

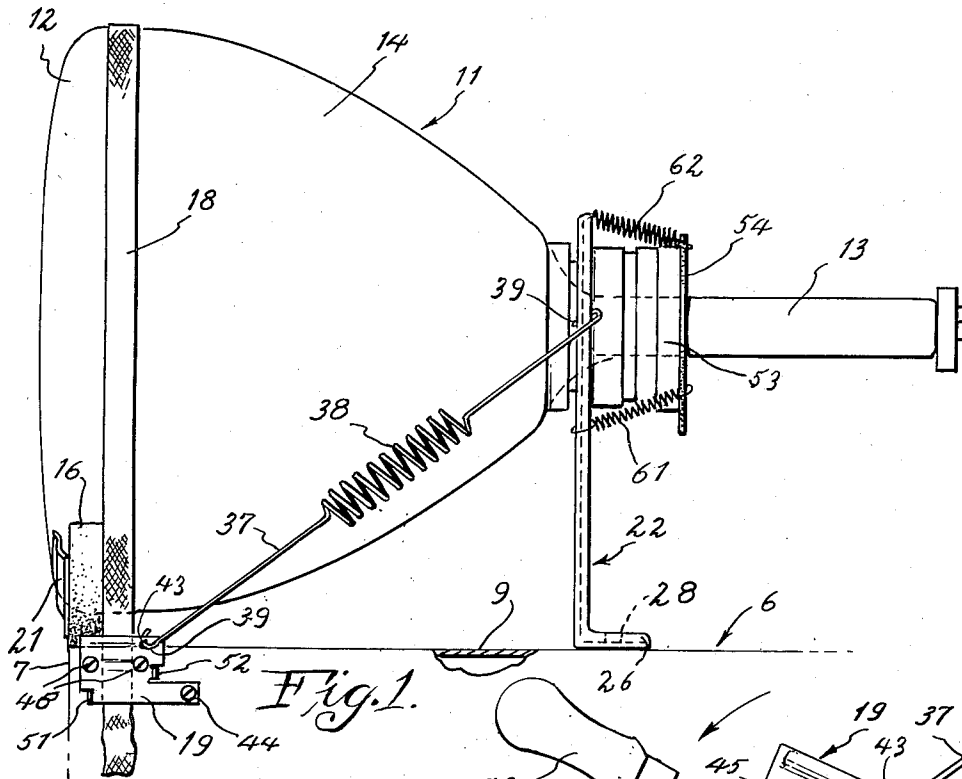
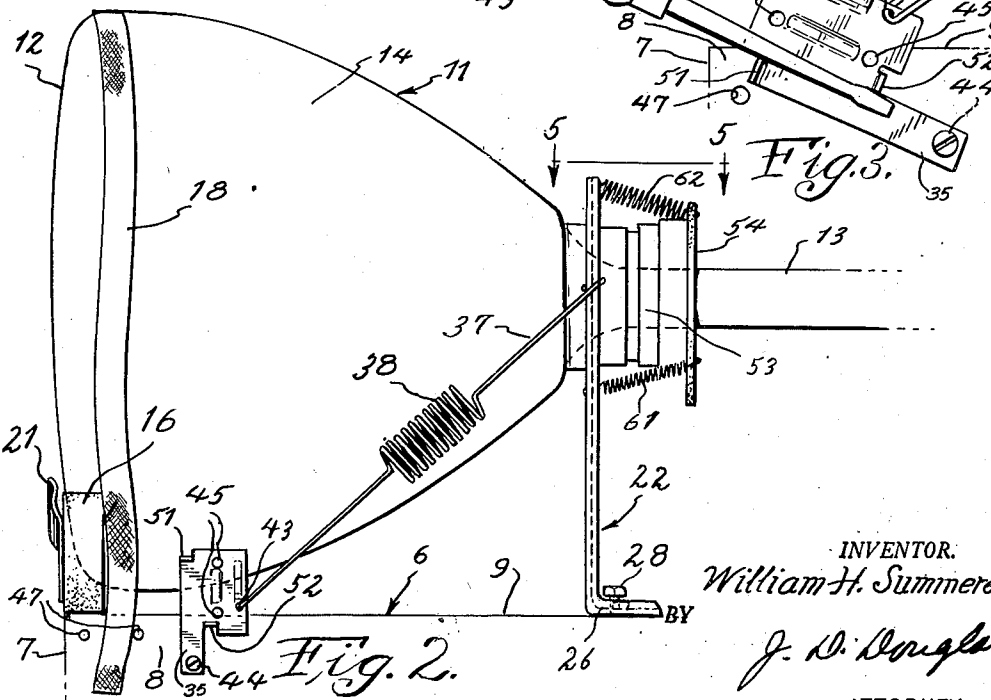
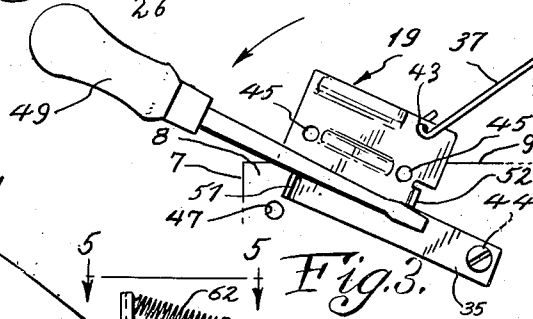
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W. H. SUMMERER
TELEVISION TUBE SUPPORT

