Nov. 10, 1936. C. FLAGSTAD 2,060,367

FOLDING TABLE

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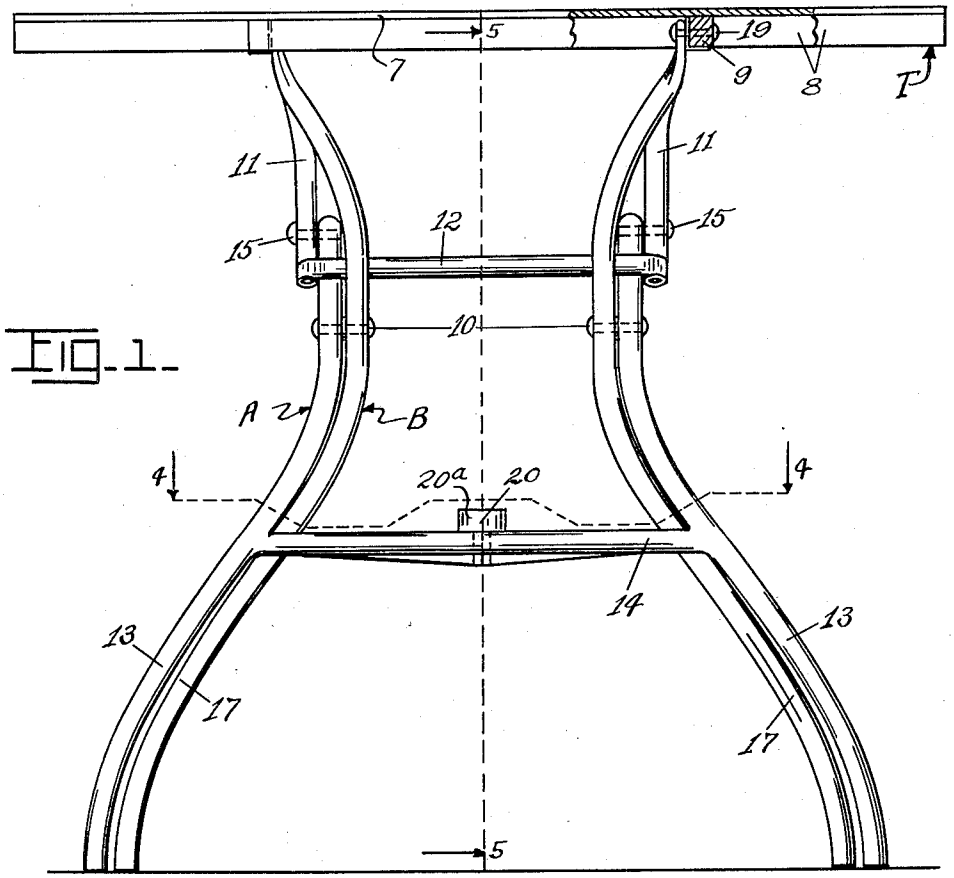


Fig. 1.

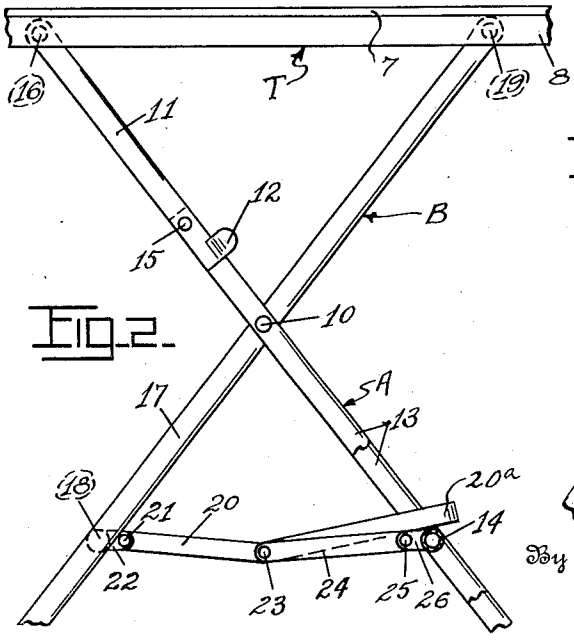


Fig. 2.

