Oct. 10, 1939. P. BERGER 2,175,242

DISPLAY DEVICE

Filed Sept. 16, 1938 2 Sheets-Sheet 1

Fig. 1.

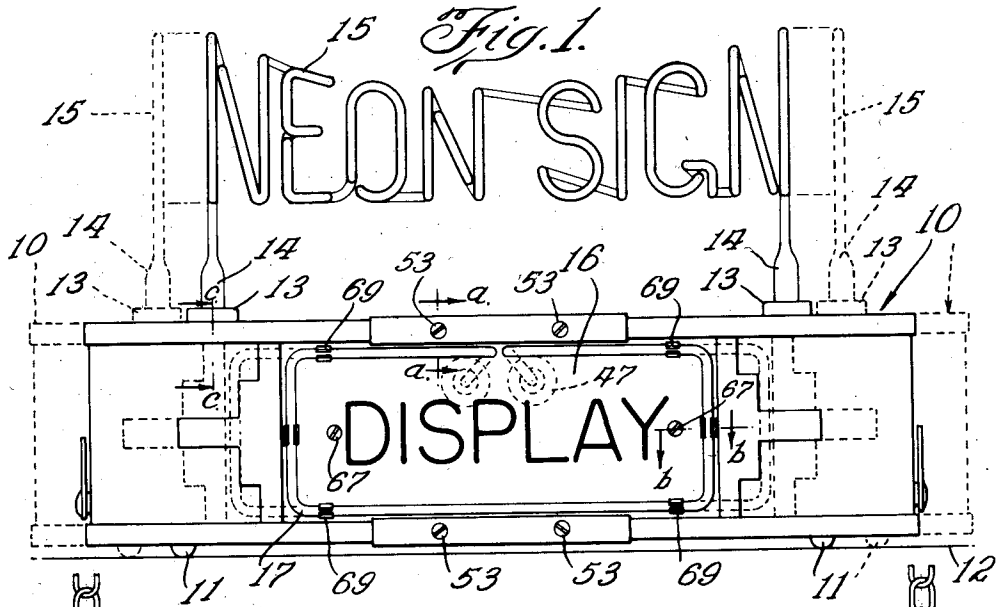


Fig. 2.

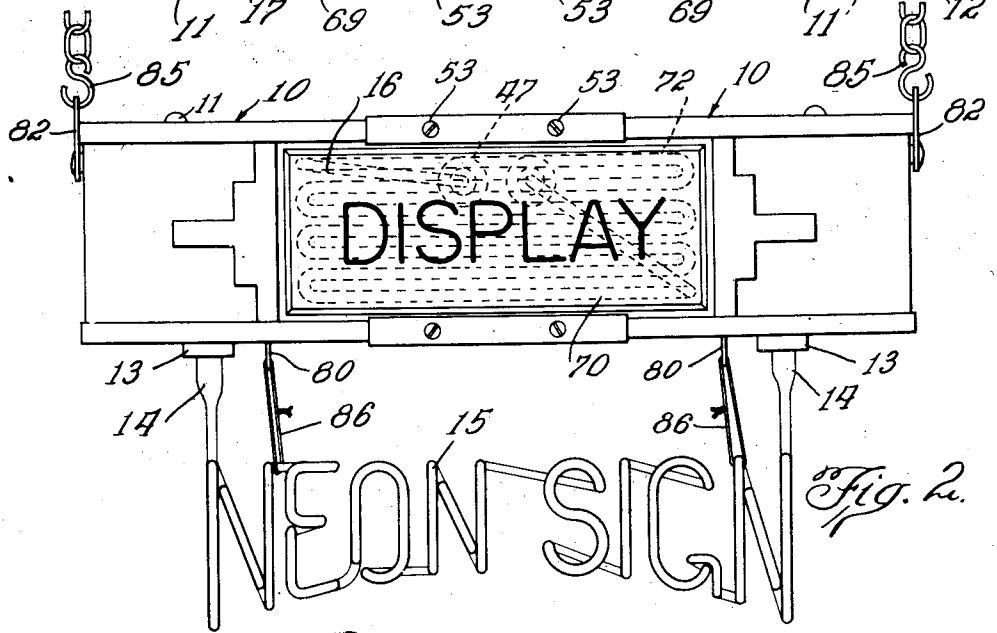
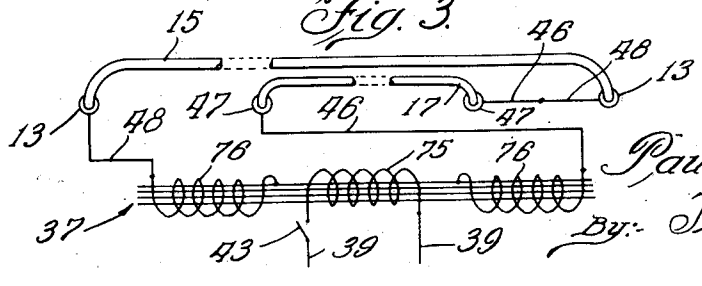


