Jan. 19, 1943. H. A. BACKUS 2,308,737

TABLE

Filed Jan. 13, 1942

Fig. 1

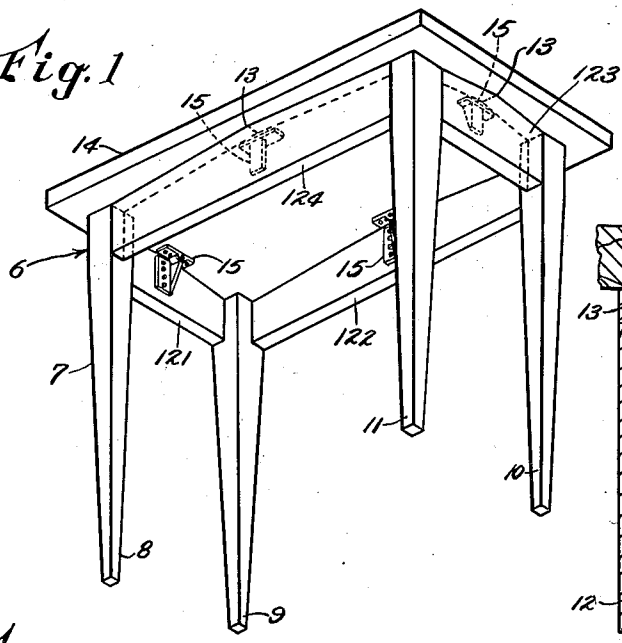


Fig. 3

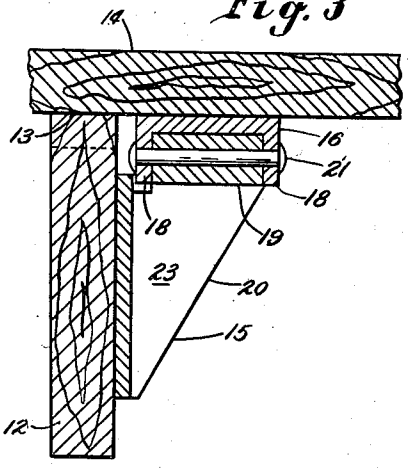


Fig. 2

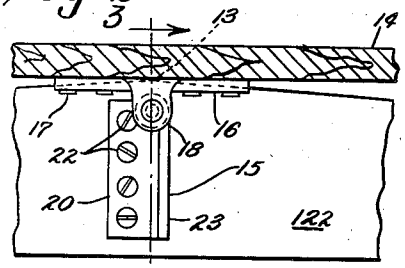


Fig. 4

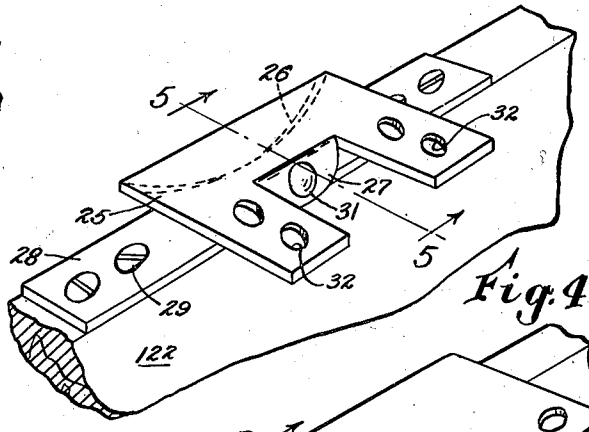


Fig. 5

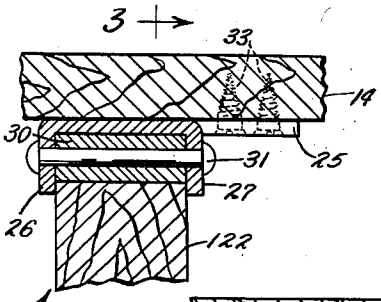


Fig. 6

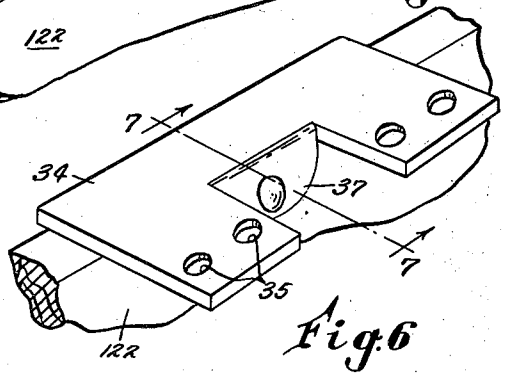
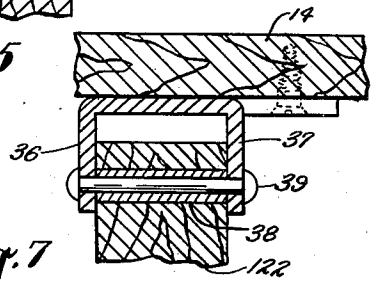


