(No Model.)

3 Sheets—Sheet 1.

C. M. HERR.

EXTENSION TABLE.

No. 457,901. Patented Aug. 18, 1891.

Fig. 1.

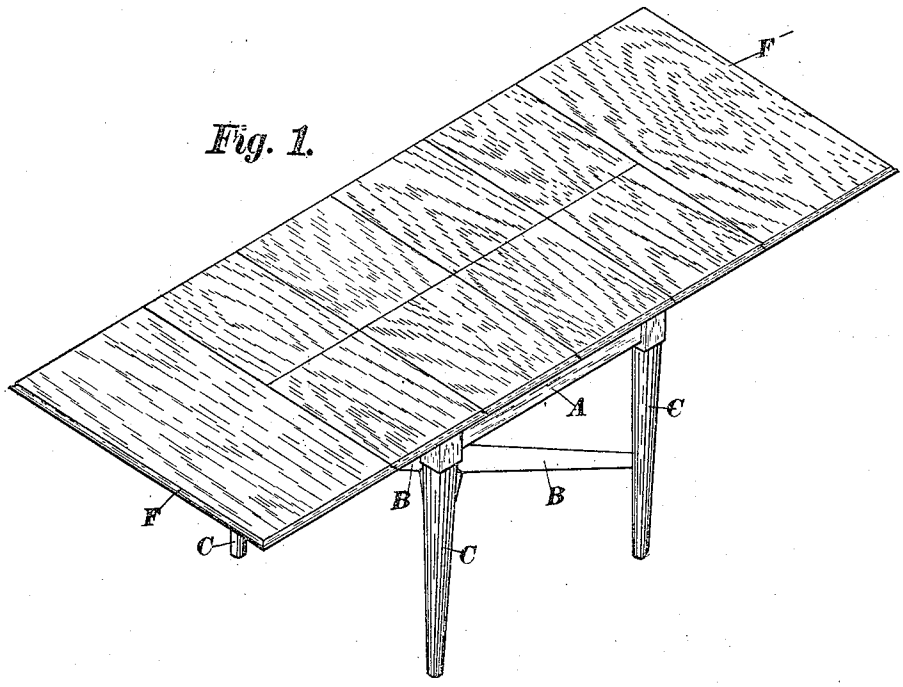
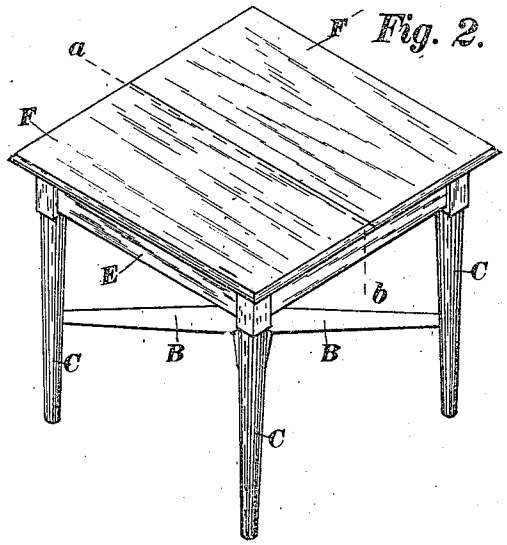


Fig. 2.



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3 Sheets—Sheet 2.

C. M. HERR.

EXTENSION TABLE.

No. 457,901. Patented Aug. 18, 1891.

Fig. 3.

