Dec. 22, 1953 K. B. OLANDER 2,663,101

IRONING TABLE

Filed June 4, 1952 3 Sheets-Sheet 1

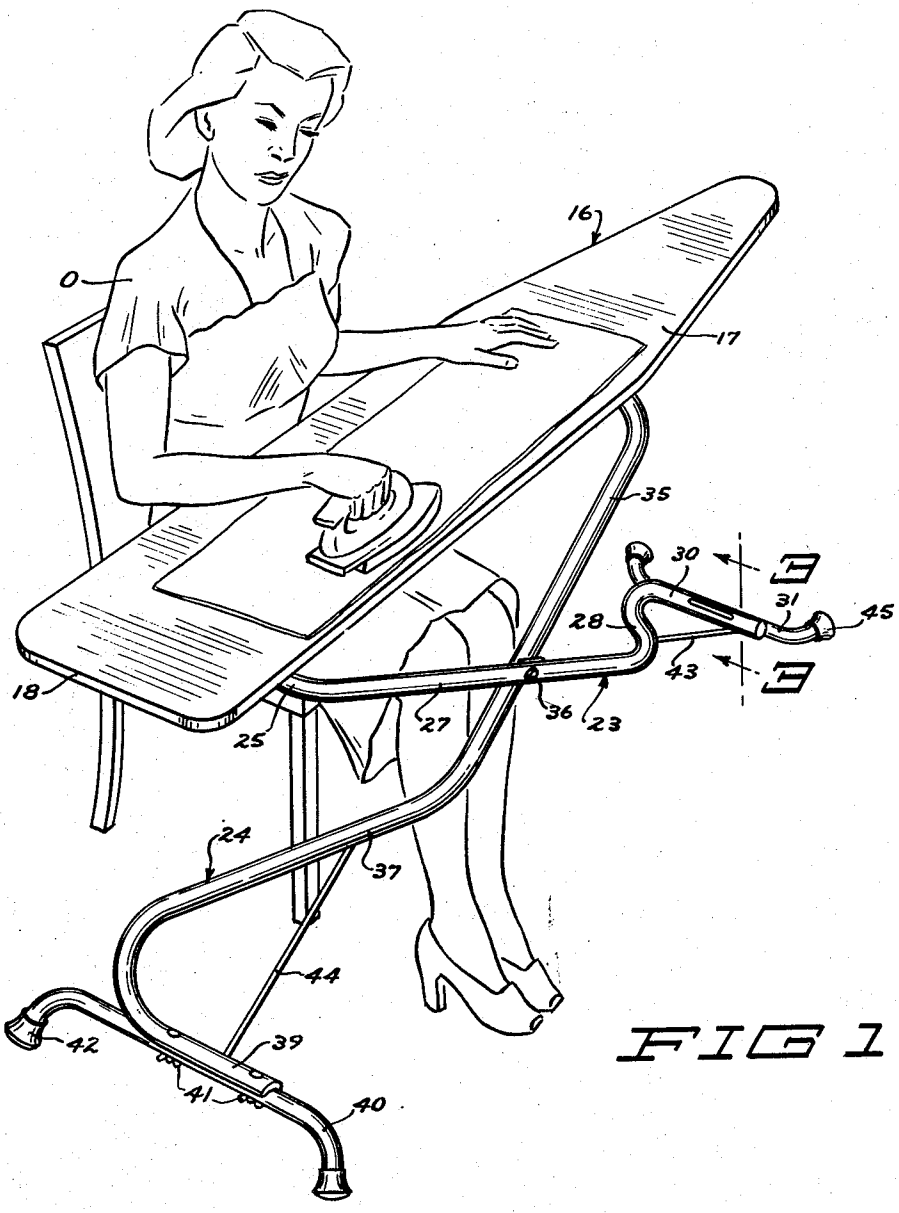


FIG 1

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IRONING