assembled. It will be apparent that variations in the shape and form of the releasable attaching means may take a variety of shapes and forms other than those herein illustrated and described and still come within the scope of this invention.

When the construction illustrated in Figures 7 through 11 inclusive is utilized, the table is assembled in the same general manner as has been described in connection with the description of Figures 1 through 3.

In view of the foregoing, it will be readily apparent that there is disclosed an improved construction for utilization in the manufacture and formation of knock-down or collapsible furniture. This construction is particularly suited for outdoor furniture of the type which may be readily assembled and disassembled and which is most ideally suited if it can be easily collapsed into relatively light parts so as to be carried in an automobile and/or easily stored in the cellar or garage. It is apparent that this construction is readily adaptable to the construction of lawn chairs, benches, tables or to complete table and bench units such as the disclosed picnic table and that this furniture can be constructed of any suitable material such as wood, pressed fiber, plastic or hollow metal members.

Although this invention has been described by way of example in connection with a limited number of embodiments, it is readily apparent that it may be adapted to a wide variety of uses and applications and therefore it is intended in the appended claims to cover all modifications and variations coming within the true spirit and scope of this invention.

What I intend to claim and protect by Letters Patent of the United States is:

1. A piece of knock-down furniture adapted for easy storage comprising a plurality of frames, each including upper and lower frame members, a plurality of elongated members removably coupled to said upper frame members to form a table, a plurality of elongated members removably coupled to said lower frame members to provide at least one seat and rigid longitudinal brace members having end surfaces substantially parallel to the plane of the frame when coupled thereto and extending between and removably coupled to said frames to thereby provide a strong rigid combination table and seat.

2. The piece of knock-down furniture defined by claim 1 wherein the longitudinal brace members extend from an upper frame member of one frame to a lower frame member of another frame and are attached to a mid-region of the respective frame members.

3. A knock-down table adapted for easy storage comprising a plurality of frames each including upper and lower frame members, a plurality of elongated members, each member of the plurality of elongated members being attached to at least one other elongated member by securing means, a plurality of releasable attaching means cooperating with said securing means to removably couple said elongated members to the upper frame members to form a table, a plurality of other elongated members, each member of the plurality of other elongated members being attached to at least one other member by securing means, a plurality of releasable attaching means cooperating with the securing means to removably couple said other elongated members to the lower frame members to provide at least one seat, and rigid longitudinal brace members extending between and removably attached to said frames to provide a strong rigid combination table and seat.

4. The knock-down table defined by claim 3 wherein the releasable attaching means are attached to the elongated members and the longitudinal brace members respectively and the elongated members and brace members are rigidly coupled to the frame members by engaging said releasable attaching means in recesses provided in the respective frame members.

5. The knock-down table defined by claim 3 wherein the releasable attaching means comprise eye bolts engaged by said securing means, said eye bolts being secured to the frame members by being received in slots provided in the frame members and the longitudinal brace members are provided with eye bolts which are received in slots provided in the respective frame members.

6. The knock-down table defined by claim 3 wherein the releasable attaching means are secured to the upper and lower frame members and releasably engage the securing means and longitudinal braces to couple the elon-

gated members and longitudinal braces to the frame members.

7. The knock-down table defined by claim 3 wherein the releasable attaching means comprise open ended eye bolts which releasably engage said securing means and said longitudinal braces to rigidly couple said elongated members and longitudinal braces to the frame members.

8. The knock-down table defined by claim 3 wherein the releasable attaching means comprise open ended eye bolts secured in the frame members and oriented to oppose each other and to engage said securing means to thereby removably couple the elongated members to said upper and lower frame members and the means for removably attaching the longitudinal braces comprise open ended eye bolts secured to said frame members to releasably engage pins in the longitudinal braces and attach the braces to the frame members.

9. A knock-down table adapted for easy storage comprising a plurality of end frames each including upper and lower frame members, a plurality of elongated members arranged in side-by-side relationship and secured by at least one transverse strap means, releasable attaching means engaging pins oriented between said elongated members and said upper frame member to removably couple said elongated members to the upper frame member and form a table, a plurality of elongated members oriented in side-by-side relationship and secured together by at least one transverse strap, releasable attaching means engaging pins oriented between said elongated members and said lower frame member to removably couple said elongated members to the lower frame member and provide at least one seat and rigid longitudinal brace members extending between and removably coupled to said frame members to thereby provide a strong rigid combination table and seat.

10. In a knock-down furniture construction a releasable attaching structure comprising a plurality of members to be secured to a first member, said plurality of members being coupled together by securing means, means attached to said securing means and engaging said first member to thereby removably couple said plurality of members to said first member.

11. A structure comprising a plurality of members secured together by a securing means, a first member provided with a recess, releasable attaching means including an eye bolt engaging said securing means and resting in the recess in the first member whereby the plurality of members are securely and removably coupled to said first member.

12. A knock-down table adapted for easy storage comprising a plurality of end frames each including upper and lower frame members, a plurality of elongated members, each member of the plurality of elongated members being secured to at least one other member by a securing means, a plurality of eye bolts engaged by said securing means and engaging said upper frame member to removably couple said elongated members to said upper frame member and provide a table, a second plurality of elongated members, each member of the second plurality of elongated members coupled to at least one other member by securing means, a plurality of eye bolts engaging said securing means and the lower frame members to provide at least one seat and thereby provide a strong rigid combination table and seat.

13. A knock-down table adapted for easy storage comprising a plurality of end frames each including upper and lower frame members, a plurality of elongated members, each member of the plurality of elongated members being secured to at least one other member by a securing means, open end eye bolts coupled to the upper frame members and engaging the securing means to releasably attach the elongated members to the upper frame members to form a table, a plurality of elongated members each member of the plurality of elongated members being secured to at least one other member by securing means, open ended eye bolts incorporated in the lower frame members and releasably engaging said securing means to removably couple the lower frame members to the elongated members and provide at least one seat and thereby provide a strong rigid combination table and seat.

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