Feb. 28, 1961 F. S. KNOLL 2,973,232

MULTIPLE DESK UNIT WITH COMBINED FRAME AND RETAINING RAIL

Filed Jan. 29, 1958

2 Sheets-Sheet 1

Fig. 1.

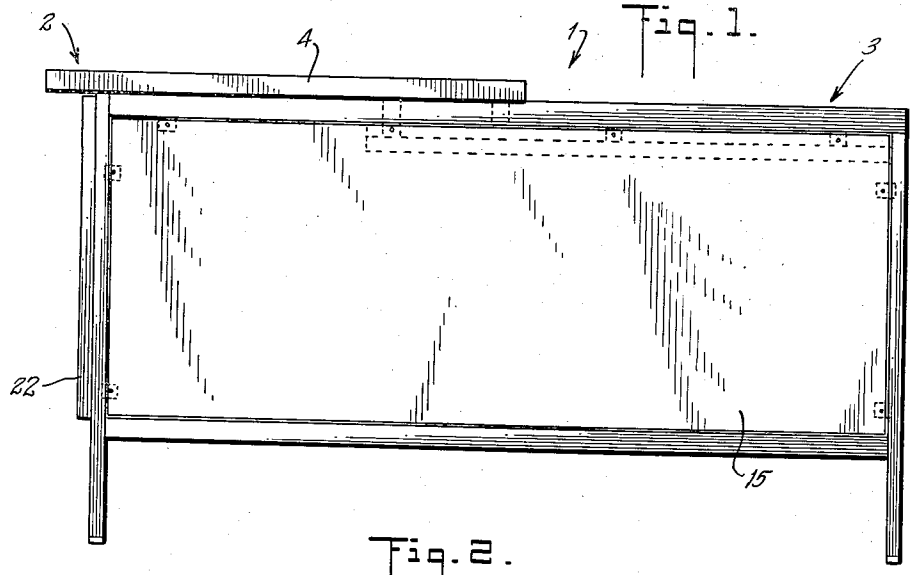

Fig. 2.

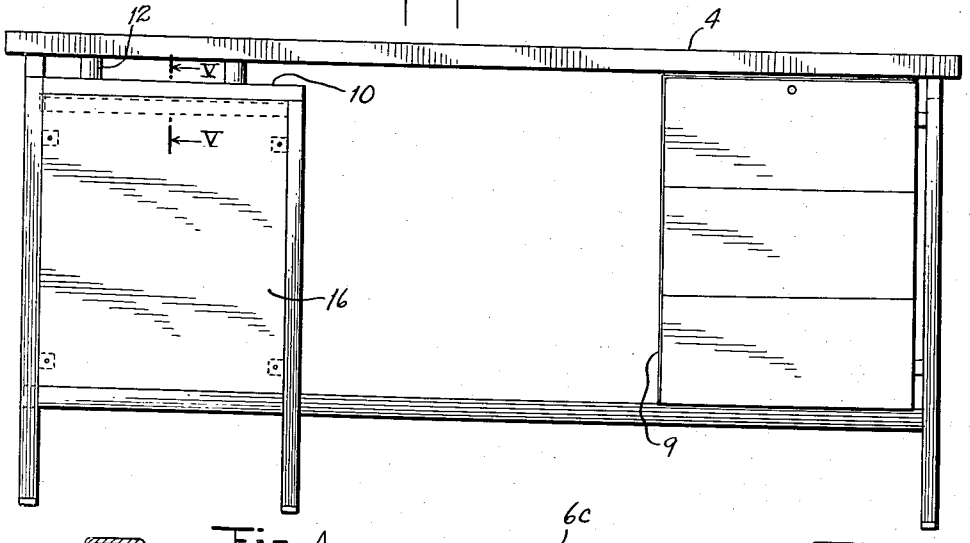

Fig. 4.

