

Nov. 10, 1953

H. ELLIS ET AL
WORK UNIT

2,658,810

Filed April 9, 1948

10 Sheets-Sheet 1

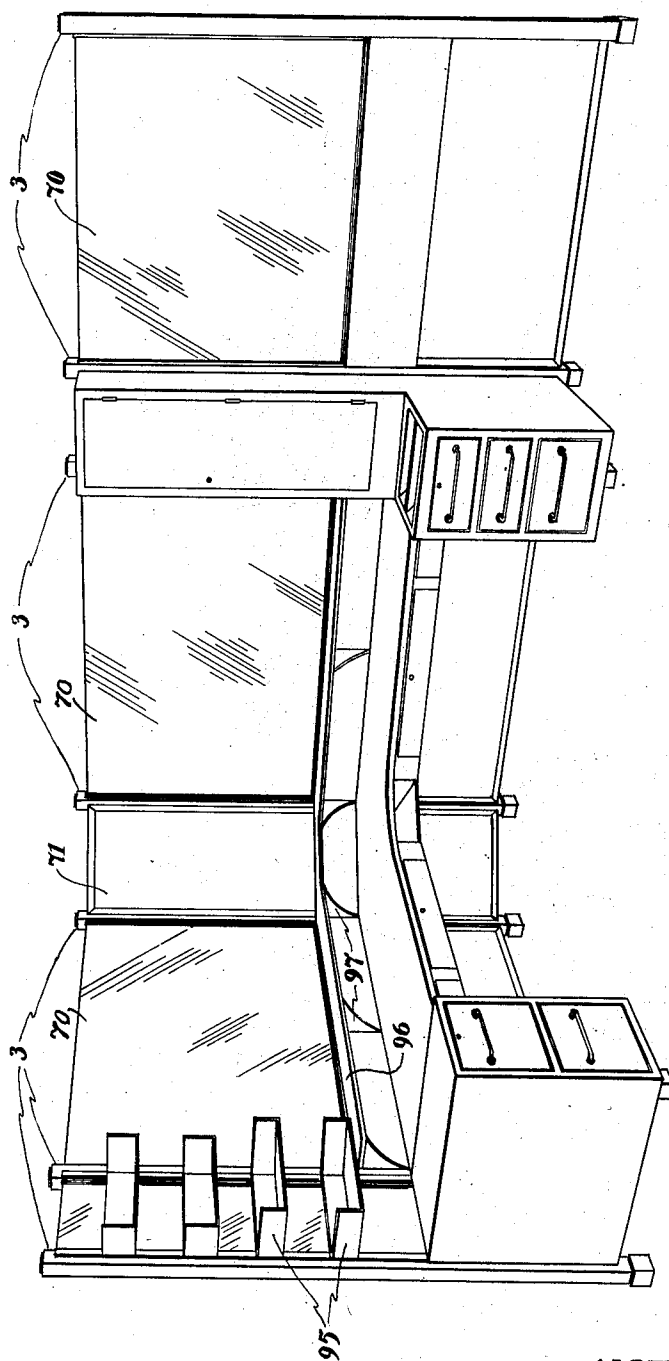


Fig. 1.

INVENTORS,
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BY *Reddick*
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Nov. 10, 1953

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10 Sheets-Sheet 2

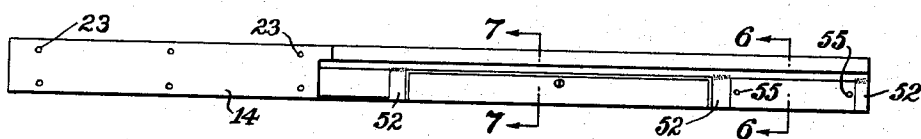


Fig. 5

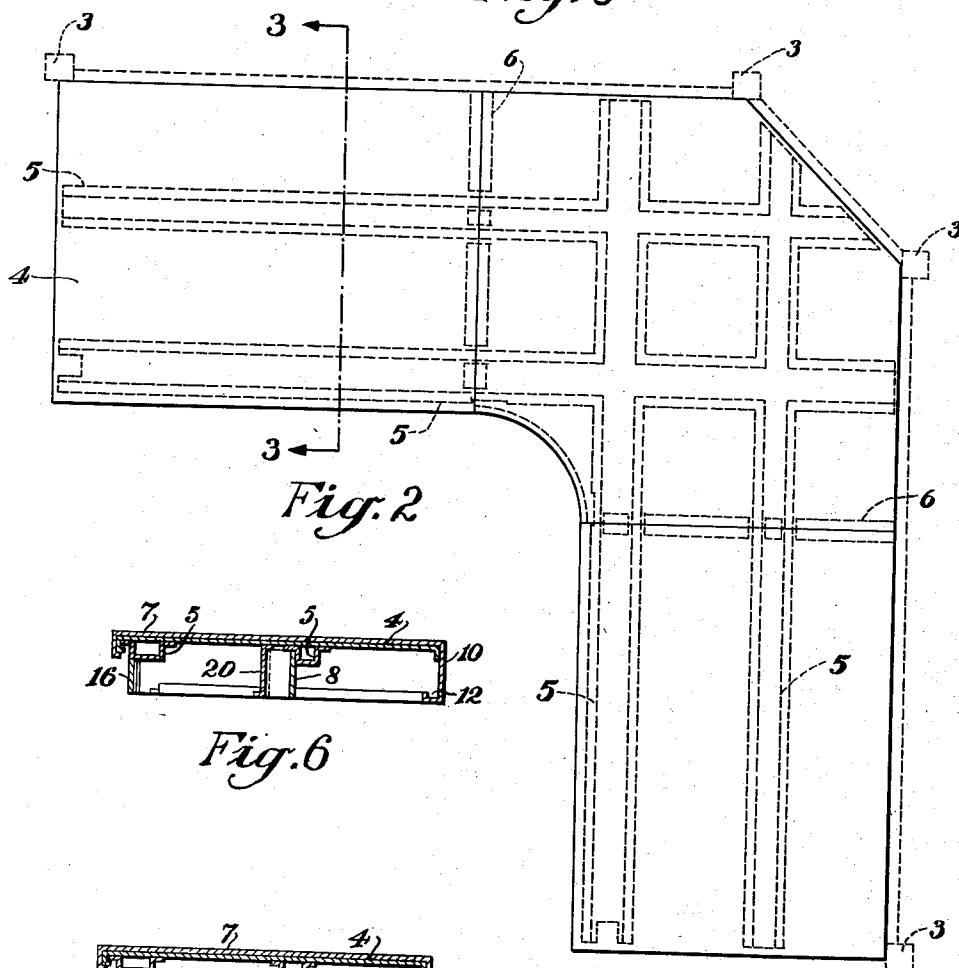


Fig. 2

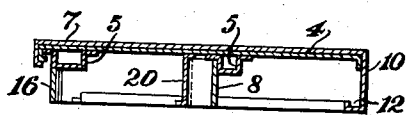


Fig. 6

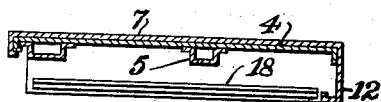


Fig. 7

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BY *Hedslers & Co.*
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10 Sheets-Sheet 3

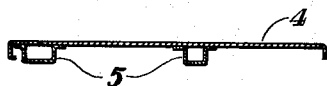


Fig. 3.

