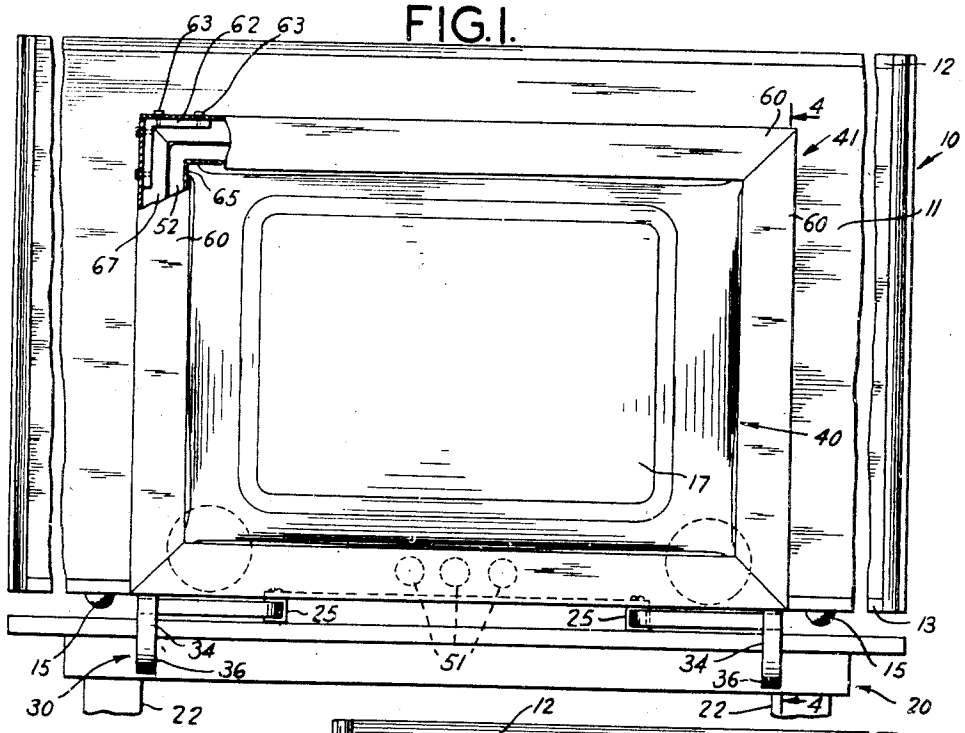
Sept. 21, 1948. J. S. DOUGHERTY 2,449,886

APPARATUS FOR MAGNIFYING THE IMAGES ON TELEVISION SCREENS

Filed March 20, 1948

2 Sheets-Sheet 1

FIG. 1.



