May 10, 1960 R. C. MARHOLZ 2,936,448

CATHODE RAY TUBE SUPPORT

Filed May 11, 1954 2 Sheets-Sheet 1

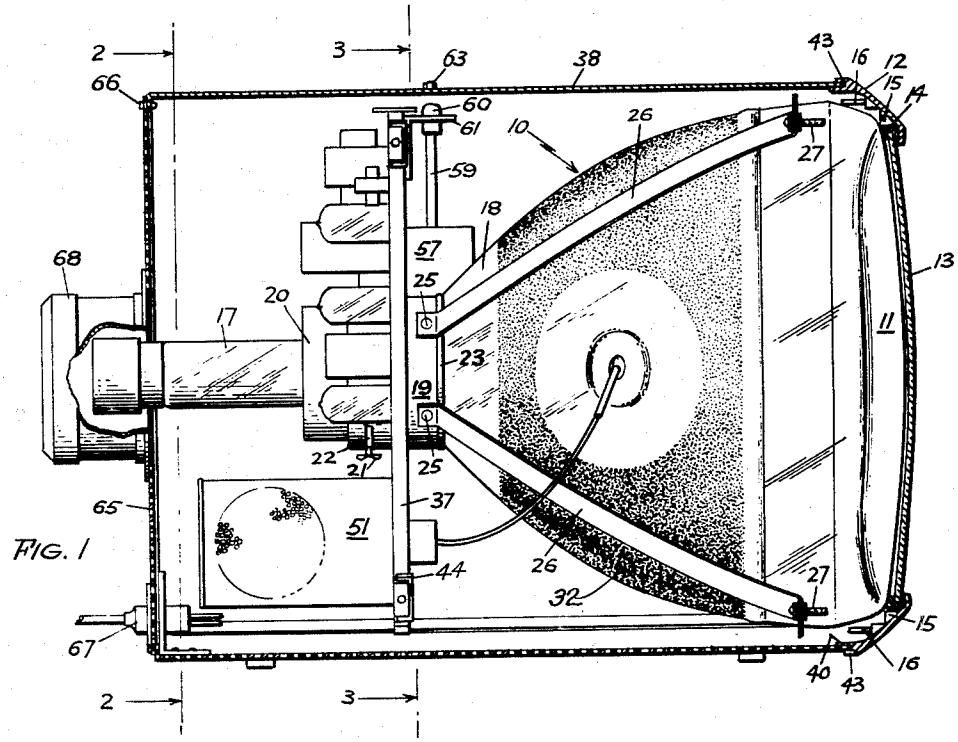


FIG. 1

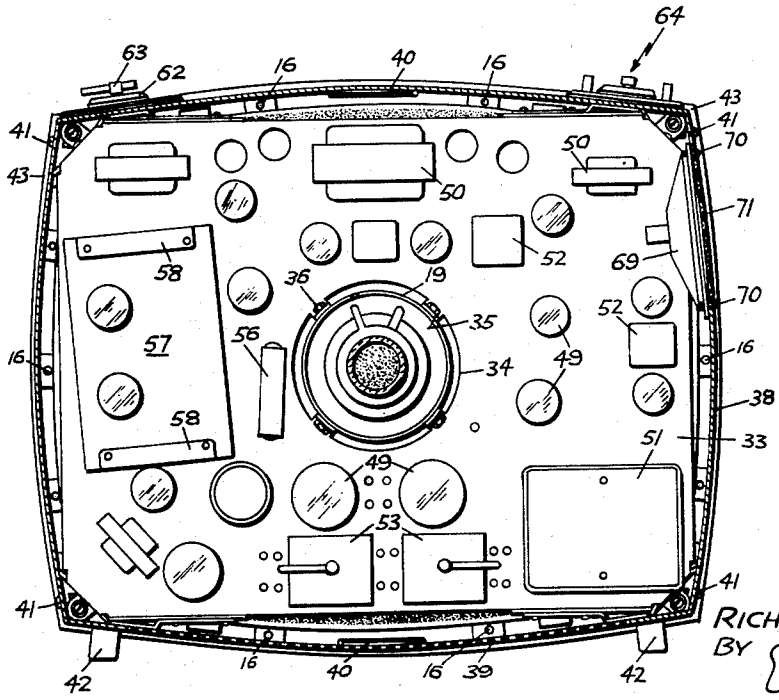


FIG. 2

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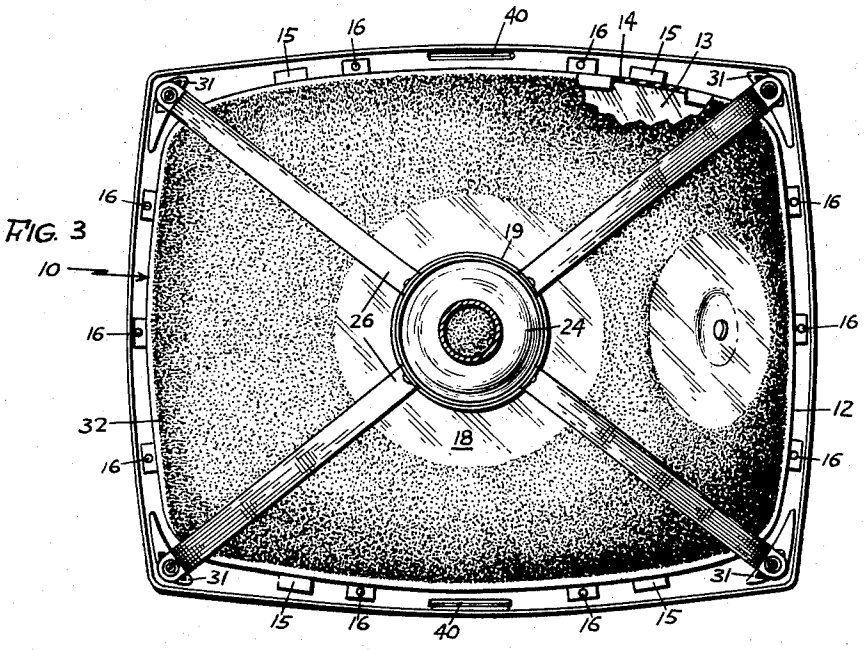


FIG. 3

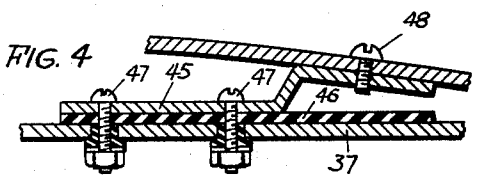


FIG. 4

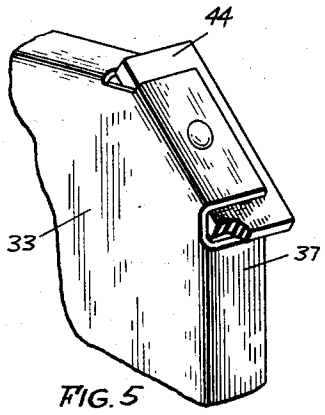


FIG. 5

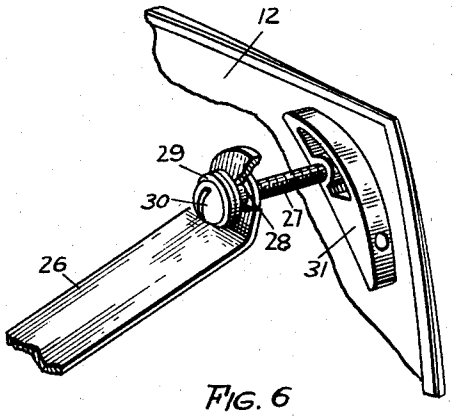


FIG. 6

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CATHODE RAY TUBE SUPPORT

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Application May 11, 1954, Serial No. 429,001

9 Claims. (Cl. 340—367)

This invention relates to cathode ray tube indicator systems and more particularly to cathode ray tube display equipment such as television receivers.

In previous cathode ray tube indicator systems, the cathode ray tube was normally supported by being fastened to a front mount which, in turn, was firmly attached to a base structure. The rear or neck portion of the cathode ray tube was generally supported by a support cylinder which was, in turn, rigidly mounted on the base member.

This invention discloses that the base member may be done away with and that the rear support cylinder may be urged toward the front support member, which may be an escutcheon surrounding the face of the cathode ray tube, by any desired tensioning means such as flexible straps. As a result, the front escutcheon, cathode ray tube, rear support cylinder and tensioning straps form, by themselves, a rigid unit, which may be removed from a cabinet for service and may be transported safely as a unit. This structure relies on the inherent strength of the glass bell of the cathode ray tube when subject to compression, and, hence provides a very strong and safe unit wherein no stresses whatsoever are applied to the neck and gun portion of the cathode ray tube.

This invention further discloses that, by the use of a resilient gasket positioned between the escutcheon and the face of the cathode ray tube at the edges thereof, a very tight seal may be achieved at this point when tension is applied to the straps. As a result, the accumulation of grime and dust on the face of the cathode ray tube, which normally occurs in most television receivers, is eliminated.

