Jan. 8, 1963 J. S. GREENBERG ET AL 3,072,451

FOLDING TABLE CONSTRUCTION

Filed July 15, 1960 2 Sheets-Sheet 1

Fig. 1.

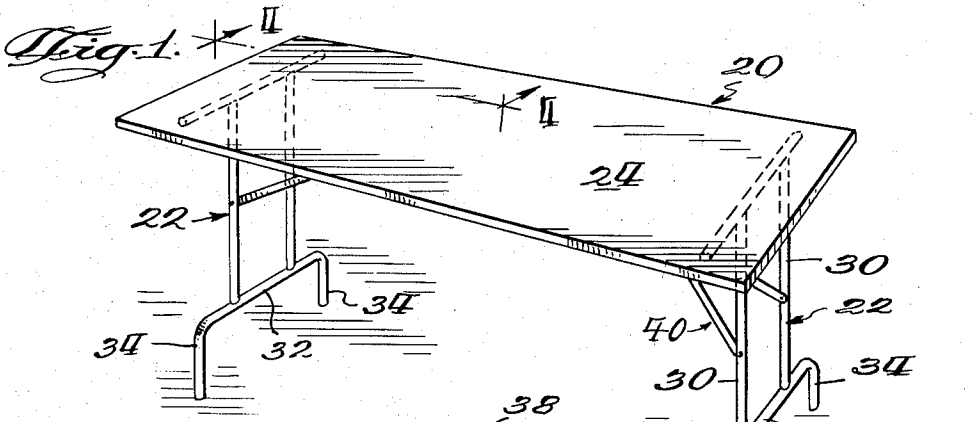


Fig. 2.

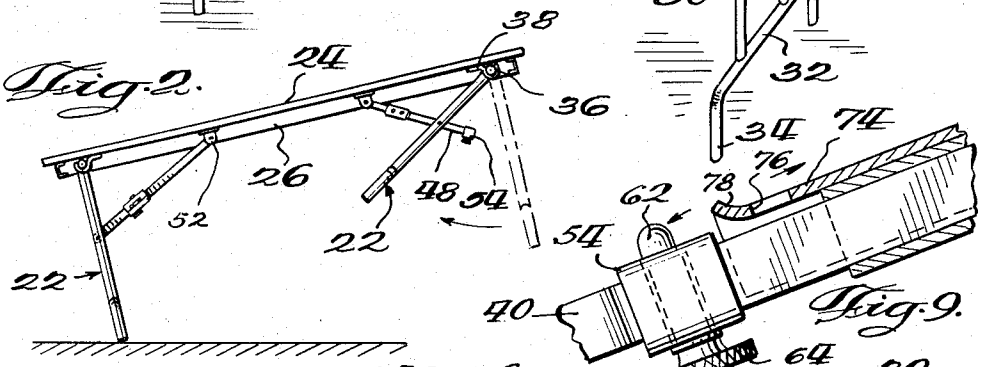


Fig. 9.

Fig. 3.

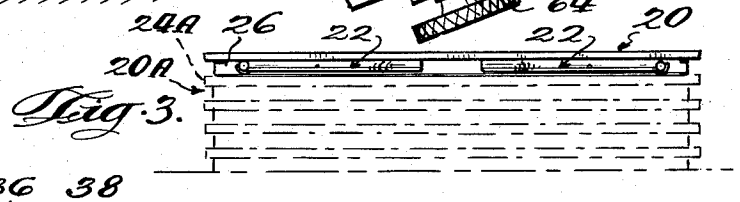


Fig. 4.