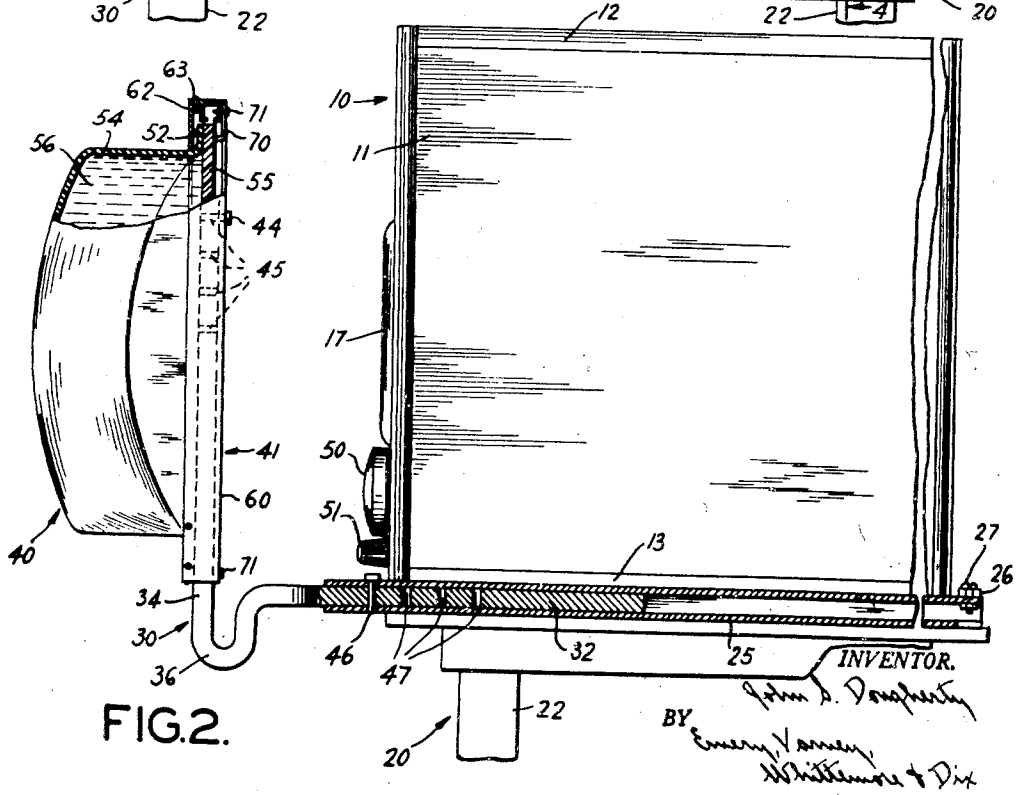


FIG. 2.

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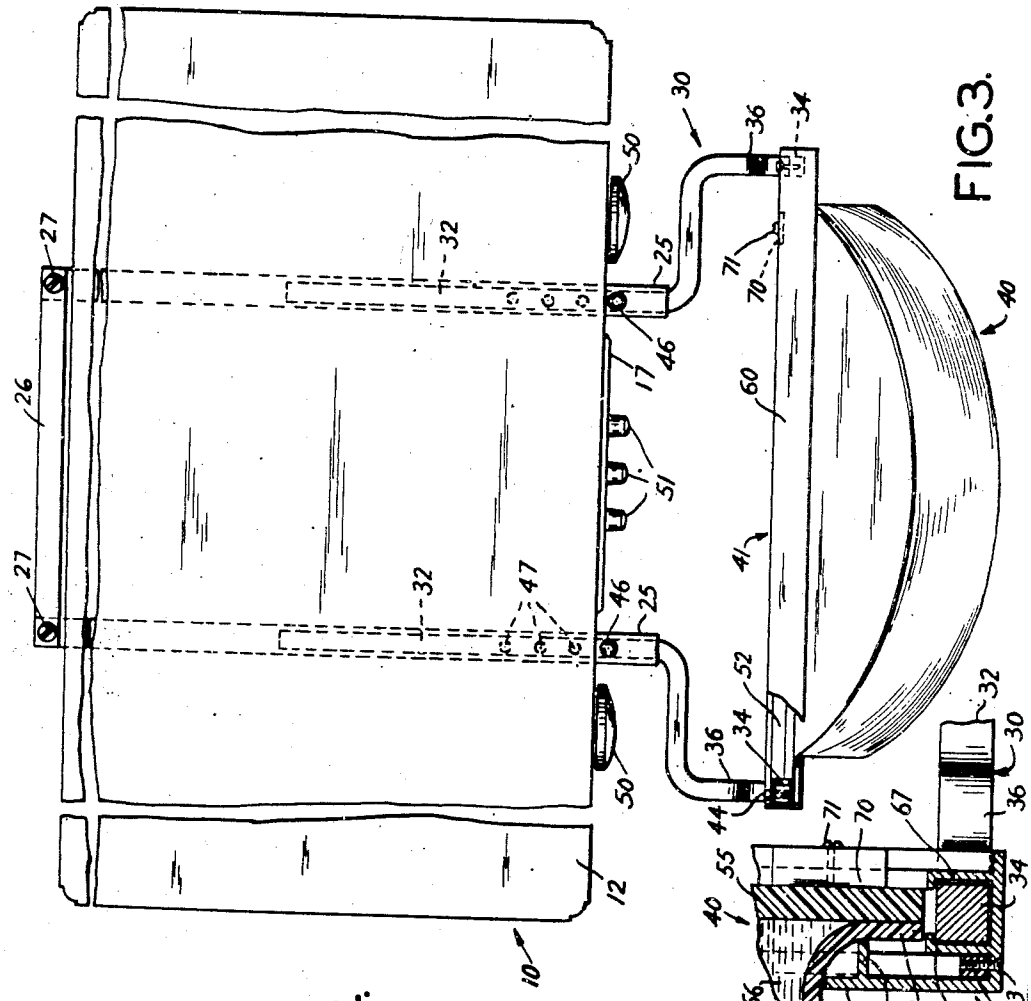


