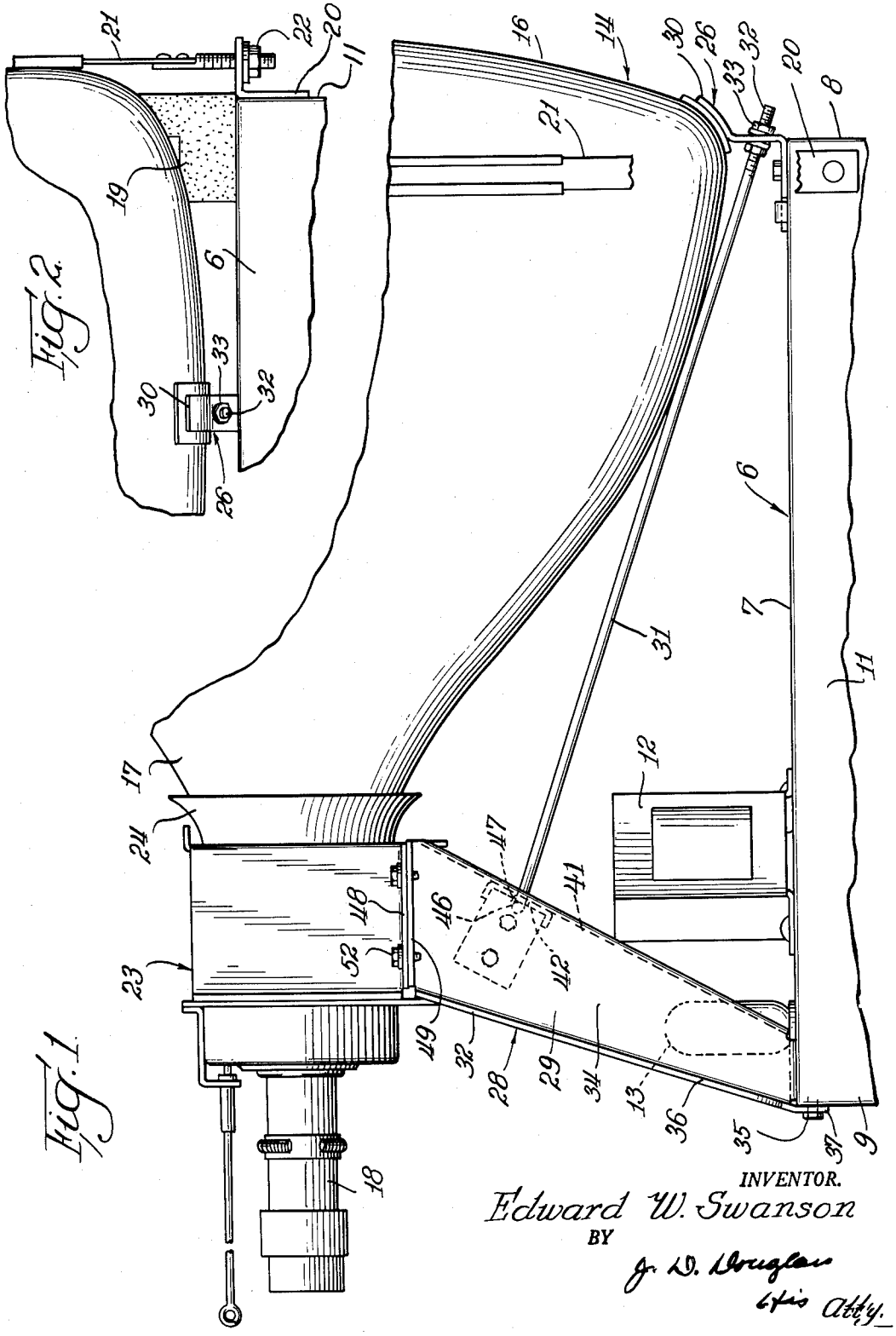
March 13, 1956 E. W. SWANSON 2,738,501

PICTURE TUBE SUPPORT

Filed Dec. 31, 1952 3 Sheets-Sheet 1



March 13, 1956 E. W. SWANSON 2,738,501

PICTURE TUBE SUPPORT

Filed Dec. 31, 1952 3 Sheets-Sheet 2

Fig. 3.

