Jan. 19, 1954 J. PUCCI 2,666,683

FOLDING TABLE WITH AUTOMATIC LEG LOCKING MECHANISM

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FIG.1

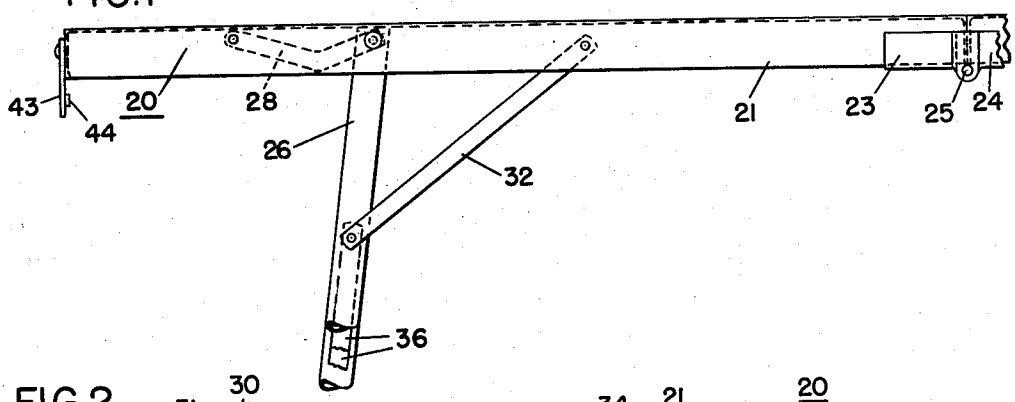



FIG.2

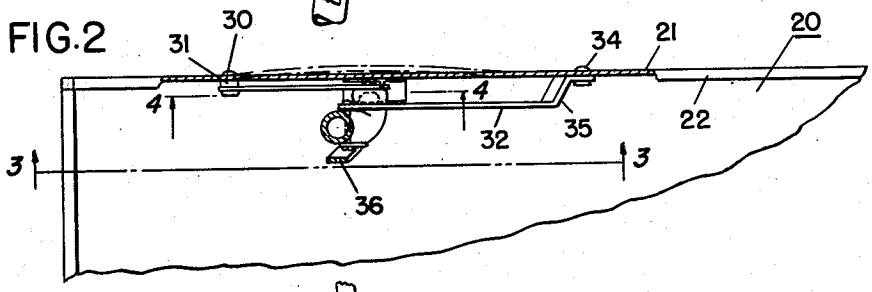



FIG.3

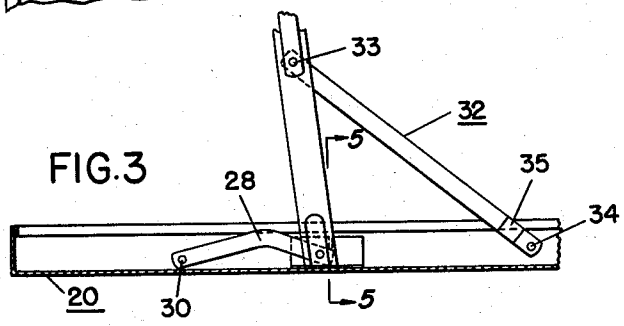



FIG.4

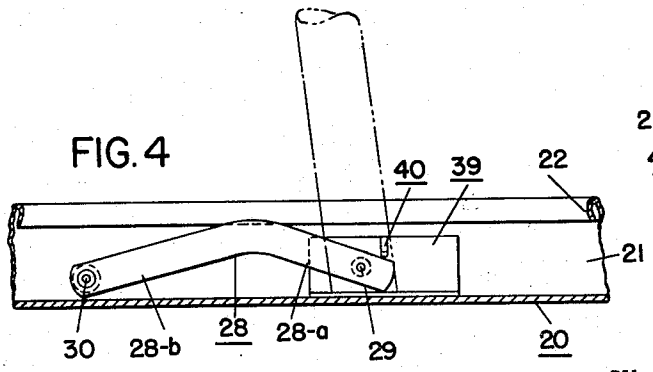
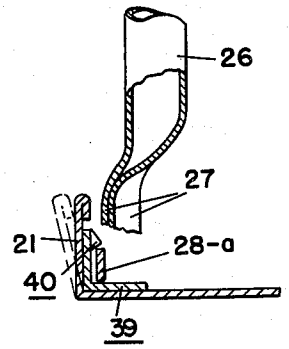