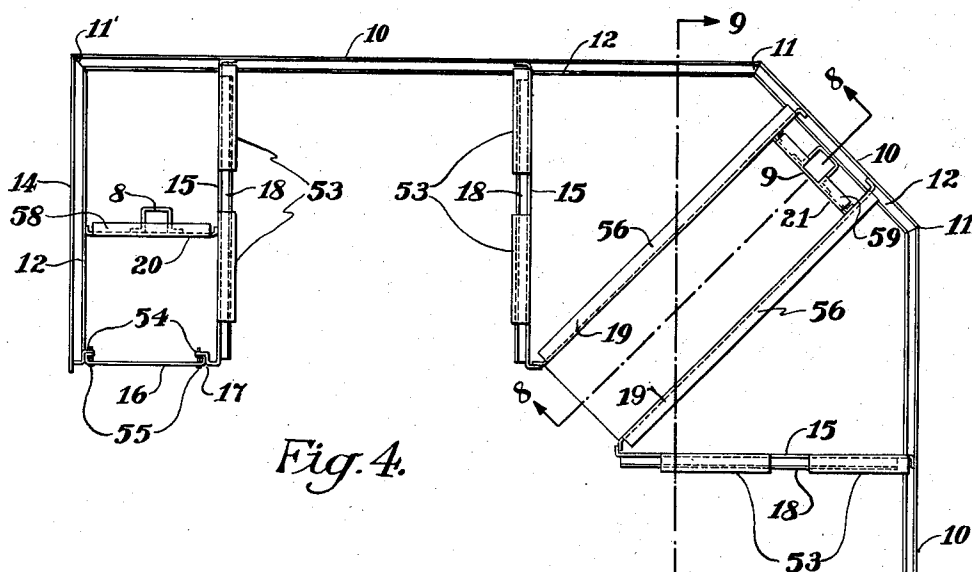


Fig. 4.

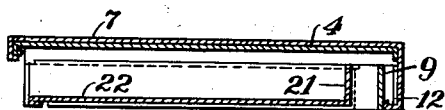
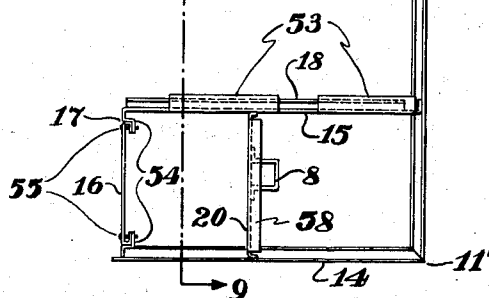


Fig. 8.



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Nov. 10, 1953

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10 Sheets-Sheet 4

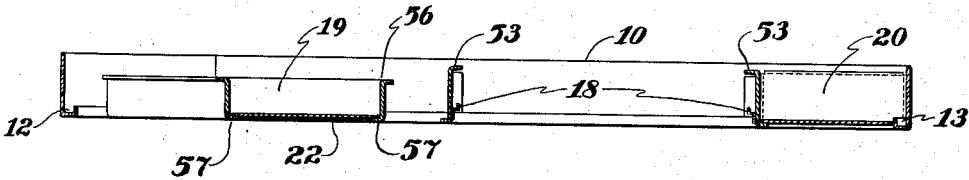


Fig. 9.

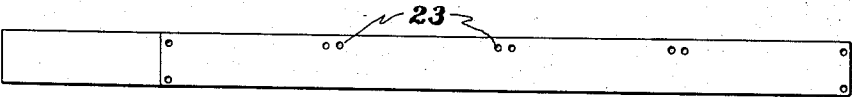


Fig. 10.

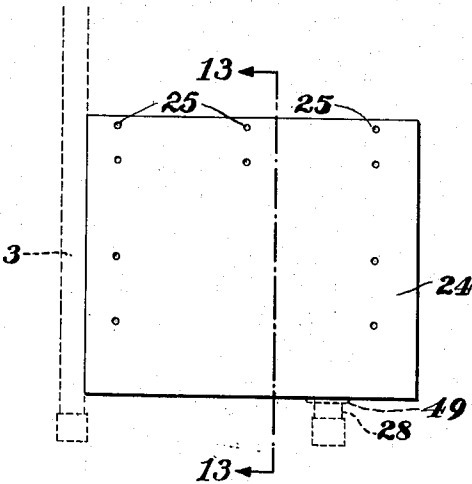


Fig. 11.

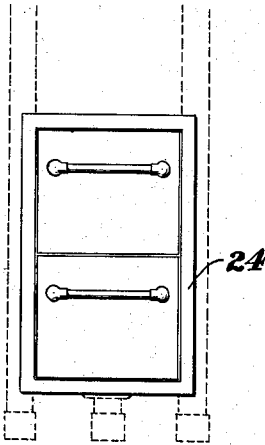


Fig. 12.

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10 Sheets-Sheet 5

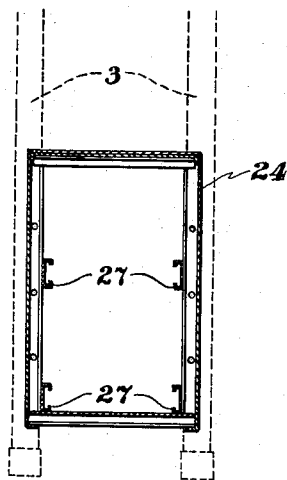


Fig. 13.

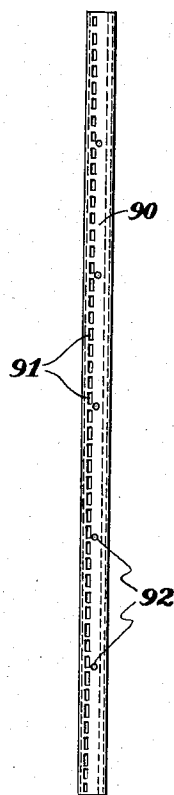


Fig. 15.

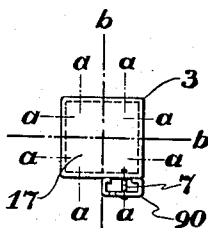


Fig. 14.

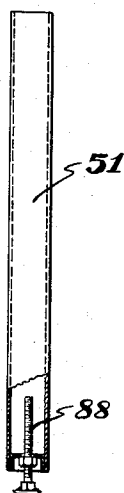


Fig. 16.

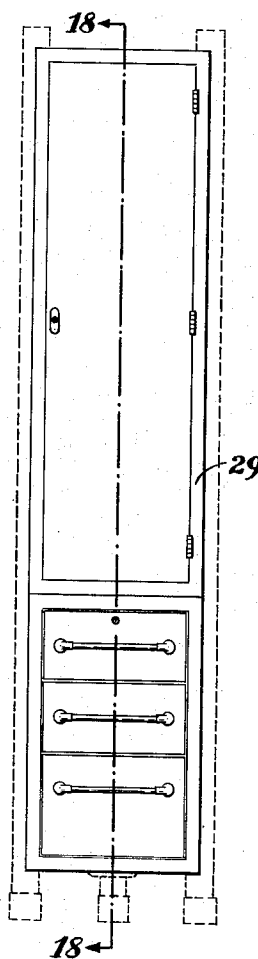


Fig. 17.

