United States Patent

[11] 3,604,372

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[45] Patented **Sept. 14, 1971**

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[54] **CONNECTOR FOR FOLDING TABLE LEG**
2 Claims, 16 Drawing Figs.

[52] **U.S. Cl.** **108/160,** 108/91, 108/129
[51] **Int. Cl.** **A47b 3/091**
[50] **Field of Search** 108/160, 125, 127, 129, 131, 132, 133, 126, 91; 248/439, 345.1

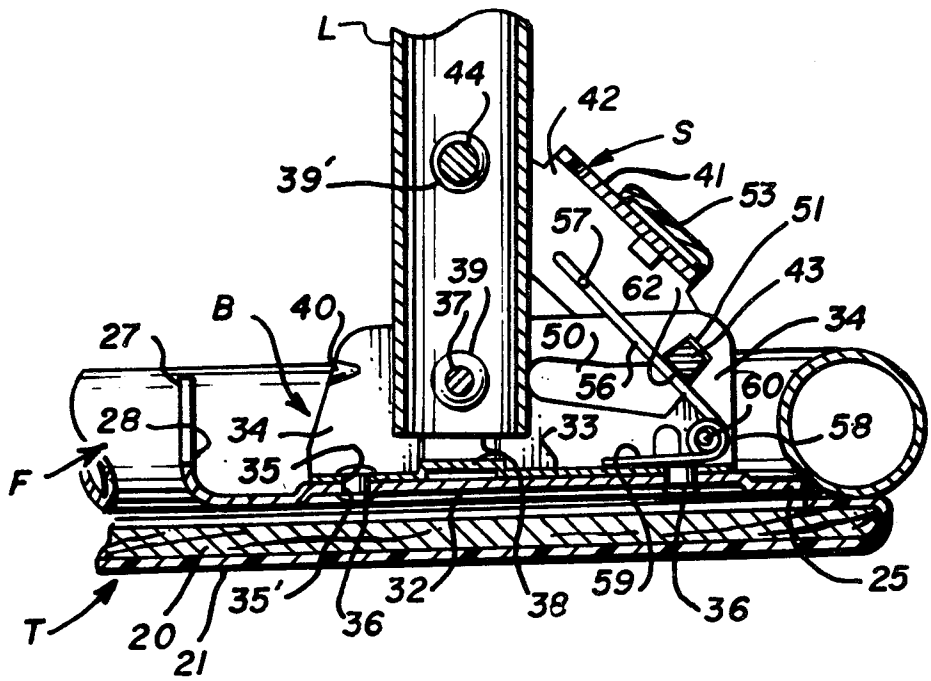
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ABSTRACT: A connector for a folding table leg having a base attached to the frame of a table underneath the top, a bracket secured to the underside of the base and having a table leg pivotally connected thereto and a stabilizing strut having one end pivotally secured to the leg below the bracket connection and the other end having a lock bar slidably carried in a slot in the bracket. The slot in the bracket includes an offset socket whereinto the lock bar wedgingly fits when the table leg is extended, to tightly hold the table leg in extended position. A spring biases the lock bar into the socket, but the lock bar may be removed therefrom by finger pressure against the face of the strut, to cause the table leg to be folded to a retracted position on the underside of the table.



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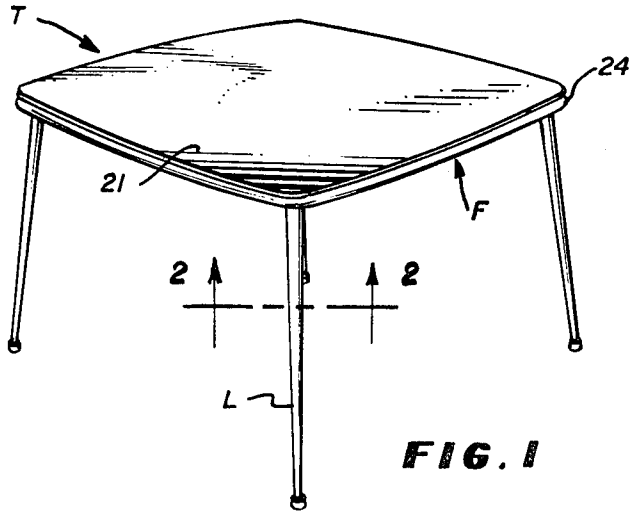