This invention further discloses that the chassis, on which are mounted the majority of the electrical components of the indicator system, may be rigidly attached to the rear support cylinder of the cathode ray tube by positioning the plane of the chassis substantially transverse to the axis of the cathode ray tube and rear support cylinder with said support cylinder passing through a suitable aperture provided in the chassis, such that the gun portion of the cathode ray tube is substantially on one side of the chassis and the bell portion and fluorescent screen of the cathode ray tube is on the opposite side of the chassis. The magnetic deflection yoke for the cathode ray tube may be adjustably positioned within the rear support cylinder.

This invention further discloses that the cabinet for containing the indicator may be made up of a relatively flexible member bent around the edges of the chassis and the escutcheon and removably attached thereto whereby the support afforded the flexible member by the escutcheon and the chassis produces a substantially rigid cabinet, and the support afforded the edges of the chassis by the flexible member prevents movement of the edges of the chassis axially or rotationally with respect to the cathode ray tube. Specifically, this invention discloses that the cabinet may be made of sheet metal which is

fabricated into a hollow substantially prismoidal form closely surrounding the cathode ray tube.

This invention further discloses centering posts positioned around the edges of the escutcheon adjacent the edge of the cathode ray tube for facilitating the centering of the cathode ray tube in the escutcheon during assembly of the unit.

Other and further objects and advantages of this invention will become apparent as the description thereof progresses, reference being had to the accompanying drawings, wherein:

Fig. 1 illustrates a longitudinal cross-sectional view of the cathode ray tube indicator cabinet illustrating a chassis, cathode ray tube, escutcheon assembly embodying this invention;

Fig. 2 illustrates a transverse cross-sectional view of the device illustrated in Fig. 1, taken along line 2—2 of Fig. 1 showing the back of the chassis, together with its attachment to the cabinet;

Fig. 3 illustrates a transverse cross-sectional view of the device shown in Fig. 1, taken along line 3—3 of Fig. 1 and showing details of the support structure for the cathode ray tube;

Fig. 4 illustrates a cross-sectional view of a detail of the insulating support for attaching the chassis to the cabinet;

Fig. 5 illustrates a perspective view of a corner of the chassis and insulated tab assembly for centering the chassis in the cabinet; and

Fig. 6 illustrates a perspective view of a detail of the threadable attachment of the tensioning straps to the escutcheon.

Referring now to Figs. 1 through 3, there is shown a cathode ray tube 10, which, as shown here, is of the so-called rectangular tube type having a glass envelope. However, it should be clearly understood that this invention contemplates the use of all types of cathode ray tubes including those having metal envelopes and having round cathode ray tube faces. Positioned around the face 11 of cathode ray tube 10 is an escutcheon 12, shown here as being contoured substantially to the shape of the cathode ray tube face 11. Escutcheon 12 has a transparent protective plate 13 positioned therein which covers the face 11 of the cathode ray tube. A gasket of resilient material 14, made, for example, of rubber, surrounds the edge of plate 13, which may, for example, be of glass or plastic, and provides a seal between plate 13 and the escutcheon 12, as well as between plate 13 and the face 11 of the cathode ray tube. Face plate 13 is centered in the escutcheon 12 by means of centering bosses 15 cast into escutcheon 12, which engage the gasket 14 surrounding face plate 13. As shown here, there are six bosses 15 positioned around the escutcheon 12. However, any desired number may be used; indeed, they may form a continuous ring, and may have any desired shape. Attached to escutcheon 12 and extending backward along the edge of the face 11 of the cathode ray tube are a plurality of centering posts 16, which are preferably fabricated integral with the escutcheon, as by casting, along with bosses 15. Posts 16 are preferably spaced slightly from the edges of cathode ray tube face 11 and are useful primarily in centering the cathode ray tube in the escutcheon during assembly of the indicator system. However, posts 16 will also maintain the cathode ray tube centered if the cathode ray tube accidentally becomes somewhat loose in the support assembly.

Positioned around the neck 17 of cathode ray tube 10 in the region where it joins to bell portion 18 of cathode ray tube 10 is a rear support cylinder 19 for cathode ray tube 10. Cylinder 19 is substantially coaxial with cathode ray tube 10 and is large enough in diameter to accommodate a deflection yoke 20 positioned therein sur-

rounding the neck 17 of the cathode ray tube. Deflection yoke 20 is adjustably attached to cylinder 19 by means of a thumbscrew 21 which threadedly engages a nut in the deflection yoke assembly 20 and which passes through a circumferential slot 22 in cylinder 19, such that when thumbscrew 21 is loosened, the rotational position of yoke 20 may be adjusted by circumferential rotation of thumbscrew 21 with respect to cylinder 19 and the axial position of yoke 20 may be adjusted by movement of the yoke axially of the cathode ray tube with the nut engaged by thumbscrew 21 sliding in a track, not shown, provided in the deflection yoke 20 according to well-known practice.

