Oct. 10, 1967 W. W. BEARS 3,346,311

DESK CONSTRUCTION

Filed April 4, 1966 3 Sheets-Sheet 1

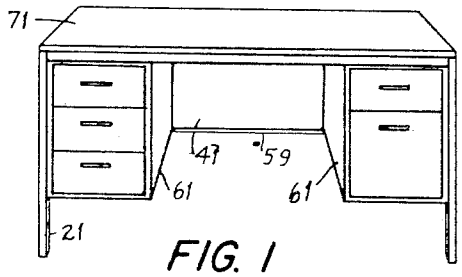


FIG. 1

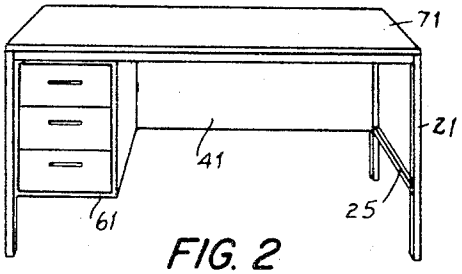


FIG. 2

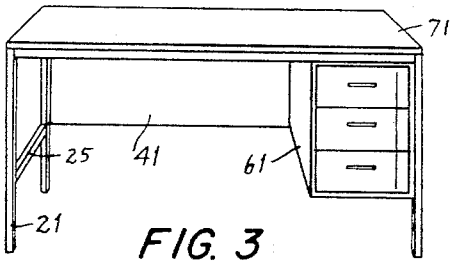


FIG. 3

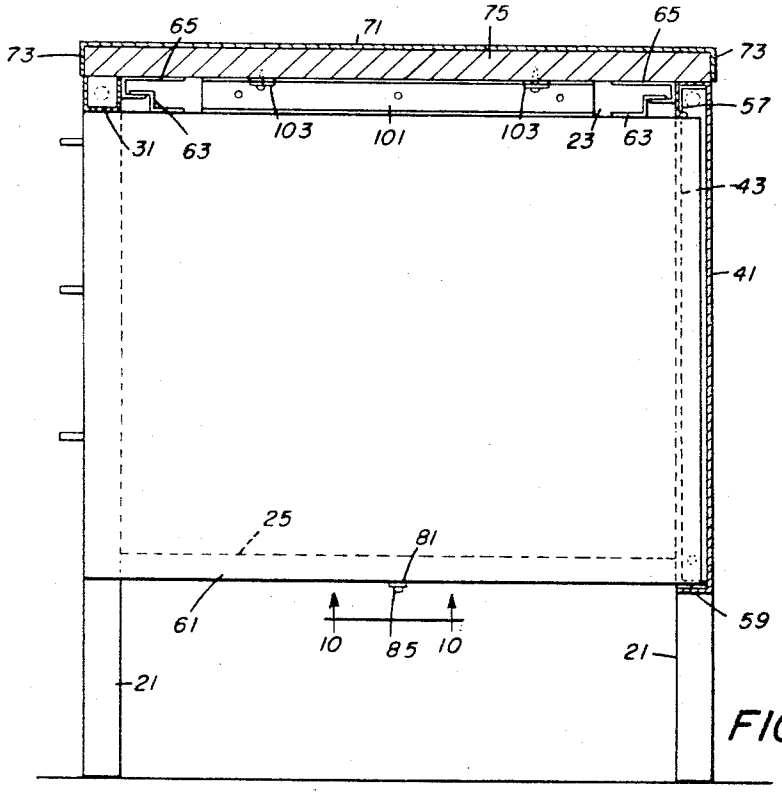


