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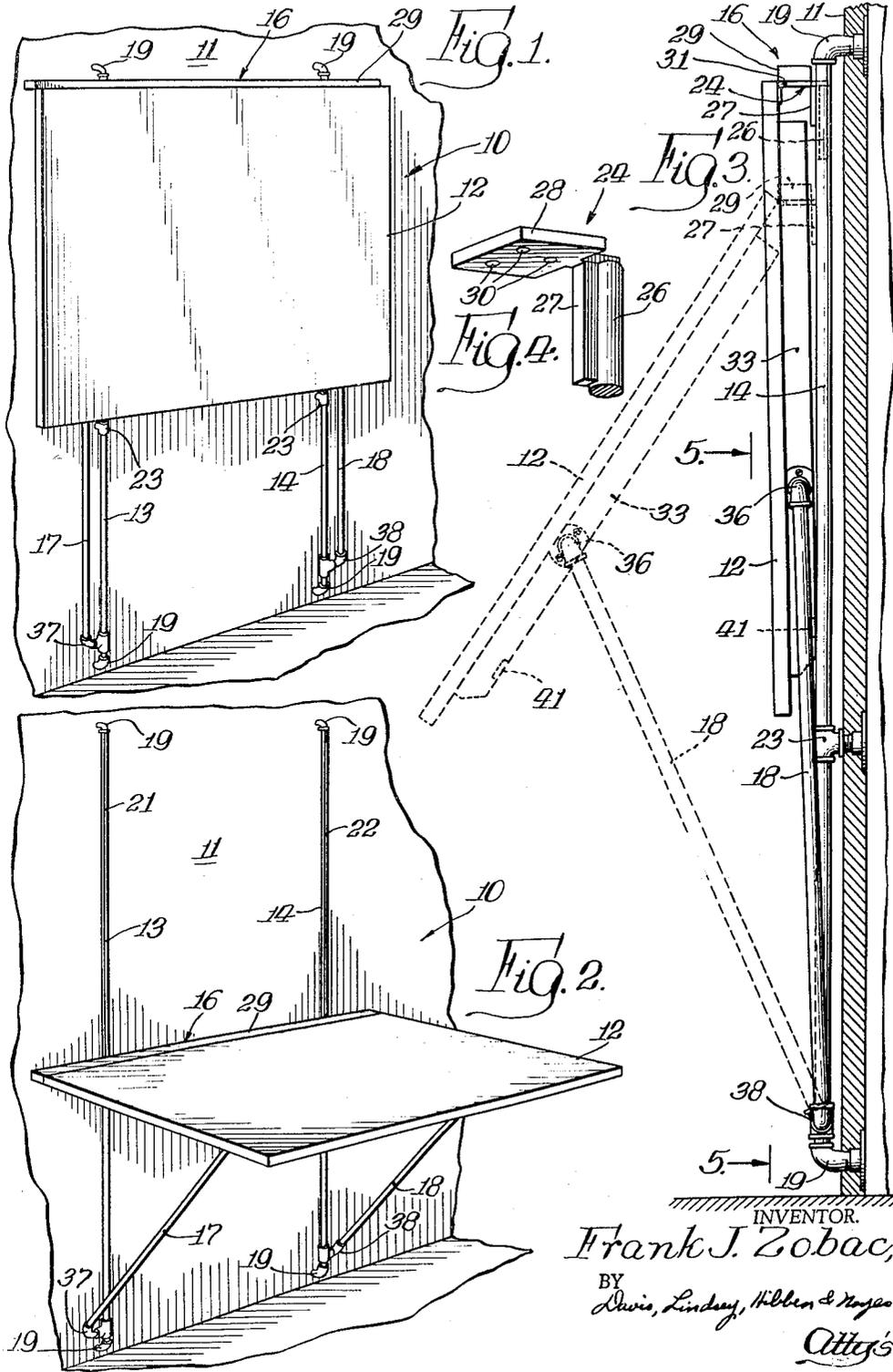
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FOLDABLE TABLE STRUCTURE