Fig. 3.



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Filed Sept. 16, 1938 2 Sheets-Sheet 2

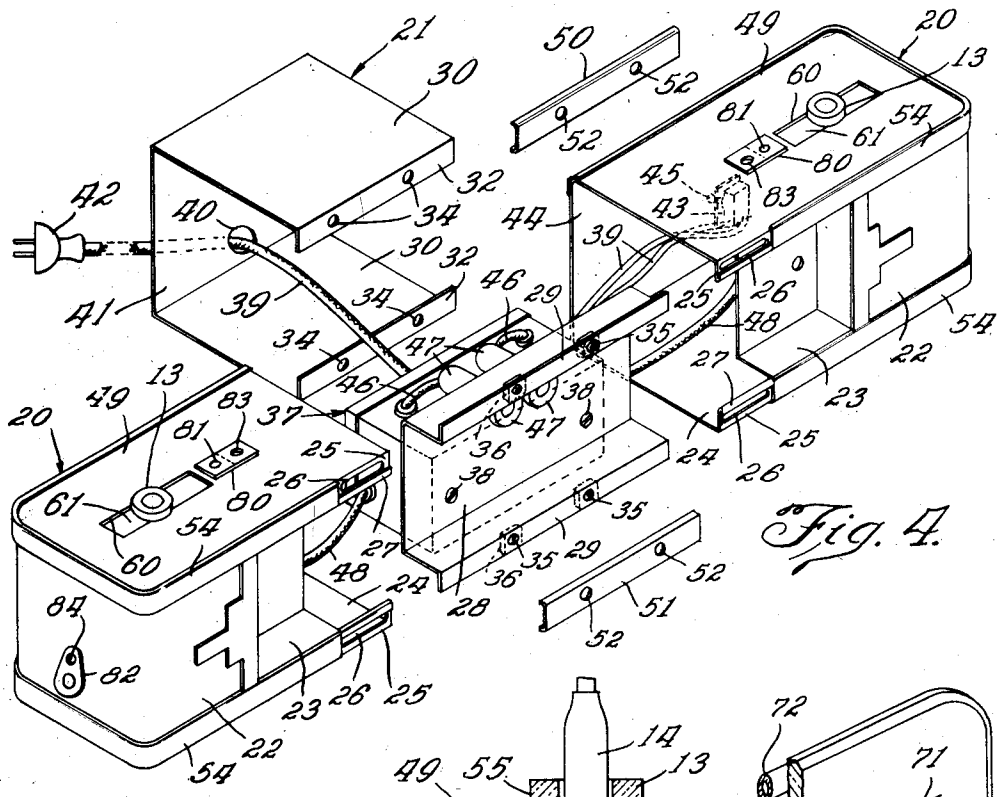


Fig. 4.