Fig. 7



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TABLE

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Application January 13, 1942, Serial No. 426,599

8 Claims. (Cl. 311—108)

This invention relates to improvements in tables and other four-legged articles of movable furniture or equipment by providing a series of pivoting devices connecting the top of the table or other article of furniture with the horizontal members or aprons which join the upper ends of the four legs. Its objects are: first, to eliminate the unsteadiness which normally results in wobbling, wiggling or shaking of the top of the table or other article of furniture whenever the floor surface is uneven beneath the table or other article; second, to eliminate the necessity of manual adjustments to accommodate the table or other article to the unevenness of a portion of floor surface to which it is moved; third, despite a rigid top to permit and accelerate the natural tendency of four-legged wooden table or furniture bases to adjust to uneven floor contours; fourth, to provide a combination of maximum strength and stability and automatic adjustability to uneven floor surfaces, in tables and other four-legged articles of furniture and equipment; and, fifth, to provide means for the accomplishment of these objects by fixing pivoting devices to existing tables, and other articles as well as to newly constructed tables.

For many years difficulties have been encountered in homes, restaurants and in industry because articles of furniture, especially tables, do not set steadily upon uneven floor surfaces. However, in the case of the ordinary wooden table these difficulties were formerly reduced by the operation of the natural tendency of these forms, which when built completely of wood had a certain inherent flexibility, to adjust to the unevenness of the ordinary floor. But these difficulties have been greatly increased in recent years by the practice, widely adopted, of using extremely rigid table tops composed of plastics, or of many thicknesses of wood or a combination of both materials. The rigidity of these tops, when they are fastened securely by the conventional methods to the four legs and connecting aprons which constitute the base of a table, makes the entire structure so rigid and unyielding that these present day tables cannot adapt themselves to the unevenness of a floor surface. Therefore, in the absence of my invention, these tables wobble, wiggle and shake when in use, upon the ordinary floor, since most floors are sufficiently uneven to prevent the firm setting of a table thereon.

In order to avoid the necessity of inserting objects underneath one or more legs, from time to time, and to furnish some temporary steadiness, spring and rubber cushioned glides and manually adjustable screw type glides have been in use and were fastened at the bottom of the legs of the table. These glides have had the effect, when manually adjusted, of increasing the operative length of a table leg, so as to adjust to floor unevenness. But all these devices require manual adjustment which must be repeated whenever a table is moved.

Attempts have been made to solve this problem, as to tables made of steel or other metals, by means of the combination of a flexible metal apron, and objects interposed between the aprons and the table top, but these devices, depending as they do for such utility as they have, upon the flexibility of the metal aprons, have no use whatever in the case of the ordinary table made completely of wood and having tops made of wood and/or plastics. In the ordinary table made of wood or plastics, the interposition of stationary means between the aprons and the table top so as merely to provide space between the table top and these horizontal aprons or braces underneath the table top would not permit sufficient freedom or speed of adjustment, would not furnish the necessary stability, and would not result in any practical, workable or useful solution to the problem of constructing, with the modern rigid top, a practical, strong table which will automatically adjust to the unevenness of floors and set firmly and steadily during and after such adjustment.

I attain these objects by the structures illustrated in the accompanying drawing, in which:

Fig. 1 is a perspective view of a wooden table made for my pivoting means and having the pivoting means embodied therein.

Fig. 2 is an elevational view of the pivot, the table top being shown in cross-section.

Fig. 3 is an enlarged cross-sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a perspective view of a modified form of hinge, the base frame member of the table being shown in fragmental perspective.

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 4 with the table top shown thereon in cross-section.

Fig. 6 is a perspective view of another modified form of hinge, the base frame member being shown in fragmental perspective.

Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 6, the table top being shown thereon in cross section.

In Figure 1 my invention is illustrated in conjunction with a wooden table 6 which has a lower

base portion 7 comprising four vertical legs 8, 9, 10, 11 which are joined together by aprons 121, 122, 123 and 124 in the usual manner.

The upper surface of each of the aprons is provided with a centrally disposed high point 13 which is in the form of a transverse extending edge portion formed at right angles to the length of said aprons. As shown in the drawing, the high point 13 is formed by gradually inclining the top edge of the aprons from low points adjacent their connections with the legs to a centrally disposed high point 13. The same high point may be provided by forming a small triangularly shaped extension at the central point of a flat top edge of the aprons. It is contemplated that this high point may be formed on existing tables and other furniture by sawing or cutting the top edge of the aprons as illustrated in the drawing and cutting down the top edge of the legs to a level with the low points at the ends of said aprons.