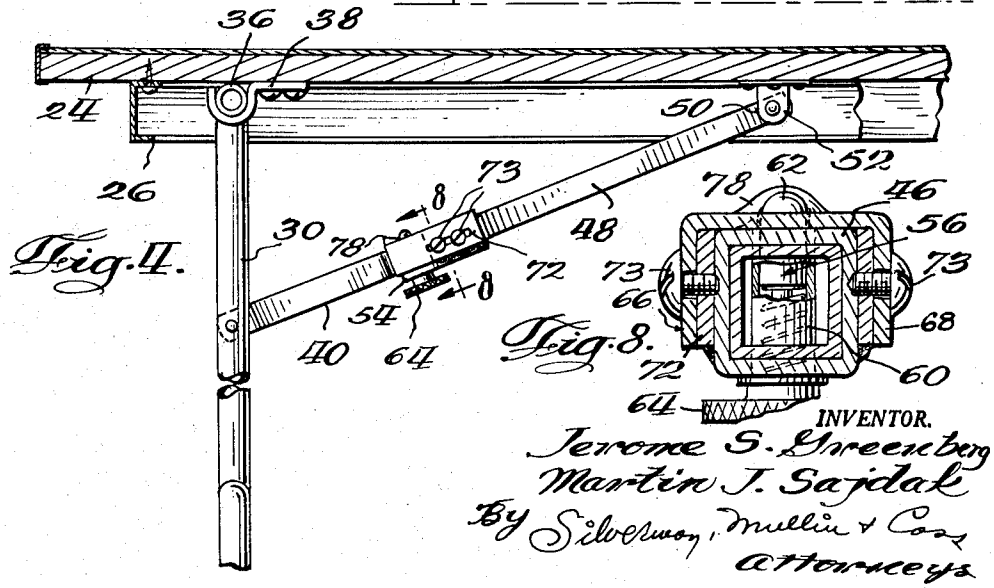


Fig. 8.

