Aug. 23, 1938. U. K. JOHANNSEN 2,128,209

FOLDING TABLE

Original Filed Feb. 28, 1936

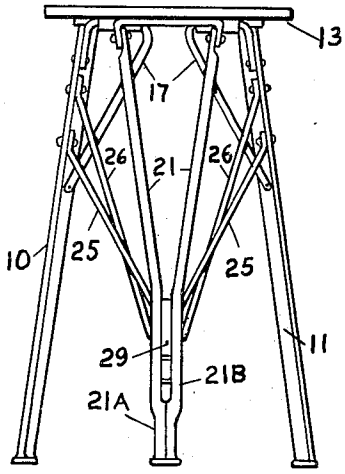



FIG. 1.

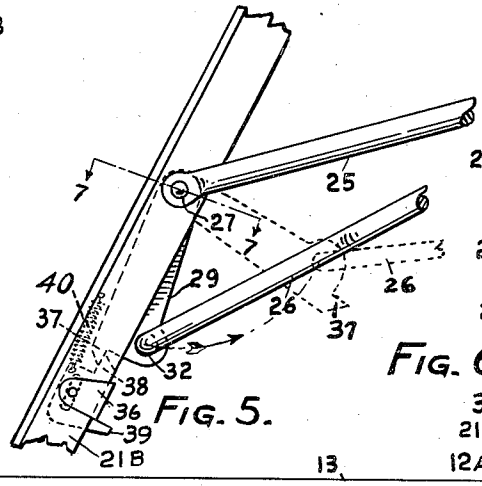



FIG. 5.

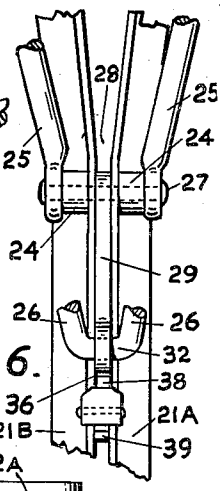



FIG. 6.

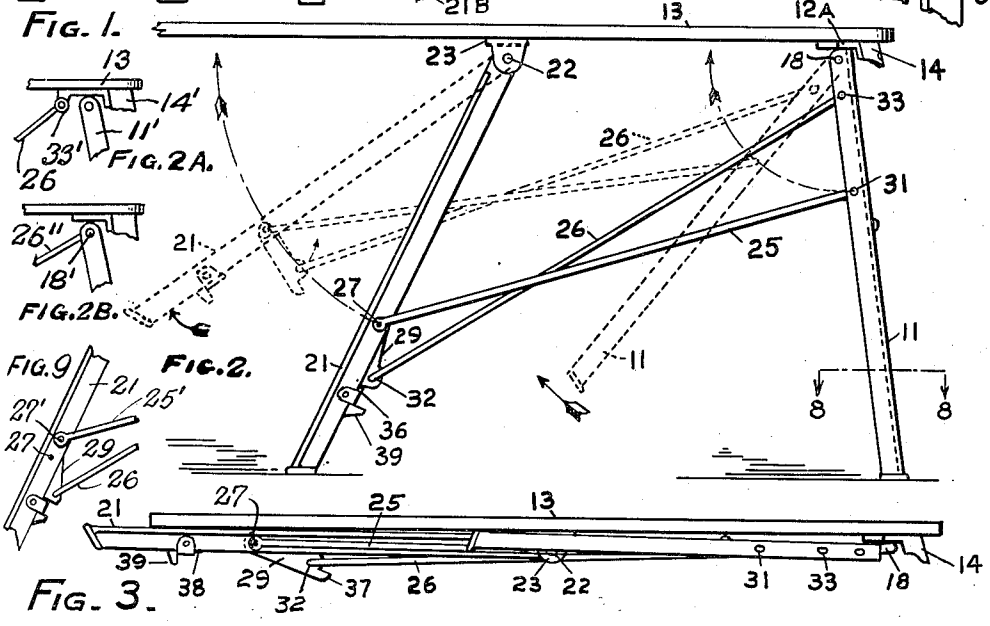



FIG. 2.




