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Scheerhorn et al.

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[54] **ATTACHMENT MEANS FOR MODULAR FURNITURE CONSTRUCTION**

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[73] Assignee: **Steelcase, Inc.,** Grand Rapids, Mich.

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[52] **U.S. Cl.** **312/280,** 312/281

[51] **Int. Cl.** **A47b 96/06**

[58] **Field of Search** 312/194, 195, 196, 197, 312/277, 281, 280

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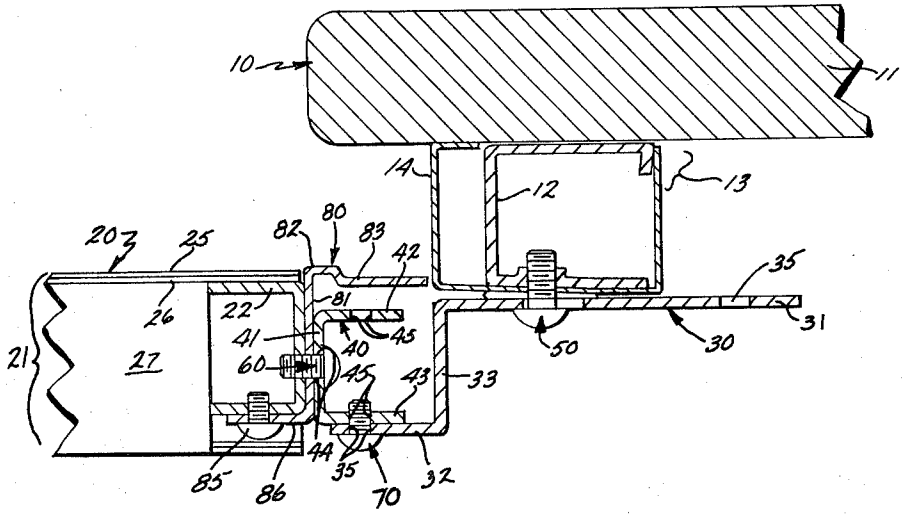
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Primary Examiner—Paul R. Gilliam
Assistant Examiner—Carl Pietruszka
Attorney, Agent, or Firm—Price, Heneveld, Huizenga & Cooper

[57] **ABSTRACT**

A wing unit is joined to a desk by a bracket system in which a first bracket is joined to the desk top, a second bracket is joined to the wing unit and the two brackets are joined to one another. The desk top bracket includes two generally parallel flanges joined by a step flange, each flange including means for joining to the wing unit bracket. The wing unit bracket is generally channel-shaped, including two spaced generally parallel flanges, each being adapted for joining to either of the flanges of the desk top bracket. The desk top bracket can be oriented with either of its flanges adjacent the wing unit, and this adjacent flange can be joined to either the top or bottom flange of the wing unit bracket, thereby making it possible to join together desks and wing units of several different relative heights.

13 Claims, 5 Drawing Figures



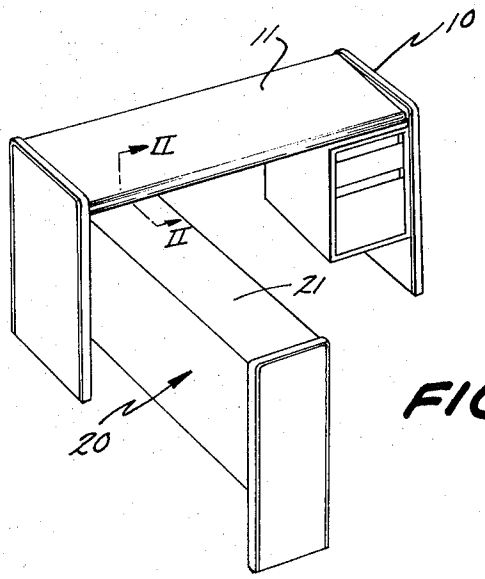

11
10
II
II
21
20

FIG. 1.