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FOLDING TABLE CONSTRUCTION

Filed July 15, 1960 2 Sheets-Sheet 2

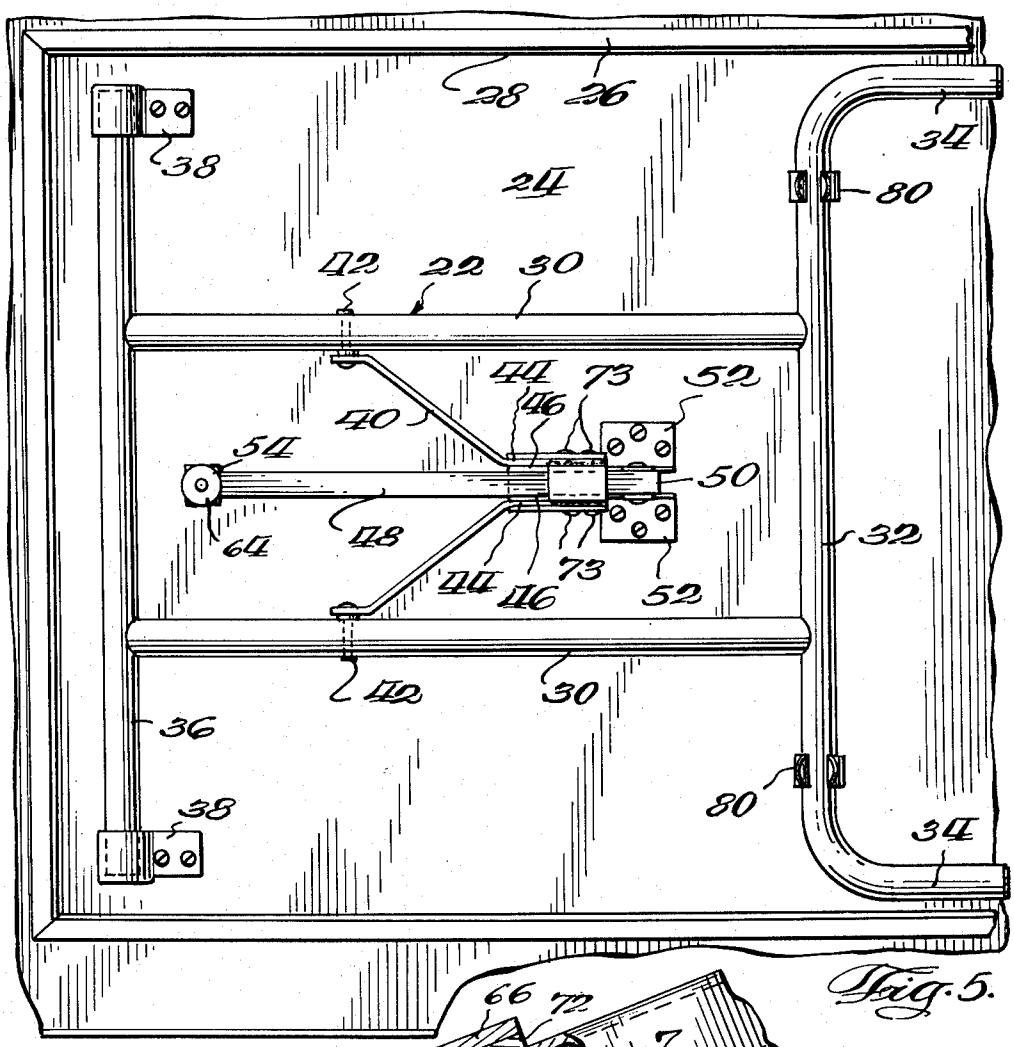


Fig. 5.

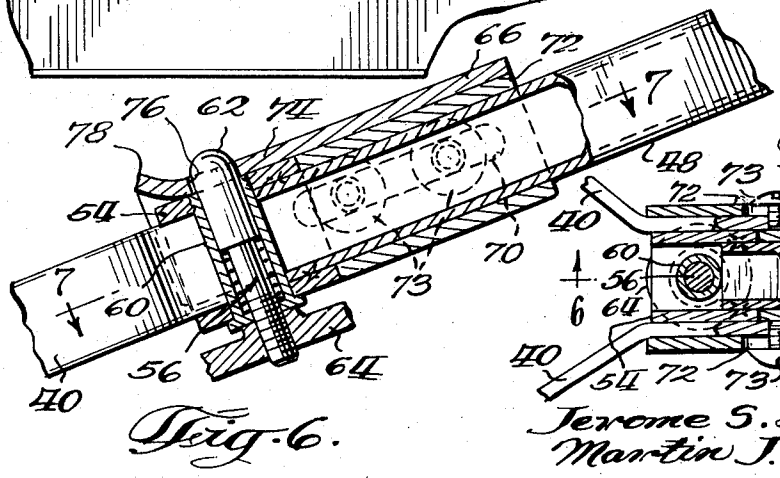


Fig. 6.

Fig. 7.

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FOLDING TABLE CONSTRUCTION

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3 Claims. (Cl. 311—87)

This invention relates generally to collapsible furniture and more particularly, relates to improvements in a folding leg and brace structure for a folding table or the like and which includes novel latch means for maintaining the table or the like in a stable, erected condition.

It is contemplated that the improved folding leg and brace structure embodying the invention may be used advantageously in connection with collapsible supporting structures other than furniture, such as, for instance, ironing boards, however, the invention will be described and illustrated in detail as used in a folding table for purposes of explanation. It has been known to provide folding leg structures for folding tables which employ telescoping members secured to the table and latching means for locking the telescoping members together in a predetermined relationship to prevent collapse of the folding leg structure after the table is unfolded. Such folding leg structures have been less than satisfactory in many respects. In general, such folding leg structures have been formed of other than readily available materials and have utilized component parts which were required to be specially formed for satisfactory use in the folding leg structure. Consequently, the cost of manufacturing such heretofore known folding leg structures was expensive and frequently necessitated expensive and special tools and machines. In order to prevent undesirable rotation of the telescoping members one relative to the other so that the erected table would be stable and would not wobble or teeter, additional means preventing such relative rotation between the telescoping members of the folding leg structure were utilized with attendant increased cost of manufacture.

Inherent in the construction of folding leg and brace structures of the general character with which the invention is concerned is the wearing of component parts which frictionally engage one with the other and move one against the other in the frequent folding and unfolding of the table, for instance. This wearing occurs frequently in the erected condition of the table when the telescopic members are locked together. Consequently, although the table can be opened, such wearing results in undesirable play between such component parts which causes the table easily and readily to wobble and teeter in its erected condition.

Accordingly, it is a primary object of the invention to provide an improved folding leg and brace structure of the character described which is characterized by a construction which substantially eliminates the aforementioned disadvantages.

Another object of the invention is to provide folding leg and brace structure of the character described which includes leg means adapted to be pivotally mounted on the underside of and adjacent one end of a table top, for instance, and a brace member adapted to be pivotally mounted on the underside of said table top spaced from said one end, said leg means and brace member having cooperating telescoping members slidable one relative the other for erecting and collapsing the table, and said telescoping members having cooperating latch means for releasably locking the telescoping members together in the erected condition of the table so as to prevent relative sliding movement between the telescoping members to separate them.