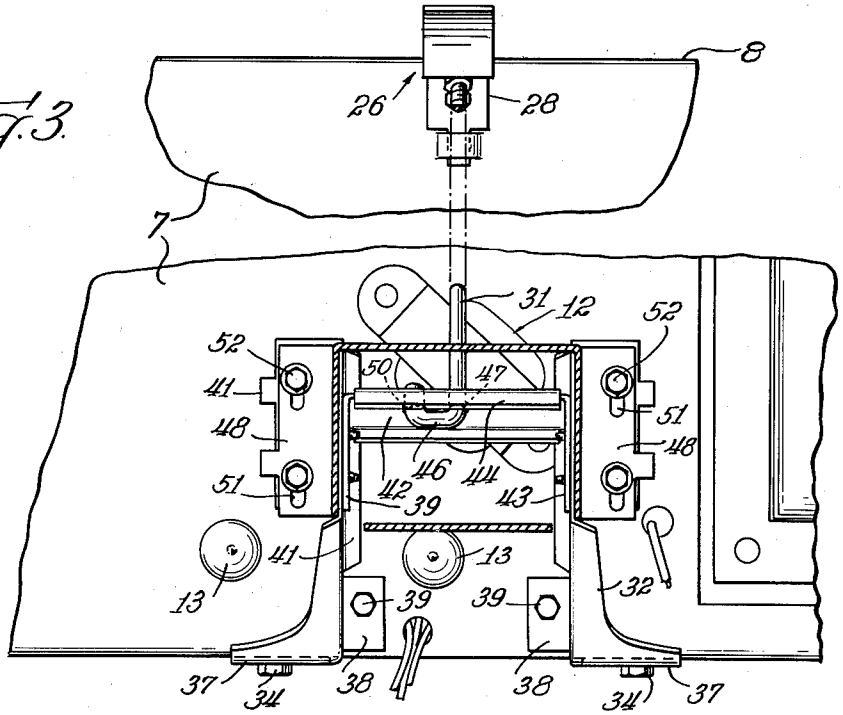
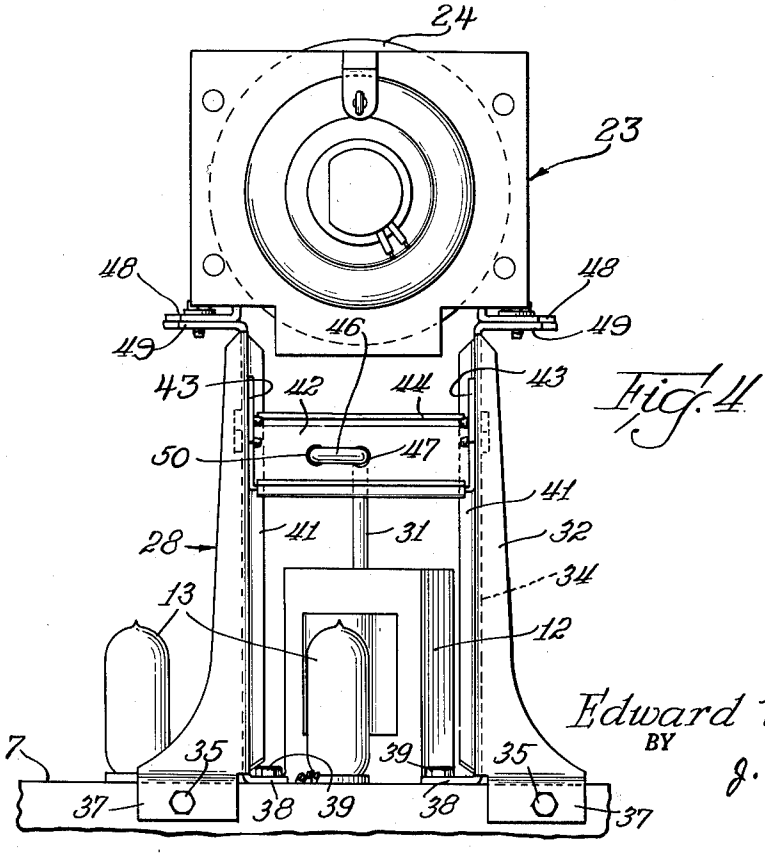


Fig. 4.



