Nov. 8, 1932. A. KARLSON 1,887,266

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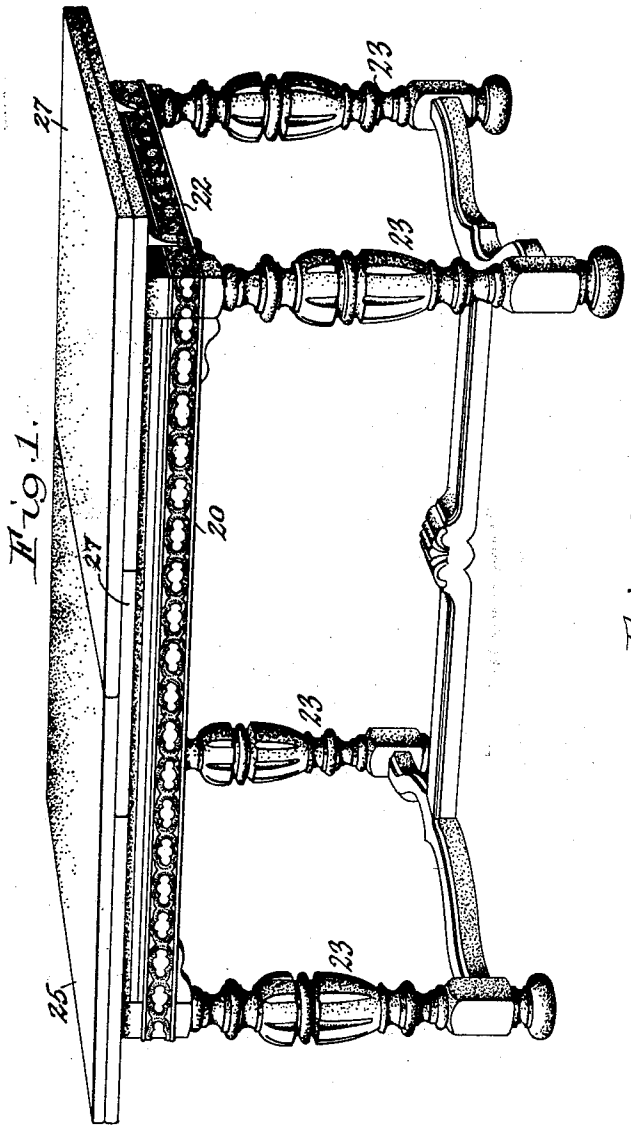


Fig. 1.

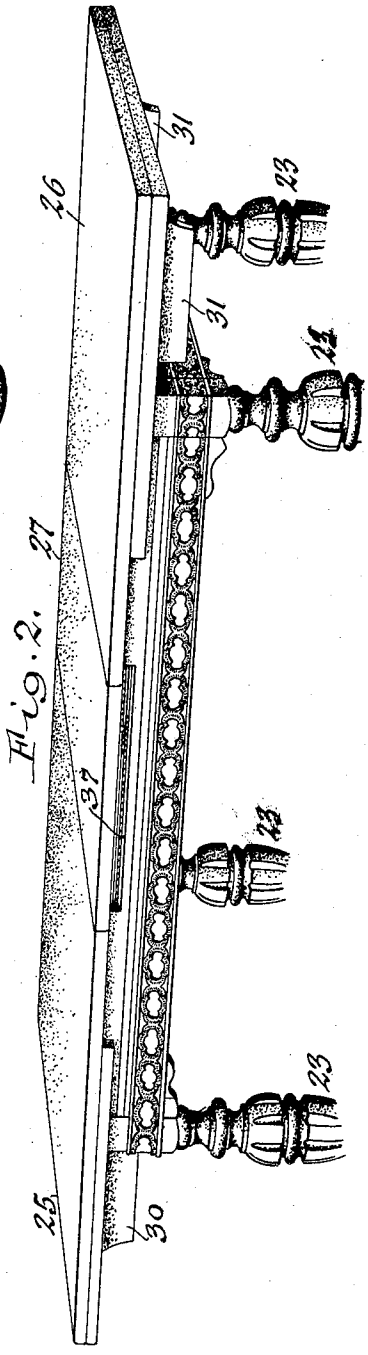


Fig. 2.