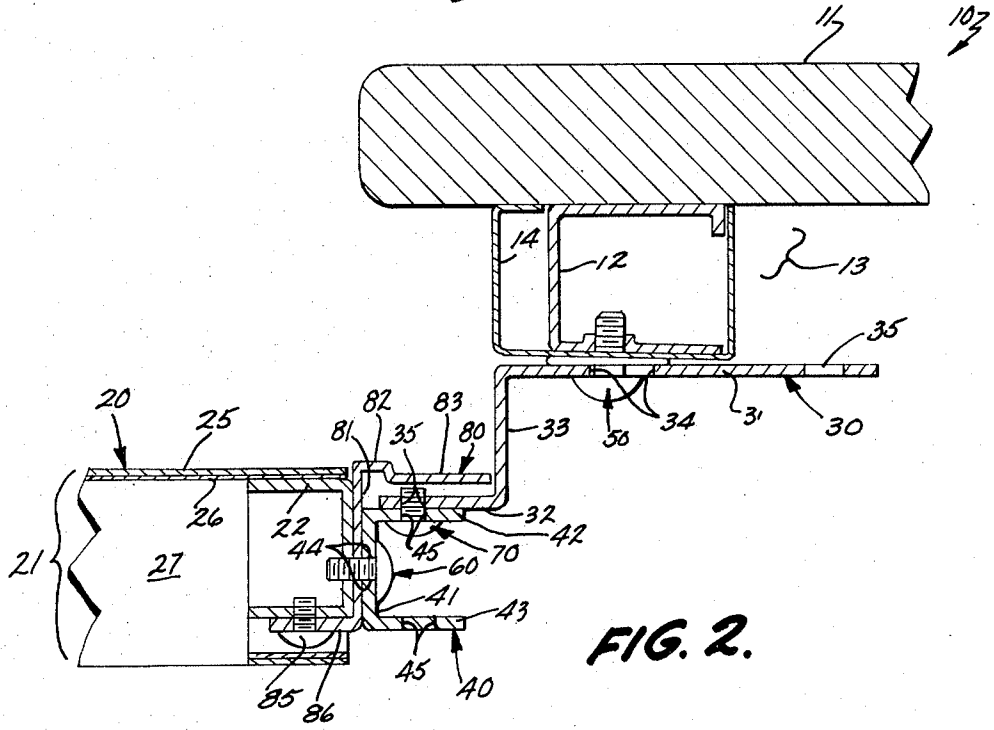

11
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82
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70
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40
85
86

FIG. 2.

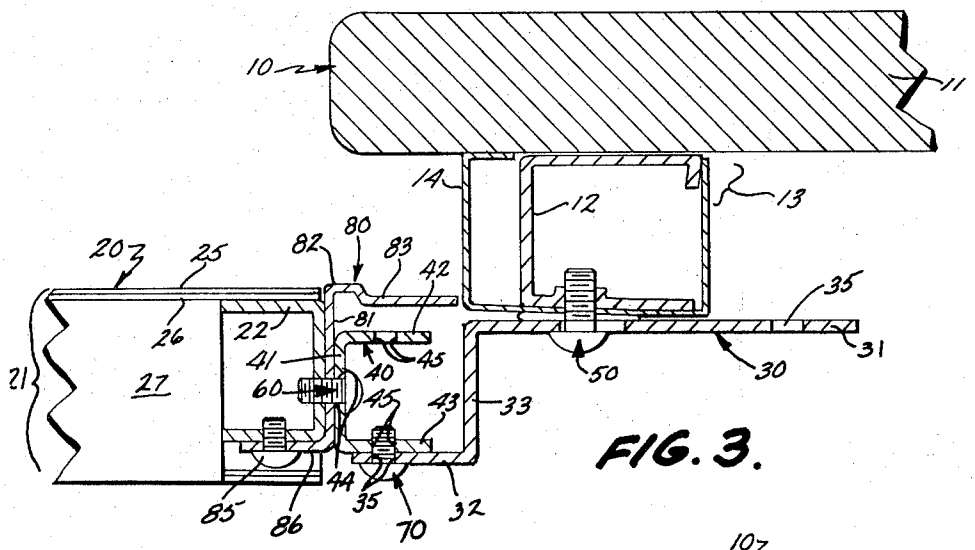


FIG. 3.