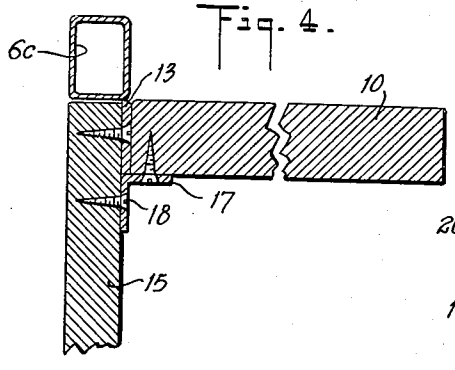

Fig. 5.

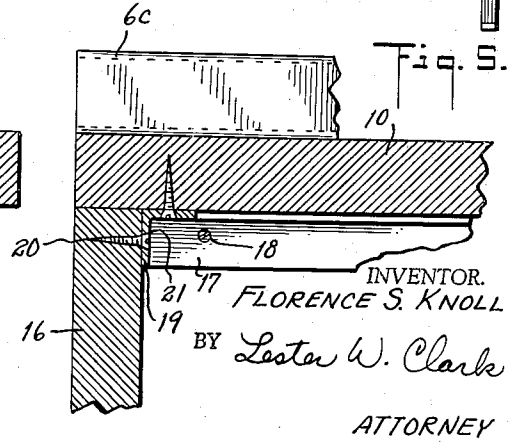

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Fig. 3.

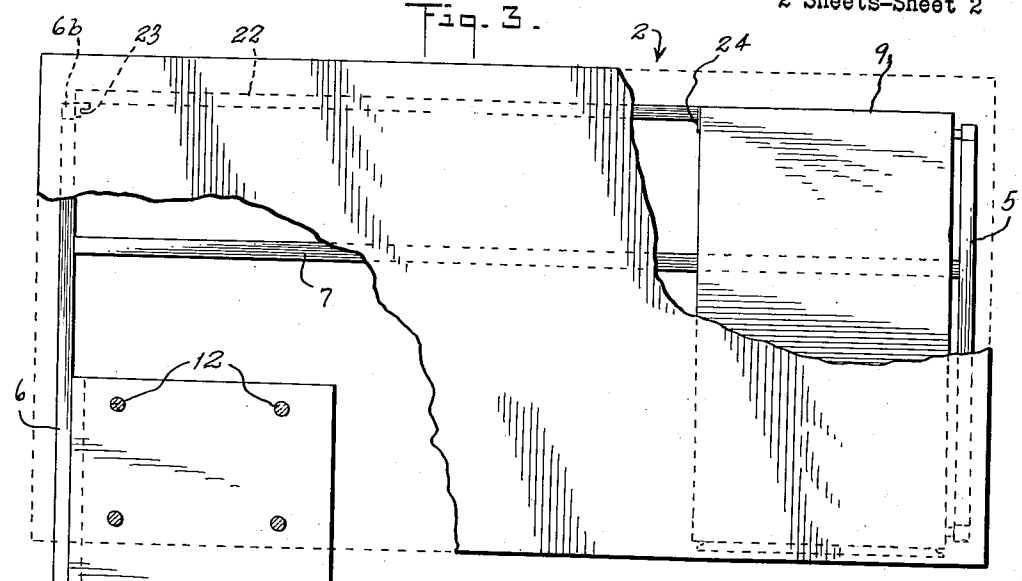


Fig. 6.

