Sept. 16, 1924. 1,508,803

E. E. McGREW

FOLDING BRACE

Filed Feb. 20. 1923

Fig. 1.

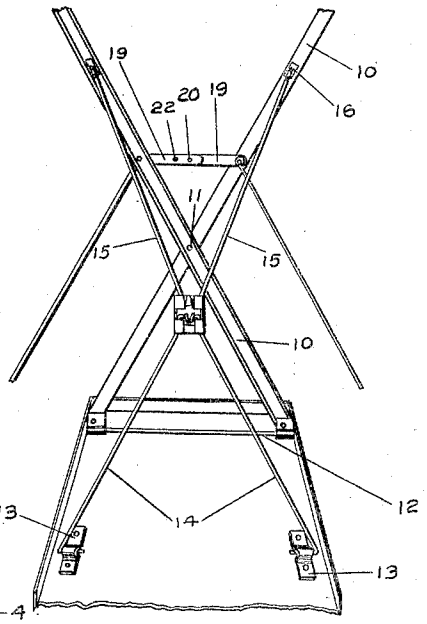


Fig. 3

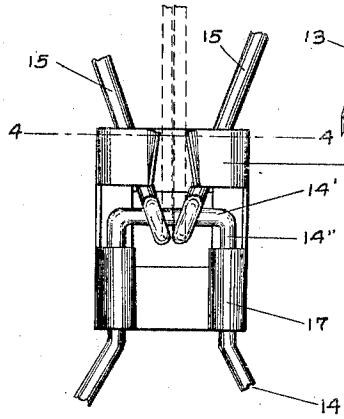


Fig. 4

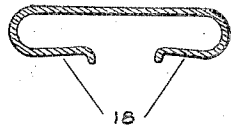
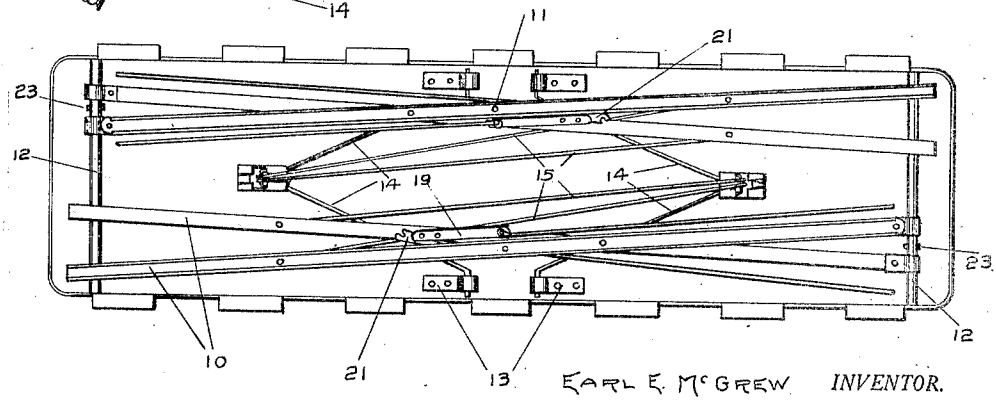


Fig. 2



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UNITED STATES PATENT OFFICE.

EARL E. McGREW, OF LINCOLN, NEBRASKA.

FOLDING BRACE.

Application filed February 20, 1923. Serial No. 620,224.

To all whom it may concern:

Be it known that I, EARL E. McGREW, a citizen of the United States, residing at Lincoln, in the county of Lancaster and State of Nebraska, have invented certain new and useful Improvements in Folding Braces, of which the following is a specification.

My invention relates to folding braces and is designed for use in any foldable braced structure and more particularly with folding camp furniture. My invention was developed and first used in connection with my folding table as shown and described in my prior application Serial Number 502,705, filed Sept. 23, 1921, and is shown and described in my present application in connection with and with reference to that table.