FIG.5




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FIG. 7

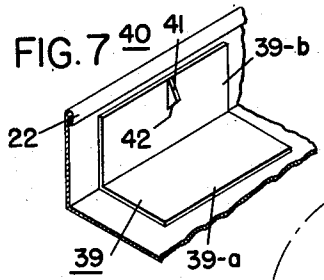



FIG. 6

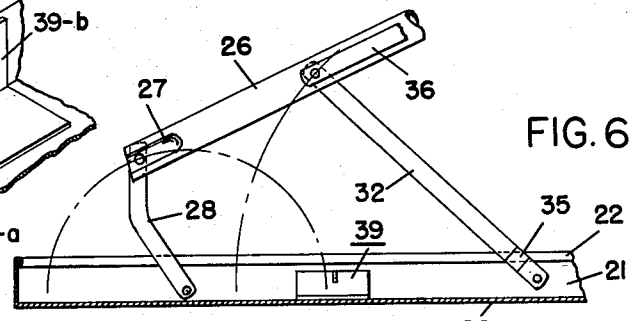



FIG. 9

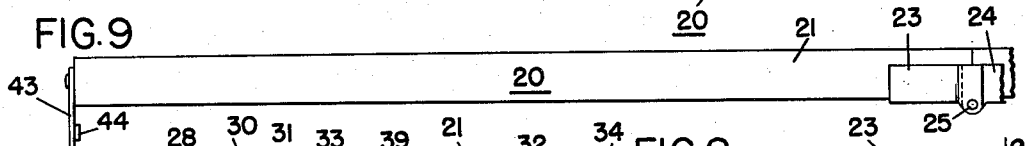



FIG. 8

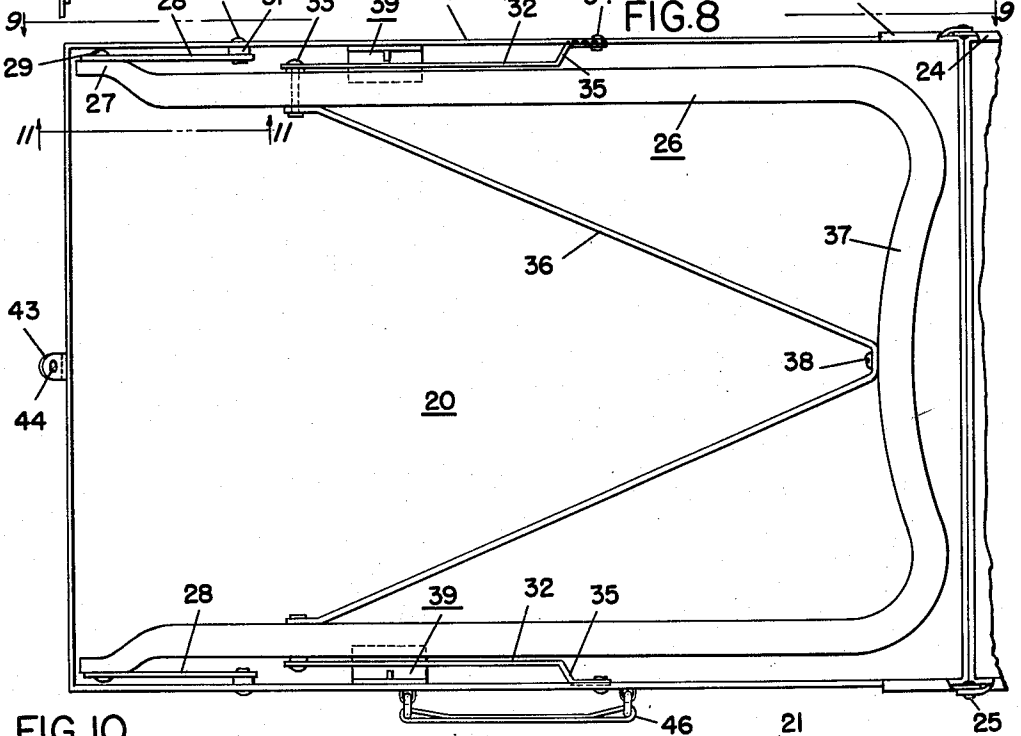



FIG. 10

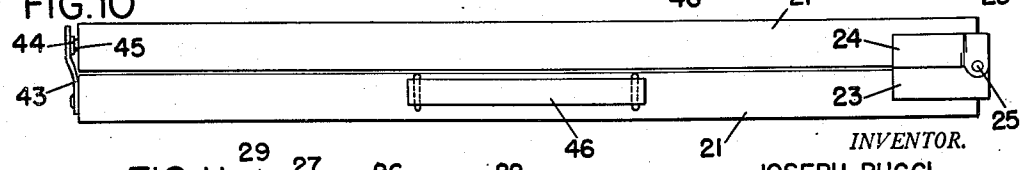
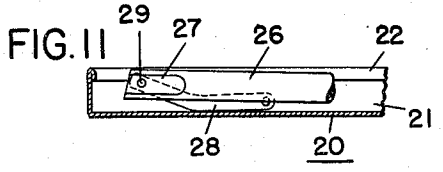



FIG. 11




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# UNITED STATES PATENT OFFICE

2,666,683

## FOLDING TABLE WITH AUTOMATIC LEG LOCKING MECHANISM

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Application May 28, 1953, Serial No. 358,078

8 Claims. (Cl. 311—87)

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The present invention relates generally to folding tables and it relates more particularly to tables having folding or collapsible legs.

An object of the present invention is to provide a new and improved collapsible-leg construction for tables and the like. Another object of the present invention is to provide a table or like structure having legs constructed and arranged to be quickly and easily shifted either to more or less vertical, open, supporting position, or to more or less horizontal closed position, wherein they lie generally flat against the underside of the table top to facilitate storage when not in use. Still another object of the present invention is to provide novel link-mounting and opposed bracing means for a folding table leg or the like, as well as simple and inexpensive locking means, co-acting with the link-mounting means, for securing the leg in open position; said locking means being effective to prevent inadvertent collapse of the leg yet yielding under intentional pressure so as to enable the leg to be manually shifted to closed position.

Other objects and advantages of the present invention are apparent in the following detailed description, appended claims and accompanying drawings.

In Cohen and Pucci Patent 2,542,394 there is shown a foldable table having a pair of hinged top-sections and having supporting legs which are pivotally mounted, so that they can be manually shifted either into open, generally vertical, supporting position, or into closed position wherein each leg member lies generally flat against the underside