TABLE

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FIG 2

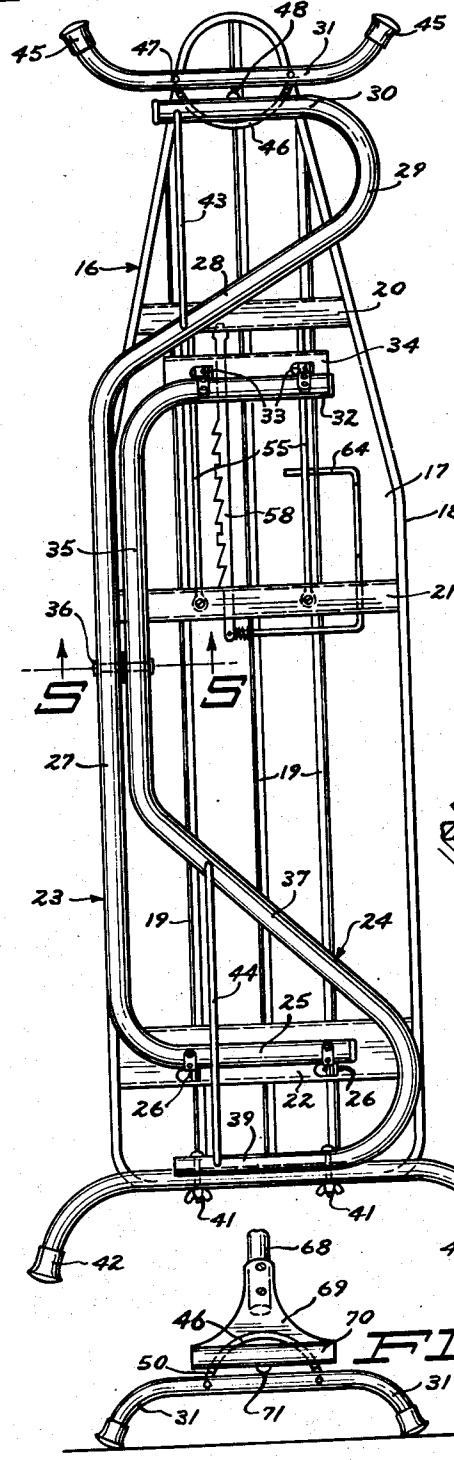
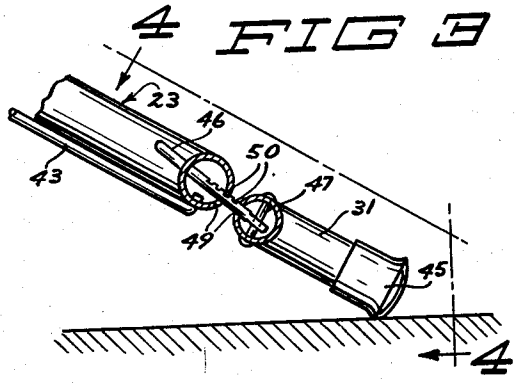