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2 Sheets-Sheet 1



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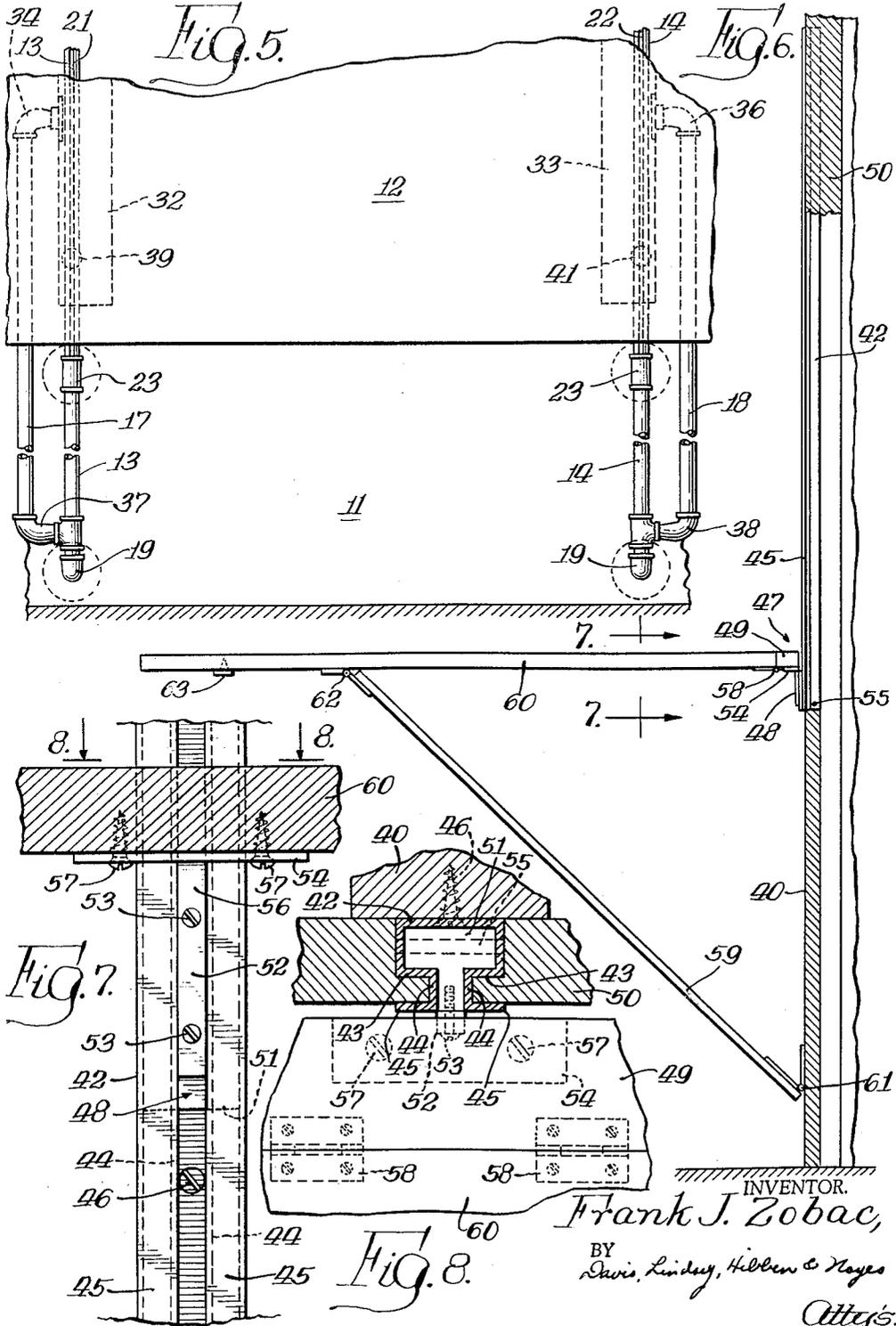
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FOLDABLE TABLE STRUCTURE

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5 Claims. (Cl. 311-19)

This invention relates generally to table structure and more particularly to table structure that is foldable.

Today's compact homes emphasize multi-purpose rooms and have created a need for household furnishings compatible with this theme. Table structures that can be folded away when not in use are often provided to conserve space under such conditions. Often, however, such foldable tables are either flimsy and structurally weak, or else difficult to operate.

Accordingly, it is a primary object of this invention to provide novel table structure that can be conveniently, quickly and easily folded away when not in use and as conveniently, quickly and easily unfolded for use, when desired.