of one of the top-sections of the table. In Patent 2,542,394, longitudinally shiftable interengaging means are associated with the leg members so that, when the two top-sections are in open co-planar position, manual tilting of the leg members to open position will shift the interengaging means into position wherein they maintain the two top-sections against displacement from their open co-planar relationship. Manually releasable automatic locking means are associated with the interengaging means of Patent 2,542,394 to prevent inadvertent collapse of the leg members from their open position.

In my co-pending application, Serial No. 253,099, filed October 25, 1951, now Patent 2,643,926, there is shown a foldable table of the same general type as that of Patent 2,542,394, but having improved locking means, also associated with the longitudinally shiftable interengaging means referred to above.

While folding tables of the type disclosed in

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Patents 2,542,394 and 2,643,926 have proven effective and have met with great commercial success, the incorporation of the longitudinally shiftable interengaging means is relatively expensive and makes it impossible to produce that type of table as a low-priced item.

I have found that the interengaging means can be eliminated, in the interest of economy, so long as the leg members are provided with effective locking mechanism which will automatically engage and lock the leg member in open position and which, at the same time, can be readily disengaged to enable the leg members to be closed.

According to the present invention, this is accomplished by providing each leg member with novel link-mounting means, operating in opposition to pivoted bracing means, and by providing somewhat yieldable cam locking means associated with the link-mounting means, whereby manual shifting of the leg member to open position will cause the link-mounting means to be automatically engaged by the locking means and to be held thereby so as to prevent inadvertent collapse of the leg member; the locking means being so constructed as to yield under deliberate manual closing force exerted upon the leg member so as to permit the leg member to be moved back to closed position.

