Feb. 23, 1971 S. W. BRACY ET AL 3,565,502

CANTILEVER MOUNTED LABORATORY EQUIPMENT MODULE SYSTEM

Filed April 16, 1969 3 Sheets-Sheet 1

Fig. 1.

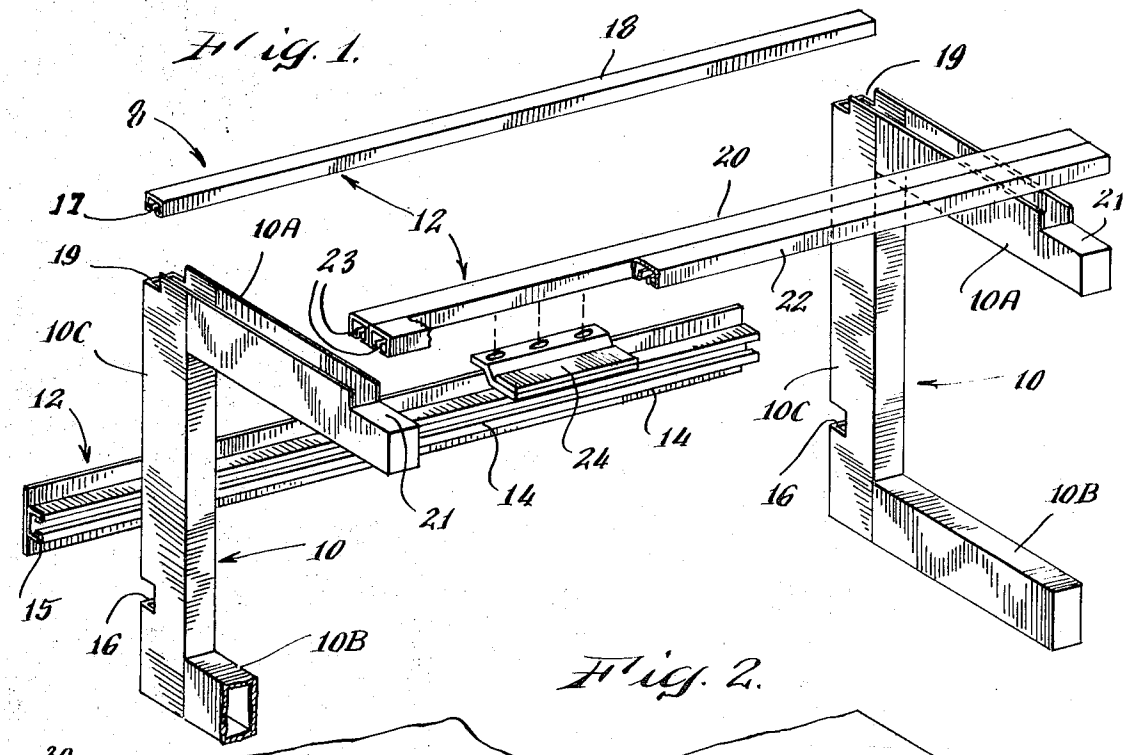
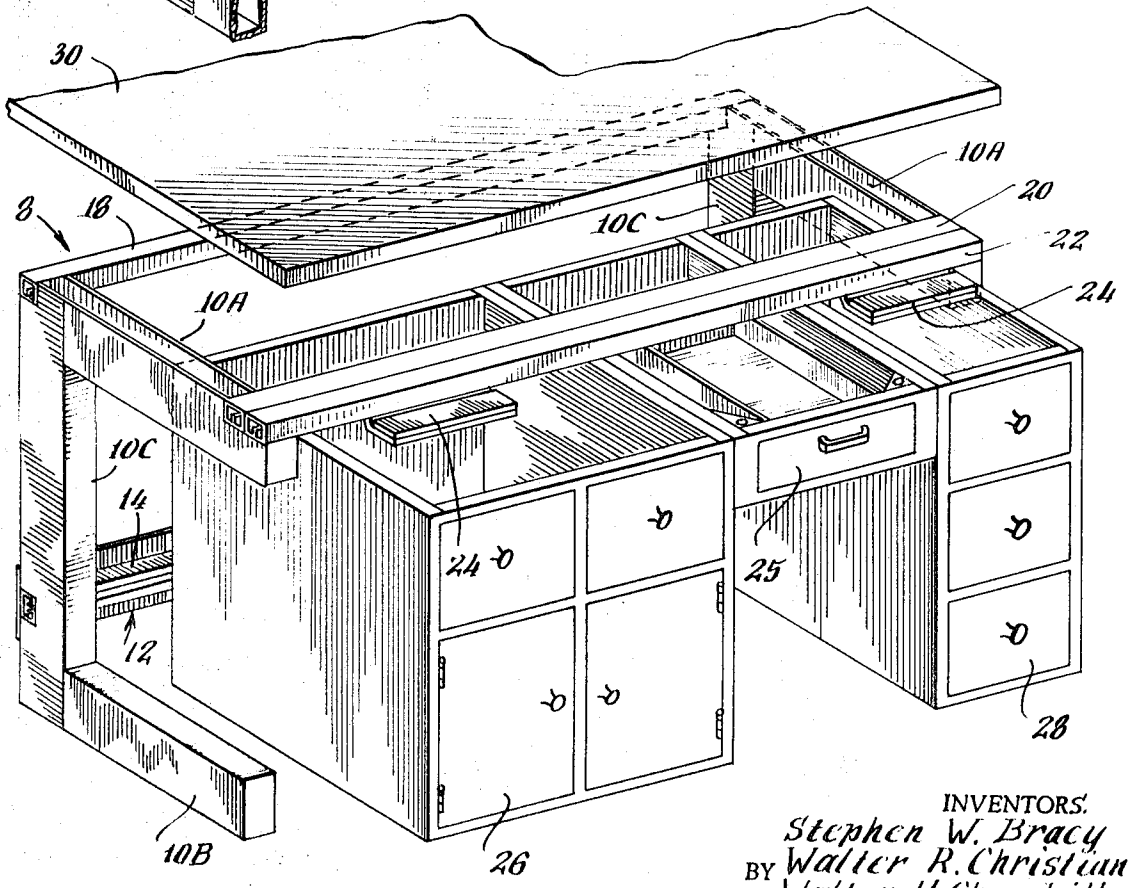