FIG. 1

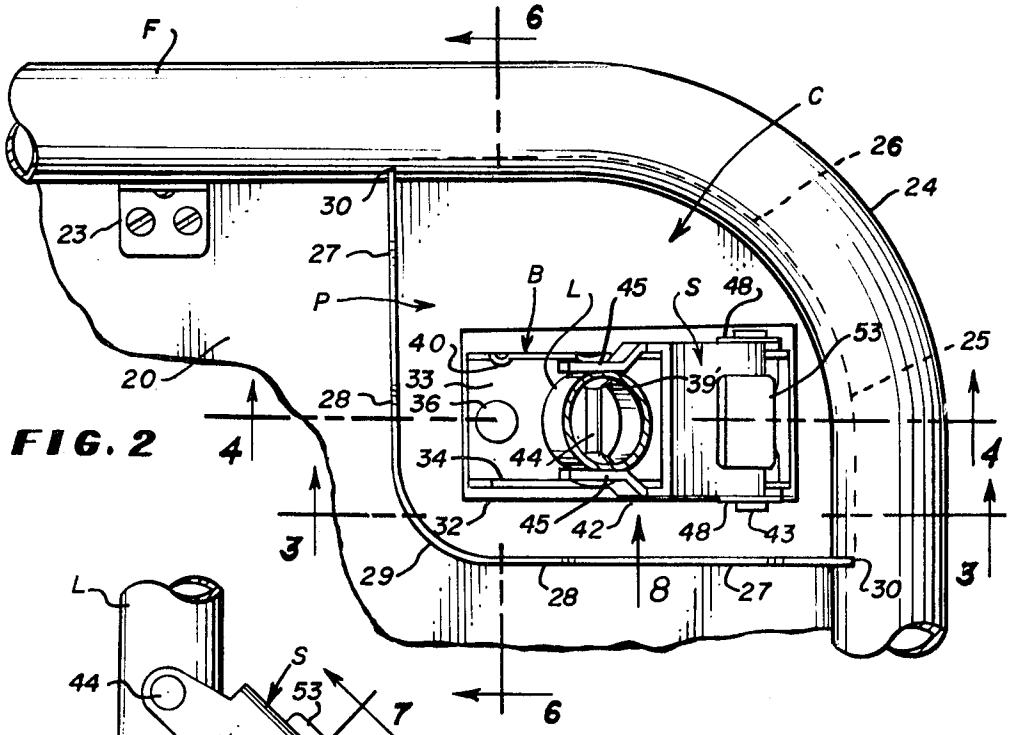


FIG. 2

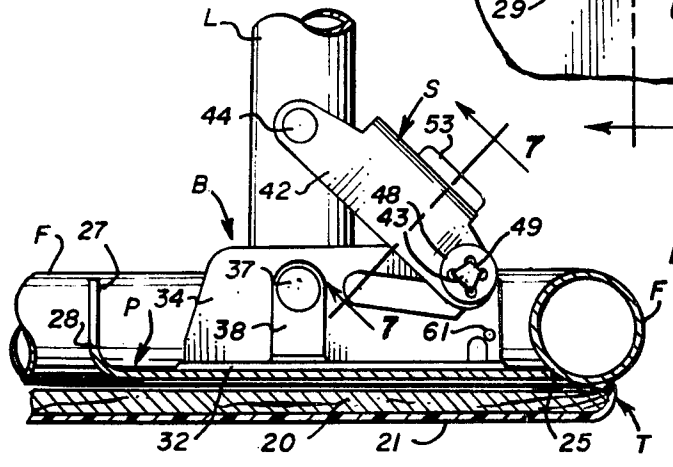


FIG. 3

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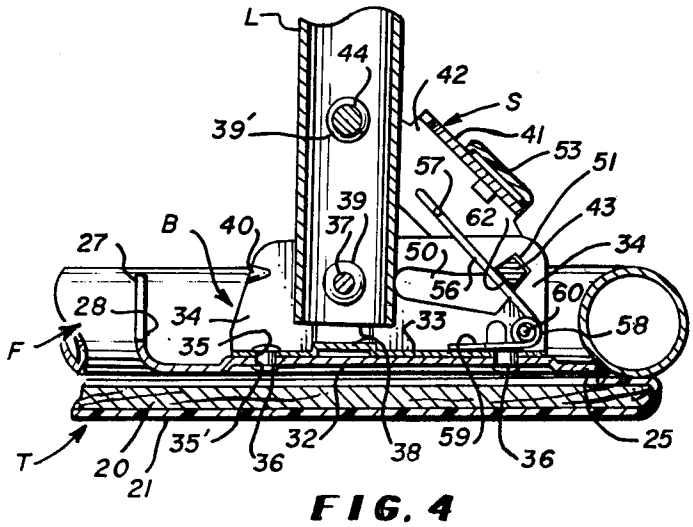