For the purpose of illustrating the invention, there is shown in the accompanying drawings one form thereof which is presently preferred; it being understood, however, that the present invention is not limited to the precise arrangements and instrumentalities shown.

Referring to the accompanying drawings in which like reference characters indicate like parts throughout:

Figure 1 is a fragmentary side elevational view showing slightly more than one-half of a folding table forming one embodiment of the present invention.

Figure 2 is a fragmentary cross-sectional view taken generally along the line 2—2 of Fig. 1.

Figure 3 is a fragmentary cross-sectional view taken generally along the line 3—3 of Fig. 2.

Figure 4 is a somewhat enlarged cross-sectional view taken generally along the line 4—4 of Fig. 2.

Figure 5 is a fragmentary enlarged vertical cross-sectional view taken generally along the line 5—5 of Figure 3.

Figure 6 is a view generally like that of Fig. 3 but showing the leg, the mounting link and the brace as they appear while the leg is in the process of being closed (or opened).

Figure 7 is a considerably enlarged perspective

view showing the cam locking element as it appears when the mounting link has been disengaged therefrom.

Figure 8 is a bottom plan view of the embodiment of Fig. 1 but showing the leg member in fully closed position.

Figure 9 is a side elevational view looking generally along the line 9—9 of Fig. 8.

Figure 10 is a view generally like that of Fig. 9 but showing the appearance of the table when the two top-sections have been closed and fastened together for carrying and/or storing.

Figure 11 is a somewhat enlarged cross-sectional view taken generally along the line 11—11 of Fig. 8.

In Fig. 1, there is shown a foldable table having a top which is formed by a pair of identical sections 20, 20. Each of the top-sections 20 is formed of light-weight sheet-metal or the like and may be generally rectangular in configuration, with integrally-formed depending flanges 21 extending along all four sides thereof.

The free edge of the flange 21 is provided with an inturned lip 22, as best shown in Fig. 5.

The top-sections 20, 20 are foldably connected in end-to-end co-planar relationship by hinge units disposed at adjoining corners thereof. Each hinge unit is made up of co-acting hinge-elements 23 and 24, riveted or otherwise appropriately secured to the side flanges 21 of the respective top-sections, and a connecting hinge-pin 25, whereby the two top-sections can be shifted from the co-planar end-to-end position shown in Figs. 1, 8 and 9 to the closed position shown in Fig. 10, for greater convenience in carrying and/or storing.

Each of the top-sections is provided with a tubular leg-member 26 of generally U-shaped configuration, having crimped free ends 27. Each free end 27 is provided with a mounting link 28. One end of the mounting link 28 is pivotally connected by a pin 29, to the crimped end 27 of the leg member 26, while the other end of the mounting link is pivotally connected, by a pin 30, to the side flange 21 at a point spaced somewhat inward of the outer free end of the top-section. The connecting pin 30 is provided with a washer 31 which serves to space the mounting link 28 slightly inward from the flange 21, and thereby enable it to clear the inturned lip 22 during pivotation thereof, as shown in Figs. 2 and 8.

The mounting link 28 is composed of two angularly-related portions 28–*a* and 28–*b*; the connecting pin 29 being disposed adjacent the free end of the portion 28–*a* while the connecting pin 30 is disposed adjacent the free end of the portion 28–*b*.

As indicated in Figure 11, when the leg member 26 is in closed position, the portion 28–*b* of the mounting link 28 bears against the underside of the top-section 20 while the portion 28–*a* diverges, at an appreciable angle, from the top-section so that the pin 29 and the free end 27 of the leg-member are spaced somewhat away from the underside of the top-sections.

I have found this feature to be important in that it prevents the free end of the leg-member from banging into the top panel every time the leg-member is closed and thereby minimizes the likelihood of injury to, or excessive wear, of the relatively thin sheet metal forming the top-section. Additionally, the inclined edge of the portion 28–*a* of the mounting link co-acts, in a novel manner, with the locking mechanism to be hereinafter described.