The table top 14 is made of a relatively thick, rigid, flat piece of wood, plastic or a combination of both materials, and, as shown in Figs. 2 and 3, the underside of said top engages the base portion at the four high points 13 formed thereon. Positioned adjacent each of the high points and fixed to the inner sides of the aprons and the underside of the table top are hinges 15 which have the axes of their elongated pivots in alignment with the transverse high portion 13 on the aprons. The hinges comprise the leaf 16 which is fastened to the underside of the table top by screws 17 and has spaced ears 18 at its central portion which extend downwardly and straddle the upwardly extending sleeve portion 19 of the lower leaf 20 of said hinge. A pin 21 is held in the sleeve 19 and fastened to the ears 18 of the upper leaf to thereby permit pivotal movement between the said leaf and leaf 20. The lower leaf of each hinge (Fig. 2) is fastened to an apron by screws 22 in a position to permit the table top to rest on the high points of the base, said leaf having an outwardly extending portion 23 formed at right angles thereto. The upper end of the portion 23 is developed into said sleeve portion 19 in the usual manner. It will therefore be noted that the top of the table rests upon the aprons at their high points and the hinge 15 prevents relative transverse motion of the top relative to the base of the table to prevent said top from sliding from said table base. The hinge also permits free pivotal action of the base aprons upon their high points 13 relative to the table top in the vertical plane of the respective aprons or, in other words, each apron pivots relative to the top on a hinge which has an elongated pivot pin disposed horizontally and at right angles to the lengthwise dimension of each apron.

In operation, with the table legs normally resting on a supporting plane, the following functions occur when one leg, for example leg 11, moves upwardly out of said plane. The top adjacent aprons 123 and 124 are subjected to torsional stress transversely of the length of said aprons and at the same time the aprons are tilted on their central pivots 13 relative to the table top so that the adjacent ends of said aprons and the leg 11 move closer to said top and the other ends of the aprons and their connected legs 8 and 10 move away from said top. The diagonal legs 8 and 10, adjacent said upwardly moving leg 11 therefor, move together in the opposite vertical direction from said leg 11, i. e., in a downwardly direction. The remaining table leg 9, in this example, is diagonally opposed to said first mentioned leg 11 and is connected to the aprons 121 and 122 which are fastened to the ends of the aprons 124 and 123, respectively, at their mutual leg connections. Said table leg 9 therefore moves upwardly in the same direction as the first leg 11 because the aprons 121 and 122 are centrally pivoted and move downwardly at their ends which are connected to the legs 8 and 10. It will therefore be seen that when a leg or legs are moved from the supporting plane of said legs to compensate for unevenness in the resting surface therefor, diagonal legs move in a common direction opposed to the direction of the other two diagonally disposed legs and that the connecting aprons for the legs are all subjected to a torsional stress which produces a slightly twisting motion at the ends to permit vertical movement of the legs and a tilting action of the aprons on their central high points. The table top will therefore pivot upon the material of the aprons and on the hinges and will also be retained in pivoting position by means of the hinges 15, said hinges being so positioned and so constructed as to permit freedom of pivotal movement between the table top and the base.

I also contemplate, in the alternative, the use of a hinge fastened between the table top 14 and the table base 6 in the position of hinges 15. To use this hinge, the top edge of each base apron is formed perfectly flat instead of being provided with a high point 13, as shown in Fig. 1. In Figs. 4 and 5 there is illustrated one form of said hinge which comprises a top leaf 25 which is stamped from a flat sheet of material and has a substantially U-shaped form. The longest exterior part of the lower portion of the U-shaped upper hinge 25 is turned downwardly at right angles to the body portion of the hinge and forms an elongated ear 26 for concealing the hinge parts from view exteriorly of the table frame. The foreshortened inner edge of the upper hinge is turned downwardly at right angles to the body of the leaf to form an ear 27. The lower leaf 28 is fastened centrally to the flat upper edge of the base apron by means of screws 29, the center part thereof being provided with a transversely disposed sleeve portion 30 which is engaged and straddled by the ears 26 and 27 of the upper leaf. A pivot pin 31 has its bearing in the sleeve 30 and its ends fastened to the ears 26 and 27 to complete the hinge structure. The upper leaf 25 is fastened to the underside of the table by running screws 33 through the holes 32. The inner surface (Fig. 4) of the base apron 122 is illustrated in full elevation and the exterior surface of the frame is not shown. The spaced, parallel extensions on the upper U-shaped leaf 25 of the hinge extend towards the center of the table top and the ear 26 can be seen from the exterior of the table and conceals the hinge structure.