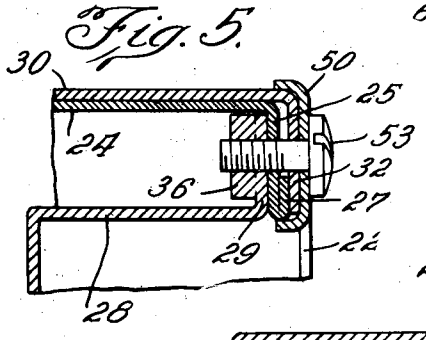


Fig. 5.

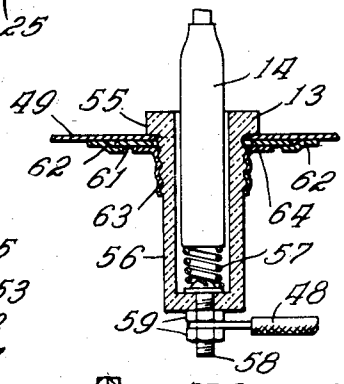


Fig. 7.

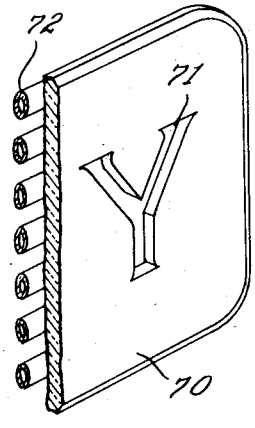


Fig. 8.

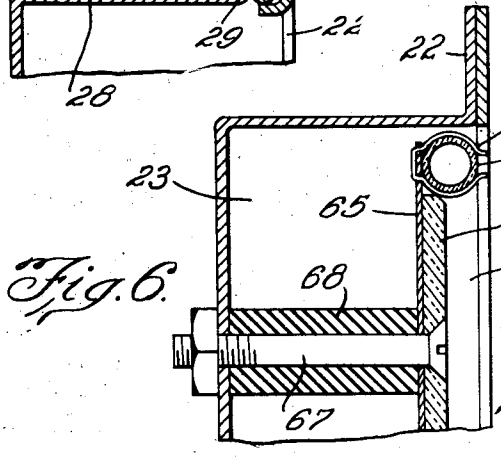


Fig. 6.

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UNITED STATES PATENT OFFICE

2,175,242

DISPLAY DEVICE

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Application September 16, 1938, Serial No. 230,191

10 Claims. (Cl. 40—130)

This invention relates to signs and displays illuminated by gaseous discharge tubes, and particularly to portable units which are self-contained in that they contain the transformer, the display and/or sign and the tube or tubes for illumination, and have an electrical supply conductor which needs only to be plugged into a socket of the ordinary 110 or 220 volt lighting circuit. The invention is concerned particularly with the cabinet for such a self-contained unit, and it is the object of the invention to provide an improved cabinet which is flexible of application and adapted for use with signs of varying sizes and character.

In the past these cabinets have been of a fixed size and adapted for a sign of fixed size and character so that a separate cabinet was required for each size of sign which it was desired to use. Furthermore, they were not adapted to accommodate the small variations in dimensions which normally occur in the manufacture of similar signs. This is a disadvantage which the present invention overcomes by providing features of variability whereby the cabinet is adapted to accommodate signs of varying sizes. This will be explained more in detail in the following description.

In the drawings,

Fig. 1 is an elevational view of the gaseous discharge tube sign of this invention with the cabinet resting upon a flat supporting surface;

Fig. 2 is a similar view with the cabinet supported by suspension from above;

Fig. 3 is a diagrammatic view showing the electrical circuit arrangement for the sign of this invention;

Fig. 4 is an exploded perspective view of the cabinet of this invention;

Figs. 5, 6 and 7 are enlarged fragmental, sectional views on lines *a*—*a*, *b*—*b* and *c*—*c* of Fig. 1 respectively, and

Fig. 8 is a fragmental, perspective view illustrating a modified form of display for which the sign of this invention is adapted.