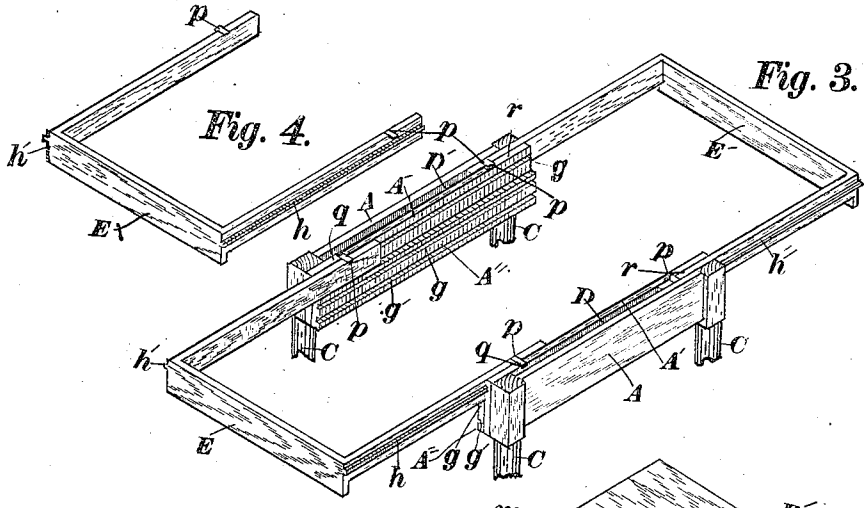


Fig. 4.

Fig. 5.

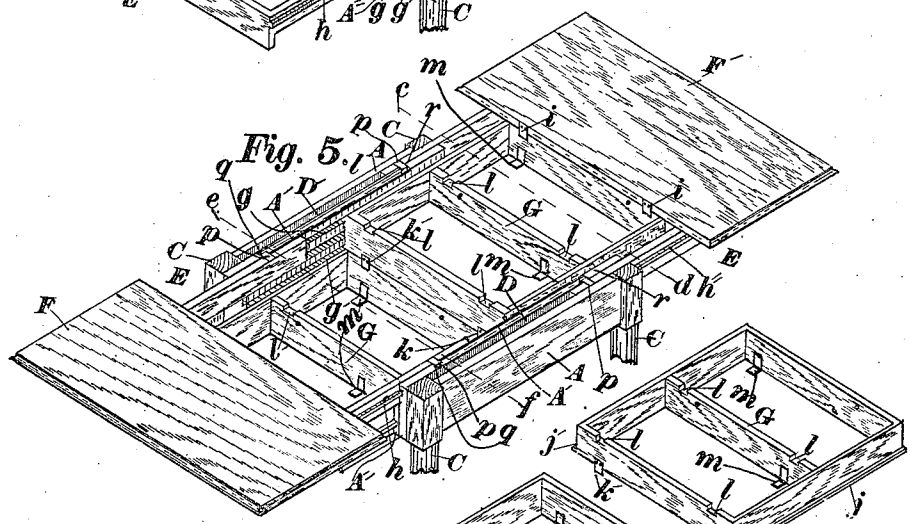


Fig. 6.

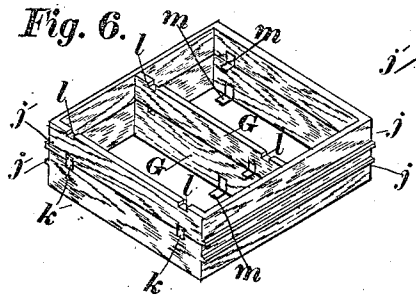


Fig. 7.

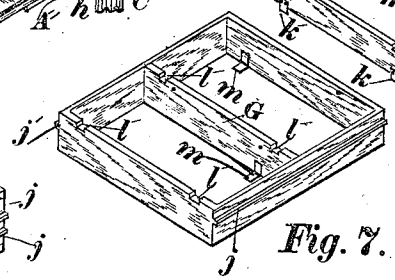


Fig. 8.

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(No Model.) 3 Sheets—Sheet 3.

C. M. HERR.

EXTENSION TABLE.

No. 457,901. Patented Aug. 18, 1891.

Fig. 9.