FIG. 4

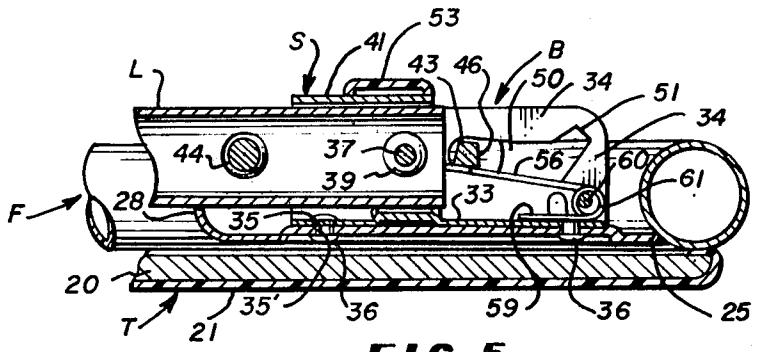


FIG. 5

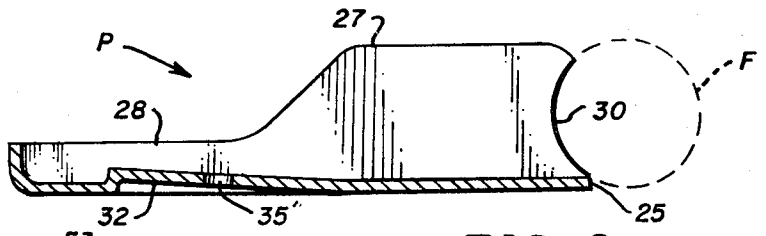


FIG. 6

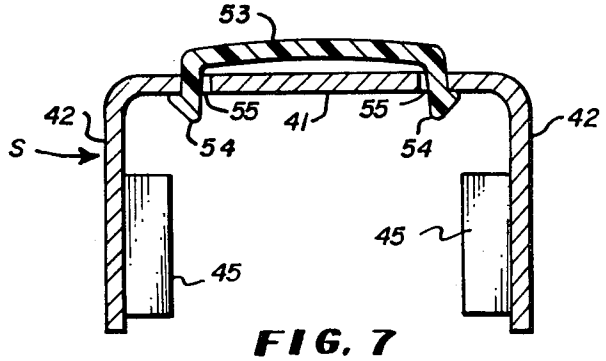


FIG. 7

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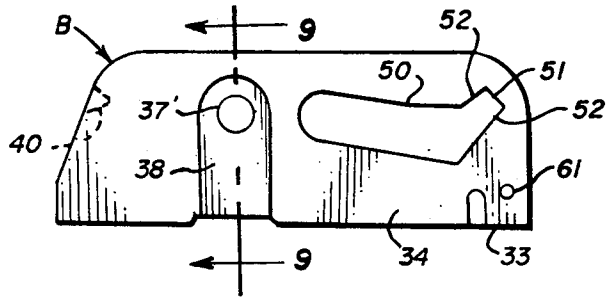