A modified form of the hinge shown in Figs. 4 and 5 is shown in Figs. 6 and 7 and comprises a top leaf 34 similar in structure to the leaf 25 except that the screw holes 35 are longitudinally formed in the leaf instead of transversely disposed as in the hinge of Fig. 4. The spaced ears 36 and 37 straddle the top of the apron 122 and a metal bearing sleeve 38 is driven through the material of the apron at the point where the ears engage said top edge. A pin 39 has its bearing in the sleeve and is fastened to the ears 36 and 37 to provide a pivot between the table top 14 and the apron 122.

What is claimed is:

1. In a movable article of furniture the combination of a rectangular base comprising aprons joined at their ends and disposed with their width dimensions in vertical planes, legs depending vertically from the intersections of the frame members, a rigid, flat top supported by the base, said top being mounted on said base by pivots located centrally upon each apron, said pivots being elongated and disposed horizontally and at right angles to the lengthwise dimension of the aprons.

2. In a movable article of furniture the combination of a rectangular base comprising a plurality of relatively inflexible aprons joined at their ends and disposed with their width dimensions in vertical planes, legs depending vertically from the intersections of the frame members, a flat, rigid top supported by the base, said top being mounted on said base by pivots located centrally upon each apron, said pivots being elongated and disposed horizontally and at right angles to the lengthwise dimension of the aprons.

3. In a movable article of furniture the combination of a rectangular base comprising a plurality of relatively inflexible aprons joined at their ends and disposed with their width dimensions in vertical planes, legs depending vertically from the intersections of the aprons, a flat, rigid top on the base, and hinges interposed between said top and the aprons and disposed centrally of the top edge of said aprons, each hinge having a horizontal pivot pin positioned at right angles to the lengthwise dimension of the apron upon which it is positioned.

4. In a movable article of furniture the combination of a rectangular base comprising aprons joined at their ends and disposed with their width dimensions in vertical planes, legs depending vertically from the intersections of the aprons, the top edge of each apron being developed into a centrally located high portion in the form of a horizontal edge disposed at right angles to the lengthwise dimension of each apron, a flat top resting upon the said high portions, and a hinge adjacent each high portion and having one leaf thereof fastened to the top and the other leaf thereof fastened to the apron, the pivot pin for said hinge leaves having its axis disposed in alignment with the high portions on the aprons.

5. In a movable article of furniture the combination of a rectangular base comprising a plurality of relatively inflexible aprons joined at their ends and disposed with their width dimensions on vertical planes, legs depending vertically from the intersections of the aprons, the top edge of each apron being developed into a centrally located high portion in the form of a horizontal edge disposed at right angles to the lengthwise dimension of each apron, a flat, rigid top resting upon the said high portions, and a hinge adjacent each high portion and having one leaf thereof fastened to the top and the other leaf fastened to the apron, the pivot pin for said hinge leaves having is axis disposed in alignment with the high portions on the aprons.

6. In a movable article of furniture the combination of a rectangular base having aprons joined to their ends and disposed with their width dimensions in vertical planes, and legs depending vertically from the intersections of the aprons, a flat top spaced from and supported by the base, and a hinge interposed between said top and the aprons and disposed centrally of each apron, each hinge having a horizontal pivot pin positioned at right angles to the length of the apron on which it is positioned.

7. In a movable article of furniture the combination of a rectangular base having aprons joined at their ends and disposed with their width dimensions in vertical planes, and legs depending vertically from the intersections of the aprons, a flat top spaced from and supported by the base, and a hinge interposed between said top and the aprons and disposed centrally of each apron, said hinge comprising a U-shaped upper leaf, ears depending from the edges of the intermediate portion of said leaf, an elongated lower leaf fastened to the upper edge of the apron and having a central bearing hole coextensive with the width of the top edge and extending horizontally and at right angles to the lengthwise direction of said apron, said ears being adapted to straddle the bearing hole, and a pin in the hole and fastened at each end to one of the ears, said extended portion on each side of the lower leaf and the leg portions of the upper leaf having screw holes therein for fastening each leaf to the base and the top respectively.

8. In a movable article of furniture the combination of a rectangular base having aprons joined at their ends and disposed with their width dimensions in vertical planes, and legs depending vertically from the intersections of the aprons, a flat top spaced from and supported by the base, and a hinge interposed between said top and the aprons and disposed centrally of each apron, said hinge comprising a U-shaped upper leaf, ears depending from the edges of the intermediate portion of said leaf, a bearing hole formed through each frame member and disposed centrally of the ends thereof and extending horizontally and at right angles to the lengthwise direction of said apron, said ears being adapted to straddle the apron, and a pin in the hole and fastened at each end to one of the ears.

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