Sept. 9, 1952 G. A. DELF ET AL 2,609,627

PIVOTED LEG TABLE WITH ADJUSTABLE HEIGHT PROVISION

Filed May 11, 1949 2 SHEETS—SHEET 1

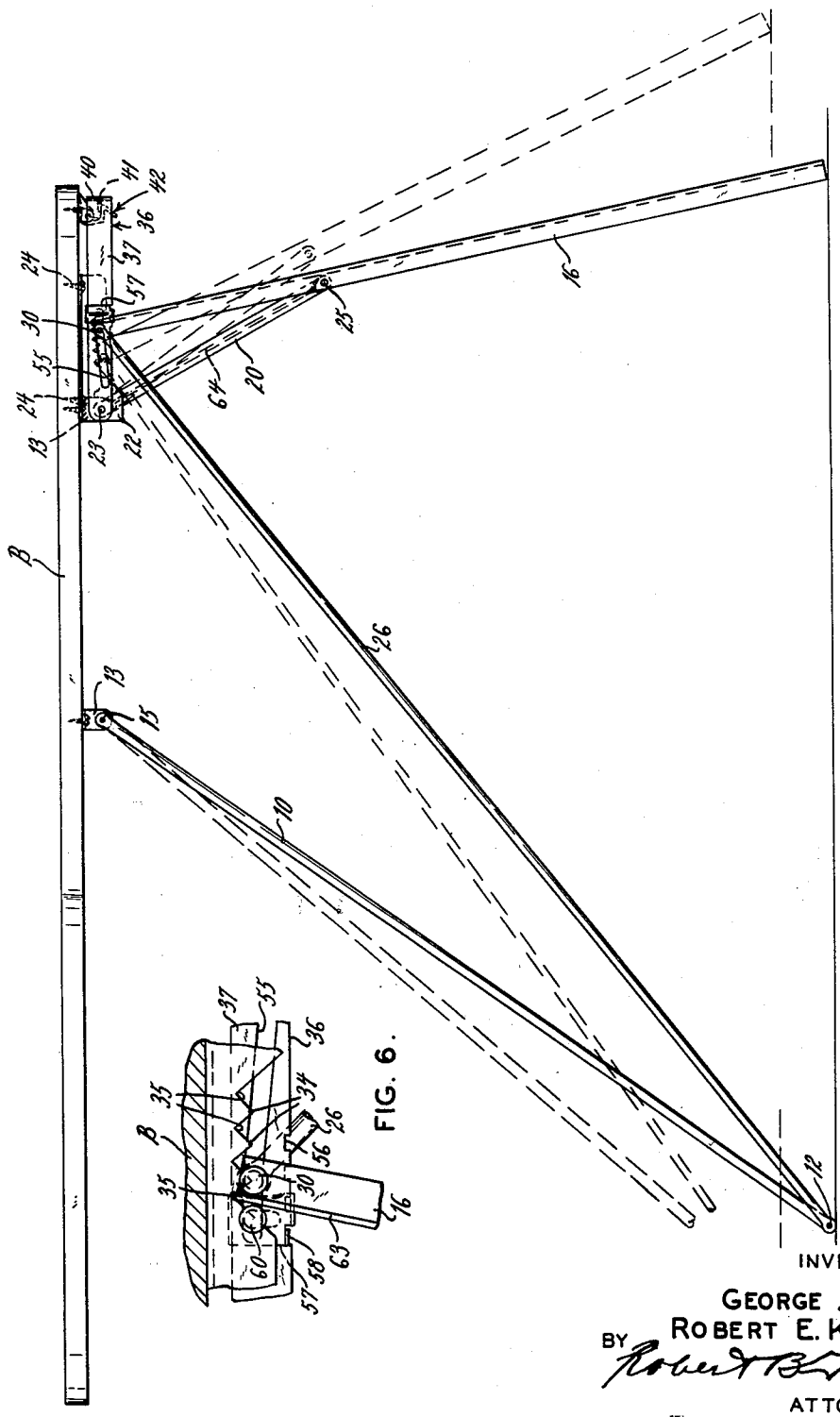



FIG. 1.




