

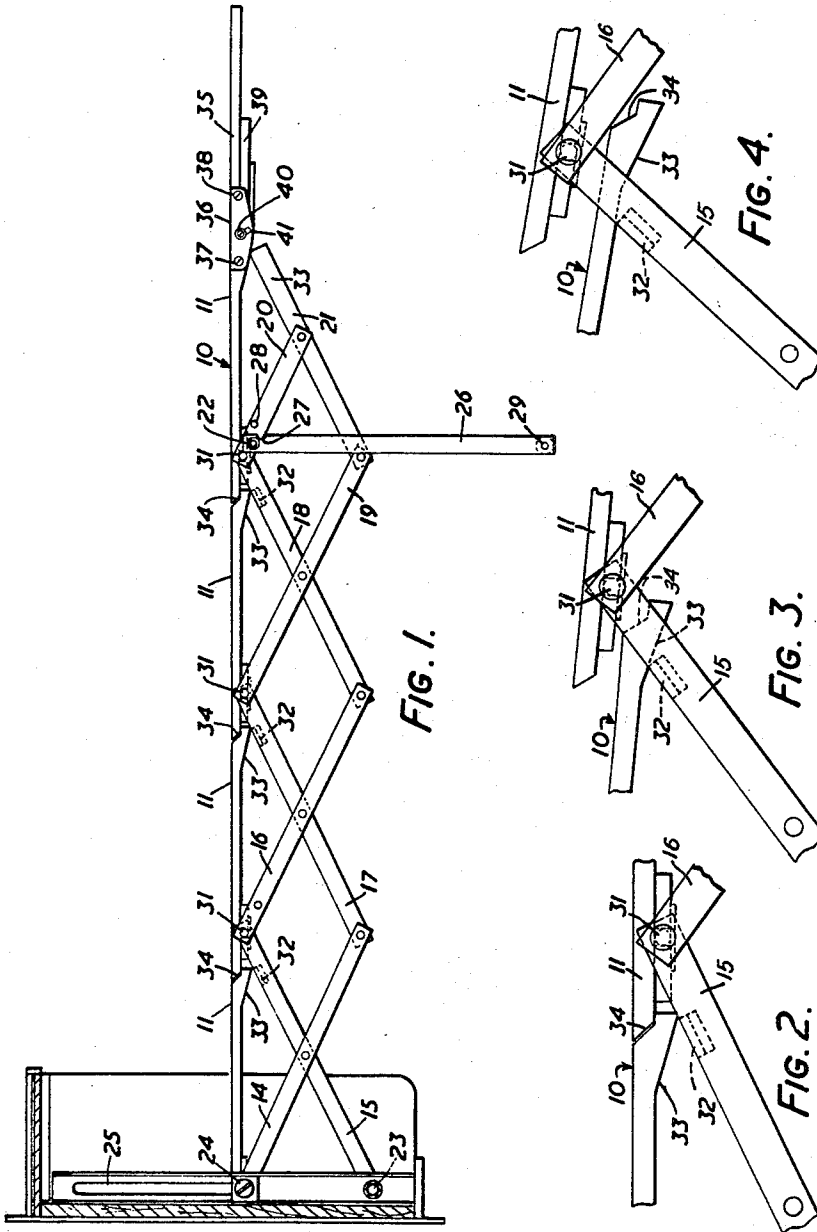
April 6, 1965

L. M. J. BALFOUR
COLLAPSIBLE TABLES

3,176,633

Filed June 18, 1962

4 Sheets-Sheet 1



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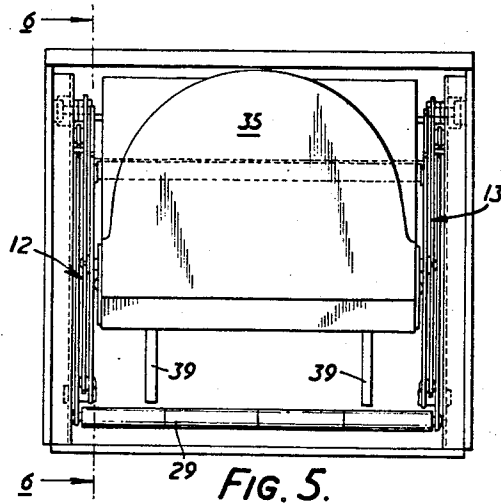


FIG. 5.