Fig. 2.



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Filed April 16, 1969 3 Sheets-Sheet 2

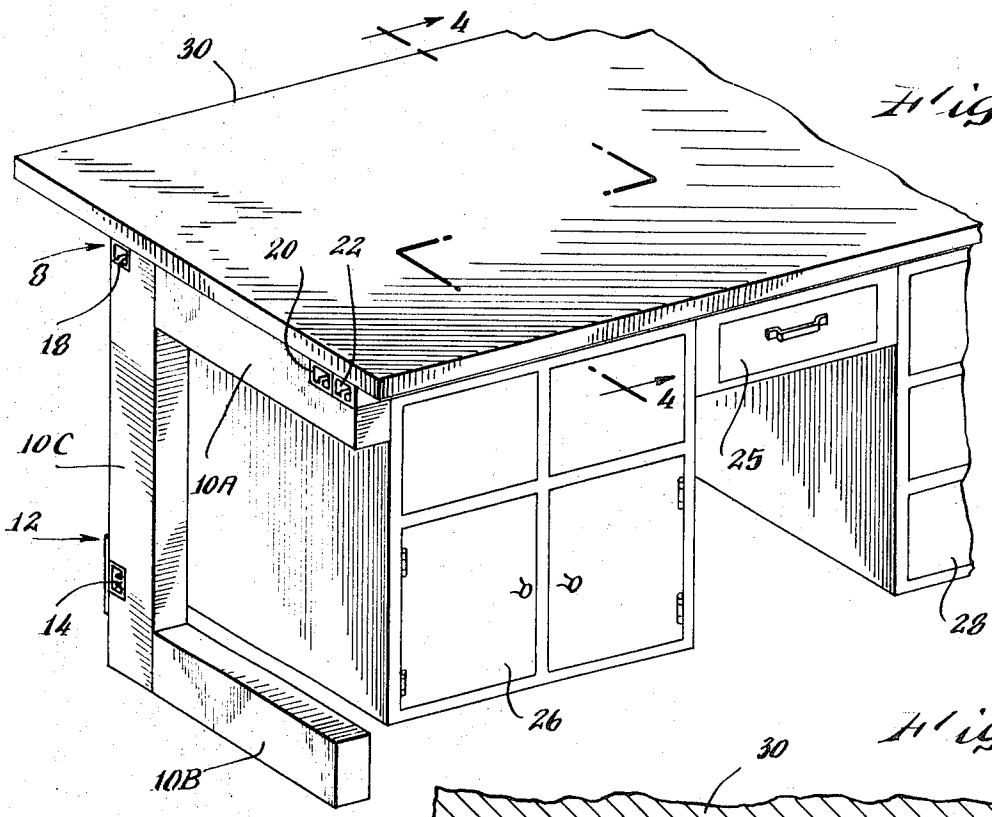


Fig. 3.