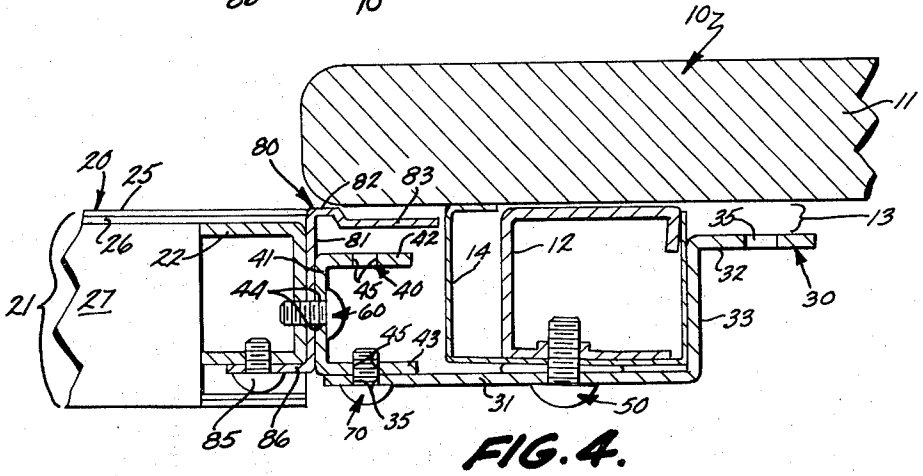


FIG. 4.

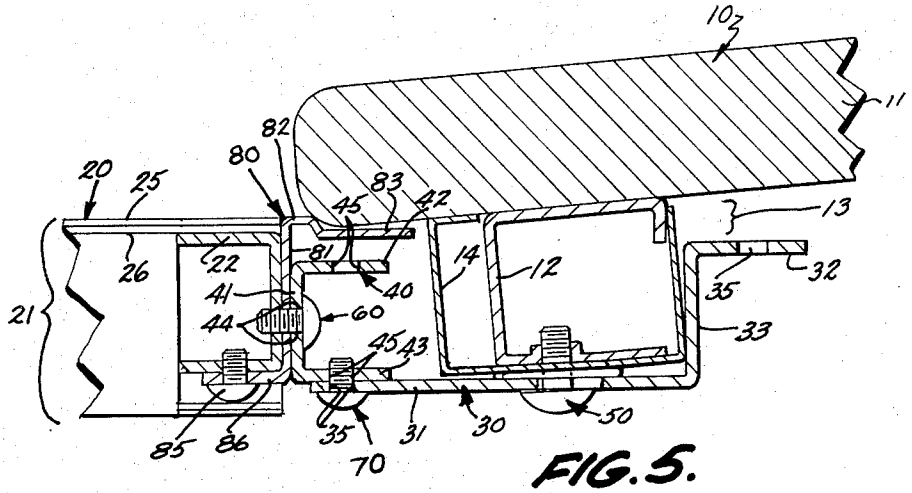


FIG. 5.

ATTACHMENT MEANS FOR MODULAR FURNITURE CONSTRUCTION

BACKGROUND OF THE INVENTION

The present invention relates to furniture systems such as desks and wing units therefor. Specifically, it relates to means for attaching such wing units to desks.

Generally, some type of bracket is used to join a wing unit to a desk. The bracket may hook over the drawer of a desk, or it may be connected directly to the desk top. While many desk and wing unit combinations are available, each requires its own specifically designed bracket. One bracket is required where the desk top and wing unit are generally the same height and another bracket is required for each situation in which the desk top and wing unit top are of a different relative heights. Desks and wing units of several different relative heights require several different specifically designed brackets for each combination.

