United States Patent

Domin

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[54] TILTING TABLE

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[52] **U.S. Cl.** **108/113**, 108/115

[51] **Int. Cl.** **A47b 3/08**

[58] **Field of Search** ..... 108/113, 112, 111, 115, 114; 211/132, 149; 5/57 B; 16/144

[56] **References Cited**

UNITED STATES PATENTS

855,113	5/1907	Mantell	108/113
1,198,431	9/1916	Forsyth	108/111
1,442,019	1/1923	Whitesides	108/113
1,534,758	4/1925	Bartholomew	16/144
2,249,234	7/1941	Srodulski	211/149
2,596,250	5/1952	Klingler	108/113 X
2,730,418	1/1956	Blink	108/113
2,781,525	2/1957	Bauer	108/113
2,843,873	7/1958	Slower	16/144
3,093,247	6/1963	Erickson	211/149 X
3,151,576	10/1964	Patterson	108/111

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[57] **ABSTRACT**

A folding table which comprises two table-tops disposed on top of each other. At least four columns are disposed at the corners of the table-tops, and the latter are pivotally connected with the columns. Each table-top comprises two table-top halves foldable towards each other, to define upper table-top halves and lower table-top halves. A folding axle of the table-top halves extends in a plane between the columns. A coupling rod connects the upper table-top halves with the lower table-top halves, and the coupling rod extends in the plane of the folding axles of the table-top halves and at a distance from the lateral edge of the table-top halves.

7 Claims, 9 Drawing Figures

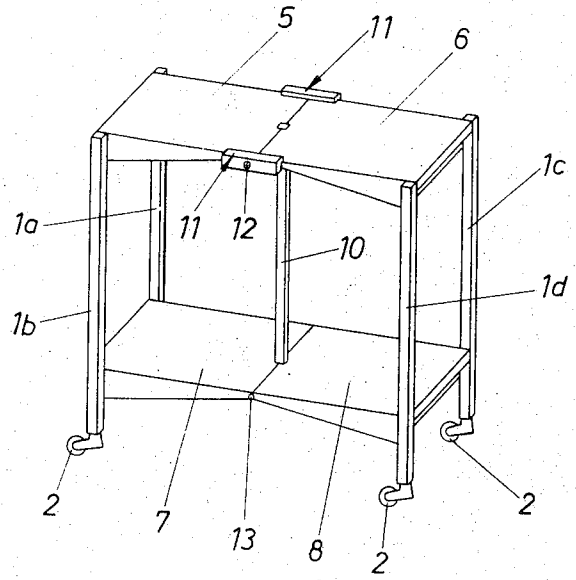


FIG. 1

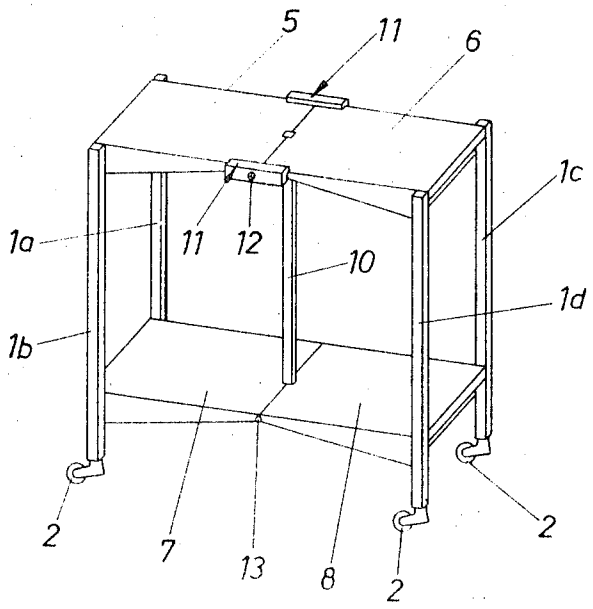
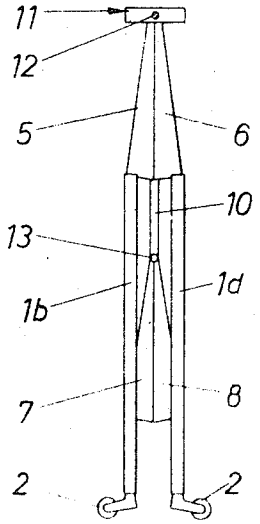


