

[54] **QUICK-RELEASE CONNECTOR
ASSEMBLY FOR MULTIPLE MEMBER
TELEVISION CABINET**

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[58] Field of Search **312/7 TV, 257 TH, 265, 111, 312/27, 208; 248/27**

[56] **References Cited**

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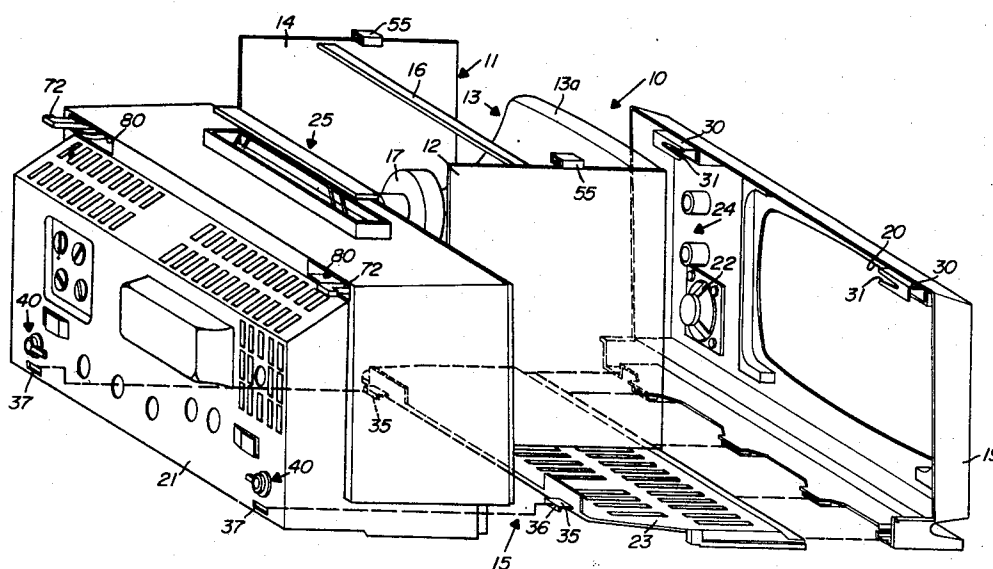
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[57] **ABSTRACT**

Interiorly mounted first and second connector means are provided for releasably attaching two separate housing members of a multiple housing member television cabinet. The second connector means is in the form of an elongated member having bi-directional movable opposite end portions and being slidably connected to one of the housing members through the provision of an arcuate groove extending both transversely and longitudinally with respect to the elongated member and a guide means captured within the groove for movement therealong. Exteriously accessible motion transmitting means are connected to an end portion of the elongated member and are effective to impart movement to said elongated member in one direction along the groove for connecting the first and second connector means and in an opposite direction along the groove for releasing the first and second connector means.