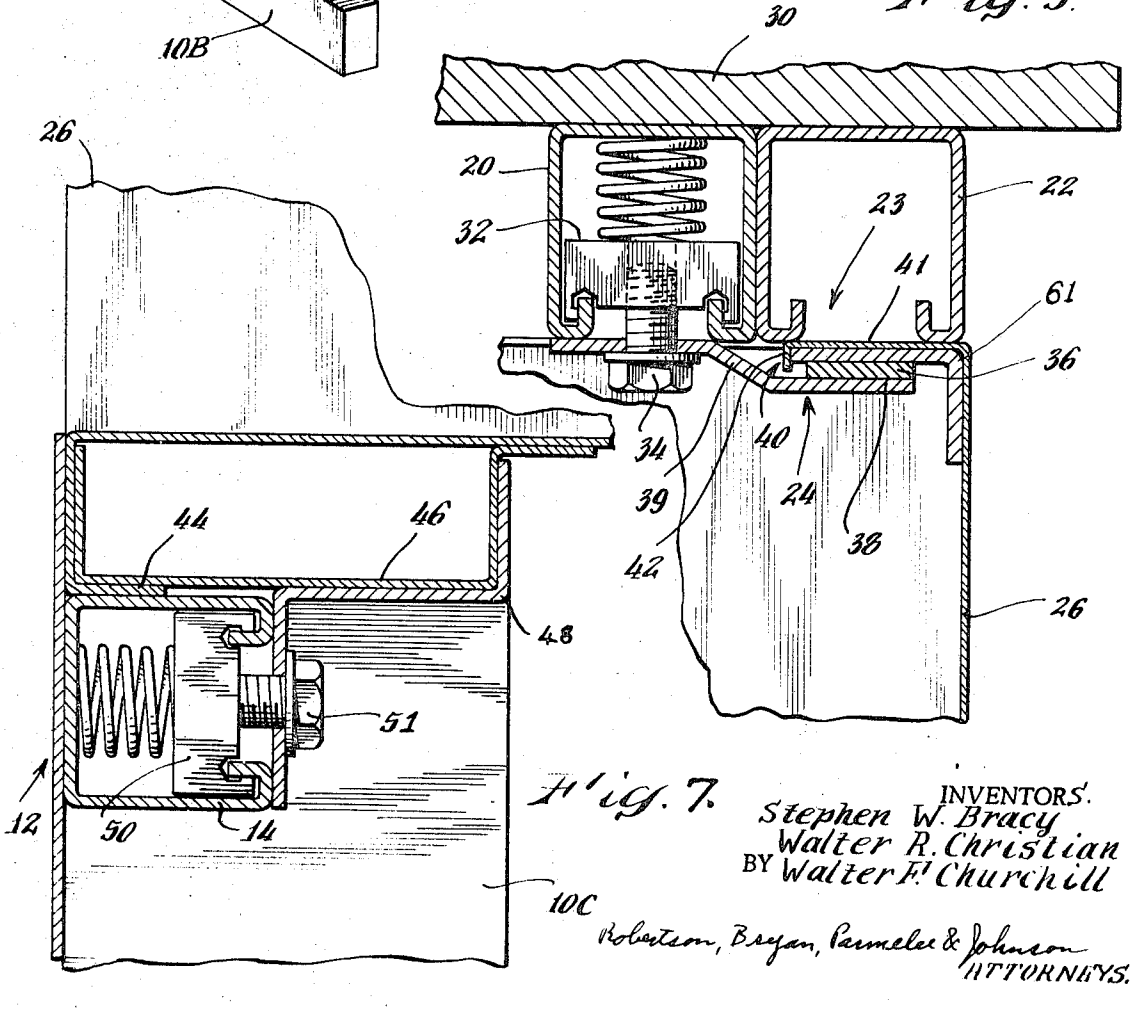


Fig. 5.

Fig. 7.

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Filed