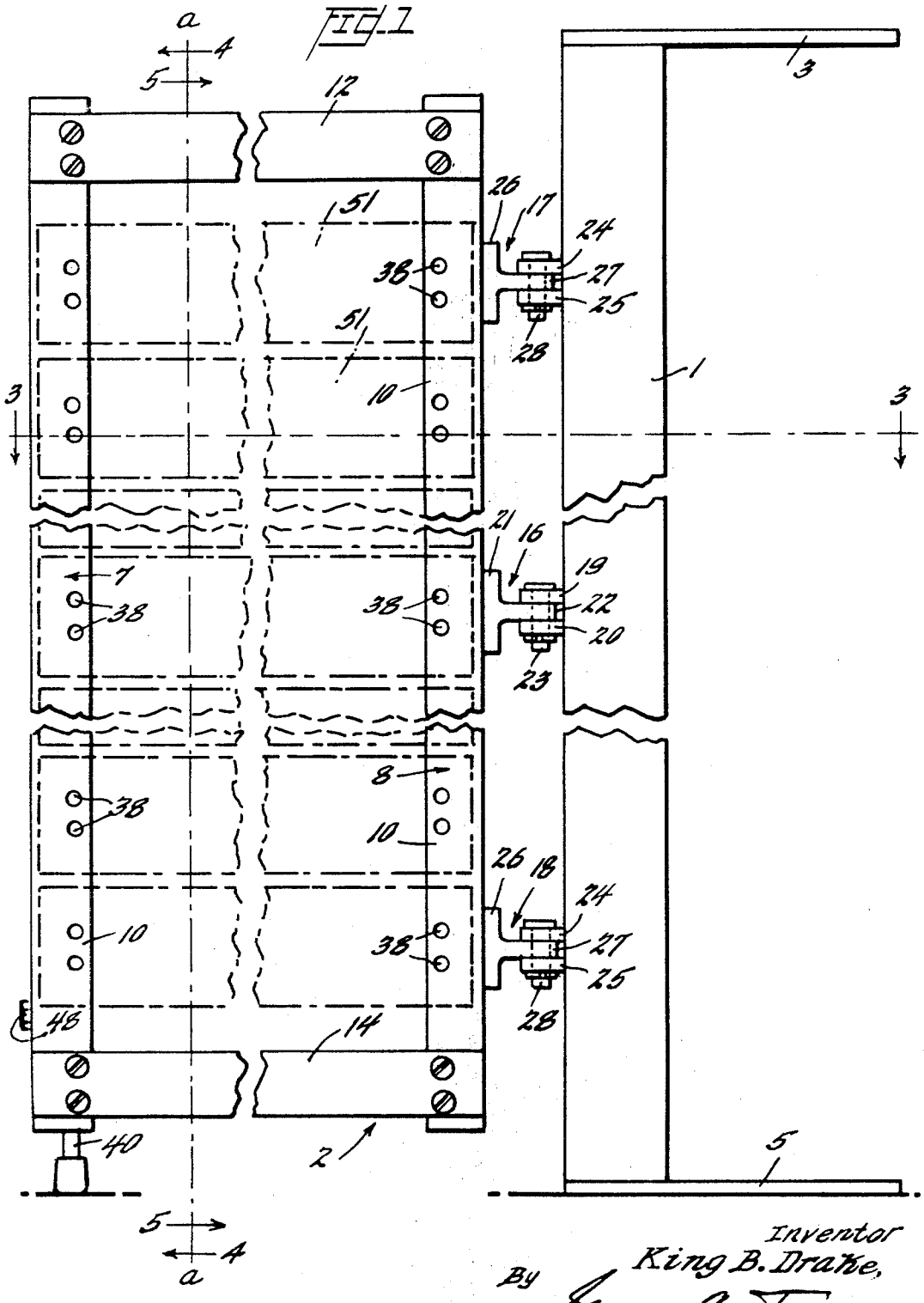
Sept. 23, 1969 K. B. DRAKE 3,468,429

TELEPHONIC EQUIPMENT RACK

Filed April 27, 1967 5 Sheets-Sheet 1

FIG. 1



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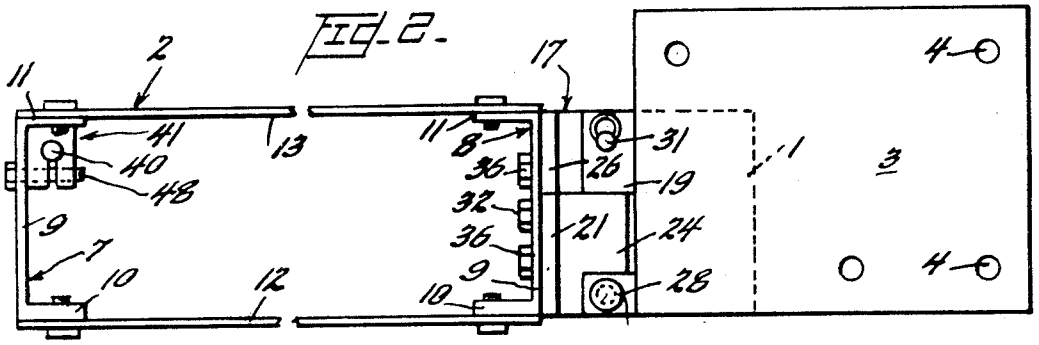
TELEPHONIC EQUIPMENT RACK

Filed April 27, 1967 5 Sheets-Sheet 2

FIG. 2.