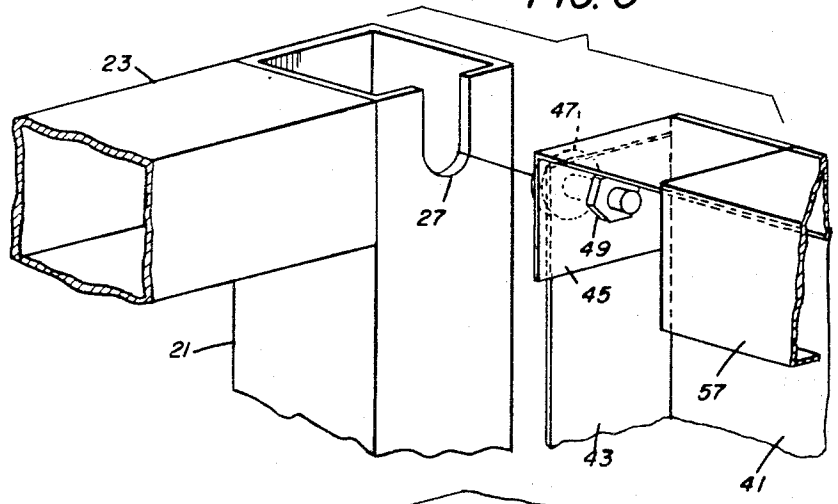
FIG. 4

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FIG. 6



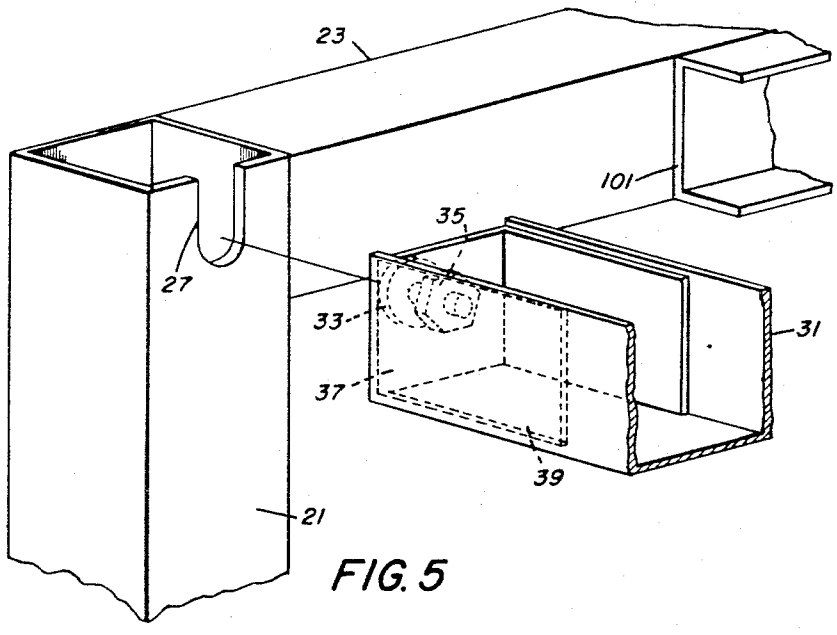


FIG. 5

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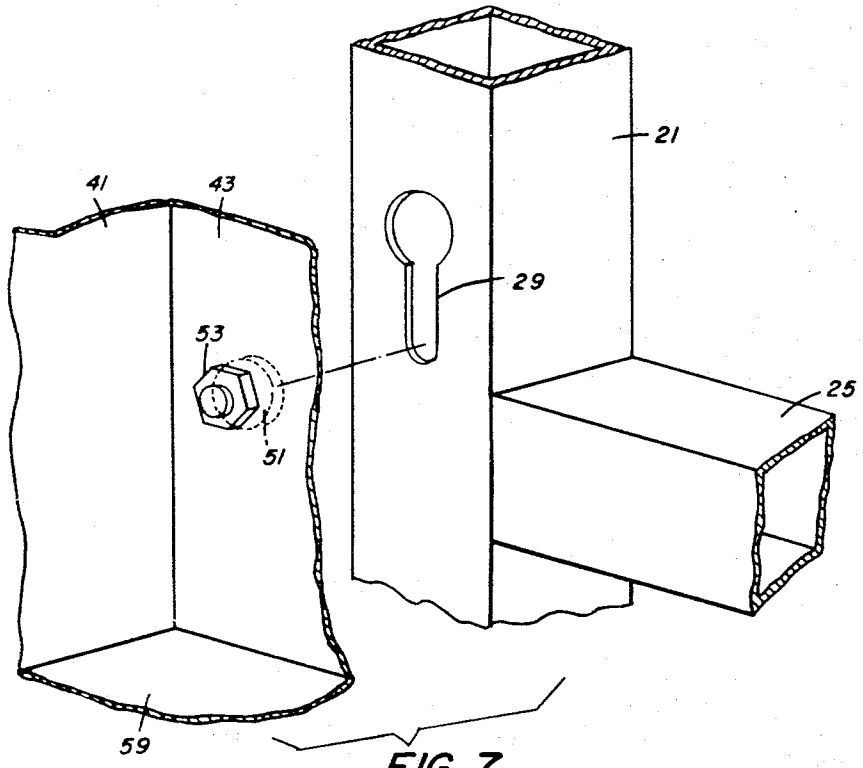


