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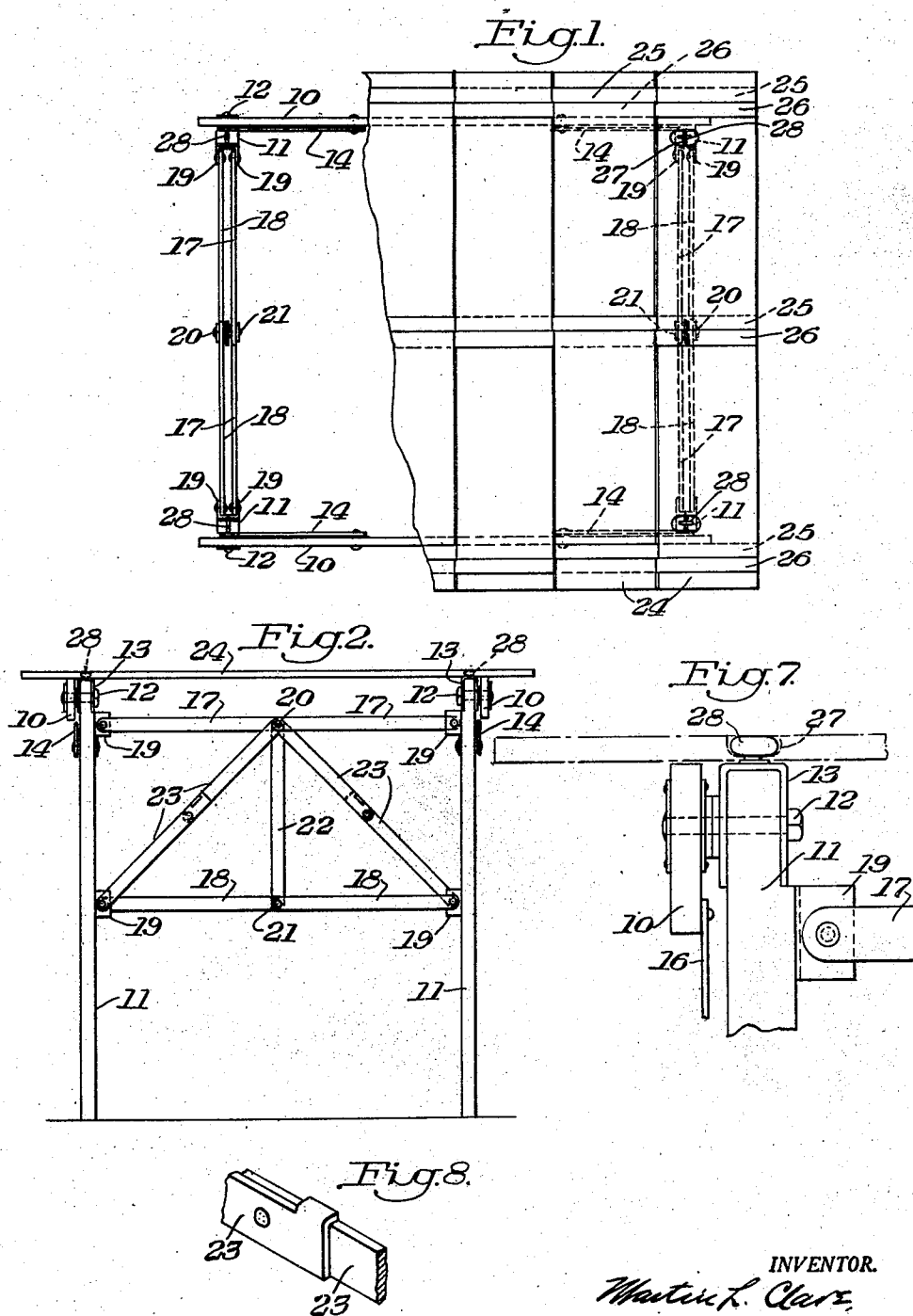
M. L. CLARE