The table of my prior application is made up of three sections, each pair of adjacent sections being connected by means of hinges and the two hinges being parallel to each other. The central section is the main or body part of the table while the outer sections serve as leaves for the table. The inner and one of the outer sections are identical in size, but the other outer section is slightly smaller in length and width. All three sections have their edges turned at right angles to the planes of the sections. When folded, all of the leg structure and bracing will be folded in the central section, the smaller of the two end sections will be folded over the leg structure and into the central section, and the second outer section will then be folded over the central section, leaving a compact bundle having twice the thickness and one-third the width of the table top. The legs are arranged in pairs which are secured to and at the ends of the central section. Each pair of legs is braced by means of a pair of braces. The braces are slidably and pivotally secured to the under side of the central section, and have detachable connections with the legs. The brace rods have however been found to have several defects which are apt to prove annoying. In setting up or taking down the table, the four brace connections consume more time than all other steps of the operation put together. Since the saving of time is a great desideratum, the drawback will be readily apparent especially when setting up the table several times a day on an extended automobile trip. Continued rough use of the table will cause the brace rods to become bent and twisted, thus making it difficult to make the connections. When the table is folded the brace rods are liable to slide in their bearings and to mar the finish on the table. While the table is being set up, the brace rods will bind unless considerable care is taken to prevent it.

My present invention is designed to avoid these and other drawbacks. Its objects and advantages will be fully pointed out in the description.

Referring now to the drawings forming part of my present application,

Figure 1 is a view of the bottom of one end of the central section of my table, the table being inverted and the pair of legs being shown in their set-up position.

Figure 2 is a plan view of the under side of the central section of my table, with all of the leg and bracing structure folded therein.

Figure 3 is a detail view of the combined hinge and clip which is part of my new brace.

Figure 4 is a sectional view taken on line 4—4 of Figure 3.

The legs 10 of each pair of legs of my table are pivotally connected, scissors like, at 11. The inner end of each of the legs is provided with a collar for pivotally and slidably connecting the legs to a transversely positioned rod 12 which is secured at its ends to the opposite upturned side edges of the central section of my table. The rod 12 serves not only as a support for the pair of legs, but it aids materially in bracing the table section which is subjected to the roughest usage. Thus far however, the structure is identical with that shown and described in my prior application.

Spaced from the rod 12 and preferably adjacent the transverse median line of the table section I secure a pair of straps 13 having pivot loops. To these loops I secure in pivotal relation therewith the ends of a rod 14. The rod 14 has two converging arms which terminate in parallel portions 14'' which in turn are connected by the straight transverse portion 14'. To the portion 14' I connect two independent rods 15. The straps 16 are secured one to each leg 10 and are provided at one of their extremities with loops. The lower ends of the rods 15 are pivotally secured in these loops.

For securing the rods 15 to the part 14', I provide eyes at the ends of the rods 15, the eyes being somewhat larger than the thickness of the part 14'. This construction results in a sliding pivotal relation between the rods 15 and the part 14' and in addition permits considerable lateral play.

For guiding the relative movements of the rods 15 with respect to the rod 14 and for latching them in bracing position, I provide the clip shown in detail in Figure 3. This clip consists of a body portion having two pairs of ears 17 and 18. The ears 17 are bent over to tightly clamp the parts 14'' of the rod 14 to prevent any movement between the clip and the rod 14. The ears 18 are however bent into the form shown in Figures 3 and 4, and are spaced apart just sufficient to permit the passage therebetween of the two rods 15 at the same time.

It will readily be seen from an inspection of the drawings how the different parts fold together. To fold a pair of legs from the position shown in Figure 1 to the position in Figure 2, it is necessary to first draw the extremities of the legs together. This not only brings the legs close together throughout their length but it also brings the rods 15 of each pair into juxtaposition as shown in dotted lines in Figure 3. It should be noted that the ears 18 are bent slightly inward as shown in Figure 4, to yieldably hold the rods 15 in the full line position of Figure 3, but owing to the rounded shape and to the resiliency of the ears the rods 15 can be easily moved toward each other.

After the legs of a pair have been folded together on their pivot 11, both together are folded inwardly on the table section on the pivot 12. This movement entirely releases the rods 15 from the ears 18, thus leaving the rods free to swing on the pivot 14'. The ears 18 have their edges outturned as shown in Figures 3 and 4. In setting up the table, the rods 15 first snap into the dotted line position of Figure 3, and on spreading the legs these rods snap into the full line position.