FIG.3.

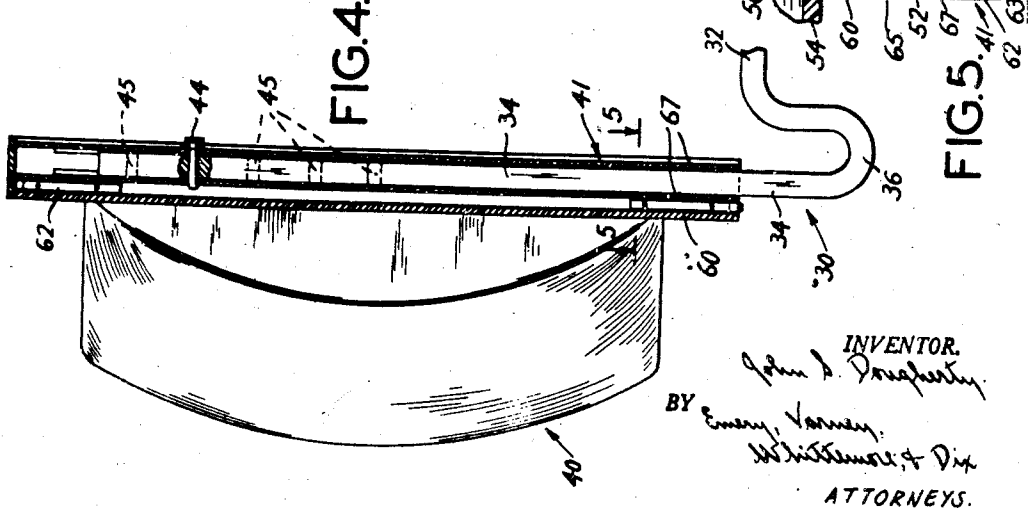


FIG.5.

FIG.4.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR MAGNIFYING THE IMAGES ON TELEVISION SCREENS

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Application March 20, 1948, Serial No. 15,988

5 Claims. (Cl. 88—39)

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This invention relates to apparatus for making television images appear larger.

One of the common objections to television is the smallness of the screen. Even the most expensive television sets that are commercially available have relatively small screens; and those in the lower price ranges have very small screens. It is an object of this invention to provide improved apparatus for magnifying a television screen so that observers viewing the screen see larger images.

Another object of the invention is to provide lens positioning apparatus that is simple and easily adjusted for changing the magnification of the screen by the lens. Although the image can be made to appear larger by moving the magnifying lens further from the screen, the angle within which observers can watch the screen is reduced at the higher magnification. It is important, therefore, to provide for convenient adjustment of the magnification so that the apparatus can be changed to accommodate more or fewer observers as the number of persons who want to watch changes from time to time with different programs.

One feature of the invention relates to a lens holding bracket that is held in place by the television set itself, and in the preferred embodiment the cabinet rests directly on a bracket holder and prevents the bracket from overturning when supporting a cantilever load.

Another object of the invention is to provide an improved lens holding structure that is suitable for use with any of the table model television sets regardless of the position of the screen between the top and bottom levels of the cabinet. This feature makes it possible for dealers to carry one size of structure for all makes of table model television sets, thereby reducing the required inventory and cost.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views,

Figure 1 is a front elevation of a television set supported from a table and equipped with the apparatus of this invention for enlarging the images of the television screen.