The front edge of support cylinder 19, which is preferably metal, has a rubber lip 23 positioned thereon. This lip engages bell portion 18 of the cathode ray tube, preferably further up on the bell portion 18 from the region 24, shown in Fig. 3, where the deflection yoke is removed from the cylinder 19, at which the neck portion 17 is sealed to the bell portion 18 of the cathode ray tube. Riveted to cylinder 19 adjacent the rubber lip 23, by means of rivets 25, are a plurality of straps 26 which extend forward around bell portion 18 of the cathode ray tube and are attached to the escutcheon 12, by means of screws 27. The details of this attachment are more clearly shown in Fig. 6 where the screw 27 for each strap passes through an aperture in the end of the strap 26, which is shown here as metal, and is insulated therefrom by means of an insulating grommet 28, for example of rubber, positioned in the aperture in strap 26 through which the screw 27 passes. A metal washer 29 is provided between the head 30 of the screw 27 and the rubber grommet 28. Screw 27 is threaded into a hole in a boss 31 cast into the escutcheon 12. As shown here, the bosses 31 are positioned at the four corners of the substantially rectangular escutcheon 12 and four straps 26 are provided. However, the straps could be attached at other points of the escutcheon than the corners thereof and any desired number of straps could be used, such as two, three, or five or more straps. With this assembly, the straps 26 are insulated from the escutcheon 12, and, hence may be used as conductors for connecting the aquadag shield 32 on the bell portion to the support cylinder 19 and hence to a ground reference for the system without connecting this ground reference to the escutcheon, which, being metal, might otherwise present a shock hazard.

A chassis 33 is positioned around and rigidly attached to cylinder 19. Chassis 33, as shown here, is made of metal and is a substantially planar member positioned substantially transverse to the axis of the cathode ray tube 10 and having an aperture 34 substantially in the middle thereof through which cylinder 19 passes. Chassis 33 is attached to cylinder 19 by means of tabs 35 struck back from the edges of aperture 34 as integral portions of the chassis 33 and screwed to cylinder 19 by screws 36. Chassis 33 has the edges thereof formed at right angles to the main portion thereof to form a skirt 37 extending toward the front or face of the cathode ray tube 10 for a relatively short distance. The skirt portion 37 of the chassis 33 provides a region for mounting various insulating support structure for attaching the chassis to the cabinet, as will be described presently.

The entire assembly, including the escutcheon and cathode ray tube chassis, is adapted to be inserted as a unit in the cabinet. As shown here, the cabinet comprises a sheet metal member 38 formed into a substantially hollow prismoidal shape positioned substantial coaxial with cathode ray tube 10. Specifically the member 38 has a modified rectangular cross-sectional shape with the sides of the rectangular shape bowed outward slightly. As shown here, the member 38 has solid side and top surfaces and an open-work bottom surface, as at 39, which may, in fact, be a separate member of wire screening, punched metal, or expanded metal work, member 39 being secured to the remainder of the cabinet portion by any desired means, such as, for example, spot welding at the junctions of members 39 and 38. Cabinet member 38 extends over the bosses 31 at the corners of escutcheon 12, as well as over lips 40, extending backward from escutcheon 12 in the middle of the upper and lower edges thereof. Member 38 is attached to escutcheon 12 by screws 41 extending through the side walls of member 38 into bosses 31. Attached to cabinet 38 on the bottom wall are short legs 42. Legs 42 may be made, for example, of rubber riveted to member 38 adjacent four corners of the bottom wall and are sufficiently high to allow ready excess of air to the open-work member 39. Legs having a height on the order of ¾" have been found to be satisfactory for this purpose. Thus it may be seen that the cabinet 38, when secured to the escutcheon 12, becomes substantially rigid in the region of the escutcheon. This rigidity is further enhanced by means of a lip 43 on escutcheon 12 which extends back over members 38 and 39 for a short distance and prevents members 38 and 39 from bowing outwardly beyond the edges of the escutcheon 12.

In order to insulatingly support the chassis 33 with respect to the cabinet 38, there is provided insulating strips 44 riveted to forty-five degree chamfered corners of the chassis 33. Specifically, members 44 are riveted to the skirt 37 at the chamfered corners and are slightly longer than the chamfered corners, and, hence, extend outwardly beyond the chasis 33. Insulating members 44, which may be of any stiff insulating material such as fiber board, engage the cabniet 38, and, hence center the chassis 33 in the cabinet 38. The details of the insulating member 44 and and its method of attachment to the chassis 33 is more clearly illustrated in Fig. 5.