FIG. 8

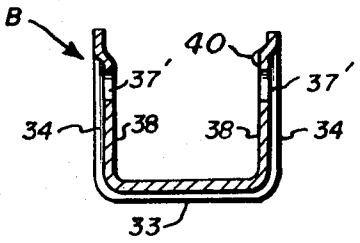


FIG. 9

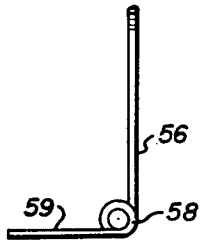


FIG. 10

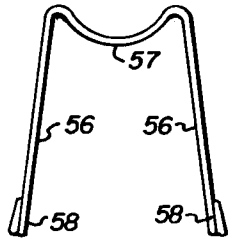


FIG. 11

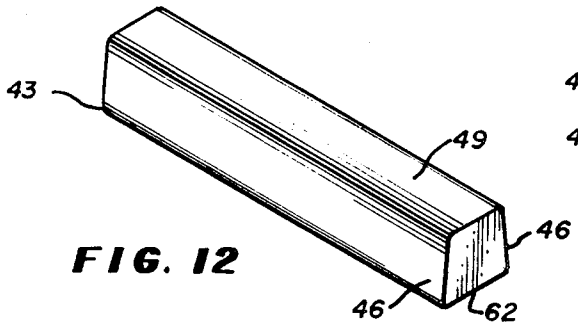


FIG. 12

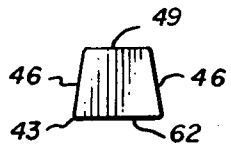


FIG. 13

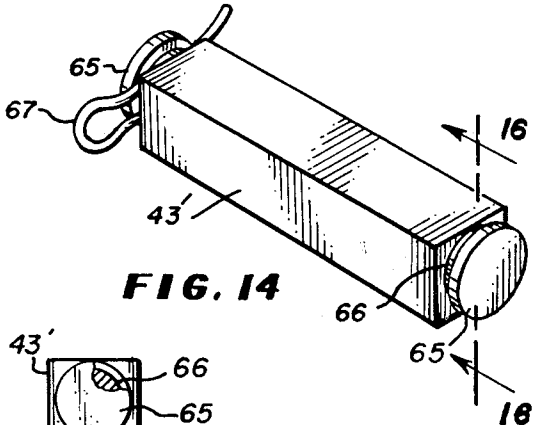


FIG. 14

FIG. 15

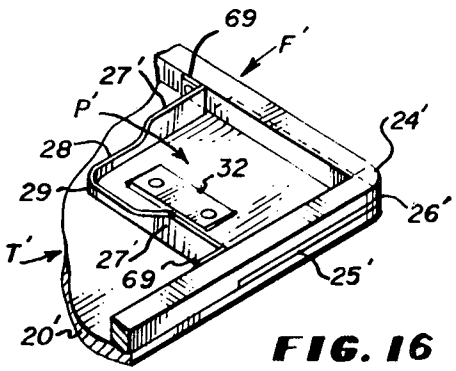


FIG. 16

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CONNECTOR FOR FOLDING TABLE LEG

This invention relates to tables having folding legs, and more particularly to the structure and mechanism which connects a folding leg to a table. Accordingly, the invention will be hereinafter referred to as a connector for a folding table leg.

An object of the invention is to provide a novel and improved connector for a folding table leg which is especially suitable for lightweight tables, such as card tables, and which is adapted to be secured to the frame of a lightweight table, as at the corners of the table, in such a manner as to enhance the overall rigidity of the structure.

Another object of the invention is to provide a novel and improved connector for connecting a folding leg to a table, which carries a stabilizing strut of a rugged, solid construction adapted to hold the leg in a solid, secure manner whenever the leg is extended and the table is in use, but which may be released by light finger pressure to permit the leg to be folded against the underside of the table.

Another object of the invention is to provide, in a novel and improved connector for a folding table leg, a shiftable strut which locks to secure the leg in an extended position and which unlocks to permit the leg to be folded against the underside of the table, wherein a unique and simplified locking mechanism holds the strut in a secure and solid position when the leg is extended, yet which is easily released to permit the leg to be folded against the underside of the table.

Another object of the invention is to provide a connector for a folding table leg which is normally hidden from view when the table is in use.

Another object of the invention is to provide a connector for a folding leg which is relatively flat in folded position and is characterized by the absence of protruding parts when the leg is folded, thereby minimizing storage space and reducing the possibility of damage to its shipping carton or to adjacent objects when in storage.

Still another object of the invention is to provide a connector for a folding table leg which may be folded to a relatively flat position and which includes a part which is outermost in folded position and which may be formed of plastic or similar material, to serve as a cushion to protect adjacent objects.

Other objects of the invention are to provide a connector for a folding table leg, which is simple, compact, low in cost, neat appearing, versatile and rugged and durable.

A connector or a folding table leg of the present invention includes a bracket secured to the underside of the table top at the position of and to which the upper end of the leg is pivoted, with a stabilizing strut pivotally connected to the leg and slidably connected to the bracket. The strut carries a lock bar which is movable in a slot of the bracket, as in opposed flanges, and this slot has an offset socket which receives the lock bar when the leg is in extended position, to hold the leg tightly in extended position. The lock bar may be shifted from the socket, as by finger pressure against a nonmetallic pad on the strut, in order to collapse the leg against the underside of the table. A spring acting against the lock bar holds the lock bar in the socket, while the bracket may be mounted on an inclined portion of a base, to produce an outward inclination of the leg in extended position, with the base being attached to a depending rim or frame of the table top.

