Feb. 21, 1961 T. T. HAAG 2,972,506

BENCH FURNITURE

Filed April 4, 1958 4 Sheets-Sheet 1

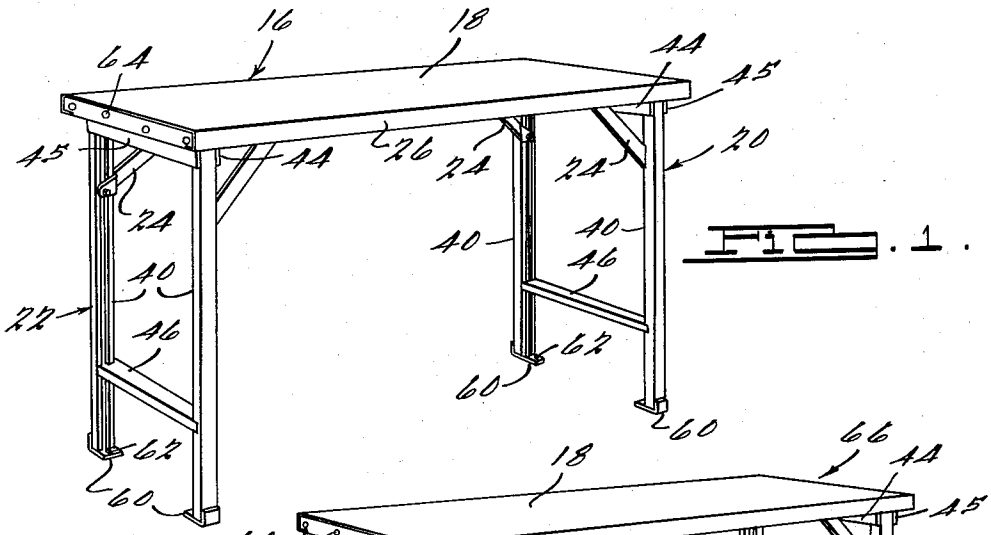


FIG. 1.

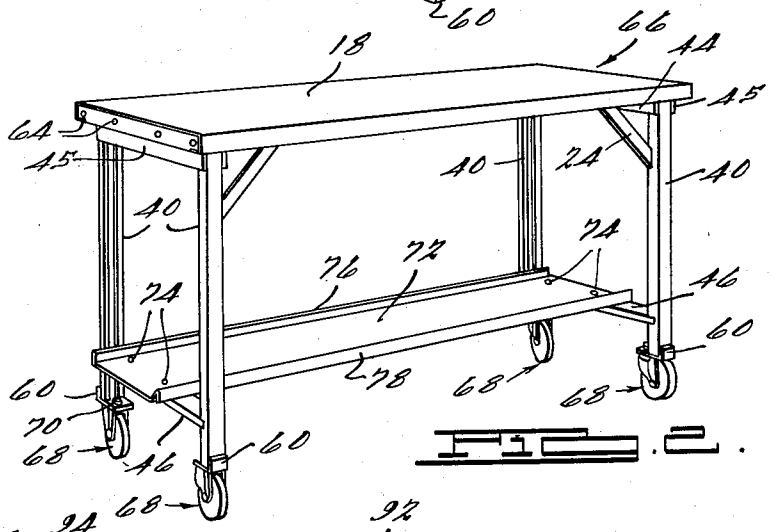


FIG. 2.

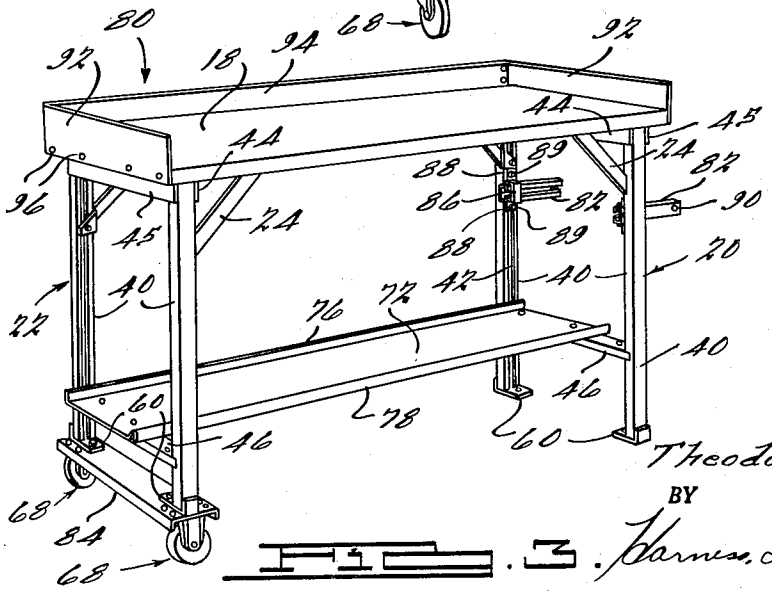


FIG. 3.

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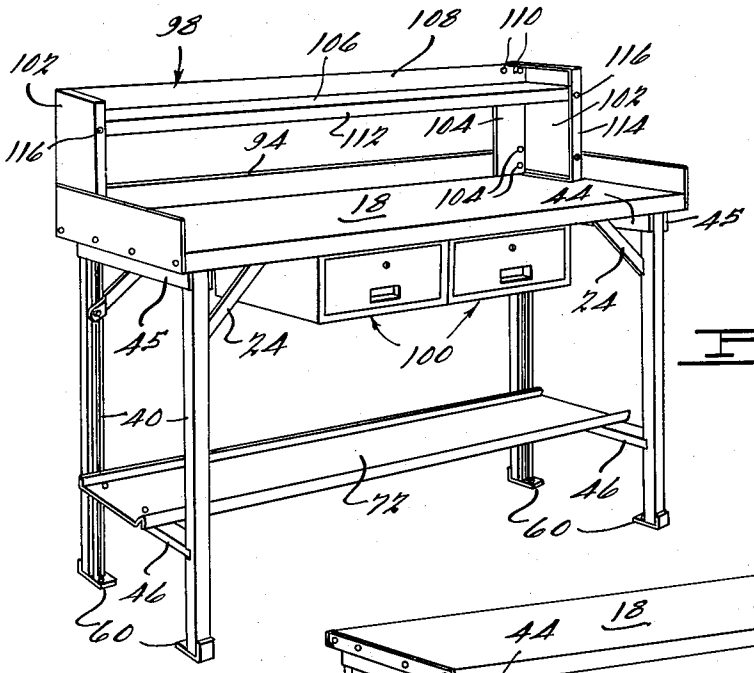


FIG. 4.

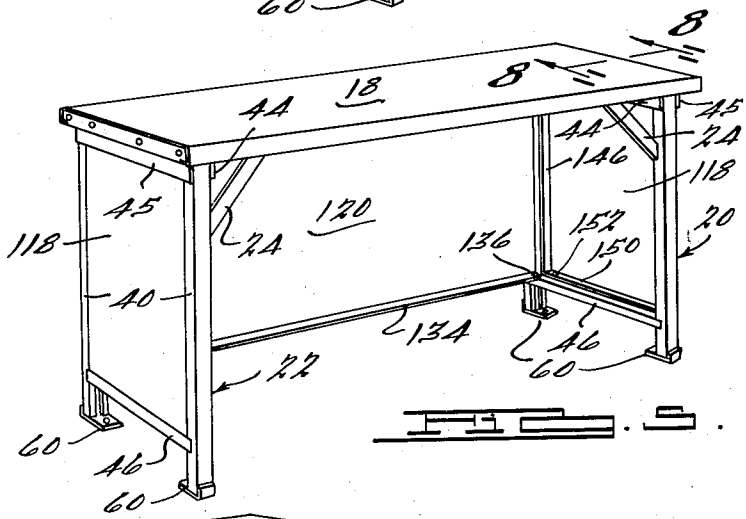


FIG. 8.

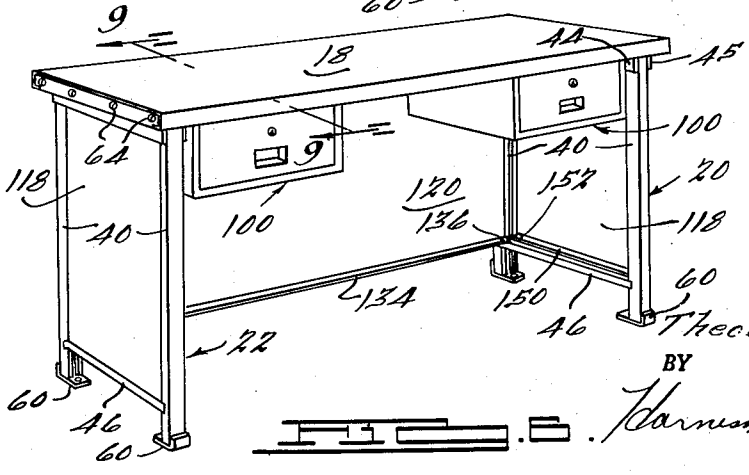


FIG. 9.

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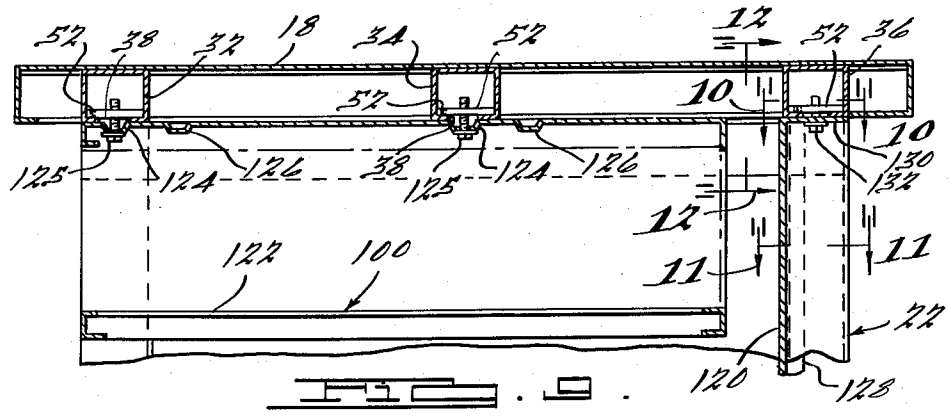


FIG. 9.

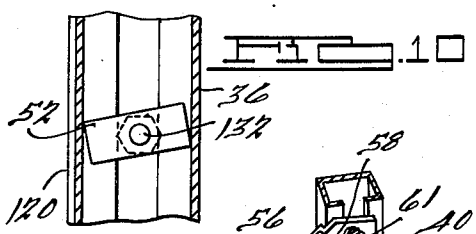


FIG. 10.

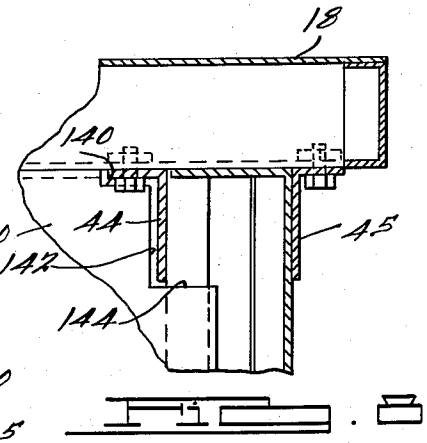


FIG. 8.

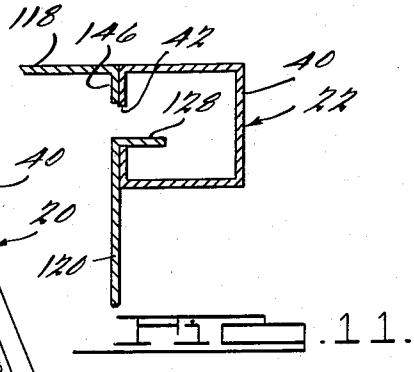


FIG. 11.

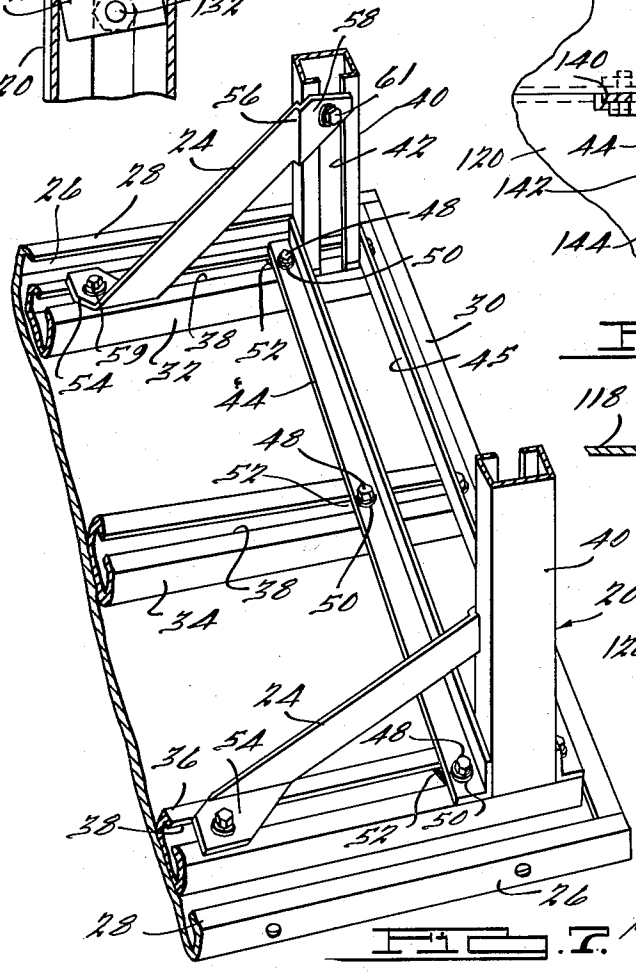


FIG. 7.

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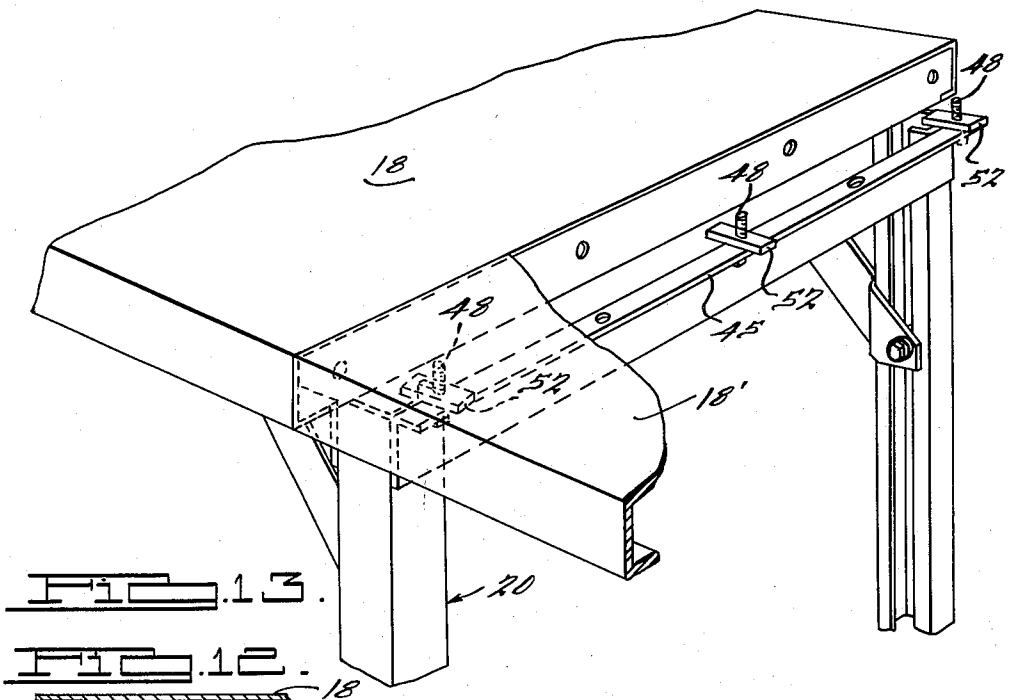


FIG. 13.

FIG. 12.

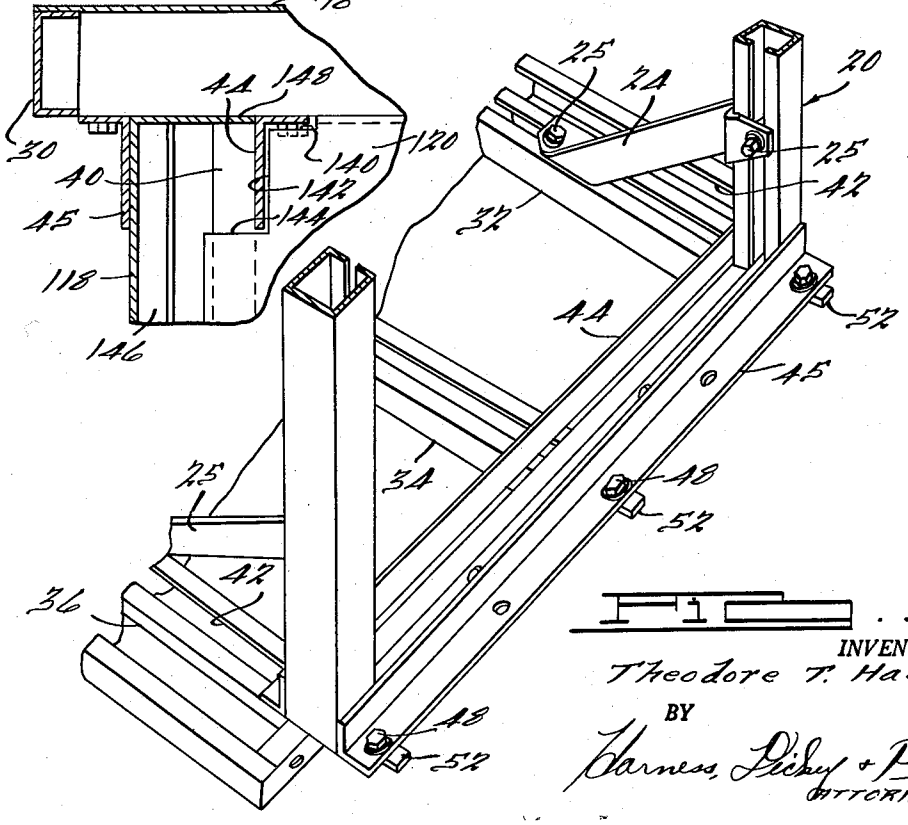


FIG. 14.

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BENCH FURNITURE

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Filed Apr. 4, 1958, Ser. No. 726,564

6 Claims. (Cl. 311—105)

This invention relates to bench furniture and particularly to a basic workbench that can be modified to provide a variety of bench furniture styles.

It is one object of the invention to provide a versatile, rigid and rugged workbench which is economical of manufacture.

It is another object of the invention to provide a workbench having a rugged top member reinforced by a plurality of parallel, spaced-apart box channel members running the length of the top member.

It is a further object of the invention to provide a rigid workbench which is adapted to be bolted to a floor, if desired, but which need not be bolted down since the rigidity of the bench is not dependent on fastening each leg to the floor.

It is a still further object to provide a workbench that can be joined end-to-end with other workbenches to form one continuous bench with a leg assembly centered below each joint between abutting workbenches.

It is a still further object of the invention to provide a workbench having removable and adjustable diagonal braces reinforcing each leg which do not interfere with the modification of the workbench into a variety of bench styles.

It is a still further object of the invention to provide a workbench that can be modified to create desk-like tables in either standing or sitting heights by adding closure panels to the back and ends thereof, and suspending drawers from the top thereof which are accessible from the front of the workbench.

It is a still further object of the invention to provide a portable and semi-portable workbench.

Other objects and features of novelty of the invention will be specifically pointed out or otherwise become apparent when referring, for a better understanding of the invention, to the following description taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a perspective view of a workbench embodying features of the invention;

Fig. 2 is a perspective view of the workbench illustrated in Fig. 1 with a lower shelf added and modified to provide a portable bench.

Fig. 3 is a perspective view of the workbench of Fig. 1 modified to provide a semi-portable bench with a pair of telescoping handles, a lower shelf, and shelf guards added.

Fig. 4 is a perspective view of the workbench of Fig. 1 with a shelf, drawers, guards and a ledge added.

Fig. 5 is a perspective view of the workbench of Fig. 1 with end and back closure panels added.

Fig. 6 is a perspective view of the workbench of Fig. 5 with two drawers added.

Fig. 7 is an enlarged broken perspective view of the right underside of the workbench of Fig. 1.

Fig. 8 is an enlarged sectional view of the workbench illustrated in Fig. 5, taken along the line 8—8 thereof.

Fig. 9 is an enlarged sectional view of the workbench illustrated in Fig. 6, taken along the line 9—9 thereof.

Fig. 10 is an enlarged sectional view of the structure illustrated in Fig. 9, taken along the line 10—10 thereof.

Fig. 11 is an enlarged sectional view of the structure illustrated in Fig. 9, taken taken along the line 11—11 thereof.

Fig. 12 is an enlarged sectional view of the structure illustrated in Fig. 9, taken along the line 12—12 thereof.

Fig. 13 is an enlarged broken perspective view of one end of the basic bench of Fig. 1 with the leg assembly connected thereto in position to support a second bench, and

Fig. 14 is a broken perspective view of the underside of the structure illustrated in Fig. 13.

Referring to Figs. 1 and 7, a basic workbench 16 embodying features of the present invention is illustrated. It is comprised of a top member 18 supported by leg assemblies 20 and 22 at each end thereof with diagonal braces 24 connected between the leg assemblies and top member for reinforcement purposes. The top member 18 is preferably fabricated from sheet metal and has downwardly extending flanges 26 and inwardly turned flanges 28 along the side edges thereof. A channel-shaped member 30 is spot welded or otherwise secured to the top member 18 at each end thereof with the ends of the members 30 fitting beneath the inwardly turned flanges 28 to form a smooth corner. Where resiliency, sound deadening or warmth are desirable characteristics, the top member 18 may be covered with a pressed wood hardboard surface material.

To further reinforce the top member 18, three longitudinally extending box channel members 32, 34 and 36 are secured as by spot welding to the undersurface of the top member with the members 32 and 36 adjacent the side edges thereof, and the member 34 extending substantially along the centerline thereof. It will be observed that each of the box channel members is formed with a slot 38 on the undersurface thereof to enable the leg assemblies 20 and 22 and diagonal braces 24 to be adjustably connected thereto as will be described in greater detail hereinafter.

Each of the leg assemblies 20 and 22 is comprised of two parallel spaced-apart legs 40 formed from box channel members similar to the members 32—36 so that each of the legs have a slot 42 on the inner sides thereof, that is the sides which face each other. The legs 40 are rigidly connected together by two angle-shaped members 44 and 45 spot welded or otherwise secured across the upper ends thereof, and a channel-shaped reinforcing member 46 spot welded or otherwise secured therebetween adjacent the lower ends thereof.

Each leg assembly is bolted to the top member 18 by six bolts 48 extending through the horizontal flanges of the angle-shaped members 44 and 45 and through the slots 38 in the box channel members 32, 34 and 36. Suitable washers 50 are provided between the boltheads 48 and the members 44 and 45 and straddle nuts 52 as most clearly illustrated in Figs. 9 and 10, are threaded on the ends of the bolts projecting within the members 32—36. Of course, each of the straddle nuts 52 may be inserted and removed from the slots 38 of the box channel members while assembled on the bolts 48 by aligning each of them with one of the slots 38 so that they will pass therethrough, and swinging them into cross position, as illustrated in Fig. 10, to prevent their removal.

With this construction, each of the leg assemblies 20 and 22 can be bolted to the members 32, 34 and 36 at any position thereon, however, for the basic workbench illustrated in Fig. 1 they are preferably bolted with the outside edge of the angle-shaped member 45 aligned with the ends of the members 32—36 which abut against the edges of the legs of the channel-shaped members 30 secured across the ends of the top member 18.

As most clearly illustrated in Fig. 7, the diagonal braces 24 are connected between each of the legs 40 and either the box channel members 32 or 36. Each diagonal brace is comprised of a flat bar or strap having one end thereof bent to form a flat end portion 54 lying in a plane substantially perpendicular to the plane of the strap with the other end thereof bent to form a shoulder 56 and a flat end portion 58 lying in a plane offset from and substantially parallel to the plane of the strap. It will be observed that the flat end portion 54 of each brace engages the face of the box channel members having the slot 38 therein, and is secured thereto by a bolt 59 and straddle nut 52 (not shown), as previously described. The flat end portion 58 on the other end of each brace overlies the face of the legs 40 with the slot 42 therein and is connected thereto by a bolt 61 and a straddle nut 52, the shoulder 56 engaging the adjacent face of the leg to provide additional rigidity.

With this construction, the bolts 59 and 61 of each brace can be loosened to permit the leg assembly 20 to be shifted longitudinally relative to the box channel members, and also to be pivoted to a substantially perpendicular position, after which the bolts may be tightened to rigidly maintain the leg assembly in the aforesaid perpendicular position. Of course, when the bolts 59 and 61 are loosened they permit the ends of the diagonal braces 24 to slide relative to the slots 38 and 42 similar to the manner in which the angle-shaped members 44 and 45 can slide relative to the box channel members 32—36 when the bolts 48 are loosened.

As can most clearly be illustrated in Fig. 1, each of the legs 40 also has a footplate 60 secured to the lower end thereof to provide bearing surfaces of greater area for engaging a floor. A suitable hole 62 is also drilled in the horizontal portion of each of the footplates to enable the plates to be bolted to the floor if desired. However, the workbench is sufficiently rigid so that it is not necessary to bolt the footplate 60 to the floor. Also, as most clearly illustrated in Fig. 1, the ends of the top member 18, that is, the webs of the channel-shaped members 30, and the back edge of the top member, that is, the downwardly extending flange 26 are provided with a plurality of spaced holes 64 to facilitate the mounting of various accessories on the top member, as will be described in greater detail hereinafter.

Referring to Fig. 2, the basic workbench of Fig. 1 is illustrated as modified to form a portable workbench 66 having a wheel assembly 68 affixed to each of the footplates 60 by bolts 70 or the like which pass through the apertures 62 in the footplates. If desired, the legs 40 of the bench may be shortened to compensate for the height of the wheel assembly 68 and maintain the overall height of the workbench the same as that of the workbench of Fig. 1.

A lower shelf 72 has also been added which spans the length of the workbench 66 and is supported on and affixed to the reinforcing members 46 by a plurality of bolts 74 or the like. The rear edge of the shelf 72 is provided with a vertically extending flange 74 and the forward edge thereof is reversely bent to provide a raised lip 78 to prevent articles placed on the shelf from falling off either the front or rear thereof. The reversely bent lip 78 also provides a smooth upper edge to prevent injury to persons reaching for articles on the shelf.

Referring to Fig. 3, the basic bench in Fig. 1 is illustrated as modified to provide a semi-portable bench 80 having wheel assemblies 68 mounted on each of the legs of the leg assembly 22 with telescoping handles 82 mounted on the legs of the leg assembly 20 for lifting and moving the semi-portable bench similar to the manner in which a wheelbarrow is lifted and moved. It will be observed that the legs 40 of the leg assembly 22 are shorter than the legs of the leg assembly 20 to compensate for the height of the wheel assemblies 68. It will be further observed that each of the wheel assemblies 68 are mounted on a channel-shaped member 84 which in turn is connected to the foot plates 60 of the leg assembly 22 by the bolts 70 or the like to provide a more rigid structure. The foot plate 60 of the leg assembly 20 merely rests on the floor, preferably not being bolted thereto to enable the right end of the semi-portable bench 80 to be lifted by the telescoping handle 82 to move the bench.

Each of the telescoping handles 82 is made up of a box channel-shaped member having one end thereof slidably disposed within a U-shaped bracket 86 having vertically extending flanges 88 bolted to the legs 40 by the bolts 89 passing through the slot 42, the straddle nuts 52 being threaded on the ends thereof projecting within the legs as previously described. With this construction, each of the handles 82 can be mounted at any desired height by simply loosening the bolts 48, sliding the brackets 86 relative to the legs 40 and tightening the bolts 48 and straddle nuts 52 to firmly lock the brackets at the desired height. Suitable bolts 90 or the like may be fastened to each end of the handle 82 to limit the telescoping action thereof and prevent accidental removal of the handle 82 from the brackets 86.

Suitable shelf guards 92 may be fastened to the ends of the top member 18 and a shelf guard 94 fastened to the back edge thereof by a plurality of bolts 96 passing through the holes 64 illustrated in Fig. 1. The shelf guards enclose the top 18 on all sides thereof except the front to prevent small objects from falling off the sides thereof.

Referring to Fig. 4, the basic bench of Fig. 1 is illustrated with a ledge assembly 98 and two side-by-side drawers 100 added thereto. Each of the drawers 100 are suspended from the underside of the top 18 between the front diagonal braces 24, and the ledge assembly 98 is mounted on the upper surface of the top member 18. The ledge assembly keeps tool boxes, parts, reference material, etc. off the working area and is punched for bolting to the back guard 94 or the top 18. It is comprised of two spaced-apart end supports 102 having rear, inwardly extending flanges 104 thereon fastened to the back guard 94 by suitable bolts 104 or the like, and a shelf 106 having a rear flange 108 fastened to the flanges 104 by suitable bolts 110 or the like with a front flange 112 thereon fastened to front flanges 114 of the end supports 102. A lower shelf 72 is also provided and supported on the lower reinforcing members 46 as previously described.

Referring to Fig. 5, the basic bench of Fig. 1 is illustrated with end panels 118 fastened between legs 40 of the leg assemblies 20 and 22, and a back panel 120 fastened between the rear legs 40 of each of the leg assemblies. The panels improve the appearance of the bench and make it suitable for use as a desk or table for an office or laboratory. The end panels 18 are flush with the outer surfaces of the legs 40, and the back panel 120 is flush with the front surfaces of the rear legs 40 to improve the appearance of the bench, each of the panels being provided with flanges along the four edges thereof to facilitate their attachment, as will be described in greater detail hereinafter.

Referring to Fig. 6, the bench of Fig. 5 is illustrated as modified with the drawers 100 suspended from the top member 18 thereof in parallel spaced-apart relation, the front diagonal braces 24 being removed to enable the drawers 100 to be positioned closely adjacent each of the leg assemblies 20 and 22. However, even with the front braces removed, the bench is still extremely rigid and will support most loads that a bench is called on to carry. As most clearly illustrated in Fig. 9, each of the drawers 100 is comprised of a box-like frame 122 having a plurality of downwardly extending bosses 124 formed adjacent the side edges and in centerline of the upper surface thereof. The frame 122 is suspended from the box channel members 32 and 34 by bolts 125

and straddle nuts 52, the bolts passing through the bosses 124 and the slots 38 and secured to the box channel members by the straddle nuts 52. Additional bosses 126 are also provided in the upper surface of the frame 122, and suitably spaced to the right of the bosses 124 to enable the frame 122 to be fastened to the box channel members 32 and 34 in a forward position, or to the left as viewed in Fig. 9 so that the front surface thereof can be flush with the front edge of the top 18, if desired.

Fig. 9 also most clearly illustrates one of the vertically extending flanges 128 and the upper horizontally extending flange 130 of the back panel 120. It will be observed that the upper flange 130 is bolted to the box channel member 36 by a plurality of bolts 132 and straddle nuts 52, one of which is shown. As most clearly illustrated in Fig. 11, each of the vertically extending flanges 128 of the back panel 120 extend within the slots 42 in the legs 40 so that the back panel is prevented from moving either to the right or left, as viewed in Fig. 5. This also permits the ends of lower flange 134, the back panel 120 to overlie the reinforcing members 46 so that they may be connected thereto by suitable bolts 146 or the like. It will be observed that the lower flange 134 extends inwardly toward the front of the bench, as viewed in Fig. 5, and that the upper flange 130 extends outwardly toward the back of the bench as viewed in Fig. 9.

As most clearly illustrated in Figs. 8 and 12, the upper corners of the back panel 120 are suitably notched and cut away as at 140, 142 and 144 to clear the angle-shaped members 44 of the leg assemblies 20 and 22. It will also be observed that the side panel 118 has inwardly extending vertical flanges 146, one of which is shown which partially overlies the face of the leg 40 having the slot 42 therein, and an upper horizontal flange 148 which may be bolted to the bottom of the box channel member 34 by a suitable bolt and straddle nut (not shown). As most clearly illustrated in Fig. 5, the side panels 118 have also a lower horizontal flange 150 bolted to the reinforcing members 46 by suitable bolts 152 or the like.

From the foregoing, it is apparent that a number of accessories may readily be attached to the basic bench of the present invention to obtain a variety of types of benches. However, as most clearly illustrated in Figs. 13 and 14, the basic bench of the present invention has additional versatility in that any number of benches may be connected end-to-end to obtain one long continuous workbench.

This is accomplished by merely shifting the leg assembly 20 of Fig. 1, for example, to the right so that the midplane thereof is aligned with the right edge of the top 18. In this position, only the bolts and straddle nuts passing through the angle-shaped member 44 will be disposed within the slots 42 of the box channel members 32–36 and the straddle nuts 52 and bolts 48 will lie beyond the right edge of the top 18. Of course, since the braces 24 are slidably connected to the box channel members 32–36 by the bolts 25 they readily permit the movement of the leg assembly 20 to the right when they both are loosened. Likewise, since the braces 24 are also slidably connected to the legs 40 of the leg assembly 20 by the bolts 25 the leg assembly 20 can be manipulated after it has been moved until it is exactly perpendicular relative to the top member 18 and affixed in this position by tightening the bolts 25.

With this construction, it is apparent that a second table top 18' may be rested upon angle-shaped member 45 of the leg assembly 20 and rigidly connected thereto by the bolts 48 and straddle nuts 52 so that the leg assembly 20 supports the ends of both top members 18 and 18' at their juncture. Of course, any number of top members 18' may similarly be added end-for-end with only one additional leg member required per top member to provide a workbench of any desired length.

While it will be apparent that the embodiments of the

invention herein disclosed are well calculated to fulfill the objects of the invention, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claims.

What is claimed is:

1. A workbench comprising an elongated top member, a plurality of longitudinally extending box channel members secured to the undersurface of said top member, each of said box channel members having a longitudinally extending slot in the lower face thereof, two leg assemblies, and bolt means for bolting said leg assemblies to the slotted faces of said box channel members at opposite ends of said top member, said bolt means comprising a plurality of bolts projecting from each of said leg assemblies and having the end thereof projecting through one of said slots with a straddle nut threaded on the end of said bolt disposed within said box channel members to enable the leg assemblies to slide relative to said box channel members when the bolts are loosened and to be tightly clamped against movement relative to the box members when the bolts are tightened and to be completely removed from the box members when the bolts are completely disconnected from the straddle nuts.

2. The subject matter as claimed in claim 1 wherein each of the legs of said leg assemblies is formed from a box channel member having a vertically extending slot in one face thereof, a diagonal brace connected between each of said legs and the box channel member adjacent thereto, and bolt and straddle nut means for connecting the ends of the diagonal braces to the slots in the legs and the box channel members respectively to enable the diagonal braces to be adjusted relative to the top member along with the leg assemblies when the bolt and straddle nut means associated therewith are loosened, to rigidly brace the leg assemblies when they are tightened and to enable the diagonal braces to be disconnected when the bolts are completely disconnected.

3. A workbench comprising an elongated top member, a plurality of longitudinally extending box channel members secured to the undersurface of said top member, each of said box channel members having a longitudinally extending slot in the lower face thereof, two leg assemblies supporting opposite ends of said top member, each of said leg assemblies comprising two parallel spaced-apart legs, two angle-shaped members secured to the upper ends of said legs on opposite sides and a reinforcing member secured between said legs adjacent the lower ends thereof, and bolt and straddle nut means for connecting the horizontal flange of each of said angle-shaped members to the slotted faces of each said box channel members, said bolt and straddle nut means connecting said leg assemblies to the box channel members for sliding movement relative thereto when the bolts are loosened and tightly clamping the leg assemblies to the box channel members when the bolts are tightened and enabling the leg assemblies to be completely disconnected from the box channel members when the bolts and straddle nut means are disconnected.

4. The subject matter as claimed in claim 3 wherein the legs of each leg assembly are formed from box channel members and have a vertically extending slot in the opposed faces thereof, and each of said diagonal braces has a flat end portion on one end thereof overlying the slotted face of one of the box channel members secured to the top member and an offset flat end portion on the other end thereof overlying the slotted face of one of the legs, and bolt and straddle nut means for connecting said flat end portions to the slotted faces which they overlie.

5. A workbench comprising a sheet metal top having downwardly and inwardly extending flanges at the front and back edges thereof, a channel-shaped member secured beneath each end of the top with the legs thereof facing toward each other, a plurality of spaced apart

longitudinally extending box channel members secured to the undersurface of said top, each of said box channel members having a longitudinally extending slot in the lower face thereof, one of said box channel members lying closely adjacent to each of said downwardly extending flanges, a transverse leg assembly bolted to the slotted faces of said box channel members across each end of the top member, each of said leg assemblies comprising two parallel spaced-apart legs, two angle-shaped members secured between the upper ends of said legs on opposite sides thereof, and a reinforcing member secured between said legs adjacent the lower ends thereof, a plurality of bolts passing through the horizontal flange of each of said angle-shaped members and projecting through the slots in said box channel members, straddle nuts threaded on the ends of said bolts for connecting the leg assembly to the slotted faces of said box channel members, said bolt and straddle nuts enabling the leg assemblies to slide relative to the box channel members when loosened and tightly clamping the leg assemblies to the box channel members when tightened and enabling the leg assemblies to be completely disconnected from the box channel members when the bolts and straddle nuts are completely disconnected from one another the legs of each leg assembly being formed from box channel members and having a vertically extending slot in the opposing faces thereof, each of said diagonal braces having a flat end portion on one end thereof overlying the slotted face of one of the box channel members secured to said top and an offset flat end portion on the other end thereof overlying the slotted face of one of the legs, and bolt and straddle nut means for connecting said flat end portions to said slotted faces of the legs.

6. The subject matter as claimed in claim 5 wherein one of said leg assemblies is shifted outwardly of the end of said top so that only the inwardly disposed angle-shaped member thereof is connected to the slotted faces of said box channel members, the outwardly disposed angle-shaped member lying beyond the end of the top in position to support a second workbench adapted to have one end of the top thereof supported on said outwardly disposed flange with the slotted faces of the box channel members thereof connected to the flange by bolt and straddle nuts.

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