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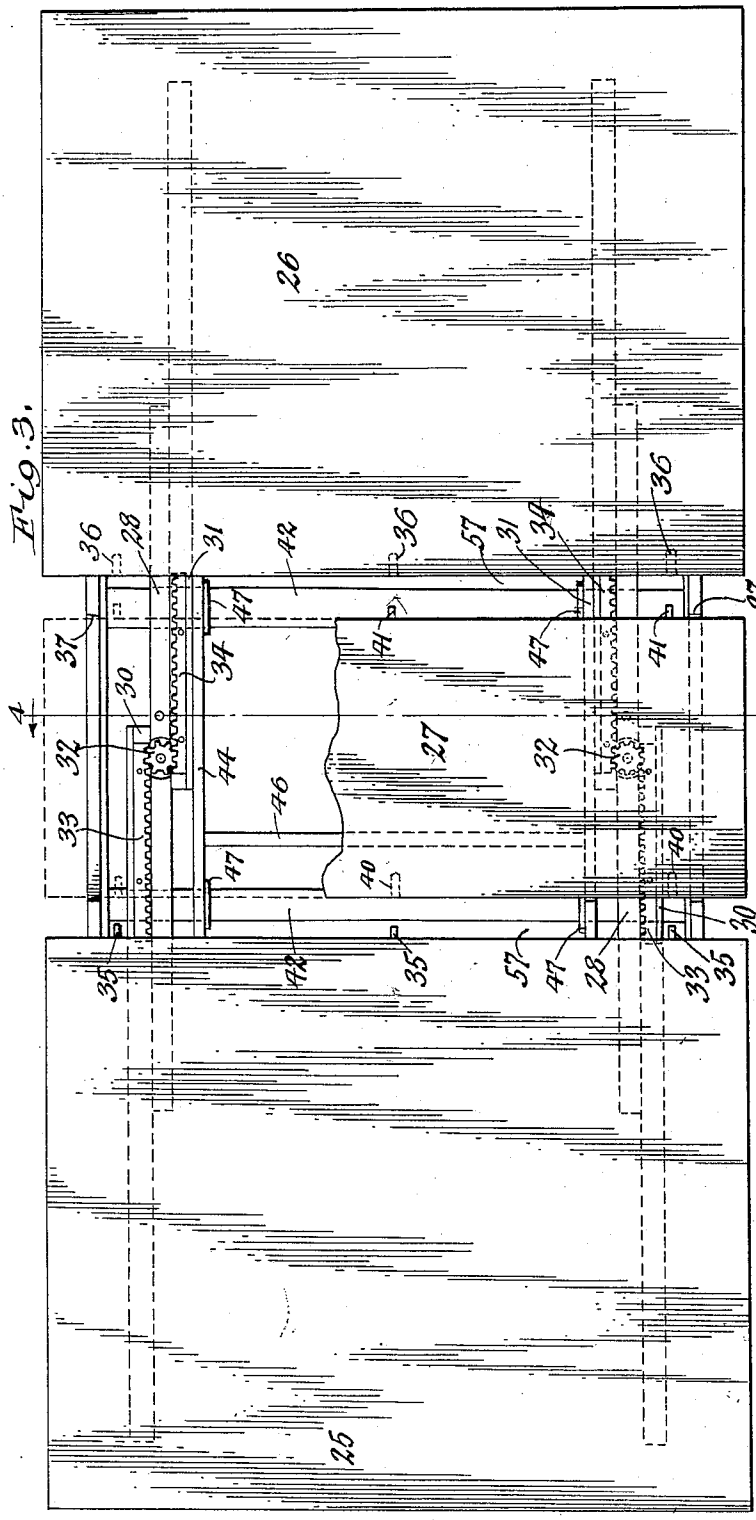


Fig. 3.

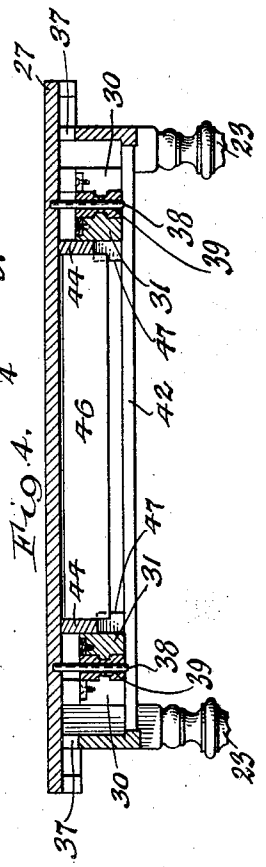


Fig. 4.

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Fig. 5.