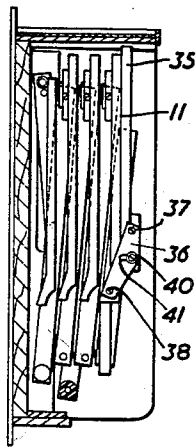


FIG. 6.

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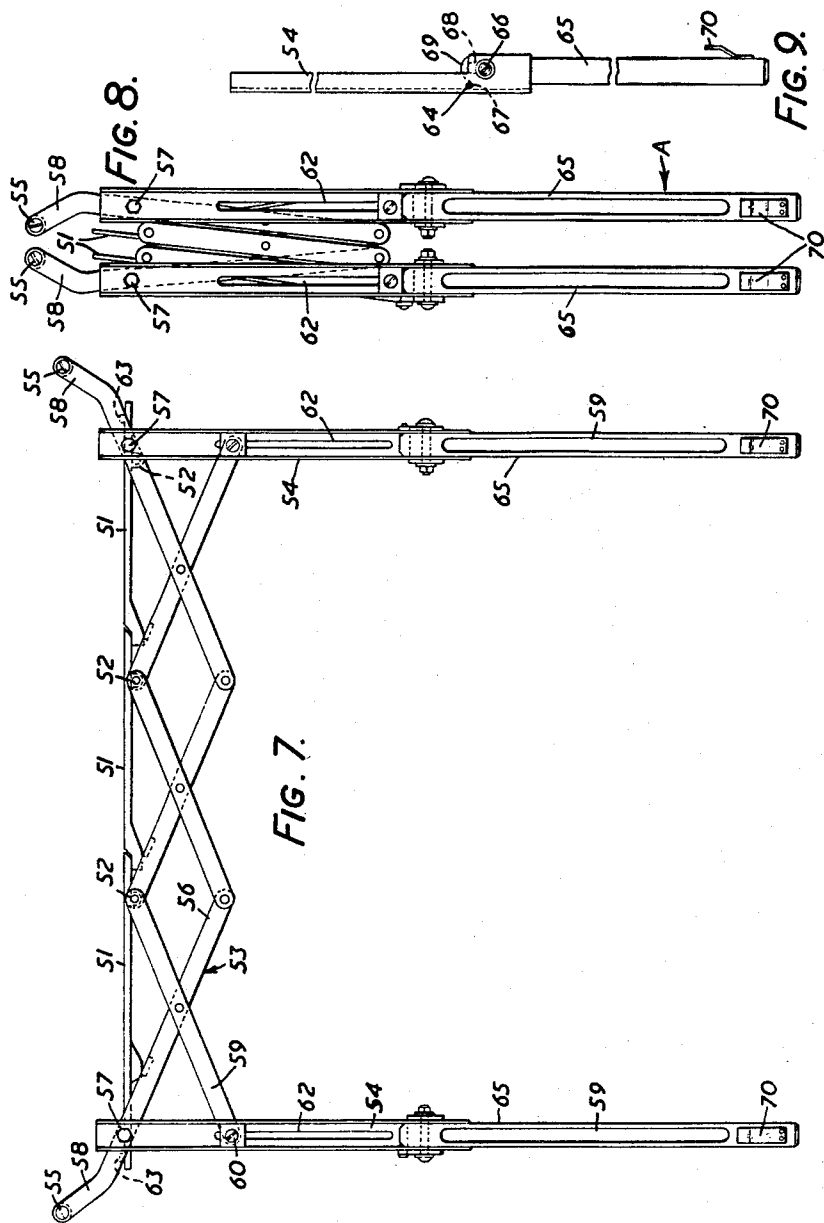