FIG. 2



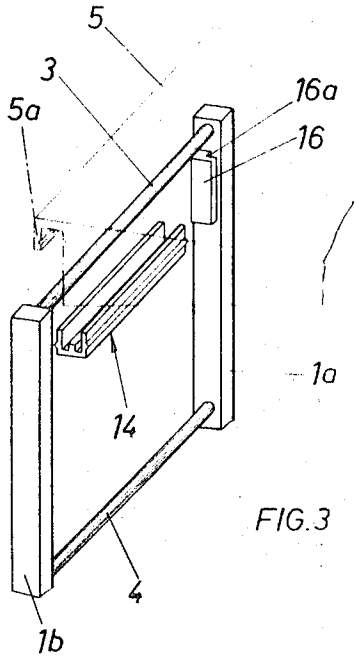


FIG. 3

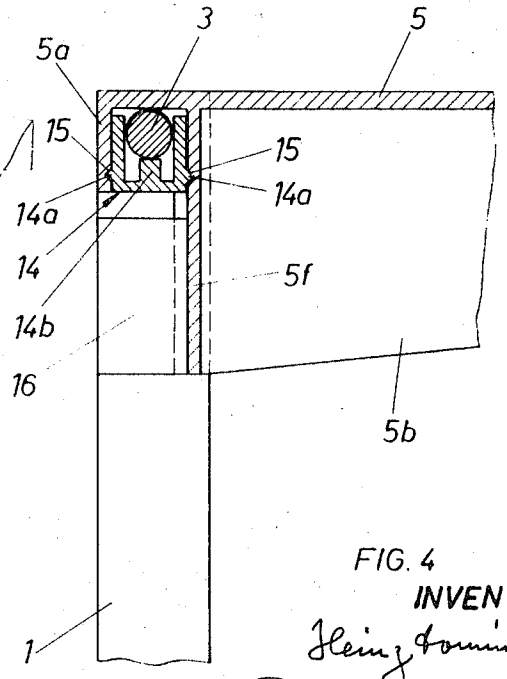


FIG. 4

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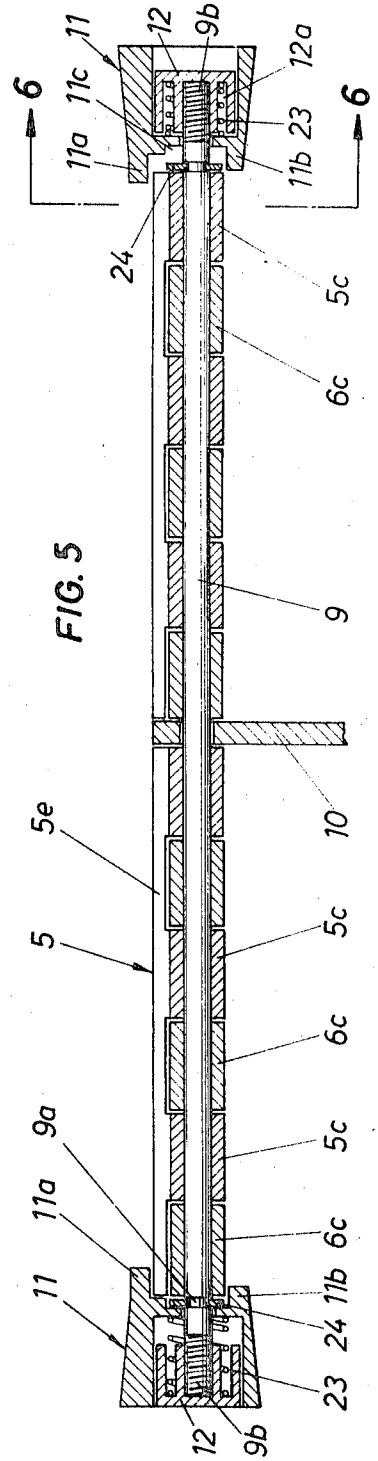