FIG 3



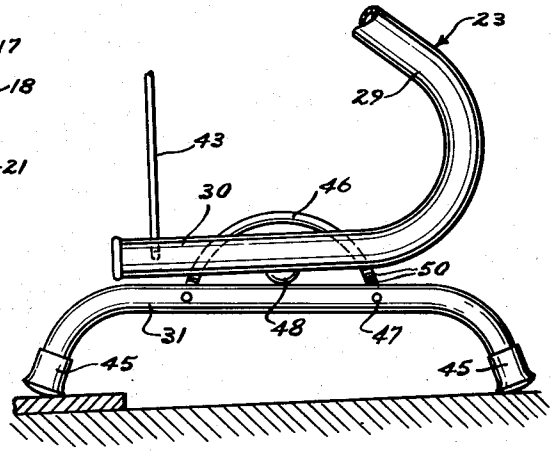


FIG 4

FIG 5

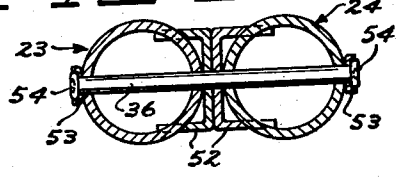


FIG 6

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IRONING TABLE

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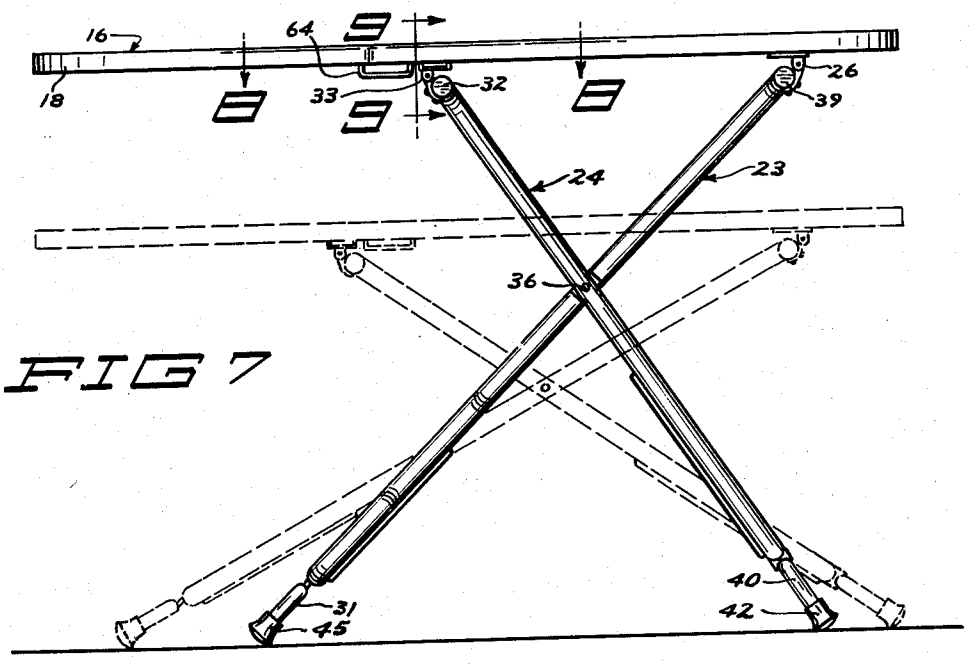


FIG 7

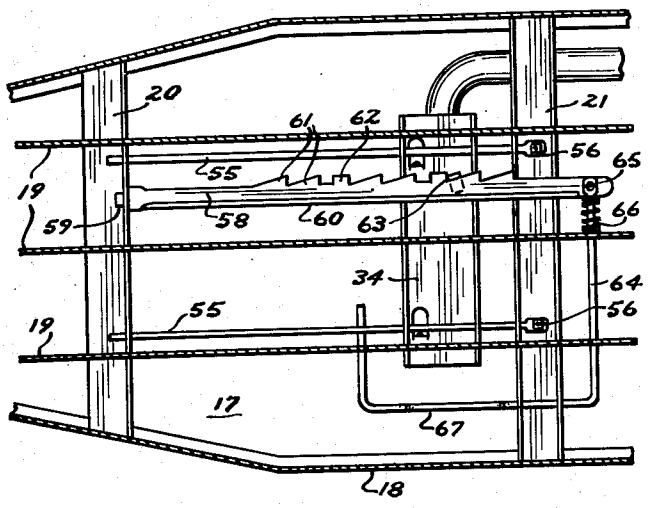
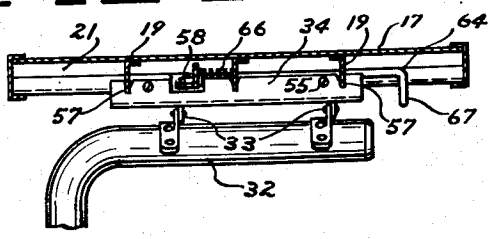


FIG 8

FIG 9



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2,663,101

UNITED STATES PATENT OFFICE

2,663,101

IRONING TABLE

Kemuel B. Olander, Minneapolis, Minn.

Application June 4, 1952, Serial No. 291,687

8 Claims. (Cl. 38—114)

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This invention relates generally to ironing tables and particularly to an improved supporting structure for the table top or board which presents the ironing surface.

The invention embodies improvements in the ironing table shown and described in my copending application Serial No. 167,199, filed June 9, 1950. While the invention there disclosed fully carries out the recited objectives and provides a table which may be comfortably used from a seated position, I have now conceived various modifications and additions which give such a table even more advantages over others in the art.