9 Claims, 4 Drawing Figures



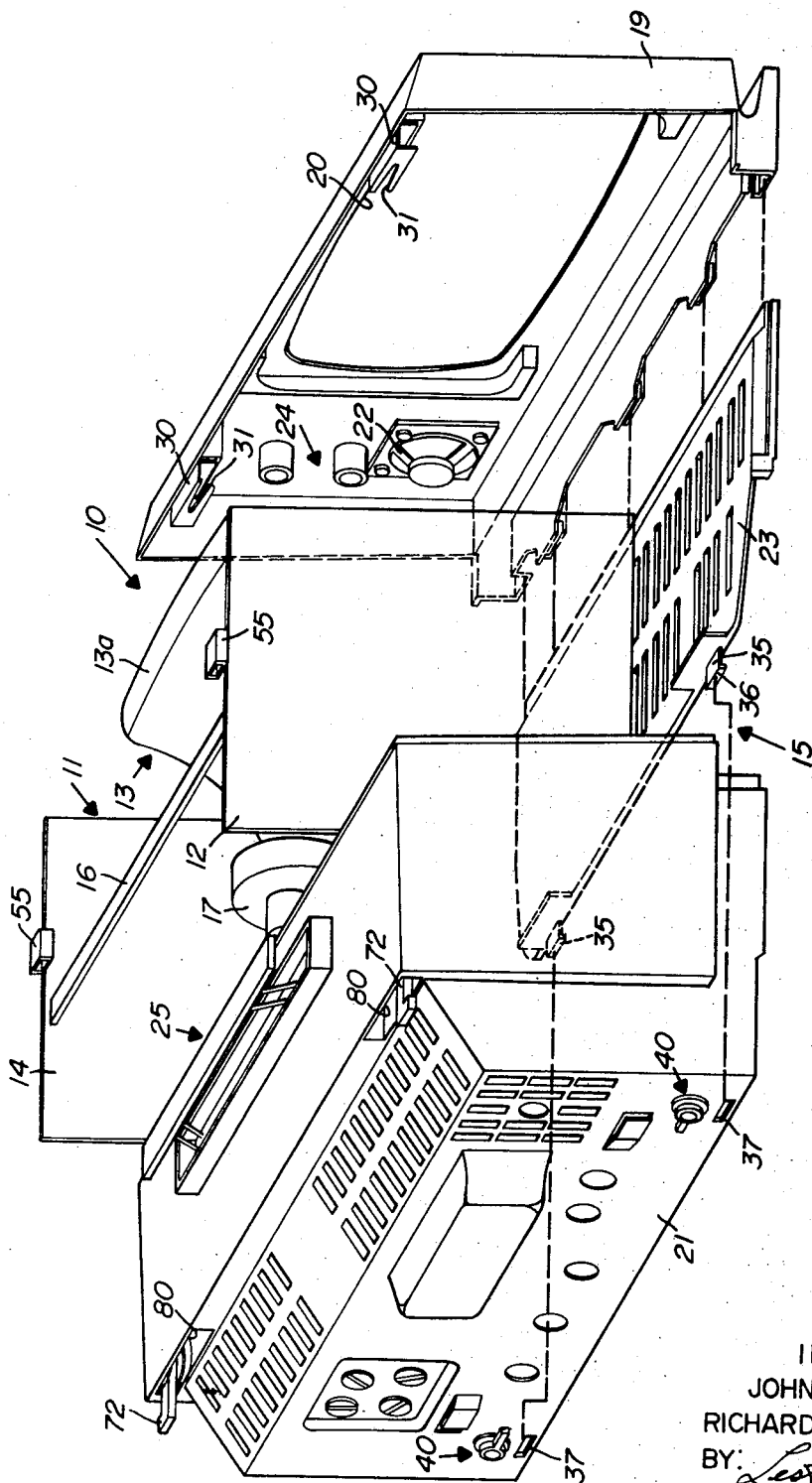


Fig. 1

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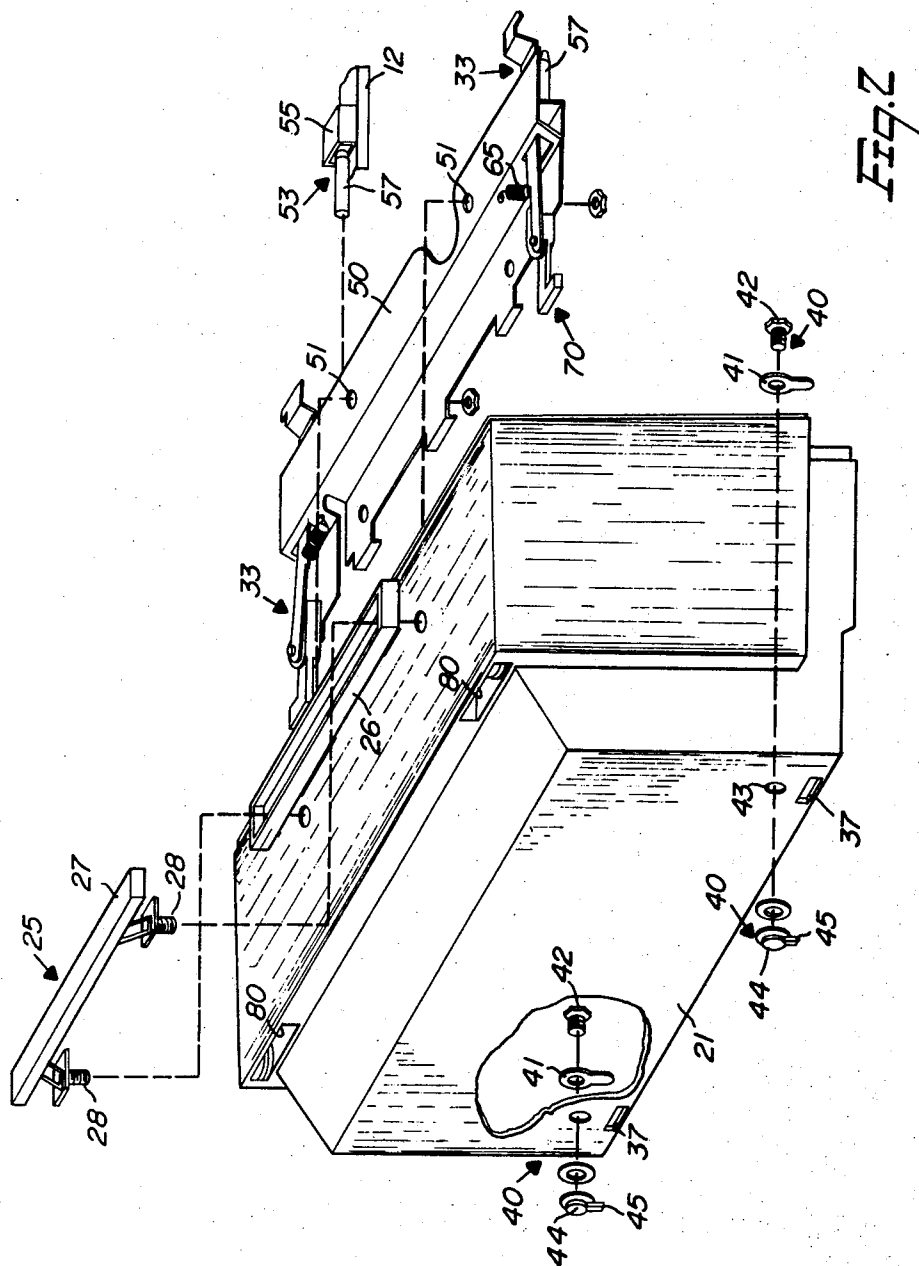