SUMMARY OF THE INVENTION

The present invention comprises a bracket system for use in conjunction with a furniture system in which desks and wing units have several different heights relative to one another. A single bracket system can be employed to join wing units and desks of several different relative heights. This development is especially useful in a new furniture system in which the desk top of the desk can be positioned at several different alternative levels and in which the desk top can even be tilted. This system is described in several copending applications assigned to the assignee of this invention, all filed on June 1, 1973, and entitled "END PANEL SUPPORT SYSTEM", Ser. No. 366,218 "SUSPENDED PEDESTAL DESK", Ser. No. 366,155, and "TILTABLE DESK TOP", Ser. No. 366,161. It is also conceivable that the invention can be employed in connection with desks and wing units of differing relative heights, even though the different units are not designed to be part of a single system.

These objectives are accomplished by a bracket system in which a first bracket is joined to a desk and a second bracket is joined to the wing unit. Joining means join the first and second brackets together in either one of a first and second position with respect to one another, said first and second positions placing the securing means whereby the brackets are secured to their respective desk and wing unit on different levels. In this manner, these two brackets can be used to attach together desks and wing units of at least two different relative heights.

Preferably, at least one of the brackets includes first and second joining points for cooperating alternatively with the joining means. The bracket is adapted for securing to its respective desk or wing unit with either its first or second joining points in position adjacent the other brackets. The first and second joining points are on different levels whereby still a larger number of wing units and desks of different relative heights can be joined together.

Another unique feature of the present invention constitutes a trim piece which can be used to hide the two brackets and the joining means joining them together. This trim piece projects outwardly from the end of the top of the wing unit and completely covers the bracket joined to the wing unit. The bracket joined to the desk top has spaced flanges projecting in opposite direction,

the first joining point being positioned on one of the flanges and the second joining point being positioned on the other. Because of this arrangement, the trim piece will always cover the protruding flange of the desk top bracket, since the flange which is not being used will be projecting rearwardly to a position beneath the desk top.

These and other objects, advantages and features of the invention will be more fully understood and appreciated by reference to the written specification and appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a desk and wing unit of the type which can be joined together by the bracket system of this invention;

FIG. **2** shows a fragmentary cross-sectional view taken generally along the plane II—II of FIG. **1,** with the bracket system adapted to join a desk and wing unit having the greatest difference in height;

FIG. **3** is a fragmentary cross-sectional view taken along the same plane as FIG. **2** with the bracket system adapted to join a desk and wing unit having an intermediate difference in height;

FIG. **4** is a fragmentary cross-sectional view taken along the same plane as FIG. **2** with the bracket system adapted to support a desk and wing unit having a generally similar height; and

FIG. **5** is a fragmentary cross-sectional view taken along the same plane as FIG. **2** with the bracket adapted to join a wing unit to the desk where the desk top is tilted on an incline.

PREFERRED EMBODIMENT

In the preferred embodiment, desk **10** is joined to wing unit **20** by "Z" bracket **30** and channel bracket **40** (FIGS. **1** and **2**). "Z" bracket **30** is bolted to desk top **11** by bolts **50,** and channel bracket **40** is bolted to wing unit top **21** by bolts **60.** The two brackets are joined together by joining bolts **70.** They can be joined together in a first position as shown in FIG. **2,** or in a second position as shown in FIG. **3,** with the result that desks and wing units of differing relative heights can be joined by the same two brackets. "Z" bracket **30** can be reversed so that its longer flange **31** projects outwardly (FIG. **4**). This makes it possible to join a desk and wing unit of yet a third different relative height. A trim piece **80** joined to wing unit **20** covers the two brackets at their joining point and includes a depressed face **83** which allows room for desk top **11** to be tilted in the manner shown in FIG. **5.**

Desk **10** includes a top **11** which can be mounted thereon at three different heights (compare FIGS. **2, 3,** and **4**). In the broader aspects of this invention, the brackets **30** and **40** could be used in conjunction with three completely different desks having tops at three different levels. Alternatively, the wing units depicted in FIGS. **2, 3,** and **4** could be three different wing units of three different heights. However, the attachment system is specifically designed for use in conjunction with a desk **10** whose top **11** can be adjusted to three different heights or can be oriented on a slope as shown in FIG. **5.** The specific means whereby these different configurations are achieved are more fully described in three copending applications, all assigned to the assignee of this invention and all filed on June 1, 1973, the three applications being entitled "END PANEL

SUPPORT SYSTEM", Ser. No. 366,218, "SUSPENDED PEDESTAL DESK", Ser. No. 366,155, and "TILTABLE DESK TOP", Ser. No. 366,161.