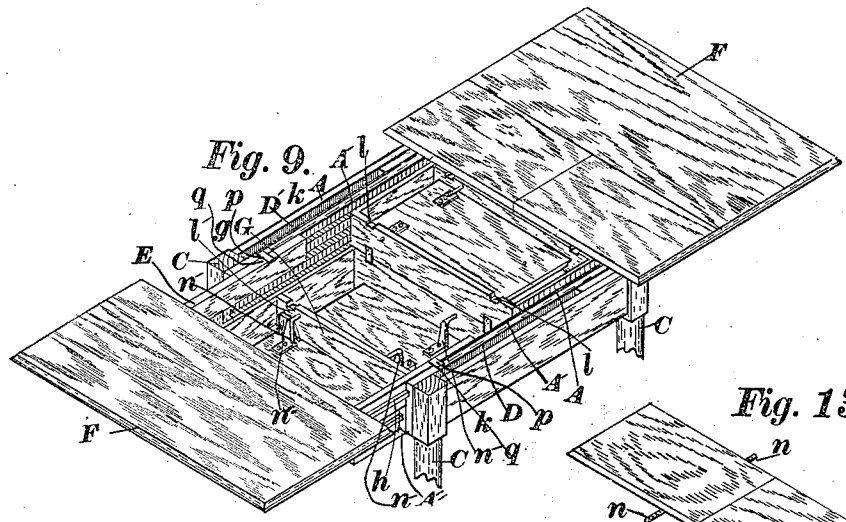


Fig. 13.

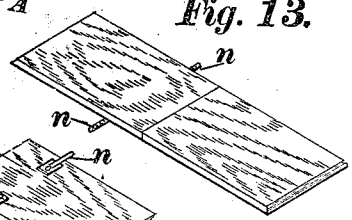


Fig. 14.

Fig. 10.

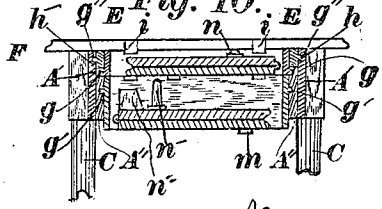


Fig. 11.

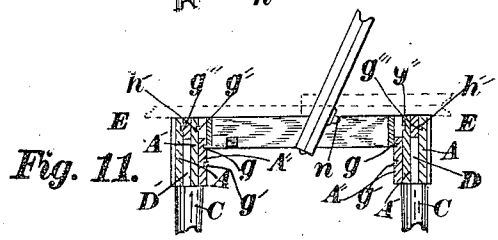


Fig. 15.

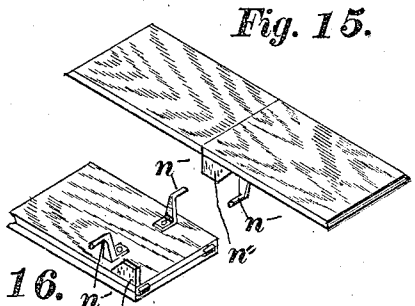


Fig. 16.

Fig. 12.

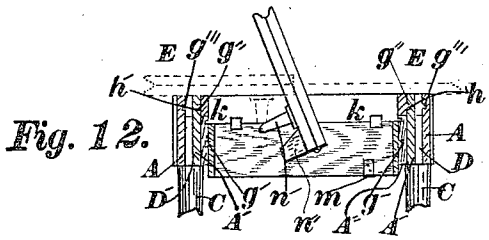
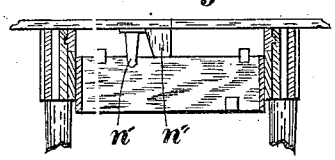


Fig. 17.



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UNITED STATES PATENT OFFICE.

CLARENCE M. HERR, OF CHICAGO, ILLINOIS.

EXTENSION-TABLE.

SPECIFICATION forming part of Letters Patent No. 457,901, dated August 18, 1891.

Application filed March 4, 1891. Serial No. 383,667. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE M. HERR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Extension-Table, of which the following is a specification.