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March 13, 1956 E. W. SWANSON 2,738,501

PICTURE TUBE SUPPORT

Filed Dec. 31, 1952 3 Sheets-Sheet 3

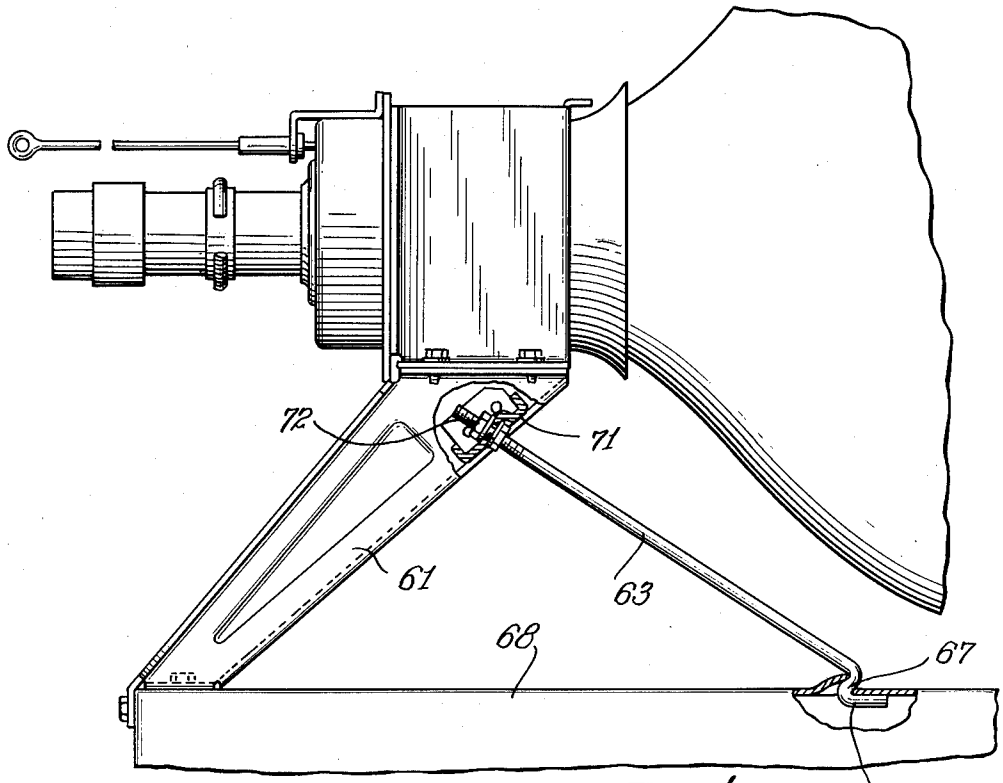


Fig. 5.

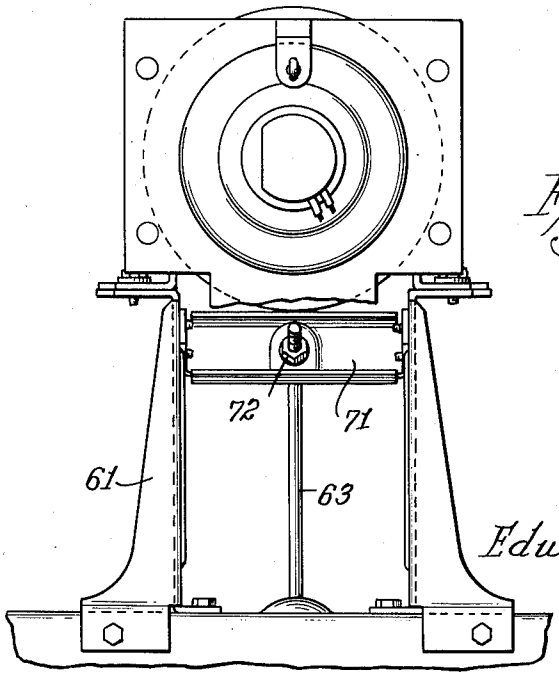


Fig. 6.

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PICTURE TUBE SUPPORT

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Application December 31, 1952, Serial No. 328,976

5 Claims. (Cl. 340—367)

This invention relates to mounting for a television picture tube, and in particular to clamping and support mechanism for securing a picture tube in a chassis in operative position relative to a frame or escutcheon of a cabinet.

