Aug. 19, 1952 E. WAGNER 2,607,143

CHANGEABLE DISPLAY SIGN

Filed July 9, 1949 2 SHEETS—SHEET 1

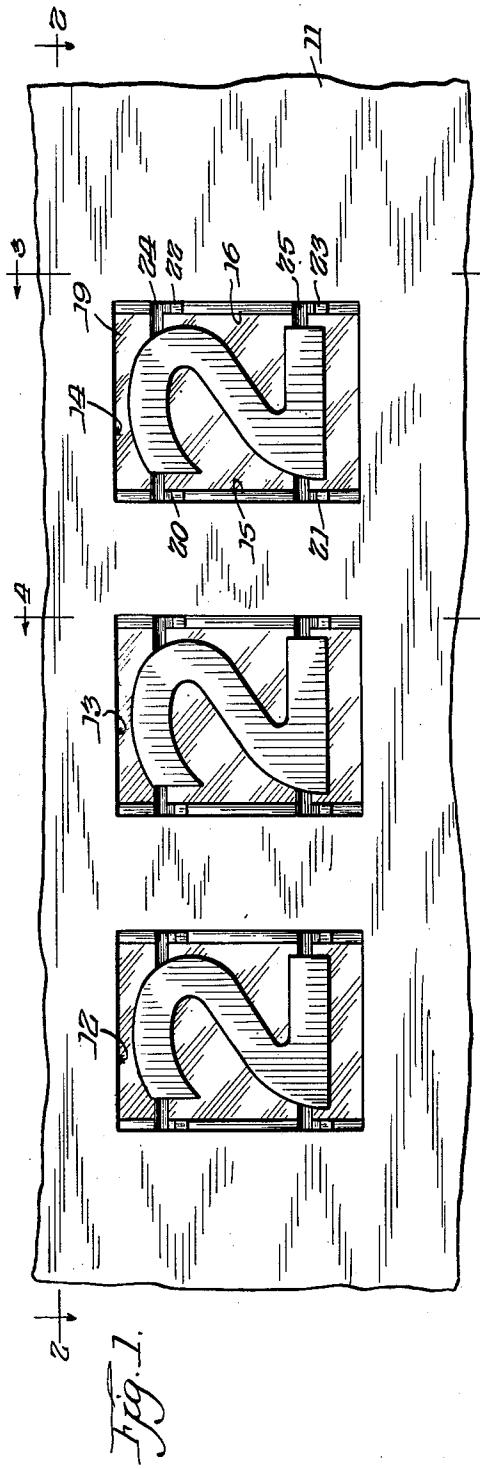


Fig. 1.

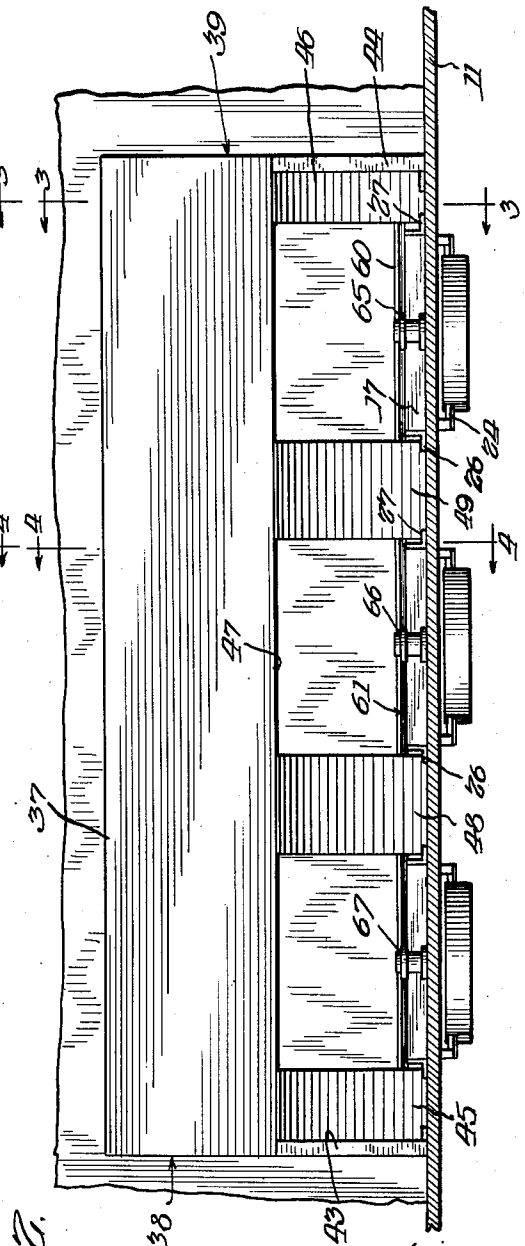


Fig. 2.