6
6
11
12
9b
12a
11c
11a
11b
23
24
5c
6c
9
10
5e
5
5c
6c
9a
11a
5c
6c
11
11b
24
23
12
9b

FIG. 5

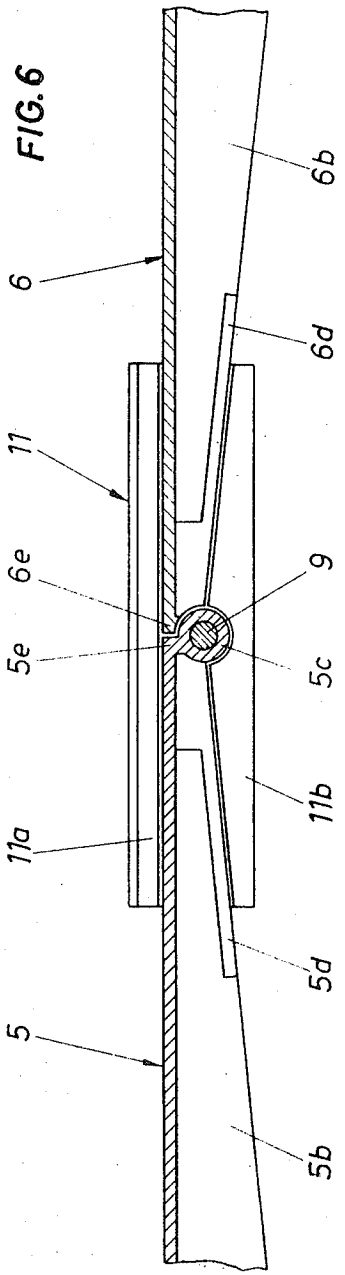

6
6b
6d
11
6e
5e
9
5c
11b
11a
5d
5
5b

FIG. 6

FIG. 7

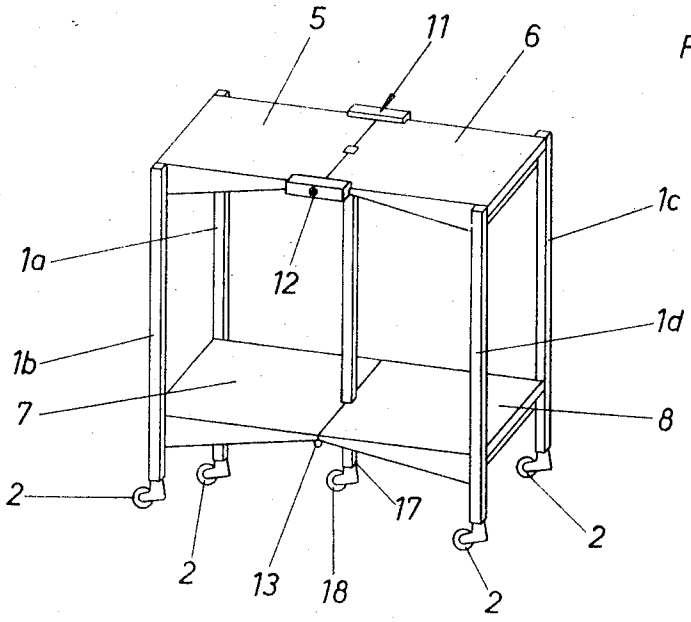
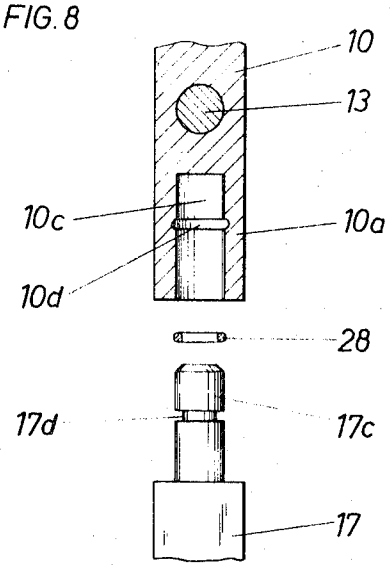
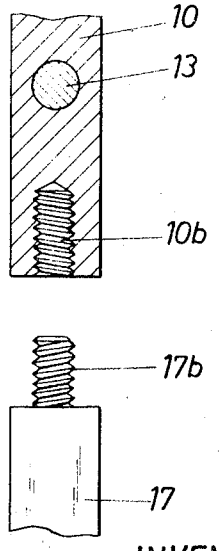