In order to firmly attach chassis 33 to cabinet 38, there are provided metal bracket members 45 bolted to the skirt 37 of chassis 38 at the corners thereof on the upper and lower edges of chassis 33. Brackets 45, shown in detail in Fig. 4, are insulated from skirt 37 by an insulating sheet 46, and bolts 47, used to bolt brackets 45 to skirt 37, are surrounded by insulating bushings where they pass through skirt 37 thereby insulating brackets 45 from chassis 33. Brackets 45 are then attached to cabinet 38 by screws 48 extending through cabinet 38 from the outside and threadedly engaging brackets 45. By this structure, chassis 33 is insulated from cabniet 37, and, hence may be used as an artificial ground in circuits where a plate transformer is not used in the power supply. If desired, the cabinet 39 may be connected to the chassis 33 by a resistance on the order of megohms, such that touching of the cabinet simultaneously with earthed objects will not produce any detectable shocking sensation. The exterior of the cabinet and escutcheon may be coated with any suitable enamel, or other coating which will further insure against a shock hazard.

As illustrated herein, the electron discharge devices 49 of the circuit are mounted on the side of the chassis 33 which is accessible from the rear of the cabinet, such that rudimentary servicing of the equipment, such as testing and changing tubes, may be readily accomplished by removal of these items through the rear of the cabinet without removing the indicator system from the cabinet. Other major components, such as transformers 50, high voltage power supply 51, interstage coupling tuned circuits 52, selenium rectifiers 53, and fuse assembly 56 may also be mounted on the rear side of the chassis 53. A tuner assembly illustrated at 57 is mounted in a rectangular aperture in chassis 33 on tabs 58 struck backwardly from chassis 33, the tubes for tuner 57 extending toward the rear of the cabinet and being accessible from the back. As illustrated herein, the shaft assembly 59 for controlling the tuner, which may be, for example of the standard type, extends upwardly from tuner 57 and has a knob hub 60 removably pressed onto the end thereof. A bracket 61 attached to chassis 33 provides sup-

port for the shaft and knob hub at the juncture thereof. In the embodiment illustrated herein, the knob hub **60** has a knob dial **62** attached thereto, dial **62** being positioned outside cabinet **38**. The shaft **59** of the tuner **57** terminates inside cabinet **38** and the knob **62** may be removed by pulling it off the end of shaft **59** with the hub **60** of knob **62** being pulled through the aperture in cabinet **38** provided for hub **60**. The knob **62** illustrated herein is used for fine tuning of the tuner **57**, and a second knob is provided engaging a station selector shaft inside shaft **59** coaxial therewith and actuated by a second knob **63** having a hub extending through knob **62**. The tuner knobs **62** and **63** are positioned on the upper surface of cabinet **38** adjacent one side edge thereof and the remaining control knobs **64**, which are used, for example for the off-on switch, volume control, brightness control, horizontal hold control, and vertical hold control, are positioned adjacent the other side edge of said surface. Knobs **64** engage the shafts of various controls such as potentiometers, which may be mounted, for example on another bracket similar to bracket **61** attached to the other upper corner of chassis **33** from that to which bracket **61** is attached. The metal shafts engaged by the knobs **62**, **63** and **64** do not extend through the cabinet **38**, and, therefore, when the knobs **62**, **63** and **64** are removed from the shafts by pulling them off, the shafts do not impede removal of the chassis, tube, and escutcheon assembly from the cabinet.

As illustrated herein, a back **65** is provided for cabinet **38** and is removably attached thereto by means of screws **66** according to well-known practice. Back **65** may, if desired, be made of metal, but preferably is made of fiber and has substantially the entire area thereof perforated with holes to allow the cooling air, which entered the cabinet through **39**, to escape therefrom. The power is supplied to the indicator, by means of an electric cord which has a plug **67** fastened to back **65** such that, when back **65** is removed, power is removed from the indicator system. A rubber cup **68** is also provided covering an aperture in the center of back **65** through which the end of the gun portion of the cathode ray tube **10** passes. Cup **68** serves to prevent the cabinet **38** from being positioned so close to the wall of a room that air is prevented from escaping through the apertures in back **65**.

A speaker assembly **69** is shown here, by way of example, as being bolted to the inside of one side wall of the cabinet **38** by means of bolts **70**. A suitable aperture **71** is provided in cabinet **38** through which the sound from speaker **69** may pass. It is to be clearly understood that any desired speaker system could be used with the indicator described herein, and the speaker could be positioned on any desired wall of the cabinet, such as the top wall thereof, or could be attached to the chassis **33**.