FIG. 7

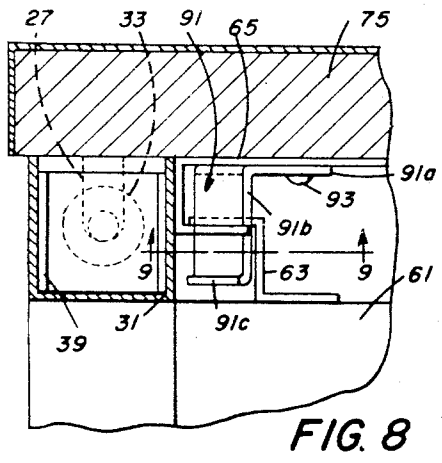


FIG. 8

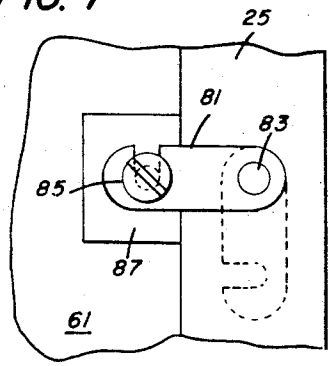
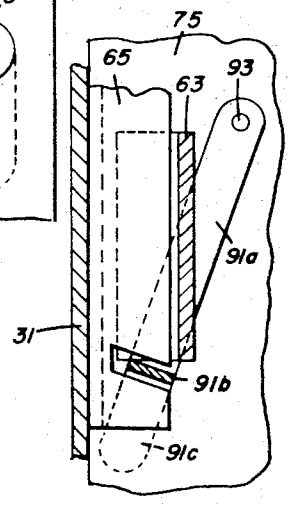


FIG. 10

FIG. 9



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3,346,311

DESK CONSTRUCTION

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Filed Apr. 4, 1966, Ser. No. 539,770
8 Claims. (Cl. 312—195)

This invention relates to an improved construction of a desk, and more particularly a desk made mainly of metal capable of being constructed in modular units.

The assembled desk of the present invention is assembled from a selected number of subassemblies or units, such for example as one top assembly, two end frames, one back panel, one front apron bar, and either one or two pedestal units or assemblies, depending upon the requirements of the customer. In addition to having a choice as to whether one or two pedestals are to be used, there is also a choice as to whether each pedestal shall be in the form of merely a storage cabinet, or a three-drawer pedestal (three drawers of approximately equal depth), or a two-drawer pedestal (one shallow drawer and one deep drawer), or any other desired interior arrangement of pedestal for which prefabricated units are available. Thus, it is seen that when the dealer or distributor carries in stock an assortment of pedestals, together with a supply of the other units or subassemblies above-mentioned, he can assemble a desk according to the particular requirements of the customer, so that many styles of desks are available from a relatively simple stock of subassemblies, and it is not necessary for the dealer to carry a large number of different kinds of desks in stock.

An object of the invention is the provision of a generally improved and more satisfactory desk construction.

Another object is the provision of an improved desk made up of modular units which can be carried in stock by a distributor or dealer and which can be assembled in various combinations, to meet the individual requirements of the customer.

Still another object is the provision of a desk so designed that the individual units or parts of the complete desk may be easily and quickly assembled to each other.

A further object is the provision of a desk so designed that the various prefabricated units which make up the complete desk are firmly and rigidly anchored to each other by a relatively simple assembly operation.