Referring to Fig. 1, the sign comprises a casing or cabinet **10** usually composed of sheet metal and having rubber supporting members or feet **11** attached to the bottom thereof and adapted to support it upon a flat supporting surface **12**. Two sockets **13** are exposed in the top surface of the cabinet and are adapted to receive the terminals **14** of a gaseous discharge tube **15** fashioned into a sign of the so-called skeleton type. These sockets may be mounted movably, as will be described hereinafter, to provide additional flexibility of application. A second display **16**, illuminated by a second gaseous discharge tube **17**, is adapted to be accommodated in a recess in the front side of the cabinet.

In the units which have been known heretofore the cabinet **10** is of a fixed size and the signs **15** and **16** must all be of the same size. Because of the varying purposes, and amounts of information or detail which it is desired to display in the signs, and the varying distances at which the signs may be located from eyes of the intended observers, it is, of course, impossible for all signs to be of the same size and the practice is to build cabinets to conform to the length of the signs which are desired. In the manufacture of skeleton signs of the character of sign **15**, the shaping of the tubing usually is accomplished manually and slight variations frequently occur in the length of the sign, or the distance apart of the terminals **14**. With the ordinary fixed cabinet after the tubing has been fashioned it must be inspected carefully and adjusted so that the distance apart of the terminals is exactly correct which is usually accomplished by heating and bending the tubing at some convenient point. It is obvious that this represents a difficulty and extra labor and expense, and the fact that a different size cabinet must be supplied for each different size sign increases manufacturing costs and restricts the use of such signs.

This invention overcomes these difficulties by providing a cabinet which is readily and conveniently variable in length so that only a moment's manipulation is required to accommodate it to the variations which may occur in individual signs of the same design and also in signs of different length and design. Referring to Fig. 4, the cabinet is made up of a number of sections which are adapted for telescopic association with one another and which may be moved relatively to one another so as to increase or decrease the length of the cabinet as desired. While any number of sections may be employed, the cabinet of Fig. 4 comprises three sections, two end sections **20** and one intermediate section **21**. The ends of the sections which are adapted to telescope together are open. The front wall **22** of the end sections **20** are recessed at **23** as shown. The front walls of the end sections are shorter than the other walls whereby said other walls have projecting portions **24** extending toward the intermediate section. The forward edges of projections **24** of the top and bottom walls have flanges **25** projecting vertically inward therefrom. The flanges have elongated slots **26** therein. The

edge portions of these flanges may be turned back upon themselves as shown at 27.

The front wall 28 of the intermediate section 21 is separable from the other walls, and is in the form of a channel to provide a recess corresponding with the recesses 23 of the end sections 20. The top and bottom edges of front wall 28 have flanges 29 projecting vertically outwardly therefrom, and the front edges of top and bottom walls 30 have flanges 32 projecting vertically inwardly therefrom. The flanges 32 have spaced openings 34 therein and the flanges 29 of front wall 28 have corresponding openings 35 therein, threaded nuts 36 being mounted, as by soldering or welding, upon the rearward surfaces of flanges 29 with their threaded openings in alignment with openings 35. A transformer 37 of the usual construction for applying energy to gaseous discharge tubes is mounted against the rearward surface of front wall 28 by means of bolts 38. The flexible electrical supply conductors, carried in the usual cord 39, extend from the transformer 37 and pass through an opening 40 in the rear wall 41 of intermediate section 21. Supply conductors 39 are provided with an ordinary attachment cap 42 adapted to be inserted in the socket of an ordinary 110 or 220 volt lighting or power circuit. One of the flexible supply conductors 39 extends to a switch 43 which is mounted in the rear wall 44 of one of the end sections 20. The operating member 45 of the switch 43 is exposed at the exterior of said rear wall 44 for hand manipulation to open and close the supply circuit. Conductors 46 extend from the transformer 37 to a pair of sockets 47 which are mounted in the front wall 28 of the intermediate section and have their open ends exposed in the recess of said front wall 28 and adapted for the insertion of the terminals of a gaseous discharge tube. Flexible conductors 48 also extend from transformer 37 to the sockets 13 which are mounted in the top walls 49 of the end sections 20.