In greater detail, the invention is identified with television apparatus comprising a picture tube associated with a sheet metal chassis frame having a top wall and depending front, rear and side walls. The novel feature comprises a generally tripod mechanism which includes a pair of support legs slanting upward from their respective spaced-apart connections with the junction of the top and rear wall to a deflection coil housing, embracing the rear portion of the tube, and a third leg acting as a draft member to retain the support legs in inclined relation to the frame, the third leg slanting downward from the coil housing to its anchorage with the frame at a point remote from the points of attachment of the support legs with the frame so that the picture tube may be embraced between the coil housing and one or more stops extending for a short distance in front of the tube from the chassis. Additionally, the coil housing may be moved in a direction axially of the tube to press the picture tube into engagement with the stop and while so pressing the tube, said housing may be clamped to the tripod mechanism to retain the tube in its position of pressure engagement with the stop. Another feature is an adjustment by which the third leg may be tensioned to a variable extent to regulate the axial position of the picture tube with respect to the top wall of the frame.

Heretofore, it has been customary to provide a column fixed to the top wall of a chassis frame to support a deflection coil housing embracing the neck of a picture tube, the tube including a back portion, diverging from the gun, engaged by the coil housing. When the tube was pinched between the coil housing and one or more stops in front of the tube, the consequent pinching resulted in a tendency, on the part of the column, to lean backward; that is, in a direction away from the tube due to the comparative resiliency of the top wall which was bulged upward between the column and front wall of the chassis frame. Where a single top wall carried most of the components of a television receiver, and was large for this purpose, the bulge was objectionable but was lessened by constructing the frame of needlessly thick metal. Where the support column was of large transverse proportions, to offset the bulging effect of the top wall, another drawback was noteworthy. When the apparatus was confined in an open back cabinet and an attempt was made to replace tubes or carry out repairs to the apparatus without removing it from the cabinet difficulty was encountered due to the space occupied by the column. Additionally, the large column occupied space to such an extent that manufacture called for positioning the components at points on the top wall where they were not always most convenient for connection with other components.

Due to the present invention, economy of metal is effected both in the frame and in the device by which the back of the picture tube is spaced from the frame, and this has been accompanied by less bulging of the top wall than was previously experienced. In addition to a reduction in the cost of manufacture, the invention makes easier the matter of servicing such television apparatus without its removal from the cabinet in which it is housed. Furthermore, initial connection of the components to each other is greatly facilitated owing to greater freedom for positioning said components.

For an explanation, in detail, of a specific example of the invention, reference will be made to the accompanying drawings wherein:

Fig. 1 is a fragmentary side elevational view of a picture tube and chassis frame illustrating the invention incorporated therein;

Fig. 2 is a fragmentary front view of the lower right hand corner of the picture tube and means by which the front portion is anchored to the frame;

Fig. 3 is a fragmentary top plan view of the improved tube mounting;

Fig. 4 is a fragmentary elevational view of the rear of the same;

Fig. 5 is a view corresponding to Fig. 1 showing a second example of the tube mounting; and

Fig. 6 is a view of the same as viewed from the rear thereof.

Particularly in Fig. 1 is shown television equipment which includes a sheet metal chassis or frame 6 having a top wall 7, front wall 8, rear wall 9, and side walls 11. The various components such as a transformer 12 and small electron tubes 13 may be carried by the top wall. The frame 6 carries a picture tube or cathode ray tube 14. Tube 14 may be of so-called rectangular construction having a front or screen portion 16 from which a back portion 17 converges to a cylindrical neck 18 for accommodation of a conventional electron gun, not shown. Adjacent the screen 16, the periphery of tube 14 is partially embraced by a metallic anchor band 21, the two ends of which are each adjustably secured to an inverted L-shaped bracket 20, fixed to either side wall 11, by bolt and nut connections 22. This clamping operation is resisted, however, by spaced apart blocks 19 of some suitable dielectric material such as Bakelite on the top wall 7. At the back portion 17, the neck 18 is embraced by the usual focus and deflection coils, not shown but contained within a coil housing 23 including an annular cushioning member 24 for engagement with the flared back portion 17. When the coil housing 23 is pushed to the right it urges the picture tube to a predetermined position with respect to the front wall 8. This position is governed by stop means provided by a bracket 26, bolted to the frame 6 intermediate the blocks 19. When thus moved into its predetermined position, the tube 14 is in pressure engagement with a rubber surfaced finger 30, by means to be described hereinafter. The finger 30 is at the upper end of bracket 26 and is formed to conform to the contour of the picture tube.