These and other desirable objects may be attained in the manner disclosed as an illustrative embodiment of the invention in the following description and in the accompanying drawings forming a part hereof, in which:

FIGURE 1 is a perspective view of one style of desk which may be assembled from the modular units within the preferred embodiment of the present invention;

FIGURE 2 is a similar view showing another style thereof;

FIGURE 3 is a similar view showing still another style thereof;

FIGURE 4 is a vertical cross-section taken transversely through the desk, illustrating particularly the details of the way in which the units are assembled to each other;

FIGURE 5 is an exploded and enlarged perspective view illustrating certain details of the end frame assembly at a front corner thereof, and the connection thereof to one end of the front apron bar;

FIGURE 6 is a similar perspective view to FIGURE 5, illustrating the connection of a rear corner of an end frame assembly to an upper corner of a back panel;

FIGURE 7 is a similar perspective view to FIGURE 5, illustrating the connection of an end frame assembly to a lower corner of the back panel;

FIGURE 8 is a fragmentary vertical section illustrating certain details of the construction, particularly with reference to a pivoted stop member;

FIGURE 9 is a fragmentary and somewhat schematic section taken approximately on the line **9—9** of FIGURE 8; and

FIGURE 10 is a bottom view illustrating the way in which the bottom of a pedestal unit is anchored to the adjacent end frame.

To illustrate the flexibility of the arrangement of the invention at the outset in comparative fashion, FIGURE 1 shows a desk with two pedestals, the left one being a three-drawer unit and the right one being a two-drawer unit; FIGURE 2 illustrates a desk with only a single pedestal at the left end of the desk, which in this instance is shown as a three-drawer unit, but could as well be a two-drawer unit, or a simple storage cabinet; and FIGURE 3 illustrates a desk with a single pedestal at the right hand end of the desk, which pedestal again could be a three-drawer unit as illustrated, or a two drawer unit or a storage cabinet.

Referring now to the other views, the desk assembly comprises two end frame units, which may be identical with each other. Each of these units is constructed mainly of hollow metal tubing, preferably of square cross-section, the parts being rigidly welded to each other. Each end frame unit has two upright legs **21**, a top cross rail **23**, and a lower cross rail **25** at such elevation that the bottom face of the lower cross rail **25** will be flush with the bottom face of the pedestal unit to be installed in the assembly.

At the top of each leg **21**, in one face thereof (the face which is faced inwardly toward the center of the desk, when the parts are assembled) there is a slot **27** extending vertically downwardly a short distance from the upper end of the leg, and open at the top, as seen in FIGURES 5 and 6. Further down the same face of each leg **21**, at an elevation slightly above that of the lower cross rail **25**, is another vertical slot **29** (see FIGURE 7) of keyhole shape, the enlarged part of the slot being at the top.

Extending across from the top front corner of one end frame to the top front corner of the other end frame (that is, lengthwise of the desk) is a strengthening bar or frame bar sometimes called a front apron bar. This is conveniently of channel shape, and is illustrated at **31** in FIGURES 4, 5 and 8. Each end of the bar **31** is fastened to its adjacent leg **21** by means of a headed stud **33**, the shank of which extends through the slot **27** at the upper end of the front leg **21**, while the enlarged head of the stud is inside the hollow leg **21** and is too large to pass through the slot **27**. The shank of the stud is threaded, and a nut **35** thereon draws against a cross wall **37** at one end of a channel shaped reinforcing insert **39** welded into the bar **31**.

The rear legs **21** of the two frames are connected to each other by the back panel assembly which comprises the flat panel portion **41** having end flanges **43** bent forwardly, as seen in FIGURE 6. At each top corner, a reinforcing angle bracket **45** is welded in place. A stud **47**, similar to the previously described stud **33**, has its shank extending through the slot **27** and through a hole formed through the bracket **45** and flange **43**, so that the enlarged head of the stud is inside the rear leg **21** of the

end frame. The nut **49** is tightened to draw the parts together. A similar arrangement comprising a stud **51** and nut **53** is mounted near the bottom of the end flange **43** of the back panel, and engages in the lower slot **29** of the rear leg **21** of each end frame, to connect the back panel near its lower corners to the end frames. The back panel assembly also includes a finishing flange portion **57** (FIGURES 4 and 6) of approximately square cross section, but partly open at the bottom, extending lengthwise along the top edge of the panel **41** through most of its length, but cut off at each end to allow space for access to the nut **49**. The cross-sectional size of this tubular flange **57** is the same as that of the front apron bar **31**. Another finishing flange **59** extends forwardly at the bottom edge of the back panel **41**, as seen in FIGURE 4, preferably at an elevation just below and snugly against the bottom edge of the pedestal unit further described below.