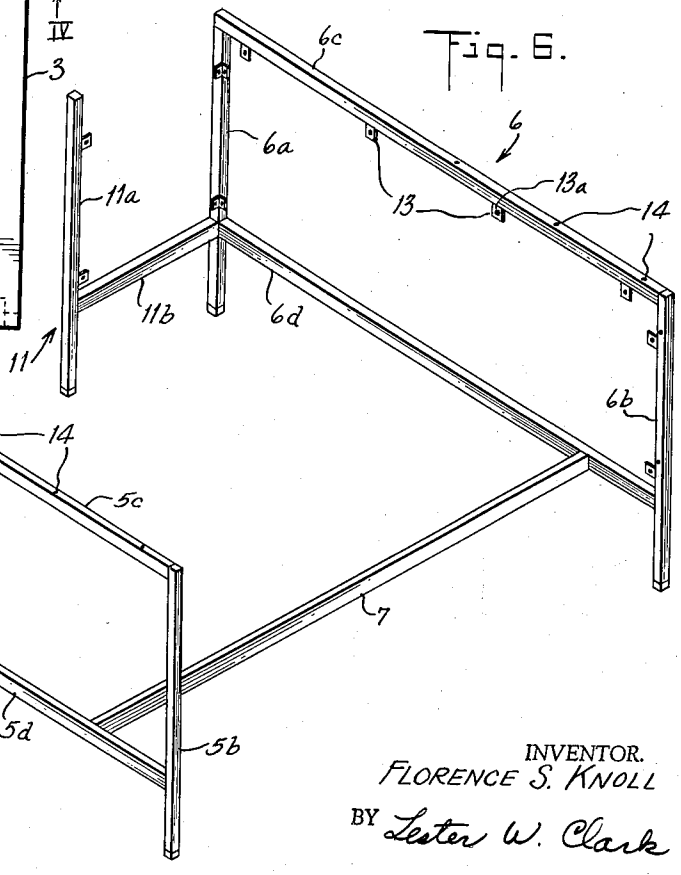
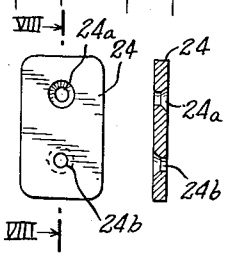


Fig. 7. Fig. 8.



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2,973,232

MULTIPLE DESK UNIT WITH COMBINED FRAME AND RETAINING RAIL

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Filed Jan. 29, 1958, Ser. No. 711,896

4 Claims. (Cl. 311—4)

This invention relates to desks and the like and particularly to L-shaped desks for use in business offices.

The ever-pressing space requirement of modern offices, coupled with the need to afford each office worker an adequate amount of working and storage space has made the L-shaped office desk extremely popular and desirable in business offices. This desk is characterized generally by a main desk having a flat oblong top and a side desk of similar configuration located at a somewhat lower level than the top of the main desk, with one of its ends received under one of the ends of the main desk.

Supports are provided for the outer ends of the main and side desks (i.e. the ends remote from the common corner of the L-shaped configuration), and for the inner end of one of the desks (i.e. the end adjacent the common corner of the L-shaped configuration).

The side desk is usually employed to support a typewriter or office equipment of a like nature and may be provided with a retaining rail which projects above the level of the side desk top adjacent the rear edge thereof and is effective to prevent such typewriter or like equipment from sliding off the rear of the side desk plate during use or other handling.

The rear portions and outer ends of the main and side desks are usually provided with decorative panel members which cover these portions. The panels are customarily connected directly to the frame, conforming closely to the shape of the frame portion to which connection is made.

The L-shaped desk may also be provided with a storage box usually open or capable of being opened only at the front end and which is attached to the main desk supports. This storage box, often mounted within a supporting pedestal, is positioned beneath the main desk plate adjacent the outer end thereof. The rear wall of the box may be contiguous with the rear panel of the main desk and serves as a decorative panel for a portion of the rear surface of the main desk. A similar storage box may be provided the side desk at its remote end. The storage box may be adapted by the provision of shelves to store stationery or the like, or it may be employed to store a typewriter or similar equipment.

An object of the present invention is to provide an improved L-shaped desk.

Another object is to provide an improved supporting frame for such a desk.

Another object is to provide a supporting frame for an L-shaped desk in which the horizontal support for one end of the main desk serves also as the rear retaining rail for the side desk top.

Another object is to provide a supporting frame for a desk of the type described having vertical supports only at the remote and common corners of the assembled desk, the horizontal frame members connecting the vertical supports extending uninterrupted and otherwise unsupported between such supports.

Another object is to provide an improved desk of the type described having an improved means for connecting

decorative panel members and desk plates to the supporting frame members and to each other.

Another object is to provide an improved means for attaching a desk storage box to a supporting frame and to the main desk panel.