Figure 2 is a side view of the apparatus shown in Figure 1, partly broken away, and partly in section,

Figure 3 is a top plan view of the apparatus

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shown in Figure 1, with one corner of the lens frame shown in section,

Figure 4 is an enlarged sectional view on the line 4—4 of Figure 1,

Figure 5 is a greatly enlarged sectional view taken on the line 5—5 of Figure 4.

The apparatus shown in Figure 1 includes a television set comprising a cabinet 10 having a front side 11, a top 12 and a bottom 13. There are feet 15 near the corners of the bottom 13 for supporting the cabinet on a table or other surface. A television screen 17 is exposed through an opening in the side 11 of the cabinet.

The television set is supported from a table 20 having a top and legs 22. In the construction shown, the cabinet 10 does not rest directly on the table top but is supported on a bracket holder comprising tubes 25 that are preferably of square cross section and connected together at their rearward ends by a tie rod 26 fastened to the top sides of the tubes by screws 27. The vertical height of the tubes 25 is greater than that of the feet 15 so that with the bottom of the cabinet 10 resting on the tubes 25, the feet 15 do not touch the table 20 and the entire weight of the television set is available for holding the tubes down firmly against the table top.

The invention includes a bracket structure that comprises a bracket 30 with horizontally extending portions 32 and the bracket holder tubes 25 into which the horizontally extending portions of the bracket telecsope and in which they are movable lengthwise on the inside surfaces of these tubes. The bracket 30 has also upwardly extending portions comprising posts 34, and the connections of the posts 34 to the horizontal portions 32 of the bracket are preferably provided with depressed connecting sections 36 that extend below the horizontal portions 32 to increase the length of the posts 34 and thereby to provide for a wider range of vertical adjustment of the apparatus. The forward ends of the horizontal portions of the bracket are offset sideways so that they diverge from one another beyond the tubes 25 as shown in Figure 1. This increases the spacing between the posts 34.

There is a lens 40 mounted in a frame 41 that slides up-and-down along the posts 34. This vertical movement of the frame 41 along the posts 34 makes it possible to locate the lens 04 in front of the screen 17 of any television set regardless of whether the screen 17 is nearer the top or the bottom of the cabinet. When the lens 40 and frame 41 are properly positioned, the frame 41 is locked in that position by a pin 44.

This pin 44 can be inserted in any one or various spaced openings 45 that extend through one or both of the posts 34. More or fewer openings 45 can be provided to obtain more precise adjustment of the vertical position of the frame 41, if desired, and it will be understood that a single hole in one or both of the posts 34 can be used in conjunction with a number of spaced holes in the frame 41, such a reversal being a mechanical equivalent of the construction shown in the drawing.

The distance from the lens 40 to the television screen 17 determines the degree of magnification. Greater magnification is obtained by moving the lens 40 away from the screen 17, but when the magnification is large the observers must be located almost directly in front of the lens in order to observe the entire field of the picture. When a number of persons want to watch the screen, therefore, it may be necessary to move the lens closer to the screen, and thus to decrease the magnification, so as to broaden the angle from which the audience can view the screen.

The tubes 25 extend in directions substantially parallel to the optical axis of the lens 40. The lens is moved toward and from the screen 17 by sliding the horizontal portions 32 of the bracket lengthwise in the tubes 25. Although the friction of the bracket in the tubes 25 is sufficient to hold the lens in any horizontally adjusted position, a pin 46 is provided also for locking the bracket at various preselected positions for different degrees of magnification.

This pin 46 extends through an opening near the forward end of one of the tubes 25, and there are a number of spaced holes 47 in the bracket for receiving the pin 46. More or fewer holes 47 can be provided, and they can be extended along a greater length of the horizontal portion 32 of the bracket. Even with the lens moved in to its position of minimum spacing from the screen, however, there is ample clearance between the frame 41 and the television cabinet 11 for access to the controls 50 and 51 of the television set.

The lens 40 is a plano-convex lens with a spherical front surface cut away along the top, bottom and sides of the lens to give the lens substantially the same shape as the television screen. The lens has a flange 52 around its entire perimeter, and this flange is used for mounting the lens in the frame 41.