When the back **65** is in place, and the cabinet is attached to the chassis **33** through the support brackets **45** and to the escutcheon **12**, the over-all cabinet assembly becomes substantially rigid; this characteristic being further enhanced by the bowed sides of the cabinet. When it is necessary to remove the chassis **33**, cathode ray tube **10**, and escutcheon **12** from the cabinet, it may be rested on the escutcheon **12** and the lower chassis support brackets **45** to permit servicing. In this position, both the tubes and other major electrical components of the system are accessible on the back side of the chassis and the auxiliary electrical components, such as resistors, condensers, and hook-up connections, are accessible on the side of the chassis facing the front of the cathode ray tube. Thus it may be seen that servicing of this equipment is greatly facilitated over previous devices where it was necessary to turn the cathode ray tube chassis on its side to expose the condensers, resistors, and other components mounted beneath the chassis. Since a relatively great tension may be applied to the straps **26** by means of screws **27**, for example on the order of fifty pounds, adjustment of the various screws **27** to center support cylinder **19** about the neck **17** of the cathode ray tube will remain fixed, and, hence, jarring of the equipment by movement thereof, for example during shipment, will not cause misalignment of the picture on the face of the tube which might otherwise occur due to movement of the focus coil **20** with respect to the cathode ray tube **10**.

This completes the description of the embodiment of the invention illustrated herein. However, many modifications thereof will be apparent to persons skilled in the art without departing from the spirit and scope of this invention. For example, the cabinet **38** may be made of other materials than metal, such as fiber, plastic or wood, and the chassis, straps, escutcheon, and support cylinder **19** could also be made of other materials than metal, if so desired. Furthermore, the chassis **33** need not necessarily be insulated from the cabinet **38**, particularly if a plate transformer is used in the power supply system and other locations of the control knobs on the cabinet, for example on the side walls thereof, is contemplated. Accordingly, it is desired that this invention be not limited to the particular details of the embodiment disclosed herein, except as defined by the appended claims.

What is claimed is:

1. A cathode ray tube display system comprising a cabinet having a detachable front section including an escutcheon, a cathode ray tube positioned in said cabinet having an evacuated envelope constructed substantially entirely of glass and having a substantially rectangular display surface surrounded by said detachable front section, a dome-shaped portion attached to said display surface and a neck portion attached to said dome-shaped portion by a glass-to-glass seal, a support for said tube comprising a first means included in said front portion of said cabinet and engaging said dome-shaped portion around a major portion of the periphery of said display surface, a second means engaging said dome-shaped portion at a point spaced from said first means and urged toward said first means by a plurality of tension members connected to said second means at a plurality of points spaced around said dome-shaped portion, said tension members extending toward said front portion of said cabinet and being anchored thereto to provide a rigid clamping support engaging said cathode ray tube solely at said dome-shaped portion whereby said cathode ray tube is supported entirely from said dome-shaped portion with no support from said neck portion, said cathode ray tube being removable from said cabinet in a unitary assembly including said escutcheon and said rigid clamping support for said cathode ray tube, and a third means substantially rigidly mounted radially of the axis of said tube and adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion with resultant strain on said seal is eliminated.

2. A cathode ray tube display system comprising a cabinet having metal side and top walls and a detachable front portion including an escutcheon, a cathode ray tube positioned in said cabinet and having an evacuated envelope constructed substantially entirely of glass and having a substantially rectangular display surface substantially filling the front portion of said cabinet, a dome-shaped portion attached to said display surface and a neck portion attached to said dome-shaped portion by a glass-to-glass seal, a support for said tube comprising a first means engaging said dome-shaped portion around a major portion of the periphery of said display surface, a second means comprising a substantially rigid member having a substantially circular aperture engaging said dome-shaped portion at a point spaced from said first means and urged toward said first means by a plurality of rigid tension members having threaded adjusting ele-

ments and extending from said second means toward the region of said first means with said tension members being attached to said second means at points spaced around said dome-shaped portion substantially equalizing the tension between said first and second means in a plurality of regions around said dome-shaped portion to provide a rigid clamping support engaging said cathode ray tube solely at said dome-shaped portion whereby said cathode ray tube is supported entirely from said dome-shaped portion with no support from said neck portion, said cathode ray tube being removable from said cabinet as a unitary assembly including said escutcheon, a chassis supporting major electrical components positioned in said cabinet substantially perpendicular to the axis of said tube with said neck extending through an aperture in said chassis, said chassis extending substantially to the walls of said cabinet and being insulatedly supported with respect to said metal walls, and a third means substantially rigidly mounted radially of the axis of said tube and adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion with resultant strain on said seal is eliminated.