April 16, 1969 3 Sheets-Sheet 3

Fig. 4.

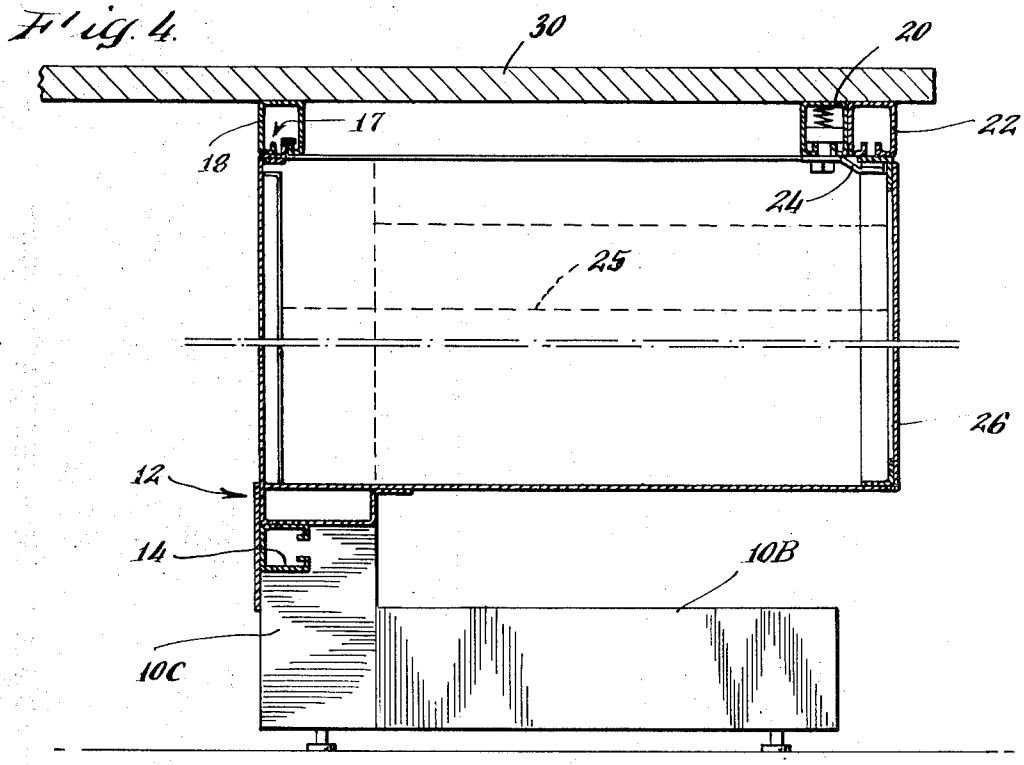


Fig. 6.