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10 Sheets-Sheet 6

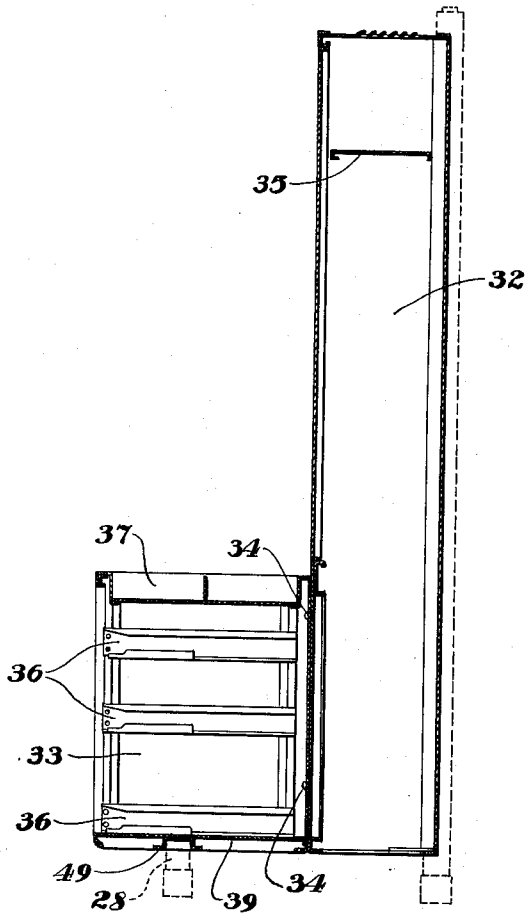


Fig. 18.

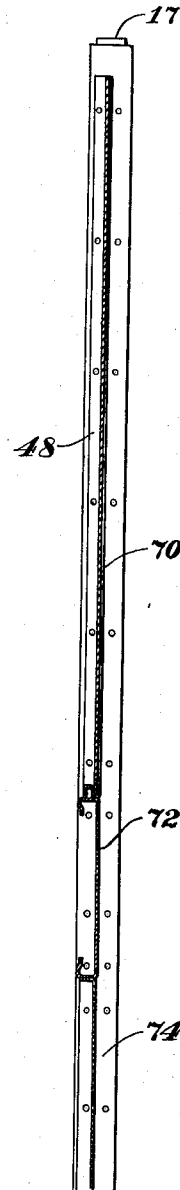


Fig. 19.

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10 Sheets-Sheet 7

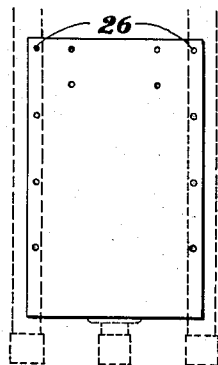


Fig. 20.

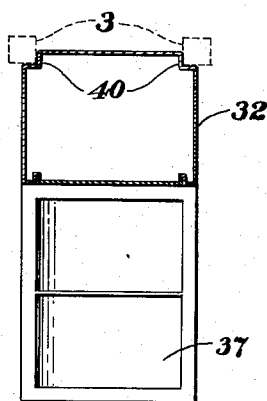


Fig. 22.

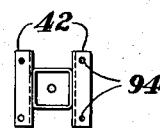


Fig. 23.

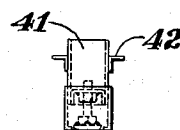


Fig. 24.

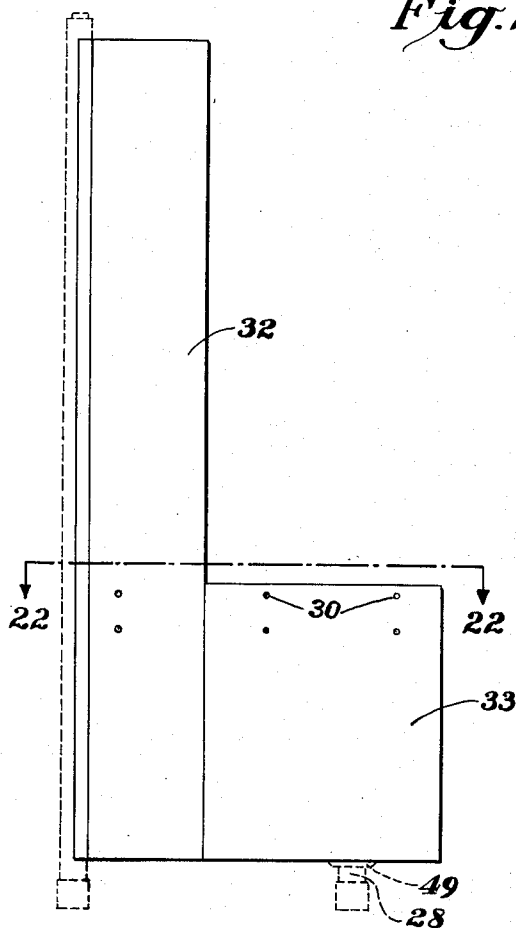


Fig. 21.

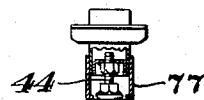


Fig. 25.

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H. ELLIS ET AL
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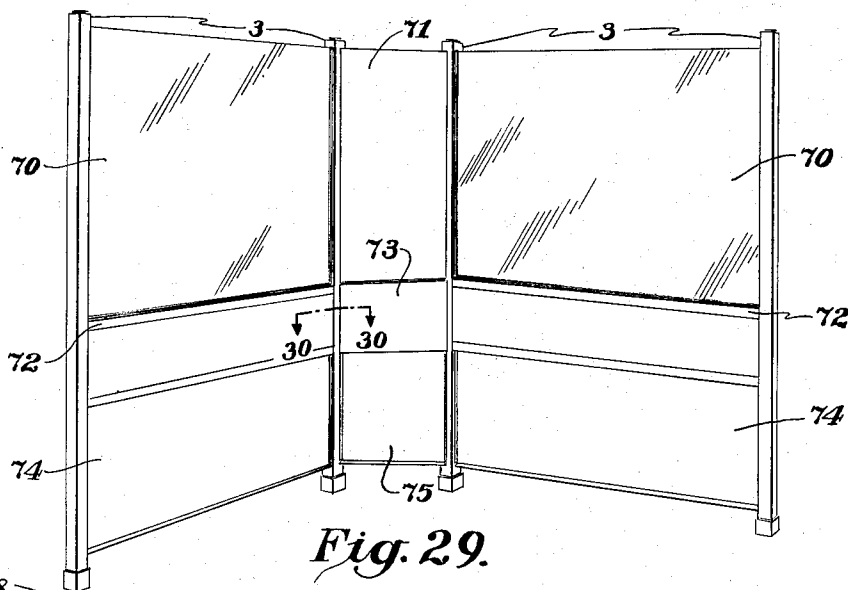


Fig. 29.