Another important object of the invention is to provide

a folding leg and brace structure of the character described in which the telescoping members are of complementary rectangular configuration so as to prevent relative rotation therebetween without interfering with relative sliding movement therebetween.

Another object of the invention is to provide a folding leg and brace structure as described which includes novel adjustable channel means cooperating with the latch means in the erected condition of the table to assure a stable and substantially rigid support for the table, said channel means being adjustable to compensate for wearing of component parts of the folding leg and brace structure after long use.

Other objects of the invention reside in the provision of a folding leg and brace structure of the character described which can be formed from standard or stock materials and readily obtainable parts economically; which can be folded or collapsed compactly against the underside of a table top, for instance, so that the folded tables can be stacked conveniently and readily; which is sturdy and durable and economical to manufacture without requiring expensive machining or dies or tools without sacrificing strength and stability of structure.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangement and a combination of parts hereinafter fully described, illustrated in the accompanying drawing, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of this invention, there is illustrated in the accompanying drawing a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, this invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

Referring to the drawings in which the same characters of reference are employed to indicate corresponding or similar parts throughout the several figures thereof:

FIG. 1 is a perspective view of a folding table in erected condition and having the folding leg and bracing structure embodying the invention installed thereon.

FIG. 2 is a side elevational view showing said table partially folded.

FIG. 3 is a side elevational view of said table collapsed or folded, and showing a plurality of folded tables stacked one upon the other in phanton outline.

FIG. 4 is a fragmentary vertical sectional view taken through the table along the line 4—4 of FIG. 1 and in the direction indicated generally.

FIG. 5 is a fragmentary bottom plan view of the table in folded condition and showing the folding leg and bracing structure folded against the underside of the table top.

FIG. 6 is a fragmentary sectional view taken along the line 6—6 of FIG. 7 and in the direction indicated generally.

FIG. 7 is a sectional view taken along the line 7—7 of FIG. 6 and in the general direction indicated.

FIG. 8 is a sectional view taken along the line 8—8 of FIG. 4 and in the direction indicated generally.

FIG. 9 is an enlarged fragmentary elevational view of latching means and adjustable channel means cooperating with the latching means, portions being shown in section to illustrate details.

Referring now to the drawings, the reference character 20 designates generally a folding table having the novel folding leg and bracing structure embodying the invention secured thereon which has been designated generally

by the reference character 22. There is a pair of identical structures 22 which are utilized in the illustrated application of the invention, said structures 22 being advantageously secured to the underside of the table top 24. The construction and configuration of the table top 24 may vary from the rectangular table top 24 illustrated and may be made of anyone of many different materials and combinations of materials well-known in the art. As shown in FIG. 4, an open rectangular frame 26 may be secured to the underside of the table top to define a well 28 (see FIG. 5) in which the leg structures 22 are received in their folded condition. The frame 26 may also be useful in connection with stacking of the folded tables as seen in FIG. 3. The depending frame 26 has been omitted from FIG. 1 of the drawings.

Since each of the structures 22 are substantially identical only one of them will be described in detail. The leg and brace structure 22 includes a table leg preferably formed of metal tubing which is readily available commercially and easily bent to desired shape. In the embodiment of structure 22, the table leg is provided by a pair of similar standards 30 arranged parallel one with the other. The cross-member 32 is secured to one end of each of the standards 30 by any well known means and is bent adjacent the extremities thereof to provide the foot members 34. The standards 30 are connected at their respective opposite ends to a cross-rod 36 which is pivotally secured to the underside of the table top 24 by means of brackets 38 screwed or otherwise fastened to the bottom at the table. The leg structures are secured adjacent opposite ends of the table top with the cross-rod 36 transverse to the longitudinal center line of the table top so that the table legs can be pivoted one relative the other for folding and unfolding of the table. Of course, the means employed for mounting the table legs to the table top may vary considerably so long as a pivotal installation thereof is realized.

A yoke member 40 is rotatably secured between the standards 30 by means of suitable pins or bolts 42, and arranged in closer proximity to the pivotal cross-rod 36 than the cross-member 32. The converging ends 44 of the yoke member are rigidly secured to a collar or tube 46 of substantially rectangular cross-section, the collar or tube 46 providing one of the telescoping members of the structure 22. The yoke member 40 is advantageously made of metal strips which are readily bent to shape.