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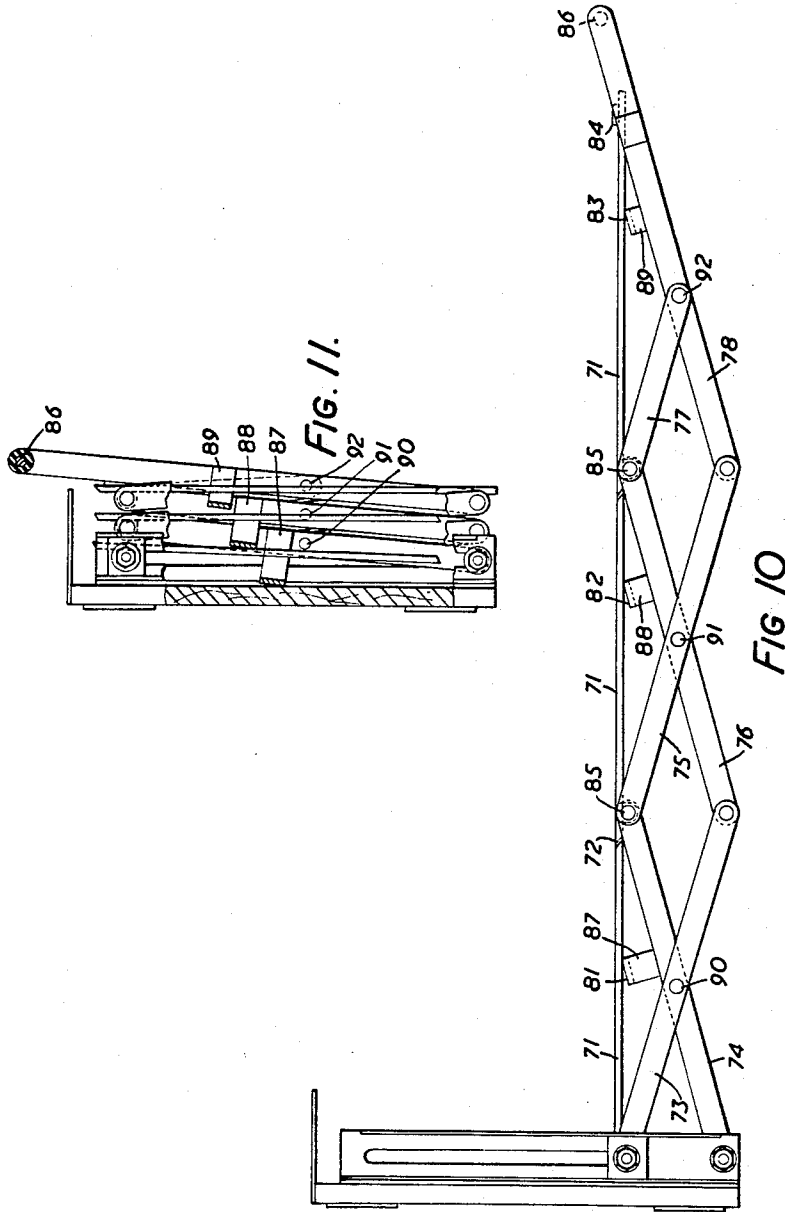
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COLLAPSIBLE TABLES