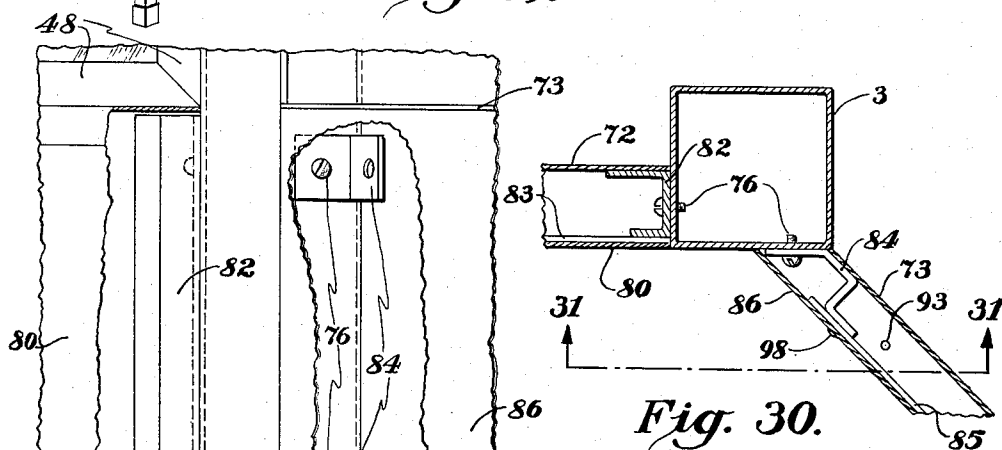


Fig. 30.

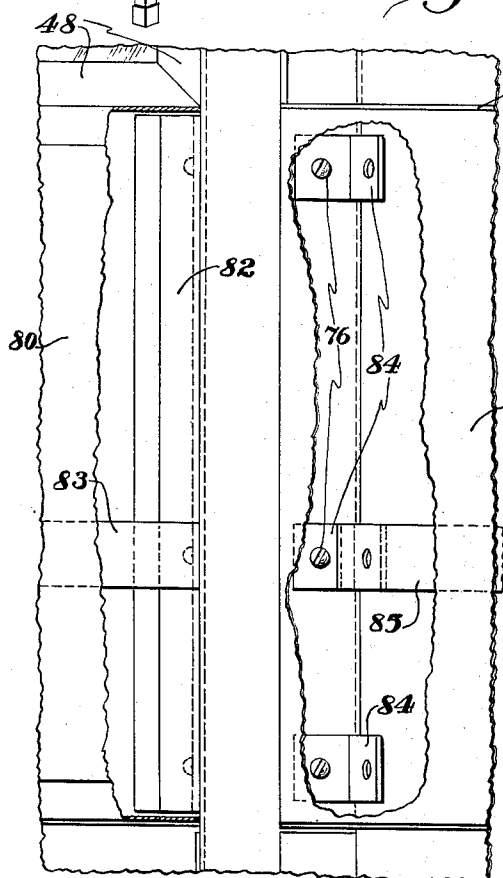


Fig. 31.

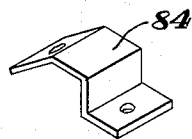


Fig. 32.

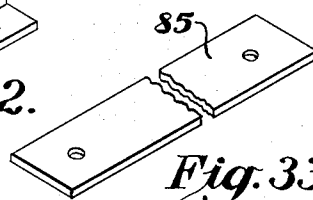


Fig. 33.

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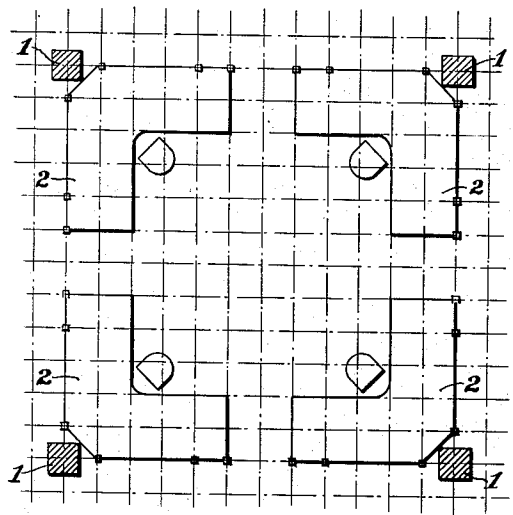


Fig. 34.

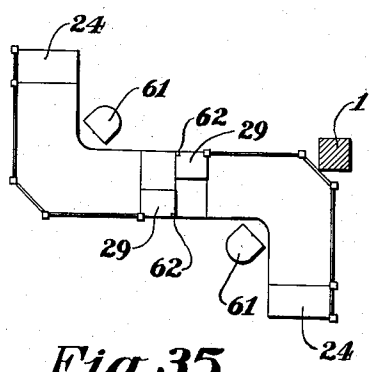


Fig. 35.

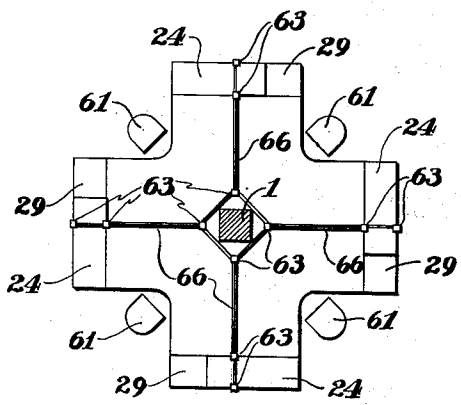


Fig. 36.

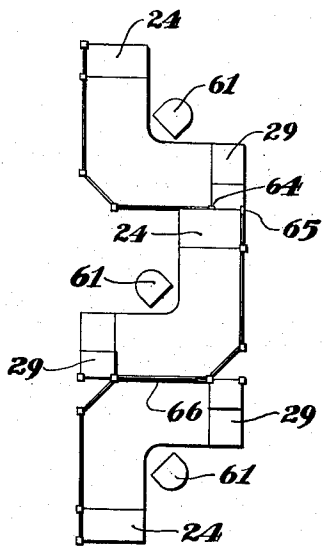


Fig. 37.

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ATTORNEY

UNITED STATES PATENT OFFICE

2,658,810

WORK UNIT

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Application April 9, 1948, Serial No. 19,914

13 Claims. (Cl. 312-238)

1

This invention relates to a method for the more effective utilization of building space and is intended for use in offices, warehouses, laboratories and like buildings. A feature of this invention is the provision of a self contained work unit which, at the same time, defines the limits of the work area desired.

The design of buildings and the allocation of the space therein for the most efficient utilization has not hitherto been correlated with the furniture arrangement and needs of the prospective users. The result has been an enormous wastage of costly building space, the provision of work space not suited in area or arrangement for efficient accomplishment of the worker's duties and a very great waste of time in the maintenance of liaison between workers whose duties are interrelated, and in the servicing of the over extended areas in which business is normally conducted. Where workers require some measure of privacy to effectively carry out their duties it has been the practice to subdivide the total inside building area into an appropriate number of independent work rooms, using relatively thick, permanent walls to separate a specific work area from adjoining work areas. This has resulted in inordinate expense in building construction, lack of flexibility in work space arrangement and planning, and the blocking of natural light and ventilation.

A principal object of this invention is to provide a flexible method for the utilization of office building space at maximum worker efficiency, which method is correlated with standard building practices to such an extent that great construction savings may be made.

Another object of this invention is to permit an increase in the number of workers per unit of floor space, thereby greatly reducing the building size necessary to accommodate a given number of workers, while at the same time locating individual workers conveniently adjacent to their fellow workers.

Another object of this invention is the orientation of workers so that each faces away from his nearest neighbors, whereby the individual is protected from distractions which interfere with his work and are otherwise annoying.

A further object of this invention is the arrangement conveniently near at hand of all work facilities which the worker normally requires, whereby lost motion and worker fatigue are greatly reduced and the sequence of his operations made more efficient.

A still further object is the provision of a

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standard furniture unit incorporating interchangeable associated facilities which permits great flexibility in the assignment of work space to persons whose work is closely associated with the work of other persons.