Fig. 2

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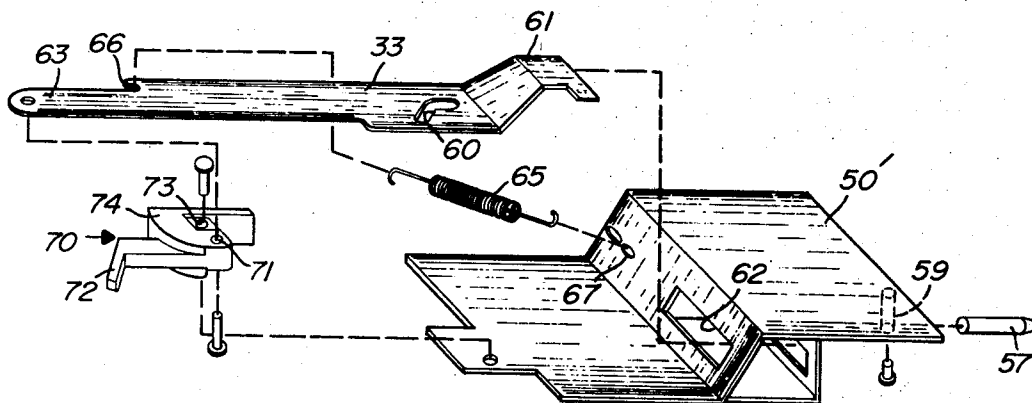