Another object is to provide an improved L-shaped desk which is structurally strong, simple and compact, and which lends itself readily and economically to modern mass production techniques.

The foregoing and other objects of the invention are attained in the structure defined herein by providing an L-shaped desk structure including a main desk having a flat plate and a side desk also having a flat plate but located at a somewhat lower level than the plate of the main desk so that one end of the side desk may be received under the end of the main desk. Supports are provided for the opposite ends of the main desk and for the outer end of the side desk. The inner end of the side desk is supported on the main desk by connectors secured to the under surface of the main desk and to the upper surface of the side desk.

The support provided the inner end of the main desk includes an A-frame substantially wider than the width of the main desk plate, having a pair of vertical legs and upper and lower crossbars extending uninterrupted between the legs. The common corner of the main desk is attached to the upper surface of the upper crossbar in a conventional manner, while the side desk is maintained positioned level with and adjacent to the lower surface of that crossbar. The connectors attaching the common corners of the main and side desk plates maintain the desks spaced apart a distance equal to the vertical dimension of the upper crossbar. The portion of the upper crossbar not supporting the common corner of the main desk serves as a back rail for the side desk top and extends to its outer edge.

The remote end of the side desk is supported by an H-frame formed of a vertical leg and horizontal crossbar connecting intermediate points on that leg and the rearward leg of the A-frame supporting the inner end of the main desk. No upper horizontal crossbar is supplied the H-frame. The side desk end is supported by direct connection of one corner thereof to the single vertical leg and by connection to panel members by right-angle brackets more fully described hereafter.

The frame members are of hollow material rectangular in cross section. The vertical frame members supporting the common end of the main desk and the outer end of the side desk and the upper horizontal crossbar are provided with integrally formed panel attachment members which project laterally from the vertical members and downwardly from the upper horizontal member. Each attachment member is provided with an aperture adapted to threadedly receive a bolt and effective in cooperation with the bolt to affix a decorative panel member to the rear and remote end of the side desk. The lower horizontal frame member in the embodiment of my invention hereinafter described is not provided with integral panel attachment members.

Two right-angle irons are also provided in the embodiment of my invention described herein. One extends substantially the length of the side desk top, having one face thereof connected to said top and one face thereof connected to a rear panel on the side desk. The second iron extends substantially the width of the side desk top, having one face thereof connected to said top and one face thereof connected to an end panel of the side desk. These irons afford additional support for the side desk top.

The main desk may also be provided a storage box at the outer end thereof supported upon a horizontal stretcher connecting intermediate points along the lower

crossbars of the A-frames supporting opposite ends of the main desk top. The storage box is further supported by connection to the rear panel member of the main desk by means of a storage box connector having a pair of oppositely directed counter sunk apertures. Each aperture is adapted to receive a bolt or screw. The connector is of a width substantially greater than the thickness of the main desk panel. The panel is attached to the vertical leg of the A-frame supporting the common corner of the main desk by means of a right-angle bracket. The storage box is mounted after the panel is in place. The connector is then affixed to the remote end face of the panel by the insertion of a threaded bolt or screw through the appropriate countersunk aperture and into the panel. The storage box is then placed on the support means, having the front face thereof contiguous with the front face of the panel and the front portion of its inner side face abutting the connector. A second threaded bolt or screw is then inserted through the second countersunk hole and into the side of the storage box, thereby securely supporting said storage box to said frame and assuring at the front face of both panel and storage box a firm and attractive continuous panel.

Other objects and advantages of the invention will become apparent from a consideration of the following description and claims taken together with the accompanying drawings.

In the drawings:

Fig. 1 is a side elevational view of the desk of the present invention showing the side panel;

Fig. 2 is a front elevational view of the desk of Fig. 1;

Fig. 3 is a plan view of the desk of Fig. 2 with portions of the main and side desks broken away to show the storage box, portions of the side desk plate, and frame members supporting both the main and the side desks;

Fig. 4 is a cross-sectional view taken on the line IV—IV of Fig. 3 showing the connection of the side desk plate to the side panel and the connection of the side panel to the upper horizontal frame member;

Fig. 5 is a cross-sectional view taken on the line V—V of Fig. 2 showing the connection of the side desk plate to the outer end panel of the side desk;

Fig. 6 is a perspective view taken from above, showing the frame of the desk of the present invention;

Fig. 7 is a front elevation view of the connector of the present invention; and

Fig. 8 is a cross-sectional view taken on the line VIII—VIII of Fig. 7.