Each pedestal unit is of the same exterior dimensions, and is basically a rectangular sheet metal box or parallelepiped indicated in general at **61**. The interior arrangement of partitions or shelves and door, if it is to form a storage cabinet, or of drawers and their runways, if it is a drawer unit, is entirely conventional and the details thereof are not important for purposes of the present invention, so are not illustrated. It is sufficient to say that any desired interior arrangement of the rectangular box **61** may be employed.

The vertical dimension or height of each pedestal unit **61** is such that it fits snugly in the vertical space between the bottom edge of the flange **57** at the top of the back panel **41**, and the top surface of the flange **59** at the bottom of the back panel. Welded to the top wall of each pedestal unit **61** are a pair of Z-bars **63**, best seen in FIGURES 4 and 8, which extend parallel to the front and rear edges of the pedestal unit, or in other words lengthwise of the assembled desk, and crosswise of the pedestal unit. The bottom flange of each Z-bar **63** is welded to the top wall of the pedestal unit **61**, and the top flange, spaced somewhat upwardly from the top wall of the pedestal unit, engages snugly on top of the bottom flange of a channel member **65**, the top flange of which is secured to the bottom face of the desk top assembly.

The desk top assembly comprises a rectangular sheet metal plate **71** with downturned flanges **73** around all four sides, and a core or filling **75** such as wood or plywood or composition, the bottom face of which is flush with the bottom edges of the side flanges **73**. The above-mentioned channels **65** are fastened to the bottom face of the core or filling **75** by any suitable means such as screws or other fasteners. It will be noted especially from FIGURE 4 that the channels **65** are placed in such positions on the undersurface of the desk top panel that the vertical flanges of these channels fit snugly between the vertical front wall of the flange **57** on the back panel member, near the rear edge of the desk, and the vertical rear wall of the front apron bar **31** at the front of the desk.

It is pointed out that the channels **65** do not extend continuously from one end to the other of the desk, but are omitted in the central part or knee space of the desk, the channels being located only over the locations where the pedestals will be, when two pedestals are installed at opposite ends of the desk. Since the knee space between the pedestals is wider than the width of each pedestal (in a direction lengthwise of the desk) as plainly seen in FIGURE 1, it follows that a pedestal to be installed in the desk can be located initially in the knee space, then the Z-bars **63** of the pedestal can be lined up with the channels **65**, and the pedestal can then be moved in a direction lengthwise of the desk toward the corner where it is to be located. When moved to the home position or final assembly position by sliding it lengthwise along the desk, the pedestal may be held in such position by the latches shown in FIGURES 9 and 10.

The latter latch (FIGURE 10) comprises a pivoted latch member **81**, pivoted on the pivot **83** on the bottom face of the bottom cross bar **25** of the adjacent end frame, and adapted to be swung from the broken line position shown in FIGURE 10 to the full line position, where a notch in the latch member **81** engages the shank of a thumb screw **85** screwed into a tapped opening formed in the bottom wall of the pedestal unit **61** and in a reinforcing plate **87** welded to such bottom wall. When the thumb screw **85** is tightened, the latch **81** holds the pedestal unit from being displaced in a direction toward the center of the desk from its intended corner location.

In addition to the pivoted latch **81** at the bottom of the pedestal unit, for holding it in assembled position, there are preferably also two pivoted latches at the top of each pedestal unit, one near the front and one near the back, cooperating with the Z-bars **63**. These latches are in the form of Z-shaped members indicated in general at **91** (see FIGURES 8 and 9) each having a horizontal top flange **91*a*** pivoted on the pivot **93** to the top flange of the channel **65**. Another flange **91*b*** of the latch member **91** extends vertically downwardly, and terminates in another horizontal bottom flange **91*c*** constituting a handle to be grasped so as to turn the Z-shaped latch member **91** on its pivot. When swung aside from the position shown in FIGURE 8 to the broken line position of FIGURE 9, it does not interfere with the assembly or disassembly movement of the pedestal, sliding it along the channels **65**. When assembly is completed, the handle portion **91*c*** of the latch **91** is grasped and it is swung on the pivot **93** so that the vertical flange portion **91*b*** of the latch slides into a notch **95** in the lower flange of the channel **65** and extends across the end of the Z-bar **63** closest to the center of the desk, engaging tightly with the Z-bar to prevent movement of the pedestal unit toward the center of the desk.