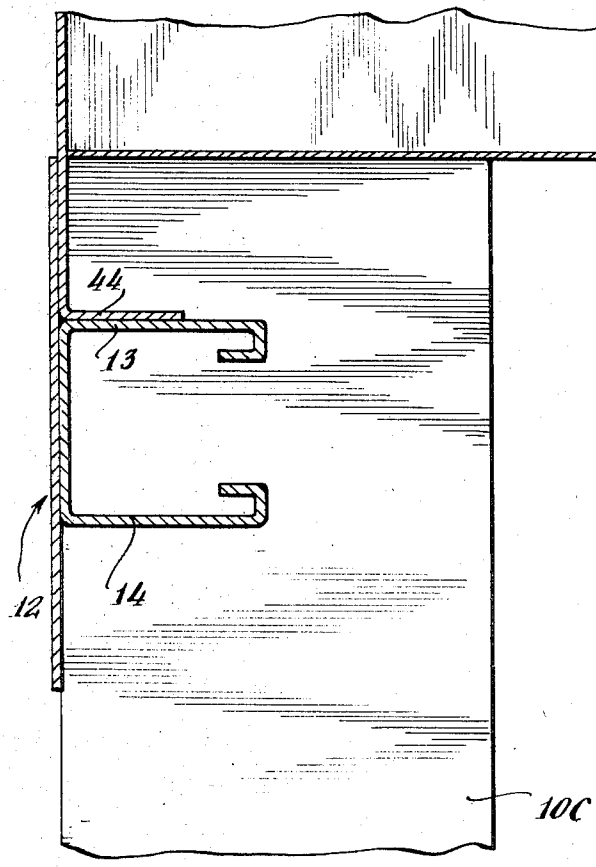
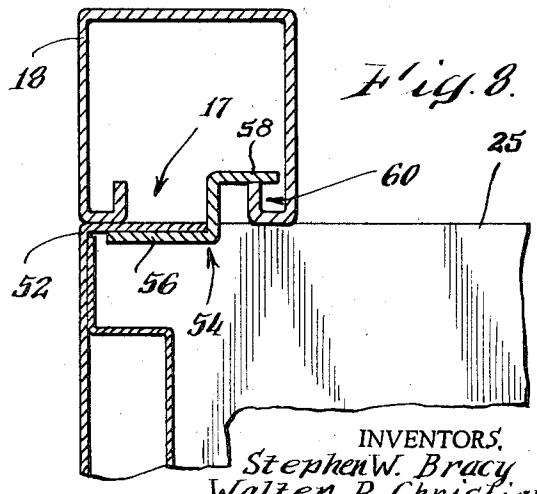


Fig. 8.



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3,565,502

CANTILEVER MOUNTED LABORATORY EQUIPMENT MODULE SYSTEM

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Int. Cl. A47b *43/00, 47/00*
U.S. Cl. 312—257 5 Claims

ABSTRACT OF THE DISCLOSURE

A rigid C-shaped laboratory equipment support structure which provides means for cantilever support and rapidly attaching, detaching, and interchanging modules such as drawer sections, cabinets and the like.

FIELD

This invention relates to an interchangeable module mounting system used primarly for laboratory equipment.

PRIOR ART

The concept of cantilever mounting is known in the art. Specifically, desks have utilized a cantilever suspension in an attempt to provide flexibility and interchangeability to drawer sections, cabinets and the like which will comprise the completed desk or laboratory table. However, none of these desk structures have achieved any significant degree of simplified flexibility with respect to the mounting structure size or module type. Those that have achieved some degree of flexibility in this respect have proved cumbersome and complicated when attaching and detaching drawer sections.

One known type of cantilever laboratory equipment system employs a wall mounted channel from which desired modules are hung. This system offers flexibility for clamping modules, but the wall support means requires time and expense to install, takes up space, and is permanently bolted to the wall, limiting the structure's utility. Since the module is attached to a channel at its rear portion, ease of attachment and detachment suffers.

OBJECTS

An object of the present invention is to provide a high degree of flexibility both in location of the mounting structure and as to the interchangeability of modules.

A further object is to provide a cantilever module support structure providing for extremely rapid attachment, detachment, and interchangeability of modules.

A further object is to provide a self-supporting system not needing wall support.

A further object is to provide a cantilever module support structure upon which a counter top can be mounted without clamping or module support.

A still further object is to provide a more inexpensive cantilever module mounting system.