The second telescoping member of the structure 22 comprises an elongate rod or bar 48 of generally rectangular cross-section complementary with that of the collar 46, albeit smaller, so that the collar 46 and rod 48 can be telscopically engaged one with the other and permit sliding movement of the collar and rod one relative the other. The complementary cross-sectional configuration of the collar and rod, however, will prevent rotation of one relative the other. The elongate rod 48 preferably is a hollow, metal member which is pivotally secured at one end 50 thereof to the bottom of the table top 24 by means of the angle brackets 52 screwed to the table top. The opposite end of the rod 48 is formed with an enlarged rectangular cross-section formation 54 provided with a spring-pressed bullet catch member designated generally 56. The function of the rod or bar 48 is that of a brace member, said brace member being located between the standards 30 and substantially coincident with the longitudinal center line of the table top 24 and normal to the pivotal cross-rod 36. In the structure 22, the brace member 48 is telscopically assembled with the yoke 40 and the enlarged formation 54 serves as a stop means to limit maximum opening of the table leg by limiting sliding movement of the telescoping members.

Referring to FIG. 6, it will be seen that the catch member 56 provided in the enlarged end 54 of the brace member is carried in a sleeve 60 extending through the enlarged end 54. The catch member has a bullet-shaped projection 62 spring-biased to a normal position exterior of the sleeve 60 and a knurled nut 64 for selectively withdrawing the projection 62 into the sleeve. The normal position of the projection 62 is exterior of the sleeve 60 and the enlarged end 54.

A cooperating latch component is provided on the yoke member 40. Said latch component comprises a channel-shaped member 66 preferably formed of metal which is fixedly secured on top of the collar 46. The opposite lateral walls 68 of the channel member 66 each have a pair of slots 70 extending parallel to the length of brace 48, each slot in one lateral wall 68 being aligned with a slot in the opposite lateral wall 68. In addition, suitable openings are provided in the plates 72 welded to the collar to enable the channel member to be secured to the collar by means of the fasteners 73 threaded into the plates 72. Projecting outwardly of and generally in the plane of the connecting web of the channel member 66 is an extension 74 having a perforation 76 therein of suitable dimension to receive the bullet shaped projection 62. The free end of the extension 74 is upwardly curved to provide a detent lip 78 which will freely ride upon the projection 62 when the table is unfolded to the maximum opening position of the table legs. The extension 74 protrudes beyond the collar 46. By loosening the fasteners 73, the channel member 66 can be adjusted along the length of the bracing member 48 which will change the position of the perforation 76 relative to the bullet-shaped projection 62 when the table is unfolded. There is thus permitted adjustment to permit the table legs to be retained in precise vertical planes when the table is unfolded and the projection 62 is engaged in the perforation 76. The engaged latch elements on the yoke 40 and brace members 48 prevent reverse sliding movement of the telescoping members 40 and 48 in the erected condition of the table.

Referring to FIG. 5, the leg structure 22 is illustrated in folded condition against the bottom of the table top 24 in the well 28 provided by the frame 26. Spring clips 80 may be provided on the bottom of the top 24 which engage the cross-member 32 to retain the leg structure 22 in folded condition on the inside of the frame 26. To unfold the table, the cross-member 32 is disengaged from the spring clips 80 and the leg structure is pivoted on the cross-bar 36 away from the table top to a position at right angle to the table top. During pivoting of the leg structure, the yoke 40 will pivot on the pins 42 permitting the bracing member 48 to slide relative to the collar 46. The bracing member also will pivot away from the table top 24 about the pivot axis provided by connection of end 50 to the brackets 52. The maximum open position of a table leg is provided by engagement of the stop means 54 with the collar 46 of the yoke 40. The detent lip 78 will ride upon the projection 62 and depress the same under the lip 78 until the catch element is spring-biased into engagement with the perforation 72. This locks the telescoping members 40 and 48 against separation along the axis of the bracing member 48. The table can then be erected canted in the position thereof shown in FIG. 2 and the procedure duplicated with the second leg structure 22.