The lens 40 is preferably a plastic, oil-filled lens, but other lenses can be used. The construction illustrated includes a front shell 54 and a rearward shall 55 integrally connected together. The space between them is filled with oil 56.

The frame 41 is made up of a number of straight pieces 60 that meet at the corners of the frame in the same way as the parts of a picture frame meet together. The pieces 60 are connected together at the corners of the frame by angles 62 and fastenings 63. Each of the frame pieces 60 has a front portion that overlaps the flange 52 of the lens 40, and has a flange 65 that contacts with the front of the flange 52 within the frame.

There are other flanges 67 within the frame and these other flanges provide a guideway for receiving the posts 34. The inner ends of the flanges 67 converge toward one another to complete the guideway, and the flanges 67 serve also as spacers for holding the perimeter of the lens 40 out of contact with the post 34 and in a properly centered relation with respect to the frame 41. The lens 40 is held in the frame by retaining clips 70.

Each of these retaining clips 70 is attached to the back of the rearmost flange 67 by a screw or other fastening means 71, and the clip 70 extends inwardly, beyond the inner end of the flange 67 and into position to overlap the rearward face of the lens.

Some features of the invention apply to a construction in which the lens 40 is not mounted in a frame but has its peripheral flange connected directly with the posts 34. When a frame is used, it is desirable to have a construction that permits the bottom side of the frame to drop below the bottom of the television cabinet so that the lens can be brought into position in front of a screen that is located adjacent the bottom of the cabinet. In the construction illustrated this is made possible by having the posts 34 extend downward below the horizontally extending portions 32 of the bracket. A similar result can be obtained, however, by cutting away the lower part of the rearward portion of the frame 41 so as to permit the frame to move down below the level of the horizontally extending portions 32 without requiring depressed connecting sections between the posts 34 and the horizontally extending portions 32 of the bracket.

The preferred embodiment of the invention has been illustrated and described, but changes and modifications can be made, and some features of the invention can be used alone or in different combinations without departing from the invention as defined in the claims.

I claim as my invention:

1. Apparatus for magnifying the image on a television screen, said apparatus comprising two parallel tubes of rectangular cross section for location on a table with a television set supported by them above the top of the table, a cross bar on top of the rearward ends of the tubes and connected at its opposite ends with the tubes for holding the tubes spaced from one another by a distance substantially less than the width of the cabinet of any of the television sets with which the apparatus is intended to be used, a bracket including two horizontally extending rods that fit into and slide lengthwise of the rectangular tubes with a telescoping action, each of said rods having a sideways extending off-set portion at its forward end extending in a direction away from the other rod, a lens substantially wider than the television screen with which the apparatus is intended to be used, a flange around the perimeter of the lens, a frame into which the flange of the lens is fitted, fastening means for holding the lens in the frame, flanges within the frame in position to hold the lens against lateral displacement in the frame and forming with outer walls of the frame substantially vertical guideways on both sides of the frame, two posts substantially parallel with one another and extending upward through the guideways in the lens frame and providing bearing surfaces along which the lens frame is adjustable to regulate the height of the lens to that of the television screen, means for holding the lens frame at a selected adjustment lengthwise of the posts, said posts extending downward below the level of the rods and being integrally connected with the outer ends of the sideways-extending off-set portions of the rods by downwardly-extending off-set connections.

2. Apparatus for holding a magnifying lens in front of a screen of a table model television set, said apparatus comprising two parallel tubes for location on a table with the television cabinet resting on them to hold them in position on the

table, said tubes being spaced from one another by a distance substantially less than the width of the cabinet of any of the television sets with which the apparatus is intended to be used, a bracket including two horizontally extending rods that fit into and slide lengthwise of the tubes for changing the degree of magnification of the apparatus, each of said rods having a sideways-extending off-set portion at its forward end extending in a direction away from the other rod, a lens substantially wider than the television screen with which the apparatus is intended to be used, two posts substantially parallel with one another and extending upward and providing bearing surfaces along which the lens is adjustable to regulate the height of the lens to that of the television screen, means for holding the lens at a selected adjustment lengthwise of the posts, said posts extending downward below the level of the rods and being integrally connected with the outer ends of the sideways-extending off-set portions of the rods by downwardly-extending off-set connections.