BRIEF SUMMARY

C-shaped members of the same general size, being located in a generally spaced parallel arrangement are formed by welding or bolting two horizontal members to a vertical member. These C-shaped members provide a rigid mounting structure when attached to a front cross-bracing channel and a rear cross-bracing channel. The cross-bracing channels provide rigidity to the structure as well as serving as support means for the module. The modules, being desk and drawer sections, cabinet sections, drawer sections, and the like, are then mounted on the structure.

The module is brought to the structure by using any conventional means, such as a dolly. The lower rear edge of the module is then placed on the lower cross-bracing channel and the module is then rotated slightly upward until the upper front edge locks into a hanger plate which is bolted to the front cross-bracing channel. The bolts are then further tightened to provide rigid but easily detachable support between the mounting structure and module.

Various features and advantages of this invention will appear more clearly from the following description given with reference to the accompanying drawings in which a typical embodiment of the invention is illustrated.

DRAWINGS

FIG. 1 is a perspective view showing the module support structure;

FIG. 2 is an exploded view of the support structure and module;

FIG. 3 is a perspective view showing a typical module arrangement when mounted on the support structure of FIG. 1, forming the completed laboratory equipment system;

FIG. 4 is a cross-section view in large scale along line 4—4 of FIG. 3 showing how the module is supported;

FIG. 5 is a partial cross-section view showing the front support arrangement;

FIG. 6 is a partial cross-section view showing how the rear of the module is held in position;

FIG. 7 is a partial cross-section view showing how the rear of the module is held in position using a clip support arrangement;

FIG. 8 is a partial cross-section view showing how the rear of the drawer housing is supported.

DETAILED DESCRIPTION

FIG. 1 shows one form of my cantilever support structure **8** for interchangeably mounting modules, drawer sections, and the like. There are two C-shaped module supporting members **10** arranged in a vertically extending spaced, generally parallel relationship. Each of the C-shaped members having an upper horizontal portion **10A** and lower horizontal portion **10B** welded to a vertical center portion **10C** to form the C-shaped member **10**.

A cross-bracing means **12** extends between and is attached to the C-shaped members **10**; the cross-bracing means has a lower rear cross-bracing channel **14** which is fastened, as for example by screwing, into the vertical portions **10C** of the two C-shaped members **10**. The bite end **15** of the channel **14** rests forward, in a groove **16** provided in the vertical portion **10C** of the C-shaped members **10**. An upper rear cross-bracing channel **18** is bolted with spring loaded nuts (not shown) in each C-shaped member in a groove **19** in the vertcial portion **10C**, with its bite edge **17** facing downward. This member **18** provides a means for clipping the rear portion of the drawer housing to the structure, see FIG. 8. The third part of the cross-bracing means is a top support being two front cross-channel members **20, 22** which are bolted with spring loaded nuts (not shown) to the upper horizontal portions **10A** of the C-shaped members **10** in grooves **21** with their bite edges **23** facing downward. An attaching means here being illustrated in part as a hanger plate **24**, is fastened to the rearward upper front cross-bracing channel **20** with spring loaded nuts, see FIG. 5. The hanger plate **24** can be readily attached, detached, or moved along the channel member **20** to the portion of the channel at which it is desired to mount a module. The desired number and type of modules are then mounted.

FIG. 2 is an exploded view of the laboratory equipment apparatus prior to assembly. Hanger plates **24** are loosely fastened to channel member **20** with spring loaded nuts.

Typical modules **26** and **28** are brought to the support structure. The rear portion of the modules is rested on the lower rear cross-bracing channel **14** and pushed rearward and upward until capture by the hanger plate **24**. The module **26** is at this point in a loose lock capture position. The module **26** can be moved laterally to its proper position and the hanger plate **24** tightened to grip and firmly lock module in place, see FIG. 5. This is the firm lock position.

The rear portion of drawer housing **25** is clipped to the upper rear cross bracing channel **18** and the front portion is bolted with spring loaded nuts (not shown) to the front cross bracing channel **20**. When properly adjusted laterally, the bolts are tightened thereby locking the drawer housing **25** firmly in position. The counter top **30** is then attached to the support structure **8**.