2,900,630

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

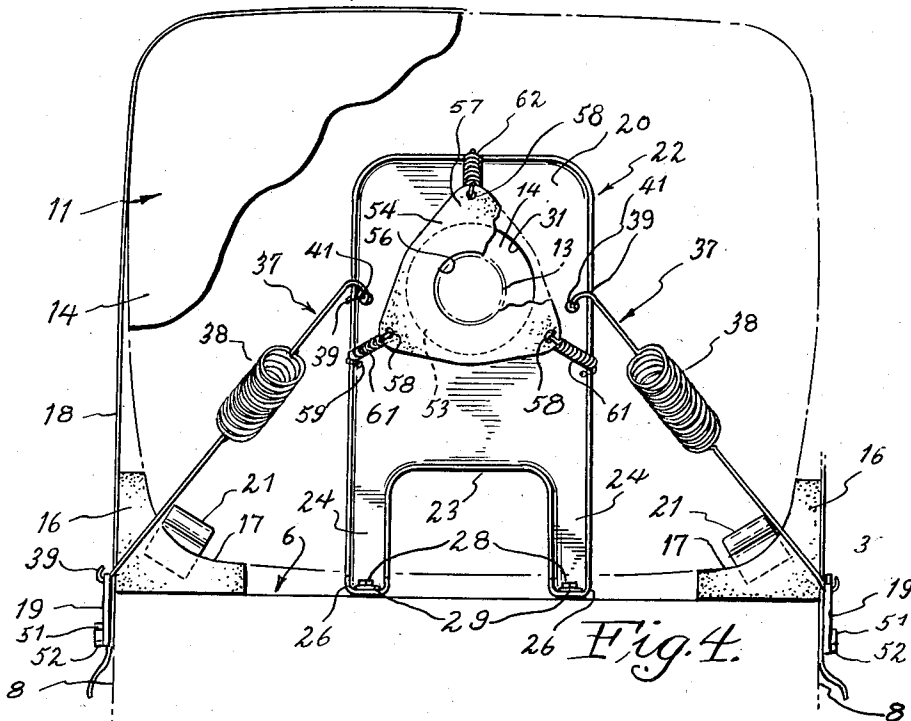
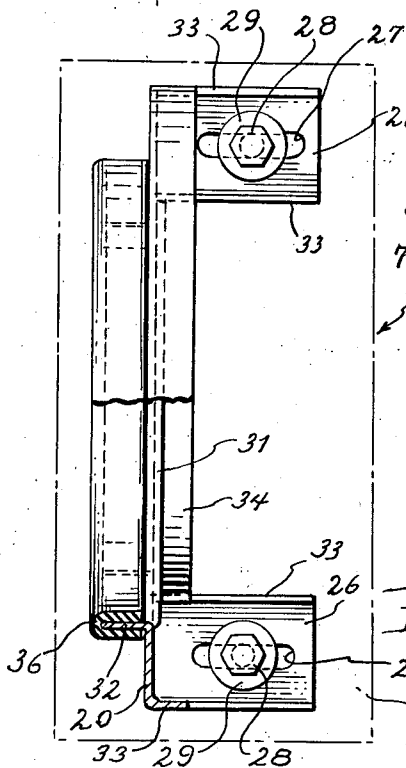
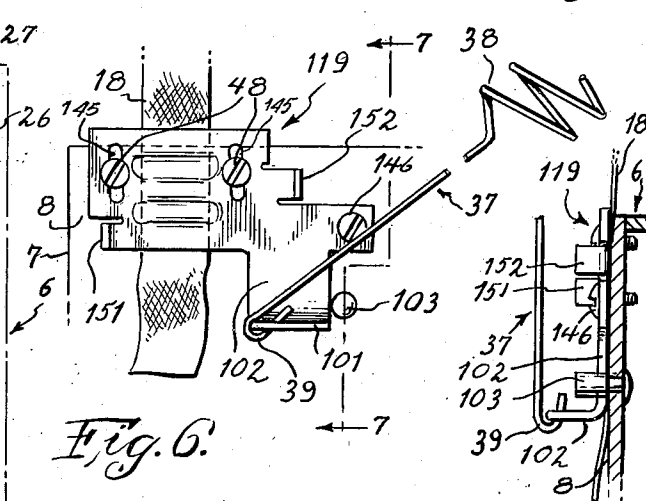