The electrical arrangement of the sign elements and the conductors is illustrated diagrammatically in Fig. 3. The supply conductors 39 and switch 43 are connected to the primary winding 75 of the transformer 37. The secondary windings 76 of the transformer are connected in series relation with gaseous discharge tubes 15 and 17 by means of conductors 46 and 48. It is noted that the tubes 15 and 17 are connected in series with each other. It is not necessary to have both displays in the same unit, and the display 16, the tube 17, the circuit connections for tube 17 and the recesses in the front walls of the sections may be omitted, and the sockets 13 may be connected directly in series with the output of transformer 37.

The cabinet sections are adapted to be united in telescopic association by moving the end sections toward each other with the front wall 28 of the intermediate section in position between them until the slots 26 of the flanges 25 of the end sections overlie the openings 35 of the flanges 29 of the front wall 28. The rear portion of the intermediate section, comprising the top and bottom and rear walls thereof, is then moved into place with the openings 34 of flanges 32 in alignment with the openings 35 of front wall 28. This is done by spreading the front end portions of the top and bottom walls 30 apart sufficiently to permit the flanges 32 to clear the top and bottom walls of the end sections and flanges 29 of front wall 28. The flanges 32 may then be allowed to return to their normal position, which they do by reason of the inherent resilience of the sheet metal, or they may be drawn together to cause the openings to coincide as described heretofore. A channel member 50, having a finished appearance is placed over the upper flange 32 of the intermediate section, and similar channel member 51 is placed over the lower flange 32. Channels 50 and 51 have openings 52 therein and the channel members are arranged so that the openings coincide with the openings 34 of flanges 32 of the intermediate section. Reference is made to Fig. 5 for the details of the assembly. A threaded bolt 53 is inserted through the aligned openings and is threaded into nut 36 to draw the parts together firmly. The same operation is repeated at the three other openings. The sections may be adjusted to provide the desired length of cabinet before the bolts 53 are inserted or they may be threaded loosely first and the cabinet length adjusted before they are drawn up tight. The channel members 50 and 51 are made to correspond in appearance to the channels 54 which are employed as beading along the corners of the end sections to impart a finished or decorative appearance. The elongated slots 26 make it possible to move the end sections farther apart or closer together as desired, and the projecting portions 24 and the slots 26 may be made of any length, and the intermediate section 21 may be similarly of any length required to permit the extension and contraction of the cabinet in any desired amount. An extended condition of the cabinet, to accommodate a longer sign, is illustrated in dotted lines in Fig. 1. The interior of end sections 20 are open and unobstructed to accommodate therein the front wall 28 of the intermediate section and the transformer 37. The end sections of the cabinet may be moved apart or together to accommodate small variations in the distance apart of the tube terminals 14 which normally occur during manufacture, and also to accommodate tubes of different design and widely varying lengths. This is done by merely loosening bolts 53 and moving the end sections to the desired positions and then tightening the said bolts again.

As stated heretofore, the gaseous discharge tube sign 15 has its terminals 14 inserted in sockets 13. The socket is of a well-known construction. The details are shown in Fig. 7. It comprises a combination socket and bushing member of electrical insulating material 13 having a flange 55 at its top open end and a shank 56 below the flange, said shank being threaded at its upper portion. A metallic spring terminal 57 is mounted at the base of the socket member 13 and is fastened in place by means of bolt 58 which passes through an opening in the end of the socket member 13 and carries nuts 59 threaded upon the end thereof between which the end of flexible conductor 48 is clamped in electrical conducting relation. The electrical conducting terminal 14 of the tube 15 is inserted into the socket and rests upon spring terminal 60 to make the electrical connection for supplying energy to the tube.