Other objects will be apparent from the description of this invention which is illustrated by the accompanying drawings in which:

Figure 1 is a perspective view of one embodiment of standard furniture unit constructed in accordance with this invention showing its relation to an adjoining partition.

Figure 2 is a plan view of the desk counter element proper showing by broken line representation the disposition of the upright members which support it and the location of the partition panels.

Figure 3 is a sectional view taken along line 3-3 of Figure 2.

Figure 4 is a plan view of the underframe structure which supports the desk drawers, showing the relative locations of the brackets that engage with the leg members which support the desk counter from underneath.

Figure 5 is a front elevation of the desk counter assembly with one of its drawers in place.

Figure 6 is a sectional view taken along line 6-6 of Figure 5.

Figure 7 is a sectional view taken along line 7-7 of Figure 5.

Figure 8 is a sectional view taken along line 8-8 of Figure 4 except with the desk counter element shown in assembled relationship.

Figure 9 is a sectional view taken along line 9-9 of Figure 4.

Figure 10 is a rear elevation view of the desk counter assembly shown in front elevation in Figure 5.

Figure 11 is a side elevation of a filing cabinet auxiliary unit which may be used with the desk counter of this invention, showing by broken line representation the relative disposition of its supporting upright members and pedestal support member.

Figure 12 is a front elevation of the filing cabinet auxiliary of Figure 11.

Figure 13 is a sectional view taken along line 13-13 of Figure 11.

Figure 14 is a top plan view of one of the upright supports showing the method of engaging the mounting strip of Figure 15 with it.

Figure 15 is a front elevation of a mounting strip piece which is adapted to support open or enclosed shelves from the upright members which are positioned at the rear of the desk counter.

Figure 16 is a side elevation of a leg member adapted to support the desk counter assembly from the underside, the lower portion being partially cut away to more clearly show the adjustable foot construction.

Figure 17 is a front elevation view of a clothes locker-filing cabinet auxiliary unit which may be used with the desk counter of this invention, showing by broken line representation the relative disposition of its supporting upright members and pedestal support member.

Figure 18 is a sectional view taken along line 18—18 of Figure 17, with the drawers removed and the uprights and front pedestal support being shown in broken line representation.

Figure 19 is a partial side elevation view of one of the outer upright members which supports the desk counter and its auxiliaries and also the separating partition panels, showing the common connecting elements in assembled relationship therewith.

Figure 20 is a rear elevation view of the filing cabinet auxiliary unit shown in front elevation in Figure 12, illustrating by broken line representation the relative disposition of its supporting upright members and foot pedestal.

Figure 21 is a side elevation of the clothes locker-filing cabinet auxiliary unit shown in front elevation in Figure 17, the disposition of its supporting uprights and foot pedestal being shown by broken line representation.

Figure 22 is a partial section-plan view taken along line 22—22 of Figure 21.

Figure 23 is a plan view of a foot pedestal.

Figure 24 is an end elevation view of a foot pedestal.

Figure 25 is a side elevation view of a foot pedestal shown in partial section.

Figure 26 is a detail sectional view showing the assembly of an upper partition panel, a desk counter back stop panel, and a lower partition panel with one of the outer upright supporting members, the adjacent portions of the desk counter itself being shown by broken line representation.

Figure 27 is a detail side elevation view showing the assembly of the lower separating partition panel with one of the outer upright supporting members.

Figure 28 is a detail sectional view of the lower end of one of the upright supporting members, showing the adjustable foot element for securing level placement of these members.

Figure 29 is a perspective view of the upright members in assembled relationship with the upper partition panels, back stop strips and lower partition panels, shown without the desk counter element for purposes of clarity.

Figure 30 is a section taken along line 30—30 of Figure 29.

Figure 31 is a partially broken side elevation detailed view looking in the direction of the arrows 31—31 of Figure 30 showing the method of attachment of the back stop strips to one of the inner upright members.

Figure 32 is a perspective view of one of the clips used to assemble the center back stop strip with one of the inner upright members.

Figure 33 is a broken perspective view of a backing strip used to reinforce the front panel of the center back stop strip in the course of assembly.

Figure 34 is a diagrammatic representation showing one method of utilizing to the maximum advantage the area lying within the building bay

defined by the four building columns shown, the area being gridded by the broken modular lines to illustrate the principles upon which the most effective utilization of this invention is based.

Figures 35, 36, and 37 are diagrammatic representations of still other ways for the effective utilization of floor space according to this invention.

The definition of work space contemplated by this invention preferably is applied to buildings which are not partitioned with permanent inner walls or partitions. However, the invention is equally applicable to buildings which are permanently partitioned into relatively large work rooms, and is also applicable to buildings which are unusual in plan arrangement, such as triangular buildings and the like.

For purposes of illustration the invention will hereinafter be described as utilized with a building devoid of any permanent building partitions whatever. In this case a single building floor will be entirely exposed to view and readily accessible to any chosen reference point, except for the vertical supporting columns which extend from the floor to the ceiling at regular intervals. The vertical columns define the building bays, the bay areas between adjacent columns generally being sixteen, eighteen, or twenty feet on a side, depending upon the column spacing chosen by the building architect.

Assuming a column spacing of, say, sixteen feet from center to center, a typical building bay area might then be gridded into equal subdivisions of any convenient linear magnitude, such a length unit being commonly referred to as a "module" or common unit of measurement. For a sixteen foot building bay it is convenient to utilize a sixteen inch module. The module is, in effect, the correlation factor which relates the building construction with the furniture design and arrangement, and the module should be chosen so that the greatest possible number of building, furniture and arrangement dimensions will be unit multiples thereof.

Referring to Figure 34 the foregoing principles are illustrated schematically. The building bay represented therein is defined by the four columns 1, and the area included in the bay is subdivided into one hundred and forty-four equal sixteen inch grids of common sixteen inch module. The furniture arrangement within the bay area is represented by the four L-shaped work units 2 which occupy an effective area equivalent to sixteen grid spaces each. The remaining eighty grid spaces are available for the seating of the worker personnel and for aisle space in any of the four cardinal directions. According to the orderly arrangement illustrated herein it is practicable to house each one of four workers in a building space of only about forty-five square feet per person, and at the same time provide all necessary work facilities and preserve the individual's comfort. The space economy realized by this invention is accentuated by comparison of the described space allotment with that of a room defined by permanent partitions which encompass an equivalent area of forty-five square feet. Such a room, less than seven feet square, would be so cramped, restricted, and unhealthful as to be useless over any but relatively brief work periods.

Proceeding now to the description of the novel work unit 2 which is a part of this invention, one such unit is shown in perspective in Figure 1. The work unit comprises an L-shaped desk

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counter which is supported by rear uprights which also support partition panels. The work unit is provided with suitable file cabinet auxiliaries, counter drawers, letter trays, book shelves, and a clothes locker. It can likewise be provided with recessed lighting fixtures, compact telephone, buzzer signal and other communications facilities, and a detachable out-of-the-way waste basket if desired. Any suitable office chair may be used in conjunction with the unit. The work unit shown incorporates all facilities which are necessary to the performance of the office worker's tasks, in a compact arrangement which enables him to utilize them with a minimum of effort and physical movement, and at the same time provides a large work table area. The worker is protected from distractions by orientation in a direction away from his fellow workers in the same bay and by the separating partition in the forefront. A further feature of the work unit is that all work facility space is concentrated along the walls or partitions and in the corners of the over-all work area in which it is located, that is, in space which is ordinarily largely wasted in buildings where work areas are defined by permanent walls.