FIG. 2A.

FIG. 2B.




FIG. 9.




FIG. 3.

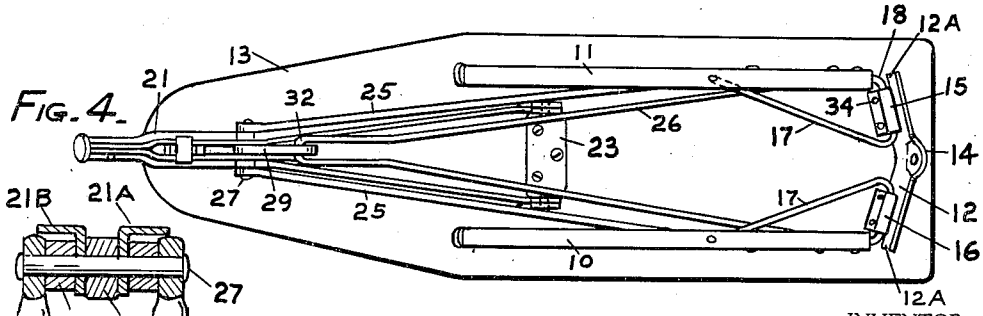



FIG. 4.

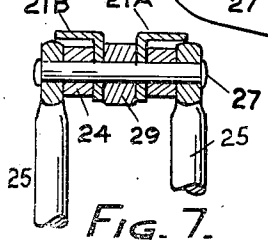



FIG. 7.

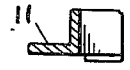



FIG. 8.

INVENTOR.
UDO K. JOHANNSEN.
BY Louis Ilmer
ATTORNEY.

Patented Aug. 23, 1938 2,128,209

# UNITED STATES PATENT OFFICE

2,128,209

## FOLDING TABLE

Udo K. Johannsen, Cortland, N. Y., assignor to The Brewer-Titchener Corporation, Cortland, N. Y., a corporation of New York

Original application February 28, 1936, Serial No. 66,193. Divided and this application June 24, 1936, Serial No. 86,930

6 Claims. (Cl. 38—117)

My invention broadly relates to portable folding tables, and is more particularly directed to a collapsible ironing board stand of the three-legged, all metal chassis type in which the legs are adapted to compactly fold flatwise underneath the table board when said understructure is not extended for use.

A pair of complementary rear legs have one end thereof pivotally attached under the top board and a single rigid front leg is similarly attached in a fixed spaced relationship to the rear leg pivots. All of my rectilinear legs are positively actuated in unison between their erected and collapsed positions by the use of an improved actuating gear, the operation of which chassis requires a comparatively small muscular exertion. Such controlled leg movement is herein brought about by means of companion guide rods which pivotally interconnect the several rear legs with the front leg in a novel manner that permits of automatically spreading the floor contacting tip of such rear legs when my table is set up.

In addition, I provide for an improved bipartite locking rod or linkage of the jointed toggle type of which one free link end may be pivotally secured adjacent to the underside of the table board in the vicinity of a rear leg board pivot. My other or mated locking rod component constitutes a rockable link or lever whose unjointed outer end is preferably mounted upon an auxiliary pivot located contiguous to or coincident with the front leg guide rod pivot. Such lever is kept comparatively short with respect to its mated toggle component and arranged to swing within finite limits about its auxiliary pivot into a locked or a released position. To interlock the erected legs, the jointed end of my cranklike lever may by a simple manipulation of the front leg be rocked in a direction toward the floor contacting extremity of the erected front leg into one extreme travel position to cause said linkage to fall into a shortened or buckled overall length. When released, the table legs are free to collapse in unison and whereby my toggle linkages assume an extended alignment or unbuckled relationship when locked in erected chassis position, my ironing board is rendered inherently rigid while having a heavy downward pressure imposed thereon.