Fig. 3

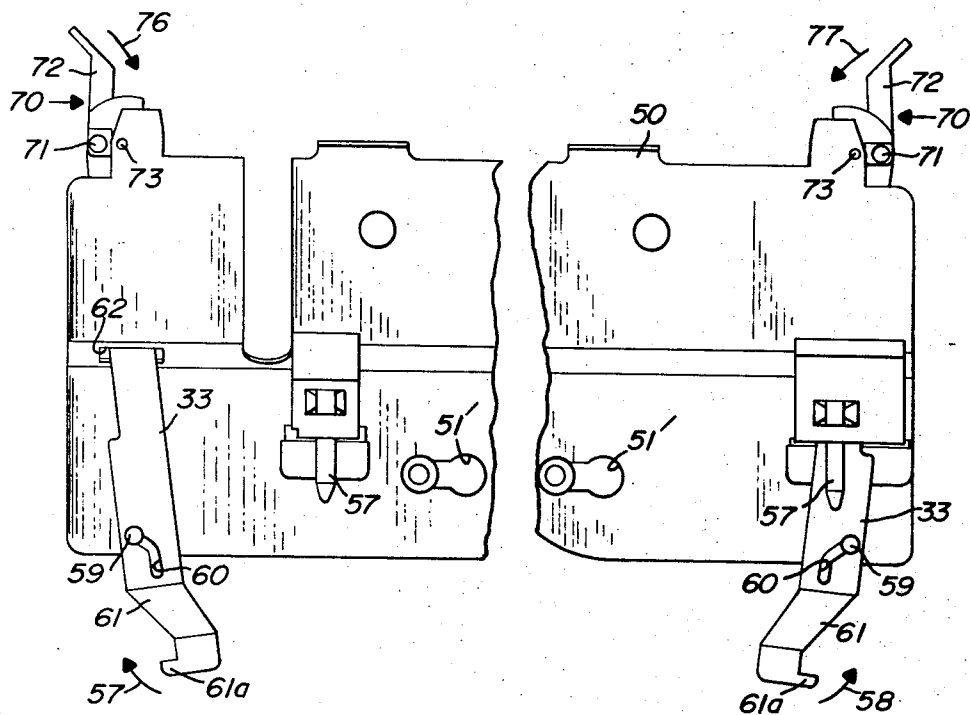


Fig. 4

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QUICK-RELEASE CONNECTOR ASSEMBLY FOR MULTIPLE MEMBER TELEVISION CABINET

BACKGROUND

This invention relates to television cabinet housings having multiple separate housing members which are readily assembled and disassembled for providing quick access for service to the interior parts of a television set. More particularly, the invention relates to a quick-release connector assembly for releasably securing two separate housing members together.

Quick access for service to the interior parts of a television set has become a significant marketing factor for television manufacturers amid consumer demand for less complicated and costly maintenance and repair and such technical advances as plug-in circuit boards and module assemblies permitting consumer maintenance. Improved chassis construction now provides movable mounting chassis which are readily extendible from the protective television cabinet housing and which provide greatly increased access to the multiple operational parts mounted thereon. However the use of movable chassis have for the most part been confined to console-type television sets as movable chassis require a more stable base for their movement than is available with the cabinet housings for portable-type television sets. For such portable-type television cabinets, it is desirable to provide multiple separate housing members comprising the cabinet housing and being connectible and releasable with respect to each other through quick-release exteriorly accessible connector means. It is also desirable to prevent damage to any cabinet housing resulting from improper weight distribution between the mounting chassis and the handle for the cabinet over an extended period of transporting the television set.

SUMMARY

It is therefore an object of the present invention to provide a quick-release connector assembly for releasably attaching two separate housing members of a multiple housing member television cabinet whereby the connector assembly may be activated for its connection and release from the exterior of the cabinet.

A quick-release connector assembly to be used for the quick assemble and disassemble of two connectible housing members of a multiple piece television cabinet includes first connector means mounted on an interior wall of a first housing member and second connector means in the form of an elongated member having bi-directional movable opposite end portions and an intermediate portion thereof slidably connected to an interior wall of a second housing member. Either the elongated member or the second housing member is provided with a generally arcuate shaped groove extending in both longitudinal and traverse directions with respect to the elongated member and the other thereof is provided with a guide means to be slidably positioned within the groove. One of the opposite end portions of the elongated member is engageable with the first connector means when the elongated member is moved in one direction along the groove and is releasable from its engagement therewith when the elongated member is moved in an opposite direction along the groove. Motion transmitting means connected to the other end portion of the elongated member and accessible for

movement from an exterior wall of the second housing member, provides a means of moving the elongated member along its associated arcuate connecting groove.

THE DRAWING

FIG. 1 is an exploded perspective view of a multiple housing member television cabinet having two separate sets of connector means which are exteriorly releasable for facilitating its assembly and disassembly;

FIG. 2 is a rear side perspective view of a combination top, rear and side housing member and showing the assembly of the two sets of connector means, a support plate for one of the sets, and a handle assembly;

FIG. 3 is an exploded perspective view of one of the connector means to be mounted on an alternative support plate similar to the end structure of the support plate of FIG. 2; and

FIG. 4 is a bottom plan view of the support plate of FIG. 2 shown as having a discontinued center section, and having a pair of the connector means of FIG. 3 mounted for movement thereon.