Referring now to the drawings, the numeral **1** generally indicates an L-shaped desk made according to the present invention and including main and side desks generally indicated, respectively, by numerals **2** and **3**. The main desk comprises a flat top plate **4** supported on a framework including a first A-frame **5** (see Fig. 6) at its outer end and a second A-frame **6** at its inner end. Each A-frame comprises two vertical legs **5***a* and **5***b* and **6***a* and **6***b*, respectively. Top crossbars **5***c* and **6***c* are provided each A-frame as well as intermediate crossbars **5***d* and **6***d* which connect intermediate points on the respective vertical legs. A longitudinal frame member or stretcher **7** connects intermediate localities on the intermediate crossbars **5***d* and **6***d*, providing additional support.

It will be noted that A-frame **5** supporting the outer end of the main desk is somewhat narrower than the width of the main desk plate supported by it, whereas A-frame **6**, supporting the inner end of the main desk plate is substantially greater in width than that plate. Indeed, frame **6** extends a distance equal to the width of the main desk plate plus the length of the side desk plate extending from the front edge of the main desk to the outer edge of the side desk. The frame members are preferably made of a hollow material of rectangular cross section as shown, for example at **6***c* in the cross-sectional view of Fig. 4.

A storage box **9** is attached (by any suitable conventional means, not shown) to the A-frame **5** and member **7** beneath the outer end of the main desk plate **4**. The box may contain drawers for the storage of stationery or it may be utilized as a storage space for a typewriter or other office machinery.

The side desk **3** comprises a top plate **10** supported at its outer end by a supporting member **11** constructed in the shape of an H and best seen in Fig. 6. This support is formed of a pair of vertical legs **11***a* and **6***a* and a cross piece **11***b* connecting intermediate localities near the lower end of the vertical legs. It will be noted that the rear vertical leg for the A-frame supporting the inner end of the main desk plate and the rear leg for the H-frame member supporting the outer end of the side desk plate are identical, i.e., leg **6***a*. The supporting member for the outer end of the side desk is also made of hollow material having a rectangular cross section. The top plate **10** may be provided with a storage box at its outer end similar to the one provided for the outer end of the main desk. However in the preferred form of my invention no box is attached, the outer end of the side desk being provided with a panel member.

The inner end of the top plate **10** projects under plate **4**. Connectors **12** are provided which support this end from the inner end of the main desk plate **4**. Connector **12** may be of any suitable conventional form.

The vertical members of frame **11** and the vertical and upper cross bar members of frame **6** are provided at spaced localities with lugs **13** welded integrally thereto having apertures **13***a* formed therein and adapted, in cooperation with conventional screws, to connect side desk rear and end panel members to the frames. The brackets project laterally from the inner surface of the vertical members and downwardly from the inward surface of the horizontal member. In addition, apertures **14** are provided on the upper surface of upper horizontal members **5***c* and **6***c* and are adapted to receive bolts (not shown) by means of which opposite ends of the main plate **4** are securely fastened from below to the horizontal members **5***c* and **6***c*. While the lugs may be of any conventional shape, I have found that steel lugs rectangular in configuration having sides approximately one inch in length and of approximately ⅛ inch in thickness provide a strong and secure connecting means. One edge of each rectangular lug is attached as by welding to a vertical or horizontal member as described above so that the inner face of the lug is contiguous with the inner face of the member to which it is welded or otherwise attached, as best seen in Fig. 6. Rear and end panels **15** and **16** are provided the rear and end portions of the side desk. Panel **15** is affixed to the A-frame **6** by means of screws inserted through the apertures **13***a* in lugs **13** and then through the rear surface of the panel itself.