The profile of each such metal table leg is preferably given a cross-sectionally angle shape to combine ample lateral stiffness with low chassis weight that shall not for a prescribed loading requirement, prove burdensome to women when carried to and from a storage closet.

The present embodiment is a division of my copending application, Serial No. 66,193 as filed February 28, 1936 and as a species thereof, represents a reversed toggle linkage disposition in that the rockable lever is herein arranged to interlock the erected front and rear legs when such manipulative front leg lever is shifted away from the rear legs as contrasted with a shifting of the lever toward the rear legs to bring about a like result in the parent disclosure.

The object of the present invention is to provide for a sturdy, foldable understructure of the character indicated in which the board supporting legs are kept rigid throughout their respective lengths and that shall possess comparatively few essential fulcrum points to constitute an assembly that is especially suited for rapid production on an extensive scale at a low fabrication cost, the leg interconnecting toggle links being herein kept free from any dead-center alignment position except when the respective table legs are fully collapsed flatwise against their top board.

Embodied herein are also other novel structural features such as an improved latch device serving to retain said lever in its erected leg position. Reference is had to the accompanying one sheet of drawings which are illustrative of a certain exemplification and in which drawing:

Fig. 1 is an elevational front view of an erected ironing board assembly equipped with my devices, and Fig. 2 is a side view thereof.

Figs. 2A and 2B respectively illustrate certain modified pintle dispositions.

Figs. 3 and 4 respectively show a side and a bottom view of my chassis when fully collapsed.

Fig. 5 represents a fragmental enlargement of the Fig. 1 side view to depict a portion of the front leg having a toggle lever fulcrumed thereon, and Fig. 6 details a corresponding rear view.

Fig. 7 shows a cross-section taken along 7—7 of Fig. 5, while Fig. 8 is taken along 8—8 of Fig. 2.

Fig. 9 fragmentally illustrates a minor modification in the hook up of my guide link.

Referring more specifically to my preferred embodiment, the numerals 10 and 11 respectively designate a pair of rear legs or structure that may be made up from relatively thin, reversely mounted angle iron lengths of which one such profile is detailed in Fig. 8. An elongated sheet metal bracket 12 is disposed crosswise of the table top or board 13 and fixedly secured to the rear thereof by suitable fastenings. The longitudinal edges of said bracket may be upturned into reenforcing lips and the medial region thereof stamped to include a hook 14 by which to

hang up the collapsed board. To each side of said hook, lies a winglike leaf portion which are respectively cross-sectionally offset or channeled as at 15 and 16 in a reversed, axially oblique relationship and secured to the top by rivets 34 or the like (see Fig. 4).

A triangularly shaped or the like leg mounting member such as 17 may be made up from metal rod stock of which one length component is pivotally mounted within a leaf channel to constitute a snugly fitted rear leg hinge pintle 18, another component is embraced within the upper portion of a rear leg angle iron and secured thereto, while still another component length serves as a lateral leg strut. The adjacent sharp bends of each such complementary pintle member when mounted in place, are preferably kept spaced apart, as shown. A sole plate may be interposed between the channeled leaves and the table board to obviate pintle wear. In addition, the top of each rear leg may be appropriately beveled and my bracket extended to provide for opposed metal stop lips 12A against which to abut the respective beveled ends when the rear legs are fully erected. The described inclined hinge disposition is such that when the rear legs are collapsed, they will lie in substantial parallelism alongside their respective board edges; but, in their erected position, the feet of the rear legs automatically spread apart in the Fig. 1 manner.

My front leg is also of the inherently rigid, rectilinear type that may be shaped up from sheet metal into a continuous semi-tubular formation of the kind more specifically disclosed in the aforesaid parent application, it being preferred to resort to a front leg 21 that is markedly tapered toward the foot region thereof. The wider upper leg end may be pivoted at 22 to a lug strap 23 provided with a pair of ears that are spaced to impart lateral rigidity to the front leg mounting. Herein such leg is shown built up out of complementary angle iron components 21A and 21B whose mated flanges are spacedly aligned at the floor contacting end region and given a divergent formation at the hinged leg end region as shown in Fig. 1. All of such table legs may be equipped with suitable shoe means at the respective swinging ends thereof.