The shank 56 extends downwardly through a slot 60 in the top wall 49 of the cabinet section and through an opening in a slidable plate 61 which is guided and held loosely against the underneath surface of the top wall 49 by brackets 62 which are fixed to said top wall and extend longitudinally with respect to slot 60. The plate 61 is slidable longitudinally between the brackets 62 and the top wall 49. The said shank 56 also passes through and is in threaded engagement

with a threaded collar member 63 which has an outwardly extending flange 64 which is welded or otherwise fixed to the underneath surface of slidable plate 61. The sockets are movable toward and away from each other upon the described supporting means. Ordinarily the socket is threaded into the collar 63 sufficiently to draw the plate 61 tightly against top wall 49 and provide a rigid mounting. When it is desired to move the socket, it is turned so as to loosen plate 61 from wall 49 and the socket may then be moved to the desired position when it may be turned again to draw plate 61 tightly against wall 49. The small variations in the distance between terminals 14 of the tube sign 15 which may occur during manufacture of the sign may be accommodated by adjustment of the distance apart of the sockets 13. Such adjustment may also be used to accommodate signs of different sizes, and such adjustment may be utilized in addition to the adjustment of the cabinet sections to accommodate a greater variation in size of sign than can be accommodated by either alone. The two adjustments therefore cooperate to augment the flexibility of application of the cabinet.

As stated heretofore, a second display 16 may be incorporated in the sign. The details for mounting this display are shown in Fig. 6. An opaque plate 65 is mounted forwardly of the recessed surface of front wall 28 of the intermediate cabinet section and a second plate 16 of translucent substance is mounted against the forward face of opaque plate 65, the bolt 67 and collar 68 serving as a means for supporting the plates in position. A gaseous discharge tube 17 encompasses the translucent plate 16 and follows the edges thereof, the terminals of said tube being inserted in the sockets 47 and being electrically connected to the supply circuit thereby as described heretofore. Tube 17 may be fastened to the opaque plate 65 by means of several spring metal clips 69. The characters on translucent plate 16 are etched or sand blasted upon the rear surface thereof whereby the illumination from tube 17 is transmitted through the translucent material of plate 16 and is reflected from the etched portions in the well-known manner to cause the characters to appear to be illuminated.

In Fig. 8 a modification of the display 16 is illustrated. In this construction the plate 70 replaces plate 16 and opaque plate 65 is omitted. The plate 70 is opaque and the characters 71 are cut out or of translucent substance, and a grid 72 composed of a single reticulated gaseous discharge tube or a number of tubes connected together in series is supported in position rearwardly of plate 70. The light from grid 72 illuminates characters 71 to form the display. The illumination of the display may be reversed from that described, and plates 70 may be of translucent material and the characters 71 of opaque substance.

In Fig. 2 a modification is illustrated in which the cabinet is suspended from above instead of being supported upon a flat supporting surface. A pair of hanger lugs 80, are riveted at 81, see Fig. 4, or otherwise fastened near one end thereof to the top walls 49 of the end sections, and a second pair of hanger lugs 82 are mounted in a similar manner to the end walls of the end sections. The lugs 82 have openings 84 therein, see Fig. 1, adapted to be engaged by chains 85, or other suitable suspending means, which may be fastened at the other ends to suitable supports to suspend the cabinet in inverted position. Lugs 80 have openings 83 therein and may be bent to positions at right angles to the top surface of the cabinet, as shown in Fig. 2, and loops of wire 86 may be threaded through the openings in these lugs and around portions of the gaseous discharge tube 15 to support the latter and maintain the terminals 14 in electrical contact with the sockets 13 when the cabinet is in the inverted position. Other suitable supporting means for the said tube 15 may be employed.