Each leg-member is provided with a pair of bracing links 32. One end of each bracing link 32 is pivotally connected, by a pin 33, to the leg-member 26 at a point spaced appreciably away from the crimped free end 27 thereof. The other end of the bracing link 32 is pivotally connected, by a pin 34, to the side flange 21 at a point disposed generally centrally intermediate the ends of the side flange 21. As best shown in Figs. 1 and 3, the pin 34 and the pin 30 are disposed on opposite sides of the leg-member 26 when the latter is in its upright open position.

The bracing link 32 is provided with an inwardly bent portion 35 generally adjacent the pin 34 so as to space the main portion of the bracing link a greater distance inward from the flange 21 than is the case with the mounting link 28; thereby enabling the bracing link 32 to clear the locking mechanism, hereinafter described, as indicated in Fig. 8, when the leg is in closed position.

Each of the U-shaped leg-members 26 is provided with a generally V-shaped reinforcing element 36. The free ends of the V-shaped member 36 are secured by the pins 33 described above while the base of the V-shaped member 36 is secured to the somewhat concave base 37 of the leg-member 26 by a screw 38.

Each of the top-sections 20 is provided with a metal reinforcing plate 39, generally L-shaped in cross-sectional configuration, which is secured, by spot-welding or in any other suitable manner, to the underside of the top-section 20 and the inner side of the side flange 21, as best shown in Figs. 4–7. The reinforcing plates 39 are so disposed that, when the leg-member 26 is in open position, the crimped free ends 27 bear against the base portion 39–*a* of the plate. In this way the plate 39 serves to strengthen the relatively thin sheet metal of the top panel at the point of greatest wear and minimizes the likelihood of failure at that point. As best indicated in Figs. 3 and 5, the edge of the crimped free end 27 may be formed so that it bears squarely against the base 39–*a*, even though the leg-member, in open position, is not precisely at right angles to the top-section; the leg-members diverging slightly downwardly as indicated in Fig. 1.

The vertical or upright portion 39–*b* of the reinforcing plate 39 is provided with a locking-element 40, in the form of an inwardly-directed, generally wedge-shaped member having a camming edge 41 which begins generally at the inturned lip 22 and diverges inwardly and downwardly (when the table is in the inverted position shown in Figs. 3-7) from the flange 21. A second camming edge 42 begins at the lower end of the camming edge 41 and extends outwardly and downwardly therefrom, terminating at a point spaced sufficiently above the base 37 to permit the portion 28–*a* of the mounting link 28 to be accommodated therebetween, when the leg-member 26 is in open position, as indicated in Figs. 3–5. The maximum inward dimension of the locking element (that is, the inward dimension at the lower end of the camming edge 41) is greater than the inward clearance between the mounting link 28 and the flange 21.

The operation of the locking element is as follows. Starting with the leg-member 26 in the closed position of Figs. 8, 9 and 11 (wherein, as indicated in Fig. 9, it is fully concealed with-

in the flange 21), the leg-member is swung toward open position by manually lifting the base 37 thereof, thereby causing counterclockwise rotation of the leg-member and clockwise rotation of the mounting link 28 and the bracing link 32 (in Fig. 6). This clockwise rotation of the mounting link 28 causes the inclined lower edge of the portion 28–*a* to contact the camming edge 41 and results in relative camming movement of the portion 28–*a* and the locking element 40. This relative movement is represented, in Figs. 2 and 5, by a slight bowing out or bulging of the somewhat resilient flange 21, as indicated in dash-dot lines. It is to be understood, however, that, in actual practice, some or all of the relative camming movement may be taken up by inward movement of the mounting link 28; the U-shaped leg-member 26 having sufficient resilience or "give" at its free ends to permit this.

After the upper edge of the mounting link 28 rides past the lowermost end of the camming edge 41, the locking element 40 (and/or the mounting link 28) snaps back to its original position wherein the locking element overlies the mounting link 28 as best indicated in Figs. 4 and 5; thereby resisting return movement of the mounting link and closing movement of the leg-member.

The lower camming edge 42 of the locking element 40 is at a sufficiently steep angle, with respect to the inclined upper edge of the portion 28–*a*, as to offer substantial resistance to relative camming displacement thereof. When the table is in its open position, as shown in Fig. 1, the above-mentioned resistance against relative camming displacement of the portion 28–*a* and the camming edge 42 is augmented by the weight of the table top and the load supported thereby so that the leg-member is securely locked against inadvertent collapse, such as otherwise might result if the leg-member were accidentally kicked, etc.