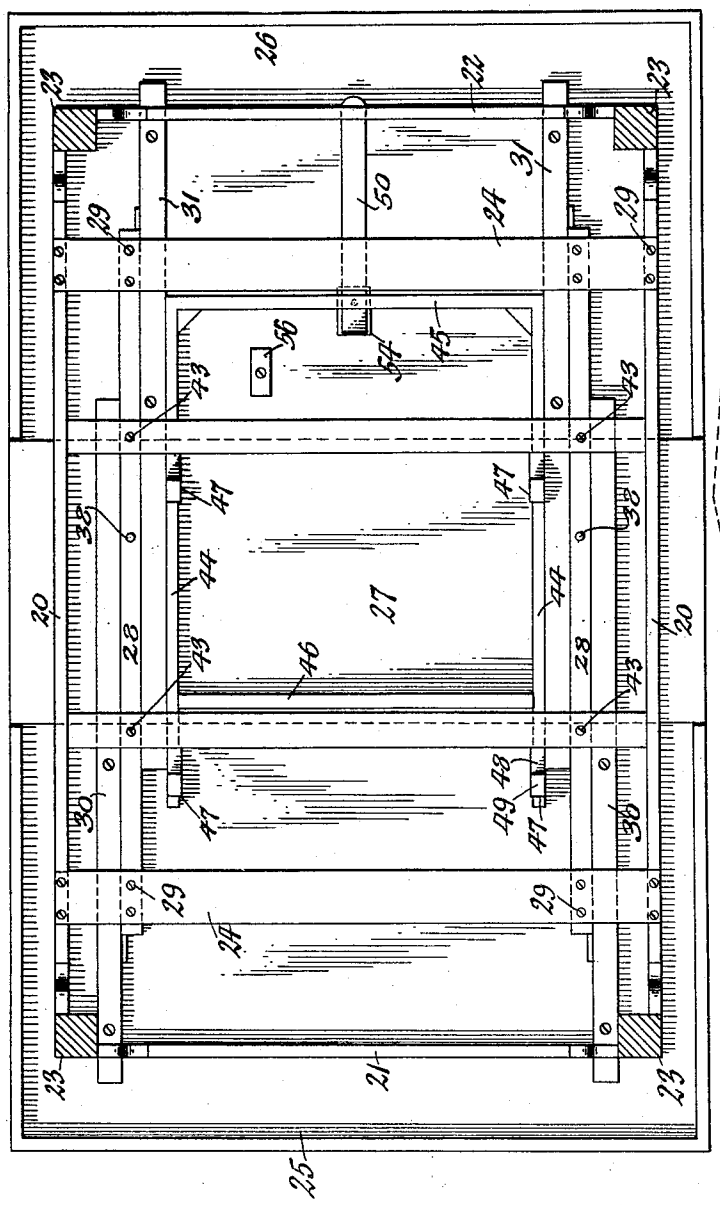
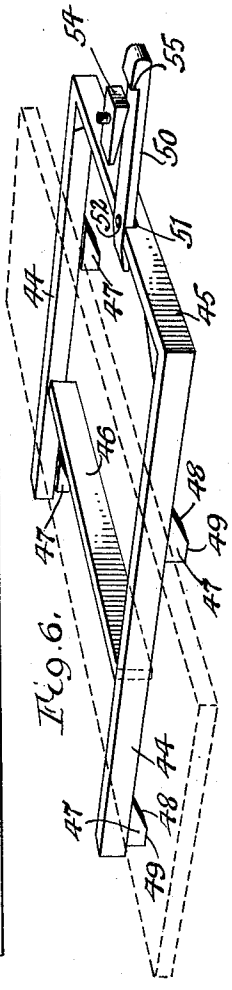


Fig. 6.