Secured to the top rail **23** of each end frame, on the side thereof faced toward the center of the desk, is a channel member **101**, extending horizontally along the member **23** as seen in FIGURES 4 and 5. The vertical flange or wall of this channel member is secured to the vertical side of the member **23** by any suitable means such as welding or screws. A bottom horizontal flange of the channel member overlies snugly the adjacent part of the upper surface of the pedestal member **61**. The upper horizontal flange of the channel member **101** is flush with the top surface of the member **23** of the end frame, and thus, like the member **23**, makes contact with the lower surface of the desk top panel. The desk top panel has, near each end, in a position close to the edge of the top flange of the channel **101**, a pair of pivoted cleats or buttons **103** (FIGURE 4) which when turned to one position will clear the edge of the channel **101**, and when turned to another position at right angles to the first position, will tightly underlie the top flange of the channel **101**, thus anchoring the desk top panel to the flange **101** and thereby to the end assembly, in addition to the other anchoring means described.

With this construction as above described, the distributor or dealer may stock a limited number of subassemblies or units, from which a variety of desks may be quickly and easily assembled when needed. Moreover, when a desk of particular kind has been assembled, the parts are anchored quite rigidly to each other, so that the resulting final desk is extremely sturdy and rigid.

A typical assembly operation may be briefly outlined. It is usually easier to assemble the desk in an upside-down position, and then turn it right side up when assembly has been completed, but to avoid possible confusion as to the terms "top" and "bottom" and the like, the assembly operation will be described as though the desk were assembled right side up.

Two end frame units are first connected to each other by means of the apron bar **31** at the front, and the back panel **41** at the rear, extending between the two end

frames. The connecting studs are placed through the respective slots **27** and **29** and the respective nuts are tightened, completing the assembly of the end frames to the longitudinal members **31** and **41**. The top panel **71**, **73**, **75** is placed in position and secured by turning the buttons or cleats **103** at right angles to their initial positions. It will be remembered that when the top panel is assembled to the previous subassembly consisting of end frames and longitudinal members, the channels **65** on the top panel fit snugly between the front longitudinal member **31** and the rear longitudinal member **57** on the panel **41**.

If it is now desired to have a pedestal **61** at the left end of the desk, the proper pedestal unit of the desired design is selected, and is initially placed near the center of the desk (in what may be called the knee space) until the Z-bars **63** on the pedestal unit are lined up with the channels **65** on the desk top panel; then the pedestal unit is slid sideways toward the left end of the desk, interlocking the Z-bars with the channels. When the pedestal unit is slid to its final home position, it is maintained in such position by swinging the pivoted latch **81** to its effective position and tightening the thumb screw **85**; also by swinging the pivoted latches **91** on their pivots **93**, so that they engage with the ends of the Z-bars **63** and prevent the pedestal unit from being slid back toward the center of the desk. The assembled pedestal unit now fills the left hand corner of the desk frame.

If a pedestal unit is desired at the right hand end of the desk, the desired unit is selected, and it may be of the same design or different design from the pedestal unit used at the left end. In either event, the outside dimensions are the same, as above explained, and the pedestal unit is assembled in a manner similar to that already described for the left hand unit. That is, it is inserted first in a position at the center of the desk, then slid rightwardly toward the right hand corner, interlocking the Z-bars **63** of this pedestal unit with the channel members **65** on the desk top panel. The unit is fastened in place in the same manner as the left hand unit, by using the pivoted latch **81** at the bottom and pivoted latches **91** at the top.

If it is desired to have a desk with no back panel, the back panel **41**, **43**, etc., is omitted, and in place of it, an apron bar is used, identical with the front apron bar **31** above described. This is fastened to the top rear corners of the end frames, just as the apron bar **31** is fastened to the top front corners. Another rear apron bar of the same construction may be placed at a lower elevation between the end frames, held by bolts engaged with the keyhole slots **29**, if desired.