However, when the table is turned over to the inverted position shown in Figs. 3 and 5, a substantial manual closing force exerted upon the base 37 will overcome the aforesaid camming resistance and will result in relative camming displacement of the lower camming edge 42 and the inclined upper edge of the portion 28–*a* until the portion 28–*a* rides over the locking element 40, whereupon further force exerted on the base 37 will cause the leg-member 26 to rotate clockwise and will cause the mounting link 28 and bracing link 32 to rotate counterclockwise (in Fig. 6) so as to return the leg-member and the links to the fully closed position of Figs. 8, 9 and 11.

The two top sections 20, 20 can then be swung into the closed abutting, side-by-side position shown in Fig. 10, for convenient carrying and/or storing. The outer end flange of one of the top-sections 20 may be provided with a fastening tab 43 carrying a female snap-fastener element 44, constructed and arranged to lock with a male snap-fastener element 45 on the outer end flange of the other top-section, to secure the two top-sections in the enclosed position as indicated in Fig. 10. A carrying handle 46 may be provided on the outside of one of the side flanges 21 to permit the closed unit to be transported more conveniently.

From the foregoing, it is evident that the novel construction of the present invention affords an extremely simple and inexpensive, and yet effective, locking mechanism for holding the leg-members of the table against inadvertent collapse when the table is in use. At the same time, the novel construction of the present invention permits the leg-members to be closed by simple manual pressure, and without the need for manipulation of separate release buttons or the like. The table is thus more convenient to use as well as greatly simplified in construction, whereby it can be manufactured at low cost and in large volume.



As indicated in Fig. 6, the mounting link 28 and the free end 27 of the leg-member 26 swing through an arc of approximately 180 degrees when the leg-member is shifted from closed position to open position, and vice versa, whereas the bracing link 32 moves through an angle of somewhat less than 45 degrees.

As shown in Fig. 8, when the leg-member 26 is in fully closed position, the free ends 27 are disposed intermediate the connecting pin 30 and the outer end flange 21 of the top-section; the leg-member occupying substantially the entire longitudinal dimension of the top-section. On the other hand, when the leg-member 26 is in open position, as shown in Fig. 1, its free end 27 is disposed on the opposite side of the pin 30 (that is, between the pin 30 and the inner end of the top-section 20). This spaces the open leg appreciably inward of the outer end of the top-section, so as not to get in the way of a person seated at the end of the table.

The use of fixed pivot mountings for the leg-members is considerably less desirable than is the novel link mounting described above, because it places a considerably greater strain upon a localized zone of the relatively weak sheet metal side flanges, such as might very well cause the side flange to fail. Additionally, the use of a fixed pivot corresponding to the location of the pin 30 would require that the leg-member be shorter than the longitudinal dimension of the top-section, which means that a longer top-section would be required to permit use of table-height leg-members.

While, in the embodiment described above, the use of relatively thin sheet metal for the top section makes it desirable to employ the L-shaped reinforcing plate 39, it is apparent that this reinforcing plate could be eliminated if the top-section were made of sufficiently heavy and thick metal or wood or the like so as not to require reinforcement. In such case, the locking element 40 would be constructed as a separate element with conventional means (not shown) for affixing it directly to the side flange of the top-section.

The present invention may be embodied in other forms and, accordingly, the foregoing embodiment is to be considered merely as illustrative and not restrictive, reference being made to the appended claims, rather than to the preceding description, as indicating the scope of the invention.