Ordinarily when the table is set up, there is very little danger of the collapsing of the table, but to entirely eliminate all possibility of this sort I pivot two overlapping links 19 to the respective legs of each pair, and I connect the links by means of a pivot pin 20 in such a way that the two links will be in alignment when the table is set up. One of the links 19 is provided with a hook shaped end 21 as shown in Figure 2, while the other of the links has an abutment pin 22 which is adapted to be engaged by the hook 21. The result is a toggle latch which is automatically latched in setting up the table, but which must be manually unlatched before folding the table.

The straps 13 are preferably spot welded to the under side of the table top in order to avoid the necessity of making holes through the table top. In fact I prefer to weld all of the permanent or nonpivotal connections of my table, but I do not wish to relinquish my rights to any or all equivalents of this method of securing the parts together.

In my table the entire leg and bracing structure can be folded into the tray like center section of the table. The various parts must lie in the tray as indicated in Figure 2, and in order that they may be expeditiously folded so that the parts will not pile up, I provide abutments 23 on the rods 12. Each rod has one abutment 23, but the two abutments are on opposite sides of the median longitudinal line of the section. Each abutment is designed to limit the inward sliding of the outer leg of the pair of legs with which it is associated. The result is that when the legs are being folded, they will naturally assume the position in which they must lie in the tray, thus relieving the user of the necessity of carefully adjusting the parts in the tray.

I have illustrated and described my invention as used with my camping table. It is obvious however that my folding brace will prove useful wherever a brace is needed on any kind of a folding structure. This is especially true of camp furniture, where it is important that the adjustments be made quickly and easily. I do not desire to be restricted to the specific use which I have described in this application, nor to any other specific use, but I desire to secure the exclusive right to my brace for any and all uses to which it may be put.

Having fully described my invention and its advantages, what I believe to be new and desire to secure by Letters Patent of the United States is:—

1. A pair of pivotally connected crossed arms, a rod, a connection between said rod and one end of each of said crossed arms, said connection permitting independent sliding movement of either or both arms on the rod and permitting also pivotal movement of both arms together on the rod, and a folding brace for preventing both pivotal and sliding movements of the arms, said brace comprising a brace arm which is pivoted at a fixed position with respect to the aforesaid rod, a pair of brace arms pivotally connected to said first brace arm, said pair of brace arms being each pivotally connected with the crossed arms, and a yielding latch for preventing pivotal movement between the brace arms.

2. The combination of two pivotally connected members, one of said members being transversely collapsible, a folding brace comprising two converging arms pivotally connected at their outer ends with one of

said members, a clip secured to said arms at their junction, two arms each having a pivotal connection with said clip and with said collapsible member, said pivotal connections permitting lateral play of the arms in a plane parallel to that of the clip, said clip limiting the pivotal movements of said arms, and ears on said clip, said ears serving to limit the lateral play of the arms.

3. A pair of pivotally connected crossed arms, a rod which is adapted to be secured to the object to be supported by the arms, collars pivotally secured to the arms at their upper extremities, said collars being adapted to engage said rod whereby the arms will have both a sliding and a pivotal connection on the rod, abutments at the extremities of the rod for preventing the sliding off of the arms from the rod, a third abutment on said rod, said third abutment being intermediate said collars and to one side of the middle point of said rod, a toggle latch and links connecting the lower portions of said arms, and a folding brace extending from the under side of the supported object to the lower portions of the legs for holding the pair of arms in supporting position.

4. In combination, two members connected by a transverse pivot, a folding brace for holding said two members in fixed angular relation, said brace comprising a pair of links pivotally connected to a single link, said single link being pivoted to one of said members, said pair of links being diverging and being pivotally connected with the other of said members in a manner such that they may be moved to decrease the angle of divergence, and a clip secured to said single link, said clip having a pair of ears for engaging said pair of links when in their extreme divergent position, the arrangement being such that the links may be released from engagement with the ears only by moving the outer ends of the links toward each other.

5. A brace for use with two pivotally connected members, one of which members consists of two crossed arms, said brace comprising links which are adapted to be connected at their outer ends to the crossed arms, and a substantially V-shaped link pivotally connected at its apex with said first named links at their inner ends, said V-shaped link being adapted to be pivoted at its base to the other of the pivotally connected members, and a clip secured to said V-shaped link at its apex, said clip being adapted to secure said first named links while the crossed arms are spread, the arrangement being such that the clip can be released from engagement with the first named links only by the folding of the crossed arms.

In testimony whereof I affix my signature.

EARL E. McGREW.