With the foregoing and other objects in view, the present invention comprises certain constructions, combinations and arrangements of parts and elements as hereinafter described and illustrated in preferred embodiment by the accompanying drawings, in which:

FIG. 1 is a perspective view of a card table of a simple, neat-appearing design which is ideally suited for using the improved folding leg connector constituting the present invention;

FIG. 2 is a fragmentary underside view of one corner of the table illustrated in FIG. 1, to show a bottom view of the improved connector and a fragment of the leg extending

therefrom, all as taken from the indicated line 2—2 of FIG. 1, but on an enlarged scale;

FIG. 3 is a fragmentary sectional view of the table corner and a longitudinal sectional view of the connector mounted thereon, taken along line 3—3 of FIG. 2, this view showing the table in an upside down position with a portion of the leg thereon in its extended position;

FIG. 4 is a longitudinal sectional view, similar in arrangement to FIG. 3, but taken through the axis of the leg and connector along line 4—4 of FIG. 2;

FIG. 5 is a longitudinal sectional view similar to FIG. 4, but showing the leg as being swung to its retracted position against the underside of the table;

FIG. 6 is a transverse, sectional view of a base plate of the connector, taken along line 6—6 of FIG. 2, but on an enlarged scale, the baseplate being shown in upside down position and broken lines indicating the outline of the table frame tube to which the base is attached;

FIG. 7 is a transverse section of a stabilizing strut of the connector, taken along line 7—7 of FIG. 3 but on a greatly enlarged scale;

FIG. 8 is a side elevation of a mounting bracket of the connector, taken in the direction of arrow 8 of FIG. 2 but on an enlarged scale;

FIG. 9 is a transverse section of the bracket, taken along line 9—9 of FIG. 8;

FIG. 10 is a side elevation of a lock spring of the connector, on an enlarged scale compared with its showing in FIGS. 4 and 5;

FIG. 11 is a front view of the lock spring illustrated in FIG. 10;

FIG. 12 is an isometric view of a lock bar of the connector, on an enlarged scale compared with its showing in FIGS. 4 and 5;

FIG. 13 is an end view of the lock bar of FIG. 12;

FIG. 14 is an isometric view, similar to FIG. 12, but illustrating a modified construction of the lock bar;

FIG. 15 is an end view of the lock bar of FIG. 14, with a portion of the end being broken away to show details hidden from view; and

FIG. 16 is a small scale, isometric underside view of the corner of a table of another type of table construction, showing a modified form of the connector base.

The present invention was conceived and developed to meet a need for an improved card table, or any other similar table, which combines the features of a lightweight, rugged and neat-appearing table top with folding legs which are rigid when they are extended, but which may be easily folded to a retracted position underneath the table. As in FIGS. 1–5, the invention is applied to a leg connector C mounted on the underside of each corner of a table T, supported by folding legs L. The connector C includes a baseplate P attached to a table frame, F, a channellike bracket B depending from the underside of the base plate P, to which the top of the leg L is pivotally connected, and an inclined stabilizing strut S having one end attached to the bracket B and the other end to the leg. To effect leg folding, the strut is pivotally connected to the leg and slidably connected to the bracket.

In accordance with this invention, the slidable connection between the strut and bracket is effected by a transversely disposed wedging bar attached to the end of the strut, which bar is carried within slots in opposed sides of the bracket. The slots terminate in offset, wedge-formed sockets which retain the bar when the leg is in its extended position. A spring member locks the bar in the sockets; however, the strut may be pushed, as with finger tip pressure, to move the bar out of this socket to slide within the slot to move the leg toward the underside of the table and to its retracted position, all as will be hereinafter further described.

Referring more particularly to the drawings, the table T may be a flat, substantially rectangular or square unit having a top panel 20 of plywood or hardboard, covered by sheeting 21. The panel 20 is mounted upon the frame F, which is con-

veniently a metal tube extending about the peripheral edge of the table, beneath the panel top. The frame is securely attached to the underside of the top panel, as by an array of screw attached clips **23**, as illustrated in FIG. **2**. Where the tubular frame is a continuous member, formed by bending the tube at the corners **24**, as illustrated, and welding the abutting ends, the corners of the table panel **20** are also rounded to correspond with the frame. With this arrangement, the table top is a neat simple unitary member.