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14 Claims. (Cl. 108-67)

This invention relates to collapsible tables.

According to the present invention a collapsible table comprises at least two table flaps each associated with one pair of links of each of two "lazy-tongs" linkages which are arranged, in an erected position, to lie substantially parallel to one another outside the flaps when viewed in plan, but to provide support for the flaps in end to end relationship, the flaps being arranged to move to overlie one another when the linkages are folded to a retracted position.

Preferably each table flap is pivoted adjacent one edge to a crossbar extending transversely between the linkages, each flap being adapted in the erected position to rest upon a supporting crossbar also extending between the linkages. The first crossbar conveniently forms the pivotal axis for the ends of two links of each linkage. The underside of each flap may be provided with a ramp adjacent its supporting crossbar so that at the commencement of the folding movement the ramp descends over this crossbar permitting the corresponding edge of the flap to drop below the level of the pivoted edge of the adjacent flap. One or each of the transverse edges of the table flaps is conveniently chamfered to provide a lead for the adjacent flap at the commencement of the collapsing movement.

Preferably a handle is provided to facilitate drawing out the "lazy-tongs" linkages and collapsing them and the handle may be provided between a continuation of one of the links of each linkage. Alternatively the handle may be pivoted to one link of each linkage so that in the retracted position the handle can be folded flat over the folded linkages.

In one arrangement the "lazy-tongs" linkages may each be connected at one end to a mounting adapted to be connected to an upright support such that in the erected position the table is cantilevered from the mounting. Conveniently an end flap is pivoted to the table flap remote from the mounting and arranged to overlie that table flap in the retracted position and the end flap may be rounded or tapered in plan view to facilitate use of the table as an ironing board.

In one form of the invention the two linkages are each supported at each end by a leg and legs may each be formed in two halves pivoted to one another so that the lower half can be folded to lie adjacent to the other half.

The invention may be carried into practice in various ways but three specific embodiments will now be described by way of example with reference to the accompanying drawings, in which:

FIGURE 1 is a front elevation of a collapsible table extending from a wall support, in the erected position;

FIGURE 2 is an enlarged view of the ends of a pair of adjacent flaps, in the erected position;

FIGURES 3 and 4 show the pair of flaps of FIGURE 2 in successive positions while being collapsed;

FIGURE 5 is an end elevation of the table in a collapsed position;

FIGURE 6 is a sectional side elevation on line 6-6 of FIGURE 5;

FIGURE 7 is a side elevation of a modification of the arrangement shown in FIGURE 1 in which the wall support is replaced by legs;

FIGURE 8 is a side elevation of the table of FIGURE 7 in the collapsed position;

FIGURE 9 is a view in the direction of the arrow A of FIGURE 8 showing details of a leg.

FIGURE 10 is a side elevation of a further modification of a collapsible table, extending from a wall support, in the erected position, and

FIGURE 11 is a sectional side elevation of the arrangement of FIGURE 10 in the collapsed position.

The arrangement shown in FIGURES 1-6 comprises a table top 10 made up of a number of flaps 11. Two sets of "lazy-tongs" linkages 12 and 13 are arranged one on each side of the table 10. Each linkage comprises four pairs of links 14-15, 16-17, 18-19 and 20-21. The links of each pair are pivoted to one another at central points and the first pair of links 14-15 are pivoted to a wall support, link 14 being attached to a movable pivot 24 sliding a guide 25 and link 15 being attached to a fixed pivot 23. The adjacent pairs of links are pivoted to one another at their adjacent ends, and the upper pivots are provided by crossbars 31 which extend transversely between the linkages 12-13 thus serving to keep them apart. The undersides of the flaps 11 (in FIGURES 1-4) are each pivoted adjacent their forward or left hand ends to the adjacent bar 31 so that as the pairs of links are folded up the forward ends of the flaps 11 are drawn towards the wall support. The right hand or rear edge of each flap 11 is provided on its underside with a ramp 33 adapted to rest freely upon another crossbar 32 when the linkages are in the extended position. The total thickness of the flap plus ramp must not exceed the width of the "lazy-tongs" members otherwise the table will not fold to a fully closed position. As shown in FIGURE 1, the four crossbars 32 are situated having their top edges flush with the upper sides of the pairs of links 15, 17, 19 and 21. At the commencement of the collapsing movement the ramp 33 descends over the crossbar 32 as shown in FIGURES 3 and 4, permitting the rear edge of the flap to drop below the level of the forward edge of the adjacent flap (which is itself rising) thus facilitating nesting of the flaps. The ends of the flaps are chamfered and arranged so that when the table is pulled out the chamfered end of one flap will overlie the chamfered end of the next flap and lock it down. In addition a chamfered recess 34 is provided in the end of each flap so that the end of the adjacent flap can nest in it, and the tops of the flaps will fit flush with one another.