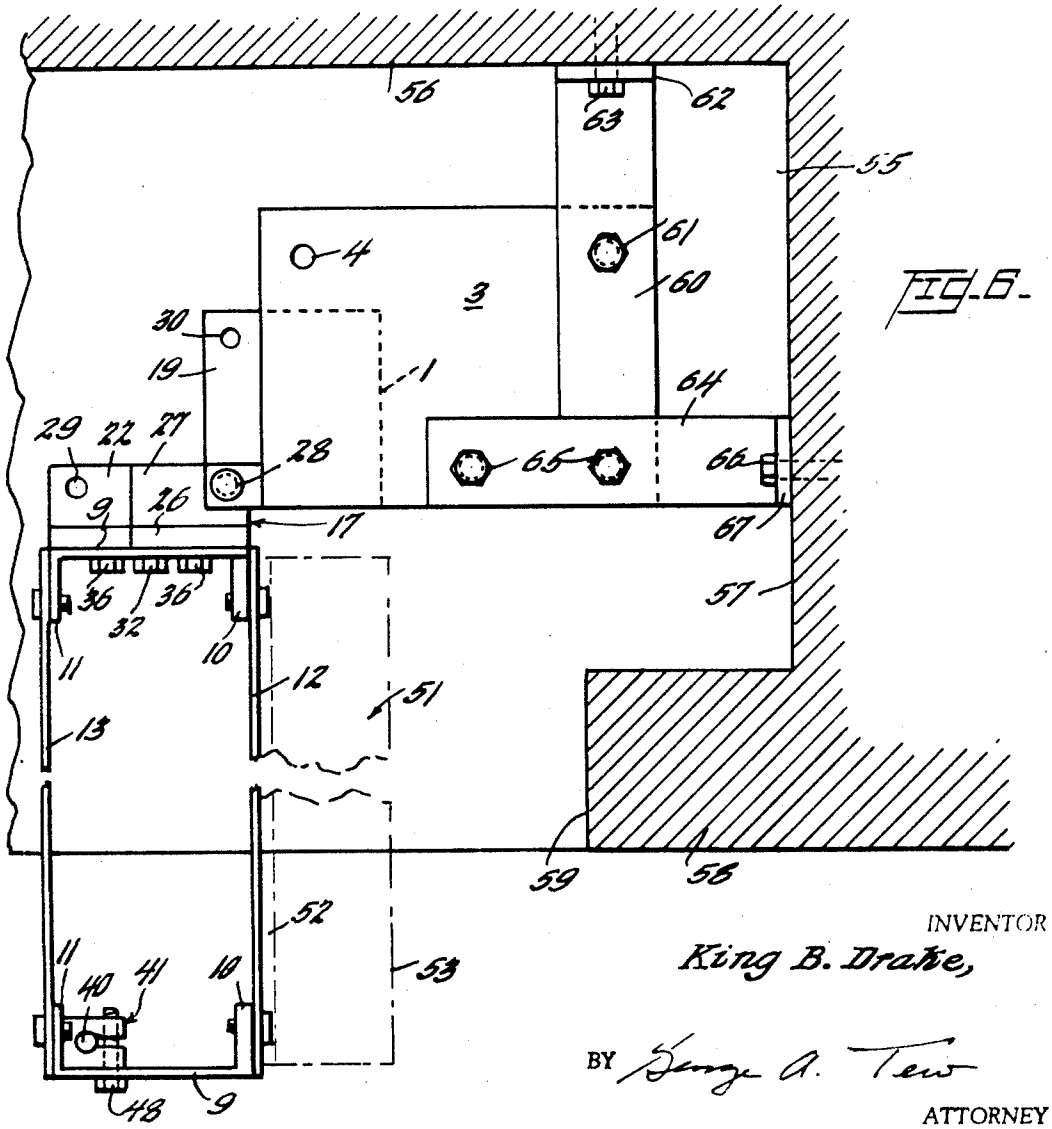


FIG. 6.

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Sept. 23, 1969 K. B. DRAKE 3,468,429

TELEPHONIC EQUIPMENT RACK

Filed April 27, 1967 5 Sheets-Sheet 3

FIG. 3.