FIG. 6.

INVENTORS
GEORGE A. DELF
ROBERT E. KORTUM
BY Robert E. Kortum
ATTORNEY

Sept. 9, 1952 G. A. DELF ET AL 2,609,627

PIVOTED LEG TABLE WITH ADJUSTABLE HEIGHT PROVISION

Filed May 11, 1949 2 SHEETS—SHEET 2

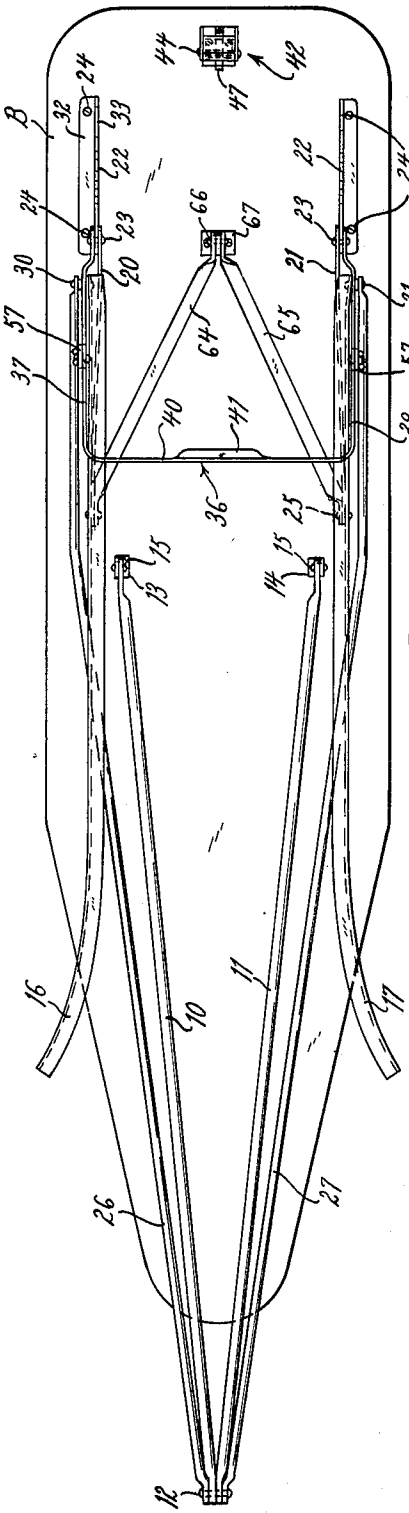


FIG. 2.

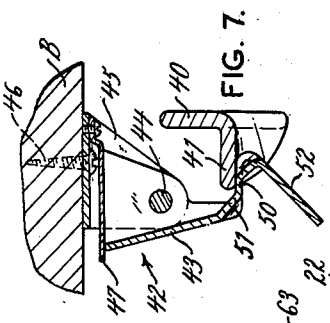


FIG. 7.

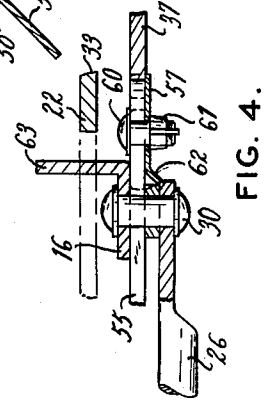


FIG. 4.

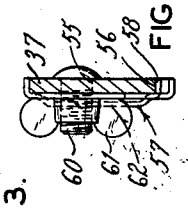


FIG. 5.

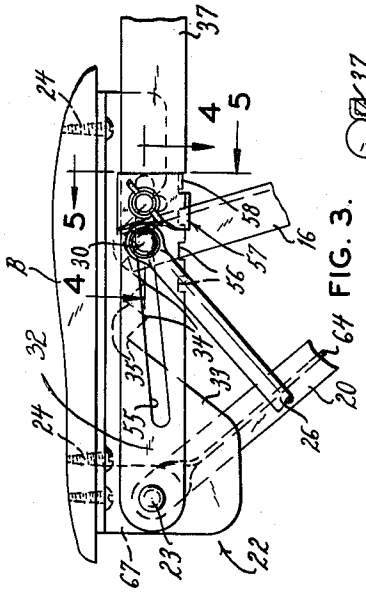


FIG. 3.