FIG. 8





INVENTOR

FIG. 9

Attorney

TILTING TABLE

The present invention relates to a folding table with at least two table-tops disposed one on top of the other, which are hingedly connected on four columns disposed in the edges of the table-tops and in which each table-top consists of two table-top halves tiltable relative to each other such, that top consists of two table-top halves tiltable relative to each other such, that the folding axle of the table-top halves extends in a plane between the columns.

The known structures of such tables have the extreme drawback of a more difficult accessibility from the sides, at which the means making possible the space-saving collapse or folding are arranged. The manipulation or operation for bringing about the space-saving folded position is difficult, and due to the practically freely disposed guides so not entirely without danger. In addition the guide members assume merely optically extensive weight.

It is one object of the present invention, to provide a folding table, wherein the table of this type is made of the least possible, simple structural parts, which table beyond that is simplified in its operation, has furthermore a better accessibility and finally also has an appealing outer appearance.

It is another object of the present invention, to provide a folding table, wherein a coupling rod is provided connecting the upper table-top halve with the lower table-top half, which coupling rod extends in the plane of the pivot axles of table-top halves, preferably in central position of the table-top.

It is in accordance with the present invention of advantage thereby, if the bolt of the pivot axle has at both ends oppositely thereof a resilient gripping handle, which has engagement faces for the counter-faces on both table-top halves.

A favorable feature of the present invention resides in the fact, that the table-top has frame members and the gripping handle has corresponding recesses.

In accordance with the present invention, it is also favorable, if each of the two table-top halves is pivotally connected at a horizontal rail, which connects two vertical columns equipped with running rollers at the height of the table-top and that these columns are connected likewise by means of a horizontal second rail in the vicinity of the lower end.

The present invention proposes furthermore, that the rail has the form of a rod of round cross-section, the end of the table-top halves pivoted to the end overlaps the table-top half with a groove, in which on the other side of the rail a holding part is retained by means of a groove and tongue.

In accordance with the present invention, it is another object of the present invention, that the coupling rod engages in the center of the folding axles. It is also advantageous, in accordance with the present invention, if all table-top halves are equal relative to each other and the frame members widen themselves to the column side end.

Beyond that, it is favorable in accordance with the present invention, if the frame members abut in use position of the table-top against abutments of the columns, whereby the abutments have preferably entrance grooves for the frame members.

Also the present invention brings about the proposal that pivotal axis is disposed in low-sided rails of the table-top halves.

Finally it is in accordance with the present invention of advantage, that the coupling rod with its lower extended end projects down to the floor.

Finally also a favorable feature of the present invention resides in the fact, that all the columns and the coupling rod are equipped with running rollers or rolling gears.

Due to such arrangement a foldable table of increased use value is created. Its operation or handling is simple and not dangerous. The supporting face of the lower table-top halves is freely accessible from all sides for reasons of a central arrangement of the coupling rod. This coupling rod has optically no weight. It fulfils a double function: First it connects together the folding axles of both table-top steps and in addition it brings about a central support due to the extension of its