The actuating gear whereby the several legs are made to fold or unfold in unison about their respective board pivots 18 and 22 will now be defined. To this end, I may resort to a pair of guide or brace rods such as 25 which are used in combination with one or more bipartite locking rods of which one jointed component is designated as 26. In the present tripod structure, the front leg 21 between the ends thereof, is provided with an auxiliary pivot 27 that may have one or more spacer bushings 24 disposed therearound in the Fig. 7 manner. The angle irons of said front leg may be kept longitudinally spaced by the gap 28 to receive a lever or rocker arm 29 of which one end may be mounted upon the auxiliary pivot 27 and between said bushings as detailed in Fig. 7 to constitute the other component of said bipartite locking rod means.

The companion guide rods 25 may respectively be pivoted to a different rear leg between the ends thereof by an intermediate pivot such as 31 and the other guide rod ends are preferably but not necessarily, riveted to opposed terminals of the auxiliary pivot 27, as shown, that is as an equivalent, the jointed connection of said other end of the guide rod 25' with the front leg may be carried to the separate link pivots 27' when located contiguous to the auxiliary or lever pivot 27 in the manner shown by Fig. 9.

The lever or mated link component 29 may be apertured near its swinging end and have the nose of an offset V-shaped locking rod or link component 26 entered therethrough to constitute a medial pivot joint 32 for my toggle linkage. The divergent ends of said locking rod are here shown independently pivoted at 33 by suitable rod pintle means located closely adjacent to their respective rear leg pivots 18, it being pointed out that the location of the pivotal attachment 33 is to a certain extent optional, except that the rear end of each such locking rod component 26 terminates in proximity to the board 13 at a proper rearward distance from the front leg pivot 22.

Since the precise hook-up location of the pintle 33 with respect to the board 13 is immaterial, one end of said locking rod may as an equivalent, be attached by a separate pivot bracket such as 33' (see Fig. 2A) or directly to the rear leg board pivot 18' as in Fig. 2B, provided the locking rods are given a corresponding length. All such mounting variations serving to produce a like result, are intended to be embraced in the claim definition: "rod pintle means carried by the board and located adjacent to the pivotal attachment of the rear leg structure."

A heavy downward pressure exerted upon said board tends to spread apart the feet of the respective front and rear legs, but this effort is herein firmly resisted by the use of a lever latching device such as 36 which may be of any appropriate type. For such purpose, the swinging end of the lever 29 may be shaped to provide for a beveled projection or tongue 37 adapted to automatically engage a retractible bolt 38 that is slidably mounted on the front leg and may be automatically actuated by the coil spring 40. Said bolt is shown provided with a finger piece 39 by which to release the lever 29 after it has been rocked into its full-lined or one extreme travel position.

Assuming the jointed components 26 and 29 of my leg actuating toggle linkage to be shifted into the buckled or inverted relationship shown in Fig. 2, then the overall length between the supplemental pivot 27 and the rear rod pivot 33 will become shortened when the manipulative lever is thrown downwardly toward the foot of the erected front leg and away from the rear legs as represented in Fig. 5 by full lever outline. When latched, such extreme toggle shift position serves to lock the brace rods 25 against movement about their pivots 27 and 31, which in turn rigidly retains the erected front and rear legs against collapse toward the top board.

When collapsed, the foot of the front leg 21 purposely overhangs one end of the top board as indicated in Figs. 3 and 4. A folded ironing board of this kind may be conveniently handled by standing the same upright upon such floor rest without defacing the fabric covering that is usually attached to a board side face.