The main improvement concerns contact of the table with the supporting floor. It is, of course, elementary knowledge that any three points lie in a common plane and that, accordingly, a structure such as a leg structure having three point contact with a supporting surface will rest firmly on the surface. Where, however, the structure is adapted for four or more point contact with the surface mechanical imperfections in the structure or an irregular surface may allow the structure to wobble, with only three of the four or more points in contact simultaneously. Ironing tables have for many years been constructed with a triple leg structure, generally with two rear legs and one front leg arranged in longitudinal crossing relation to insure stability of the table when erected. Recently, however, efforts in ironing table improvement have been directed toward forming the table leg structure to avoid passing through the area lying under the central portion of the board so that the operator might use the board from a comfortable seated position with his or her legs extending into said area. Developments along this line, as in my heretofore mentioned invention, have quite generally, if not invariably, resulted in a leg structure requiring four point contact with the floor for a well supported table. Furthermore, it is recognized that in a four point support the contact points may be arranged to delineate an area broader than the board itself to give increased stability over the conventional three point support. Thus the leveling or four point contact problem has become an important one to the ironing table industry.

Accordingly, the primary object of this invention is to provide an ironing table adapted for four point contact with the floor and having a leveling mechanism in its leg structure insuring such contact regardless of irregularities in the floor surface or slight mechanical imperfections in the structure itself.

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Another object of the invention is to provide an ironing table having leveling means adapted for self-adjustment to irregularities in the floor surface and to then lock in the adjusted position to assure stability of the table.

Still another object of the invention is to provide an ironing table adapted for use by an operator in seated position and having an improved diagonal leg structure adapted to give rigid support to the table top.

Still another object of the invention is to provide an ironing table having an improved height adjustment mechanism with a manually operable control positioned for convenient operation by the operator as he grasps the board in the normal manner for erection or collapsing.

With these and other objectives in view my invention broadly comprises an ironing table having a board, a longitudinally crossing leg structure under the board configured to extend around the knee area under the center of the board and having two point front and two point rear contact with the table supporting surface, one of said two point contacts being made by a foot member so attached to the structure for lateral play as to be self-adjusting to irregularities in the surface, and means coacting between the foot and leg structure to automatically lock the foot in its adjusted position.

These and other more detailed and specific objects of the invention will be brought to light in the course of the following specification, reference being made to the accompanying drawings, in which—

Fig. 1 is a perspective elevation of my improved ironing table showing an operator seated in working position at the table.

Fig. 2 is a bottom plan view of the table with the leg structure in collapsed condition against the underside of the board.

Fig. 3 is a longitudinal vertical section, taken on line 3—3 of Fig. 1, through the lower end of the front leg and showing the leveling device in adjusted and locked condition on the leg.

Fig. 4 is a fragmentary elevation taken on line 4—4 of Fig. 3 showing the leveling device adjusted to an irregular table supporting surface.

Fig. 5 is an enlarged detail section of the leg pivot taken along line 5—5 of Fig. 2.

Fig. 6 shows the leveling foot on a slightly modified form of table leg.

Fig. 7 is a side elevation of my improved ironing table showing the table top adjusted to different heights by means of full and broken lines.

Fig. 8 is a longitudinal horizontal section taken

on line 8—8 of Fig. 7 showing the table height adjustment mechanism.

Fig. 9 is a transverse vertical section taken on line 9—9 of Fig. 7 also showing the height adjustment mechanism.

Referring now more particularly to the drawings and using reference numerals to denote like parts in the different figures, the number 16 designates generally the table top or ironing board of conventional flat elongated shape with a laterally tapering front portion. Inasmuch as the invention here concerned deals primarily with the supporting means for the board, the term "board" is used in its broad sense to indicate the flat element presenting the ironing surface regardless of whether said "board" is made of wood, sheet metal, expanded metal or other material. The board shown in the drawings comprises a sheet of metal 17 having a peripheral rim 18 and various longitudinal frame members 19 and transverse frame members 20, 21 and 22 for reinforcing the sheet 17 to insure the retention of a flat ironing surface.

The board is supported by a leg structure comprising a front leg 23 arranged in longitudinal crossing relation with rear leg 24 under the board. Both legs are preferably formed of tubular metal and each has the general configuration of the letter S. The front leg 23 has its upper end portion 25 (Fig. 2) pivotally connected as at points 26 to a pair of hinge ears punched downwardly from the rearmost transverse frame member 22, for movement of the leg about a transverse axis. This leg then extends forwardly under the board as at 27 substantially on a vertical plane with one lateral edge thereof then crossing diagonally under the board as at 28 and terminated in a U-shaped bend 29 under the forward end of the board, as shown, with the lower end portion 30 lying parallel to the hinged upper end 25. A leveling foot 31 having floor contact tips 45 is attached to the portion 30 in a manner to be later described.