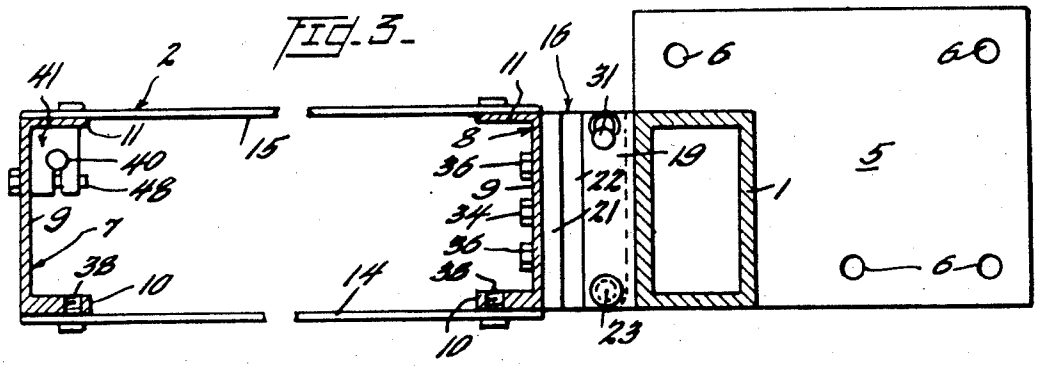

FIG. 9.

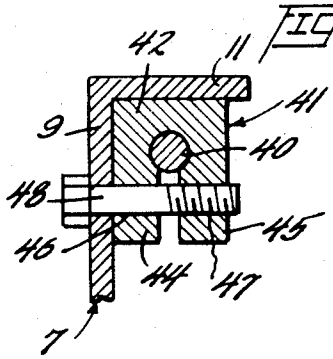

FIG. 10.

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Sept. 23, 1969 K. B. DRAKE 3,468,429

TELEPHONIC EQUIPMENT RACK

Filed April 27, 1967 5 Sheets-Sheet 4

FIG. 4.

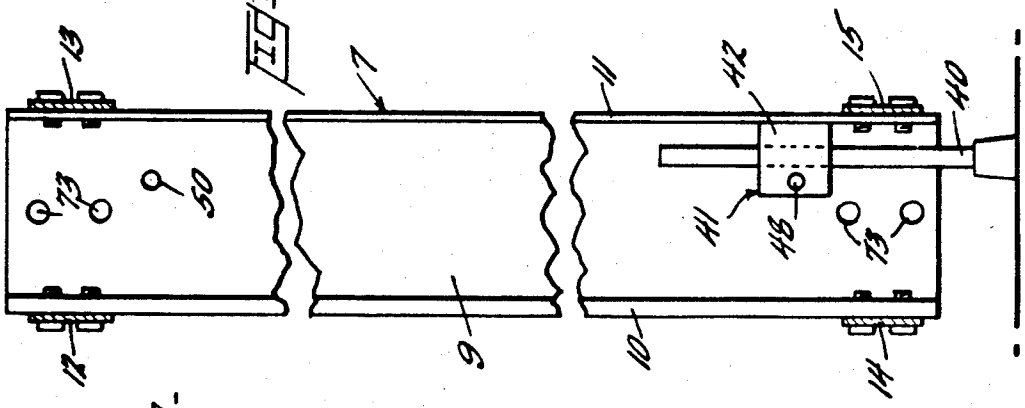
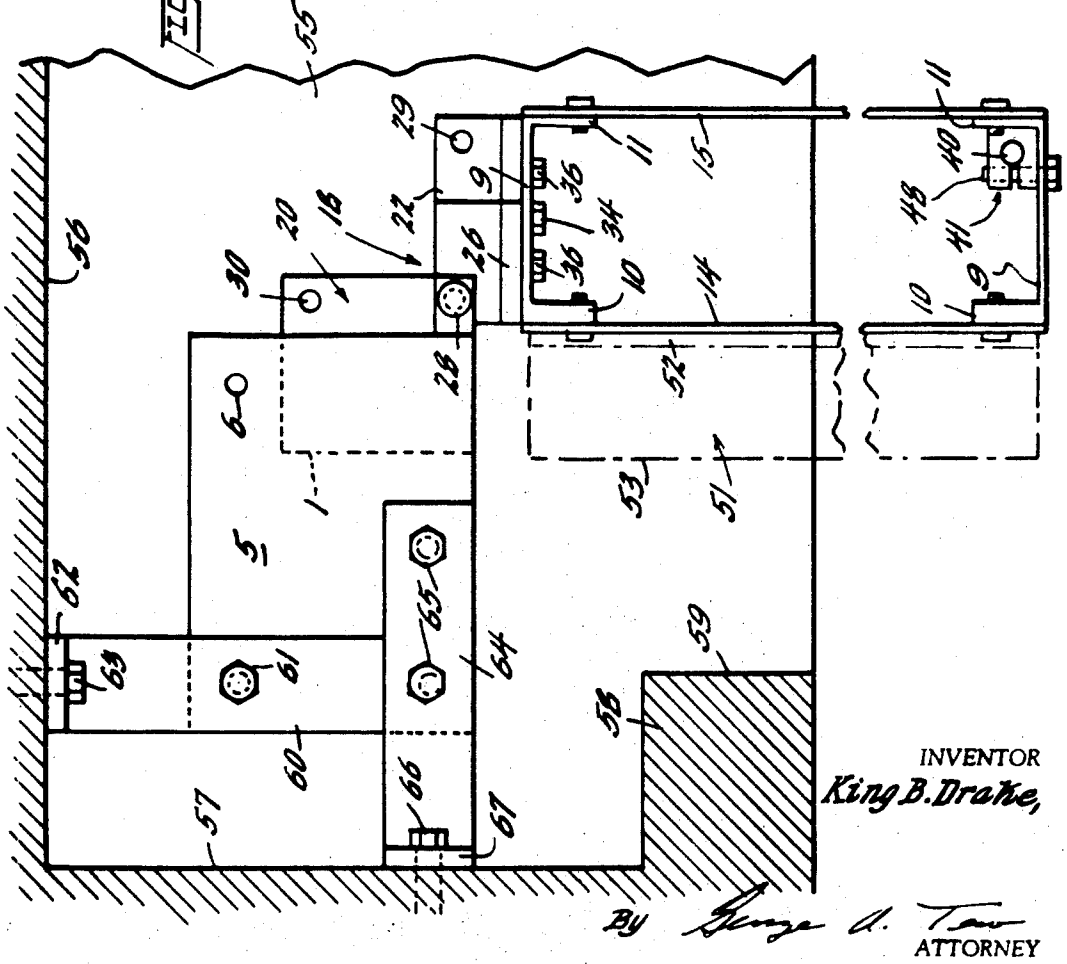