It is understood that where a display 16 is used in combination with the display 15, it is made to correspond in length with such display 15 so that the same adjustment of cabinet length is suitable for both. The variations in distance apart of the tube terminals 14 which occur normally in the manufacture of such a display usually do not exceed ¼ inch and such variations do not require a change of the length of display 16, the recess in the front wall of the cabinet being caused to be of a size to accommodate such variations.

While but a single modification of the main features of the invention is described herein it is understood that the invention embraces modifications thereof which may be within the capabilities of one skilled in the art. The words top, bottom, forward, rearward and similar terms are not used in a restrictive sense but merely to facilitate the description of the invention.

I claim:

1. A gaseous discharge tube sign comprising a cabinet comprising two end sections and an intermediate section associated together in telescoping relation, said sections being movable relatively to one another to various telescoping positions, said sections having recessed front walls, the said intermediate section having an opening in one of the walls thereof and having the front wall separable from the rear and top and bottom walls thereof, a transformer mounted interiorly upon said front wall of said intermediate section, flexible electrical supply conductors extending from said transformer through said opening in one of said intermediate section walls, a switch mounted in a wall of one of said sections and interposed in one of said supply conductors, said switch having an operating member exposed on the exterior surface of said wall, the top wall of each of said end sections having a slot therein, said slots being substantially in alignment with each other when said sections are in telescoping association, a socket exposed at each of said slots and mounted upon said top walls respectively, said sockets being movable to various positions along said slots, means for locking said sockets in said various positions, a gaseous tube having it terminals engaged in said sockets, a pair of similar sockets exposed in the recessed front wall of said middle section, a second gaseous discharge tube having its terminals engaged in said pair of sockets, flexible conductors extending from said transformer to said sockets, means for simultaneously locking said sections together in various telescoping positions and fastening the separable front wall to the other walls of said intermediate section, said recesses in the front walls of said sections cooperating to form a single recess adapted to accommodate said second gaseous discharge tube, and a display disposed in said recess adjacent said second tube.

2. A cabinet for gaseous discharge tube signs comprising two end sections and an intermediate section associated together in telescoping relation, said sections being movable relatively to one

another to various telescoping positions, said sections having recessed front walls, the said intermediate section having an opening in one of the walls thereof and having the front wall separable from the rear and top and bottom walls thereof, a transformer mounted interiorly upon said front wall of said intermediate section, flexible electrical supply conductors extending from said transformer through said opening in one of said intermediate section walls, a switch mounted in a wall of one of said sections and interposed in one of said flexible supply conductors, said switch having an operating member exposed on the exterior surface of said wall, a socket adapted for engagement by a terminal of a gaseous discharge tube exposed in the top wall of each of said end sections, a pair of similar sockets exposed in the recessed front wall of said intermediate section and adapted to receive the terminals of a second gaseous discharge tube, flexible conductors extending from said transformer to said sockets, means for simultaneously locking said sections together in various telescoping positions and fastening the separable front wall to the other walls of said intermediate section, said recesses in the front walls of said sections being adapted to receive said second gaseous tube and a display disposed adjacent said second tube.

3. An extensible cabinet for gaseous discharge tube signs comprising two end sections and an intermediate section associated together in telescoping relation, said sections being movable relatively to one another to various telescoping positions, said sections having recessed front walls the said intermediate section having an opening in one of the walls thereof and having the front wall separable from the rear and top and bottom wall thereof, a transformer mounted interiorly upon said front wall of said intermediate section, flexible electrical supply conductors extending from said transformer through said opening in one of said intermediate section walls, a switch mounted in a wall of one of said sections and interposed in one of said flexible supply conductors, said switch having an operating member exposed on the exterior surface of said wall, a socket adapted for engagement by a terminal of a gaseous discharge tube exposed in the top wall of each of said end sections, a pair of similar sockets exposed in the recessed front wall of said intermediate section and adapted to receive the terminals of a second gaseous discharge tube, flexible conductors extending from said transformer to said sockets, means for locking said sections together in various telescoping positions, said recesses in the front walls of said sections cooperating to form a single recess adapted to receive said second gaseous discharge tube.