2,450,827

FOLDING TABLE

Filed June 29, 1944

2 Sheets-Sheet 1



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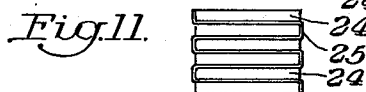
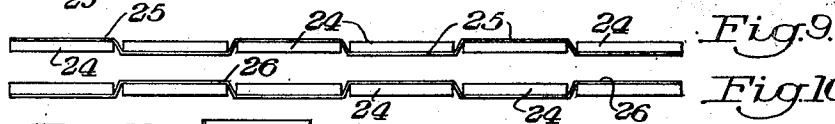
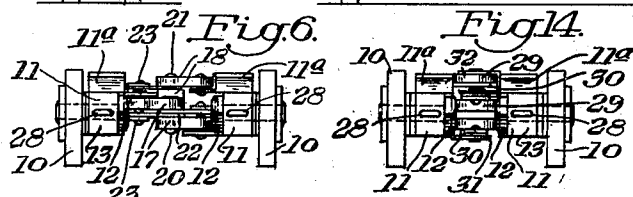
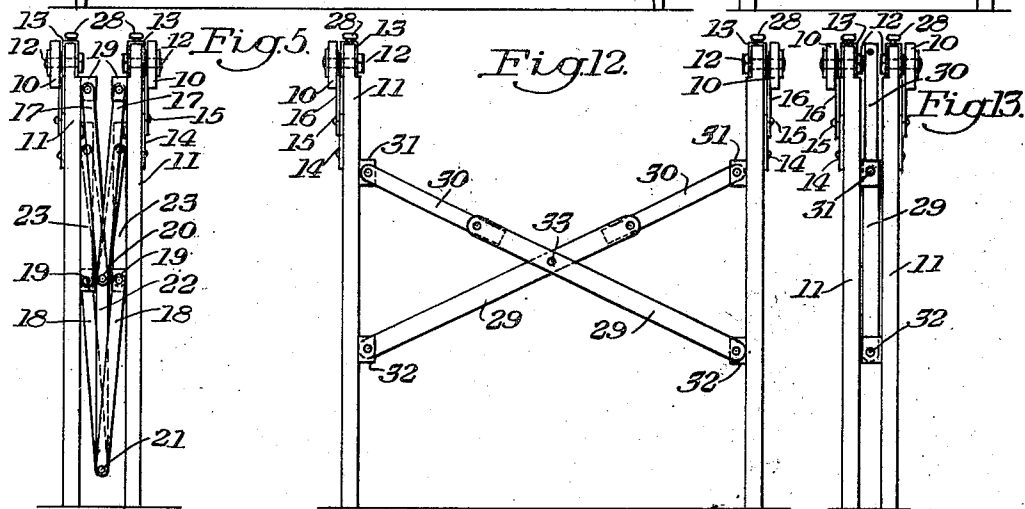
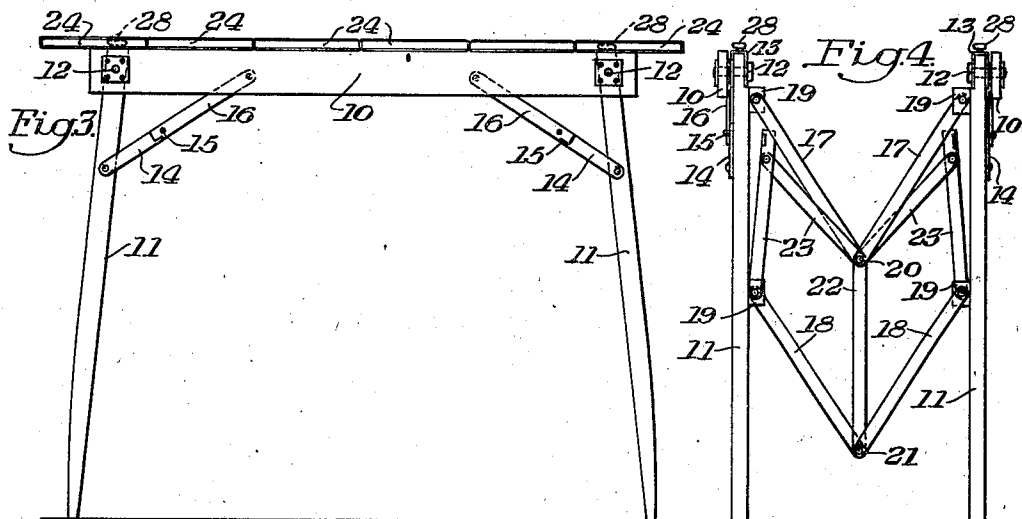
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FOLDING TABLE

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2 Sheets-Sheet 2



INVENTOR.