INVENTORS
GEORGE A. DELF
ROBERT E. KORTUM

BY Robert B. Terry

ATTORNEY

Patented Sept. 9, 1952 2,609,627

# UNITED STATES PATENT OFFICE

2,609,627

## PIVOTED-LEG TABLE WITH ADJUSTABLE HEIGHT PROVISION

George A. Delf, Creve Coeur, and Robert E. Kortum, Robertson, Mo., assignors to Atlas Tool & Manufacturing Company, St. Louis, Mo., a corporation of Missouri

Application May 11, 1949, Serial No. 92,722

7 Claims. (Cl. 38—118)

1

This invention relates to improvements in pivoted-leg tables with adjustable height provisions, and more particularly to improved tables of the class including ironing boards and the like, in which it is desirable to predetermine an optimum working height of the table surface, and in which provisions are made for maintaining the predetermined height of the board when erected at various times, after periods of folding or collapsing for space economy in storage.

This applicant is aware of the many types of foldable leg table, particularly ironing boards which have appeared in trade, and which include provisions for retracting or folding the leg assembly of the table between periods of its active use, for obvious economy in storage space and in shipping. Certain boards and tables of this type have from time to time been offered to the trade as including provisions for varying the effective working height of the table surface. However, so far as is known at the time of perfecting the present design, each of the tables or boards of this type heretofore available, requires an adjustment operation de novo, incident to each erection of the assembly. It is accordingly an important objective of the present improvements to realize a foldable leg structure for tables of the type referred to which, while susceptible of a reasonable range in height adjustment, provides for the retention of such adjustment once the optimum working height of the table is determined upon, as for a given user, irrespective of repeated operations of folding and erection.

A further and valuable objective of the present improvements is realized in a board or table structure of pivoted leg type, in which a height adjustment is attained through a variable-range translatory movement of the upper ends of the legs, or at least one pair thereof or one leg unit, in a direction lengthwise of and beneath the table surface.

A further important and useful objective of the present improvements is realized in the most advanced embodiment of the present improvements in enabling a single such adjustment of position of upper ends of one pair of legs along the table, and a coordinated variation in angle of a second pair of legs, in such manner as to assure horizontality of the table through a leg adjustment assembly which need be applied only to one pair of the pivoted legs.

A still further object reflected in a reduction in overall space requirements of the folded table, consists of an arrangement of pivoting links acting with at least one of the pairs of legs, to cause

2

a convergence of the legs incident to movement thereof from an erected position to a folded relation to the table.

The foregoing and numerous other objects will hereinafter more clearly appear, particularly when considered in connection with the following detailed description of a presently preferred embodiment of the improvements taken in connection with the accompanying drawing, in which:

Fig. 1 is a side elevation of an ironing board with legs erected and in a position for use, and embodying the present improvements;

Fig. 2 is a bottom plan view of the assembly of Fig. 1, with the legs folded to a position adjacent the under surface of the board or table top;

Fig. 3 is a fragmentary, enlarged, side elevational view showing certain of the elements coacting with the legs of one pair to permit folding of the legs, and providing for various predetermined relations of such legs to the table top for variation in effective working height of the ironing board or other table;

Fig. 4 is a fragmentary sectional elevation as viewed along a staggered plane indicated by line 4—4 of Fig. 3;

Fig. 5 is a fragmentary sectional view of certain parts as viewed along line 5—5 of Fig. 3;

Fig. 6 is a view similar to portions of Fig. 3, but as viewed from the opposite side of the assembly, and

Fig. 7 is an enlarged, detailed, sectional elevation of a latch assembly serving releasably to retain a movable guide member for the legs in an operative position beneath the table, when the leg structure is erected to a table-supporting position.

Referring now to characters of reference to the drawing, an ironing board proper, or other form of table top, is indicated at B and may be of any suitable or usual form in plan such as shown by Fig. 2 for example, the board or top per se forming no part of the present improvements.