3. A cathode ray tube display system comprising a cabinet having metal side and top walls, and a detachable front portion including an escutcheon, a cathode ray tube positioned in said cabinet and having an evacuated envelope constructed substantially entirely of glass, said envelope having a substantially rectangular display surface substantially filling the front of said cabinet, a dome-shaped portion attached to said display surface, and a neck portion attached to said dome-shaped portion by a glass-to-glass seal, a support for said tube engaging said tube solely on said dome-shaped portion and comprising a support member clamped to said dome-shaped portion around a major portion of the periphery of said display surface, said support member being rigidly connected to said cabinet to provide a rigid clamp and support for said cathode ray tube whereby said cathode ray tube is supported entirely from said dome-shaped portion with no support from said neck portion, a chassis supporting major electrical components positioned in said cabinet substantially perpendicular to the axis of said tube with said neck extending through an aperture in said chassis, said tube being removable from said cabinet as a unitary assembly with said escutcheon and said support for said tube, said chassis extending substantially to the walls of said cabinet and being insulatedly supported with respect to said metal walls, and a structure substantially rigidly mounted radially of the axis of said tube and adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion with resultant strain on said seal is eliminated.

4. A cathode ray tube display system comprising a cabinet having a detachable front portion including an escutcheon, a cathode ray tube positioned in said cabinet and having an evacuated envelope constructed substantially entirely of glass, said envelope having a substantially rectangular display surface, a dome-shaped portion attached to said display surface, and a neck portion attaced to said dome-shaped portion by a glass-to-glass seal, a support for said tube engaging said tube solely on said dome-shaped portion and comprising a support member clamped to said dome-shaped portion around a major portion of the periphery of said display surface, said support member being rigidly connected to said detachable front portion to provide a rigid clamp and support for said cathode ray tube whereby said cathode ray tube is supported entirely from said dome-shaped portion with no support from said neck portion, said tube being removable from said cabinet as a unitary assembly with said escutcheon and said support for said tube, and a structure substantially rigidly mounted radially of the axis of said tube and adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion with resultant strain on said seal is eliminated.

5. A cathode ray tube display system comprising a cabinet having a detachable front portion including an escutcheon, a cathode ray tube positioned in said cabinet and having an evacuated envelope constructed substantially entirely of glass, said envelope having a substantially rectangular display surface substantially filling the front portion of said cabinet, a dome-shaped portion attached to said display surface, and a neck portion attached to said dome-shaped portion by a glass-to-glass seal, a support for said tube engaging said tube solely on said dome-shaped portion and comprising a support member clamped to said dome-shaped portion around a major portion of the periphery of said display surface, said support member being rigidly connected to said detachable front portion to provide a rigid clamp and support for said cathode ray tube whereby said cathode ray tube is supported entirely from said dome-shaped portion with no support from said neck portion, said tube being removable from said cabinet as a unitary assembly with said escutcheon and said support for said tube, a chassis supporting major electrical components positioned in said cabinet substantially perpendicular to the axis of said tube with said neck extending through an aperture in said chassis and said chassis extending substantially to the walls of said cabinet, and a structure substantially rigidly mounted radially of the axis of said tube and adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome-shaped portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion with resultant strain on said seal is eliminated.

6. A cathode ray tube display system comprising a cabinet having a detachable front portion, a cathode ray tube positioned in said cabinet and having an evacuated envelope constructed substantially entirely of glass, said envelope having a display surface substantially filling the front portion of said cabinet, a dome-shaped portion attached to said display surface, and a neck portion attached to said dome-shaped portion by a glass-to-glass seal, said detachable portion including an escutcheon removably attached to said cabinet and contoured substantially to the shape of said display surface, a protective transparent plate positioned within said escutcheon and disposed in front of and spaced from said display surface, and a gasket of resilient material surrounding the edge of said plate and providing a seal between said plate and said escutcheon and between said plate and said display surface, a chassis supporting major electrical components positioned in said cabinet substantially perpendicular to the axis of said tube with said neck extending through an aperture in said chassis, said chassis being removably attached to said cabinet, support means for said tube including a rear support cylinder attached to said chassis radially of the axis of said tube and surrounding said neck portion adjacent the junction of said neck portion and said dome-shaped portion, said rear support cylinder being adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome-shaped portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion with resultant strain on said seal is eliminated, said rear support cylinder having a resilient lip portion engaging the dome-shaped portion of said tube, and a plurality of rigid strips attached at one end to said rear support cylinder and

attached at the other end to said escutcheon by means of adjustable screws, said strips extending forward around the dome-shaped portion only of said tube, whereby said tube is supported entirely from said dome-shaped portion with no support from said neck portion, said tube being removable from said cabinet as a unitary rigidly mounted assembly with said detachable front portion and said support means for said tube.