At its forward end, i.e. to the right in FIGURE 1, the table is provided with a handle formed by a pair of side rails 26 pivoted at 22 to the two links 20 just below the adjacent crossbar. The other ends of the rails 26 are interconnected by a bar 29 which can be gripped whilst extending or collapsing the table. The upper surface of each rail has, close to the pivot 22 a recess 27 which is arranged to engage a pin 28 extending from the link 20 when the table is being extended.

Attached to the flap 11 furthest from the support is an end flap 35. In the construction shown the end flap 35 has a semicircular end so that the table can be used as an ironing board. The adjacent flap 11 has attached to its underside two bars 39 which extend under flap 35 to support it. The end flap 35 is attached to the adjacent flap 11 by a pair of plates 36, one on each side, which are pivoted to the flap 11 at 37 and to the end flap 35 at 38. The movement of the flap 35 about the pivots 38 is limited by pins 40 sliding in slots 41 in the plates 36. When the table is put in the collapsed position the end flap 35 and the plates 36 pivot about the pivots 37 until the rearward end of the flap 35 abuts against the top of adjacent flap 11. Thereafter the pin 40 moves up the slot 41 (which is now inverted from the position of FIGURE 1) permitting slight relative movement between the plates 36, and the end flap 35, until the end flap lies flat against the adjacent flap 41, the dimensions being such

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that at this point the pin 40 is at the end of the slot 41.

A second embodiment of the invention is shown in FIGURES 7-9. FIGURE 7 shows a collapsible table in the erected position. The table comprises three flaps 51 each pivoted adjacent one edge (to the right in FIGURE 7) to crossbars 52 extending between two sets of "lazy-tongs" linkages 53. In the erected position the flaps are arranged to have a small gap between them to facilitate closing. The construction of this embodiment is similar to that described of FIGURES 1-6 except that the wall support is replaced by four table legs 54 at both ends. The upper "lazy-tongs" links at each end are connected to the table legs 54 by fixed pivots 57, the links 56 being extended to form side rails 58, which are interconnected by a transverse hand grip 55. The ends of the other links 59, at each end are attached to pivots 60 slidably mounted in vertical guides 62. The links 56 have projecting lugs 63 extending a short distance over the top of the left hand flap 51 to provide an additional support to prevent the flap moving upwards as the table is collapsed. The table legs 54 are of channel section and have extension legs 65 pivoted to them at their lower ends, and are sized so as to fold round and fit the channel section of the legs 54. The extension legs 65 are attached to the legs 54 by pins 66 extending between the sides of the channel and through the slot 68 in the top of the extension leg 65. When the extension leg is in use the pin 63 will abut against the lower end of the slot 68, and the slot is arranged so that the distance between its lower end and the top of the leg 69 is greater than the distance between the pin 66 and the bottom of the channel shaped leg 54. Thus it cannot be disengaged in this position. To disengage the leg it must be pulled down until the pin abuts against the other end of the slot, and in this position the distance between the end of the slot and the top 69 of the leg is less than that between the pin and the bottom of the channel, and the leg can thus be folded through 180° so that at least a part of it fits inside the channel of the leg 54.

The lower end of the extension leg is provided with a hook 70. When the extension leg is swung into the retracted position, it can be locked in this position by pushing it down so that the pin 66 will once again abut against what was the lower end of the slot 68, and the hook is so positioned that when the leg is pushed down it will overlie the back of the channel leg 54 and hold the end of the extension leg in position.

So that not all the load of the table bears on the pin 66 and the end of the slot 68 an additional supporting lug 64 is positioned in the bottom of the channel section leg 55 such that in the extended position it is engaged by a shelf 67 on the top of the extension leg 65.

The extension leg has on its inner face (i.e. that adjacent to the bottom of the channel of the leg 55 in the folded position) a longitudinal groove 59 to enable the top of the pin forming the pivot 60 to slide up and down the guide 62 whether the extension leg is in use or not.