FIG. 3 shows a typical module combination attached to the support structure **8** forming the completed laboratory equipment apparatus. Drawer housing **25** is held in place at its rear by being clipped to rear cross-bracing channel **18**, see description of FIG. 8, and attached to the most rearward front cross-bracing channel **20**, with spring loaded nuts in the manner previously described. The modules **26** and **28** can be brought to the assembled support structure **8** by the use of a dolly or other conventional means. The rear portion of the modules **26** and **28** is moved back until it rests on rear cross-bracing channel **14**. The front portions of modules **26** and **28** are then rotated upwardly until they engage hanger plate **24**, see FIG. 4. The modules are then pushed back slightly, so that the rear cross-bracing channel **14** is made to support more of the modules **26** and **28**. In this loose lock position the modules **26** and **28** can be properly located laterally and locked firmly as previously described. Counter top **30** is then attached to the structure **8**. End caps may then be placed over the cross-bracing channel ends to provide a more pleasing appearance.

The specific form of the laboratory apparatus shown in FIG. 3 is only illustrative and it should be obvious numerous module combinations or arrangements are also possible. It should be apparent that structure **8** may be utilized with counter top **30** without the modules **26** and **28** being mounted to the structure **8**. Counter top **30** may rest upon the upper horizontal member **10A** and cross-bracing channels **18**, **20** and **22**. It should also be obvious that counter top **30** in structure **8** may have a sunken portion forming a sink or be any other kind of laboratory top desired.

If plumbing and gas lines are to be utilized with the structure and its location desired to be kept rather permanent it should also be obvious that the rapid and easy assembly afforded by the system is highly advantageous.

FIG. 4 illustrates in cross section how the modules and drawer housing is attached to the support structure. For specific descriptions of each module and housing support means, see description of FIGS. 5–7.

FIG. 5 shows one form of the upper front attaching means. The hanger plate **24** is securely but loosely fastened to the most rearward front upper cross-channel **20** by using a spring load nut **32** and bolt **34** fastening means. A metal buttress strip **36**, spot welded to the lower front portion **38** of the hanger plate **24** becomes its upper front portion **36**. A difference in width between the lower front portion **38** and upper front portion **36** of the hanger plate **24** along with a bend in its middle portion **39** provides a groove **40** for the reception of a return bend **42** in the top front edge **41** of the module **26**. When engaged, the top front edge **41** and buttress angle **61** of the module **26** are held between the upper front portion **36** of the hanger plate **24** and the bite edge **23** of the most forward upper front cross-channel **22**.

When the module **26** is properly located laterally hanger plate **24** is then tightened by turning bolt **34** into spring loaded nut **32**. This turning develops a moment of force

with the fulcrum at the point of contact between the most rearward bite section of cross channel **20** and the hanger plate **24**, see FIG. 5. This force is transmitted by hanger plate **24** into a compressive contact between buttress strip **36** and the module **26**. This compresive force is distributed over a sizable area of the top front edge surface **41** of the module **26** firmly locking the module **26** to the mounting structure **8**. This method uniquely distributes the weight load of each module over a sufficient area so as to eliminate sag or flexure between the modules **26** and **28** and the bracing cross-channel **20**. Thus, no screw holes, cut outs or rework to the module **26** or the top front edge surface **41** are required.

FIG. 6 illustrates the lower rear cross-channel supporting means. The bottom rear edge **44** of the module **26** is supported merely by resting on upper side **13** of the lower rear cross-channel **14**.

FIG. 7 is an illustration of an alternate scehme of support for use at the lower rear cross-channel supporting means. The bottom rear edge **44** of the module **26** is placed on the rear cross channel **14** described with reference to FIG. 6, a supporting clip **46** is then placed against the bottom rear edge **44** of the module **26** and allowed to extend outward. A retaining clip **48** is then removably fastened to the bite end of the lower rear cross-channel **14** by a spring loaded nut **50** and bolt **51**. Generally, by turning bolt **51** into the spring loaded nut **50**, a moment of force is developed with the fulcrum at the point of contact with the lower bite edge of rear cross channel **14** and the retaining clip **48**. This force is transmitted into a compressive force between the upper vertical edge of the retaining clip **48** and the rear of cross-bracing channel **14** thus securely locking the module **26** without the use of screw holes, cut outs and the like.