FIG. 7.



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TELEPHONIC EQUIPMENT RACK

Filed April 27, 1967 5 Sheets-Sheet 5

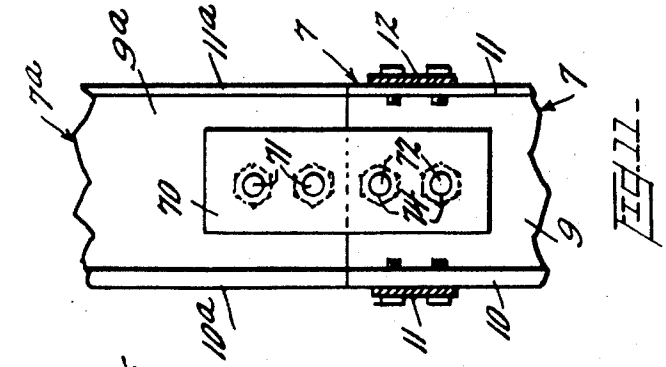

FIG. 7

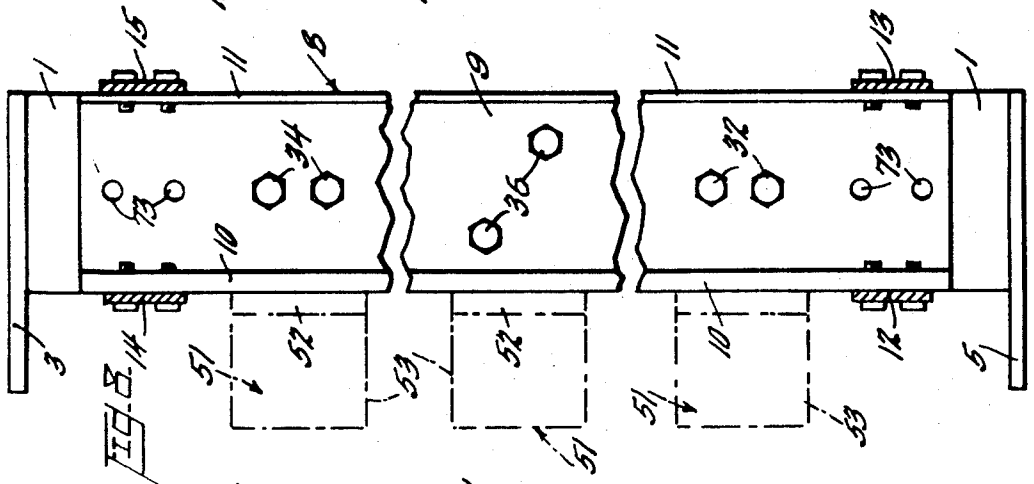

FIG. 8

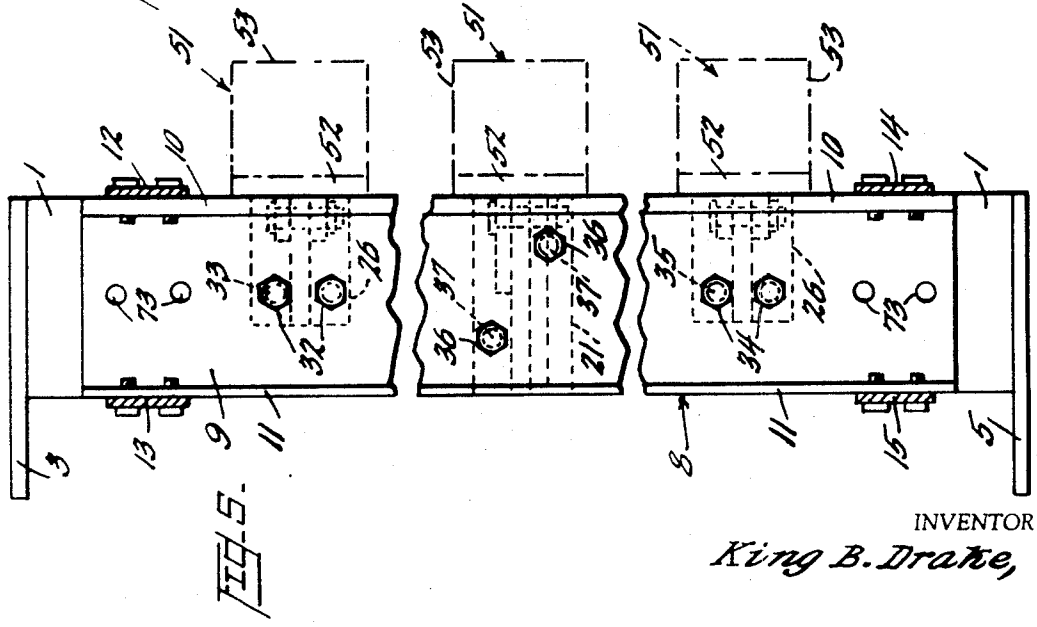

FIG. 5

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United States Patent Office 3,468,429 Patented Sept. 23, 1969

3,468,429

TELEPHONIC EQUIPMENT RACK

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Filed Apr. 27, 1967, Ser. No. 634,313
Int. Cl. A47f 7/00
U.S. Cl. 211—169 3 Claims

ABSTRACT OF THE DISCLOSURE

A telephonic instrument rack which is adapted to support a plurality of telephone outlet and distribution panels for swinging movement out of and into a closet, in which it is located, through the doorway thereof.

In all large office buildings having a great number of individual telephones scattered throughout the building, the telephone company installs a plurality of distribution panels, at a central location therein, which are connected by a single multiple wire cable to the telephone central office, and to which the various telephones in the building are connected. These panels are all mounted upon a common rack which is disposed in a compartment provided in the building for this purpose. Usually, in order to conserve space, these compartments consist of a shallow closet having an entrance door in the front wall thereof behind which the rack is located.

Generally these panels comprise a plurality of electrical instruments such as coils, tubes, relays, condensers, transformers, and resistors which are mounted on a base plate and are wired together, and are enclosed by a removable dustproof cover. The base plate is adapted to be removably secured to a rack assembly which is secured in fixed position in a closet and is adapted to have a plurality of panels mounted thereon.

The panels must be periodically inspected, and serviced from time to time for repairs, to connect new telephones thereto, and to disconnect previously connected telephones therefrom. Due to the shallowness of the compartment closets the panels are not always readily accessible and sometimes require the removal thereof from the rack assembly for inspection and service.