The novel support for the rear portion of tube 14, and in particular for the coil housing 23, comprises tripod mechanism identified in its entirety by the character 28 and includes a pair of supporting beams or legs 29 and a draft rod or leg 31. The beams 29 slant forward and upward from the junction of walls 7 and 9 to the coil housing 23 while, therefrom, the member 31 slants downward to the frame 6 for anchorage thereto at some point remote from the rear wall 9. A convenient point is as shown, on the bracket 26 through which a threaded portion 32 extends freely and bears a nut 33 for tensioning the rod. Preferably each of the beams 29 is of sheet metal, is channel-shaped in cross-section and so includes

a web portion 34 from opposite rear edges of which rear flanges 36 extend away from each other and are of width decreasing toward their upper ends. The lower ends of the flanges 36 are bent slightly and continue below the webs to provide lugs 37 bolted to the rear wall at 35. The lower ends of the webs 34 are flanged laterally toward each other to provide feet 38 through which screws 39 pass for securing the beams 29 to the top wall 7. The front edges of the beams also bear flanges 41 extending toward each other.

Intermediate their ends the beams 29 are rigidly secured to each other by a cross member 42, also of channel-shaped cross-section, the cross member additionally having end flanges 43, bolted to the web portion 31 of the beams 29, and lateral flanges 44 for the sake of rigidity.

Any convenient means may be adopted for connecting the draft rod 31 to the legs 28. For example, the member 31 may be bent at one end thereof to provide a hook 46. In assembly the tripod mechanism with the chassis 6, the draft member 31 is passed through an aperture 47 in the cross member 42 until the hook portion 46 engages the member and the threaded end 32 extends through the bracket 26. Then the nut 33 is tightened against bracket 26. To resist turning of the rod 31 about its axis when the nut 33 is tightened, the hook 46 is finally bent to extend backward and to pass through a hole 50, in the cross member, spaced from the hole 47. For coupling the tube 14 to the tripod mechanism, the coil housing 23 has at its base a pair of lateral flanges 48 extending away from each other and arranged to overlie a pair of flanges 49 extending laterally from the tops of the beams 29. Provision is made to releasably and adjustably associate the coil housing with the beams 29. This is carried out by means of slots 51 in the flanges 48 and screws 52 which pass freely through the slots 51 but which are threaded in the flanges 49. Prior to tightening the screws 52, the coil housing is pushed to the right to urge the picture tube into pressure engagement with the finger 28 and while it is so disposed the screws 52 are tightened to retain this relationship between the coil housing 23 and the stop 26. Then, if need be, the nut 33 on the draft member 31 may also be tightened or loosened to slightly vary the engagement between bracket 26 and the front of the picture tube so that the position of the screen is in a desired relationship to the front of the frame 6.

In Figs. 5 and 6 is depicted another embodiment of the present invention. This construction is desirable when the size of picture tubes does not permit a draft rod 63 to pass under it to the front of the frame. Accordingly, a draft rod 63 has at its lower end an S-shaped hook portion 64 adapted to be inserted in an aperture 67 in the top wall 68 of a chassis frame. The upper end of the draft member 68 extends through a cross member 71 bridging the beams 61, the counterparts of beams 28. Lock nuts 72, threaded on the upper end of member 63 rigidly secure it to the beams 61.

It will now be apparent that the tripod mechanism, while supporting the rear of the tube 14, also plays the role of a prop or brace to resist displacement of the picture tube away from the stop finger 26. It will also be noted that the legs 29 and 31 are attached to points, on the frame, least susceptible of deflection by the pinching operation exerted on the picture tube to secure it to the frame. This has been accomplished by securing the draft rod 31 to the frame at a point remote from the two points where the beams 28 are attached to the frame. And it is also noteworthy that the area of the top wall 7 occupied by the beams overlie but a small area of said top wall thereby affording additional room for small tubes and other components of the apparatus. As will be apparent from an examination of Fig. 6, the vertical area taken up by the beams 29 is particularly slight so that a minimum of obstruction is presented to a service man desiring to make repairs to the chassis when it is in an open backed cabinet.

Although I have described two embodiments of my invention I am aware that numerous and extensive departures may be made therefrom without departing from the spirit or scope of the invention.

