Feb. 8, 1966 J. E. R. HENTZI ETAL 3,233,701

FOLDABLE LEG ASSEMBLY

Filed March 31, 1964 2 Sheets-Sheet 1

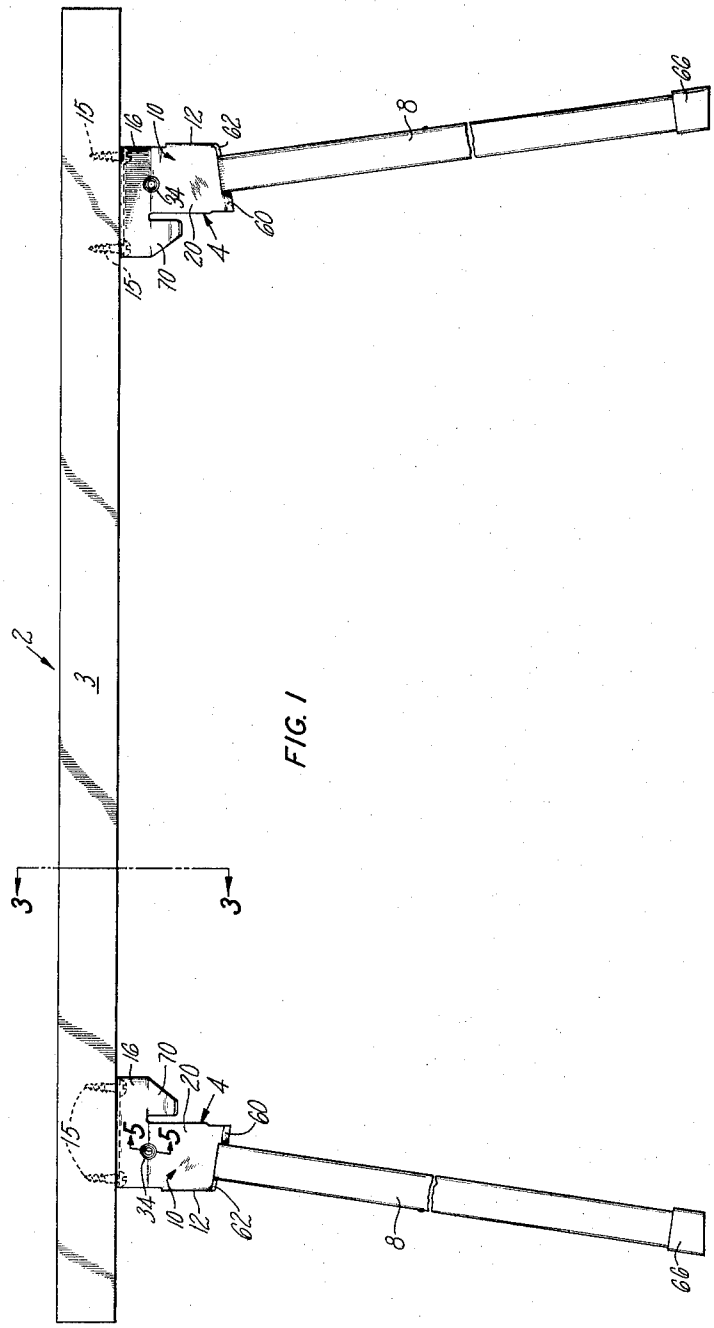


FIG. 1

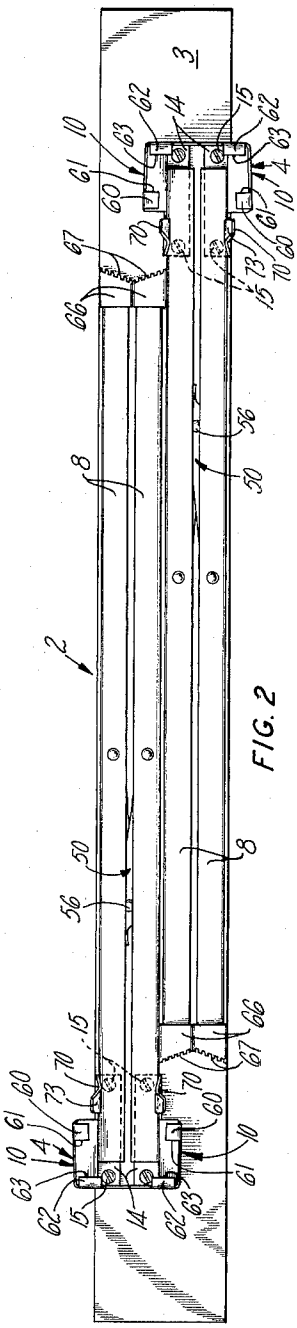


FIG. 2

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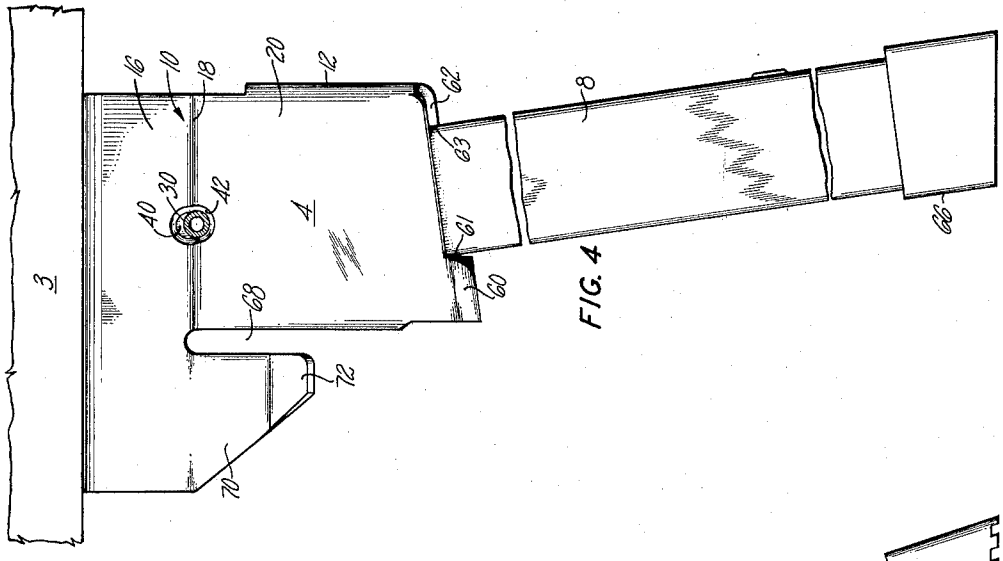