It is therefore the principal object of this invention to provide a rack assembly of the character described which includes a pivoted rectangular frame, one side of which is adapted to have a plurality of instrument panels removably secured thereto, and is adapted to be swung out through a compartment doorway to provide ready access to the panels mounted thereon.

Another object of the invention is to provide a rack assembly of the aforesaid character which is so constructed and arranged that it can be easily converted from a righthand swing of the panel frame to a lefthand swing thereof.

Another object of the invention is to provide a rack assembly of the aforesaid character in which the panel frame thereof may be selectively arranged in the assembly so that the panels mounted thereon will extend forwardly therefrom toward the compartment doorway or rearwardly therefrom toward the rear wall of the compartment.

Still another object of the invention is to provide a rack assembly of the aforesaid character which is of simple sturdy construction, and which may be easily and inexpensively manufactured.

To this end the rack assembly comprises an elongated vertically disposed post which is adapted to be secured in fixed position within a compartment closet, and a rectangular frame which is adapted to have a plurality of instrument panels removably secured to one side only

thereof and is pivotally connected to the post adjacent one edge thereof by a plurality of hinge members, for outward swinging movement in one direction only with respect to the post.

The post is provided with a pair of similar plates one of which is welded to each end thereof. The plate at the lower end thereof is adapted to be bolted to the closet floor, and the plate at the upper end thereof is adapted to be bolted to a pair of brackets which are secured to the closet walls and extend horizontally outwardly therefrom, thereby securely mounting the post in fixed position in the closet.