The work unit is further characterized by a high degree of interchangeability of component parts, which makes it possible to adjust work space and arrangement to fit the worker's individual needs, all as is hereinafter described.

Referring to Figure 2, the four rear upright supports 3 are shown in plan relation to the counter 4. This view does not include any filing or clothes-locker auxiliary units, for the counter may be used singly, without the added facilities which make for a complete, self-contained work unit, if such use is desired.

The counter 4 is a metal plate which may be fabricated as a single piece or which may be made up from several separate plates of suitable shape as illustrated which are welded to the longitudinal support elements 5. The front and back edges of the counter are bent downward to present an edge of substantial thickness as shown in Figure 3. The counter is covered with a length of suitable desk covering material 7 (Figs. 6, 7 and 8) such as linoleum or the like which is widely sold for these purposes, the covering being preferably cemented securely to the metal plate member described.

The longitudinal supports 5 are channel shapes which are securely welded to the underside of counter top plate 4 and are cut through at points of intersection so that their lower surfaces all lie in a common horizontal plane. Lateral connecting members 6 are metal strips of relatively small thickness which are welded to the undersides of the three pieces of metal which make up the L-shaped counter top plate 4 and thus join them together as a single unit. As shown in Figure 2 lateral connecting members 6 are interrupted at the points of intersection with longitudinal supports 5. When the counter is assembled to the underframe the forward support members 5 define the front of the work unit. Face plates 52 end welded to forward members 5, as indicated in Figure 5, close off the spaces between adjacent compartments of the counter.

The counter top plate 4 is secured by welding it to the underframe structure shown in plan in Figure 4 and in section in Figure 9. The underframe structure provides support for the removable desk drawers and also carries the leg brackets 8 and 9 which are adapted to receive

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the counter legs 51 (Fig. 16) which may be used to support the counter from the underside. With this construction it is possible to dispense with the rear upright supports entirely if the counter is not used with separating partitions. If the counter is used with the partitions the counter legs will provide additional forward support for structural stability, however, such additional stability will usually be provided by auxiliary furniture units which are joined to the ends of the counter in a manner to be described, in which case the counter legs may be dispensed with.

The underframe consists of a continuous back plate 10, formed by welding separate metal plates together at the points 11. The ends of the underframe are closed off by the two end plates 14 which are welded to the back plate at the points 11'. The lower edges of plates 10 and 14 are bent inwardly as shown in Figures 6, 7, 8 and 9 and all bracing members intersecting these plates are cut through as shown at 13, Figure 9, to form a continuous, open wire receiving channel 12 for telephone, buzzer and other communications system electrical conductors. It will be noted that the wire-way so formed extends completely around the back side and both ends of the counter.

The four cross struts 15 are single pieces of metal formed with top flanges 53. Cross struts 15 are securely welded to the back plate 10 at the points of intersection therewith and are notched at the points where the longitudinal supports 5 traverse them. The counter top plate 4 and the underframe are assembled and are then securely welded together at the points where the flanges 53 abut against the lateral connecting members 6 or against the underside of the counter top plate, depending upon which cross strut is involved. In this connection, the thickness of the lateral connecting members 6 is so small that the upper flanges of the end cross struts may be readily held against the underside of the counter plate by suitable clamps during the welding process, notwithstanding the fact that members 6 are interposed between the flanges of the inner cross struts 15 and the counter plate only, and not between the end cross struts 15 and the counter plate.

The forward edges of the two end-most cross struts 15 and the inner edges of the two end-most face plates 52 are formed with recessed flanges 54 which are adapted to receive removable front plates 16, secured thereto by threaded cap screws 55 which engage with tapped screw holes in the flanges. If it is desired to install special communications equipment, such as a telephone conversation recorder, an intra office buzzer button panel, or the like, front plates 16 may be removed and the space thus provided may be utilized for securing and housing these devices in a compact arrangement adjacent to the wire-way hereinbefore described.

The two inner cross struts 15 are welded at their forward ends to diagonal struts 19 which define the side walls of a storage pigeon hole located in the region of the angle of the L-shaped counter.

Cross struts 15 support conventional counter drawer receiving channels 18 which are securely welded to them. It will be understood that the counter drawers are disengageable from channels 18, which permits the easy reassignment of personnel from one work unit to another by merely interchanging the drawers of the two work units.

Diagonal struts 19 are single pieces of metal formed with top and bottom flanges 56 and 57, respectively. As indicated in Figure 9, struts 19 are terminated at a lower level than struts 15, so that the top flanges 56 are contiguous to the lower surfaces of longitudinal supports 5 to which they are joined by welding. The bottom flanges 57 provide support for the bottom plate 22 of the storage pigeon hole, to which they may be conveniently joined by spot welding.

The underframe structure is completed by three leg bracket retaining braces, the two end braces 20 being similarly disposed while the central brace 21, which defines the rear wall of the storage pigeon hole, is positioned parallel to the intermediate portion of back plate 10. Braces 20 and 21 are single pieces of metal with top edges bent over to form flanges 58 and 59, respectively. Brackets 8 and 9, which are adapted to retain the counter legs 51, are securely welded to braces 20 and 21, respectively, immediately below the top flanges. Since central brace 21 is at a somewhat lower level than the end braces 20, due to the fact that flange 59 is welded to the underside of the longitudinal supports 5, this flange is cut away in the region immediately above bracket 9 to permit free passage of the central counter leg through it to the level of the underside of counter plate 4, where its upper end will lie in approximately the same plane as the upper ends of the two end legs. The thin metal flanges 58, interposed between the upper ends of the end legs and the counter plate, provide some additional strength at these points.

Referring now to Figures 29, 30, 31, 32 and 33, the detailed construction of the partition-upright assembly will be described.

The assembly shown in Figure 29 consists of the four rear upright members 3, the two upper translucent partition panels 70, the central metal partition panel 71, the two side back stop panels 72, the central back stop panel 73, the two lower metal side partition panels 74, and the central lower metal partition panel 75, all of these elements being joined to the supporting uprights 3 by cap screws which engage with tapped holes in these members.

As shown in Figure 14 upright members 3 are fabricated from square cross section metal tubing, the full size illustrated being provided with two rows of tapped screw holes 47 disposed equidistantly along the quarter lines of each side surface as indicated by the broken lines *a* (see Fig. 26). This invention contemplates the use of several sizes of uprights, the half size upright being a closed tube having the same disposition of holes but being only half as thick, whereupon it will have only one row of holes on its short side. Similarly, the outer surfaces of a quarter size upright will be defined by the broken lines *b-b*, and it will therefore only have a single row of tapped holes on each side surface. All other construction details of the uprights are the same, regardless of the particular size under consideration.

The upper ends of the upright members may be closed off by flat metal caps 17 securely welded thereto. The lower ends are closed off with cap pieces 45 (Fig. 28) which recess into the upright members and are joined to them by welding. Cap pieces 45 are fitted with welded nut portions 46 which are adapted to receive height adjusting foot screws 44. The entire bottom region is closed off by a short guard piece 77 which is frictionally engaged with upright 3 and is freely slidable thereon to permit its displacement to any

level required by the adjustment of foot screw 44.