The rear leg 24 has its upper end portion 32 extending transversely under the board and hinged as at points 33 to a channel shaped slide 34 mounted on the underside of the board for longitudinal sliding movement between the transverse frame members 20 and 21. From this connected portion the leg extends rearwardly and downwardly as at 35 on a longitudinal vertical plane passing closely by portion 27 of leg 23 to which it is pivoted as at 36. It then passes diagonally crosswise under the board as at 37 terminating in a reverse bend and end portion 39. Leg portion 39 has its lower wall collapsed to form an elongated concave channel seat for the arched tubular foot 40 secured against the leg by screws and wing nuts 41. The ends of the foot 40 are capped by crutch tips 42 of rubber or other non-skid material. The legs 23 and 24 carry strut bars 43 and 44, respectively, connecting the sides of the U-bend at their extended ends.

It may now be observed that, when the leg structure is erected as in Fig. 1, the legs extend around the area below the central portion of the board allowing the operator O to be seated with the knees extending into said area in such a position that the board is disposed in working position across the lap. The longitudinal stability of the table through the use of crossing leg members has been preserved. Furthermore, transverse rigidity is assured by the configuration of the legs 23 and 24 and the foot members attached to each. It is found that by forming the legs in an S-shape endwise pressure upon them sets up opposing forces so as to have a stiffening effect. It will be understood that in the structure shown, downward pressure on the table will tend to set up equalizing forces in the leg portions 28 and 37 so as to preserve longitudinal rigidity of each leg and retain the parallel relationship between the end portions thereof, both of which intersect the longitudinal vertical center plane of the table.

The floor area delineated by the contact points 42 and 45 extends laterally beyond the vertical planes of the side edges of the board. Accordingly, the possibility of sideward tipping of the table is virtually eliminated regardless of the unequal downward pressure or load on the board. The rear foot 40 is considerably longer than the board width but may be removed by unthreading wing nuts 41 for shipping or storage of the table in a carton of board width.

While the four point contact provided by the feet 31 and 40 assures lateral stability, it also presents the heretofore mentioned problem of effecting such contact with an irregular floor surface. I have accordingly provided the foot 31 with a self-adjusting and locking means. Attention is called to Figs. 3 and 4 where foot 31 and its mounting are shown in detail. The foot has an arched configuration similar to that of the rear foot 40 and has crutch tips 45 capping its ends for non-skid engagement with the floor. A bow shaped locking rod 46 rises from the top side of the foot, being longitudinally centered thereon and is integrally associated therewith by having its ends rigidly fixed in the foot as by rivets 47. It will be noted in Fig. 3 that the rod is formed on a plane which lies at a slight angle to the plane on which foot 31 is arched.

As best shown in Fig. 3, rod 46 holds the foot on the leg by passing upwardly and downwardly through arcuately arranged openings 49 in the walls of leg portion 30. Intermediate the openings 49 portion 30 is provided on its extended side with a rocker head 48 against which the foot 31 rests in spaced relation to the leg proper. This head contacts the foot at its longitudinal center and substantially at the center of the arc formed by rod 46. Accordingly, the foot is allowed limited lateral rocking movement about the head 48 with rod 46 sliding through the leg portion 30. It will thus be understood that when the foot engages an uneven surface, such as accentuated in Fig. 4, the foot will laterally adjust itself about point 48 so that both contact members 45 will rest firmly on the surface.

As heretofore mentioned it is also important that the leveling foot be rigidly locked to the leg structure in its adjusted position. This is accomplished by providing a series of notches 50 on the upper side of the rod 46 and adjacent each end thereof. These notches extend substantially radial from the center of the rocker member 48 and are formed to seat the upper catch forming edges of openings 49 in the leg portion 30 (Fig. 3) so that the foot is locked against lateral movement. The operation of this locking structure will shortly be described in greater detail.

In Fig. 5 the leg pivot 36 is shown in detail. The leg members are reinforced at this point by channel members 52 which are set into the leg walls as shown. These members 52 are mounted to extend between the legs with their bottoms in flush engagement and pin 36 passes through both the legs and channels insuring movement of the legs about the pin on parallel planes. Pivot

pin 36 is in the form of an elongated rivet having its ends clinched as at 54 against the cupped washers 53. This type of pivotal connection at this point is found to be very efficient yet simple to manufacture and with a minimum production cost. It is thought important that the channels need not be actually attached to the respective legs as they are held in place by rivet 36 and will not twist around the rivet relative to the adjacent leg as each cups against the side of the leg.