The panel frame comprises a pair of opposed similar vertically disposed channel members which are connected together at the upper and lower ends thereof by a pair of narrow cross bars. One side of each of the channel members is provided with a vertically aligned row of threaded apertures for the reception of machine screws by which the base plates of the panels are removably secured to the frame.

The construction and arrangement of the post and frame assembly is such that the upper and lower ends thereof are identical, thereby permitting up-ending of the assembly to convert the outward swing of the panel frame from a righthand to a lefthand swing. The panel frame is removably secured to the hinge members which in turn are permanently secured to the post. In order to change the panels from an outside mounting to an inside mounting, the panel frame is disconnected from the hinge members, turned end for end with respect to the post, and then reconnected to the hinge members.

Having stated the principal objects of the invention, other and more specific objects thereof will be apparent from the following specification and the accompanying drawings forming a part thereof in which:

FIG. 1 is a front elevation of a telephonic equipment rack constructed according to my invention;

FIG. 2 is a top plan view of the rack as shown in FIG. 1;

FIG. 3 is a horizontal section taken on the line 3—3 on FIG. 1;

FIG. 4 is a vertical section taken on the line *a*—*a* on FIG. 1 looking in the direction of the arrows 4—4;

FIG. 5 is a vertical section taken on the line *a*—*a* on FIG. 1 looking in the direction of the arrows 5—5;

FIG. 6 is a top plan view of the rack assembly showing it mounted in the righthand end of a closet with the panel frame swung out through the closet doorway;

FIG. 7 is a view similar to FIG. 6 showing the rack assembly up ended from the position shown in FIG. 6 and mounted in the lefthand end of the closet with the panel frame swung out through the doorway;

FIG. 8 is a view similar to FIG. 5 showing the panel frame turned end for end so that the panels secured thereto extend inwardly therefrom instead of outwardly as shown in FIG. 5;

FIG. 9 is an enlarged horizontal fragmentary detail section through the split clamping block by which a vertically disposed supporting rod is clamped in adjusted position to the panel frame;

FIG. 10 is a side elevation of the upper end of the rack assembly, partially in section, showing the manner of securing an upward extension to the panel frame; and

FIG. 11 is a vertical sectional view taken on the line 11—11 on FIG. 10.

The construction, arrangement and operation of the rack assembly having been generally described, it will now be specifically described in connection with the drawings by the use of reference characters.

Referring first to FIGS. 1 to 5, the rack assembly comprises a vertically disposed elongated, rectangular, tubular post which is adapted to be secured in fixed position

within a compartment provided for this purpose; and a rectangular frame, generally indicated by the numeral 2, which is pivotally connected to the post 1 and is adapted to have a plurality of telephone outlet distribution panels removably secured thereto. A rectangular plate 3, having a plurality of bolt holes 4 drilled therein, is permanently secured, as by welding, to the upper end of the post 1; and a rectangular plate 5, similar to the plate 3, is permanently secured to the lower end of the post 1. A plurality of bolt holes 6, which are similar in number and arrangement to the bolt holes 4 drilled in the upper plate 3, are drilled in the lower plate 5.

The frame 2 comprises a pair of spaced, opposed vertically disposed similar channel members 7 and 8 each of which comprises a base section 9 and spaced parallel front and rear side sections 10 and 11, respectively. The channel members 7 and 8 are connected together at the upper ends thereof by a pair of flat cross bars 12 and 13 which are bolted to the front and rear side sections 10 and 11 respectively; and at the lower ends thereof by a pair of cross bars 14 and 15, which are similar to the cross bars 12 and 13, and are bolted to the front and rear side sections 10 and 11 respectively.

The frame 2 is pivotally connected to the post 1, for forward swinging movement, by a central hinge assembly 16 and upper and lower hinge assemblies 17 and 18, respectively, which are connected between the post 1 and the base section 9 of the channel member 8. The hinge assembly 16 is disposed intermediate the upper and lower ends of both the post 1 and the frame 2, and the hinge assemblies 17 and 18 are equally spaced, respectively, above and below the hinge assembly 16. The length of the frame 2, vertically, and the mounting thereof with respect to the post 1 are such that the lower end of the frame 2 is disposed a short distance above the lower end of the post 1, and the upper end thereof is disposed a like distance below the upper end of the post 1. The upper and lower ends of the rack assembly are therefore identical.