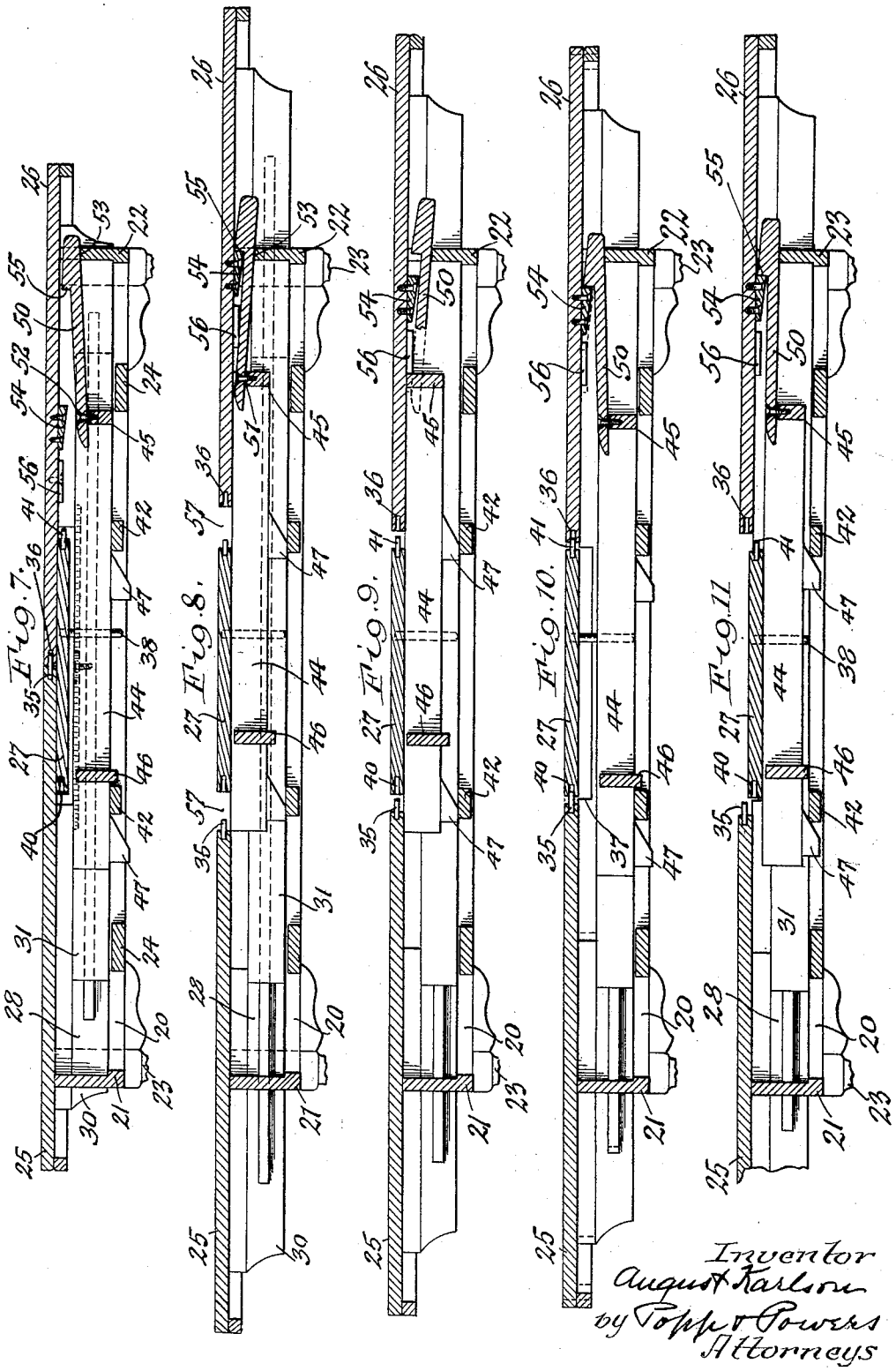


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UNITED STATES PATENT OFFICE

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EXTENSIBLE TABLE

Application filed December 11, 1931. Serial No. 580,330.

This invention relates to an extension table of the character which is commonly used in dining rooms and which is provided with a table top having two main end leaves which are movable toward and from each other and a center or intermediate leaf which is adapted to be inserted between the end leaves for the purpose of lengthening the table or removed therefrom for the purpose of shortening the table.

The chief object of this invention is to provide automatically operating means whereby upon moving the two end leaves of the table top horizontally outwardly and inwardly relatively to each other the center leaf will be lifted into its normal operative position between the end leaves and become interlocked therewith, and a similar movement of the end leaves will cause the center leaf to become disengaged from the end leaves and drop into its lower inoperative position below the end leaves so as to be covered by the latter when not required for use.

A further object of this invention is to provide means for thus automatically moving the center leaf of the table top into and out of its operative position which are very simple in construction and capable of being manufactured at low cost and which are easily operable and not liable to get out of order and do not detract from the appearance of the table either in its extended or contracted condition.

In the accompanying drawings:

Figure 1 is a perspective view of an extension table embodying my improvements and showing the same in its shortened condition.

Figure 2 is a similar fragmentary view of the same showing the table top extended.

Figure 3 is a top plan view of the table, with part of the center leaf broken away, showing the position of the parts in which the end leaves of the table top are pulled apart to their fullest extent for raising the center leaf between the same preparatory to interlocking this center leaf with the end leaves.

Figure 4 is a vertical cross section taken on line 4—4 Fig. 3.

Figure 5 is a bottom plan view of the table with the legs in section and showing the parts in the position which they occupy when the table is shortened.

Figure 6 is a perspective view of the lifting member and associated parts whereby the center leaf of the table top is raised and lowered.