Top **11** includes a beam **12** depending downwardly therefrom to which "Z" bracket **30** is actually secured (FIGS. **2–5**). Beam **12** defines a recess **13** therebehind into which a portion of "Z" bracket **30** can be positioned when "Z" bracket **30** is oriented as shown in FIGS. **4** and **5.** Beam **12** is a generally channel-shaped length of steel which is secured to top **11** by bolting, welding, or the like. A trim channel **14** is used to cover beam **12** to thereby provide an attractive exterior appearance for the desk.

Wing unit **20** includes a top **21** supported in conventional fashion (FIGS. **2–5**). Top **21** is generally conventional, including a sheet of plastic laminate **25** adhered to a sheet of metal **26.** Sheet metal **26** is welded to supporting metal beams **27.** A generally channel-shaped steel end piece **22** is secured to the end of top **21** to provide a means whereby channel bracket **40** and trim piece **80** can be secured to top **21.** It is secured by being welded to sheet metal **26** at its top and to metal beams **27** along its edges. End piece **22** includes holes therein for receiving the self tapping screws or bolts **60** and **85** which perform the securing functions. It is readily accessible from the end and bottom of top **21.** A wooden wing unit top might also be employed, in which case wood screw counterparts for bolts **60** and **85** would be threaded directly into the wooden top.

"Z" bracket **30** is so named because of a generally "Z" configuration. It is approximately as long as top **21** of wing unit **20** is wide. It includes a long flange **31** and a generally parallel short flange **32,** the two flanges being joined together by a step flange **33** and projecting in opposite directions from step flange **33.** Long flange **31** and short flange **32** project in opposite directions so that when one is projecting into position adjacent channel bracket **40,** the other is projecting rearwardly away from the front edge of desk **10** and is hidden from view in a position generally underneath desk top **11.**

"Z" bracket **30** is formed of metal by bending. Long flange **31** includes bolt holes **34** therein for receiving top bolt **50.** Both long flange **31** and short flange **32** include a plurality of bolt holes **35** therein for receiving, in the alternative, joining bolts **70** which are used to join "Z" bracket **30** to channel bracket **40.**

In an alternative embodiment, "Z" bracket **30** includes a longer long flange **31** for use in conjunction with a wider beam **12.** In such a case, a third row of holes **34** is provided between hole **34** and hole **35** as shown in FIG. **2.** This intermediate row of holes would be used for bolt **50** when the alternative embodiment "Z" bracket **30** were reversed and positioned as shown in FIG. **4** or FIG. **5.** Openings **34** and **35** in the long and short flanges of "Z" bracket **30** cooperatively form joining portions with beam **12** and channel bracket **40** when secured thereto by joining bolts **50** and **70.**

Channel bracket **40** is formed of steel by bending and comprises a base wall **41,** top flange **42,** and bottom flange **43.** It is approximately as long as top **21** of wing unit **20** is wide. Base wall **41** includes a bolt hole **44** therein for receiving wing unit bolt **60.** Wing unit bolt **60** is passed through wing unit bolt hole **44** and into wing unit end piece **22.** In this manner, channel bracket **40** is secured to wing unit **20.**

Both the top and bottom flanges **42** and **43,** respectively, of channel bracket **40** include a plurality of holes **45** for receiving self tapping joining bolts **70.** As a result, "Z" bracket **30** can be joined either to top flange **42** or to bottom flange **43** by joining bolts **70.** In the broader aspects of the invention, it would be sufficient if bracket **40** were only "L" shaped, having a base and a leg flange. The bracket could be reversed so as to put the projecting leg flange either on the top or on the bottom of the base depending on the manner in which the bracket were to be joined to "Z" bracket **30.** However, it is preferable that bracket **40** be channel shaped, having top and bottom flanges, so that it does not have to be inverted or readjusted at any time.