The hinge assembly 16 comprises a pair of vertically spaced parallel horizontally disposed blocks 19 and 20 which are welded to the post 1, and a hinge member having a vertically disposed base 21, to which the channel member 8 is removably secured, and a tongue 22 which extends outwardly therefrom between the blocks 19 and 20 to which it is pivotally connected by a hinge pin 23 which extends through aligned apertures in the blocks 19 and 20 and tongue 22. The hinge assemblies 17 and 18 each comprise a pair of vertically spaced parallel vertically disposed blocks 24 and 25 which are welded to the post 1, and a hinge member having a vertically disposed base 26, to which the channel member 8 is removably secured, and a tongue 27 which extends outwardly therefrom between the blocks 24 and 25 to which it is pivotally connected by a hinge pin 28 which extends through aligned apertures in the blocks 24 and 25 and the tongue 27. The pivot pins 28 and 23 are all disposed in vertical alignment adjacent the forward sides of the post 1 and frame 2 thereby permitting the frame to swing outwardly from the inner position shown in FIG. 2 to the outer position shown in FIG. 6. The tongue 22 of the hinge assembly 16 is provided with an aperture 29 which is adapted to register with an aperture 30 in the block 19 for the reception of a removable locking pin 31 when the frame 2 is in its inner position. The channel member 8 is removable secured to the hinge assembly 17 by a pair of machine screws 32 which extend through vertically spaced apertures 33, in the base section 9 thereof, into threaded bores in the base 26 of the hinge assembly 17; to the hinge assembly 18 by a pair of machine screws 34 which extend through vertically spaced apertures 35, in the base section 9, into threaded bores in the base 26 of the hinge assembly; and to the hinge assembly 16 by a pair of machine screws 36 which extend through vertically and horizontally spaced apertures 37, in the base section 9, into threaded bores in the base 21 of the hinge assembly 16. The apertures 33 and 35 are all disposed in vertical alignment in a vertical medial plane between the sides of the channel member 8, with the spacing between the apertures 33 being the same as the spacing between the apertures 35, and with the apertures 33 being located a fixed distance above a horizontal medial plane between the upper and lower ends of the channel member 8, and the apertures 35 being located a like distance below said horizontal medial plane. One of the apertures 37 is located a fixed distance above said horizontal medial plane and to one side of said vertical medial plane, and the other aperture 37 is located a like distance below said horizontal medial plane and to the opposite side of said vertical medial plane. It will therefore be seen that the spacing of the apertures 33, 35 and 37 is symmetrical about both the said vertical and horizontal medial planes. This permits the frame 2 to be removed from the hinge assemblies 16, 17 and 18, turned end to end from the position shown in FIG. 5 to the position shown in FIG. 8, and then re-connected to the hinge assemblies thereby reversing the front and rear sides of the frame.

The channel member 7 is provided with a vertically disposed supporting rod 40 which is adjustably slidably mounted in a split clamping block 41 and extends downwardly therefrom below the lower end of the channel member 7 for engagement with the closet floor on which the post 1 is mounted. The split block 41, which is disposed in contact with the inner surfaces of the base section 9 and the rear side section 11 of the channel member 7 adjacent the lower end thereof, comprises a body section 42, having a vertical bore 43 therein for the reception of the rod 40, and a pair of spaced clamping arms 44 and 45, one of which, 44, is provided with a smooth horizontal bore 46, and the other of which 45 is provided with an internally threaded bore 47 which is disposed in axial alignment with the bore 46. The block 41 is maintained in fixed position on the channel member 7, and the arms 44 and 45 clamped about the rod 40 by a machine screw 48 which extends through an aperture 49 in the base section 9 adjacent the lower end thereof and through the bore 46 in the arm 44 and is screwed into the threaded bore 47 in the arm 45. In order to permit the reversal of the supporting rod 40 and clamping block 41 therefor when the frame 2 is turned end to end from the position shown in FIG. 5 to the position shown in FIG. 6 the base section 9 of the channel member 7 is provided with an aperture 50, adjacent the upper end thereof, through which the screw 48 is inserted into the block 41.

The front sides 10 of both the channel members 7 and 8, which are thicker than the rear sides 11 thereof, are each provided with a vertical row of spaced threaded bores 38, which extend from end to end thereof, and are provided for the securing of a plurality of telephone outlet distribution panels, generally indicated by the numeral 51, to the frame 2.

The panels 51 comprise generally a base plate 52, on which a plurality of electrical telephonic instruments, not shown, are adapted to be mounted and wired together, and a removable dustproof cover 53 by which the instruments are enclosed. The panels 51, per se, constitute no part of the present invention. Consequently they are not shown and described in more detail herein, and for clarity of illustration are indicated in the drawings by dot and dash lines. The panels 51 are adapted to be removably secured to the frame 2 by machine screws which are inserted through apertures in the base plates 52 and screwed into the threaded bores 38.

FIG. 6 shows the manner of mounting the rack assembly in one end of a shallow closet 55 having a rear wall 56, end walls 57, and a front wall 58 having a doorway 59 therein, with a righthand swing of the frame 2 out through doorway 59. The bottom plate 5, which is secured

to the lower end of the post 1, is bolted to the floor of the closet by bolts, not shown, which extend through the bolt holes 6 in the plate 5. The upper plate 3, which is secured to the upper end of the post 1, is connected to the rear wall 56 of the closet by a bracket arm 60, which is bolted to the plate 3 by a bolt 61 which extends through one of the bolt holes 4 in the plate 3, and extends rearwardly therefrom into engagement with the rear wall 56 to which the upturned end 62 thereof is secured by a bolt 63. The plate 3 is also connected to the end wall 57 of the closet by a bracket 64, which is bolted to the plate 3 by bolts 65 which extend through other bolt holes 4 in the plate 3, and to the wall 57 by a bolt 66 which extends through a bolt hole in the upturned end 67 of the bracket.