My invention relates to that class of tables which are so constructed that their length can be increased or decreased to suit the requirements of their use; and my main object is to provide a series of folding leaves which are at all times hinged to the table and which can be folded away under the table when not in use, and when it is necessary to increase the length of the table all or a part of these leaves can be unfolded and placed in proper position to extend the length of the table, as is required; and another object is to so construct the parts that unnecessary complication is avoided, so that it can be easily manipulated by unskilled help and not cost more than would be within the reach of people of moderate means. I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the table extended to what would ordinarily be the full length. Fig. 2 is a perspective view of the table contracted to its smallest dimensions, the leaves being folded in under the top, as will be shown and described; Fig. 3, a perspective view of the extension-frames in an extended position in the side frames of the table; Fig. 4, a detached view of one of the extension-frames; Fig. 5, a view of table extended with the extension-leaves removed; Fig. 6, a view of the two slide-boxes, one imposed upon the other, as they are when the table is in the closed position, as will be explained; Fig. 7, the lower slide-box; Fig. 8, the upper slide-box; Fig. 9, the table extended with one extension-leaf unfolded from its slide-box, the other extension-leaves folded in the slide-boxes; Fig. 10, a section on line *a b*, Fig. 2, showing position of extension-leaves when folded in their boxes under the top of the table; Fig. 11, a section of table-frame and slide-boxes on line *c d*, Fig. 5, with extension-leaves in elevation and in dotted lines, showing different positions taken when being unfolded out of the upper slide-boxes; Fig. 12, a cross-section similar to Fig. 11, but on line *e f*, Fig. 5, showing positions of extension-leaves when unfolded out of the lower slide-boxes; Fig. 13, a detached view of an unfolded upper-box extension-leaf; Fig. 14, extension-leaf as it appears when folded within an upper slide-box; Fig. 15, unfolded extension-leaf from lower slide-box; Fig. 16, same as Fig. 15, but in a folded position; Fig. 17, same sectional view as Fig. 12, but showing lower-box extension-leaf unfolded and in position on the top of the table-frame.

Similar letters refer to like parts throughout the several views.

A and A are the outside longitudinal pieces of the frame of the table, and B shows braces which connect the two sides of the table by being attached to the legs C, as shown in Figs. 1 and 2. The lower part of the legs C and the braces B are not shown in any of the other views.

In Fig. 3 it is seen that the two sides of the table consist of two pieces of material A and A′, which are firmly secured to the tops of the legs C, leaving a space D or D′ between them. There is secured to the inside piece A′ a piece A″, which is provided with two grooves *g* and *g′*. Piece A′ also has a groove *g″*, all these grooves being cut at the inside face of the pieces and taking a longitudinal direction with the pieces.

Figs. 10, 11, and 12 are end views of sides A and A′ and piece A″, showing position of grooves hereinbefore referred to; also, a groove *g‴*, cut into the inside of frame-piece A.

Fig. 4 is a view of one of the extension slide-frames shown by letter E in Fig. 3. This slide-frame has a tongue *h* and *h′*—one on each side—which is fitted to operate in groove *g″* of frame side pieces A. The slide-frame E′, Fig. 3, is wider from side to side than E, and is also provided with a tongue *h″*, which is fitted to slide in grooves *g‴*, the body of the sides of the slide-frame E′ being fitted to slide between the outer frame-piece A and inner piece A′, as is plainly shown in Fig. 3, which also shows that the sides of sliding frame E are fitted to slide longitudinally in and out against the inside of piece A′, the bottom surface of the sides of sliding frame E resting and sliding upon the

surface of the top edge of piece A''. It will be understood that the construction and arrangement of these slides and their operative position relative to the pieces A, A', and A'' are for the purpose of permitting the sides of the slides to pass each other, so that the slides can be pushed in until their end boards are even with the legs, as is shown in Fig. 2.

Fig. 5 shows the extension-frames pulled out to the same extent as in Fig. 3; but their ends are covered by the end boards F and F', which form the top of the table, as shown in Fig. 2, or the ends of the top, as shown in Fig. 1. These top pieces F and F' are firmly secured to the top of the extension-frames and have stops i and i', projecting downward below the bottom side, for a purpose as will be shown.

Figs. 7 and 8 show two bottomless boxes. Fig. 8 I have termed the "top box" and Fig. 7 the "bottom box." Each of these boxes is provided with a partition G, as shown. The sides of the boxes have tongues j and j', the tongues j of the upper box sliding longitudinally in groove g of piece A'', Figs. 3 and 10, and tongue j' of lower box, Fig. 7, sliding longitudinally in groove g' of piece A''. Top box, Fig. 8, has stops k and k' projecting downward below its rear end, as shown. When the boxes are in position, when the table is extended, they appear as shown in Figs. 5 and 9. There are notches l cut out of the top edges of the rear end and partition of the top box, Figs. 5, 6, 7, and 8. These notches l permit the stops i and i' of top piece F' to pass over the top of the top box when the table is being closed after the extension-leaves have been folded into the boxes, as will be better understood after the method of operation is explained. Notches l' are also made in the front and partition of the lower box, Fig. 7, to permit the stops k and k' of the top box, Fig. 8, to pass over the lower box when the top box is slid over the lower box in closing the table to cause the boxes to take the position—one above the other—shown in Fig. 6.

Figs. 5, 6, 7, and 8 show angle-pieces m, which are secured to the insides of the slide-boxes, near the bottom. One arm of the angle-pieces m projects inward and acts as a stop to hold the extension-leaves at one end from falling through the bottomless boxes, as will be explained more fully hereinafter.

Each of the folding extension-leaves, Figs. 13, 14, 15, and 16, is provided with hinges n for the top-box leaves, Figs. 13 and 14, and hinges n' for the bottom-box leaves. These hinges are of a crank form; or, in other words, their center of motion is not coincident with the surface upon which they are attached. It will be seen that where the extension-leaves are hinged in the top box the center of motion is half the distance from the top surface of the leaf when folded and the top surface of the frame of the table, as is shown in the end section, Fig. 10. The extension-leaves of the lower boxes being necessarily in a position when folded much lower than those of the top slide-boxes, the center of motion of their hinges is a much greater distance above the upper surface of the leaves when folded, in order to be half the distance between the upper surface of the folded leaves and the top surface of the frame of the table, as is shown in Figs. 10, 11, and 12. The reason for thus arranging the hinges n and n' in this manner is that the top surface of all the folding extension-leaves when they are folded in the boxes is the bottom when the leaves are unfolded and in proper position on top of the table, so that the center of motion of the hinges would necessarily take an intermediate position, Figs. 11 and 12.

In Figs. 14 and 16 are plainly shown the crank-hinges n and n', which carry the folded leaves down into and up out of the boxes provided for them below the table-top. These hinges are also shown in position with the leaves folded in the boxes. It will be observed that the wrist-pin upon which these hinges turn is long; also, that the shank or arm to which the hinge-pin is attached is secured a short distance inside the edge of the leaves. This great length of hinge-pin is to permit the leaves to slide longitudinally with the center line of the hinge-pins, the pins sliding endwise in their bearings in the boxes when the table is being closed, as will be hereinafter mentioned in the proper place.

In Fig. 3 it is obvious that it is necessary to prevent pulling out the extension-slides beyond a certain limit, and this is provided for by projecting stops p, which are secured to the side pieces of the extension-frames. There is a portion of the top edge of frame-piece cut away, forming a depression below the general surface of the top of the table-frames, and this depression on each side of the table ends in shoulders at q and q' and r and r', and against these shoulders the stops p contact when the extension-frames are pulled out to their greatest extent.