Referring now to Figs. 7, 8, and 9 the board height adjustment mechanism will be explained. In Fig. 7 the full and broken line representations respectively show the table in positions for standing and seated use by the operator. It is found desirable to also provide means for locking the board at various inbetween elevations. This is to accommodate operators of varying heights and use of chairs or stools of different seating elevations.

The frame members 20 and 21 have an upwardly opening channel construction and a pair of parallel transversely spaced slide rods 55 (Fig. 8) are mounted therebetween, the ends thereof extending through the channel side walls and their rear ends secured as at 56 to prevent their longitudinal movement. These rods slidably carry the member 34 to which the upper end portion 32 of leg 24 is pivoted. The side walls of slide member 34 are notched as at 57 for reception of the lower edges of longitudinal members 19 (Fig. 9). It will accordingly be understood that the leg carrying slide 34 is movable longitudinally of the board between the cross members 20 and 21 of the frame and that the supported height of the table top is dependent on the longitudinal position of the slide.

I accordingly provide means for locking the slide at various selected positions. An elongated latch bar 58 has its reduced forward end 59 loosely inserted through the rear side wall of the member 20 and extends rearwardly under the top 17 with its rear end portion lying across the member 21, the side walls of the member being cut away, as shown, to allow clearance for the bar and a limited amount of lateral play of the bar about its forward connection.

The bar has a vertical stiffening flange 60 along one longitudinal edge and is provided along its opposing edge with a series of sidewardly pointing latch teeth. The majority of these teeth denoted at 61 have their forward edges inclined with the rear edges perpendicular to the longitudinal axis of the bar. The intermittently spaced teeth 62 are similar in size but also have a perpendicular leading edge.

A catch 63 for engagement along the toothed side of the latch bar is mounted on the slide 34 and an operating handle 64 is pivotally connected as at 65 to the rear end of the latch bar. The handle extends laterally through aligned apertures in the longitudinal ribs 19 and a compression coil spring 66 is disposed around the handle and between the center rib 19 and latch bar to urge the bar in a catch 63 engaging direction. The handle is formed in a gripping portion 67 adjacent the edge of the board and forward of the center of weight of the table. It is normal and convenient for a person in erecting, collapsing or moving an ironing table to grasp the board along the opposing longitudinal edges with one hand forward and the other hand to the rear of the center of weight of the table. Handle 67 lies just inside the edge portion normally gripped by the forward hand. It is accordingly extremely simple to extend the fingers of that hand inward to engage and operate the handle.

When the table is collapsed the slide 34 is in its forwardmost position (Fig. 2). It will be observed that to erect the table the top is held in an elevated position with the legs down allowing the legs to gravitationally swing downwardly about their pivotal connections with the table and each other. This causes the slide 34 to move rearwardly along rods 55 and the catch 63 will move along the toothed edge of the latch bar catching and locking behind each tooth to prevent return or forward movement.

The leg weight will carry the catch over teeth 61 sliding over the forward inclined edges thereof until it meets the first stop tooth 62. This tooth is located so as to lock the catch 63 against movement in either direction when the legs have lowered a sufficient distance to place the table in the conventional seated height condition such as shown in broken lines in Figs. 7. If a higher board elevation is desired the handle may be squeezed toward the board edge to release the catch which may then skip along teeth 61 until the next stop tooth 62 is met. This tooth is so located to lock the legs in position to support the board at a conventional standing height. If further elevation is desired the catch may be allowed to move past this tooth also.

Accordingly the board may be locked in any one of a plurality of adjusted positions. Teeth 62 allow the board to be erected to an often used elevation automatically without the necessity of experimental adjustment. Should a person normally use the board at an intermediate height such as two notches above the conventional seated elevation, it is a simple matter to release the catch from its restraint by the first stop tooth and raise the board for two more clicks of the catch over teeth 61. This allows the person to always adjust the table immediately and accurately to the height he or she has found to be the most desirable.

Stop teeth 62 also make it possible to pick up the table and move it without the board skipping to a higher elevation.