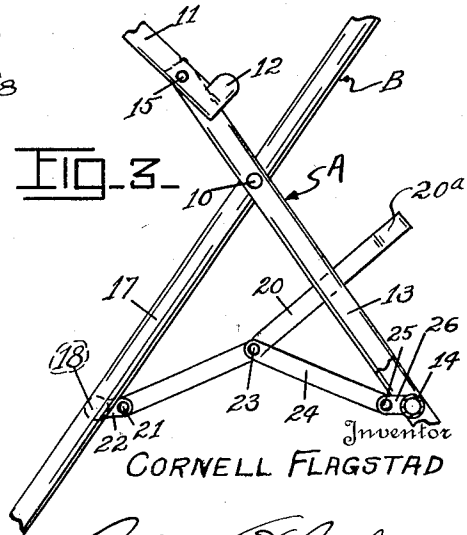


Fig. 3.

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FOLDING TABLE

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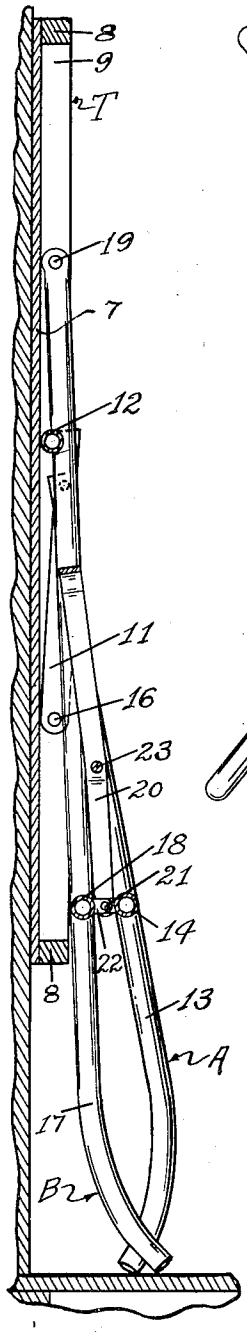


Fig. 5

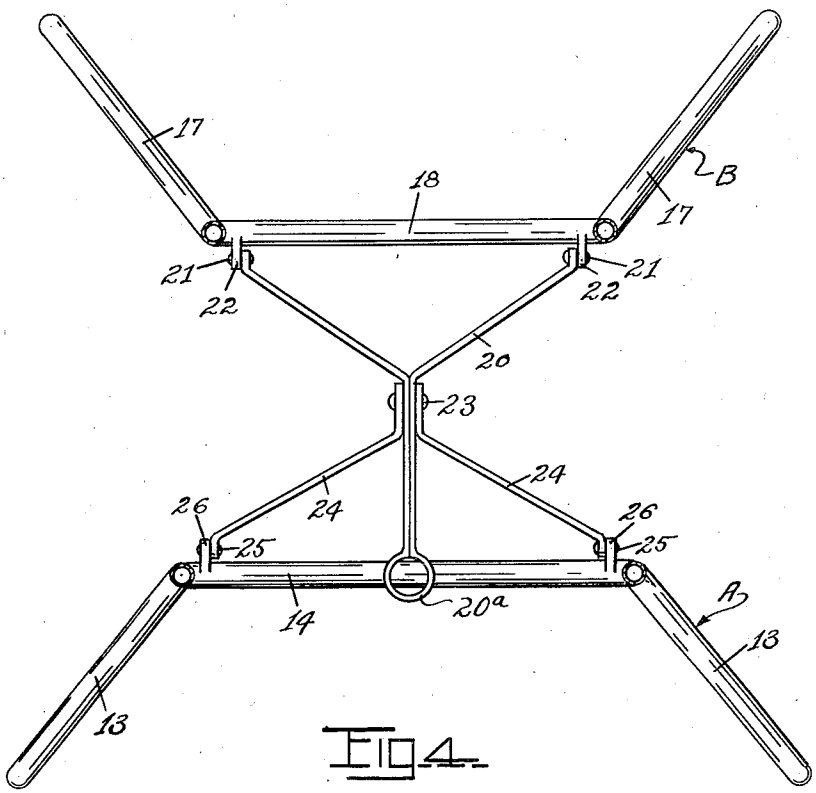


Fig. 4

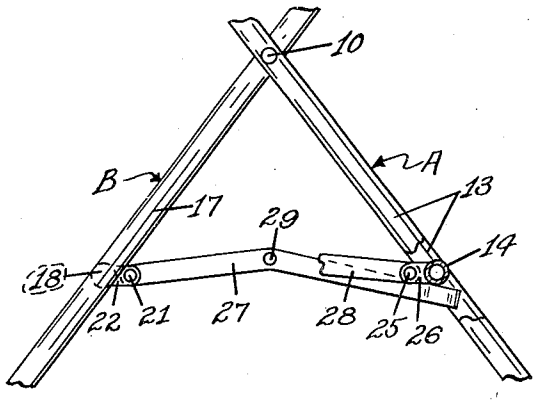


Fig. 6

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2,060,367

FOLDING TABLE

Cornell Flagstad, Minneapolis, Minn.