A third embodiment is shown in FIGURES 10 and 11 in which three flaps 71 are chamfered at their edges as shown at 72 to provide a lead for the adjacent flap at the commencement of the collapsing movement, to ensure that the flaps move properly out of the extended flat condition towards the overlapping stacked position.

The "lazy-tongs" are arranged as before to provide a linkage on each side of the table, each linkage comprising links 73-74, 75-76, 77-78. Each flap is hingedly attached adjacent one edge of a crossbar 85 extending transversely between the linkages and serving to connect the upper pivots of links 74, 75 and 76, 77 together. Link 78 extends beyond and above the level of the table top to provide a support for a handle 86 formed by a crossbar extending transversely between the linkages. Further crossbars 81, 82 and 83 extend transversely between the linkages and having integral brackets at their ends at 87, 88 and 89 attaching them to links 74, 76 and 78. The

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distances of the brackets 87, 88 and 89 from their respective adjacent pivots 90, 91 and 92 are progressively increased to enable the links of the "lazy-tongs" to lie flat against one another and the crossbar to lie in offset stacked relationship, in the collapsed position as shown in FIGURE 11. It will be seen that the depth of the brackets 87, 88 and 89 are also different in order to support the flaps 71 in the plane.

The links 78 are provided with lugs 84 positioned so that when the table top is in the extended position the lugs overlie and abut against the top of the end flap 71 and prevent the flap from rising upwards.

Instead of having the handles 29 and 86, suitable knobs can be provided on each side on an extension to any suitable crossbar 31, 85, but preferably on the crossbar adjacent to the outermost one.

The links of the "lazy-tongs" linkages may be made of stiff metal, or as die castings or of sheet metal pressed to provide side flanges and longitudinal ribs which impart rigidity. To improve the wearing properties of the pivotal joints in these metal links, close joints may be constructed in the manner described in the present applicant's corresponding British application No. 5,332/61.

To provide added rigidity further crossbars may be provided extending transversely between the linkages and joining the lower pivots of each pair of links of the linkages.

It should be noted that although the arrangement shown in FIGURES 1-6 and FIGURES 10 and 11 discloses the first pair of links of the "Lazy tongs" linkages being attached to a wall support with the upper pivot arranged to slide in a guide while the lower pivot is fixed, the arrangement will work equally well if the upper pivot is fixed and the lower pivot slides in a guide.

What I claim as my invention and desire to secure by Letters Patent is:

1. A collapsible table comprising at least two table flaps, and, pivoted to the flaps, a pair of lazy tongs linkages adapted to extend generally horizontally while lying in parallel vertical planes, and each comprising at least two pairs of elongated links each pair being pivotally connected to each other at middle pivots and to at least one neighboring pair of lower pivots and upper pivots, means for supporting the linkages so as to be movable between an erected position with the linkages horizontally extended and the upper faces of the flaps in a common horizontal plane, and a retracted position with the linkages horizontally collapsed and the flaps in spaced parallel planes inclined at a substantial angle to the horizontal, in which the flaps lie wholly between the vertical planes containing the linkages and each is pivoted to each linkage about an axis perpendicular to said planes which axis is situated adjacent an upper pivot of the linkage and adjacent one end of the flap, but so spaced from the upper surface of the flap that in the erected position the upper surface of the flaps lies wholly above the upper ends of the links, and a plurality of supporting crossbars each supporting the end of a flap remote from its pivot in the erected position and extending between corresponding points of the two linkages, each such point being adjacent but spaced from an upper pivot, so that when moved to the retracted position the end of each flap remote from its pivot first moves down relatively to the adjacent end of the next flap and then swings down to the retracted position in which the flaps lie mainly within the space between the linkages.

2. A collapsible table as claimed in claim 1 in which the supporting crossbars supporting successive table flaps are each secured to a pair of links and are at different positions along said pairs of links and project up different distances to engage the undersides of the table flaps.

3. A collapsible table as claimed in claim 1 including a handle to facilitate drawing out the lazy-tongs linkages and collapsing them.

4. A collapsible table as claimed in claim 3 in which the

handle is provided between a continuation of one of the links of each linkage.