For support of the board B there are provided two longitudinally spaced leg units, each such unit comprised in the present example of a pair of legs 10 and 11, these being preferably of a metal rod or tube stock and connected together at their lower ends as by a pin 12. The upper ends of this leg unit are connected at fixed pivotal points to the board B as by lugs 13 and 14 each of which provides a pivoted joint with the upper leg end as through a headed pin 15.

A second leg unit, consisting in the present example of a pair of legs, is indicated at 16 and 17,

the outer ends of the legs of this pair being curved so as to present an outward flare for increase of effective base of support and hence stability of the board when erected to a position of use. The upper ends of the legs 16 and 17 are not directly pivotally connected to the board B, but are indirectly thus related through a pair of links, one associated with each of the legs 16 and 17, the links being indicated at 20 and 21. Each link 20—21 is pivoted at its uppermost end to a downwardly presented fixed rail member 22, the shape and location of which best appear from Fig. 3, the pivotal connection between the adjacent link and the rail member 22 being made through a headed pin 23. Each rail member may be secured to the under surface of the board B, as by wood screws or the like 24. The lower or opposite ends of the links 20—21 are pivotally connected at a selected point well below the upper ends of the flared legs of the second leg unit 16—17, for example, by means of headed pins 25.

It will now have appeared that, but for restraining means at the tops of the legs 16—17, the upper ends thereof may be given for purposes of adjustment, a translatory movement in a direction longitudinally of the board B, this translatory movement being limited to provide an adjustment in angularity of this leg unit with respect to the table top, for example but without limitation, between the full and dotted lines shown by Fig. 1. From this adjustment facility later to be described in more detail, it will appear that the aforesaid translatory movement enables an adjustment in effective working height of the board as will be apparent from the difference in vertical positions of the full and dotted leg ends in Fig. 1.

There is provided a positive operative interconnection between the two leg units or pairs of legs, whereby to realize, incident to the translatory leg adjustment movement of members 16—17, an appropriate similar range of movement of the lower ends of the legs 10—11, whereby to maintain the board B in horizontal position at all times irrespective of differing height adjustments of the board, as realized through changes in the leg angularity. This connection is found in the present example, in a pair of rods 26 and 27, the lower ends of which are apertured and connected to pin 12, hence to the lower ends of legs 10—11. The rods 26 and 27 are connected at their opposite ends, to the upper end portions of the legs 16 and 17 respectively. The length of these distance rods, which also function as stabilizing braces between the legs, and the location of the pivot points between the rods 26 and 27 and the respective leg units, are so selected that despite variations in angularity of the legs, as for height adjustment of the table, the board B presents at all times a horizontal working surface. Suitable connections between the upper ends of rods 26—27 and the upper end portions of the legs 16—17, consist of headed pins 30 and 31.

Proceeding now further to describe the fixed rails 22, each of these may be, in sectional form, an angle member including a horizontal part 32 and a vertical portion 33. The portion 32 is apertured to receive wood screws 24 above mentioned, and the vertical flange or web of the fixtures 22, is characterized by a series of downwardly presented projections or teeth 34, and intervening recesses or tooth spaces 35. With the leg structure in operative position as shown by Fig. 1, an upper end portion of each leg of one pair, extends into a selected one of the recesses 35 in the adjacent fixed rail 22.

As a stabilizing and guide structure for the upper leg ends of the leg units 16—17, there is provided a U-shaped bail member which may be formed of a flat metal stock and which is generally indicated at 36, the form of which best appears in Fig. 2. The member 36 is comprised of a pair of longitudinal side arms 37 and 38, the arms 37—38 being connected by an integral bridge or cross piece 40 provided with a lip or flange 41 as an aid to manual movement of the bail member 36, as will be described. The member 36 has its arms 37 and 38 pivoted at fixed points identified with headed pins, these latter engaging suitable apertures in the fixed rails 22 and which may, for convenience, consist of the pins heretofore described at 23, connecting the upper ends of the links 20—21 to the fixtures 22. It will now have become apparent that the bail member 36 is movable through an angular range of approximately 180 degrees, between its position shown by Fig. 2, and an opposite position in which the bridge 40 of the bail engages and is releasably retained by a latch structure generally indicated at 42 and which is detailed in structure in Fig. 7.