Panel **15** is formed having dimensions smaller than the inside dimension of the rectangle formed by the horizontal and connecting vertical members of frame **6**. When connected as above described, each horizontal and vertical side of panel **15** is positioned spaced inwardly from the corresponding side of the frame, as best seen in Fig. 1. The provision that panel members have dimensions smaller than the inside dimensions of the supporting frame is of importance, for it permits of considerable tolerance in the manufacture of the panel and frame members. Heretofore it was necessary to construct decorative panels with dimensions substantially identical with the dimensions of the supporting frame. Anything less than substantial identity made assembly impossible with attendant loss of time, materials and labor.

A right-angle bracket **17** is provided the side desk adjacent the upper edge of the panel **15** having its vertical leg secured to the upper edge of the panel and its

horizontal leg secured to the under surface of side plate **10**. The angle bracket extends the entire length of the plate **10** in the preferred embodiment of my invention and is provided at spaced localities along each of its legs with apertures adapted to receive screws **18**. These screws securely fasten the vertical leg of the angle bracket to panel **15** and the horizontal leg to plate **10**, as best shown in Figs. 4 and 5.

Panel **16** is provided the H-frame support member at the outer end of the side desk and is attached in much the same fashion as panel **15** described above, with the exception, however, that plate **10** supports at least partially the upper edge of the end panel member rather than a top crossbar as was the case in supporting the rear panel. While the connection of the H-frame panel to the vertical members is the same as the connection of the side panel to its vertical supports, i.e. by means of screws inserted through apertures **13***a* and into the panel, the upper edge connection to the plate **10** is not made by means of such brackets but rather by right-angle bracket **19**. When the panel **16** for the H-frame member is in position, i.e. connected to lugs **13** by means of screws, the vertical leg of angle bracket **19** is connected to the upper end of the inner surface of the panel **16** by the insertion of screws **20** through apertures **21**, and the horizontal leg is connected to the under surface of the side plate.

Side plate **10** is firmly supported to the L-shaped desk unit at its inner end by means of the connectors **12** previously described. The entire rear longitudinal edge of the plate is supported by connection to the horizontal leg member of angle bracket **17** which in turn is supported by connection of its vertical legs to panel **15** as stated. The outer end of the plate **10** rests on the upper end of the vertical leg **11***a*. However, the entire outer edge receives additional support by connection with the horizontal leg member of angle bracket **19** whose vertical leg as previously described is securely connected by means of suitable screws to rear panel member **16**.

Since the depth of connectors **12** is equal to the depth of horizontal frame member **6***c*, the upper surface of plate **10** is on the same longitudinal plane as the under surface of the frame member. Thus the frame member **6***c* supports the inner end of the main desk plate **4** and also acts as a retaining rail for the side plate **10**. It will be noted that in order that the side plate be parallel to the main plate, vertical leg **12***a* must be shorter than each of the other vertical members by a length equal to the thickness of the side plate.