Each of the extension-leaves consists of two parts, as shown, and they are hinged together by any simple form of hinge which does not form an obstruction at the upper surface of the top of the table when the extension-leaves are unfolded, as shown in Fig. 1. These hinges, however, must be so placed as to permit the extension-leaves to be folded with their top sides together, as is shown in several of the views. There is attached to the extension-leaves of the lower slide-box a block or projection n''. (Plainly shown in Fig. 17.) This block rests upon the top of the partition of the lower box when the lower-box leaves are unfolded and on the top of the table, as shown, and are for the purpose of preventing the sinking down of the leaf to which they are attached when the leaf is an unfolded position, as will be more fully understood after the manner of operating the table is understood.

To place the extension-leaves in an unfolded position on the top of the frame of the table, as shown in Fig. 1, we will first consider the table as closed, when it presents the appearance shown in Fig. 2. The first move to make in extending the table is to pull out the extension-frames E and E′ until the stops *p* contact with shoulders *q q′* and *r r′*. Now it will be understood that the slide-boxes, Figs. 7 and 8, are in position under the top of Fig. 2, one upon the top of the other, as seen in Fig. 6, so that when the extension-frames E and E′ are pulled out the stops *i* and *i′* of both top end boards contact with the end boards of the slide-boxes, when the outward movement of end board F′ causes top box, Fig. 8, to slide outward one-half its length and bottom slide-box, Fig. 7, to slide outward one-half its length until the stops *k k′*, attached to the lower inside end of top slide-box, contacts with the top inside end of bottom box and limits any further outward movement of the boxes when the several parts mentioned will have taken the position shown in Fig. 5. The folding extension-leaves, Figs. 13, 14, 15, and 16, however, are not shown in Fig. 5, so as to more plainly show the movements and positions of the extension-frames and slide-boxes; but Fig. 9 shows the same relative positions of the parts just named and also three extension-leaves folded within the sliding boxes and one extension-leaf unfolded upon the top of the table-frame. The unfolding of the extension-leaves can be understood by reference to Figs. 10, 11, and 12.

In Fig. 10 the extension-leaves are shown in a folded position under the top of the table as they appear in a cross-section of Fig. 2, dotted line *a b*. Fig. 11 shows a section through one of the top boxes on line *c d* of the extension-frame and top box, Fig. 5, Fig. 11 showing the folded top-box extension-leaf after it has been lifted to a position greater than vertical, the motion of its revolution on its hinges *n* being from left to right. The right-hand side of the top of the table-frame shows dotted lines for the position of folded leaf when its lower half reposes in a horizontal position, while the left-hand side shows by dotted lines the other half of the leaf after it has been turned over from right to left, the two leaves being now in position to form an extension to the table.

Fig. 12 shows a section through one of the lower boxes when the box is pulled out in extending the table, as on line *e f*, Fig. 5. The lower-slide-box leaves of Fig. 12 are lifted up out of their boxes in a similar manner to the leaves of the upper boxes and take the position, when unfolded, as shown in Fig. 17.

I will now describe how the extension-leaves of both the upper and lower slide-boxes are prevented from sinking down in their center of length, and which is as follows: When the extension-frames E and E′ are pulled out to their greatest distance, the space from the inside edge of top board F to that of top board F′ is greater than the combined width of all the extension-leaves shown in Fig. 1, and this condition gives ample room between each leaf when it is first unfolded and on top of the table-frame, so that one leaf will not interfere or rub against another. When the leaves are in this condition, they are held from sinking down in their center of length and folding back into the slide-boxes by the following constructive condition: It will be noticed that each of the folding leaves is composed of two parts, Figs. 13 and 15, and that these parts are held together by means of hinges of the ordinary type, so that the parts of the leaves will fold together, as shown by Figs. 14 and 16. It will be noticed also that in Figs. 14 and 16 both the swing-hinges *n* and *n′* are secured to the bottom of the folding leaf near the center of length of the complete leaf or where the two parts of the leaf are hinged together.