The back stop panels 72 (Figs. 19, 26, 30 and 31) are made up from single sheets of metal bent forwardly at the top and bottom to form a hollow box-like enclosure. The forward ends are bent toward each other and are then drawn slightly inwards to form a shallow recess for the attachment of closure plates 80. The ends of panels 72 are closed off by channels 82 securely welded to the edges of the sheet. Channels 82 are drilled to permit the passage of screws 76, joining panels 72 with uprights 3. A stiffening strip 83, running the full length of panel 72, is welded to channels 82 and serves as a backing support for the central portion of closure plate 80.

The central back stop panel 73 is similar in construction to panels 72, except that, in this case, the joinder with uprights 3 is at an acute angle, necessitating cutting the ends of the sheet at a suitable angle so that the top and bottom edges will lie adjacent to the inside surface of the upright 3. Drilled metal clips 84, welded to the back side of panel 73, and cap screws 76, secure the panel to the uprights. Stiffening strip 85, extending from the center clip at one end of the panel to the center clip at the other, provides backing support for the central portion of closure plate 86 which is secured to tapped screw holes in clips 84 by cap screws 98.

The top and bottom edges of all back stop panels are drilled with tapped screw holes 93 to permit the connection of the upper and lower partition panels with them.

Metal partition panels 74 and 75 are unitary plates with the edges turned inwardly to provide flanges for screw connection to uprights 3. As shown in Figure 27 the lower edges of these plates are bent backwardly so as to contact with the vertical expanse thereof, thereby providing a sloping surface upon which dust will not readily collect.

In erecting the assembly shown in Figure 29, all operations are performed from the front side. The first elements assembled to the uprights are the back stop panels 72 and 73. In this operation the closure plates 80 and 86 are removed and the back stop panels are secured along the first row of screw holes in the uprights by the cap screws 76. The closure plates are then replaced by securing their top screws 60 to the back stop panels. Panels 74 and 75 may next be assembled, using screws 76 to join them to the uprights and screws 87 to join the upper edges to the back stop panels. The upper partition panels 70 and 71 are then assembled as a final step.

Panel 71 is a unitary metal plate with the side and bottom edges turned inwardly as has been described for panels 74 and 75. The bottom and side flanges so created afford connection surfaces with the top of the central back stop panel 73 by means of cap screws identical with screws 87, and with the uprights 3 by screws 76.

The translucent partition panels 70, which may be fabricated from glass or a synthetic resinous material having similar light transmitting properties, are joined to the uprights 3 and back stop panels 72 by moulding strips 48 (Figs. 19, 26 and 31). Moulding strips 48 are S-shaped metal lengths, the outside channel of which may be cushioned with a strip of elastic material 78 where in contact with panels 70. Separate moulding strips, beveled at adjacent ends, are fitted to each side and the bottom edges of the panels. The panels are conveniently joined to the up-

rights and the back stop panels by first pressing all three strips into proper position along the three edges and then disposing the panel at an oblique angle across the top of the back stop panel. In this position a single screw 88 may be loosely engaged with the proper threaded hole in the top of panel 72, whereupon the partition may be rotated into its proper position by revolving it about the single screw as a pivot. The elastic strips 78 are sufficiently flexible to permit bending the edge mouldings slightly to avoid any binding interference with the uprights during this operation. When the panels 70 have been rotated into position the edge moulding strips are secured to the uprights by screws 76 and the remaining screws 88 are inserted to complete the connection with the panels 72.

The assembly of the counter-underframe to the partitions and uprights is facilitated by the use of the three counter legs 51 shown in Figure 16. The counter legs are constructed of square cross section metal tubing of the same dimensions as the full size upright members 3. The counter legs are, of course, much shorter, a length of about thirty inches being sufficient. The adjustable foot screws 83 of the legs are made of greater length than the foot screws 44 of the uprights to permit the complete removal of the uprights 51 after the assembling operation if they are to be used solely as erecting aids.

With the counter-underframe supported on the three legs 51, the assembly is shifted to its proper position adjacent to the closure plates 80 and 86 of the assembled partition elements and uprights and the common assembling screws 89 are inserted from the front side through the screw holes 23 in back plate 10 and engaged with the complementary tapped holes in the elements of the back stop panels.

While the assembled work unit comprising the counter-underframe with the counter legs and partition-uprights described may be used alone, the complete self contained embodiment of this invention incorporates additional facilities which will now be described.

One such adjunct is the filing cabinet auxiliary 24 shown in Figures 11, 12, 13 and 20. The body of the filing cabinet may be of conventional form with removable drawers supported upon suitable ways 27 secured to the inside walls. The side walls of the cabinet are provided with a series of screw-receiving tapped holes 25 mating with holes 23 in the end plates 14 of the counter underframe, while the rear wall is provided with through holes 26 mating with tapped holes 47 of uprights 3. The filing cabinet is integrally joined to the counter and to the rear uprights by cap screws inserted from the front side. The area to the rear of the filing cabinet is closed off by providing upper and lower partition and back stop panels identical with those which have been described except that they are of correspondingly reduced length. Additional forward support is supplied to the cabinet by a removable foot pedestal 28 such as that shown in Figures 23, 24 and 25.

The foot pedestal consists of a short length of square cross section tubing 41 of the same size used for the fabrication of the full size uprights 3. The upper end of 41 is adapted to engage with a suitable bracket 49 secured to the underside of cabinet 24. Short angle iron support pieces 42 are welded to opposite sides of 41 and are drilled at points 34 to receive cap screws for engagement in mating tapped screw holes in

bracket 49. The lower end of the foot pedestal is fitted with a height adjusting foot screw 44 and a guard piece 77 of identical design as hereinbefore described for the uprights 3.

If it is desired to utilize the filing cabinet auxiliary without rear uprights or partitions, it will be understood that this may be accomplished by providing two additional brackets 49 disposed near the rear edge of the cabinet whereupon the cabinet may be independently supported upon three foot pedestal members 28.

A second useful auxiliary unit is the clothes locker-drawer cabinet 29 shown in Figures 17, 18, 21, and 22. This unit is adapted for assembly to either end of the desk counter by cap screw connection through tapped screw holes 30, matching with screw holes 23 in end plates 14, in the same manner as described for the filing cabinet auxiliary.

The clothes locker-drawer cabinet auxiliary 29 is made up of two compartments, the clothes locker 32 and the drawer cabinet 33, joined together by matching screw fittings 34 located along their adjacent sides. The clothes locker portion is similar to the common clothes locker used in work shops and gymnasiums except that the door is made shorter in length to permit clearance with the drawer cabinet, and the bottom is open to facilitate recovery of any small articles which the user may inadvertently drop from the shelf 35. The rear corners of the clothes locker are recessed as shown at 40 to permit neat cap screw assembly with uprights 3. The clothes locker may be fitted with clothes hooks, mirrors, overshoe holding brackets or other convenient fixtures not shown.

The drawer cabinet component 33 is of modified conventional three drawer design, incorporating the three drawer hanger members 36, which support the several drawers on draw out and return, and which permit complete removal of the drawers in the event the user is moved to a new location. The top of the drawer cabinet is modified to receive the two compartment letter tray 37, which is permanently welded to the cabinet frame. The bottom of the cabinet is fitted with a foot pedestal receiving bracket 49 securely welded to the drawer cabinet bottom plate 39 along its longitudinal center line for the reception of a foot pedestal member 28 of identical design with that hereinbefore described for the filing cabinet auxiliary 24.