I claim:

1. In television apparatus comprising a frame having a top wall from which front, rear and side walls extend downward and a stop at the front wall extends upward for abutment by the front of a picture tube concurrently anchored in engagement with a pair of supports at either end of the front wall, the tube having a back portion converging to a cylindrical neck embraced by a coil housing in engagement with the back portion, the combination of, means by which the picture tube is supported and concurrently braced rearwardly thereof to urge it toward the stop comprising a pair of spaced-apart supports having lower end portions fixed to the frame at the junction of the top and rear wall, said supports being inclined over the top wall, means by which a releasably clamped relationship is provided between the coil housing and the upper ends of the supports, said means enabling the picture tube to be pushed against the stop when the clamped relationship is relieved and for said tube to be secured in pressure engagement with said stop when said clamped relationship is restored comprising a draft member having anchor portions at either end thereof, one of the anchor portions being anchored to the pair of supports intermediate their ends and the other of the portions being anchored to the frame at a point remote from the rear wall to resist tipping of the braces about the rear of the frame.

2. In television apparatus comprising a frame having a top wall from which front, rear and side walls extend downward and a stop at the front wall is extending upward for abutment by the front of a picture tube concurrently anchored in engagement with a pair of supports at either end of the front wall, the tube having a back portion converging to a cylindrical neck embraced by a coil housing in engagement with the back portion, the combination of, means by which the picture tube is biased toward the stop and concurrently supported rearwardly thereof comprising a pair of spaced-apart braces having lower end portions fixed to the frame at the junction of the top and rear wall, said braces slanting upward over the top wall to the coil housing, means by which a releasably clamped relationship is provided between the coil housing and the upper ends of the braces, said means enabling the picture tube to be pushed against the stop when the clamped relationship is relieved and for said tube to be secured in pressure engagement with said stop when said clamped relationship is restored, bridging means fixed to the braces intermediate their ends and rigidly securing the braces together, a draft member having anchor portions at either end thereof, one of the anchor portions being anchored to the bridging means and the other of the portions being anchored to the frame at a point remote from the rear wall, and adjustment means in connection with one of the anchor portions by which the tension in the draft member may be varied to resist tipping of the braces about their junction with the top and rear walls.

3. In television apparatus comprising a frame having a top wall from which front, rear and side walls extend downward and a stop at the front wall is extending upward for abutment by the front of a picture tube concurrently anchored in engagement with a pair of supports at either end of the front wall, the tube having a back portion converging to a cylindrical neck embraced by coil housing in engagement with the back portion, the combination of, means by which the picture tube is biased toward the stop and concurrently supported rearwardly thereof comprising a pair of elongated metallic members of channel shaped cross section having web and flange portions and lower ends fixed to the frame at the junction

of the top and rear wall, said braces slanting upward over the top wall to the coil housing, a transverse beam fixed to both of the members and spacing them from each other, means by which a releasably clamped relationship is provided between the coil housing and the upper ends of the braces, said means enabling the picture tube to be pushed against the stop when the clamped relationship is relieved and for said tube to be secured in pressure engagement with said stop when said clamped relationship is restored comprising a draft member having anchor portions at either end thereof, one of the anchor portions being anchored to the transverse beam and the other of the portions being anchored to the frame at a point adjacent the front wall to resist tipping of the braces about their junction with the top and rear walls, and adjustment means in connection with one of the anchor portions by which the tension in the draft member may be varied to govern the angular relationship between the picture tube and the frame.

4. A support for supporting a television picture tube on top of a chassis wherein the front end of said tube is provided with means to limit its movement forward of the chassis, said support being arranged to engage the tube around the neck and adjacent the outwardly flared part to push said tube forwardly comprising a pair of spaced apart beams secured to the back top edge of the chassis and inclined forwardly and upwardly, a yoke support housing carried on the top ends of said beams and tieing said beams together, and draw bar means secured between the upper end of said beams and to a forward portion of said chassis and having adjustment means thereon

for pulling the upper end of the support toward the flared part of the tube.

5. A support for supporting a television picture tube on top of a chassis wherein the front end of said tube is provided with means to limit its movement forward of the chassis and said support is arranged to engage the tube around the neck and adjacent the outwardly flared part to push said tube forwardly on the chassis comprising a pair of spaced apart beams, each of which is narrow at the base and wider at the top, secured to the back top edge of the chassis and inclined forwardly and upwardly to a point spaced below the tube neck, a yoke support housing carried on the top ends of said beams and tieing said beams together and having a yoke coil therein engaging the neck and flared base of the tube, draw bar means secured between the upper end of said beams and to a forward part of said chassis and having adjustment means thereon for pulling the upper end of the support toward the flared part of the tube.

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