A suitable form of bail latch is shown by Fig. 7 wherein the latch arm proper is indicated at 43. It is of channelled form, with its sides apertured to receive a pin 44 engaging apertured ears in a fixed clip 45 secured as by screws 46 to the under side of the end of the board B. A leaf spring 47 tends to bias the latch 43 in a counterclockwise direction (Fig. 7) about pivot pin 44, to keep the latch arm, until manually released, in engagement with the bail bridge 40. It will be noted that the latch arm 43 is extended to form a latch portion 50 with an intervening stiffening rib 51, the latch being provided with an acute angled bail-camming portion 52. It will appear from Fig. 7 that as the bail bridge is brought toward the latch, the action of the bail against the camming lip 52, will serve momentarily to open the latch against the loading of leaf spring 47, then to restore the latch arm to a bail-retaining position.

Describing now certain variable stop provisions identified with the side arms 37 and 38 of member 36, each such arm is provided with a generally longitudinal slot 55, each such slot comprising, as will appear from Figs. 3 and 6, a linear sloping portion, leading into a short horizontal end portion which latter is close to the limit of end movement of the ends of legs 16—17. One of the margins of each of the arms 37 and 38 is provided with a series of squared recesses 56. Adjustably supported laterally of each of the arms 37—38, is a stop device or limiting member in the form of a clip 57. Each such clip may be preformed of sheet metal and includes an instruck tongue 58 which is of a width to occupy a selected one of the recesses 56 in the adjacent arm. Securement of this stop member and provision for its release and reapplication as desired to effect a change in adjustment, consist of a bolt or screw 60 provided with a wing nut 61. It will now be obvious that, upon release of the nut 61, the clip 57 may be backed away from the adjacent arm, moved therealong, and reapplied with its tongue 58 in any selected one of the recesses 56, and the nut 61 again threaded up to maintain the adjusted stop position. The clip 57 includes by preference an outturned lip or flange 62 (Fig. 4) which is so located as to be engaged by the upper

end of the adjacent leg 16 or 17, or by some element fixedly connected thereto, for example and as shown, the head end of one of the rods 26 or 27. It will now have appeared that the translatory movement of the upper ends of the legs 16—17 as heretofore described, will be positively limited to that length of the slots 55 which is forward of the adjustable stop clips 57. Thus it will have appeared that, as shown by Fig. 1, in case a lower operating level of the board B is desired, the stop clips 57 will be inserted farther forwardly, i. e. to the left (Fig. 1 and Fig. 3), thus assuring that the adjustable legs are held farther from the vertical, or otherwise expressed, closer to the dotted line positions (Fig. 1).

It will be apparent from Fig. 4 that when the bail 36 is in its operative position so as to lie substantially entirely to the right of its pivot pins 23 (Fig. 2), the guide members consisting of arms 37 and 38 will lie alongside the fixed rails 22. The legs 16 and 17 in the example shown, are of angle stock. Thus their upper ends, one of which is shown in section by Fig. 4, will each normally present a projection 63 which occupies one of the recesses 35 between the teeth 34. It is of course quite possible, but for provisions for folding the table hereinafter referred to, to utilize the teeth 34 as selected adjusting abutments for stopping or limiting the translatory movement of the legs 16—17 in one direction. Thus it should be observed that, merely by making the recesses 35 of sufficient depth to obviate casual disengagement therefrom of the projections 63, the spaced paired fixed rails 22 may be, in certain simplified structures, relied upon to provide adjustments of the aforesaid nature, both in leg angularity and table height.

It is desirable, although not in all cases strictly necessary, to predetermine an accurate range and to fix the planes of movement of the legs incident to folding the leg structure and erection of same between periods of active use of the board. Such added stability and smoothness of folding function are enhanced by the provision of a V-shape guiding and brace structure comprised of paired strap elements 64 and 65, best seen in Fig. 2. The upper ends of the V-brace are connected together as through a headed pin 66 engaging an apertured clip 67 secured to the under surface of the board B. The opposite ends of members 64—65, may be secured by pins 25, one to each of the legs 16 and 17, and on the same pivot centers as the links 20—21 heretofore described.