5. A collapsible table as claimed in claim 3 in which the handle is pivoted to one link of each linkage so that in the retracted position the handle can be folded flat over the folded linkages.

6. A collapsible table as claimed in claim 1 in which the lazy-tongs linkages are each connected at one end to a mounting adapted to be connected to an upright support such that in the erected position the table is cantilevered from the mounting.

7. A collapsible table as claimed in claim 6 including an end flap pivoted to the table flap remote from the mounting and arranged to overlie that table flap in the retracted position.

8. A collapsible table as claimed in claim 7 in which the end flap is rounded or tapered in plan view to facilitate use of the table as an ironing board.

9. A collapsible table as claimed in claim 1 in which the two linkages are each supported at each end by a leg.

10. A collapsible table as claimed in claim 9 in which the legs are each formed in two halves pivoted to one another so that the lower half can be folded from an extended position to lie adjacent to the other half.

11. A collapsible table as claimed in claim 10 in which the lower half in either or both the extended and folded positions can be moved longitudinally relatively to the upper half, thereafter to prevent pivotal movement of the lower half.

12. A collapsible table as claimed in claim 9 in which each end of each linkage has one link secured to a fixed pivot on the adjacent leg, and the other to a sliding pivot on that leg.

13. A collapsible table comprising at least two table flaps, and, pivoted to the flaps, a pair of lazy tongs linkages adapted to extend generally horizontally while lying in parallel vertical planes, and each comprising at least two pairs of elongated links each pair being pivotally connected to each other at middle pivots and to at least one neighboring pair at lower pivots and upper pivots, means for supporting the linkages so as to be movable between an erected position with the linkages horizontally extended and the upper faces of the flaps in a common horizontal plane, and a retracted position with the linkages horizontally collapsed and the flaps in spaced parallel planes inclined at a substantial angle to the horizontal, in which the flaps lie wholly between the vertical planes containing the linkages and each is pivoted to each linkage about an axis perpendicular to said planes which axis is situated adjacent an upper pivot of the linkage and adjacent one end of the flap, but so spaced from the upper surface of the flap that in the erected position the upper surface of the flaps lies wholly above the upper ends of the links, the underside of the end of each flap remote from its pivot being provided with at least one ramp, and a plurality of supporting crossbars each supporting the ramp of a flap in the erected position and extending between corresponding points of the two linkages, each such point being adjacent but spaced from an upper pivot, so that when moved to the retracted position the end of each flap

remote from its pivot first moves down relatively to the adjacent end of the next flap and then swings down to the retracted position in which the flaps lie mainly within the space between the linkages.

14. A collapsible table comprising at least two table flaps, and, pivoted to the flaps, a pair of lazy tongs linkages adapted to extend generally horizontally while lying in parallel vertical planes, and each comprising at least two pairs of elongated links each pair being pivotally connected to each other at middle pivots and to at least one neighboring pair at lower pivots and upper pivots, means for supporting the linkages so as to be movable between an erected position with the linkages horizontally extended and the upper faces of the flaps in a common horizontal plane, and a retracted position with the linkages horizontally collapsed and the flaps in spaced parallel planes inclined at a substantial angle to the horizontal, in which the flaps lie wholly between the vertical planes containing the linkages and each is pivoted to each linkage about an axis perpendicular to said planes which axis is situated adjacent an upper pivot of the linkage and adjacent one end of the flap, but so spaced from the upper surface of the flap that in the erected position the upper surface of the flaps lies wholly above the upper ends of the links, the end of each flap remote from its pivot being chamfered down and away from its pivot and the adjacent end of a neighboring flap being correspondingly chamfered, and a plurality of supporting crossbars each supporting the end of a flap remote from its pivot in the erected position and extending between corresponding points of the two linkages, each such point being adjacent but spaced from an upper pivot, so that when moved to the retracted position the end of each flap remote from its pivot first moves down relatively to the adjacent end of the next flap and then swings down to the retracted position in which the flaps lie mainly within the space between the linkages.

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FRANK B. SHERRY, Primary Examiner.