Fig. 7.

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TELEVISION TUBE SUPPORT

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6 Claims. (Cl. 340—367)

This invention relates to television apparatus, and in particular to means for anchoring a picture tube to a television chassis.

Mountings for picture tubes have been needlessly expensive to manufacture and install due partly to inherent features of the parts of which they were composed and to the time-consuming effort called for in assembling the parts and picture tubes. The older mountings also sometimes caused additional expense because of tube breakage due largely to the rigidity of the mountings. And this occasionally happened both during assembly and during transportation of complete television chassis in which the older apparatus was employed.

Furthermore it is customary to support the deflection coils around the base of the tube and to hold those coils against the bell shaped part of the tube where it merges with the neck to provide for the most efficient operation of the sweep circuits. Frequently these coils have a tendency to shift axially of the tube away from the bell thus causing the deflection circuits to be less effective. The present structure assures that the coils will always be held in their proper position and that the tube itself will always be held in a forward position in the proper proximity to the front of a cabinet for best viewing by the user.

By the present invention, the expense of manufacturing a mounting for a picture tube is lessened. The expense occasioned by damage to the picture tubes during assembly of the chassis and during transportation thereof is also minimized. The assembly may be made quicker and without special tools or equipment.

For a further and better understanding of the invention besides one manner of carrying it out, reference may be had to the accompanying drawings in which:

Fig. 1 is a fragmentary side elevational view of the chassis of a television receiving set in which the improved mounting is incorporated;

Fig. 2 is a view corresponding to Fig. 1 prior to completion of assembly of the parts;

Fig. 3 is a fragmentary view, drawn to an enlarged scale, of the clamping plate while it is being manually turned toward its final position;

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

Fig. 5 is a fragmentary top plan view, drawn to an enlarged scale, of the rear tube carrier;

Fig. 6 is also a fragmentary view, drawn to an enlarged scale and corresponding to the parts shown in Fig. 1, showing a second embodiment of the invention; and

Fig. 7 is a side elevational view of the parts shown in Fig. 6.