Martin L. Clare,

BY

Edward A. Lawrence
his attorney

UNITED STATES PATENT OFFICE

2,450,827

FOLDING TABLE

Martin L. Clare, Appollo, Pa.; Mabel Kuhlman Clare, executrix of said Martin L. Clare, deceased, assignor to Mabel Kuhlman Clare

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4 Claims. (Cl. 311-79)

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My invention comprises a new and improved foldable table which may be advantageously used as a camper's or tourist's table or for any use wherein the table is to be set up temporarily and then folded into compact and easily handled form for storage, or for transportation as, for instance, in the boot or rumble seat of an automobile.

In the case of most of the foldable tables now manufactured or in use, the structure is too heavy and cumbersome for convenient use, or not sufficiently large or sturdy and rigid when erected.

My invention provides a table structure which is inexpensive to manufacture, can be made in different sizes, durable in its construction, readily folded into small compass for storage or transportation, and sturdy, providing a strong and rigid supporting surface when unfolded and erected for use.

In my improved table structure two main elements are employed, the table top and the supporting structure therefor.

The top element preferably comprises a plurality of leaves, preferably narrow wooden boards, which when the table is erected for use extend transversely of the latter. The leaves are hinged together along their abutting longitudinal edges in such a manner that they can be folded one upon the other somewhat like a pack of cards, but when extended for use the leaves fit snugly together to provide a substantially continuous surface. Adjacent the four corners of the table the outside leaves are provided with means for temporarily attaching and locking the top to the supporting structure of the table.

The supporting structure in general comprises a pair of side sills upon which, when the table is erected, the table top rests, and two pairs of legs, one pair adjacent each end of the side sills and pivotally connected at their upper end to the respective side sills. When extended the legs are locked at right angles to the side sills by means of toggle levers interconnecting the sills and the legs, the legs being arranged to swing up into parallelism with the sills in folding.

The legs of each pair are connected together by toggle lever mechanism, which when extended holds the legs of a pair in rigid parallel spaced relation, but which when released permits the legs to be moved into close contiguity.

In the accompanying drawings, which illustrate a practical embodiment of the principles of my invention:

Fig. 1 is a plan view of the preferred form of my improved table shown erected, the top being

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partially broken away to expose parts of the supporting structure.

Fig. 2 is an end elevation of the table fully erected.

Fig. 3 is a side elevation of the same.

Fig. 4 is an end view of the supporting structure, the top having been previously removed, showing the toggle joint lever interposed between the opposite legs of the pairs of legs partially contracted during the process of folding the table support.

Fig. 5 is an end elevation showing the completion of the step of bringing the side sills and the legs into contiguity.

Fig. 6 is an end elevation showing the supporting structure completely folded, the legs being swung up between the closely adjacent side sills.

Fig. 7 is an enlarged detail of the connection between a leg and the corresponding side sill and also of the leg and one member of the toggle lever mechanism by which it is connected to the other leg of the pair.

Fig. 8 is an enlarged detail showing the toggle joint between a pair of toggle levers.

Fig. 9 is an elevation of one end of the table top shown extended and illustrating the hinged connection between the adjacent leaves, the spacing between the leaves being exaggerated for the sake of clearness.

Fig. 10 is a similar view showing the opposite end of the same.

Fig. 11 is an end elevation showing the top completely folded for storage or transportation.

Fig. 12 is an end elevation showing a modified form of toggle lever connection between the legs of a pair, the table top being omitted in this view.

Fig. 13 is a view, similar to Fig. 5, but showing, in the case of the modified form, the legs of the pairs and the side sills brought into contiguity during the process of folding the supporting structure.

Fig. 14 is an enlarged end elevation showing the modified supporting structure completely folded.

Referring first to Figs. 1 to 10 inclusive, 10 indicates a pair of side plates, which preferably are wooden and about two and one-half inches in cross section and of such length as to extend for almost the full length of the table.