To unfold my all metal chassis, the front leg may be drawn away from the board and by virtue of my rod interconnections, the rear legs will regularly follow in unison. A like result may be had by thumping said overhanging front leg foot upon the floor and simultaneously tilting the board in a proper direction. When performed rapidly, the lever 29 may thereby be thrown so as to automatically engage the latch bolt 38 and snap into its extreme full-lined position of Fig. 5. Preparatory to collapsing said chassis, the latch

36 is released which in turn allows said lever to be raised inwardly away from the free extremity of the front leg and toward the rear legs into the dotted position of Fig. 5, whereupon the several legs may be unrestrainedly folded in unison toward one board face into their Fig. 3 position.

In the present species, the erected Fig. 2 represents the rockable lever 29 shifted into one of its extreme travel positions, and the collapsed Fig. 3 shows said lever in its other extreme position. My bipartite actuating gear operates in a reverse manner from a conventional toggle brace in that the jointed component links 26 and 29 of the present actuating gear serve to lock the erected legs when my toggle linkage is inverted as in Fig. 2. On the other hand, said toggle components assume a substantially aligned relationship when the legs are fully collapsed. In the latter instance, the medial toggle pivot 32 lies in a normal relationship between the extended link ends, whose respective pivots 27 and 31 then become spaced apart into a lengthened condition. When the legs are erected, my buckled linkage draws the toggle components 26 and 29 into their retracted or shortened condition.

As a further structural feature, my jointed pin 32 is not allowed to assume substantial toggle alignment with the extended link pins 27 and 33 except when my table understructure is fully collapsed flatwise against the board 13 as in Figs. 3 and 4. In all partially folded positions, the toggle link components 26 and 29 purposely remain in a maintained buckled relationship to obviate any intermediate dead center alignment likely to stall the cooperating guide rods 25. Furthermore in collapsed position, the diverging strut ends of each rear leg mounting member 17 respectively overlie an associated locking rod so that when the front leg is initially unfolded, both rear legs 10 and 11 are thereby positively lifted away from the board, which in turn carries the jointed pin 32 out of its aligned toggle position.

Hence by a simple and easily understood manipulation, my table understructure may be either folded or unfolded in one operation from a centralized point by a corresponding continuous manual shifting of the front leg in one and the same direction without gear obstructions of any kind. When fully erected, my beveled rear leg ends may abut their respective stop lips 12A to augment table rigidity.

It will be observed that the jointed end 32 of the lever 29 in all its swing positions herein remains rearward of the pivot 27 and behind the rear longitudinal edge of the erected front leg and which edge serves as a stop agency to confine the lever shift between finite extreme limits; also that subsequent to the initial unfolding of the collapsed legs from extended toggle alignment, the rods 25 and 26 remain crossed between the extreme travel positions of said lever in the Fig. 2 manner. Furthermore, it is preferred to axially cross the inclined guide rods 25 with respect to the locking rod 26 in erected or spread leg position and to so space these rod members apart that they will then produce a frictional drag or lateral crowding at the cross point region thereof for the purpose of promoting frame rigidity.

In the commercial exemplification of my ironing board, the toggle pivot 32 and the respective pivoted ends 27 and 33 of the relatively extended link components 25 and 29 are not allowed to fall into complete toggle alignment with each other even when the leg structure is fully collapsed against the board as in Fig. 3. This is to say, my extended toggle links then bridge a rectilinear span distance that is fixed by the collapsed position of the supplementary pivot 27 and its pintle 33, the overall length of each link component being kept shorter than said span length. Such refined disposition permits the floor contacting end of my rigid front leg to be freely manipulated without encountering interlocking toggle interference in any of its intermediate swing positions about the leg pivot 22.

In my foldable table, all structural parts are kept extremely simple and comparatively light in weight in order to reduce fabrication and assembly costs to a minimum which enables my table to be profitably sold at a correspondingly low retail price as a household commodity through chain stores and the like large scale distributors.