4. A cabinet for gaseous discharge tube signs comprising a plurality of cabinet sections associated together in telescoping relation, said sections being movable relatively to one another to various telescoping positions, one of said sections having a wall portion separable from the remainder of the walls thereof, a transformer mounted interiorly upon a wall of said separably-walled section, flexible electrical supply conductors extending from said transformer and having the terminals thereof exposed exteriorly of said cabinet, a switch mounted in a wall of one of said sections and interposed in one of said supply conductors, said switch having an operating member exposed on the exterior of said wall, at least two of said sections each having a socket mounted in corresponding walls thereof, said sockets being exposed upon the exterior of said walls and being movable toward and away from each other, flexible conductors extending from said transformer to said sockets, and means for locking said sections together in said various telescoping positions.

5. A cabinet for gaseous discharge tube signs comprising a plurality of sections associated together in telescoping relation to form a substantially closed cabinet, said sections being movable relatively to one another to various telescoping positions, a transformer mounted interiorly in one of said sections, at least two of said sections having sockets exposed in corresponding walls thereof, said sockets being adapted for engagement by the terminals of a gaseous discharge tube, conductors extending from said transformer to said sockets, the said conductors extending between sections being flexible, and means for locking said sections together in various telescoping positions.

6. A cabinet for gaseous discharge tube signs comprising a casing having spaced slots in a wall thereof, said slots being substantially in longitudinal alignment with each other, a socket adapted for engagement by the terminal of a gaseous discharge tube exposed at each of said slots and mounted upon said wall, said sockets being rotable and movable to various positions along said slots, and means for locking said sockets in said various positions upon rotation of said sockets.

7. A cabinet for gaseous discharge tube signs comprising a casing having a recess in the front wall thereof, a pair of gaseous discharge tube sockets in the top wall of said cabinet and a pair of similar sockets in said front wall recess, a transformer within said cabinet, electrical supply conductors extending from said transformer to a point exteriorly of said casing and other electrical conductors extending from said transformer to said sockets, said pairs of sockets each being adapted to receive the terminals of a gaseous discharge tube, said recess in the front wall of said casing being adapted to accommodate a gaseous discharge tube display device.

8. A cabinet for gaseous discharge tube signs comprising a plurality of cabinet sections associated together in telescoping relation, said sections being movable relatively to one another to various telescoping positions, one of said sections having a wall portion separable from the remainder of the walls thereof, a transformer mounted interiorly upon a wall of said separably-walled section, electrical supply conductors extending from said transformer and having the terminals thereof exposed exteriorly of said cabinet, at least two of said sections each having a socket mounted in corresponding walls thereof, said sockets being exposed upon the exterior of said walls and being adapted for engagement by the terminals of a gaseous discharge tube, and conductors extending from said transformer to said sockets.

9. A cabinet for gaseous discharge tube signs comprising a plurality of sections, said sections comprising walls the adjacent ones of which are disposed angularly to each other, said sections being movable relatively to one another to various telescoping positions, the walls of the different sections in said telescoping relation forming a substantially closed cabinet, a transformer mounted interiorly in one of said sections, at least two of said sections having sockets exposed in corresponding walls thereof, said sockets being adapted for engagement by the terminals

of a gaseous discharge tube, and conductors extending from said transformer to said sockets.

10. A cabinet for gaseous discharge tube signs comprising a casing having a recess in the front wall thereof, a pair of gaseous discharge tube sockets in the front wall of said cabinet, a transformer within said cabinet, electrical supply conductors extending from said transformer to a point exteriorly of said casing and other electrical conductors extending from said transformer to said sockets, said pair of sockets being adapted to receive the terminals of a gaseous discharge tube, said recess in the front wall of said casing being adapted to accommodate a gaseous discharge tube display device.

PAUL BERGER.