FIG. 8 shows one means of supporting the rear of the drawer housing **25**, see FIG. 4. The housing **25** is supported at its rear edge **52** by being clipped to the rear cross-bracing channel **18**. As illustrated an offset clip **54** provides the supporting means. The rear portion **56** of the offset clip **54** is welded to the rear drawer housing edge **52**. The front portion **58** of the offset clip **54** is then hung from the most forward bend **60** in the bite edge **17** of the rear cross bracing channel **18**. This arrangement provides proper support for the rear of the housing but allows rapid attachment or detachment. The front portion of the drawer housing **25** is supported by spring loaded nuts and bolts which engage cross-bracing channel **20** as discussed in the description of FIG. 2.

This apparatus employs the invention-method of rapidly and interchangeably mounting modules. The first step in this method is to place the module which is desired to be mounted near the desired portion of the front upper cross-bracing means. This can be accomplished by placing the module on a dolly or other conventional transporting apparatus and moving the module to the supporting structure. When positioned at the proper portion of the upper front cross-bracing means where mounting is to take place, the module is then moved back while still on the dolly until it rests on a lower rear cross-bracing means. The front top edge of the module is then rotated upward until its edge engages an attaching means, such as hanger plate. The module is then pushed rearward slightly to provide more stable support. At this point the attaching means, hanger plate, is more securely fastened to the cross-bracing member by tightening the front top edge of the module securely to the hanger plate, as for example through the use of spring loaded nuts.

What is claimed is as follows:

1. A cantilever supporting structure for interchangeably mounting modules such as a drawer and cabinet section and the like comprising two C-shaped module supporting members arranged in vertically extending, spaced, generally parallel relationship, each of said members being similarly shaped and having an upper substantially horizontal portion, a subjacent vertical portion

and a lower substantially horizontal portion; cross-bracing means transversely extending between and attached to said generally parallel C-shaped members to provide a rigid construction, said cross-bracing means being an upper cross channel extending between and attached to the upper substantially horizontal portions of said C-shaped members near its front and the second cross channel being a lower cross channel extending between and attached to said subjacent vertical portions of said C-shaped members near their bottom; whereby said module is supported by having its rear bottom portion supported by said lower cross-bracing means and its top front portion removably attached to said upper cross channel bracing means.

2. A support structure according to claim 1 upon which a counter top can be supported on said upper substantially horizontal portions and said upper cross channel independently from the modules or any module attaching means.

3. A support structure according to claim 1 in which said cross-bracing means includes a rear brace extending between said C-shaped members and rigidly attached thereto at a position where said vertical portion is joined to the upper horizontal portion and means for supporting a drawer housing in part from said brace.

4. A module support structure for removably mounting modules comprising a C-shaped horizontally extended structure for receiving and supporting said modules within the C-shaped cavity formed therein, said structure

having an upper horizontal forwardly projection portion, a vertical rear portion and a lower horizontal portion adapted to rest on the floor; means for supporting said modules at their rear bottom edge from said vertical rear portion of said C-shaped structure and means for removably attaching said modules at their top front edge to said forwardly projecting portion of said C-shaped structure.

5. An improved cantilevered method of module mounting comprising the steps of providing a floor supported cantilever support of a C-shape, supporting the bottom of a module at its lower rear and removably attaching the top front of said module to support the same at its upper front part, all to said support whereby the front attachment provides a fast and easily detachable mount for modules of desk, cabinets, and the like.

References Cited

UNITED STATES PATENTS

3,042,473	7/1962	Vincens	312—257
3,104,138	9/1963	Renaud	312—195
3,370,521	2/1968	Honerkamp	312—257X

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U.S. Cl. X.R.

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