Television apparatus, in conjunction with which the invention is incorporated, includes a chassis frame indicated in its entirety by the reference character 6. It is usually formed from sheet metal and includes vertical end walls 7 and side walls 8 extending downward from a top wall 9 generally of rectangular formation. The

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chassis usually supports a picture tube 11 which has a front or screen portion 12 and a neck which houses a gun portion 13, the tube converging from the screen to the neck as shown at 14. Additionally, the tube 11 frequently is of the all-glass envelope variety having a so-called rectangular screen.

Forwardly thereof, the tube 11 is spaced from the top wall 9 by a pair of horizontally spaced-apart front supports 16, fixed to the base 6. As viewed axially of the tube, the supports 16 are substantially L-shaped and have seats 17, complementary to the lower corner portions of the tube, in which the corner portions of the tube are seated, and maintained therein by a strap or band 18 passing over the tube beside the screen portion 12; the band is anchored to the base 6 beside the supports 16 by tension members or clamp plates 19, the structure and function of which will be described later. The supports 16 also include stops which may take the form of fingers 21 extending in front of the picture tube screen to resist displacement of the tube axially forward while it is secured in the seats 17.

Up to this point the apparatus described is well known to the prior art. Some of the novel features of the apparatus will now be described. They include means to carry the rear of the picture tube and rigging for applying pressure to the rear of the tube for resisting its displacement away from the stops 21, as well as means for holding the deflection coils in position. They comprise a carrier, standard or rear support 22 and other elements later to be referred to. The support 22, Fig. 4, is struck from sheet metal and includes a planar web portion 20 divided downwardly thereof by an arch 23 thereby providing a pair of legs 24 and feet portion 26 at the lower ends of both legs normal to the web for engagement with the top wall 9. Each foot 26, in turn, is formed with a slot 27, Fig. 5, extending longitudinally thereof, through which a screw 28 may extend freely and into threaded engagement with the top wall 9 for adjustably clamping the support to the frame 6. A washer 29 may be used under the head of each of the screws if desired. At the axial level of the tube 11, the support is formed with an aperture 31 which is further defined by a pressure director, pressure localizer, or annular flange 32, extending forward from one side of the web 20 for a purpose later to be indicated. The remaining edges of the support 22, with the exception of the ends of feet 26 are also provided with flanges 33 and 34, extending from the opposite side of the web 20 to afford rigidity for said support.

During its assembled relationship to the mounting, the tube neck 13 extends through the aperture 31. At the same time the flange 32 is arranged to exert, throughout its circumference, pressure on the back portion 14, the flange 32 carrying an annular seat or cushioning member 36 which is of U-shaped cross-section and embraces opposed sides of the flange throughout its circumference which engages the tube. Preferably, the member 36 is composed of rubber of a soft and resilient texture so that it may compensate for irregularities in the contour of the back 14 yet is sufficiently resistant to compression to convey forward thrust of the carrier 22, to the picture tube, by the agency of elements now to be described.

Although the springs 38 are preloaded at the time of their installation it is timely to consider the structure of the plates 19 to understand the mode of preloading said springs. Therefore it may be stated that both of the plates 19 are similar to each other with the exception that they are of opposite hand. In greater detail, each of said plates is rectangular and is formed with an arm 35 the end of which is pivotally secured to the wall 8 by a screw 44. A hole 43 in said plate spaced from the pivot point is carried through an arc when the plate is