The clothes locker-drawer cabinet may be used in conjunction with two rear uprights 3, as indicated in Figure 22, in which case no partition panels are required to close off the area between the uprights, since auxiliary 29 extends from the bottom level to the top level of adjacent partition panels. If desired, auxiliary 29 may be independently supported on three foot pedestal supports 28 as in the case of filing cabinet 24, in which case the rear uprights may be dispensed with.

Uprights 3 may be conveniently employed to support a series of superimposed book shelves 95 as illustrated in Figure 1 by the use of mounting strips 90 of the design shown in Figures 14 and 15. Mounting strips 90 comprise single strips of metal bent into a channel shape and perforated along one side with an offset row of elongated holes 91 adapted to be engaged with mating projections on the adjacent edges of the book shelves. Cap screws 76 traversing screw holes 92 secure the mounting strips to the uprights.

The work unit may also be provided with a

shelf 96 supported on brackets 97 connected by screws or otherwise to the back stop panels at appropriate points.

As illustrated in Figure 1 the partitioning to the rear of the work unit may be extended by connecting additional partitioning sections to the endmost uprights. Such additional sections incorporate top and bottom partition panels and intermediate backstop panels similar to those which have been described for use in connection with the work units and provide supports for the connection of additional work units if this is desired.

If conditions of use do not require partitioning to the front of the work units, the L-shaped desk counter may be advantageously utilized as an open desk by reversing the position of the back stop members so that the end which is shown extended above the level of the counter in Figure 26 is disposed below the counter and the lower end is disposed on a level with the counter top. It will be understood that with this orientation the top screw 89 will engage with what was before the bottommost screw hole of the back stop while the lower screw 89 will engage with the intermediate screw hole. In this use the lower partition panels 74 and 75 are either not employed or corresponding panels of shorter length must be substituted. When used as an open desk the desk counter may be supported by counter legs 51 or uprights similar in construction to the uprights 3 may be used, except that the length is made such that these members terminate flush with the top of the back stop members.

Referring to Figures 35, 36 and 37, some of the preferred methods of utilization of the work units of this invention will now be described.

In these views the locations of the front or working sides of the units are indicated by the orientation of the office chairs 61 with respect thereto, the position of auxiliary filing cabinets being also shown. The use of common upright members for the support of adjacent work units is preferred wherever possible as such use contributes to economy and the saving of floor space and, in addition, permits the neat flush arrangement of neighboring units.

In Figure 35 two work units are shown in opposed relationship, the common quarter size uprights recessing into the rear corners of the clothes locker-drawer cabinet auxiliary units being indicated at 62. All other upright members may be full size as shown.

In Figure 36 four work units are shown in compact cluster arrangement about a single building column 1. In this combination twelve full size uprights indicated at 63 may be used to advantage with single partition elements 66 interposed between adjacent work units, it being understood that in this case all units are provided with back stop members which close off the space between adjacent work units.

The alternated arrangement of Figure 37 employs a quarter size upright at 64 and a half size upright at 65. All other upright members may be full size as shown. Single partition elements indicated at 66 are again employed wherever possible.

It will be apparent from the foregoing description that we have provided both a novel work unit and a flexible method of utilizing building space to the utmost advantage, and we intend to be limited in our invention only to the extent indicated in the following patent claims.

We claim:

1. In an article of office furniture, a space-saving unit comprising a L-shaped, metal desk top composed of a plurality of component parts joined together to form a unitary structure having rear edges at right angles, and having front and back edges bent downwardly to present an edge of substantial thickness, an underframe structure comprising cross-struts and auxiliary elements including longitudinal channel members and lateral connecting members welded to the underside and in supporting position for said desk top, a plurality of rear uprights in supporting position adjacent to said rear edges, back plates adjacent to said rear edges and carried by said uprights, and means securing the rear edges to said back plates.

2. The invention of claim 1 in which said cross-struts comprise single pieces of metal, end welded to said back plate at their points of intersection therewith, and supporting flanges for said counter carried by said cross-struts.

3. The invention of claim 1 including longitudinal supports and lateral connecting members interposed in supporting position between said counter and underframe, in which said lateral connecting members comprise relatively thin metal strips secured to the underside of said counter in supporting position and are interrupted at their points of intersection by said longitudinal supports.

4. The invention of claim 1 in which said underframe structure comprises auxiliary furniture units joined to the underside of said counter in spaced relation to provide leg room for the operator and stability for said counter.

5. The invention of claim 1 in which said underframe comprises compartments and counter legs in spaced relation and in supporting position for said counter from its underside.

6. In an article of office furniture, a space-saving unit comprising a metal, L-shaped desk top having leg room beneath said top and longitudinal rear edges at right angles, formed from a plurality of component parts including longitudinal supports and lateral connecting members welded to the underside of said desk top, an underframe structure in supporting position for said desk top comprising cross-struts and back plates also welded to the underside of said desk top, a plurality of rear uprights adjacent said rear edges, and in supporting position for said back plates, and a plurality of panels supported by said uprights substantially in the same plane as the supported back plates.

7. An article of office furniture manufactured in sub-assembly components including a L-shaped, metallic desk top comprising a multiplicity of component parts joined together to form a unitary structure having neighboring work areas with rear edges arranged at right angles longitudinally, longitudinal and lateral connecting members welded to the underside of said desk top for securing the component parts together, an underframe structure of cross-struts and auxiliary elements for supporting said desk top, back plates extending along the line of said rear edges and welded in supporting position to the ends of said cross-struts, rear upright members supporting said back plates, and a plurality of panels supported by said uprights substantially in the same plane as said back plates.

8. The invention of claim 7 including longitudinal supports and lateral connecting mem-

bers interposed in supporting position between said counter and underframe.

9. An article of office furniture manufactured in sub-assembly components, including a L-shaped, metallic desk top comprising a multiplicity of component parts joined together to form neighboring work areas, a multiplicity of prefabricated separate plates welded to the underside of said desk top for securing the component parts into a unitary structure having rear edges at right angles longitudinally, a plurality of uprights in supporting position adjacent said rear edges, an underframe structure supporting said desk top and providing leg room for the neighboring work areas, comprising cross-struts and auxiliary supporting elements, said underframe also including a plurality of back plates supported by said uprights and welded to the rear ends of said cross-struts.

10. In an arrangement and construction of an article of office furniture, a L-shaped desk top comprising a multiplicity of component parts joined together into a unitary structure and adapted to form neighboring work areas having leg room beneath and horizontally positioned rear edges, a plurality of rear uprights adjacent said rear edges but outside the vertical plane thereof, an underframe structure in supporting position for said desk top but providing leg room for the worker comprising back plates supported by said uprights and cross-struts having their rear ends welded thereto and secured in supporting position for and beneath said desk top, partition panels also supported by said uprights in the same vertical plane as the back plates, drawer-receiving channels supported by said cross-struts, forwardly positioned legs for supporting the under structure and desk drawers therefor, and brackets for positioning said legs.

11. The invention of claim 10 in which the diagonal struts comprise single pieces of metal formed with top and bottom supporting flanges.

12. The invention of claim 10 in which longitudinal supports and lateral connecting members are interposed between said cross-struts and counter top and are affixed thereto.

13. The invention of claim 10 in which diagonal struts are connected to the forward ends of the inner cross-struts to form the side walls of an auxiliary storage space in the region of the angle of said L-shaped counter, counter leg brackets having legs in supporting position near the forward position of said counter, and face plates affixed to the forward ends of said cross-struts in the regions adjacent to said drawer space and auxiliary storage space.

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