Figures 7, 8, 9, 10 and 11 are vertical longitudinal sections of the upper part of the table showing the parts of the same in the different positions which they occupy when the table is in its shortened condition, and also the various stages which they occupy during the operation of automatically raising the center leaf between the end leaves preparatory to interlocking the center leaf in its operative position with the end leaves, and also lowering the center leaf from between the end leaves for the purpose of storing the center leaf while it is not in use.

The extension table proper may be of any suitable or well-known construction and the form shown in the drawings is therefore to be regarded as merely typical of one organization in which my invention may be embodied.

As there shown the main elements of the extension table comprise a main frame consisting of two longitudinal side bars 20, 20, two cross bars 21, 22 connecting the corresponding opposite ends of the side bars 20, upright legs 23 connected with the corners of the longitudinal bars 20 and transverse bars 21, and two transverse spacing bars 24, 24 each connected at its opposite ends with the lower edge of the side bars 20 adjacent to one pair of legs.

Above this frame is arranged a table top which comprises two main end sections or

leaves 25, 26 which are movable horizontally and lengthwise over the end portions of the main frame for the purpose of lengthening or shortening the table, and a center or intermediate leaf or section 27 which is adapted to be raised and lowered into and out of an operative position between the opposing inner edges of the leaves 25, 26 for the purpose of filling the gap between the end leaves when the table is extended or occupying a position below the end leaves when the latter are moved together for shortening the table.

The end leaves of the table top may be guided on the main frame of the table for this purpose by any suitable or approved means but this is accomplished in the present instance by two longitudinal guide rails 28, 28 arranged adjacent to the inner sides of the side bars 20 and each secured at its opposite ends to the upper side of the spacing bars 24 by means of screws 29 or other fastening means, two longitudinal sliding bars 30 secured to the underside of the end leaf 25 and having longitudinally sliding engagement with the outer sides of the guide rails 28 and also passing over the adjacent spacing bar 24 and through the corresponding cross bar 21 of the frame, and two longitudinal slide bars 31 secured to the underside of the other end leaf 26 of the table top and having longitudinally sliding engagement with the inner sides of the guide rails 28 and also moving over the adjacent spacing bar 24 and through the companion cross bar 22 of the main frame.

In the preferred construction means are employed for causing both of the end leaves or sections of the table top to move horizontally toward and from each other in unison upon actuating one or the other of these leaves. The means for this purpose, as shown in the drawings, are preferred and comprise two equalizing gear pinions 32 pivotally mounted on the central parts of the upper sides of the guide rails 28, outer gear racks 33 secured to the upper sides of the outer slide bars 30 of the end leaf 25 and engaging with the outer sides of the gear wheels or pinions 32, respectively, and inner gear racks 34, 34 secured to the upper sides of the inner slide bars 31, respectively, and meshing with the inner sides of the gear pinions 32, as shown in Fig. 3.

By these means pulling out or pushing in one of the end leaves of the table top will cause the other end leaf of the table top to be moved in unison therewith in the corresponding direction due to the rotation of the equalizing gear wheels or pinions for transmitting rectilinear motion from one of these gear racks associated with one of the end leaves to the gear rack associated with the other end leaf, in an obvious manner.

When the two end leaves of the table top are moved inwardly to their fullest extent for shortening the table, the inner ends of these end leaves engage with each other and also interlock for the purpose of maintaining these end leaves in alignment, this being preferably effected by means of dowel pins 35 arranged on the end leaf 25 and engaging with recesses 36 in the opposing inner edge of the other end leaf 26, as shown in Fig. 7.

When the table is shortened, as shown in Fig. 7, the center leaf 27 is arranged below the underside of the end leaves 25 and 26 and the inner portions of the latter overlap this center leaf and at this time the center leaf has its opposite end portions arranged in recesses 37 formed in the central parts of the upper edges of the longitudinal side bars 20 of the table frame, as shown in Figs. 1 and 7.

The center leaf is preferably guided in its vertical movements and this is practically accomplished in the present case by means of upright guide pins 38 secured at their upper ends to the center leaf 27 and sliding in guide openings 39 formed in the guide rails 28, as shown in Figs. 4, 5 and 7 to 11, thereby preventing displacing of the center leaf and insuring maintenance of the same in the proper position relative to the end leaves for cooperation therewith. In the elevated position of the center leaf the same is adapted to interlock or inter-engage its opposite transverse edges with the inner transverse edges of the end leaves by interlocking means which preferably consist of recesses or openings 40 arranged on one of the transverse edges of the center leaf and adapted to receive the dowel pins 35 of the end leaf 25 while the opposite transverse edge of the center leaf is provided with dowel-shaped locking pins 41 which are adapted to engage with the recesses 36 in the inner edge of the other end leaf 26, as shown in Fig. 10.