Of primary importance in the present invention is the adjustable foot 31 and particularly the mechanism which locks the foot in its self-adjusted position. While others in the art have attempted to provide a leveling means where four point contact is desired this feature alone does not provide satisfactory stability. It will be understood that where two points are allowed play about their connection such as in the Patent No. 2,546,097 to Hild, while wobble is eliminated there is little greater table stability than in a three point contact table. With my construction the foot 31 is locked in adjusted position so that the four contact points are in unyielding relative position. This prohibits any twisting of the front and rear legs about their pivot connection 36 to cause torsional twisting of the board.

The foot 31 levels and locks in the following manner. As the table is placed against the floor in erected condition the rear leg support points 42 are allowed to contact first and the front foot rod 46 will rest upon the lower edges of the openings 49 in leg portion 30, its notched face clear of the upper edges thereof. The foot is accordingly free to move on the inclined plane of the rod about the pivot formed by the rocker head 48 so that both tips 45 will engage the floor even though the surface be irregular (Fig. 4). As the full weight of the table is released leg portion 30

will settle against the rod with the upper edges of openings 49 registering in the opposing notches 50 on both sides of the member 43, locking the foot in its adjusted position. The table weight preserves the locking engagement until it is lifted allowing the foot rod to again fall to a released movable position.

A slight angle between the plane of the rod 46 and the plane of the foot 31 is found desirable to give the foot ample time for lateral adjustment prior to locking. Also this design tends to hold the foot in an off-balance unlocked position when the table is stored in its normal vertical position, as in Fig. 2, to decrease the possibilities of members sticking in locked engagement.

In Fig. 6 I have shown a slightly modified form of the invention showing the self-adjusting foot applied to a leg having a longitudinally extending lower end 68 such as the front leg of a conventional three legged table. A foot support plate 69 having its forward edge rolled as at 70 is secured to the leg and the foot 31 is attached to the portion 70 in the same manner as to leg portion 30 in the preferred form. A pivot lug 71 is carried by the member 69 and obviously the operation and locking of foot 31 is the same as that heretofore discussed in connection with the leg 23. Here, as in the preferred form, the leveling foot is approximately as long as the board is wide so as to insure the desired stability while yet allowing the packing and shipping of the collapsed table in a rectangular carton substantially of board width.

The leveling foot described insures a rigid relationship between the table ironing surface and the floor regardless of floor irregularities and regardless of variables in precision which might occur in manufacturing an item of this type.

Accordingly, the ironing table herein disclosed economically and effectively carries out the aforementioned objectives. It is understood that suitable modifications may be made in the structure as disclosed, provided that such modifications come within the spirit and scope of the appended claims. Having now therefore fully illustrated and described my invention, what I claim as new and desire to protect by United States Letters Patent is:

1. In an ironing table, an elongated ironing board, a pair of leg members arranged in longitudinally crossing relation below the board, each leg having means at its upper end connecting the leg to the board and means at its lower end for crosswise engagement with a table supporting surface, the portion of each leg from the connecting means to the crossing point lying completely and both on the same side of the vertical longitudinal center plane of the board, and each leg between the crossing point and the base having a U-bend extending transversely under the board, the sides of such bend being vertically spaced.

2. In a collapsible ironing table, an elongated board, a pair of leg members supporting opposite ends of the board and arranged in longitudinally crossed relation under the board and pivotally connected to each other, each leg having its upper end pivotally attached to the board for swinging movement of the leg on an axis transverse relative to the board, said leg axes being parallel and one of said axes being movable longitudinally of the board to allow spreading of the upper ends of the legs with respect to each other to permit collapsing of the legs about their connecting pivot and against the underside

of the board, each leg having a general S configuration formed on a plane with its swinging axis, said pivotal connection being at the closed side of the upper bend in each leg, said bends opening laterally toward the same side of the board with one lying outside the other, the outer of said bends being wider than and the inner being narrower than the distance between said leg connecting means when the legs are collapsed against the board so that both legs may fold against the underside of the board to lie in a common plane.

3. In an ironing table, an elongated ironing board, a collapsible board supporting structure including a pair of crossing and pivotally connected leg members attached at their upper ends to the board and extending downwardly in laterally offset positions with respect to the median vertical longitudinal plane of the board, each leg member having an upper extension disposed transversely with respect to the board for the attachment thereto, and each leg having a base disposed transversely with respect to the board for supporting contact with the floor, said extensions and bases intersecting said median plane, and each of said leg members being formed with lower portions extending diagonally through said plane to connect with its extension at the opposite side of the plane.