FIG. 4

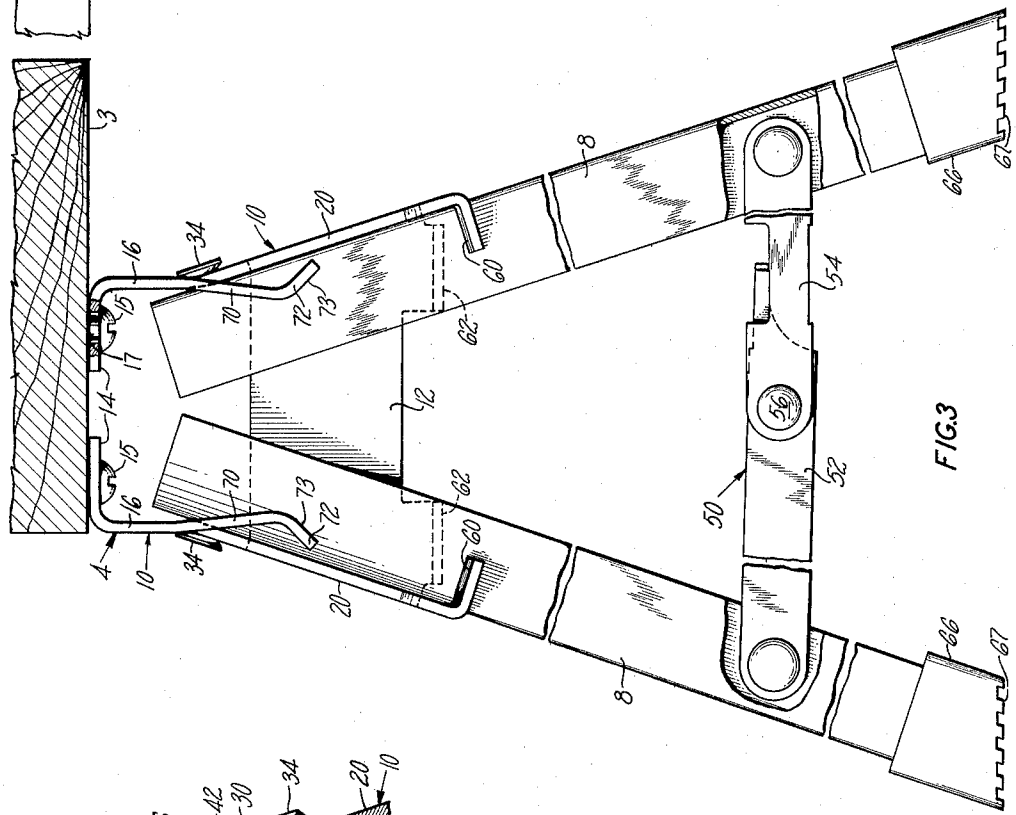


FIG. 3

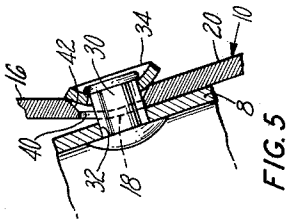


FIG. 5

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FOLDABLE LEG ASSEMBLY

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9 Claims. (Cl. 182—155)

This invention generally relates to foldable legs for tables, trestles, sawhorses and the like and more specifically to a new and improved foldable leg assembly which is particularly suitable for use in connection with sawhorses and the like.

A primary object of the present invention is to provide a novel, foldable leg assembly of the type described which will provide sturdy support from the standpoint of strength and rigidity while being easily and quickly foldable for storage or extendible for use.

A further object of the present invention is to provide such a foldable leg assembly which is readily foldable for storage while being designed to retain its stability and safety after extended and heavy use.

A still further object of the present invention is to provide a novel and improved foldable support assembly that will obtain the above objects and yet may be economically manufactured with a minimum of parts provided by readily available materials.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts whch is exemplified in the construction hereafter set forth, and the scope of the invention is indicated in the appended claims.

In the drawings:

FIG. 1 is a side elevational view of a sawhorse embodying the present invention and illustrating the foldable legs in the fully extended position;

FIG. 2 is a bottom plan view of the sawhorse of FIG. 1 but with the legs folded into a fully retracted position;

FIG. 3 is an enlarged cross-sectional view of the sawhorse taken along lines 3—3 of FIG. 1;

FIG. 4 is an enlarged view of the right-hand portion of the sawhorse of FIG. 1; and

FIG. 5 is an enlarged fragmentary cross-sectional view taken generally along lines 5—5 of FIG. 1.

Referring to the drawings in detail, there is illustrated in FIG. 1, a sawhorse 2 embodying the present invention and basically including a cross member 3, a pair of identical end brackets 4 supported at the opposite ends of cross member 3; and two pairs of foldable legs 8 pivotally connected in each of the brackets 4, respectively.