The means which embody my invention for automatically elevating the center leaf into a position between the inner ends of the end leaves and interlocking the same with the latter, and also releasing the center leaf from the end leaves and lowering the same into its inoperative position for the purpose of either lengthening or shortening the table, as circumstances require, are constructed as follows:—

Below the central part of the table top and preferably in substantial alignment with the spacing bars 24 are two supporting bars 42, the opposite ends of which are preferably secured to the undersides of the guide rails 28 by means of screws 43 so that these supporting bars in effect form part of the stationary frame of the table.

Between the upper side of these supporting bars and the central part of the underside of the table top is arranged a lifting member or frame which is adapted to move both horizontally lengthwise of the table and

also vertically. In its preferred form this lifting member comprises two longitudinal side bars 44, a front cross bar 45 connecting the front ends of the side bars 44, a rear cross bar 46 connecting the side bars 44 adjacent to their rear ends, and front and rear pairs of cams 47, 47 arranged on the underside of the side bars 44 and each having front inclined cam face 48 and a rear horizontal face 49, either of which may be engaged with the upper side of the adjacent supporting bar 42 upon moving the lifting member horizontally relative to the frame of the table.

Forward or outward movement of the lifting member is effected by coupling the same with one of the end leaves which in the present case is the end leaf 26 and will for convenience of description be hereinafter referred to as the master or front leaf, so that the lifting frame will move longitudinally outward relative to the table frame with the leaf 26 during the last part of the outward movement of the latter. The preferred means for this purpose which is shown in the drawings consists of a vertically swinging latch or catch 50 which has its inner or rear end arranged in a notch 51 in the cross bar 45 of the lifting member and pivoted thereto by means of a vertical screw 52 secured to the bar 45 and passing loosely through an opening in the rear end of the latch 50, while the front end of this latch is guided in a notch 53 formed in the central part of the upper edge of the adjacent transverse bar 22 of the main frame, and an outward tappet 54 having the form of a block secured to the underside of the master end leaf 26 and adapted to engage its front or outer end with an inwardly facing shoulder 55 on the outer or front end of the latch 50.

Inward longitudinal movement of the lifting member is effected by means of an inward tappet 56 having preferably the form of a block which is secured to the underside of the master end leaf 26 and adapted to engage with the front or outer side of the cross bar 45 of the lifting member on one side of the center of the table.

When the table is closed or folded into its shortened condition, as shown in Figs. 1 and 7, the inner edges of the end leaves engage with each other and are interlocked by means of the cooperating dowel pins and recesses arranged thereon, the center leaf 27 is depressed below the end leaves and the lifting frame is also moved into its rearmost and lowermost position in which its cams 47 are out of engagement with the supporting bars 42 and the latter engage with the underside of the side bars 44 of the lifting member, the latch 50 has its inner or rear end tilted downwardly, the outward tappet 54 is spaced from the shoulder 55 of the latch, and the inward tappet 56 is spaced from the cross bar 45 of the lifting member.

If it is desired to lengthen the extension table by inserting the center leaf 27 between the end leaves 25, 26 of the operation is as follows:

One of the end leaves is first moved longitudinally outward its full extent which causes the other end leaf to also move in the opposite direction to the same extent due to the equalizing gearing between the same. The first part of this outward movement of the two end leaves is idle and no change in the relation of any of the other parts of the table occurs, but during the last part of this outward movement of the end leaves the outward tappet 54 of the master end leaf 26 engages with the shoulder 55 of the latch 50 and moves the latter outwardly together with the lifting member which is coupled therewith. During this movement of the lifting member the inclined front faces 48 of its cams 47 ride up on the supporting cross bars 42 whereby the lifting member is elevated, and this outward longitudinal movement of the lifting member is continued a sufficient extent to bring the horizontal or flat surface 49 of the cams 47 on top of the supporting cross bars 42 so that no wedge or cam action of the cams is exerted at this time against the bars 42 and the lifting member remains in its elevated position, as shown in Fig. 8.

As the lifting member moves upwardly and longitudinally forward it lifts the center leaf of the table top by engaging the underside of the latter so that this center leaf is lifted from the depressed position shown in Fig. 7 to the elevated position in line with the end leaves and into the space between the separated inner ends of the end leaves which exist at this time, as shown in Fig. 8.

When the end leaves are thus pulled out to their fullest extent and the center leaf has been elevated in the manner just described, a gap 57 is formed between the inner edge of each of the end leaves and the adjacent transverse edge of the center leaf 27, as shown in Figs. 3 and 8.