Another object is to provide novel foldable table structure that is adapted to be mounted adjacent a wall or the like and when so mounted, is adapted to be folded away, flat against such wall so that its upper surface is exposed to view, whereby the same is adapted to serve as part of the room decoration when not in use as a table.

A further object is to provide novel foldable table structure of the foregoing character, that can be structurally as strong as is desired.

Still another object is to provide table structure of the foregoing character which has fixed support structure that is adapted to be mounted in and substantially hidden by a wall, as by being plastered into the wall, to improve the appearance of the table when folded away out of use.

Other objects and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawing, wherein:

Fig. 1 is a perspective view of one form of the invention as it appears when folded up against a wall;

Fig. 2 is a view similar to Fig. 1 showing the same table structure as it appears when folded out for use;

Fig. 3 is a side or end elevation, on a somewhat enlarged scale, showing the form of the invention shown in Fig. 1 folded against a wall and also showing in dotted lines the changed relative positions of the parts thereof occurring as the table is folded out for use;

Fig. 4 is a perspective view of a form of slidable bracket used in connection with the form of the invention shown in Fig. 1;

Fig. 5 is a fragmentary front elevational view of the structure shown in Figure 1;

Fig. 6 is a view similar to Fig. 3 showing a second form of the invention;

Fig. 7 is an enlarged scale sectional view of part of the structure taken along line 7-7 in Fig. 6; and

Fig. 8 is a sectional view taken along line 8-8 in Fig. 7.

Broadly speaking, the objects of this invention are accomplished by providing table structure that comprises a table top supported along one edge by fixed upright supports. The upright supports are also tracks that ex-

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tend substantially vertically from a lower level to an upper level and are such that they may be fixed to and even plastered in a wall. The one edge of the table top is hinged to bracket structure and the bracket structure is, in turn, slidably engaged with the tracks for movement between the upper and lower levels. Outwardly from the one edge, the table top is supported by swingable brace means. The brace means is pivotally connected to the top and is also pivotally connected to wall structure or the like below the one edge. When the one edge of the top is shifted to the upper level, the brace means swings the top downwardly about the hinged connection to the bracket means. Thus, the top is folded flat against the fixed supports with the upper surface of the table top exposed outwardly. Upon shifting of the one edge downwardly toward the lower level, the table top will swing outwardly and assume a horizontal position for use.

Referring to the drawings, Figs. 1, 2, 3 and 5 illustrate one preferred form of the invention. Fig. 1 shows this form of table structure folded to generally upright position and Fig. 2 shows the same table structure as it appears when folded out for use. In the present instance the table structure, indicated generally at 10, is installed on a wall 11 so that the structure folds flat against the wall 11 when not in use.

The instant form of the invention comprises a top or panel member 12, one edge of which is supported by a pair of fixed, generally vertical track members 13 and 14. The panel member 12 is slidably connected to the track members by bracket means, indicated generally at 16. Opposite the bracket means 16, the panel 12 is supported by brace means, such as the pair of swingable braces 17 and 18.

The vertical track members 13 and 14 are the main supporting members of the structure and for this reason are rigidly secured in position. The track members 13 and 14 are, in this instance, cylindrical tubes or pipes that are fastened at each end to the wall 11 by suitable fittings 19. For reasons hereinafter discussed, the members 13 and 14 are provided with longitudinal openings or slots 21 and 22, respectively, that extend from an upper level to a lower level. At such lower level the members 13 and 14 are each provided with a T fitting 23 fastened to the wall 11. The T fittings 23 cooperate with the fittings 19 to rigidly fasten their respective members to the wall 11 and also serve as stops for limiting the extent of downward travel of the bracket means 16.

An important feature of the present invention resides in bracket means 16 and its slidable cooperation with the track members 13 and 14. The bracket means 16 interconnects the panel member 12 and the track members 13 and 14 and comprises a pair of spaced rigid brackets, indicated at 24, interconnected by an elongated mounting element 29. The specific form of one of the brackets 24 used in the present instance is shown in detail in Fig. 4. Each bracket 24 is a unitary rigid structure having a cylindrical piston portion 26 that closely fits the bore of one of the tubular track members 13 and 14, a longitudinally extending lug 27 that is dimensioned to extend outwardly through the opening or slot 21 or 22, and a cantilever fastening portion or plate 28 that extends perpendicular to the longitudinal axis of the portions 26 and 27. The cylinder portion 26 is slidably disposed in the bore of the track member and is sufficiently long to prevent any substantial tipping or canting thereof relative to the longitudinal axis of the tubular track member in which it is mounted. The side surfaces of the lug 27 engage the edges of the elongated slot or opening in the track member whereby to prevent relative rotation between the bracket and its associated track member. Therefore, the fastening portion 28 is

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always retained in horizontal position as the bracket 24 slides vertically with respect to its associated track member.