Trim piece **80** is formed of metal by bending. It includes a base wall **81** having a plurality of holes therein through which wing unit bolts **60** pass. Base wall **81** is sandwiched between channel bracket **40** and wing unit end piece **22** to thereby hold trim piece **80** in place. Alternatively, trim piece **80** is welded to channel bracket **40.** A foot flange **86** extends laterally from the base of base wall **81,** extending beneath end piece **22.** It includes a plurality of holes therein through which pass bolts **85** which thread into the bottom of end piece **22.** This further secures trim piece **80.**

Base wall **81** is sufficiently tall that it extends to a point generally flush with the top surface of wing unit top **21.** It then projects laterally away therefrom for a short distance and then jogs downwardly to define a ridge **82** along the end edge of wing unit top **21.** Projecting from ridge **82** is a slightly depressed face **83.** It is depressed below the level of top **21.** The reason that face **82** is depressed is to allow one to tilt desk top **10,** even when wing unit top **21** is in its uppermost position (compare FIGS. **4** and **5**).

In operation, desk top **11** can be positioned at three different heights. In FIG. **2,** desk top **11** is positioned at its uppermost level. In order to attach wing unit **20** thereto, "Z" bracket **30** is bolted to beam **12** by bolts **50** with step flange **33** projecting downwardly therefrom and with short flange **32** projecting towards wing unit top **21.** Short flange **32** is slipped in beneath face **81** of trim piece **80** and above top flange **42** of channel bracket **40.** Channel bracket **40** is already bolted to end piece **22** of wing unit top **21** by bolts **60.** Short flange **32** is securely fastened to top flange **42** by threading bolts **70** through holes **45** and into holes **35** of short flange **32.**

In FIG. **3,** desk top **11** has been mounted in its intermediate position. To facilitate the attachment of wing unit **20,** "Z" bracket **30** is secured to beam **12** in the same manner as shown in FIG. **2.** However, short flange **32** is bolted to bottom flange **43** of channel bracket **40** rather than to top flange **42.** Because brackets **30** and **40** can be joined together in two different relative positions which place their points of securance to their respective desks and wing units at different relative levels, desk top **11** and wing unit top **21** can have two different relative heights and still be joined together.

In FIG. **4,** desk top **11** is mounted in its lower-most position. To secure wing unit **20** to desk **10,** "Z" bracket **30** is disassembled from beam **12** and is reversed in orientation, both from front to rear and from top to bottom. Thus, step flange **33** projects upwardly into position in recess **13** behind beam **12.** Similarly, short flange **32** projects into recess **13,** completely hidden from view. Now, the end of long flange **31** projects outwardly from beam **12** into position adjacent channel bracket **40.** It is bolted to bottom flange **43** of channel

bracket **40** by joining bolt **70.** As in the other positions, trim piece **80** serves to mask all of this joining system.

In FIG. **5,** desk top **11** is tilted at an angle with respect to desk **10.** Wing unit **20** is joined to desk **10** in the same manner as shown in FIG. **4.** The fact that the face **83** of trim piece **80** is depressed provides sufficient room for the edge of desk top **11** when it is oriented on this slope. Ridge **82** butts up against the edge and provides a neat, trim appearance.

In the broader aspects of this invention, this bracket system could be employed not only with a desk having a remountable top, but also in conjunction with a system having desks of three different heights. Similarly, it is conceivable that the invention could find application in conjunction with unrelated systems, allowing one to join a wing unit from one system to a desk from another system by selecting the proper combination of "Z" bracket **30** and channel bracket **40** to accmmodate the differing heights.

Of course, it is understood that the above is merely a preferred embodiment of the invention and that various changes and alterations can be made thereof without departing from its spirit and broader aspects.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A furniture system including a wing unit or the like, a desk unit or the like and attaching means for attaching the wing unit to the desk, said attaching means comprising:

a first bracket having first securing means for securing said first bracket to a desk;

a second bracket having second securing means for securing said second bracket to a wing unit;

joining means joining said first and second brackets together; one of said first and second brackets including first and second joining points for cooperating with said joining means; said joining means cooperating with said one bracket at one of said first and second joining points; said one bracket being adapted for securing to its respective desk or wing unit with either its first or second joining point in position adjacent the other of said brackets; said first and second joining points being on different levels whereby desks and wing units of several different relative heights can be joined together by effecting an appropriate one of the alternative arrangements of said brackets.