DETAILED DESCRIPTION

FIG. 1 shows an assembly of parts of a television receiver set 10 including an interior mounting chassis 11 for mounting thereon the multiple operational parts of the television set such as a picture tube 13, and a multiple housing member television cabinet 15 for enclosing the chassis 11 and the picture tube 13 therein. The mounting chassis 11 is of a standard construction, having a pair of opposite side panels 12 and 14 reinforced by a cross member 16. The picture tube 13 as shown in FIG. 1 is of the enlarged screen cathode-ray tube configuration with an image screen 13a projected forwardly of the chassis 11 and having a rear mounted deflection coil 17.

The multiple housing members that comprise the television cabinet 15 may be numerous but a convenient and basic construction for a portable-type receiver set 10 consists of a front escutcheon member or first housing member 19, a combination top, rear and side member or second housing member 21, and a bottom or third member 23. The front escutcheon member 19 typically includes an opening 20 for framing the front image screen 13a of the picture tube 13, an audio output speaker 22 and a mounting area 24 for the controls of the receiver set 10. The top wall of the combination member 21 is typically provided with a handle assembly 25 extendible above the top wall for being grasped in lifting the assembled receiver set 10.

In its intended assembly, the bottom member 23 is attached to the rear of the bottom edge portion of the front escutcheon member 19 and forms a bottom support for the chassis 11; thereafter, the combination member 21 is telescoped over the rear of the chassis 11 and attached to the front and bottom members 19 and 23, respectively. It is this attachment of the assembly of parts that the present invention is concerned with, it being desirable that the assembly of parts be readily detachable for providing access to the multiple operational parts on the chassis 11 for expedient service, maintenance and repair thereof.

Now according to the present invention, the rear of the top edge portion of the escutcheon member 19 is

provided with first connector means 30 in the form of a pair of spaced stationary members. Each of the stationary connector members 30 is provided with an inwardly opening slot 31 for facilitating its connection to other connector means. The combination member 21 is then provided with second connector means 33, FIG. 2, in the form of a pair of elongated movable members. The elongated members 33 are connectible and releasable from engagement with the connector members 30, respectively, for assembling the front and combination housing members together. Further, the rear of the bottom housing member 23 is provided with a pair of spaced extension arms or members 35, FIG. 1, for use in assembling the bottom and combination housing members together. An abutting edge portion of the combination housing member 21 (the bottom edge portion as shown in the drawing) is provided with a pair of complementarily spaced apertures 37 aligned to receive the extension members 35 therethrough, respectively.

The extension members 35 are provided with an outer flange or rim portion 36 for providing an offset portion thereof whereby the extension members can be retained within their associated apertures 37 following their insertion therein. For this purpose, separate biasing means 40 are provided for selectively engaging the extension members 35 following their insertion for biasing (downwardly in FIG. 1) the rim portion 36 into an interfering engagement with the rear wall portion through which the apertures 37 are formed. The extension arms 35 are thereby captured within their associated apertures 37. The biasing means 40 are selectively releasable from their engagement with the extension members 35 for relieving the interfering engagement so that the extension members are then retractible from the apertures and the disassembly of the bottom and combination housing members 23 and 21 is permitted.

The biasing means 40 are provided in the form of a pair of rotatable cam levers or members 41 to be positioned in spaced apart relationship on an interior side of the rear wall portion of the combination housing member 21 in an adjacent association to the pair of apertures 37. Each of the cam members 41 is pivotally attached on one end portion thereof as by a suitable fastener 42 being received through an opening 43 in the rear wall of the combination housing member 21 and thereafter attached to an exteriorly mounted knob device 44. The knob device includes a pointer 45 which extends coaxially with its associated cam member 41 so that the position of the free end portion of the interior cam member can immediately be ascertained.

In the operation of the cam members 41, following the insertion of the extension members 35 through the apertures 37 the cam members 41 are rotated by means of grasping the knobs 44 and manually moving the cam members 41 from a first released position as shown in FIG. 1 to a second engaged position as shown in FIG. 2. It can be seen that the free end portions of the cam members 41 are moved through an arcuate path aligned to slightly overextend the adjacent surfaces of the flexible extension members 35 thereby to engage the surfaces for biasing the members 35 downwardly into interfering engagement with the surrounding wall portions that define the apertures so that the extension members 35 are prevented from being withdrawn.