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rotated. The hole provides an anchor point for the draft member 37 to the plate, and is carried between points of greatest and least proximity to the member's anchorate point on the carrier 22. The members 37 are each of such a length that when either of the plates 19 is swung to its Fig. 2 position, wherein the hole 43 is in greatest proximity to the anchorate point of the carrier 22, tension in the spring 38 is at a minimum. When, however, the plate is swung to its Fig. 1 position the hole 43 is carried farther from the points 41, thereby tensioning the spring 38, at this time tension on the draft member 37 is at a maximum, and the spring is deflected within its elastic limits. In this process of preloading the spring, the plate 19 is swung over the band 18 and concurrently; a pair of holes 45, of smooth bore in said plate, are carried over and into registration with a pair of threaded holes 47 in the wall 8, one of the holes of each pair being then disposed on either side of the band 18. Then screws 48 are passed through the holes 45 and threaded in the holes 47 to both clamp the plates to the wall 8 and pinch and anchor one end of the band 18 to one side of the base by pinching it between said side wall and plate 19. The draft member on the opposite side of the picture tube is preloaded in a similar manner although prior to tightening the screws 48 thereof, that portion of the band 18 below the plate 19 is grasped and pulled downward to tension the portion of the band passing over the tube when the screws 48 are tightened.

Cooperation between the back portion 14 of the tube and the support 22 is provided by similar draft members 37. They may take the form of metallic rods or wires of heavy gauge such as steel .080" in diameter and have hooked ends 39 for their ready connection with opposite sides of the support 22 at the level of the tube neck 13. From their points of anchorage to the support 22, where they pass through holes 41, the members 37 extend diagonally of the top wall 9 and their remaining ends are hooked in holes 43 in the plates 19. Intermediate their ends, both of the members 37 are formed to include spiral tension springs 38 so that during their operation the cushioning member may be biased into pressure engagement with the back 14.

The springs are preloaded at the time of their assembly with the support 22 and plates 19. The means by which the preloading is effected is best illustrated in Figs. 1-3 inclusive. Starting with Fig. 2 it is assumed that the support 22 is positioned on the top wall 9. One of the plates 19 is loosely secured to the walls 8 by a single screw 44 so that the plate is pivotally supported by said screw at which time the draft member 37 is in a state of relaxation. Then the plate is forcibly swung about the screw 44, against the resistance of the spring 38 until the hole 45 in the plate 19 where it is spaced from the screw 44, is in registration with a threaded hole 47 in the side 8. Then a second screw 48 is passed through hole 45 and threaded in the hole 47. This serves to retain the plate against rotation and maintain the elongated status of the draft member. The draft member on the opposite side of the picture tube is preloaded in a similar manner after the first referred to member has been preloaded.

Desirable means by which the plate 19 may be swung about the pivot 44 from its Fig. 2 to its Fig. 1 position is illustrated in Fig. 3. As will be noted, a screw driver 49 is brought into association with the plate 19 where the screw driver is used as a lever by resting it against the upper side of a lug 51 and the lower side of a lug 52, both lugs being struck outward from the plate 19, and rotating said plate counter-clockwise by pressing down on the handle of the screw driver until the screws 48 can be passed through the plate and threaded in the wall 8.

During these operations the clamp screws 28 loosely couple the rear support 22 to the top wall 9. On completion of clamping the plates 19 to the frame and preloading of the springs 38 the bottom on the carrier 22 is

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adjusted, if necessary, by swinging its lower end about its region of engagement with the rear portion 14 until it occupies a position normal to the wall 9. Also, if need be, the support 22 is adjusted in such a way that transversely, it is normal to the side walls 8. Then the feet 26 are rigidly secured to the frame 6 by tightening the screws 28.

It will be appreciated that although the carrier 22 is relatively stiff due to its edge reinforcing flange there is still a certain amount of resiliency therein which allows the springs 38 to maintain pressure by the parts against the bell of the tube and that the amount of this pressure may be controlled by the positioning of the screws 28 on the top of the chassis.