Application February 23, 1935, Serial No. 7,759

5 Claims. (Cl. 311—83)

This invention relates to folding or collapsible tables, and the primary object is to provide a table, particularly adapted for card playing, but which may also be used as a picnic or camp table or for any other purpose where it is desired to employ a table that is simple, efficient, and rigid in construction, and which may be alternately collapsed and set up with a minimum amount of effort. A further object is to provide a table with a collapsible supporting structure so designed that it requires little more than merely lifting and tilting to produce the collapsing or unfolding movements. A further object is to provide a supporting structure which is not only virtually automatic in operation, but which, when set up, will give ample leg clearance for persons seated about it, and, having no vertical leg supports from the four corners (as in conventional card tables) enables such persons to swing their knees in and out when sitting down to or getting up from chairs about the table. Still further and more specific objects will be disclosed in the course of the following specification, reference being had to the accompanying drawings, wherein:—

Fig. 1 is what may be conveniently referred to as a front elevation of the table when in set up position ready for use.

Fig. 2 is a side elevation of the table, as seen from the left in Fig. 1, with fractional portions broken away.

Fig. 3 is an elevation similar to a portion of Fig. 2 but with the leg lock released and in partly collapsed condition.

Fig. 4 is a sectional plan view on the line 4—4 in Fig. 1.

Fig. 5 is a sectional elevation on the line 5—5 in Fig. 1, but with the table fully collapsed and showing how it may be placed against a wall when stored out of use.

Fig. 6 is a fractional side elevation similar to Fig. 2 but showing a modification of the leg brace and lock device.

Referring to the drawings more particularly and by reference characters, T designates a table top which may be of any preferred construction but is here shown as made up of a surface sheet or plate 7 to the edge portions of which are secured depending flanges or strips 8, and under which are secured a pair of spaced cross bars or strips 9, the strips all serving to reinforce and render rigid the top construction.

The supporting structure for the top T comprises a pair of intersecting leg frames designated generally by the letters A and B, and these frames are pivotally secured together, as at 10, so that they may be swung from the angularly crossed positions as shown in Figs. 2, 3, and 6, to the substantially parallel positions as shown in Fig. 5.

The frame A is jointed for buckling action and consists of an upper section, formed by links 11 and a cross bar 12, and a lower section, formed by reversely curved leg bars 13 connected by a cross bar 14 welded or otherwise rigidly secured thereto. The upper and lower sections are pivotally connected as at 15, with the links 11 outwardly of the upper ends of legs 13, and the bar 12 is arranged to stop against the leg bars 13 to maintain the sections in alignment when the table is set up, but permits of an upward break in the joint, as shown in Fig. 3. The upper ends of the section links 11 are pivotally anchored to the cross members 9 of the table top, as at 16.

The leg frame B comprises a pair of reversely curved bars 17 rigidly connected by a cross bar 18. The upper ends of these bars 17 are pivotally anchored to the cross bars 9 of the table top as at 19, and from thence curve inwardly and extend downwardly within the bars 13 to the inner sides of which they are secured by the pivot members 10.

When the table is set up the length of the frame B is equal to the total length of the aligned sections of frame A; but the distances between the respective pivot centers 10, 15, 16, and 19 are so proportioned that the frames may collapse into the positions indicated in Fig. 5 without disconnecting any of the pivots. It may be noted (see Fig. 4) that the foot ends of the leg bars are diagonally spanned so as to have floor and supporting contact only slightly inwardly of the table top corners thereby giving vertical support thereto, but the supporting structure is so designed that it will also result in maximum leg and knee clearance for a person sitting down to, remaining at, or getting up from a chair at any side of the table.

The frame members 11, 12, 13, 14, 17, and 18 are all shown as being formed of tubular material because of the added strength and better appearance presented thereby, but obviously solid bars or members of angle iron or other cross section construction may be used.