Although the table is illustrated as being rectangular in form, with rounded corners, it is to be understood that the invention herein disclosed may be used with tables having other forms, such as a table formed with sharp corners, as illustrated in FIG. **16**, or even with a rounded table. This is because each leg connector C, ordinarily located at each corner of the table, may be placed at appropriate positions around a circular or oval table. Each leg connector includes a flat base plate P which is welded or otherwise connected to the frame member. In the preferred construction illustrated, as in FIGS. **2–6**, this baseplate is a metal sheet which is easily formed in a press. It is essentially square or rectangular, with its outer edges **25** lying against the inner side of the frame adjacent to the underside of the panel **21**, and with an outer corner **26**, between the outer edges curved to correspond with the curved frame corner **24**. A depending flange **27** extends around the inner edges of this baseplate, being formed with a cutout **28** at and adjacent to the inner corner **29**, to accommodate the leg L when in folded position. Each end of flange **27** has a concave edge **30**, which abuts the inside of a tubular frame, when used. Each baseplate P may be welded in position against the tubular frame, as along the edges **25**, corner **26** and the ends **30**, thus being rigidly secured in position underneath the table top, not only to hold the corresponding leg, but also to rigidify the entire table.

The bracket B is attached to the underside of the base plate P to carry a leg L. To facilitate aligning the leg in a position in which it will be inclined outwardly at a slight outward and downward angle from a perpendicular to the top of the table, the bracket B is mounted upon an inclined pad **32** formed in the undersurface of the base frame **25**, at a small angle, offsetting a portion of the metal constituting the base, as best illustrated in FIG. **6**.

The bracket B is a relatively short, channel-shaped member having a central web **33**, which is mounted upon the pad **32**, and having flanges **34** depending from each side of the web. Holes **35** in the web **33** register with holes **35'** in the pad **32**, to receive rivets **36** which securely connect the bracket to the pad, as in FIGS. **4** and **5**. The bracket B is aligned upon the baseplate P in the direction in which the leg L, mounted thereon, is to be swung for retraction, and this alignment will be substantially parallel to the adjacent side of the table. The top of the leg L is attached between the flanges **45** by a pivot pin **37**, such as a rivet, at an approximate inner one-third point of the bracket and extending through holes **37'** in these flanges. The leg-supporting portion of the bracket B is an inset partial collar **38** formed in each side of the bracket, as by distorting the web and flanges of the bracket, as in FIGS. **8** and **9**. The collar **38** provides a snug fit against the sides of the tubular leg held between the flanges **34**, and provides a recess at each outer side of the flanges to retain the heads at the ends of the pivot pin **37** within the outer wall contour of the flanges **34**. Ordinarily, the leg L will be formed from thin-walled tubing, and to minimize wear at pivot pin **37**, a reinforcement **39** may be extruded inwardly from the leg walls at each end of the pivot pin **37**.

The leg is held in its extended position by the strut S, at a small angle outwardly and downwardly from a normal to the table top, while the leg is held in its retracted position against the underside of the table top by a wedge projection **40**, deformed from an inner face of the inward corner of a flange **34**, as in FIGS. **2, 4** and **8**, which snaps over the edge of the leg when it is folded to its retracted position.

The stabilizing strut S, as in FIGS. **2–4**, is formed as a short, channel-shaped link having an outward web surface **41** and a flange **42** at each side thereof which extends beyond each end of the web **41**, as in FIG. **3**. The side flanges **42** are spaced apart sufficiently to embrace the flanges **34** of the bracket B and are connected to the bracket by a lock bar **43**, as hereinafter described. The upper ends of the flanges **42** extend to and connect with a pivot pin **44** on the leg, which is spaced a suitably short distance from the bracket pivot pin **37** at the top of the leg, as in FIG. **4**, within reinforcements **34'**. The ends of the strut flanges **42** are narrowed by offsets **45** to provide a secure fit to the leg, as best illustrated in FIGS. **2** and **7**. The opposite ends of flanges **42** of the strut extend beyond the web **41** to steady and embrace the bracket flanges **34**, while the transverse lock bar **43** is mounted between these flange extensions.