Main desk panel **22** is provided to cover the rear of the main desk. This panel is attached on its side adjacent the inner desk corner to vertical member **6***b* by means of a third angle bracket **23** (Fig. 3) having one of its legs connected to the inner surface of the support member and the other leg to the inner surface of the panel. The corner of the angle member and the rear inner corner of the frame member are positioned adjacent one another so that the main desk panel member **22** projects rearwardly of the vertical support member a distance equal to its depth. The end of the panel **22** adjacent the outer corner is supported on the desk by attachment to the rear edge of the side surface of the storage box **9**. This attachment is made by means of a metal connector **24** which is provided with two oppositely directed, countersunk, threaded apertures **24***a* and **24***b*. The connector may be of any suitable shape and constructed of any strong material, preferably metal. It must, however, extend horizontally for a distance substantially greater than the thickness of panel **22** as will be more apparent from reading the following description. The connector of the present invention is rectangular in configuration and has a length substantially greater than the thickness of the main desk panel. It may be constructed of steel approximately ⅛ inch in thickness. The storage box and main panel are connected in the following manner: Connector **24** is placed adjacent the remote end of panel **22** with the rear edge thereof parallel to but spaced slightly forwardly of the rear panel face. It is positioned so that the appropriate countersunk hole, necessary for the attachment of the connector to the end by means of a threaded screw, overlies that end of the panel and so the oppositely directed countersunk aperture is positioned forwardly of the forward face of the panel. The rear edge of the connector is positioned forward of the rear face of the panel so that when connection of panel and storage box is made, the connector itself is substantially unobservable. It is for this reason also that the connector is substantially thin. A threaded screw (not shown) is inserted through the appropriately directed and more rearwardly positioned aperture and into the panel end, thereby securely affixing the connector to the panel. The box **9** is now placed upon horizontal stretcher **7** and suitably attached (by any conventional means, not shown) to A-frame **5** in such a manner that its inner face abuts the panel end and its rear face lies contiguously with the rear face of the panel. A second threaded screw (not shown) is inserted through the more forwardly positioned, appropriately directed, countersunk aperture and into the side panel of the storage box, assuring a firm and secure connection between panel and storage box. A single connector as thus described may be employed if it be of a sufficient height to support the respective weights of panel and storage box, and if it be provided with a plurality of apertures. In the preferred embodiment of my invention, however, two connectors as above described are employed and are attached to panel and storage box adjacent the upper and lower surfaces thereof.

While I have shown and described certain preferred embodiments of my invention, other modifications thereof will readily occur to those skilled in the art, and I therefore intend my invention to be limited only by the appended claims.

I claim:

1. A desk structure comprising a main desk including an oblong top, a side desk including an oblong top, means supporting said tops in an L-shaped configuration with the end of said side desk top which is adjacent the corner of the L received under the main desk top in spaced relation thereto, said side desk top projecting substantially at right angles to said main desk top, said supporting means including a frame supporting the corner end of said main desk top and supporting said side desk top, said frame including leg means and an upper horizontal rectilinear support bar supported on said leg means, said bar extending at right angles to the length of said main desk top and having a portion of the rectilinear length thereof supporting said main desk top at the under side thereof and having another portion of said rectilinear length thereof disposed adjacent and above the upper side of said side desk top and extending along the length of said side desk top, said bar thereby being effective in cooperation with said leg means to provide said support for said corner end of said main desk top and simultaneously to serve as a retaining rail for said side desk top.

2. A desk structure as defined in claim 1 in which said leg means includes first and second legs supporting respectively opposite ends of said bar, said bar being attached only at said ends to said legs adjacent upper portions thereof.

3. A desk structure as defined in claim 2 in which said means includes a lower horizontal support bar parallel to said upper bar, said lower bar being attached only at its ends to intermediate localities on said legs.

4. A desk structure comprising a main desk including an oblong top, a side desk including an oblong top, means supporting said tops in an L-shaped configuration with the end of said side desk top which is adjacent the corner of the L received under the main desk top in spaced relation thereto, said side desk top projecting substantially at right angles to said main desk top, said supporting

means including a frame supporting the corner end of said main desk top and supporting said side desk top, said frame including vertically disposed legs spaced apart in the direction along the length of said side desk top, a horizontal rectilinear bar spanning between and supported by said legs and having a portion of the rectilinear length thereof disposed at the under side of and supporting said main desk top, said bar having another portion of said rectilinear length thereof disposed adjacent and above the upper side of said side desk top and extending along the length of the side desk top, a lower bar connected to and spanning between said legs, a third leg disposed adjacent the end of said side desk opposite to the end thereof which is received under said main desk top, a horizontal bar connected to and spanning between said third leg and said frame, said opposite end of said side desk top being connected to said third leg and to said

frame so as to be supported thereby, said top supporting means including a structure for supporting the end of said main desk top opposite to said corner end thereof, and a horizontal bar connecting said end supporting structure to said frame.

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CERTIFICATION OF CORRECTION

Patent No. 2,973,232 February 28, 1961

Florence S. Knoll

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 65, after "said" insert -- support --; line 66, strike out "support".

Signed and sealed this 8th day of August 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents