Jan. 18, 1966 G. L. DE'CACCIA 3,229,824

KNOCKDOWN WORK TABLE

Filed June 18, 1962 3 Sheets-Sheet 1

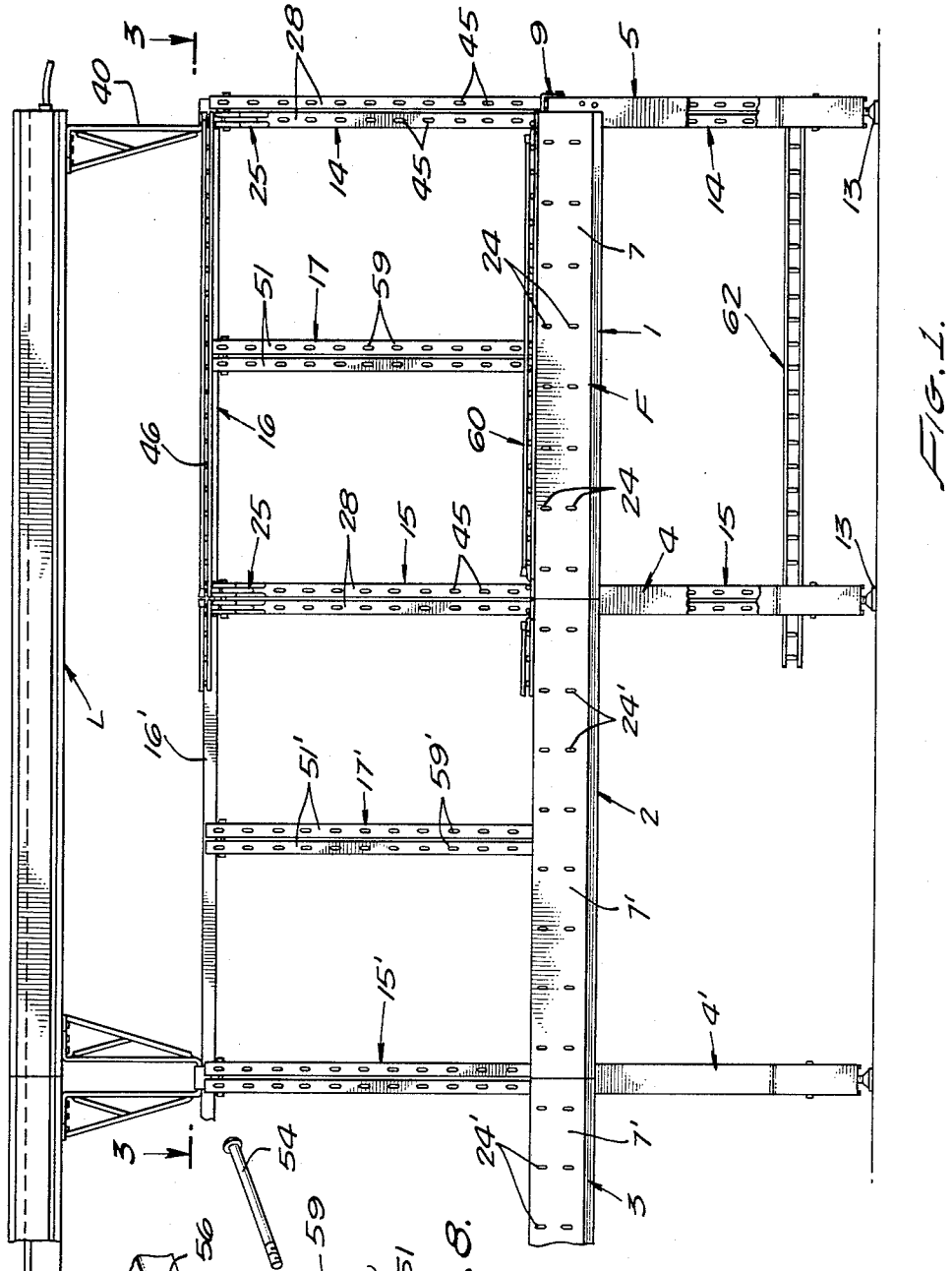


FIG. 1.

FIG. 8.

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KNOCKDOWN WORK TABLE

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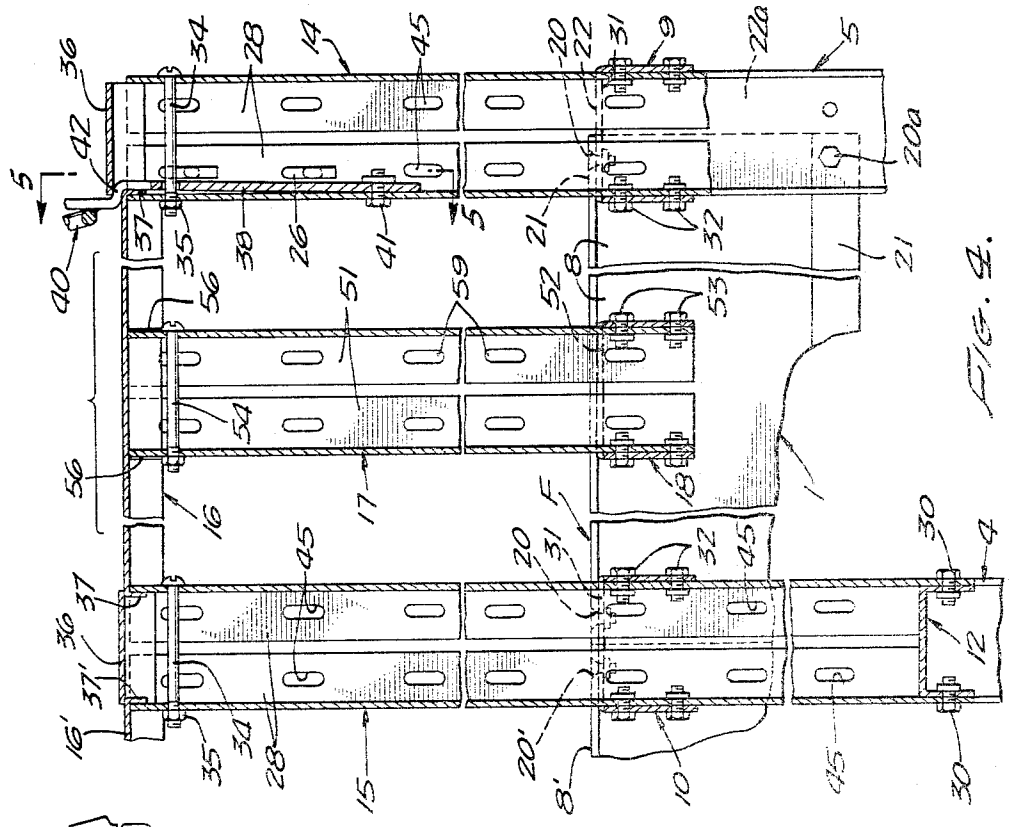


FIG. 4.

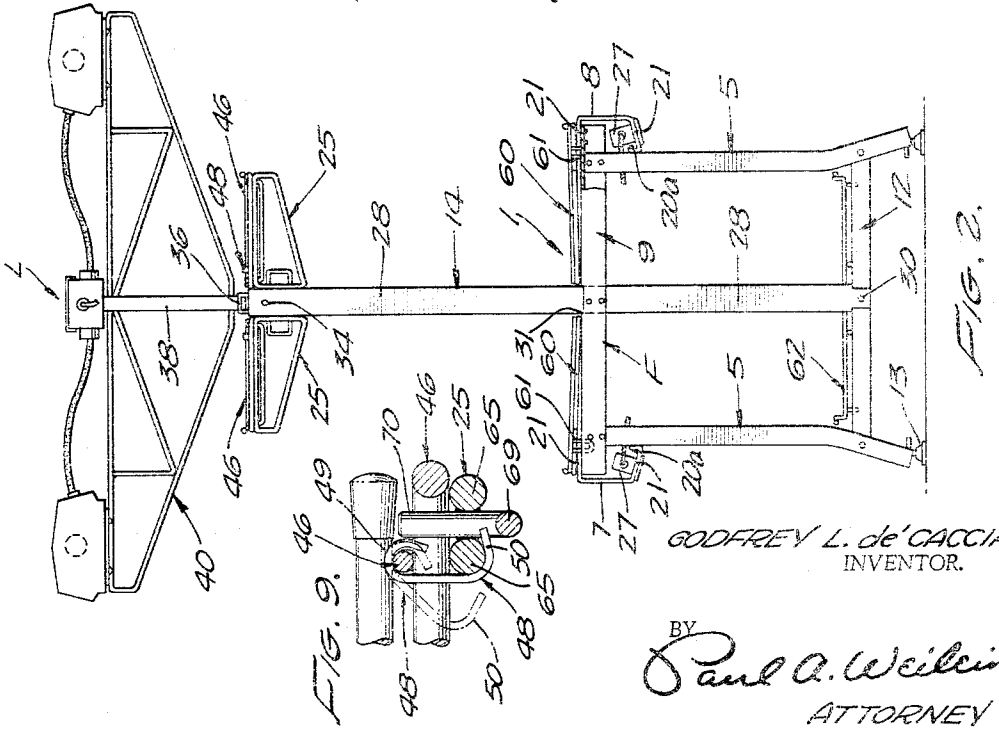


FIG. 2.

FIG. 9.

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KNOCKDOWN WORK TABLE

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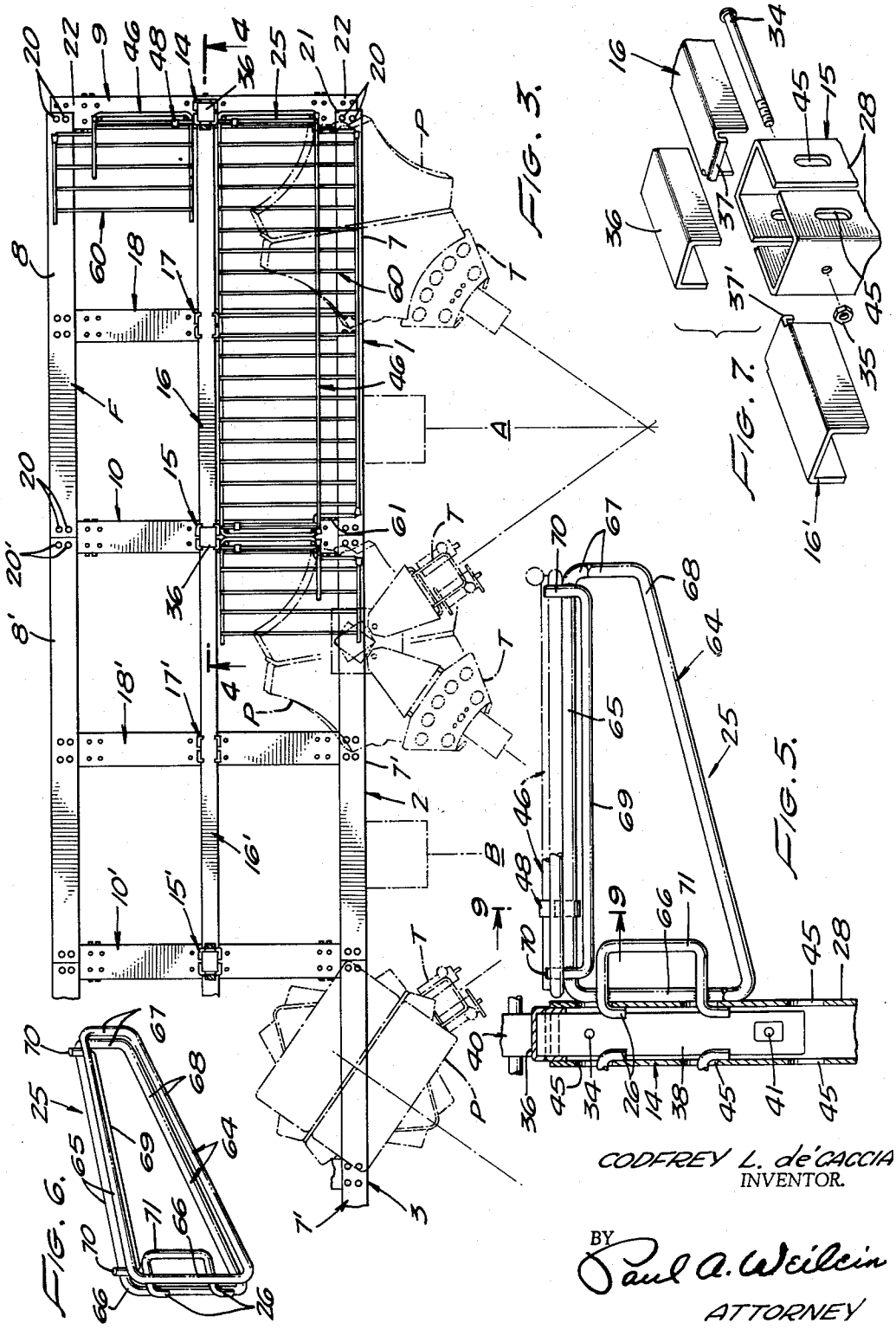


FIG. 3.

FIG. 7.

FIG. 5.

FIG. 6.

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3,229,824

KNOCKDOWN WORK TABLE

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Filed June 18, 1962, Ser. No. 203,346
6 Claims. (Cl. 211—182)

This invention relates to a unitary structure for facilitating the establishment of production stations and the like in manufacturing plants.

It is the primary object of this invention to provide a novel production station unit which is constructed and arranged to minimize the physical and human factors that tend to ill affect the efficiency and productivity of production workers as well as product quality, this improvement being effected by utilizing the production unit to group and position in a novel manner all parts, tools and facilities required for given production work at production stations whereby operators at such stations, while in a predetermined seated or standing position, and with a minimum of effort and movement, may have full and ready access to all of such parts, tools, facilities and other aids.

It is another object of this invention to provide a production station unit of the character described which may be used as a base structure for establishing, with the aid of similar production units, a plurality of related production stations wherein each unit includes vertically and horizontally disposed frame members of such formation and particular relation to one another as will make it possible readily and easily to group selectively, all parts, elements, tools and other facilities subject to use at such stations, in positions at desired locations readily accessible to production workers.

A further object hereof is to provide a prefabricated skeleton frame unit for use as a production station wherein components of the frame are provided with a plurality of spaced apertures of such construction, arrangement and location that numerous accessories such as tool holders, parts containers, shelves, instruction charts and various other facilities and aids may be selectively positioned at locations best suited to particular production work at prescribed production stations, it being possible readily to position and remove such accessories with provision in some instances for adjusting and rotating certain of the accessories to afford ready access to all parts and facilities supported thereby.

A further object of this invention is to provide a production station base frame unit such as described in which the elements thereof are detachably connected with one another and are capable of selective positioning with respect to one another, for example, to form in the base unit two modules or sections whereby, with similar frame units joined to the base unit, there will be provided spaces for parts and facilities to serve production stations on opposite sides of the assembly with adequate lighting facilities serving all such stations and with electrical outlets and other power take-off points conveniently positioned on opposite sides of the assembly for use in connection with power tools.

Other objects and advantages of the invention will be hereinafter described or will become apparent to those skilled in the art, and the novel features of the invention will be defined in the appended claims.

Referring to the drawings:

FIG. 1 is a fragmentary side elevation of a production station assembly constructed in accordance with the present invention;

FIG. 2 is an end elevation of the assembly shown in FIG. 1 looking toward the right hand end of FIG. 1 and shown partly in section;

FIG. 3 is a horizontal sectional view taken on the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary sectional view on an enlarged scale taken on the line 4—4 of FIG. 3;

FIG. 5 is a fragmentary sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a perspective view of the detachable bracket shown in FIG. 5;

FIG. 7 is an exploded perspective view of a joint construction embodied in the frame structure as shown at the upper ends of FIG. 5;

FIG. 8 is an exploded perspective view of a joint of structural members as shown in the upper central portion of FIG. 5; and

FIG. 9 is a detailed sectional view on an enlarged scale taken on the line 9—9 of FIG. 5.

An illustrative example of a production station assembly constructed in accordance with this invention, as shown in FIGS. 1 and 3, includes a base frame unit 1, a second frame unit 2 similar to unit 1 and joined to one end thereof, and a third frame unit 3 shown in part and which corresponds to and is connected with the unit 2.

The units 1, 2 and 3, as shown more particularly in FIG. 3, are set up to serve production stations which are designated A and B, respectively, on one side of the assembly, but which may be duplicated on the other side of the assembly, this arrangement requiring one and one-half portions of two of the frame units in order to provide a single production station on each side of the assembly.

In instances where a lighting unit L, as shown in FIGS. 1, 2 and 3, is to be used, two of the frame units are required, for example, units 1 and 2. However, it is to be noted that this is but one example of use of the frame units and that other arrangements may be resorted to for different kinds of production work. Moreover, the base unit 1 may be used independently of units 2 and 3 or a number of base units 1 may be employed to provide separated production stations. In this connection, it should be observed that the base unit 1 is provided with pairs of legs 4 and 5 at its ends, whereas units 2 and 3 differ from unit 1 in that they have but a single pair of legs when the units are to be connected as shown in FIGS. 1 and 3.

The base unit 1 as here shown, includes a main rectangular and horizontally disposed frame F made up of elongate side members 7 and 8 connected at their ends by like end members 9 and 10. The legs 4 and 5 are detachably secured to the end members 9 and 10 and have horizontal brace members 12 secured thereto adjacent the lower ends thereof. The legs support the frame F at worktable or workbench height which may be leveled by use of the adjustable feet 13 on the lower ends of the legs. The brace members 12 and the end members 9 and 10 support upright posts 14 and 15 which are disposed centrally of and extend well above the end members.

A horizontally disposed top member 16 extends the length of the frame F and is joined at its ends to the upper ends of the posts 14 and 15. In addition, the base unit 1 may include an upright member 17 shorter than the posts 14 and 15 in that it extends between and is connected at its ends with the top member 16 and a cross member 18, respectively, the cross member 18 being extended between and secured to the side members 7 and 8 at points substantially centrally of the ends of the latter.

Inasmuch as the frame units 2 and 3 differ from the base unit 1 only in having a single pair of legs when

these units are connected to the member 1 as here shown, those elements of the units 2 and 3 which correspond to elements in unit 1 are identified by the same reference numerals plus the prime character in each instance.

Referring more specifically to the base unit 1, it is seen that the frame members thereof are preferably of channel form as this formation facilitates fabrication of the frame members, the detachable joining thereof to each other by simple expedients, and the attachment to the unit of all accessories, parts, tools, and aids for use at the production stations. Moreover, this channel formation of the frame members makes it possible to provide desired strength and rigidity with light gauge metal, and renders the unit more flexible and capable of ready connection with other units in forming a line of production stations.

The channelled side members 7 and 8 are of greater width than the other frame members of the unit 1 and, as shown in FIG. 4, are secured at their ends by means of suitable removable fastenings 20 to the channelled end members 9 and 10 and by similar fastenings 20*a* to the legs 4 and 5. The open sides of the members 7 and 8 face inwardly and the open sides of the end members 9 and 10 face downwardly, about one-half of the width of the top surface of the web of the end members, being covered by the upper of the two flanges 21 of the side members. The lower flanges 21 of the side members 7 and 8 are secured by the fastening 20*a* to the legs, as shown in FIGS. 2 and 4. This leaves, as shown at the right side of FIG. 4, an ample surface 22 of the end members 7 and 8 and an ample surface 22*a* of the legs, to permit of the connection of ends of the side members 7' and 8' of another frame unit such as the unit 2, to an end member and to one pair of legs of the unit 1, in which case there would be no legs at the ends of the side members 7' and 8' of the second unit that are connected to an end member of the base unit 1, the second unit having but a single pair of legs 4' at the end farthest removed from unit 1.

As a means for attaching to the channelled side members 7 and 8 various accessories and facilities such as parts container units P, tool holder units T, as indicated in dashed lines in FIG. 3, these side members are provided with pairs of elongate openings or slots 24 in the wide web portions thereof at spaced points therealong. Each of the above noted accessories will be mounted on the side members 7 and 8 by attaching means, not shown, and may be somewhat similar to the bracket 25 shown in FIGS. 5 and 6, and formed with the attaching means having hook elements thereon corresponding to the hook elements 26 in the bracket 25, so as to hook into the slots 24 in the side members 7 and 8 at desired locations as afforded by the spacing of the slots 24. This makes it possible to group the accessories as desired to serve one or more production stations such as indicated at A and B in FIG. 3.

With reference to FIG. 2, it will be seen that the channels of the side members 7 and 8 may be employed to contain or house electrical outlets and associated wiring 27. The members 7 and 8 may also house hydraulic or pneumatic power lines and suitable valved outlets, both not shown, for use in the operation of power tools at the production stations.

Each of the posts 14 and 15 is preferably made of a pair of like channel members 28 arranged to form a hollow rectangle in cross section when the two channel members are secured with their open sides facing one another. At their lower ends the channel members 28 of the posts 14 and 15 have their flanges cut away so that the web portion, as shown in FIGS. 2 and 4, will straddle the flanges of the brace members 12 between the legs 4 and 5, these web portions being secured to the brace members 12 by means of suitable removable fastenings 30. In extending upwardly from the brace members 12 to the top member 16, the members 28 of the posts 14 and 15 pass through snugly fitting openings 31 in the webs of the channelled end members 9 and 10 and are secured thereto by means of suitable removable fastenings 32. At their upper ends the channel members 28 are secured together with clamping bolts 34 and nuts 35, there being flanged closure caps 36 fitted in the upper ends of the posts 14 and 15 and clamped there by the bolts 34 and nuts 35.

As shown in FIGS. 4 and 7, the ends of the webs of the channelled top member 16 are provided with downwardly directed flanges 37 which hook over the webs of the channelled members 28 of the posts 14 and 15 and extend under the caps 36. With this arrangement a simple and effective detachable joining of the posts to the top member is provided and at the same time provision is made for supporting of the light fixture L above the top member 16, as shown in FIGS. 1, 2 and 4. FIG. 4 shows at the upper right hand end thereof how a leg member 38 of the lighting fixture bracket 40 may be extended into the post 14 and clamped in place by means of the bolts 34 and suitable removable fastenings 41. The flanged cap 36 in each post 14 overlies an offset portion 42 formed in each leg member 38, this offset portion resting on an end of the top member 16, as particularly shown in the upper right hand portion of FIG. 4, thereby holding the light fixture bracket 40 in place.

It will now be apparent that in making the posts of two channel sections the assembly of the frame structure is made easier, it being noted that the channel members of the posts are clamped together so that the flanges are in slightly spaced relation to one another. This makes it possible for the upper portion of the channel members 28 to be clamped together in forming the joints with the top members 16 and for supporting the light fixture bracket.

The flanges of the members 28 forming the posts 14 and 15 are provided with a plurality of slots 45 which are utilized in the same manner as the slots 24 in the side members 7 and 8 for supporting facilities and accessories to be used at production stations. In this connection, brackets 25, as shown in FIG. 5, are adapted to be mounted at selected positions on the posts 14 and 15 for supporting shelving generally designated 46. The brackets 25, as hereinbefore pointed out, are provided with hook elements 26 which are engageable in the slots 45 to maintain the brackets in place. The shelving 46 may be of skeleton or grill form and secured to the brackets 25 as by means of spring metal clips 48 as shown in FIG. 9. These clip members may be used as required to hold the shelving on the brackets, each clip member comprising a single piece of resilient metal having hooks 49 and 50 at opposite ends facing in the same direction, the hook 49 being in the form of a partially closed loop adapted to be snapped over portions of the grill-type shelving while the hook 50 is more open with an arcuate bill of large radius adapted to be snapped around portions of the brackets 25. Clips of this type may be quickly and easily applied and once in place, will securely but detachably hold the shelving on the supporting brackets 25.

The upright member 17 of base unit 1 is made of two channelled sections 51 corresponding to the channelled sections 28 of the posts 14 and 15. The lower ends of the channelled sections 51 are inserted through an opening 52 in the cross member 18 and are secured by removable fastenings 53 to this cross member. The upper ends of the members 51 are secured together by a clamping bolt 54 and a nut 55 in the same manner as the upper ends of the sections of the posts 14 and 15. Where the top member 16 extends over the tops of the channelled members 51, the flanges of the top member are slotted as at 56 to accommodate the upper ends of

the members **51**. This construction is clearly shown in FIG. 8. Slots **59** are provided in the flanges of the members **51** forming the upright member **17** and correspond in arrangement and formation to the slots **45** in the posts **14** and **15** in that they facilitate the attachment of accessories or facilities to be used at the production stations.

As shown in FIGS. 1 and 2, shelving **60** either of grill form or solid as for a table top, may be supported on the upper surfaces of the side members **7** and **8** and the end members **9** and **10**, there being U-shaped members **61** welded to the shelving so as to depend therefrom and engage edges of the frame members **7** and **8** as a means for detachably holding the shelving in place. However, any other suitable means may be employed for holding the shelving in place as desired. As the shelving **60** is disposed on both sides of the unit **1**, facilities for use on both sides by production operators may be supported on the shelving or the latter used as working surfaces.

If desired, shelving **62** similar to the shelving **60** may be supported on the brace bars **12** between the legs **4** and **5**, being held thereon in any suitable manner to provide storage spaces or surfaces for supporting accessories beneath the side members **7** and **8** and which are accessible from opposite sides of the frame unit **1**.

It should be noted that the posts **14** and **15** in extending below the side members **7** and **8** to the brace members **12**, may be employed to support accessories for use by operators on opposite sides of the unit. In such use of the lower portions of the posts **14** and **15**, brackets corresponding or similar to the brackets **25** may be employed to support the accessories. However, any other mounting means capable of being attached with the aid of slots **45** in the posts may be employed for supporting accessories.

The bracket **25**, as shown in FIGS. 5 and 6, is ideally constructed for use in connection with the frame structure of this invention as it may be quickly and easily mounted at selected positions on the frame structure and as easily removed. As here shown, the bracket **25** includes a pair of elongate skeleton frames **64**, each formed of a single length of wire or rod stock bent to provide a horizontal upper portion **65**, downwardly directing end portions **66** and **67** of different lengths, and a lower portion **68** inclined from the longer end portion **66** to the shorter end portion **67** and joined thereto. Where the ends of the single length of wire or rod stock meet, they may be welded together. The two frames **64** are positioned in parallelism with a rod **69** disposed therebetween so that the upturned ends **70** of the rod extend between and above the horizontal portions **65**. These ends are welded to the portions **65** and aid in holding shelving **46** in place as they will extend above this shelving. The hooks **26** on the bracket **25** are formed as the down-turned ends of an inverted C-shaped member **71** welded to the end portions **66** and disposed therebetween. This construction of the bracket **25** provides the larger end portions **66** as bearing elements engageable with the posts **14** and **15** and upright members **17** to stabilize the bracket. The horizontal upper portions **65** serve as a support for shelving or as a means for supporting other accessories. The construction of the bracket **25** and shelving **46** makes it possible conveniently to employ the spring clips **48** as shown in FIG. 9 for securing the shelving to the brackets.

It will now be apparent that a production station unit constructed in accordance with this invention is adaptable to a wide variety of uses in establishing prefabricated assembly lines at a comparatively low cost and with assurance of more efficient production and better product quality by reason of the built-in factors hereinbefore noted which make it possible for production workers to operate with a minimum of effort and movement.

While specific structural details have been shown and described, it should be understood that changes and alterations may be resorted to without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. In a frame structure of the character described, a horizontal frame member; a post secured to and extending upwardly from said frame member; said post being formed of a pair of channelled members; fastening elements securing the webs of said channelled members to said frame member so that the flanges of said channelled members are disposed in opposed and spaced relation to one another; said channelled members having a plurality of slots in the flanges thereof for reception of means for mounting objects on said post; a channelled top frame member having its web extended across and engaged with the upper end of said post; the flanges of said channelled top frame member having slots therein in which the webs of said channelled post members are engaged; and fastening elements engaged with the webs of said channelled post members and operable to clamp said post members together to retain said top frame member in connected relation to said post.

2. In a frame structure of the character described, a horizontal frame member; a post secured to and extending upwardly from said frame member; said post being formed of a pair of channelled members; fastening elements securing the webs of said channelled members to said frame member so that the flanges of said channelled members are disposed in opposed and spaced relation to one another; said channelled members having a plurality of slots in the flanges thereof for reception of means for mounting objects on said post; a channelled closure member in the upper end of said post having its flanges engageable with the inner surfaces of the flanges of said channelled post members; the ends of said flanges being engaged with the inner surfaces of the webs of said channelled post members; an element of the frame structure interposed between the web of one of said channelled post members and an end of the web of said channelled closure; and fastening means engaged with the webs of said channelled post members and operable to clamp said post member against the closure to thereby clamp said closure against said element for holding the latter secured to said post.

3. In a frame structure of the character described, a horizontal frame member; a post secured to and extending upwardly from said frame member; said post being formed of a pair of channelled members; fastening elements securing the webs of said channelled members to said frame member so that the flanges of said channelled members are disposed in opposed and spaced relation to one another; said channelled members having a plurality of slots in the flanges thereof for reception of means for mounting objects on said post; a channelled closure member in the upper end of said post having its flanges engageable with the inner surfaces of the flanges of said channelled post members; the ends of said flanges being engaged with the inner surfaces of the webs of said channelled post members; fastening means engaging the webs of said channelled post members and operable to clamp the webs thereof against the ends of the flanges of said channelled closure members; and an upper frame member engaging and extending laterally from the upper end of the web of one of said channelled post members; said closure member having one end of the web thereof overlying the portion of said upper frame member that is engaged with said one channelled post member.

4. A prefabricated base structure for supporting facilities and accessories for use at production stations in assembly lines and the like, comprising: a horizontal frame unit including a pair of opposed elongate channelled side members having their open sides facing one another; channelled end members joined to the ends of said side members with the open sides facing downwardly

and their ends partly encompassed by said side members; a pair of legs joined to each end member at points spaced inwardly of the ends of said end members; each of said channelled end members having an opening in the web portion thereof; posts extending through the openings in said end members; said posts extending below and above said end members; a top member extending between and secured to the upper ends of said posts; each of said posts being composed of a pair of channelled sections with their open sides opposed; the webs of said channelled sections abutting the inner surfaces of the flanges of said end members; and means securing said webs of said channelled sections to said flanges of said end members; there being slots in the webs of said channelled side members and in the flanges of said channelled sections of said posts for reception of means to attach accessories to said side members and said posts.

5. A prefabricated base structure for supporting facilities and accessories for use at production stations in assembly lines and the like, comprising: a horizontal frame unit including a pair of opposed elongate channelled side members having their open sides facing one another; channelled end members joined to the ends of said side members with the open sides facing downwardly and their ends partly encompassed by said side members; a pair of legs joined to each end member at points spaced inwardly of the ends of said end members; each of said channelled end members having an opening in the web portion thereof; posts extending through the openings in said end members; said posts extending below and above said end members; a top member extending between and secured to the upper ends of said posts; each of said posts being composed of a pair of channelled sections with their open sides opposed; the webs of said channelled sections abutting the inner surfaces of the flanges of said end members; there being slots in the webs of said channelled side members and in the flanges of said channelled sections of said posts for reception of means to attach accessories to said side members and said posts; said top members having flanges depending therefrom for engaging the inner surface of the web portion of a channelled section of each post; and fastening means securing together the upper portions of said channelled sections of each post adjacent said top member.

6. A prefabricated base structure for supporting facilities and accessories for use at production stations in

assembly lines and the like, comprising: a horizontal frame unit including a pair of opposed elongate channelled side members having their open sides facing one another; channelled end members joined to the ends of said side members with the open sides facing downwardly and their ends partly encompassed by said side members; a pair of legs joined to each end member at points spaced inwardly of the ends of said end members; each of said channelled end members having an opening in the web portion thereof; posts extending through the openings in said end members; said posts extending below and above said end members; a top member extending between and secured to the upper ends of said posts; each of said posts being composed of a pair of channelled sections with their open sides opposed; the webs of said channelled sections abutting the inner surfaces of the flanges of said end members; said top members having flanges depending therefrom for engaging the inner surface of the web portion of a channelled section of each post; fastening means securing together the upper portions of said channelled sections of each post adjacent said top member; and a flanged closure in the upper ends of said posts disposed between said channelled sections and held there by being clamped by said sections upon the tightening of said fastening means.

References Cited by the Examiner

UNITED STATES PATENTS

1,905,908	4/1933	Karnes	108—108
2,310,326	2/1943	Swartwout	189—34
2,787,382	4/1957	Williams	189—34 X
2,956,688	10/1960	Glassi	108—108
2,998,107	8/1961	Zimmerla	189—34
3,009,581	11/1961	Stewart	211—175
3,040,848	6/1962	Powell et al.	189—34
3,081,718	3/1963	Shoffner	108—108
3,127,020	3/1964	Bibb	211—148
3,142,386	7/1964	Skubic	211—182

OTHER REFERENCES

Bild-A-Flex: Republic Steel Corporation, Berger Division, Catalog ES–2058, February 1958, pages 4 and 7.

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