The mounting element 29 that interconnects the pair of brackets 24 is, in the present instance, a horizontally extending strip or ledge. The fastening portion 28 of the bracket 24 is, in effect, a platform on which the undersurface of the strip 29 rests and to which the same is rigidly fixed, as by screws (not shown) which extend through openings 30 in the portion 28 into the strip 29. The pair of brackets 24 are spaced along the strip 29 to correspond to the spacing of the members 13 and 14. Furthermore, the strip 29 is disposed outwardly on the portions 28 away from the portions 26 so that it will not interfere with the sliding relationship between the brackets 24 and their corresponding track members 13 and 14. Thus, it is seen that the strip 29 is held horizontally disposed and spaced in front of the track members 13 and 14 by the coaction between the pair of brackets 24 and their associated track members. At the same time, the strip 29 is vertically movable between the lower level and the upper level.

In the preferred forms of the invention the panel 12 and the bracket means 16 cooperate to provide a continuous horizontal surface when the table is folded out for use. To this end the strip 29 and the panel 12 are substantially the same thickness. Since the strip 29 is horizontally disposed at all times, the panel 12 is swingably connected to the strip in edge-to-edge relation by hinge means 31, such as a piano hinge or the like, between the strip 29 and the panel 12 being substantially coextensive at their abutting edges as clearly seen in Fig. 2. The hinge means 31 is such that it allows the panel 12 to swing downwardly at its innermost bottom corner to the substantially vertical position illustrated in Figs. 1 and 3. A pair of elongated reinforcing members 32 and 33 are added to the undersurface of the panel 12 for strengthening the same. These reinforcing members 32 and 33 are parallel and spaced to correspond to the track members 13 and 14.

In addition to supporting the panel 12 opposite the track members 13 and 14, the braces 17 and 18 swing the panel 12 from horizontal position to vertical as the bracket means 16 is raised from the lower level to the upper level. The braces 17 and 18 are elongated members each having one end pivotally connected to the panel 12 to swing in a vertical plane with respect thereto. The member 17 has one end connected by a swivel fitting 34 to the outside surface of the reinforcing member 32. Likewise, the brace 18 has one end connected in similar fashion by a swivel fitting 36 to the outside surface of the reinforcing member 33. The opposite end of the brace 17 is pivotally connected by a swivel fitting 37 to the lower end of the track member 13, and the corresponding end of the member 18 is pivotally connected by a swivel fitting 38 to a corresponding point on the track member 14. The lower end of the members 13 and 14 are located substantially below the fittings 23. As is indicated in Fig. 5, the braces 17 and 18 with their corresponding fittings are substantially mirror images of each other so that the panel 12 will smoothly swing between the horizontal and vertical positions as the bracket means 16 is moved between the lower level and the upper level.

From Figs. 1 and 3, it is apparent that when the table is folded away out of use, the bracket means 16 is at the upper level and the panel 12 hangs downwardly therefrom. When the table is in this condition the braces 17 and 18 are disposed generally vertically under the table top portion and support the greater part of the weight of the table top. Of course, there is some friction between the brackets 24 and their respective track members which also contributes to the support of the top when in the upper position. Because of the cantilever character of the portions 28 of the brackets, the frictional resistance

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to movement offered by the brackets when in the upper position is substantially greater than when in the lower position. This factor coupled with the substantially vertical alignment of the braces 17 and 18 and the panel 12 is normally sufficient to maintain the table in the folded generally vertical position shown. As a precaution against accidental unfolding of the table, however, means is provided for holding the table in folded condition. In the present instance a pair of permanent magnet elements 39 and 41 (Fig. 5) are fixed in the reinforcing members 32 and 33 near the outer edge of the panel 12 and in alignment with the track members 13 and 14, respectively. In the present instance the track members 13 and 14 are iron pipes, and, therefore, when the table is in raised position the magnets 39 and 41 contact the track members 13 and 14, respectively, and provide an additional force for holding the table in raised position by holding the now lower edge of the table tightly against the track members.