The carrier 22 also provides support for the deflection coils 53 embracing the tube neck 13. The support provided includes a pressure plate 54, of non-metallic material, having a central aperture 56 through which the neck 13 passes freely. Peripherally, it is of generally triangular form, having equiangularly spaced ears 57. The plate 54 is further arranged with one of the ears 57 directly above the axis of the neck 13. All three of the ears are formed with holes 58 therein. The web 20 is also formed with holes 59 therein adjacent the flange 33, one of which is directly above the axis of the neck 13 and the others equidistantly spaced therefrom and below the level of the tube axis. Similar springs 61, having hooked ends are hooked to the two lower pairs of holes 58 and 59 while a spring 62, resembling but less resistive to elongation than the springs 61, has ends hooked in the uppermost holes 58 and 59. The springs 61 and 62 while anchored, as indicated, are elongated by the spacing effect of the coil 53 between the back portion 14 and plate 54, the aperture 56 being of diameter adequate to readily accommodate the coil therein.

The strength of the spring 62 is greater than the strength of the springs 61 to offset the tendency of the plate 54 to sag from a position wherein the aperture 56 is concentric with the neck 13.

In Figs. 6 and 7 is disclosed an alternative counterpart of the plate 19. It is identified in its entirety by the character 119. It is pivotally attached to the frame 6 by screw 146 and has abutments 151 and 152, corresponding to 51 and 52 of the previously described embodiment, by which it may be turned about its pivot through the agency of a lever. The draft member 37, however, is anchored to a lateral lug 101 on an arm 102, extending downward in such a relationship to the pivot that when the plate 119 is swung counterclockwise from a position corresponding to the Fig. 2 position of plate 19 to tension the draft member, the point of connection thereof with the lug 101 passes an over-the-center position immediately after which the counterclockwise rotation is arrested by engagement of the arm 102 with an abutment or stop 103 on the base 6, the force of the spring 38 then maintaining the engagement so that the screw driver can be removed. Also during cooperation of stop 103 with the plate 119 a pair of preferably elongated holes 145, one on either side of the band 18, are in position to receive the screws 48 which are then threaded in and tightened in the side wall 8, as in the first structure.

While I have described one embodiment 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. Apparatus for support of a picture tube above and in a predetermined relation to a horizontal base, the tube having a back portion converging to a neck of uniform diameter including an upright carrier on the base for the rear of the tube, said carrier being higher than the neck above the base and having an opening upwardly thereof for accommodation of the neck and an operating coil thereon one of the sides of which is adjacent the back portion, a confining plate having an aperture therein at

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the other side of the coil and being engageable with said coil when the neck extends through said aperture, and separate resilient means angularly spaced about the neck by being anchored to both the carrier and plate, the anchorate points of one of said resilient means being directly above the neck and a pair of the means being anchored below the level of the neck and equidistantly spaced from the anchorate points of the first mentioned resilient means, all the resilient means urging said member into engagement with the coil to in turn bias said coil toward the back portion.

2. The apparatus as defined in claim 1 in which the uppermost resilient means is formed to offer greater resistance to longitudinal deflection than the remaining resilient means thereby to compensate for the weight of the plate and coil by exerting greater upward force on the plate than said remaining resilient means.

3. Apparatus for support of a picture tube in a predetermined relation to a horizontal base, the tube having a back portion converging from a screen portion, a vertical carrier of height greater than the axis of the tube above the base and being formed with an aperture upward thereof, a cushioning member at the edge of the aperture to function as a seat for the back portion when engaged by said member, means to confine the tube against axial displacement by urging it against a pair of stops on the base extending in front of the screen by biasing the carrier toward the back portion comprising a pair of resilient draft members, one of said draft members being anchored to the carrier on either side thereof, means for tensioning the draft members by deflecting them longitudinally thereof within their elastic limits including a tensioning element pivoted to the frame at a point remote from the carrier, an end of the draft member remote from said carrier being coupled to the element at a point thereon spaced from its pivot whereby the draft member may be deflected by swinging said element about its pivot, and means coupled to the frame to clampingly cooperate with said element when it is swung to a predetermined operative position to resist angular displacement of said element about its pivot.