It should here be noted as a feature of some value that the arrangement of the legs 16—17, and the system of links and braces 20—21 and 64—65 are such that as the legs are brought from erected or operative position (Fig. 1) to a folded position (Fig. 2) by movement of the bail, these links particularly the V-shaped brace 64—65 exerts a retractive effect on the legs 16 and 17 so as to bring them closer together as they are folded back against the board B, and in fact bringing the whole leg structure substantially within a continuation of the margins of the wider portions of the board. An opposite or converse effect prevails upon erection of the legs, in that they are spread somewhat beyond the relation shown by Fig. 2, upon being restored to erected relation.

The operations involved, first in predetermining the optimum height of the board, are thought to have been fully apparent from the foregoing description of functions of the legs and associated adjusting elements, but it may be noted that



in order to change the effective table height, the legs are erected substantially as in Fig. 1, the adjustable clips 57 are released each from the adjacent arm 37 or 38, and the exactly desired height of table arrived at by seating the upper ends of legs 16—17, in selected pairs of the notches 35 between the teeth 34 in fixed rails 22. The leg elements will remain in this adjusted position until the table is again folded. However to assure the identical height adjustment at the next period of use, the stop clips 57 are, upon release, moved as far as possible to the left (Fig. 3) until their flanges 62 abut the adjacent leg-carried elements. Each clip is then fixed in position by seating its tongue 58 in the nearest recess 56, and the wing nut 61 tightened.

As to the operations involved in folding the leg structure and in reerecting same, assuming the board to be in working position as in Fig. 1, the latch arm 52 is manually released from the flange 41 of the bail 36, and the bail actuated about its fixed pivot axis identified with pins 23, through a range of substantially 180 degrees, to that shown by Fig. 2. Incident to this movement, the leg units 16—17 will have been moved clockwise (Fig. 1) through a range somewhat greater than 90 degrees, so as to bring legs 16—17 upwardly against and parallel with the board B as shown by Fig. 2. Incident to this movement, the links 20 and 21 will swing about their board pivots 25 as will the V brace structure 64—65 it being noted that the upper ends of the legs may now move along the slots 55 incident to the swing of the bail member as described. This movement will, acting through the distance rods or braces 26—27, similarly move the leg unit comprising members 10 and 11, to a retracted position along the board, substantially as shown by Fig. 2.

An opposite movement of the bail 36 will, by the reverse of the motions described, again restore the leg structure to erected position. It should be noted that the complete folding and erection operation of the parts described, is or may be accomplished solely by manipulation of the U-shaped bail 36, together with manual latch release just prior to folding of the board or table.

It will of course be understood that the table or ironing board as commercially produced, includes numerous accessories and refinements not material to the dominant features herein described. Among such added equipment may be mentioned a suitable covering for the board, finish as desired, and suitable resilient tip elements on the extremities of the leg units.

It will now have appeared that the device as described fully realizes each of the several objectives above expressed, and others implied from the foregoing description.

Although the invention has been described by detailed reference to a selected advanced embodiment, the explicit nature of description should not be taken as limiting, but solely in an instructive sense, numerous variants being possible within the scope of the claims hereunto appended.

I claim as my invention:

1. In an ironing board or the like of a type provided with foldable legs and height adjustment provisions, a table top board, a pair of rails fixedly carried by said board and secured to the latter in parallel spaced relation and each provided with downwardly projected teeth and intervening recesses, a U-shaped member pivotally secured to said board adjacent said rails and movable about its pivot in a longitudinal plane