In the illustrated embodiment, each end bracket 4 is a one-piece body preferably formed by bending a suitable sheet steel blank and includes a pair of spaced side walls 10 interconnected at their lower ends by an integral transverse end wall 12. Extending inwardly from the side walls 10 are a pair of inwardly directed flanges or spaced top walls 14 secured to cross member 3 by screws 15 which extend through apertures 17 provided in the top walls 14. As shown in FIG. 2, the brackets 4 are secured to the cross member 3 in offset relationship relative to the longitudinal axis thereof thereby providing sufficient space for accommodating the legs 8 in their fully retracted or folded position against the cross member.

Referring to FIGS. 3 and 4, each of the side walls 10 of the bracket 4 includes an upper portion 16 which extends vertically, or perpendicular to the top walls 14, and a lower portion 20 which diverges outwardly to the free ends thereof at an angle of 16° relative to the upper portion 16 from a gently curved juncture or fold line 18.

The side walls 10 of the bracket 4 are further provided with downwardly extending integral spring arms 70 for releasably holding the legs 8 in their fully retracted positions against the underside of the cross member 3. As shown in FIG. 4, the spring arms are formed by lancing slots 68 in both side walls 10 of the bracket adjacent the open end of the bracket 4. The spring arms 70 are permanently bent toward each other to resiliently and releasably engage the legs 8 when the legs are in retracted position. The distance between the spring arms 70 is such that the legs must be forced through the spring arms 70 causing the arms to deflect outwardly and to consequently securely retain the legs 8 in their fully retracted positions. The free ends or extremities 72 of the spring arms 70 are curved outwardly to provide a pair of inclined cam surfaces 73 which are also broad and flat so as not to cut into the legs 8 as the legs are passed therebetween.

It will be readily apparent that the bracket 4 may be formed from a sheet metal blank by simple bending operations and no riveting or other assembly of parts is required. Moreover, since the lateral spacing of the top walls 14 is variable during mounting on cross member 3, the spacing between the legs 8 in folded position is adjustable.