4. In an ironing table, an elongated ironing board and a board understructure providing four point contact support for the board on a floor, said understructure comprising a first leg member for supporting one end of the board and having two relatively non-adjustable points of support which contact the floor on a plane substantially parallel to the plane of the board, and a second leg member for supporting the other end of the board and being disposed in a plane extending transversely of the board, a foot member at the lower end of the second leg member and having two transversely spaced points of supporting contact with the floor, means connecting the foot member to said second leg member including a fulcrum about which the foot member may rock in said transverse plane to adjust itself to floor surface irregularities and which connecting means will also permit limited tilting of the foot member with respect to the second leg member about an axis disposed transversely under the board, means connecting the said second leg member and foot member spaced from the fulcrum and operative upon such limited tilting movement of the foot member to lock the latter against rocking movement thereof in the said transverse plane and with respect to the second leg member.

5. A leveling device for an ironing table leg disposed in an inclined plane and having a transversely extending lower end portion, comprising an elongated foot member arranged adjacent to and in substantial parallelism with said lower end portion of the leg, means connecting the foot member to the adjacent lower end portion of the leg including a fulcrum allowing the foot member to rock about an axis perpendicular to said inclined plane, an arcuate holding member, the axis of which is coincident with said fulcrum, anchored in the foot member and slidable in the lower end portion of the leg to guide the rocking movement of the foot member in said inclined plane, said holding member having a roughened surface adapted to be engaged by the leg portion to releasably restrain the foot member against the aforesaid rocking,

the foot member having freedom for limited tilting movement about an axis substantially parallel with its length, and such tilting being operative to frictionally engage and disengage the holding member with respect to the leg member portion in which it is slidable.

6. In an ironing table, an elongated ironing board, a pair of leg frames supporting opposite ends of the board above the floor, one of said leg frames having two points of floor contact support that are relatively rigid and transversely spaced with respect to the board and lie in a plane substantially parallel with the plane of the board so as to impart lateral stability to the table, the other of said leg frames being disposed in an inclined plane under the board, a foot member for the other of said leg frames having two points of floor contact support that are also transversely disposed with respect to the board, said foot member being pivotally connected intermediate its two points of floor contact to said other leg frame for rocking movement in the inclined plane thereof, whereby the foot member will upon initial contact with the floor adjust itself to the surface contour thereof, the foot member connection to the said other leg frame also providing freedom for limited tilting of the foot member about an axis extending transversely under the board, and a connection between the foot member and said other leg frame, spaced from the pivot connection therebetween, and operative by such tilting action of the foot member, to releasably hold the foot member in its self-adjusted position with respect to such other leg frame to thereby further increase the lateral stability of the table.

7. An ironing table comprising a top member and a pair of leg members for maintaining the top member in operative position above the floor, one of said leg members having two spaced points of floor contact rigidly interconnected and maintained in a plane parallel with the plane of the top member, the other of said leg members being disposed in a plane transverse of the board and having a foot member pivotally connected therewith for rocking movement in such transverse plane, said foot member having two spaced points for floor contact to adjust the foot member to the adjacent floor contour, the connection between the foot member and said other leg member providing freedom for limited tilting of the foot member about an axis extending transversely under the board and with respect to the said other leg member, and means including a toothed element connecting the foot member to said other leg member, and operative by such relatively tilting of the foot member to releasably lock such members together after the foot member has been adjusted by initial contact of its said two points with the floor surface.

8. An ironing table comprising an ironing board supported at one end by a leg member having transversely spaced points of contact with the floor, a second leg member disposed in a longitudinally inclined plane for supporting the other end of the board, a foot member pivotally connected to the lower end of said second leg member for rocking movement in said inclined plane and with its ends in self-adjusting contact with the adjacent floor surface, the connection between the foot member and its leg member providing freedom for limited up and down tilting of the foot member about a transversely extending axis, a toothed member attached to the foot member, at a point spaced from the pivoted connection thereof to its leg member, and slidably engaging said leg member, said toothed member being operative upon upward tilting of the foot member to releasably engage its teeth with the leg member and thereby lock the foot member against rocking movement in the aforesaid inclined plane.

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