The table structure as thus far described is entirely capable of being used as a complete table unit as will presently be described. To give added rigidity and sturdiness to the structure, however, and to remove any possibility of vibrations or rattling, I have provided a mechanism, a preferred form of which is shown in Figs.

1, 2, 3, 4, and 5, while a modification thereof is illustrated in Fig. 6. In either event the purpose of this mechanism is to give a secondary spreading action to the lower ends of the leg frames, and to releasably lock the legs in set up position and under slight tension so as to greatly remove any tendency towards a flexing or twisting action.

Further objects of this mechanism are to effectively tie the lower portions of the leg frames together to resist spreading action by downward pressure on the table; and to facilitate folding when the table is to be collapsed.

The preferred form of the device consists of a lever **20** having spread ends pivotally connected as at **21** to a pair of lugs **22** at the outer ends of the cross bar **18**, with the opposite end of the lever of such length that it may rest on the opposite cross bar **14** when the table is set up, as indicated in Figs. 1, 2, and 4. At an intermediate point between its ends the lever **20** is pivotally secured as at **23** to a pair of links **24** which in turn have their outer ends pivoted as at **25** to lugs **26** projecting inwardly from and at the outer ends of the cross bar **14**. It will be noted that the lever **20** is angularly formed so that when it is in its lowermost position the pivot center **23** will be slightly below the level of the pivot centers **21** and **25**, and when the parts are properly proportioned the lever **20** will snap down into position with a toggle action that will have a spreading strain on the lower ends of the leg frames and place all the parts under tension; and this strain or tension is maintained until the lever is kicked or otherwise manually lifted to a point where the pivot **23** is raised above the level of centers **21** and **25**, at which time the tension of the leg frames will cause the lever **20** to rise to the position substantially as indicated in Fig. 3, at which time also the centers **21** and **25** will be free to move toward each other when the table is lifted, to break the joint **15** also as indicated in Fig. 3.

It is also to be noted that while the link members **20** and **24** are here designed to effect a tension action they also serve as a tie to prevent spreading tendency of the lower ends of the legs beyond their normal operative positions and thus more firmly resist the tendency of weight pressure on the table which would otherwise cause such spreading tendency. The tie link connection has still a further and important function, and that is to facilitate the collapsing operation, and this is particularly advantageous when the various pivot connections offer noticeable friction resistance as will presently be described.

In the modification shown in Fig. 6 the lever **27** operates in exactly the same manner as the lever **20**, except that it is movable upwardly against the bar **14** to lock the legs, and when the table is to be collapsed it is pushed downwardly so as to carry the links **28** and the connecting pivot **29** in a downward direction to thereby release the leg tension and permit the collapsing operation.

The method of setting up or collapsing the table is similar whether or not a tension and locking mechanism such as just described is used, but if it is used it is of course necessary to first release this device before the table can be collapsed. This having been done, however, or in the event that no locking device is used, then it is only necessary, to effect the collapsing operation, for a person to grip the table top with both hands and lift it slightly off the floor, while at the same time tilting it with the right side moving upwardly as viewed in Fig. 2, whereupon the weight of the leg sections acting under gravity will break the joint **15** and cause the respective parts to move through the positions first indicated in Fig. 3, and as the table top continues to be tilted to the vertical position, as shown in Fig. 5, the various parts will automatically move to the substantially vertical positions as shown in Fig. 5, and thereupon the table may be stored or placed away against a wall where it will remain with the top A entirely out of contact with the floor.

The leg connecting device **20—24**, as shown in Figs. 1 to 5, inclusive, may be directly employed to facilitate the collapsing operation, and this is particularly true where joint friction or weight distribution factors hinder the gravitational or automatic folding just referred to. Under such circumstances the operator merely grasps and lifts up on the loop **20a** at end of link **20**, and thereby not only releases and breaks the spanning connection, but by doing so also draws the lower ends of the leg frames toward each other to automatically and positively break the joint **15**, whereupon the remaining folding action becomes extremely simple and may be completed with virtually no effort.

To again set up the table it is only necessary to lift it from its inactive position, as shown in Fig. 5, and tilt the top T to a horizontal position, whereupon the leg sections will open until the jointed sections of frame A will align themselves with each other, and when the table is now placed upon the floor any pressure applied upon the top will only tend to spread the lower ends of the leg frames, and thereby insure stability to the entire structure. Should the locking mechanism be employed it is of course necessary to give a slight further movement, either with the hand or the foot, to thereby apply a spreading strain on the legs and insure complete rigidity to the entire supporting structure.