to an active or use position of the board in which the sides of the U-shaped member lie parallel to and along said fixed rails, each of the sides of the U-shaped member being provided with a longitudinal guideway, a pair of supporting legs pivoted to the table top board, a second pair of supporting legs spaced from said first mentioned pair of legs and provided with a horizontal pin in their upper portions, each such pin extending into one of the guideways of said U-shaped member, a movable stop member carried by each side arm of said U-shaped member and adjustably positionable at various points along the said slotted guideway, a pair of links each pivoted at its upper end to said table top board, the opposite ends of the links being pivoted to the respective legs of said second pair at a point substantially below the upper leg ends thereof, the upper ends of the legs of said second pair engaging, in a position of use of the ironing board, selected ones of the recesses between the teeth of the fixed rails, as determined by the positions of the stop members in the sides of the pivoted U-shaped member, whereby to enable a variation of height of the table top board by variation of the angle of the legs of the second pair to the horizontal plane of the table top board, a latch carried by the table top board and positioned to be latchingly engageable with said pivoted U-shaped member to retain the same in its normal or use position with said legs extended, and a rod pivotally interconnecting the upper ends of the legs of said second pair with the lower ends of the legs of said first pair, said connection arranged to act incident to a variation in height and angle adjustment of the legs of the second pair to effect a comparable variation in the table-supporting relation of the legs of the first pair and thus acting to assure support of the table top board in horizontal position irrespective of its variably adjusted height.

2. In an ironing board or the like of a type provided with foldable legs and height adjustment provisions, a table top board, a pair of fixed rails carried by said board in parallel spaced relationship and each provided with downwardly projected teeth and intervening recesses, a U-shaped member pivotally secured at one end to said board adjacent said rails and movable about its pivot in a longitudinal plane to an active or use position in which the sides of the U-shaped member lie parallel to and along said fixed rails when the U-shaped member is in use position, each of the sides of the U-shaped member being provided with a longitudinal slotted guideway, spaced pairs of legs for the table, one pair of said legs being pivoted to the table top board, the legs of the second pair each being provided with a horizontal pin in an upper portion, each such pin extending into one of the slotted guideways of said U-shaped member, a movable stop carried by each of the side arms of said pivoted U-shaped member and positionable at various points along the slotted guideway thereof to form an end enclosure, a pair of links each pivoted at its upper end to said table top board at a distance spaced from the upper ends of said second pair of legs, the opposite ends of the links being pivoted to the respective legs of said second pair at a point substantially below the upper leg ends thereof, the upper ends of the legs of said second pair engaging, in a position of use of the ironing board, selected ones of the recesses between the teeth of the fixed rails, as determined by the positions of the stop members in the sides of the pivoted U-shaped member, whereby to enable a variation of use height of the table top board by variation of the angle of the legs of the second pair to the horizontal plane of the table, a latch carried by the table top board and latchingly interlocking with said pivoted U-shaped member to retain same in its normal or use position when the legs are extended, said links, and the legs of said second pair being so related as to effect a relatively convergence of the legs of the said second pair, incident to folding actuation thereof from an erected position to a folded position, and a rod pivotally interconnecting the upper ends of the legs of said second pair and the lower ends of the legs of said first pair, said connection arranged to act incident to a variation in height and angle adjustment of the legs of the second pair to effect a comparable variation in the table-supporting relation of the legs of the first pair and thus acting to assure support of the board in horizontal position irrespective of its variably adjusted height.



3. In a foldable ironing board, a table top board, a bracket fixed to and arranged between the ends of said table top board and extending longitudinally thereof and provided with a series of longitudinally spaced abutment teeth, a lever fulcrumed at one end to said bracket for swinging movement to terminate substantially parallel with said table top board and having an elongated slot to extend along said teeth, a supporting leg having its upper end pivotally connected to and being slidable in said slot to adjustably interlock with said teeth when said lever is positioned to lie substantially parallel with said table top board, a brace element pivotally connected at one end intermediate the ends of said leg and at its other end to said table top board adjacent said fulcrumed end of said lever, a second leg pivotally secured to said table top board at a point spaced from said upper end of said brace, and a rod pivotally interconnecting the upper end of said first leg and the lower end of said second leg so that swinging movement of said lever will simultaneously swing both of said legs into operative or inoperative position.