3. Apparatus for magnifying the image of the screen of a television set that has a cabinet which is supported on a table and which has an opening on one side for exposing the screen, said apparatus comprising a lens assembly including a lens substantially higher and substantially wider than the screen of the television set with which the apparatus is intended to be used, a bracket element connected with one side of the lens assembly and having a post portion extending downward from the lens assembly, a second bracket element connected with the other side of the lens assembly and having a post portion extending downward parallel to the post portion of the first bracket element, bearing surfaces on the lens assembly that contact with outside surfaces on the post portions of the bracket elements and that are movable into different positions along said surfaces of the post portions to adjust the lens assembly up-and-down along the post portions, fastening means for holding the lens assembly at different selected positions on said post portions, a horizontally extending portion at the lower end of each bracket element integrally connected with the post portions of the respective bracket elements, a bracket holder comprising a tube into which the horizontally extending portion of one of the bracket elements extends, a second bracket holder comprising a tube into which the horizontally extending portion of the other bracket element extends, the tubes being substantially parallel with one another and each of said tubes having inside bearing surfaces that contact with the upper and lower surfaces of the horizontally extending portion of the bracket element and along which the horizontally extending portion of the bracket element slides to move the lens toward and from the screen when the apparatus is used with a television set, the bracket elements being curved sideways away from one another at the forward ends of their horizontally extending portions so that the post portions of the bracket elements are spaced substantially further from one another than are the tubes in which the bracket elements slide.

4. Apparatus for magnifying the image of a television set that is supported on a table, said apparatus including, in combination, two parallel tubes having lower surfaces that rest upon

a table, and upper surfaces on which the television cabinet is supported, two bracket elements each of which comprises a post and a horizontally extending portion connected by an intermediate portion, said horizontally extending portion being slidable in one of the tubes with a telescoping movement for shifting the bracket element in the direction in which the tube extends, said intermediate portion of each of the bracket elements being curved toward one side and in a direction away from the other bracket element, said posts extending upwardly parallel with one another and spaced from one another by a distance greater than the spacing of the tubes, and said posts being rigidly connected at their lower ends with said intermediate portions of the bracket elements, a lens assembly supported by the posts, and fastening means for holding the lens assembly at different adjusted levels along the posts.

5. Apparatus for holding a magnifying lens in front of a television screen of any of various television sets having their screens located at different positions both vertically and horizontally with respect to the front of a television cabinet, said apparatus comprising a lens substantially wider than the screen of any television set with which the apparatus is intended to be used, so that opposite sides of the lens are beyond the side edges of the screen, a bracket element comprising a post portion at one side of the lens, another bracket element including a post portion at the opposite side of the lens and parallel to the post portion of the first bracket element, a horizontally extending portion at the lower end of each bracket element for extending under the cabinet of the television set, the horizontally extending bracket portions being substantially closer together than the post portions of the bracket elements, and being long enough to extend under the television cabinet for a distance sufficient to support the lens when the lens is spaced from the cabinet by the distance which produces the maximum magnification of which the particular lens is capable without putting the sides of the image of the screen out of focus, each of the said bracket elements having an intermediate portion connecting the horizontal portion of the bracket element with the lower end of the post portion of the bracket element, said intermediate portion of at least one of the bracket elements being offset sideways away from the other bracket element, and fastening means connecting the sides of the lens with the post portions of the bracket elements and adjustable for supporting the lens at different levels along said post portions.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
443,359	Duncan	Dec. 23, 1890
661,688	Castelow	Nov. 13, 1900
852,656	Denio	May 7, 1907
1,074,316	Dragits	Sept. 30, 1913
1,112,736	Vogel	Oct. 6, 1914
1,579,557	Marquis	Apr. 6, 1926
1,733,485	Desrosiers	Oct. 29, 1929