It is understood that suitable modifications may be made in the structure as disclosed, provided such modifications come within the spirit and scope of the appended claims. Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. A collapsible structure comprising a top member normally disposed in a horizontal plane, a pair of cross bars secured under the top member and at opposite sides of the center thereof, a pair of intersecting leg frames for supporting the top member and each including transversely connected side bars, one of said frames being jointed below the top member and above the point of leg frame intersection for breaking movement inwardly from the normal erected position of such frame to effect the collapsing action, the side bars of the said frame above the joint being pivotally attached directly to said cross bars of the top member, the side bars of the other frame being pivotally attached at their upper ends to the cross bars of the top member and thence curving inwardly to pass within the side bars of the other frame at the point of leg frame intersection, to thereby cause the upper ends of the frame bars to move into nested positions and in substantially a common plane adjacent the back middle part of the top member when the structure is collapsed.

2. A collapsible structure comprising a nor-

mally horizontal top member, a pair of intersecting leg frames for supporting the top; one of said leg frames including a pair of rigidly connected leg bars disposed in a common plane, a pair of link members respectively pivoted to the outer sides of the bars near the upper ends thereof and normally disposed in said plane when the top member is horizontal, the upper ends of said links being pivotally secured to the top member at transversely spaced points, means serving as a stop to limit the swinging movement of the links with respect to said leg bars; the other of said leg frames including rigidly connected leg bars which pass upwardly between the leg bars of the first mentioned frame, at the point of leg frame intersection, and thence spread outwardly at their upper ends for pivotal connections with the top member at points spaced equally with respect to the transverse spacing between the points of pivot connection of the links to the top member, whereby upper bar portions of said other leg frame will be between the link members and in the plane of the pivot connections between the link members and leg bars of the first mentioned frame when the structure is collapsed.

3. A collapsible structure comprising a normally horizontal top member, a pair of intersecting leg frames each having two side legs, said frames being pivotally connected on an axis of intersection intermediate their upper and lower ends, and pivotally secured at their upper ends to the top member, one of said frames being rigid throughout its length, and the other of said frames having a joint below the normally horizontal top member and above the axis of leg frame intersection permitting the upper portion of such frame to be angularly broken and folded inwardly from a normally rigid supporting position, and a pair of pivotally joined link devices connecting the leg frames below their axis of intersection, said devices being attached at transversely spaced points to the respective leg frames and being relatively rigid when in operative position to effect an interbracing action as between diagonally opposed legs of the leg frames, one of said link devices including two link members connected by an intermediate handle forming member adapted upon being manipulated to move the devices into operative and inoperative positions.

4. A collapsible structure comprising a normally horizontal top member, a pair of intersecting leg frames each having two side legs, said frames being pivotally connected on an axis of intersection intermediate their upper and lower ends, and pivotally secured at their upper ends to the top member, one of said frames being rigid throughout its length, and the other of said frames having a joint below the normally horizontal top member and above the axis of leg frame intersection permitting the upper portion of such frame to be angularly broken and folded inwardly from a normally rigid supporting position, and a pair of pivotally joined link devices connecting the leg frames below their axis of intersection, said devices being attached at transversely spaced points to the respective leg frames and being relatively rigid when in operative position to effect an interbracing action as between diagonally opposed legs of the leg frames, one of said devices having a portion extending substantially beyond the pivot connecting the two link devices to form a manipulating handle.

5. A collapsible structure comprising a normally horizontal top member, a pair of intersecting leg frames each having two side legs, said frames being pivotally connected on an axis of intersection intermediate their upper and lower ends, and pivotally secured at their upper ends to the top member, one of said frames being rigid throughout its length, and the other of said frames having a joint below the normally horizontal top member and above the axis of leg frame intersection permitting the upper portion of such frame to be angularly broken and folded inwardly from a normally rigid supporting position, a rigid lever acting member pivotally attached to the frame which is rigid throughout its length and at transversely spaced points adjacent the respective legs of such frame and below the axis of leg frame intersection, and a pair of links pivotally secured at corresponding ends to the jointed leg frame below the said axis and pivoted at their other ends to the lever acting member intermediate its ends whereby the free end of the lever acting member will project beyond the pivot connection to the links for operating the lever acting member and links.

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