7. A cathode ray tube display system comprising a cabinet having a detachable front portion, a cathode ray tube positioned in said cabinet and having an evacuated envelope, said envelope having a display surface substantially filling the front portion of said cabinet, a dome-shaped portion attached to said display surface, and a neck portion, said detachable portion including an escutcheon removably attached to said cabinet and contoured substantially to the shape of said display surface, a protective transparent plate positioned within said escutcheon and disposed in front of and spaced from said display surface, a chassis supporting major electrical components positioned in said cabinet substantially perpendicular to the axis of said tube with said neck extending through an aperture in said chassis, said chassis being removably attached to said cabinet, support means for said tube including a rear support cylinder attached to said chassis radially of the axis of said tube and surrounding said neck portion adjacent the junction of said neck portion and said dome-shaped portion, said rear support cylinder being adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome-shaped portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion is eliminated, and a plurality of rigid strips attached at one end to said rear support cylinder and attached at the other end to said escutcheon, said strips extending forward around the dome-shaped portion only of said tube, whereby said tube is supported entirely from said dome-shaped portion with no support from said neck portion, said tube being removable from said cabinet as a unitary rigidly mounted assembly with said detachable front portion and said support means for said tube.

8. A cathode ray tube display system comprising a cabinet having a detachable front portion, a cathode ray tube positioned in said cabinet and having an evacuated envelope constructed substantially entirely of glass, said envelope having a display surface substantially filling the front portion of said cabinet, a dome-shaped portion attached to said display surface, and a neck portion attached to said dome-shaped portion by a glass-to-glass seal, said detachable portion including an escutcheon removably attached to said cabinet and contoured substantially to the shape of said display surface, a protective transparent plate positioned within said escutcheon and disposed in front of and spaced from said display surface, and a gasket of resilient material surrounding the edge of said plate and providing a seal between said plate and said escutcheon and between said plate and said display surface, a chassis supporting major electrical components positioned in said cabinet substantially perpendicular to the axis of said tube with said neck extending through an aperture in said chassis, said chassis being removably attached to said cabinet, support means for said tube including a rear support cylinder attached to said chassis radially of the axis of said tube and surrounding said neck portion adjacent the junction of said neck portion and said dome-shaped portion, said rear support cylinder being adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome-shaped portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion with resultant strain on said seal is eliminated, said rear support cylinder having a resilient lip portion engaging the dome-shaped portion of said tube, and a plurality of rigid strips attached at one end to said rear support cylinder and attached at the other end of said escutcheon by means of adjustable screws, said strips extending forward around the dome-shaped portion only of said tube, whereby said tube is supported entirely from said dome-shaped portion with no support from said neck portion, said tube being removable from said cabinet as a unitary rigidly mounted assembly with said detachable front portion, said chassis and said support means for said tube.

9. A cathode ray tube display system comprising a cabinet having a detachable front portion, a cathode ray tube positioned in said cabinet and having an evacuated envelope, said envelope having a display surface substantially filling the front portion of said cabinet, a dome-shaped portion attached to said display surface, and a neck portion, said detachable portion including an escutcheon removably attached to said cabinet and contoured substantially to the shape of said display surface, a protective transparent plate positioned within said escutcheon and disposed in front of and spaced from said display surface, a chassis supporting major electrical components positioned in said cabinet substantially perpendicular to the axis of said tube with said neck extending through an aperture in said chassis, said chassis being removably attached to said cabinet, support means for said tube including a rear support cylinder attached to said chassis radially of the axis of said tube and surrounding said neck portion adjacent the junction of said neck portion and said dome-shaped portion, said rear support cylinder being adjustably mounted axially of said tube for positioning a magnetic deflection yoke in a fixed position adjacent said dome-shaped portion and loosely around said neck portion whereby pressure of said deflection yoke against said neck portion is eliminated, and a plurality of rigid strips attached at one end to said rear support cylinder and attached at the other end to said escutcheon, said strips extending forward around the dome-shaped portion only of said tube, whereby said tube is supported entirely from said dome-shaped portion with no support from said neck portion, said tube being removable from said cabinet as a unitary rigidly mounted assembly with said detachable front portion, said chassis and said support means for said tube.

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