The legs 8 are formed from conventional U-shaped channel steel stock and are mounted on the brackets 4 for compound pivotal movement between a fully extended position (shown in FIG. 3) wherein the upper portions of the legs 8 engage the inclined lower wall portions 20 of the bracket and extend along the same angle thereof, and a fully retracted position as shown in FIG. 2 wherein the legs project through the open end of the bracket 4 and extend along the underside of the cross member 3.

In accordance with another aspect of the present invention, the legs 8 are pivotally mounted individually to the brackets 4 by means of a pivot pin or rivet 30 fixed to each leg and an elongated slot 40 centered on the fold line 18 in each of the bracket side walls 10 with a portion of the slot 40 located in the upper side wall portion 16 and a portion of the slot located in the inclined or lower side wall portion 20. In the illustrated embodiment, the rivet 30 extends through an aperture 32 in the outer wall of the legs 8 and then through the slot 40 as shown in FIG. 5. The rivet 30 secures its associated leg 8 to bracket 4 with the leg 8 engaging the side wall 10 through the use of a dish-shaped or spherical washer 34 which is fixed to the rivet 30 and is seated tightly against the countersunk surface 42 of the slot 40.

The diameter of the rivet 30 is slightly less than the length of the slot 40 so as to permit the rivet 30 to move longitudinally and rock in the slot 40 during the folding and unfolding of the legs 8. However, the diameter of the rivet 30 is substantially equal to the width of the slot 40 and the diameter of the aperture 32 in the associated leg 8 so that, while the rivet can move longitudinally and rock in slot 40, lateral movement of the rivet 30 in the slot 40 is precluded.

Thus it will be seen that the above-described rivet and slot connection accommodates rotary and rocking movement of the legs 8 relative to the bracket 4 with the axis of the rivet 30 perpendicular to the effective backing wall at all times and at the same time eliminates slack movement or lost motion of the legs when they are in their extended position so that any instability in the legs is precluded.

In order to releasably lock the legs 8 in their fully extended positions as shown in FIG. 3, a suitable brace, such as overcenter brace 50, is provided. As shown, brace 50 includes a pair of links 52 and 54 pivotally connected at their ends to the legs 8 respectively, and pivotally in-

terconnected by a pin 56. The length of the brace links 52, 54 is such that the brace will exert a force on the legs 8 urging the same against the inclined side wall portions 20 and placing the rivet 30 in tension when the brace is in the locking position shown in FIG. 3. In this manner the legs are held rigid against relative movement as well as movement together relative to the bracket 4. To release the legs 8 for retraction, the brace links 52 and 54 are folded upwardly in the usual manner.

Referring again to FIGS. 3 and 4, the legs 8 are located in their fully extended positions and rigidly held therewith against pivotal movement about the axis of rivet 30 by the provision of the tabs 60 and 62, tab 60 being turned inwardly from the lower edge of the inclined wall portion 20 and tab 62 being turned inwardly from the lower edge of the end wall 12. The tabs 60 and 62 are spaced a distance substantially equal to the width of the legs 8 so that the legs will fit closely between the tabs 60, 62 to prevent endwise movement of the legs. If desired, the leg-engaging edges 61 and 63 of the tabs 60 and 62 may be tapered so as to insure a tight fit regardless of minor dimensional irregularities that may exist in the legs 8.

To provide increased stability, the leg-engaging edges 61 and 63 of the tabs are offset to support the legs at approximately an angle of 8° (see FIG. 4) relative to a vertical plane passing through the pivot slots 40, the pivot slots 40 themselves being inclined at an equal angle so as to be in alignment with the legs when extended thereby facilitating longitudinal and rocking movement of the rivet 30 in the slots 40 as the legs are pivoted from their fully extended positions to an intermediate upright position as they are being folded for storage. The legs may then be folded to their fully retracted position by pivoting them about the axis of the rivets 30.

Each of the legs is provided on the lower end thereof with a foot 66 having a serrated flat bottom surface 67 which, when the legs are fully extended, will extend horizontally for engagement with a floor or the like. The foot 66 which may be molded from a suitable synthetic plastic, is provided with a U-shaped socket dimensioned to tightly receive the leg thereby to be firmly held thereon.