Other advantages inherent in my all metal foldable table chassis are believed apparent to those skilled in this art, it being obvious that the same underlying structural principles may be utilized in associations other than for ironing board stands, and that various modifications in design may readily be resorted to in likewise carrying out my illustrative embodiment, all without departing from the spirit and scope of my invention heretofore described and more particularly pointed out in the appended claims.

I claim:

1. A collapsible table or the like adapted to unfold into erected position, said table comprising a top board, a rear leg structure having one end thereof pivotally attached to said board, a manipulative rigid front leg also pivoted to said board in a forwardly spaced relation to the rear leg structure, intermediate pivot means located on the rear leg structure between the ends thereof, brace rod means interconnecting the intermediate pivot means with the front leg, said brace rod means being so constructed and arranged as to shift the several legs in unison in a common direction, rod pintle means located adjacent to the pivotal attachment of the rear leg structure, a rockable lever of which one end portion is pivotally mounted upon the front leg and which pivotal mounting assumes a certain span distance with respect to the rod pintle means when the several legs are collapsed against the board, stop means confining the rocking movement of the other lever end portion between alternate extreme travel positions respectively located rearwardly of the longitudinal axis of the front leg, and a locking rod pivotally interconnecting such other lever end portion with the pintle means, said lever and locking rod being so arranged and of such proportions as to constitute jointed toggle components each having an overall length shorter than the stipulated span distance and which other lever end by a manipulation of the front leg is unrestrainedly rockable about the aforesaid pivotal mounting within the travel confines afforded by the stop means.

2. A collapsible table or the like adapted to unfold into erected position, said table comprising a top board, a rear leg structure having one end thereof pivotally attached to said board, a manipulative rigid front leg also pivoted to said board in a forwardly spaced relation to the rear leg structure, intermediate pivot means located on the rear leg structure between the ends thereof, brace rod means interconnecting the intermediate pivot means with the front leg, said brace rod means being so constructed and arranged as to shift the several legs in unison in

a common direction, rod pintle means located adjacent to the pivotal attachment of the rear leg structure, a rockable lever of which one end portion is pivotally mounted upon the front leg and which pivotal mounting assumes a certain span distance with respect to the rod pintle means when the several legs are collapsed against the board, stop means confining the rocking movement of the other lever end portion between alternate extreme travel positions respectively located rearwardly of the longitudinal axis of the front leg, a locking rod pivotally interconnecting such other lever end portion with the pintle means, said lever and locking rod being so arranged and of such proportions as to constitute jointed toggle components each having an overall length shorter than the stipulated span distance and which other lever end by a manipulation of the front leg is unrestrainedly rockable about the aforesaid pivotal mounting within the travel confines afforded by the stop means, and latch means carried by the front leg and arranged to coact with the lever in one extreme travel position thereof.

3. A collapsible table or the like adapted to unfold into erected position, said table comprising a top board, a rear leg structure having one end thereof pivotally attached to said board, a manipulative rigid front leg also pivoted to said board in a forwardly spaced relation to the rear leg structure, intermediate pivot means located on the rear leg structure between the ends thereof, brace rod means interconnecting the intermediate pivot means with the front leg, said brace rod means being so constructed and arranged as to shift the several legs in unison in a common direction, rod pintle means located adjacent to the pivotal attachment of the rear leg structure, a rockable lever of which one end portion is pivotally mounted upon the front leg and which pivotal mounting assumes a certain span distance with respect to the rod pintle means when the several legs are collapsed against the board, stop means confining the rocking movement of the other lever end portion between alternate extreme travel positions respectively located rearwardly of the longitudinal axis of the front leg, and a locking rod pivotally interconnecting such other lever end portion with the pintle means, said lever and locking rod being so arranged and of such proportions as to constitute jointed toggle components having a combined extended length approximately equal to the stipulated span distance and being cooperatively disposed to allow the several erected legs to unrestrainedly collapse flatwise against the top board without passing the aforesaid toggle components through dead center alignment.