The multiple housing members which comprise an enclosing cabinet for a portable-type receiver set are quite often constructed of lightweight durable materials such as plastics. Because of the stresses placed upon this type cabinet when the entire receiver set 10 is supported by the handle assembly 25 for the transport of the receiver set 10, at least the top wall of the combination housing member 21 should be structurally reinforced to lend strength and provide better weight distribution between the attachment for the handle assembly and the internal chassis 11. FIG. 2 shows the handle assembly 25 as comprising a handle well 26 and a handle 27 having suitable attachment means 28 for connecting both the handle and handle well to the combination housing member 21.

A reinforcing plate structure 50 is provided as a separate structural element to be mounted interiorly of the housing member 21 and serves to reinforce the top wall thereof. The support element 50 can be attached to the top wall of the housing member 21 in any suitable manner but at least preferably includes an attachment through the attachment means 28 for the housing assembly. The support element 50 can be provided with threaded apertures 51 for receiving the attachment means 28, or alternatively, the shape of the apertures as 51' in FIG. 4 can be used instead to avoid threaded apertures. Insertable-type connector means 53, FIG. 2, is then utilized to connect the support element 50 to the internal chassis 11 of the receiver set 10, and consists of two pair of first and second mating connector portions 55 and 57, respectively. The pair of first mating connector portions 55 are provided in the form of open-ended box-like receptacles which are conveniently secured to the side panels 12 and 14, respectively, of the chassis 11. The pair of second mating connector portions 57 are provided in the form of extension prongs or fingers which are conveniently secured to the underside of the support element 50.

The placement of the first mating portions 55 upon the chassis 11 is such that a balanced weight distribution of the chassis is provided through the support element 50 to the handle assembly 25. The open ends of the receptacles forming the first mating portions 55 should be aligned to receive the prongs of the second mating portions 57 when the combination housing member 21 is slidably inserted onto the chassis 11 for being connected to the other housing members of the cabinet 15. The placement of the second mating portions 57 on the support element 50 is dependent upon the selective placement of the first mating portions 55 on the chassis 11.

It is not required that the mating engagement between a selected pair of the first and second connector portions 55 and 57 be a snug or close-fitting securement as some limited amount of lateral and vertical adjusting movement must be permitted therebetween for providing for the proper alignment of the multiple housing members of the cabinet 15. Thereafter, the alignment of the multiple housing members upon their assembly automatically determines the proper alignments of the mating portions 55 and 57. However, the allowable vertical movement between the connector portions 55 and 57 should be somewhat limited so that solid connection is made therebetween when the cabinet housing 15 is lifted by the handle assembly 25. Obviously, other suitable mating-type connectors could

be employed to accomplish the same results of distributing the weight of the chassis 11 to the handle assembly 25.

It is to be noted that even though the single plate structure 50 provides a convenient means for reinforcing the structural integrity of the housing member upon which the handle assembly 25 is mounted, that there are many alternate ways for providing this structural integrity so that an adequate connection between the insertable-type connector means 53 and the handle assembly 25 is obtained. For example, the housing material itself could be reinforced along the top wall of the combination housing member 21 by providing a greater thickness of material or impregnating the material with metal fibers or rods. The section of plate structure 50 then could be restricted to only a pair of opposite plate supports such as 50' in FIG. 3 upon which to mount the pair of elongated members 33 used to connect the housing members 19 and 21.

FIG. 3 shows one of the elongated movable members comprising the pair of second connector means 33 that are employed in connection with the pair of first connector means 30 to releasably connect the first and second housing members 19 and 21 together. In accordance with the present invention, the elongated member 33 is generally bar-shaped having an intermediate section thereof and two bi-directional movable opposite end portions 61 and 63. The elongated member 33 is slidably attached to the second or combination housing member 21 along its intermediate section by virtue of a pin connector 59 being received within a generally arcuate shaped groove 60, which groove is oriented to extend in both a longitudinal and a traverse direction with respect to the elongated member 33. Optionally, the groove 60 or the pin connector 59 could be located on either one of the elongated member 33 and the plate structure 50; and, if an alternative reinforcing as previously described is used for the top wall of the housing member 21, the slide-type connection for the elongated member could be provided directly with the housing member 21.