The end leaves 25 and 26 are now moved longitudinally inward, but the first part of this inward movement is idle without affecting any other parts of the table. During the next following intermediate part of this inward movement of the end leaves 25 and 26 the inward tappet 56 is moved into engagement with the front bar 45 of the lifting frame, as shown in Fig. 9, and moves the lifting frame inwardly while the horizontal faces 49 of the shoes 47 are still resting on the supporting bars 42 so as to engage the locking pins 35 of the end leaf 25 with the recesses 40 on the rear edge of the center leaf and the recess 36 in the front end leaf 26 with the locking dowel pins 41 of tha center leaf before the inclined faces 48 of the cams come

into engagement with the supporting bars 42. Immediately after the end leaves 25, 26 are thus interlocked with the center leaf the continued inward movement of the inward tappet 56 with the corresponding end leaf 26 will cause the lifting member to be moved inwardly to such an extent that the inclined faces 48 of the cams will come into engagement with the supporting bars 42, whereupon the weight of this lifting member will cause the cams to slide by gravity downwardly and rearwardly off from the supporting bars 42 into the lowered position shown shown in Fig. 10.

As the lifting member thus moves longitudinally inwardly and downwardly the front cross bar 45 of the lifting member moves inwardly and downwardly away from the inward tappet 56, as shown in Fig. 10. Thereafter the inward movement of the two end leaves continues until the inner ends thereof bear fully against the opposite transverse edges of the center leaf, as shown in Fig. 2, in which condition the table is ready for use in the extended condition of its top.

For the purpose of again unlocking the center leaf from the end leaves and lowering the center leaf so as to permit of moving the end leaves inwardly and shortening the table, the end leaves are first pulled outwardly a short extent sufficient to disengage the locking pins 35 of the rear end leaf 25 from the recesses 40 on the adjacent edge of the center leaf, and also disengaging the recess 36 of the front end leaf 26 from the locking pins 41 on the adjacent transverse end of the center leaf, whereby the center leaf is permitted to drop by gravity through the space between the inner ends of the end leaves, as shown in Fig. 11.

During such partial outward movement of the front and rear end leaves 25 and 26 the outward tappet 54 engages with the shoulder 55 of the latch 50 and moves the lifting member longitudinally forward sufficiently to cause the inclines 48 of the cams to ride part way up the supporting bars 42 so that the upper side of the side bars 44 will be a certain distance above their lowermost position and thereby catch the center leaf, as shown in Fig. 11, on its underside as it drops from between the opposing edges of the end leaves, thereby avoiding dropping the center leaf the full extent of its downward movement at this time and avoiding any noisy action which otherwise might occur.

After the center leaf has been thus deposited upon the partly raised lifting member the two end leaves are moved inwardly toward each other and as this occurs the lifting member is also permitted to move inwardly so that its inclines 48 slide downwardly on the supporting bars 42, whereby the center leaf 27 is lowered below the plane of the end leaves by the time the inner edges of the end leaves reach the opposite transverse edges of the center leaf, and thereby permit the two end leaves to close over the center leaf during the last part of the inward motion of the end leaves for the purpose of restoring the table to its fully closed or shortened condition, as shown in Fig. 7.

The several actions above described can be effected easily and conveniently without liability of binding or distorting any of the parts, the several members are all of simple construction and may be made practically out of small pieces of waste lumber, thus effecting a considerable economy in manufacture; and the parts are so organized that they are not liable to get out of order and can also be operated without making any noise.

Moreover, all parts of the elevating device are concealed from view so that they do not detract from the appearance of the table, thereby rendering the same well-suited in high class furniture in which this is an important consideration.

I claim as my invention:

1. A folding table comprising a frame; a top having end leaves movable horizontally toward and from each other on said frame, and a center leaf movable vertically into and out of a position between the end leaves; interlocking means arranged on the opposing edges of said end and center leaves; and means for lifting said center leaf into and out of its operative position between said end leaves including a lifting member movable horizontally and vertically and adapted to engage the underside of said center leaf and having cam surfaces adapted to engage said frame, outward coupling means for moving said lifting member outwardly and causing said cam surfaces to ride up on said frame and lift the center leaf upon moving one of said end leaves outwardly; and inward coupling means for moving said lifting member inwardly and causing said cam surfaces to run down said frame and lower the center leaf upon moving the respective end leaf inwardly.