The lock bar **43** may be rectangular or approximately trapezoidal in section, as in FIGS. **12** and **13**, with two opposite, inclined sides **46** to provide a tapered, wedge-shaped member. This bar is held in correspondingly shaped holes **47** in each flange **42** of the strut, and its length is such as to extend through holes **47** with a projection at each side sufficient to receive a lock ring **48** to hold the bar in place, as in FIGS. **2** and **3**. The holes **47** are broached to snugly fit the lock bar **43** and hold the same between the flanges in a nonrotative position with the narrower face **49** of the lock bar, between the tapered faces **46**, adjacent to the web edge of the strut.

The lock bar **43**, secured to the ends of the strut flanges, moves in a pair of identical, opposed slots **50** in the bracket flanges **42**, with these slots extending from the outward end of the bracket to the approximate center thereof and over a reach which is sufficient to permit the table leg to swing from its extended position, when the strut is inclined and the lock bar **43** is at the outward end of the slots, as in FIG. **4**, to a retracted position alongside the underside of the table when the strut is lying flatly upon the bracket and the lock bar is at the inner end of the slot, as in FIG. **5**.

In accordance with this invention, the outward end of each slot **50**, as in FIG. **8**, is offset to extend away from the bracket web and towards the extended edge of each flange **34** to provide a socket **51** having sides **52**. Thus, the socket **51** is offset angularly but extends in the same direction as slot **50**, being inclined obtusely to the slot **50**, with the angle between the centerline of slot **50** and the centerline of socket **51** being greater than 90° but less than 180°, such as about 120°, as shown. Socket **51** may be inclined with respect to the edges of the bracket, as in FIG. **8**, sized to correspond with the form of the lock bar **43**, with sides **52** diverging, as shown, so that the socket will be wedge shaped, although the socket may be rectangular, as indicated above. In any event, socket **51** will snugly receive and hold the lock bar when the table leg is extended and the strut is inclined, as in the manner illustrated in FIG. **4**. It is immediately apparent that any pressure tending to swing the extended table leg either outwardly or inwardly will cause the faces **46** of the lock bar to press against the sides of the sockets **51**, but with the fit attained by the lock bar in the sockets, there can be no slack or slop of the lock bar **45** in the mating sockets **51**. Thus, the strut will hold the leg securely and solidly in its extended position, a few degrees outwardly from the normal to the table surface.

However, the lock bar **43** may easily be pushed out of the slot offset **51** by simple pressure against the outward face of the strut web **41**, which will move the free end of the strut S to move the lock bar out of the offset socket **51** and into the main portion of the slot **50**. A finger pad **53** is provided in the outward web face **41** of the strut, being secured to this face in any suitable manner, as by hooked fingers **54** on each side of the pad extending through slits **55** in the web **41**, as in FIG. **7**. Finger pad **53** is formed of a nonmetallic material, such as plastic, since it is the outermost part when the leg is folded, as in FIG. **5**, and will minimize damage to other articles when the table is stored, as with the top T on edge.

In further accordance with this invention, the lock bar is resiliently urged into the sockets **51**, as by a U-shaped hairpin spring **56**, which is mounted within the bracket between the bracket web **33** and the lock bar, as in FIGS. **3** and **4**. This spring, shown also in FIGS. **10** and **11**, may be formed as a symmetrical unit having a pair of legs, as shown, extending from each side of an arched crotch **57** and each extended end being curled to form a hinge loop **58** and a foot **59** extending from each loop **58** in a direction perpendicular to the legs. The hinge loops **58** are held between the flanges **34** of the bracket B by a retainer pin **60** carried between the flanges **34** in holes **61** adjacent to the web **33** and with the feet **59** lying upon the web surface. Accordingly, the spring may be folded inwardly towards the feet **59** and will thus be biased resiliently, with each leg pressing against the base side **62** of the lock bar, to thereby urge the lock bar into the socket **51**. The length of the spring legs is such that the lock bar **43** can be moved to the inward end of slot **50**, as in FIG. **5**, while the arch crotch **57** will clear the end of the leg L during movement between the positions of FIGS. **4** and **5**.

The use of the present invention is very simple and is inherently described above. The user of a table, having its legs so mounted upon the improved folding connectors, can extend the legs by simply pulling them to the extended position, since the pressure of the spring will secure the lock bar **43** in the respective sockets **51**. When a table leg is to be retracted to lie against the underside of the table, the finger pad **53** on the strut S may be pressed, as by finger tip pressure, to push the lock bar **43** out of its socket **51** and thereafter, the table leg easily swings to the retracted position, with the lock bar **32** moving in the slot **50**.