4. In a foldable ironing board, a table top board, a bracket fixed to and arranged intermediate the ends of said table top board and extending longitudinally of the same, a lever fulcrumed at one end to said bracket for swinging movement about an approximately horizontal axis to a position substantially parallel with said table top board, and having an elongated slot to extend therealong to lie lengthwise of said bracket and closely adjacent thereto, a supporting leg having its upper end pivotally interconnected to and slidable in said slot to adjustably engage said bracket when said slot is positioned to lie substantially parallel with said table top board, a brace element pivotally connected at one end to a point intermediate the ends of said leg, and at its other end to said table board top adjacent said fulcrumed end of said lever, a second leg pivotally secured to said table top board at a point longitudinally spaced from said upper end of said brace element, and a tie rod pivotally interconnecting the upper end of said first leg and the lower end of said second leg so that swinging movement of said lever will swing both of said legs simultaneously into operative or inoperative position.

5. In a foldable ironing board, a table top board, a bracket secured to and arranged intermediate the ends of said table top board and

extending longitudinally of the latter and provided with a series of longitudinally spaced abutment teeth, a lever fulcrumed at one end to said bracket for swinging movement to a position substantially parallel with said table top board, and provided with an elongated slot to extend along said teeth at the end of swing of said lever, a supporting leg having its upper end pivoted to and slidable in said slot to adjustably interlock with said teeth when said lever is positioned to lie substantially parallel with said table top board, a stop element adjustable on said lever for longitudinally moving therealong to vary the effective length of said slot and form an end closure therefor so that said fulcrumed end of said leg may abut against said stop element, a brace element pivotally interconnected at one end to a region intermediate the ends of said leg, and at its other end to said table top board adjacent the fulcrumed end of said lever, a second leg pivotally secured to said table top board at a point spaced from said brace element, and a tie rod pivotally interconnecting the upper end of said first leg with the lower end of said second leg and whereby swinging movement of said lever will simultaneously swing both of said legs relatively to said board into operative or inoperative position.

6. In a foldable and collapsible ironing board adjustable through a predetermined range of varying heights, a table top board, a bracket fixed to and extending longitudinally of said table top board and provided with a series of longitudinally spaced teeth, a lever pivotally fulcrumed at one end to said bracket on a substantially horizontal axis to be swingable to either side of said axis to a position approximately parallel with said table top board and having an elongated slot that extends longitudinally along said teeth so that the latter can project downwardly into said slot, a leg member having a transverse offset upper end slidably insertible through said slot to engage said teeth in a table-supporting position of said leg member, a brace pivoted to said table top board adjacent said lever fulcrum and to said leg intermediate the ends of the latter, means for securing said bracket to depend from said table top board and whereby said lever may be swung to adjustably vary the effective height of said leg member, a second leg member pivotally secured to said table top board at a point spaced from the fulcrum of said lever, and a tie rod pivotally interconnecting the opposite ends of said leg members so that they will move simultaneously by manipulation of said lever.



7. In a folding table, a table top member, a longitudinally spaced set of leg units below and having pivotal connection therewith, a U-shaped bail member pivoted at one end beneath and to said top member and swingable through an angle of approximately 180° to be substantially parallel to said top member at the extreme limits of its said angular movement, a link pivotally interconnecting said bail member and one of said leg units, said last-mentioned leg unit comprising a pair of legs with projections adjacent their upper ends, the arms of said bail member provided with slots each engageable by one of said projections and through which the latter extend and slide therealong, means fixed to said top member to engage said projections when the bail member is positioned to lie substantially parallel with said top member, means interconnecting said leg units with said bail member so that actuation of the latter to one extreme of its pivotal swing retracts said leg units together from an erected to a folded relation to said table top member, and actuation of said bail member to the other extreme of said pivotal swing moves said leg units simultaneously to an erected table-supporting position, and a latch fixed to said table top member and releasably engageable with said bail member at said last-mentioned extreme position of the latter to retain the bail member in said position.

GEORGE A. DELF.
ROBERT E. KORTUM.


REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 846,105 | Harris et al. | Mar. 5, 1907 |
| 1,990,032 | Johanson | Feb. 5, 1935 |
| 2,311,612 | Pleiss | Feb. 16, 1943 |
| 2,424,734 | Booth | July 29, 1947 |
| 2,432,192 | Gaudette | Dec. 9, 1947 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 39,228 | France | July 28, 1931 |