Adjacent each end of each of the side plates 10 a leg 11 made of wood or light metal is pivotally attached to the inner face thereof as by the pivot bolts 12. The legs preferably taper downwardly toward their ground engaging ends. The upper portion of the legs, if of wood, is

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preferably strengthened on the side and top by the metal 13. The thickness of the legs is reduced adjacent the top by an inset to prevent the nut end of the bolt interfering with parts as the supporting structure is folded up.

The legs are maintained in their depending or unfolded position by the levers 14 which at their outer ends are pivotally attached to the outer faces of the legs at a point spaced from the upper end of the legs, and which are connected at their other ends by the toggle joints 15 to the end of the complementary levers 16 whose other ends are pivotally attached to the inner faces of the side plates 10 at a suitable distance from the ends thereof. Sufficient clearance is provided, as illustrated in Fig. 7, to enable the leg to be folded up along the inside of the side plates and to permit the levers 14 and 16 to be folded parallel with each other and with the legs and side plates.

It is evident that by swinging the legs downwardly into their substantially vertical positions shown in Fig. 3, the levers 14 and 16 are straightened and the toggle joints 15 lock the levers 14 and 16 and the legs in their extended position against accidental movement.

It will be noted that the legs are so pivoted that they will swing in a plane parallel to but spaced from the planes of the side plates, and when extended are disposed at an angle to the side plates slightly greater than 90° to provide more rigidity to the table when the latter is set up for use.

Best shown in Fig. 2 are the upper and lower pairs of braces or rails 17—17 and 18—18 whose outer ends are pivotally attached to brackets 19 secured to the legs 11, while the inner ends of the two pairs are pivotally connected together at 20 and 21 respectively. 22 indicates a vertical strut the upper end of which is pivotally connected to the inner ends of the braces or rails 17—17 and the lower end of which is pivotally connected to the inner ends of the braces or rails 18—18.

23—23 represent two jointed toggle levers whose lower ends are respectively pivotally connected to the lower brackets 19 on the legs 11 on the same axis as those of the braces or rails 18 while their upper ends are pivotally connected to the pivotal connection between the inner ends of the braces or rails 17—17 and the upper end of the strut 22. To save weight the braces or rails 17—17 and 18—18 may be wooden while the strut 22 and the toggle levers 23 preferably are of metal to provide strength. The braces, strut and toggle levers are offset in relation to each other to permit folding.

It is evident that when the side plates 10 are moved outwardly from one another into erected position the members of each pair of braces or rails 17—17 and 18—18 are brought into alignment with each other, and the toggle levers 23 are straightened and locked, as shown in Fig. 8, against accidental movement, and thus the supporting structure is held rigidly extended as illustrated in Figs. 2 and 3.

When it is desired to fold the supporting structure, the table top is first removed, and the toggle joints between toggle levers 23 are then released by forcing them upwardly which permits the strut 22 and the upper and lower pairs of braces or rails 17—17 and 18—18 to swing downwardly, Fig. 4 illustrating this movement when about half completed. The said movement is continued until the pairs of legs 11 at either end of the structure are brought into close proximity between the side plates 10 and the braces, strut and toggle levers are folded substantially as in-

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dicated in Fig. 5. The toggle joints 15, locking the pairs of levers 14 and 16 which hold the legs extended, are then released by an upward shove and the legs are folded in turn up between the side plates 10 as illustrated in the end elevation shown in Fig. 6.

In Fig. 6 the legs at the farther end of the table have first been folded up between the sills 10, and for the sake of clearness their ends have been indicated at 11a.

Referring now to Figs. 9, 10 and 11, the table top is formed of a plurality of relative narrow leaves 24 of sufficient length to more than span the distance between the side plates 10 when the supporting structure is in its extended or erected position.

Again the leaves are of sufficient width and number to extend the full length of the table and somewhat beyond the ends of the side plates 10, as shown in Fig. 1 and Fig. 3.

The leaves are flexibly hinged together by means of pairs 25—26 of heavy tapes of waterproof canvas or other suitable stout material, three pairs being used in a top for a table of the relative dimensions illustrated in the drawings, but it will be understood that as many pairs of tapes may be used as are necessary to properly and permanently hinge the plates together.