FIG. 7 illustrates the manner of mounting the rack assembly in the other end of the closet 55 with a lefthand swing of the frame 2 out through the doorway 59. When mounting the rack assembly in this end of the closet it is up turned end to end from the position shown in FIG. 6 so that the plate 3 is bolted to the floor 60 and the plate 5 connected to the rear and end walls 56 and 57 by the brackets 60 and 64. This up ending of the rack assembly to convert the outward swing of the frame 2 from a righthand swing to a lefthand swing is possible due to the upper and lower ends of the assembly being symmetrical about a central horizontal axis. When so converted the supporting rod 40 must be removed and secured to the other end of the channel member 7 as explained in connection with the reversal of the connection of the frame 2 to the hinge assemblies 16, 17 and 18 which is done when it is desired to have the panels 51, secured to the front sides 10 of the channel members 7 and 8 of the frame 2, extend inwardly from the frame 2 toward the rear wall 56 of the closet 55 instead of outwardly from the frame 2 toward the doorway 59 of the closet. This reversible mounting of the frame 2 in the assembly enables the use of lighter channel members 7 and 8 and greatly reduces the number of tapped holes 38 required, as otherwise the rear sides 11 of the channel members 7 and 8 would have to be the same thickness as the front sides 10 thereof and would have to be correspondingly tapped.

FIGS. 10 and 11 disclose channel member extensions 7^a and 8^a which are removably secured to the upper end of the channel members 7 and 8 to lengthen the frame 2 and thereby increase the panel capacity thereof. The channel member extensions 7^a and 8^a are identical in cross section with the channel members 7 and 8 and comprise the base sections 9^a, the front side sections 10^a, and the rear sections 11^a. The front sections 10^a are each provided with a vertical row of spaced threaded bores 38^a which constitute extensions of the rows of threaded bores 38 in the front side sections 10 of the channel members 7 and 8. The channel member extensions 7^a and 8^a are removably secured to the upper ends of the channel members 7 and 8 by plates 70 which are secured to the lower ends of the channel member extensions 7^a and 8^a by bolts 71, and to the upper ends of the channel members 7 and 8 by bolts 72 which are inserted through apertures 73 in the base sections 9 of the channel members 7 and 8 and into threaded bores 74 in plates 70. In order to permit the channel extensions 7^a and 8^a to be applied to the channel members 7 and 8 when the rack assembly is turned end for end as shown in FIG. 6, or when the frame 2 has been reversed in the assembly as shown in FIG. 8 the apertures 73 are provided in both the upper and lower ends of the base sections 9 of the channel members 7 and 8.

From the foregoing it will be apparent to those skilled in this art that I have provided a very simple and efficient mechanism for accomplishing the objects of the invention; and although the invention has been described herein in connection with telephonic equipment it will likewise be obvious that the rack assembly of this invention may be used equally well with various other types of apparatus.

It is to be understood that I am not limited to the specific construction shown and described herein as various modifications may be made therein within the spirit of the invention and the scope of the appended claims.

I claim:

1. An instrument rack assembly of the character described comprising a vertically disposed post, means by which said post is adapted to be secured in fixed position in a compartment, a rectangular frame which is adapted to have a plurality of instrument panels removably secured thereon, and hinge means by which said frame is pivotally connected at one side thereof to said post for horizontal swinging movement outwardly from said post, in which said post securing means comprises a pair of flat plates having a plurality of similarly arranged bolt holes drilled therein, one of said plates being permanently secured to the lower end of said post and the other of said plates being permanently secured to the upper end of said post, the said one of said plates being adapted to be bolted to the floor of said compartment, and the other of said plates being adapted to be connected to the rear and end wall of said compartment by bracket arms which are bolted to the said other of said plates and to the said rear and end walls.

2. An instrument rack assembly as defined by claim 1 in which said rectangular frame comprises a pair of spaced opposed similar channel members which are connected together at the upper and lower ends thereof by narrow cross bars, each of said channel members comprising a base section and front and rear side sections, each of the said front sections of said channel members being provided with a vertical row of spaced bores by means of which said instrument panels are adapted to be removably secured to said frame, and connecting means by which the said base section of one of said channel members is connected to said hinge means.

3. An instrument rack assembly as defined by claim 2 in which the said connecting means is so constructed and arranged that said frame may be disconnected from said hinge means, turned end to end to reverse the said front and rear side sections of said channel members, and then reconnected to said hinge means.

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U.S. Cl. X.R.

179—91; 317—99