2. The furniture system of claim **1** in which said first and second joining points of said one bracket are on first and second flanges, said first and second flanges projecting away from one another in generally opposite directions whereby when one of said flanges is adjacent said other of said brackets, the other of said flanges projects away therefrom to a position generally beneath its respective desk or wing unit whereby it is generally hidden from view.

3. The furniture system of claim **2** in which the other of said brackets also includes first and second joining points for cooperating with said joining means; said joining means cooperating with said other bracket at one of its said first and second joining points; said first and second joining points of said other bracket being on different levels.

4. The furniture system of claim **3** in which said first and second joining points of said other bracket are on flanges which are generally parallel to one another and which project towards said one bracket in generally the same direction.

5. The furniture system of claim **1** in which said first and second joining points of said one bracket are on flanges which are generally parallel to one another and which project towards said one bracket in generally the same direction.

6. A furniture system including a wing unit or the like, a desk or the like, and attaching means for attaching the wing unit to the desk, said attaching means comprising: a first bracket having first and second generally parallel flanges projecting in generally opposite directions and being joined by a step flange therebetween; means on said first flange for securing said first bracket to the top of said desk or the like with said second flange projecting either forwardly in the direction of the front of said top or rearwardly away therefrom; a second bracket having a base and a flange projecting generally laterally from said base, said base including means for securing said second bracket to said wing unit with said flange either above or below said base; joining means for joining said second bracket flange alternatively to either said first flange or said second flange of said first bracket whereby desks and wing units of several different relative heights can be joined together.

7. The furniture system of claim **6** in which said desk top includes a recess on the underside thereof; said first bracket being adapted to be secured to said desk top with said step flange and said second flange projecting alternatively either downwardly and forwardly from said first flange, generally towards the front edge of said desk top, or upwardly and rearwardly from said first flange, generally away from the front edge of said desk top; said recess being positioned such that when said step flange and second flange are oriented upwardly and rearwardly from said first flange, they are positioned in said recess.

8. The furniture system of claim **7** in which said second bracket is generally channel-shaped, having a top flange and a bottom flange projecting laterally from said base flange, said top and bottom flanges projecting in the same direction, generally towards said desk; said joining means including means for joining alternatively either said top or said bottom flange of said second bracket to either said first or second flange of said first bracket.

9. The furniture system of claim **8** which includes a trim piece, said trim piece including means for securing to said wing unit and a face flange projecting from the end of said wing unit above said second bracket whereby said second bracket and said joining means joining said first and second brackets are masked from view by said trim piece.

10. The furniture system of claim **9** in which said trim piece includes a ridge which is generally flush with the top surface of said wing unit, said face flange projecting from said ridge on a lower level than said top of said wing unit whereby said desk top can be tilted forwardly with its lower front edge positioned below the level of said wing unit top, generally adjacent said face flange of said trim piece.

11. The furniture system of claim **6** in which said second bracket is generally channel-shaped, having a top flange and a bottom flange projecting laterally from said base flange, said top and bottom flanges projecting in the same direction, generally towards said desk; said

joining means including means for joining alternatively either said top or said bottom flange of said second bracket to either said first or second flange of said first bracket.

12. The furniture system of claim **6** which includes a trim piece, said trim piece including means for securing to said wing unit and a face flange projecting from the end of said wing unit above said second bracket whereby said second bracket and said joining means joining said first and second brackets are masked from view by said trim piece.

13. The furniture system of claim **12** in which said trim piece includes a ridge which is generally flush with the top surface of said wing unit, said face flange projecting from said ridge on a lower level than said top of said wing unit whereby said desk top can be tilted forwardly with its lower front edge positioned below the level of said wing unit top, generally adjacent said face flange of said trim piece.

* * * * *