Upon lowering of the table top, as shown in Fig. 3, the braces 17 and 18 cause the lower or front edge of the panel 12 to swing outwardly from the track members 13 and 14. Or, saying it another way, an outward pull on the lower edge of the panel 12, when the table is in raised position, breaks the magnetic bond of magnets 39 and 41 and pulls the slide or bracket means 16 downwardly relative to the track members 13 and 14 and at the same time swings the braces 17 and 18 outwardly until the same are disposed at an angle of preferably, but not necessarily, 45° with respect to the vertical. When this occurs the lug portions 27 of the brackets 24 engage the stop members 23 and further downward movement of the rear edge of the table top is prevented. Also, the panel portion 12 is disposed substantially horizontal, as shown in Fig. 2, with the rear edge of the table supported by the stops 23 and the front edge of the table supported by the braces 17 and 18.

To raise the table from the horizontal position to the vertical position, the bracket means 16 is simply moved upwardly along the track members 13 and 14 by lifting the rear portion of the table top. This causes the front edge of the panel 12 to drop relative to its edge connected to the bracket means 16. At the same time brace members 17 and 18 are pulled rearwardly toward the track members 13 and 14, respectively. Upward movement of the bracket means 16 is continued until the same reaches the upper level shown in Figs. 1 and 3, at which time the table is folded substantially vertical as shown. It should be noted in this connection that with this arrangement, the upper surface of the panel 12 is always exposed while the undersurface thereof is always hidden. If desired, the exposed surface can be made to serve as decorating means by providing it with a suitable decorating medium such as a picture or the like.

The track members in the preferred forms of the invention can be substantially hidden. This feature results from the orientation of the track members so that their longitudinally extending openings or slots face outwardly. As shown in Figs. 2 and 5, the slots 21 and 22 in the members 13 and 14 are parallel and face the rear edge of the panel 12. Since the remainder of the table structure is carried forwardly of the track members opposite the wall, the track members may be largely hidden in the wall, as where they are plastered in, with only the slots exposed. This feature is clearly illustrated in Fig. 6 where a second form of the device is shown.

The form of the device illustrated in Figs. 6, 7 and 8 is broadly the same as that just described. The structure of this form has been simplified in certain respects to make a more compact assembly when folded up and comprises a pair of vertically disposed channels, such as 42, which are fastened to, and adapted to be plastered in, a wall 40 in recessed relation therein. The channels 42 are tracks and correspond to the track members 13 and 14 in the preceding form. The instant channels 42,

although they extend from an upper level to a lower level, terminate at a point just below that lower level rather than at a point adjacent the floor, as in the preceding form. In the present instance the channels 42, although generally tubular, have a generally T-shaped cross section with reentrant front walls 43 having portions 44 extending outwardly in parallel spaced relation to define a slot therebetween and terminating in laterally extending flanges 45. The channels 42 may be conveniently fastened to the wall 40 by screws, such as 46, which are countersunk to be flush with the inner surface of the channel. The channels 42 are plastered into the wall as is shown at 50 in Figs. 6 and 8.

Cooperable with the channels 42 is bracket means 47 that is similar to the bracket means 16 previously described. The bracket means 47 comprises a pair of spaced brackets, one being shown at 48, interconnected by a strip 49. As before, the brackets 48 are spaced to correspond to the channels 42 and are rigidly fixed to the strip 49. Each bracket 48 comprises an elongated upright guide member 51 having a T-shaped cross-section formed to slidably fit the interior of the channel 42 and a T-shaped strap member 52 rigidly fastened to the front or exposed edge of the member 51, as by screws 53. The T member 52 has its laterally extending portion 54 bent at right angles to the plane of the upright portion 56 thereof and rigidly secured, as by screws 57, to the undersurface of the strip 49. A cross pin, such as 55, is provided for the lower end of one or both of the channels 42, the pin 55, like the fitting 23, serving as a stop for the brackets 48.

As in the preceding form, a panel member 60 is hinged along one edge to the strip 49. In this instance, a plurality of hinges 58 connect the panel 60 and the strip 49 in edge-to-edge relation to provide a continuous table surface as before.