The tapes of each pair are placed side by side in closely spaced relation, and are oppositely laced, each tape being permanently secured, as by waterproof glue or cement, to one face of one leaf and the opposite face of the next leaf, the intermediate portions of the tapes extending between the leaves and forming the hinges proper. The two tapes are secured to the opposite faces of each leaf as indicated in Figs. 9 and 10, illustrating opposite ends of the table and also by solid and dotted lines in Fig. 1.

The end leaves of the top are provided with longitudinally slotted holes 27 which are counter-sunk from above, to receive the swivel buttons 28 mounted on the upper end of the posts 11. When the top is in position the buttons are turned to right angles with the axis of the holes and hold the table top firmly in place on the supporting structure. When the top is removed it is easily foldable into compact form as shown in Fig. 11.

By notching the edges of the leaves so that the hinge portions of the tapes may extend through the notches, the leaves will not be separated by the thickness of the tapes when the top is extended but will be more snugly fitted together.

Turning now to the modified form of supporting structure illustrated in Figs. 12, 13 and 14, the methods of bracing the legs 11 in their extended position relative to the sills 10 are the same as illustrated in Fig. 3, and as above described.

However the legs 11 of each pair of legs are connected together by the crossed pairs of toggle levers 29—30 the ends of which are pivotally attached to the upper and lower brackets 31 and 32 carried by the legs 11, the upper brackets on the opposite legs being offset laterally from each other and each lower bracket being offset from the upper bracket on the same leg to provide clearance in folding. The toggle levers 29 are pivotally attached to each other at 33, their point of crossing, and they may be made of wood. The upper levers are preferably of metal.

When, in erecting the table, the side sills 10 are forced apart, the pairs of toggle levers 29—30

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are straightened and their toggle joints are locked.

When the table is to be folded the toggle joints are released and the levers 29—30 are folded together as the sills and legs are moved into the relative positions shown in Fig. 13.

The final step in folding the support is accomplished by releasing the toggle joints 15, which lock the legs 11 in their extended position, and folding the same up between the sills 10 as illustrated in Fig. 14.

As shown in Figs. 13 and 14 the folding structure of Fig. 12 is capable of folding to a minimum size that includes the width of the side plates 10, the width of the legs 11 and the width of the toggle levers 29. The same would be true of the structure shown in Figs. 2 and 6 if the braces 17 were shorter than the vertical strut 22. In Fig. 14 it will be noted that the upper bracket 31 is substantially flush with the lower face of the left leg 11; whereas, the bracket 31 on the right leg is substantially flush with the upper surfaces of the legs 11. It should also be noted in Fig. 12 that the bracket 31 of the left leg is in the same plane as the bracket 32 of the right leg and the bracket 31 of the right leg is in the same plane as the bracket 32 of the left leg. Thus, by alternating the positions of the brackets the toggle levers 29 and 30 are enabled to overlap one another as shown in Fig. 14 between the bracket members 31. The structure shown in Fig. 14 indicates the toggle levers 29 as having material thickness; whereas, the toggle levers 30 are made of scrap metal and lie on the outer side of the members 29. The opposite pair of legs 11a of the table are of course shown inverted in Fig. 14 as the ends are folded toward the legs 11 and the lower bracket 32 of the right leg 11a is indicated. The balance of the toggle structure of the legs 11a is of course not feasible in Fig. 14 because both sets of legs are pivoted at the same elevation and when they overlap one another one set of legs obliterates the structure of the other set which accounts for the fact that only one-half of the toggle lever structure 29, with its accompanying bracket 32, is shown at the top of Fig. 14. Thus, the disposition of the brackets 31 and 32 permit the table legs to be folded to the last dimension equivalent to the width of the legs and the width of one of the toggle levers 29 and 30. As previously stated, this would also be true of the structures shown in Figs. 2, 5 and 6 if the braces 17 and 18 were shorter than the center strut 22, in which case the pivot 20, as shown in Fig. 5, would pass above the pivot point 19.

It is evident that my novel foldable table structure marks a substantial improvement in the art. The same may be manufactured into a durable piece of furniture at relatively small cost; it is capable of being set up and folded quickly and conveniently; when erected it forms a sturdy and substantially rigid article, and when folded up it may be stored or transported in small compass.