bottom-sided section up to the supporting floor. By this arrangement an extremely load-capable structure is achieved. For folding of the table is merely required, to pull away the handle grips against the effect of the spring from the counter-faces on the two table-top halves and to lift lightly the table in this position. By this arrangement the table-top halves fold automatically by their own weight into the folding position. The use position can likewise be equally easily brought about, by merely spreading the table columns. The grips enter swingingly again into the safety position. The hinge for the table-top halves is formed by a horizontal rail connecting the columns any way with each other. The corresponding structure of the present invention is set entirely to a simplified mounting. Concerning the structure of the table-top halves, by completely equal formation of these halves, account is taken with the requirements concerning a mass production. A use position is defined by abutment on the columns, while the grip constitutes substantially merely a safety of this position, thus is to a great extent free of loads. The structural arrangement, to permit entrance of the frame members of the table-top halves in grooves of these abutments, brings about simultaneously a side stabilization, particularly since the frame members are widened within the range of the columns. The arrangement of running rollers, particularly of steering rollers, at the columns and even on the downwardly extending coupling rod, permits to move the folding table even in its loaded state.

With these and other objects in view, which will become apparent in the following detailed description, the present invention, which is shown by example only, will be clearly understood in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of the folding table in accordance with the present invention and in particular in use position;

FIG. 2 is a side elevation of the collapsed folding table and in particular in a space-saving collapsed position;

FIG. 3 is a perspective view of a pair of columns with the rails connecting the same in the parts for the pivot connection of the table-top halves;

FIG. 4 is a section of the pivot point;

FIG. 5 is a longitudinal section within the range of the pivot axle with a right-sided removed handle grip and a left-sided handle grip disposed in safety position;

FIG. 6 is a section along the lines 6 — 6 of FIG. 5;

FIG. 7 is a perspective view of a second embodiment of the folding table;

FIG. 8 is a fragmentary section indicating the possibility of the guiding roller arrangement on the coupling rod; and

FIG. 9 is a variation of the showing in FIG. 8.

Referring now to the drawings, the folding table designed in accordance with the present invention has four vertical columns 1*a*, 1*b*, 1*c* and 1*d*, which are equipped at their lower edge with a running roller 2.

The two columns 1*a* and 1*b* are connected by the use of round rods, namely an upper round rod 3 and a lower round rod 4 to form a stiff rail.

In the same manner the columns 1*c* and 1*d* are also formed by such round rods to a rigid frame. The round rods are disposed horizontally. The upper round rods 3 serve as rotary pivot pins for the table-top halves 5 and 6, the lower round rods 4 as rotating pins for the table-top halves 7 and 8, forming the second table-top.

The table-top halves 5 and 6 are completely equally formed relative to each other.

Also the column-sided pivot formation is equal in all table-top halves. For this reason only one pivot pin is shown in the drawing, namely that of the table-top half 5. The latter has on both of its longitudinal sides a frame 5*b*, which widens in outward direction, that means towards the column end continuously downwardly, in order to continue finally into a wall 5*f* extending perpendicularly thereto. A hook-shaped part 5*a 1* continues from the wall 5*f*. The part 5*a* is of lower height than the wall 5*f*.

On the inner side of the hook-shaped part 5*a* projecting over the entire width of the table-top half 5 and on the outside of the wall 5*f* extending likewise of the entire width of the table-top half 5 are provided oppositely disposed grooves 15. For the formation of the bearing recess, a rail 14 is pressed in form below into the space between the parts 5*a* and 5*f*, so that their longitudinal ribs 14*a* enter the grooves 15. The rail 14 has at its center a projection 14*b*, which engages from below the round rod 3, which is thus retained from below and from both sides by the rail 14 and from above by the table-top half 5.

An abutment 16 disposed at the column 1*a* and under circumstances on all columns limits the outward swinging of the table-top halves such, that the frame member 5*b* enters the groove 16*a*. The frame member 5*b* and under circumstances all frames are thus stabilized in lateral direction.

The table-top halves 5 and 6 run towards the center of the table in a plurality of sleeves 5*c*, 6*c*, respectively, which are spaced from each other, which space is of the same length as the length of the sleeve, of course with the provision of a certain play.

Perpendicularly above the axle of these sleeves 5*c* terminates the plates 5 and 6 terminate with a vertical rail 5*e* and 6*e*, respectively.