Due to frequent opening and closing of the leg structures 22, the exact positions of the leg structures 22 will change from vertical in the erected condition of the table due to wearing of the perforation 76. The table will tend to be loose and wobbly in its erected position due to the play between the latch elements. Adjustment of the position of the channel member 66 as enabled by the invention so that the portion of the perforation 76 to engage the projection 62 can be moved to firmly abut the projection 62 in the erected condition of the leg structure. However, the open position of the leg structure remains fixed by reason of the action of the stop means 54 engaging collar 46 of the yoke 40.

To fold the table, the knurled nut 64 is retracted to

withdraw the projection 62 from the perforation 76 so as to permit the leg structure to be pivoted and returned to the folded position of the leg structure against the table top 24 as seen in FIG. 5. The leg structures 22, when folded into the well 28 of the frame 26 are entirely recessed within the frame 26. This permits a plurality of the folded tables to be stacked one upon the other in a stable formation as shown in FIG. 3. It will be noted that the frame 26 of the upper table 20 is engaged upon the table top of the nether table 20A and so on down the stack as represented by the phantom outline 82.

It is believed that this invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing without further description and it should also be manifest that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the specific details are nevertheless capable of wide variation within the purview of this invention as defined in the appended claims.

What is claimed and desired to be secured by Letters Patent of the United States is:

1. In a collapsible table, a folding leg and brace structure comprising, a leg member adapted to be pivotally connected at one end thereof to the top of the table for movement between a folded position adjacent the table top and an extended position substantially normal to the table top, a yoke member pivotally connected intermediate the opposite ends of the leg member and is closer proximity to said pivotally connected end of the leg member, an elongate brace member of rectangular cross-section pivotally connected at one end thereof to the table top and engaged with a portion of said yoke member for sliding movement one relative to the other during movement of said leg member between said positions, said portion of the yoke member being rectangular in cross-section so as to prevent rotation of the brace member and yoke portion one relative the other during said sliding movement, said brace member having an enlarged formation at the opposite end thereof for limiting relative sliding movement between the brace member and yoke portion when the extended position of the leg member is reached, said opposite end of the brace member being free of the table top and having latch means carried thereby for releasably locking the brace member and yoke portion together in said extended position of the leg.

2. In a collapsible table, a folding leg and brace structure comprising, a leg member adapted to be pivotally connected at one end thereof to the top of the table for movement between a folded position adjacent the table top and an extended position substantially normal to the table top, a yoke member pivotally connected intermediate the opposite ends of the leg member and in closer proximity of said pivotally connected end of the leg member, an elongate brace member of rectangular cross-section pivotally connected at one end thereof to the table top and engaged with a portion of said yoke member for sliding movement one relative to the other during movement of said leg member between said positions, said portion of the yoke member being rectangular in cross-section so as to prevent rotation of the brace member and yoke portion one relative the other during said sliding movement, said brace member having an enlarged formation at the opposite end thereof for limiting relative sliding movement between the brace member and yoke portion when the extended position of the leg member is reached, said opposite end of the brace member being free of the table top and having latch means carried thereby for releasably locking the brace member and yoke portion together in said extended position of the leg, said yoke portion comprising, a channel member having said brace member telescopically engaged therein, said channel member having a latch component adjustably installed thereon to compensate for normal play in the latch means in said extended position of the leg member.

3. In a collapsible table, a folding leg and brace structure comprising, a leg member pivotally connected to the top of the table and movable between a first position folded adjacent the bottom of the table top and a second position substantially normal to the table top, a yoke member pivotally connected to the leg member, an elongate brace member pivotally connected at one end thereof to the table top and telescopically engaged with said yoke member for sliding movement one relative to the other during movement of the leg member between said positions, said brace member having an opposite free end having stop means comprising an enlarged formation for limiting relative sliding movement between the brace member and yoke member when the second position is reached, and said brace and yoke member having cooperating latch means for releasably locking the same together in said second position, said enlarged formation adjacent the opposite end of the brace member adapted to abut the yoke member in said second position, said latch means comprising, a catch element on said formation and said yoke having a latch component adapted to frictionally engage the catch element in said second position, said latch component being adjustably installed to permit selective movement of the latch component relative to the catch element to compensate for normal play therebetween in said second position.

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