In the final assembly, it is seen that vertical movement of the assembled parts relative to each other is impossible because the apron bar **31** at the front edge, and the similar apron bar or the bent flange **59** at the rear edge, are snugly retained in a vertical direction between the top panel which overlies these members, and the upper face of the pedestal **61** which underlies these members. Moreover, the top panel cannot move upwardly relative to the end frames because of the interengagement of the Z-bars **63** on the pedestal units with the channels **65** on the top panel unit, which ties the top panel to the pedestal, and the pedestal in turn cannot move upwardly relative to the end frame because it underlies the channel **101** on the end frame. Also, even at an end of the desk where no pedestal is used, the top panel cannot move upwardly relative to the end frame because of the buttons or cleats **103** engaging the channel **101**. The top panel cannot move forwardly or rearwardly relative to the end frames because of the snug fit of the channels **65** against the members **31** and **57**, and it cannot move endwise because the outer ends of these same channels **65** fit snugly against the faces of the top bars **23** of the end frames. Hence a very rigid construction is provided, firmly fastening all parts together, but nevertheless enabling the desk to be disassembled when necessary, by a reverse procedure to the assembly procedure above described and disclosed.

It is seen from the foregoing disclosed specification that the objects, advantages and purposes of the invention are well fulfilled. It is to be understood that the foregoing disclosure of invention is given by way of illustrative example only, rather than by way of limitation, and that without departing from the invention, the details may be varied within the scope of the appended claims.

What is claimed is:

1. A desk structure comprising a pair of end frames, a top unit resting on and supported by said end frames, a pedestal unit in a corner between said top unit and one of said end frames, a portion on said one of said end frames overlying said pedestal unit to prevent upward movement of said pedestal unit relative to said one of said end frames, and a portion on said pedestal unit overlying a portion of said top unit to prevent upward movement of said top unit relative to said pedestal unit, thereby also preventing upward movement of said top unit relative to said one of said end frames.

2. A construction as defined in claim **1**, in which portions on said top unit and pedestal unit comprises a channel on one of said units and a Z-bar on the other of said units.

3. The construction as defined in claim **1**, in which means forming guideways are provided on the underside of said top unit near each end thereof, said guideways extending in a direction lengthwise of the desk structure and being so placed that there is a substantial gap between the adjacent ends of the guideways near one end of the desk structure and those near the other end thereof, the parts being so arranged that said pedestal unit may be placed substantially against the underside of said top unit centrally thereof, with the guideways of said pedestal unit aligned with the guideways of the top unit in said gap, and then may be moved along the guideways of the top unit toward one end of the desk structure to a final assembled position.

4. A construction as defined in claim **3**, further including latch means for latching said pedestal unit, when in final assembled position, to the adjacent end frame.

5. A construction as defined in claim **3**, further including means mounted on said top unit for holding said pedestal unit, when in final assembled position, against movement along said guideway on said top unit in a direction toward the center of said desk structure.

6. A construction as defined in claim **3**, wherein the guideway on said pedestal unit is tightly engaged with the guideway on the top unit, when in final assembled position, to prevent vertical separation movements of said two units relative to each other, said construction further including a part on said pedestal unit underlying a part on the adjacent end frame to prevent upward movement of said units relative to said end frame.

7. A construction as defined in claim **6**, further including interengaging slidable guideway means on said pedestal unit and said top unit so arranged that said pedestal unit may be mounted in hanging relation to said top unit by a sliding motion approximately horizontally in a direction toward the end of thed esk where it is to be mounted and may be detached from said top unit by a sliding motion in a reverse direction toward the opposite end of the desk.

8. The construction as defined in claim **3** wherein at least two pedestal units each have at its top two horizontal flanges for engaging with horizontal bottom flanges at one end of said top unit so that each pedetal unit may be hung from said top unit, each pedestal unit being snugly engaged beneath said second horizontal flange of the adjacent end frame unit, and means holding each

pedestal unit against movement in a direction horizontally away from the adjacent end frame unit.

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