Certain simple modifications can be made to vary the basic features of the connector herein described. For example, FIGS. **14** and **15** show a lock bar **43'** of a type which has each end turned to provide a circular head **65** and a circular slot **66**, to receive a snap-on lock pin **67**, such as shown at one end of the bar in FIG. **14**. This arrangement may be used in lieu of the lock ring **48** heretofore described. Lock bar **43'** is also rectangular in cross section and, when used, the sides **52** of slot **51** should be slightly modified so as to be parallel, rather than diverging.

In FIG. **16** is shown a base plate P' which is slightly modified from the structure heretofore described, in order to fit a wooden frame F' of a square cornered table T'. In a table of this type, the top **20'** is ordinarily secured by adhesive to the frame, with the frame F' being rectangular and different components being fitted together at a moderately sharp corner **24'**. To modify the baseplate P' for use with frame F', the outer edges **25'** and outer corner **26'** of the plate are shaped to lie between the undersurface of the table panel **20'** and the frame F'. Accordingly, it is contemplated that frame F' will be rabbeted or otherwise slotted to receive the edges of plate P'. The flange **27'** is formed substantially the same as flange **27** heretofore described, with a cutout **28** at and adjacent to the inner corner **29**. In the construction described, however, where the frame F' is made of wood or similar material, it is convenient to provide a tab **69** at each end of the flange **27'** which abuts against the side of the frame F' and which is affixed thereto in any suitable manner, as with a wood screw or rivet. The modified baseplate P' is provided with an inclined pad **32**, if it is desired to tilt the leg at a small angle from a normal to the table top, the same as heretofore described.

We have now described our invention in considerable detail; however, it is obvious that others skilled in the art can build and devise alternate and equivalent constructions which are nevertheless within the spirit and scope of our invention.

What we claim is:

1. A connector for connecting a folding leg to the underside of a table, comprising in combination therewith:

means for pivotally mounting the top of said leg on the underside of said table;

a metallic bracket attached to the underside of the table and having a depending flange in alignment with the direction of the leg fold, said flange having a slot adjacent said pivot means;

a metallic strut pivotally connected at one end to the table leg spaced from the aforesaid pivot means and having a lock bar at the opposite end slidably carried in said bracket slot;

said bracket slot being offset to form a socket to receive said lock bar when the table leg is extended, whereby said strut will hold the table leg in its extended position; and

a nonmetallic pad mounted on the outside of said strut against which pressure may be exerted to move said lock bar out of said socket and to minimize damage to adjacent objects when said table is stored with said leg in folded position.

2. A connector for connecting a folding leg to the underside of a table formed as a flat, rectangular panel having a reinforcing tubular frame underneath the panel and about the periphery thereof, comprising in combination therewith:

a bracket mounted on a baseplate attached to the underside of the table, said bracket having a depending flange in alignment with the direction of the leg fold and on which the top of the leg is pivotally mounted, said flange having a slot adjacent said pivot;

a strut pivotally connected at one end to the table leg spaced from the aforesaid pivot and having a lock bar at the opposite end slidably carried in said bracket slot, said bracket slot being offset to form a socket extending obtusely thereto to receive said lock bar when the table leg is extended;

said baseplate being formed as a substantially rectangular member having outward edges thereof attached to a corner of the said frame member, and having inner depending flanges whose ends extend to and are shaped to engage said tubular frame;

said baseplate being provided with a mounting pad to which said bracket is connected, said pad being inclined to the plane of the table top, whereby to incline said leg a like amount from a normal to the plane of the table top, when said leg is in extended position;

said bracket being a channel-shaped member formed with two parallel flanges to carry the leg pivot between them and with opposed, identically oriented slots and sockets, said table leg being mounted on the pivot between said flanges;

said strut being a channel-shaped member having a central web and flanges extending from each end thereof to straddle the table leg at one end and carry said pivot connection to said leg, and at the opposite end, to carry said lock bar and to straddle the bracket flanges with said lock bar extending through said slots;

a hairpin-type spring disposed between said bracket flanges, said spring having a pair of legs engaging said bracket web and a pair of feet engaging said lock bar with a curl connecting each leg and the corresponding foot and a concave crotch connecting said pair of legs for clearing the top of said leg during movement of said leg between extended and retracted positions;

said lock bar being trapezoidal in cross section, with the narrower face thereof facing the socket when lying in said slot adjacent to the socket; and

said socket being tapered to correspond to said cross section of said lock bar.