From the above, it will be evident that the improved leg assembly of the present invention will provide rigid and stable support for sawhorses and like devices while being readily foldable and extendible without requiring the use of a single tool. Additionally, the leg assembly can support unusually heavy loads since the weight of the loads is distributed directly to the legs by virtue of the full bearing relationship between the inclined wall portions 20 of the bracket and the legs when the legs are in their fully extended positions which reduces the shear loading on the rivets 30. Finally, the provision of a bracket having side walls provided with an upper portion disposed at an angle to the inclined wall portions 20 accommodates the upper ends of the legs without interference during the folding operation or requiring a special configuration of the upper ends of the legs.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

We claim:

1. A support assembly for a sawhorse cross member and the like comprising a bracket including a pair of spaced side walls and a top wall extending from at least one of the side walls and adapted to support one end of the cross member, said side walls each including an upper portion generally perpendicular to the top wall and a generally planar lower portion diverging outwardly from the upper portion along a fold line dividing said upper and lower portions, a pair of elongated foldable legs each having an upper end portion received in the bracket between the side walls thereof, pivot means mounting the legs to the side walls respectively at said juncture line for pivotal movement toward and away from each other between a fully extended position wherein the upper portions of the legs engage said lower portions of the side walls and a partially retracted portion wherein the upper portions of said legs engage said upper portions of the side walls, said pivot means mounting the legs for pivotal movement about a second axis between said partially retracted position and a fully retracted position wherein said legs extend generally parallel to the cross member, and a brace means for releasably holding the legs apart in the fully extended positions thereof against the lower portions of said side walls.

2. The support assembly as defined in claim 1 wherein said pivot means includes an elongated slot formed in each of the side walls with a portion of the slot formed in said upper wall portion and a portion of the slot formed in said lower wall portion and with the slot extending in the direction of the legs in their fully extended positions, said pivot means including a pair of pivot pins each fixed to one of the legs and received through one of the slots respectively, said pivot pins having a width equal to the width of the slot but less than the length of the slot.

3. The support assembly as defined in claim 2 wherein each of said pivot pins includes a generally dish-shaped washer fixed on the ends thereof to tightly secure the legs to the side walls of the brackets.

4. The support assembly as defined in claim 2 wherein abutment means are provided on said bracket for holding the legs in their fully extended positions thereof against pivotal movement about the axes of said pivot pins, said abutment means positioning the legs to extend at approximately an 8° angle to a vertical plane intersecting the slots when the legs are in the fully extended positions thereof.

5. The support assembly as defined in claim 4 wherein the longitudinal axis of each of said slots extends generally parallel to the legs when the legs are in the fully extended positions thereof.

6. A support assembly adapted to support a sawhorse cross member and the like including a bracket having a pair of spaced side walls, an end wall interconnecting said side walls and a pair of flanges extending toward each other from the side walls to form a top wall to be secured to the underside of the cross member, each of said side walls including a generally planar upper portion and a generally planar lower portion extending outwardly at an obtuse angle from said upper portion along a juncture line extending therebetween, a pair of elongated foldable legs each having an upper end portion received in the bracket between the side walls thereof, means pivotally connecting each of the legs to a side wall including an elongated slot in the side wall longitudinally extending into the upper and lower planar portions and centered on the juncture line therebetween, and a pivot pin extending through the slot and having one end fixed to the leg, said pivot pin being dimensioned to move longitudinally and rock in said slot to provide pivotal movement of the leg between a fully extended position wherein the leg engages the lower planar portion of the side wall and a partially retracted position with the leg engaging the upper planar portion, said pivot pin further being pivotable about its own axis to permit the leg to be pivoted into a fully retracted position substantially parallel to the cross member, brace means for releasably holding the legs apart in the fully extended positions thereof, and a resilient catch means on the side walls of the bracket for releasably holding the legs in said fully retracted positions.

7. The support assembly as defined in claim 6 wherein the bracket is a one-piece metallic structure and wherein the catch is formed integral with the bracket structure and includes a pair of spring arms depending downward-

ly and inwardly from said upper planar portions of the side walls at the end of the bracket opposite to said end wall.

8. A support assembly adapted to be secured to the cross member for a sawhorse and the like comprising a bracket having a pair of spaced side walls each including an upper portion and a lower portion diverging outwardly from said upper portion along a juncture line dividing said upper and lower portions, a pair of elongated foldable legs each having an upper end portion received in the bracket between the side walls thereof, and pivot means mounting the upper end of the legs to said side walls respectively at said juncture line for pivotal movement in a first plane between a fully extended position wherein the legs engage said lower portions of the side walls and a partially retracted position wherein the legs engage said upper portions of the side walls, said pivot means further pivotally connecting the legs for movement in a second plane generally normal to said first plane for pivoting the legs into a fully retracted position wherein the legs extend generally parallel to the cross member.

9. A support assembly as defined in claim 8 wherein said connecting means includes elongated slots extending across said juncture lines and rivets secured to said legs and extending through said slots respectively whereby the pivotal movement of the legs in said first plane results from longitudinal and rocking movement of said rivets in said slots.

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