4. Apparatus for securing a picture tube to a horizontal base, the tube having a back portion converging from a screen portion and part of the periphery of the screen portion being embraced by a hold-down band, a vertical carrier of height greater than the axis of the tube above the base and being formed with a pressure directing portion thereon adjacent the back portion, a resilient cushioning member on the pressure directing portion for engaging said back portion and equalizing pressure directed thereto by said pressure directing portion, means to confine the tube against axial displacement by urging it against a pair of stops on the base extending in front of the screen by biasing the carrier toward the back portion comprising a pair of resilient draft members, the carrier having one of the draft members anchored to either side thereof for extension diagonally of the base, means for tensioning the draft members by deflecting them longitudinally thereof within their limits of elasticity including a tensioning element on either side of the base, each of the elements having a remaining end of one of the draft members secured thereto at an anchorate point and being pivoted to the frame at a point spaced from the anchorate point for the draft members to be deflected by swinging said elements about their pivot, each of said elements when swung to deflect the draft member being concurrently swung over the bands, and means for coupling the element to the frame on either side of the band to concurrently secure it to the frame by pressing it there against and operatively resist angular displacement of said element about its pivot.

5. Apparatus for securing a picture tube to a horizon-

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tal base, the tube having a back portion converging from a screen portion to a neck and part of the periphery of the screen portion being embraced by a hold-down band, a vertical carrier of height greater than the neck above the base and being formed with an aperture upward thereof, a pressure directing portion at the edge of the aperture extending toward the back portion, a resilient cushioning member on the pressure directing portion for engaging said back portion and equalizing pressure directed thereto by said pressure directing portion, means to confine the tube against axial displacement by urging it against at least one stop on the base extending in front of the screen by biasing the carrier toward the back portion comprising a pair of resilient draft members, the carrier having one of the draft members anchored to either side thereof at the level of the neck for extension diagonally of the base, means for tensioning the draft members by deflecting them longitudinally thereof within their limits of elasticity including a tensioning element on either side of the base, each of the elements having a remaining end of one of the draft members secured thereto at an anchorate point and being pivoted to the frame at a point spaced from the anchorate point, a pair of abutments extending normal to the surface of each of the elements, said abutments being formed and spaced for cooperative engagement with a lever when it is extended between said abutments and swung into engagement with opposite sides of the abutments and pressure is applied to said lever remotely of the abutments to deflect the draft members by swinging said elements about their pivots, each of said elements when swung to deflect the draft member being concurrently swung over the bands, and means for coupling the element to the frame on either side of the band by concurrently pressing said band against said frame and operatively resisting angular displacement of said element about its pivot.

6. Apparatus for securing a picture tube to a horizontal base, the tube having a back portion converging from a screen portion partly embraced by a hold-down band, means to resist displacement of the picture tube longitudinally thereof by biasing it into engagement with the least one stop extending from the base in front of the screen comprising a carrier on the base, said carrier extending to a height in excess of half the elevation of said tube, a cushioned pressure directing portion upwardly of the carrier arranged for engaging the back portion, means by which the pressure directing portion is caused to exert pressure on the back portion about the axis thereof thereby to support the rear of the tube and urge it forwardly including a pair of resilient draft members, the carrier having one of the draft members anchored thereto on either side of said tube and slanting downward therefrom to lower end portions adjacent the screen portion, a pair of tensioning elements, one of said elements being pivoted to the base at opposite sides thereof, each of said lower ends being coupled to one of the elements at an anchorate point thereon arranged to be carried through an over-the-center position relative to the pivot when the draft member is longitudinally deflected within its elastic limit, abutments on the elements for engagement by a lever to twist said element about its pivot and move it through its over-the-center position, a stop on the base arranged to be engaged by said element after it has been swung in one direction by the lever slightly past its over-the-center position thereby for the draft member connected thereto to be placed under tension, said element being over one of the ends of the band when engaged by the stop, and means capable of being adjustably supported from the frame to clampingly cooperate with said element and lock the band to the frame by pressing it thereagainst as said means is adjusted and concurrently to operatively

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resist angular movement of said element relative to its position of engagement with said stop.

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