A pivot bolt 9 is inserted (FIG. 5) into the sleeves 5*c* of the table-top half 5 and the similarly-formed sleeves 6*c* of the table-top half 6.

Due to the vertical rails 5*e* and 6*e* of the table-top halves 5 and 6, as of course also of the lower table-top halves, these table-top halves can be turned about the round rods 3 downwardly only up into the horizontal position. Upwardly, the table-top halves 5 and 6 and the round rod 3 can swing so far, until their frame members 5*b* and 6*b* engage each other (FIG. 2). The frames have thus a height, which assures a certain distance of the columns relative to each other in the folded position, whereby the standing ability is retained also in folded position.

The pivot axle bolts 9 have at both ends an angular groove 9*a*, in which a spring ring 24 sits, which prevents an axial movement of the table-top halves 5 and 6 relative to the bolt 9. The two outer ends of the bolt 9 are equipped with a thread 9*b*, on which a nut 12 is screwed on, which carries in an annular slot 12*a* a spring 23. The spring 23 supports itself, on the other hand, on a handle or manual grip 11, which has a recess 11*c* for the spring ring on the side pointing towards the table-top halves. Furthermore, the handle grip 11 has an inwardly projecting upper rail 11*a* and a likewise projecting however slightly shorter lower rail 11*b*. The lower edge of the upper rail 11*a* is disposed closely above the surface of the table-top halves 5 and 6 (FIG. 6), while the upper edge of the lower rail 11*b* is closely below the lower edges of the frame members 5*b* and 6*b*. The handle grips 11 are displaced by the springs 23 such, over the median part of the side edges of the table-top halves 5 and 6, that the table-top halves 5 and 6 are assured in an exactly horizontal plane, which is flush with each other. Between the rails 11*a* and the the recess 11*c*, the manual grips include abutment faces 11*d* for outer counter faces 11*e* disposed on lateral ends of the table—- top halves 5 and 6.

The lower plane halves 7 and 8 are connected together in similar manner by a pivot axle bolt. The pivot axle bolt 13 and the pivot axle bolts 9 are connected together by means of a vertical coupling rod 10 extending in the plane of the first axles. This coupling rod sits in an overall distance from the side edge of the table-top halves and in particular in central position of the table-top halves.

The coupling rod has for its pivotal connection to the mentioned bolt at its upper end and within the range of the lower end an eye formation, through which the bolts 9 and the bolts 13, respectively, are guided through.

If the table in upright position, as shown in FIG. 1, is to be folded up, one pulls on the two handle grips 11 in opposite directions until the lower projection is outside of the range of the frame members of the table-top halves 5 and 6. This position is shown on the right side of FIG. 5, while on the left side of this Figure the position is shown, which the handle grip 11 assumes in use position of the table. After both handle grips 11 have been pulled outwardly, by upward drawing of these two handle grips, the table can be folded or collapsed without difficulty into the shape shown in FIG. 2. The table-top halves 5 and 6 are equipped with reinforcement ribs 6*d* and 5*d*, respectively, (FIG. 6), where they are no more reinforced, by narrow frame members.

The folding table, in accordance with the second embodiment, is completely equally formed with the exception of the coupling rod 10 of the previously described example or embodiment. For this reason the same numerals have been applied in the second embodiment.

In a further development of the first embodiment, the rod 10 is extended downwardly as an integral member 17, which has a running roller 18 and is extended such, that the running roller 18 is disposed in the same plane as the running rollers 2.

The parts 10 and 17 can be formed integrally. The arrangement can be made, however, also such and this is particularly of importance for a later equipment with a running — and pivot — roller 18, respectively, that the coupling rod 10 is disposed below its bore, with which it grips or surrounds the pivotal axle bolt 13, has a threaded bore 10*b*, while the member equipped with the running roller 18 has a corresponding threaded bore 17*b* (FIG. 9). Instead such screw connection also the possibility exists, that a plug connection is provided, as it is shown in FIG. 8. Here the coupling rod 10 has below the bore for the hinge bolt 13 a projection 10*a* with a circular bore 10*c* with a groove 10*d*, while the part 17 has a projection 17*c* corresponding with the bore 10*c* and an annular groove corresponding with the annular groove 10*d*, the latter serving the mounting of a spring ring 28, which maintains the plug connection.