By referring to Figs. 10, 11, and 12 it will be seen that swing-hinges *n* and *n′* for both top and bottom boxes take a position not far from the center of width of the table—so near, in fact, that the weight of the right-hand half of the leaf to which hinge *n′*, Fig. 12, dotted lines, lower half, is attached that almost all of this leaf projects to the right of hinge *n′*, which more than balances the amount of its projection to the left of hinge *n′*, together with the weight acting downward of the inside end of the half-leaf on the left-hand side. In practice it requires considerable weight placed over the center of length of the folding leaf to cause it to sink in the middle before the table is closed, and the sole cause of this is the central position occupied by the supporting swing-hinges *n* and *n′*.

If when all the leaves are folded out of the boxes and lie apart, as just described, they can be closed together by pushing in the extension-frames E and E′, which will cause the inside edges of the end boards F and F′ to contact with and slide the adjacent extension-leaf, and this leaf the one next to it, the hinge-pins of each sliding endwise in its bearings in the leaf-boxes, and so on until all the extension-leaves will be in close contact, as shown in Fig. 1, when the extension-leaves which lie over the top slide-boxes will be prevented from sinking in their center of length by the top of the end pieces, and the partition G of the slide-boxes being level with the top of the side frame-pieces A and A′, and therefore contact with the under side of the extension-leaves.

Since the top of the bottom box is several inches below the level of the top of the table-frame pieces A and A′, the block *n″*, Fig. 17, is provided to form a support to the center of length of the extension-leaves of the lower slide-box, this block being secured to the center of length of the extension-leaves and near one edge, Figs. 15 and 16, and projecting downward when the extension-leaves are unfolded, Fig. 17, far enough to contact with

the tops edges of the ends and partition G of the bottom slide-box when the extension-leaves are brought up in close contact, as shown in Fig. 1. Only the two leaves which occupy or are supported over the lower boxes are provided with blocks n''. This block n'', being firmly attached to the under side of these leaves, simply forms a downwardly-projecting support to the center of length of the leaves and does not come into action until the table is closed together after the leaves have been unfolded out of the boxes and lie spread out upon the top of the table. In closing together the leaves, as hereinbefore described, the blocks n'', Fig 17, take a position with their sides in contact and their lower end resting upon the partition G of the lower boxes.

This table can be extended from the size shown in Fig. 2, one extension-leaf at a time, until it has a length equal to that shown in Fig. 1, and when it is extended to any length shorter than its greatest limit the remaining leaves will always be folded away under the top of the table ready for use, thus avoiding the great annoyance common to ordinary extension-tables, whose extension-leaves, being separate from the table, are almost always hid away where they cannot be found when wanted, and when they are found are frequently soiled or warped to such a degree as to be useless.

What I claim as my invention is—

1. In an extension-table, legs C, firmly connected together by outside frame-pieces A A, longitudinal with the table, longitudinal pieces A′ A′, attached to the inside of frame-pieces A A, longitudinal therewith, as shown, grooves D D′ between A A and A′ A′, the described slide-frames E and E′, sides $h\,h'$ of slide-frame E, fitted to slide longitudinally along the inside faces of pieces A′ A′, sides $h''\,h'''$ of slide-frame E, fitted to slide longitudinally in grooves D D′ between A A and A′ A′, and the boards F F′, provided with stops $i\,i'$ to operate the boxes outwardly in opposite directions and longitudinally with pieces A′ A′, substantially as shown and described.

2. In an extension-table having the described frame and slides, boxes sliding longitudinally within said frame, as described, leaves hinged at their center of length to fold down into said boxes on cranked hinges n', said hinges firmly attached to said leaves near their center of length and said hinges journaled in said boxes, as described, and capable of a longitudinal sliding motion on their journals in said boxes, and the described support n'', attached to said folding leaves at the under side of said leaves near their center of length, said support capable of resting upon the top of the lower boxes by virtue of the sliding motion of the journals of said crank-hinges when the table is closed, in the manner and for the purpose hereinbefore stated.

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