Having thus described my invention, I claim as new and desire to protect by Letters Patent:

1. In a table having a top of sheet metal or the like provided with an integral depending side flange; a generally L-shaped plate having a horizontal base portion affixed to the underside of the top and having a vertical portion affixed to the inner side of the flange; a locking element mounted on said vertical portion and directed inwardly therefrom, said locking element being spaced appreciably away from the base portion and having a camming edge inclined inwardly away from the free edge of the flange; a leg

member; a mounting link having one end pivotally connected to the upper end of the leg and the other end pivotally connected to the inner side of the flange at a point longitudinally intermediate the L-shaped plate and the outer end of the top, said mounting link being normally disposed in a plane intersecting the inclined camming edge of the locking element; a bracing link having one end pivotally connected to the leg member at a point appreciably spaced from the upper end thereof and having its other end pivotally connected to the inner side of the flange at a point longitudinally inward of the L-shaped plate; said leg member being positionable in generally horizontal closed or collapsed position wherein it lies generally adjacent the underside of the top with its aforesaid end located longitudinally outward of the pivotal connection of the mounting link to the flange, said leg member being manually movable to generally vertical open position with the mounting link swinging through an arc of about 180 degrees so as to seat the aforesaid upper end of leg member against the base portion of the L-shaped plate, the edge of the mounting link contacting the inclined camming edge and causing momentary relative lateral displacement of the locking element and the mounting link so as to permit the mounting link to ride over the locking element and to be seated intermediate it and the base portion so as to secure the leg member in open position; and means associated with the locking element for permitting return leg-closing movement of the mounting link.

2. A construction according to claim 1 wherein the last-mentioned means comprises a second camming edge inclined outwardly from the innermost end of the first camming edge, manual movement of the leg member toward closed position causing the edge of the mounting link to contact the second-mentioned camming edge and to cause momentary lateral displacement of the locking element and the mounting link so as to permit the mounting link to ride back over the locking element, thereby freeing the mounting link for swinging movement back to leg-closing position.

3. A construction according to claim 2 wherein the flange is somewhat resilient so that it can be bowed outward to facilitate lateral displacement of the locking element during the locking and unlocking movement of the mounting link.

4. A construction according to claim 3 wherein the mounting link is formed with two angularly related portions, whereby, in the leg-enclosed position, one portion is seated against the underside of the top and the other portion diverges from the underside so as to support the aforesaid end of the leg member in somewhat spaced relationship to the underside.

5. A construction according to claim 1 wherein the mounting link is formed with two angularly related portions, whereby, in the leg-enclosed position, one portion is seated against the underside of the top and the other portion diverges from the underside so as to support the aforesaid end of the leg member in somewhat spaced relationship to the underside.

6. In a table having a top provided with a depending side flange; a locking element mounted on the inner side of said side flange and directed inwardly therefrom, said locking member being spaced appreciably away from the underside of the top and having a camming edge inclined inwardly away from the free edge of the flange; a leg member; a mounting link having one end pivotally connected to the upper end of the leg and the other end pivotally connected to the inner side of the flange at a point longitudinally intermediate the locking member and the outer end of the top, said mounting link being normally disposed in a plane intersecting the inclined camming edge of the locking element; a bracing link having one end pivotally connected to the leg member at a point appreciably spaced from the upper end thereof and having its other end pivotally connected to the inner side of the flange at a point longitudinally inward of the locking member; said leg member being positionable in generally horizontal closed or collapsed position wherein it lies generally adjacent the underside of the top with its aforesaid end located longitudinally outward of the pivotal connection of the mounting link to the flange, said leg member being manually movable to generally vertical open position with the mounting link swinging through an arc of about 180 degrees so as to seat the aforesaid upper end of the leg member against the underside of the top, the edge of the mounting link contacting the inclined camming edge and causing momentary relative lateral displacement of the locking element and the mounting link so as to permit the mounting link to ride over the locking element and to be seated intermediate it and the underside of the top so as to secure the leg member in open position; and means associated with the locking element for permitting return leg-closing movement of the mounting link.

7. A construction according to claim 6 wherein the last-mentioned means comprises a second camming edge inclined outwardly from the innermost end of the first camming edge, manual movement of the leg member toward closed position causing the edge of the mounting link to contact the second-mentioned camming edge and to cause momentary lateral displacement of the locking element and the mounting link so as to permit the mounting link to ride back over the locking element, thereby freeing the mounting link for swinging movement back to leg-closing position.

8. A construction according to claim 7 wherein the mounting link is formed with two angularly related portions, whereby, in the leg-enclosed position, one portion is seated against the underside of the top and the other portion diverges from the underside so as to support the aforesaid end of the leg member in somewhat spaced relationship to the underside.

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