The elongated member 33 is mounted on the plate structure 50 as by its being inserted within a suitable window-like opening 62, FIG. 3. The bar member 33 has first and second stable positions in which the pin connector 59 remains, respectively, either in the extreme end of the longitudinally extending portion of the groove 60 or in the extreme end of the transversely extending portion of the groove 60. The first stable position for the pin connector 59 would be an outward position of the bar members 33 with respect to each other as viewed in FIG. 4, and would correspond to a latched position for the bar members with respect to their associated ones of the stationary connector portions 30. The second stable position for the pin connector 59 (the position shown in FIG. 4) would be an inward position of the bar members 33 with respect to each other, and would correspond to a released or unlatched position for the bar members with respect to their associated ones of the stationary connector portions 30.

For each bar member 33, movement of the bar member as by means of grasping its end portion 63 or through utilizing separate motion transmitting means 70 such as an actuator lever arm or member, would

then cause the movement of the pin connector 59 in one direction along the arcuate groove 60 from one of its extreme positions to the other. The pin connector 59 cooperating with the groove 60 comprises a guide means for the bar member 33 whereby movement thereof from the unlatched position of FIG. 4 to its latched position (not shown) is firstly in the traverse direction and secondly in the longitudinal direction. The resulting composite movement of the bar members 33 is therefore as indicated by the arrows 57 and 58 in FIG. 4. Movement of the pin connector 59 in the opposite direction along the groove 60 from the other extreme position to the one extreme position corresponds to movement from the latched to the unlatched position, and is firstly in the longitudinal direction and secondly in the traverse direction. A spring biasing coil 65 is attachable between a shoulder portion 66 of the elongated member 33 and a connection 67 on the plate structures 50 and 50' for biasing the elongated member 33 to its inward and released position. When in the inward position, the end portions 61 of the elongated members 33 are aligned to be insertedly received within the slots 31 of the stationary connector means 30 as the combination housing member 21 is positioned for its connection to the front housing member 19.

The actuator lever member 70 is provided for imparting the bi-directional movement to the bar member 33 by means of its being joined through a first pivotal connection 71 to the end portion 63 and through a second pivotal connection 73 to the housing member 21. The first pivotal connection 71 is spaced from the second pivotal connection 73, and the second pivotal connection 73 comprises a pivot axis about which the first pivotal connection 71 moves in an arcuate path for providing both longitudinal and traverse components of movement for the connecting bar member 33. Also, the actuator lever arm 70 is provided with a handle portion 72 for moving the lever member 70 about the pivot axis 71, the handle 72 protruding from a first or body portion 74 in which the first and second connections 71 and 73 are located.

When the pair of lever members 70 of FIG. 4 are moved in the directions of the arrows 76 and 77, the pair of bar members 33 are pivoted in the directions of the arrows 57 and 58, respectively. The end portion 61 of each of the bar members 33 is generally hook-shaped with a shoulder protrusion 61a thereon. The shoulder portion 61a faces toward the closed end of the slot 31 and after being inserted therethrough is moved into engagement with the first connector means 30 for selectively clamping the first housing portion 19 to the second housing portion 21.

The combination housing member 21 contains a pair of recesses 80, FIGS. 1 and 2, in which to mount the actuator members 70. These recesses 80 are provided for the purpose of protecting against the inadvertent releasing of the first and second housing members 19 and 21. Also, a latching device (not shown) may be utilized to prevent unauthorized release of an associated actuator member 70 by preventing its pivotal movement about the pivot axis 71. When the actuator members 70 are in their latched positions, the protruding handles 72 are completely received within the recesses 80; nevertheless, the handles 72 remain exteriorly accessible for being conveniently activated toward their outwardly extending positions as shown in FIG. 1.

It is to be understood that while the present invention has been shown and described with reference to the preferred embodiments thereof, the invention is not limited to the precise forms set forth, and that various modifications and changes may be made therein without departing from the spirit and scope thereof.

We claim:

1. A quick-release connector assembly for facilitating the assembly and disassembly of a multiple housing member television cabinet having first and second separable housing members, including in combination:

a first connector means mounted on an interior wall of said first housing member,

a second connector means in the form of an elongated member having bi-directional movable opposite end portions and an intermediate portion thereof slidably connected to an interior wall of said second housing member, one of said elongated member and said second housing member containing a generally arcuate shaped groove extending in both a longitudinal and a traverse direction with respect to said elongated member and the other of said elongated member and said second housing member having a guide means to be slidably positioned within said groove, one of said opposite end portions of said elongated member being engageable with said first connector means when said elongated member is moved in one direction along said groove and releasable from said engagement therewith when said elongated member is moved in an opposite direction along said groove, and

a motion transmitting means accessible for movement from an exterior wall of said second housing member and having a first portion movable in both of said traverse and longitudinal directions, said first portion being connected to the other end portion of said second connector means for moving said elongated member along said arcuate path whereby said first housing member and second housing member are selectively clamped together and released from engagement with each other, respectively.