I claim:

1. In a supporting structure for a removable table top, the combination of a pair of parallel side plates upon which the top is supported when the table is extended for use, a leg pivotally attached at its upper end to the inner face of each side plate and adjacent to each end of the latter and spaced therefrom to provide clearance for other parts, said leg being arranged to swing in a plane parallel to the plane of the side plate, toggle lever mechanism attached to the outer side of each leg and the inner face of the correspond-

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ing side plate and arranged when extended to lock the leg in its extended position relative to the side plate but when collapsed to permit the leg to be folded parallel to the inner face of the side plate, the folded toggle lever mechanism being received between the folded leg and the side plate, a set of oppositely disposed brackets on each pair of legs, and toggle lever mechanism connecting the brackets of the pair of legs at each end of the side plates which when extended lock the side plates and legs in their spaced and extended position and when collapsed permits the same to be brought into close relation and the legs to be folded up and contained between the side plates with the oppositely disposed brackets in overlapped relation, said last mentioned toggle mechanism when folded being contained between folded pairs of legs.

2. In a supporting structure for a removable table top, the combination of a pair of parallel side plates upon which the top is supported when the table is extended for use, a leg pivotally attached at its upper end to the inner face of each side plate and adjacent to each end of the latter, said leg being spaced inwardly from the side plate and arranged to swing in a plane parallel to the plane of the latter, toggle lever mechanism connecting each leg with the corresponding side plate at points spaced from the pivot point and arranged when extended to lock the leg in its extended position relative to the side plate but when collapsed to permit the leg to be folded parallel with the inner face of the side plate with said toggle lever mechanism nesting between the leg and the side plate, two pairs of jointed parallel levers interposed between the legs at each end of the side plates, and toggle joints between the members of each pair of levers and arranged when extended to lock said levers horizontal and the side plates and the legs in their predetermined spaced and extended relation but when collapsed to permit the side plates to be brought together and the legs to be folded up between the same with the last mentioned toggle lever mechanism nested between the two legs of the pair at each end of the structure.

3. In a supporting structure for a removable table top, the combination of a pair of parallel side plates upon which the top is supported when the table is extended for use, a leg pivotally attached to each side plate adjacent the end of the latter but spaced inwardly therefrom to swing in a plane parallel to the plane of the side plate, toggle lever mechanism connecting points on the leg and side plate spaced from the pivot point and arranged when extended to lock the leg in its extended position relative to the side plate but when collapsed to permit the leg to be folded parallel to the inner face of the side plate with the collapsed toggle lever mechanism nested between the side plate and the leg, upper and lower pairs of braces having their ends pivotally attached to the inner faces of the pair of legs at each end of the table, the members of each pair of levers being pivotally connected together at their inner ends, a strut connecting the inner ends of the two pairs of braces together and pivotally attached thereto, and toggle lever mechanism connecting the pivot point of one of the pairs of braces and the strut with the legs at the pivot points of the members of the other pair of braces and arranged when extended to hold the members of both pairs of braces in alignment and the side plates in their predetermined spaced relation but when collapsed to permit the mem-

bers of the pairs of braces to fold toward each other and the side plates to be brought into close relation and the legs to be folded up between the side plates with the upper and lower braces and the strut nesting between the legs of a pair.

4. In a foldable table structure, the combination of a pair of parallel side plates upon which a top may be supported, a leg pivotally attached to each side plate adjacent to each end of the latter to swing in in a plane parallel to the plane of the side plate but spaced inwardly therefrom, toggle lever mechanism connecting each leg with the corresponding side plate at points spaced from the pivot point and arranged when extended to hold the leg in its extended position but when collapsed to permit the leg to be folded parallel with the side plate with the toggle lever mechanism nested between the side plate and the leg, a pair of rails for each leg and pivoted thereto at spaced pivoted points, a member between each pair of legs at the ends of the side plates and in parallel relation to the legs, means to pivot the rails to their respective member to maintain the rails of each pair in parallel relation, and a toggle brace for each pair of rails having a pivoted joint midway between its ends, the ends of each toggle brace being pivoted at diagon-

ally opposed pivot points of the rails of each pair.

MARTIN L. CLARE.

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