2. A folding table comprising a frame; a top having end leaves movable horizontally toward and from each other on said frame, and a center leaf movable vertically into and out of a position between the end leaves; interlocking means arranged on the opposing edges of said end and center leaves; and means for lifting said center leaf into and out of its operative position between said end leaves including a lifting member movable horizontally and vertically and adapted to engage the underside of said center leaf and having cam surfaces adapted to engage said frame; outward coupling means for moving said lifting member outwardly and causing said cam surfaces to ride up on said frame and lift the center leaf upon moving one of said end leaves outwardly; and inward

coupling means for moving said lifting member inwardly and causing said cam surfaces to run down said frame and lower the center leaf upon moving the respective end leaf inwardly; said outward and inward coupling means being arranged to operate on said lifting member with an interval of rest for the same between the outward and inward movemeans of the respective end leaf.

3. A folding table comprising a frame; a top having end leaves movable horizontally toward and from each other on said frame, and a center leaf movable vertically into and out of a position between the end leaves; interlocking means arranged on the opposing edges of said end and center leaves; means for lifting said center leaf into and out of its operative position between said end leaves including a lifting member adapted to engage said center leaf and having a cam engagement with said frame; and outward coupling means for connecting said lifting member with one of said end leaves comprising a vertically swinging latch pivoted on said lifting member and having an inwardly facing shoulder, and an outward tappet arranged on the respective end leaf and adapted to engage the shoulder of said latch during the last part of the outward movement of the respective end leaf.

4. A folding table comprising a frame; a top having end leaves movable horizontally toward and from each other on said frame, and a center leaf movable vertically into and out of a position between the end leaves; interlocking means arranged on the opposing edges of said end and center leaves; means for lifting said center leaf into and out of its operative position between said end leaves including a lifting member adapted to engage said center leaf and having a cam engagement with said frame; and outward coupling means for connecting said lifting member with one of said end leaves comprising a vertically swinging latch pivoted at the inner end of said lifting member and guided at its outer end on said frame and provided on its upper side with an inwardly facing shoulder; and an outward tappet arranged on the underside of the respective end leaf and adapted to engage the shoulder of said latch during the last part of the outward movement of the respective end leaf.

5. A folding table comprising a frame; a top having end leaves movable horizontally toward and from each other on said frame, and a center leaf movable vertically into and out of a position between the end leaves; interlocking means arranged on the opposing edges of said end and center leaves; means for lifting said center leaf into and out of its operative position between said end leaves including a lifting member adapted to engage said center leaf and having a cam engagement with said frame; outward coupling means adapted to connect said lifting member with the respective end leaf during the last part of the outward movement of the respective end leaf for causing the lifting member to raise said end leaf; and inward coupling means for connecting said lifting member with the respective end leaf during the last part of the inward movement of the latter for causing the lifting member to be lowered after the center leaf has been interlocked with the end leaves.

6. A folding table comprising a frame; a top having end leaves movable horizontally toward and from each other on said frame, and a center leaf movable vertically into and out of a position between the end leaves; interlocking means arranged on the opposing edges of said end and center leaves; means for lifting said center leaf into and out of its operative position between said end leaves including a lifting member adapted to engage said center leaf and having a cam engagement with said frame; outward coupling means for connecting said lifting member with one of said end leaves comprising a vertically swinging latch pivoted at its inner end to said lifting member and guided at its outer end on said frame and provided on its upper side with an inwardly facing shoulder; and an outward tappet arranged on the underside of the respective end leaf and adapted to engage the shoulder of said latch during the last part of the outward movement of the respective end leaf for causing the lifting member to raise said end leaf; and inward coupling means consisting of an inward tappet arranged on the underside of the respective end leaf and adapted during the last part of the inward movement of the respective end leaf to engage said lifting member and move the same inwardly and downwardly relative to the frame.

7. A folding table comprising a frame; a top having end leaves movable horizontally toward and from each other on said frame, and a center leaf movable vertically into and out of a position between the end leaves; interlocking means arranged on the opposing edges of said end and center leaves; means for lifting said center leaf into and out of its operative position between said end leaves including a lifting member adapted to engage said center leaf and having a cam engagement with said frame; outward coupling means for connecting said lifting member with one of said end leaves comprising a vertically swinging latch pivoted at its inner end to said lifting member and guided at its outer end on said frame and provided on its upper side with an inwardly facing shoulder; and an outward tappet arranged on the underside of the respective end leaf and adapted to engage the shoulder of said latch during the last part of the outward movement of the respective end leaf; and inward coupling means consisting of an inward tap-

pet arranged on the underside of the respective end leaf and adapted during the last part of the inward movement of the respective end leaf to engage said lifting member and move the same inwardly and downwardly relative to the frame, the relative arrangement of the outward and inward tappets being such that when the outward tappet engages said latch then the inward tappet is disengaged from said lifting member and when the inward tappet engages said lifting member then said outward tappet is disengaged from said latch.

In testimony whereof I hereby affix my signature.

AUGUST KARLSON.