2. A connector assembly as claimed in claim 1 wherein said one end portion has an engaging shoulder protrusion positioned forwardly of said first connector means when said elongated member is in its released position with respect thereto, and said one direction of movement along said groove for engaging said first connector means and said elongated member is firstly largely a traverse direction and secondly largely a longitudinal rearward direction and said opposite direction of movement along said groove for releasing said engagement therebetween is firstly largely a longitudinal forward direction and secondly largely a traverse direction whereby upon engagement of the first connector means by said elongated member said first and second separable housing members are drawn tightly together.

3. A connector assembly as claimed in claim 1 wherein said first portion of said motion transmitting means includes a first pivotal connection between said first portion and said second housing member for moving said first portion with respect to said second housing member, and further includes a second pivotal connection between said first portion and the other end

portion of said elongated member for moving said first portion with respect to said other end portion, and said second connection is spaced from said first connection for providing the movement of said second connection in an arcuate path about said first connection whereby movement of said other end portion of said elongated member is in an arcuate path about said first pivotal connection.

4. A connector assembly as claimed in claim 3 wherein said second housing member includes a recess opening therein in which to mount said motion transmitting means, said motion transmitting means includes an actuator handle member, said handle member being received within said recess opening when said elongated member is engaged with said first connector means and being exposed therefrom when said elongated member is fully released from its engagement with said first connector means.

5. A connector assembly as claimed in claim 1 wherein said multiple housing member television cabinet includes a third housing member connectible to one of said first and second housing members, said third housing member has a peripheral wall portion having an aperture defined therein and said one of said first and second housing members includes an extension member having an offset portion insertable through said aperture, and separate biasing means is selectively engageable with said extension member for biasing said offset portion into interfering engagement with the wall portion defining said aperture whereby said extension arm is captured within said aperture and said biasing means is selectively releasable from said engagement with said extension member for releasing said interfering engagement whereby said extension arm is retractable from said aperture for facilitating the disassembly of said third and said one housing member.

6. A connector assembly as claimed in claim 5 wherein said extension arm is relatively flexible and said biasing means comprises a rotatable cam lever pivoted on one end portion and having a free end portion opposite thereof for circumscribing an arcuate path when said cam lever is pivoted about said one end portion, said path being aligned to slightly overextend an adjacent surface of said extension arm for providing said free end portion to engage said extension arm on said adjacent surface when moved along said path to bias said flexible extension arm away from said arcuate path whereby said extension arm is biased into said interfering engagement with said wall portion.

7. A connector assembly as claimed in claim 1 wherein said television cabinet includes an interior mounting chassis for mounting thereon the multiple operational parts of a television set, said second housing member comprises a top wall for said television cabinet having a support element secured thereto and including a handle member connected to said support element for facilitating the transport of said cabinet, said chassis and said support element include first and second mating portions of an insertable-type connector means secured thereto, respectively, for providing chassis support directly through said support element during transport of said cabinet, and said first and second mating portions are engageable when said second housing member is positioned for connection to said first housing member through the movement of

said elongated member and are releasable when said second housing member is removed from said position whereby said second housing member is removable from said television cabinet independently of said chassis.

8. A connector assembly as claimed in claim 7 wherein said first mating portion for said insertable-type connector means comprises at least one open ended box-like receptacle positioned on said first housing member with said open ends thereof aligned in the direction of movement of said second housing member when said second housing member is being positioned with respect to said television cabinet to be connected

to said first housing member, and said second mating portion comprises at least one elongated prong aligned with respect to said receptacle for being insertably received within said open ends thereof.

5 9. A connector assembly as claimed in claim 8 wherein said elongated prong is loosely received within said receptacle and engages said receptacle when said television cabinet is lifted by said handle member whereby the weight of said chassis is distributed through said support element to said handle member during the transporting of said television cabinet.

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