Instead of providing two pairs of table-top halves 5, 6, 7 and 8, more plates can be disposed on top of each other and can be connected by a correspondingly extended coupling rod 10.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense.

I claim:

1. A folding table comprising

two table-tops disposed on top of each other, at least four columns disposed at the corners of said table-tops, 8 said table-tops being pivotally connected with said columns, each table-top comprising two table-top halves foldable towards each other, to define upper table-top halves and lower table-top halves,

a folding axle of said table-top halves extending in a plane between said columns,

a coupling rod connecting said upper table-top halves with said lower table-top halves, and

said coupling rod extending in the plane of said folding axles of said table-top halves and at a distance from the lateral edge of said table-top halves,

said folding axle includes a bolt, said bolt has at both ends a manual grip disposed opposite said ends, each grip being resiliently biased toward the center of said bolt, and

said manual grips have abutment faces for counter faces disposed on both table-top halves.

2. The folding table, as set forth in claim 1, wherein

said table-tops have frame members, and

said manual grips have complementary recesses.

3. The folding table, as set forth in claim 2, wherein

each of said two table-top halves is pivotally connected with a horizontal rail,

the latter connects together said two vertical columns equipped with running rollers at the level of said table-top,

a second horizontal rail connecting together said columns in the vicinity of their lower ends.

4. The folding table, as set forth in claim 3, wherein

said rails are made of a round rod,

an end of said table-top halves is pivotally connected with said firsttmentioned rail and overgrips said table-top halves with a groove, and

a holding member is retained on the other side of said rail by means of a key and groove.

5. A folding table comprising

two table-tops disposed on top of each other,

at least four columns disposed at the corners of said table-tops,

said table-tops being pivotally connected with said columns,

each table-top comprising two table-top halves foldable towards each other, to define upper table-top halves and lower table-top halves,

a folding axle of said table-top halves extending in a plane between said columns,

a coupling rod connecting said upper table-top halves with said lower table-top halves, and

said coupling rod extending in the plane of said folding axles of said table-top halves and at a distance from the lateral edge of said table-top halves,

all said table-top halves being equal relative to each other, and including

frame members widening towards the end on the side of said columns,

said frame members in the position of use of said table-tops engaging abutments of said columns, and

said abutments have entrance grooves for said frame members.

6. A folding table comprising

two table-tops disposed on top of each other,

at least four columns disposed at the corners of said table-tops,

said table-tops being pivotally connected with said columns,

each table-top comprising two table-top halves foldable towards each other, to define upper table-top halves and lower table-top halves,

folding axles for each of said table tops for said two table-top halves thereof extending in a plane between said column and pivotally hinging together said two table-top halves of each table top,

a coupling rod pivotally connecting said folding axle of said upper table-top halves with said folding axle of said lower table-top halves, and

said coupling rod extending in the plane of said folding axles of said table-tops and at a distance from lateral edges of said table-top halves,

said table-top halves form adjacent coaxial sleeves dependent from said table top halves, and

said folding axle is disposed in said sleeves of said table-top halves.

7. A folding table comprising

two table-tops disposed on top of each other,

at least four columns disposed at the corners of said table-tops,

said table-tops being pivotally connected with said columns,

each table-top comprising two table-top halves foldable towards each other, to define upper table-top halves and lower table-top halves,

folding axles for each of said table tops for said two table-top halves thereof extending in a plane between said columns and pivotally hinging together said two table-top halves of each table top,

a single coupling rod pivotally connecting said folding axle of said upper table-top halves with said folding axle of said lower table-top halves and engaging said folding axles at their centers,

said coupling rod extending in the plane of said folding axles of said table-tops and at a distance from the lateral edges of said table-top halves, and

a manual grip disposed on both ends of the upper of said folding axles and including abutment faces for outer counter faces disposed on lateral ends of said table-top halves of said upper table-top.

* * * * *