The panel 60 is supported opposite the hinges 58 by a pair of elongated braces 59. In this case each brace 59 is hinged at one end to a point substantially below the lower end of the corresponding track member 42, as by a hinge 61 fastened thereto and to the wall 40. The opposite end of the brace 59 is connected by a hinge 62 directly to the undersurface of the panel 60, the panel 60 in this instance having no reinforcing members. From the structure just described it is clear that the instant form of the invention can be folded into a substantially thinner, more compact unit than the first form of the invention described. In principle of operation, however, the two forms of the invention are substantially the same.

To insure that the second form of the invention, just described, will remain in raised position when moved thereto, the panel 60 is also provided with at least one permanent magnet element 63 that is fastened to the undersurface thereof, as by screws. The magnet element or elements 63 are aligned to contact the flanges 45 of the track members 42 to hold the panel member 60 against the same. Again, the magnets provide additional force which, coupled with the natural tendencies of the table structure, prevents the table from accidentally opening.

It should be pointed out in connection with both forms of the invention described that the panel members are connected to their respective strips at the bottom of the abutting edges thereof. This mode of connection causes the panel member, when raised out of use, to swing from its bottom edge and hang at a slight angle to the vertical such as is indicated in Fig. 3.

Both forms of the invention above described operate in substantially the same fashion. With their respective bracket means raised to upper position, the remainder of the structure is disposed substantially vertically against their track members to provide a flat structure when not in use. Both tables are easily opened by pulling the

lower or outer edge of the panel or top away from the track members. This action causes the bracket means to move downwardly on the track members toward the lower position, the panel and the braces swinging outwardly together so that the panel assumes a horizontal position when the bracket means has reached its lower limit of travel. At that time the braces assume an angle to the plane of the support or track members sufficient to provide adequate support for the outer edge of the panel member, such as an angle of 45°. At all times the bracket means remains substantially horizontally disposed. When the bracket means reaches its lower level, it is supported by stop or abutment means which in turn supports the adjacent edge of the attached panel.

To raise the table structure out of use, the bracket means is simply moved upwardly along the track member. This causes the panel and the braces to swing inwardly towards the plane of the track members, and when the bracket means reaches its upper level of travel, the panel and the braces are substantially vertically disposed.

From the foregoing it is clear that the instant invention provides novel table structure that can be conveniently and easily folded away when not in use and that is as conveniently and easily unfolded for use. Furthermore, the table structure is adapted to be mounted adjacent a wall and when so mounted it is adapted to be folded away flat against the wall with its upper surface exposed to view so that it will not detract from but may contribute to the appearance of the room when folded away out of use.

Although the invention has been described in connection with certain specific structural embodiments, it is to be understood that various modifications and alternative structures may be resorted to without departing from the scope of the invention as defined in the appended claims.

I claim:

1. Table structure adapted to be folded to generally upright positions when not in use, comprising a pair of spaced fixed generally tubular track members each having a longitudinal slot, said track members extending vertically from a lower level to an upper level, a table top comprising a rear strip extending horizontally outwardly from said track member, a front panel, and hinge means swingably interconnecting said strip and said panel in edge-to-edge relation, a pair of brackets interconnecting said strip and associated track members, each of said brackets including a piston portion shaped to fit and slidably disposed in its associated track member and a lug portion projecting outwardly from said piston portion through the slot in said associated track member and rigidly secured at its outer end to said strip, stop means engageable for supporting said strip when at said lower level, and elongated swingable brace means for supporting said panel in alignment with said strip when said strip is at said lower level and for swinging said panel downwardly from said hinge means as said strip is raised so that when said strip is fully raised to said upper level said panel is disposed generally vertically against said track members.

2. Table structure according to claim 1 and further characterized in that said track members are oriented relative to each other so that their slots are parallel and open outwardly toward the table top.

3. Table structure according to claim 1 and further characterized in that said track members are of magnetic material and said panel is provided with a permanent magnet element fixed to the underside thereof in alignment with at least one of said track members for engagement therewith when said bracket means is raised to said upper level.

4. Table structure according to claim 1 in which each of said track members is a cylindrical tube.

5. Table structure according to claim 1 in which each of said track members is a rectangular channel.

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