4. A collapsible table or the like adapted to unfold into erected position, said table comprising a top board, a bracket attached to the bottom face of said board, a rear leg structure having one end thereof pivotally attached to the bracket, stop lip means for the bracket serving to limit the unfolding movement of the rear leg structure upon reaching its erected position, a manipulative rigid front leg pivoted to said board in a forwardly spaced relation to the rear leg structure, intermediate pivot means located on the rear leg between the ends thereof, rod pintle means located adjacent to the pivotal attachment of the rear leg structure, an auxiliary pivot located on the front leg between the ends thereof, brace rod means pivotally interconnecting the intermediate pivot with the auxiliary pivot and which last named pivot assumes a certain span distance with respect to the pintle means when the several legs are collapsed flatwise against the board, a rockable lever of which one end portion is mounted upon said auxiliary pivot, a locking rod pivotally interconnecting the other lever end portion with the rod pintle means, said lever and locking rod respectively constituting jointed toggle components with said lever arranged for unrestrained rocking movement by a manipulation of the front leg, and latch means carried by the front leg and arranged to coact with the lever, said lever when rocked away from the top board toward the floor contacting end of the front leg into a latched position serving to restrain the erected front leg against movement with respect to the unfolded rear leg structure.

5. A collapsible table or the like adapted to unfold into erected position, said table comprising a top board, a rear leg structure having one end thereof pivotally attached to said board, a rigid front leg also pivoted to the board in a forwardly spaced relation to the pivotal attachment of the rear leg structure, said front leg including complementary angle irons that contiguous to their floor contacting ends are spaced apart by a gap and diverge therefrom toward the respective pivoted leg ends, intermediate pivot means located on the rear leg structure, an auxiliary pivot located on the front leg between the ends thereof and having its pivotal axis disposed crosswise to span the angle iron lengths in the gap region thereof, brace rod means interconnecting the intermediate pivot means with said auxiliary pivot and arranged to guide the several legs in unison in a common direction, a lever of which one end portion is pivotally mounted on the auxiliary pivot within the aforesaid gap and the other lever end portion is by a manipulation of the front leg freely rockable between opposed travel positions respectively directed toward and away from the floor contacting terminal of the front leg, stop means confining the extreme travel of said other lever end portion, rod pintle means located adjacent to the pivotal attachment of the rear leg structure, locking rod means pivotally interconnecting the aforesaid other lever end with the pintle means, said lever and locking rod means being so arranged and of such proportions as to constitute components of a toggle joint that lie flatwise against the board in axially extended alignment when the several legs are collapsed and which lever when rocked toward the front leg terminal serves to buckle such toggle joint, and latch means retaining the lever in such buckled relationship.

6. A collapsible table or the like adapted to unfold into erected position, said table comprising a top board, a pair of rear legs having corresponding ends thereof pivotally attached to said board, strut means interposed between and serving to laterally brace the rear legs, a rigid front leg also pivoted to the board in a forwardly spaced relation to the pivotal attaching means of the respective rear legs, an intermediate pivot located on each rear leg between the respective ends thereof, an auxiliary pivot located on the front leg between the ends thereof, brace rod means pivotally interconnecting the respective intermediate pivots with the auxiliary pivot and arranged to guide the several legs in unison in a common direction, a lever of which one end portion is mounted upon the auxiliary pivot and the other lever portion is by a manipulation of the front leg freely rockable between opposed

travel positions respectively directed toward and away from the floor contacting terminal of the front leg, stop means confining the extreme travel of said other lever end portion, rod pintle means located adjacent to the pivotal attachment of said rear legs, and locking rod means pivotally interconnecting the aforesaid other lever end with said pintle means, said lever and locking rod means being so arranged and of such proportions as to constitute components of a toggle joint by which said lever when rocked away from the front leg terminal serves to guide the adjoined locking rod means flatwise against the board in axially extended relationship therewith and to superimpose the rear leg strut means upon said locking rod means.

UDO K. JOHANNSEN.