Inventor.
Erwin Wagner.
By. J. J. Ahy.
Atty.

Aug. 19, 1952 E. WAGNER 2,607,143

CHANGEABLE DISPLAY SIGN

Filed July 9, 1949 2 SHEETS—SHEET 2

Fig. 3.

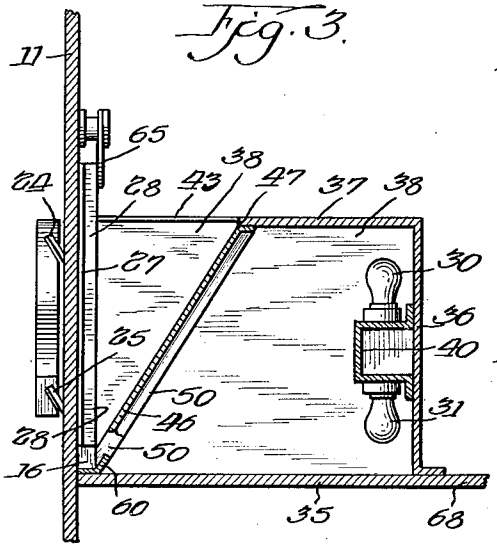


Fig. 4.

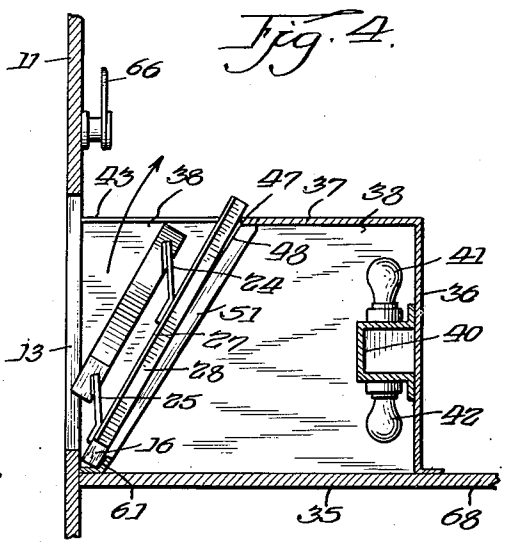


Fig. 5.

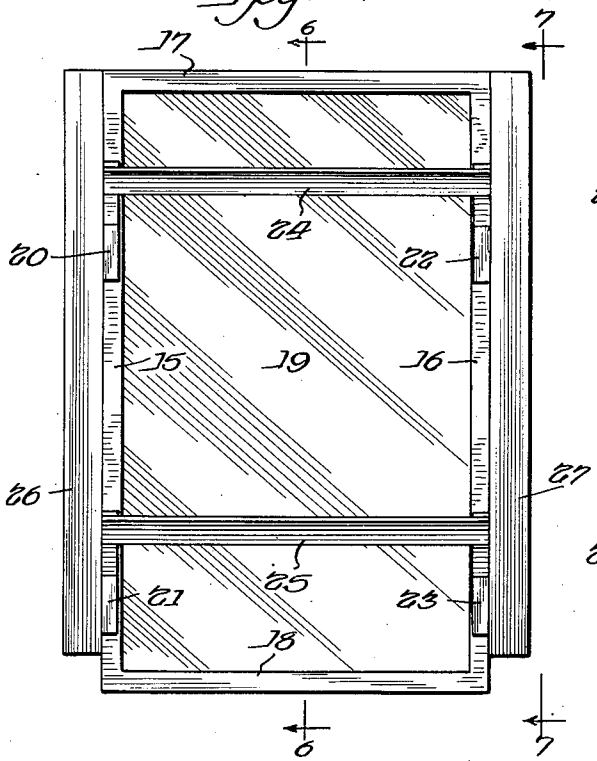


Fig. 6

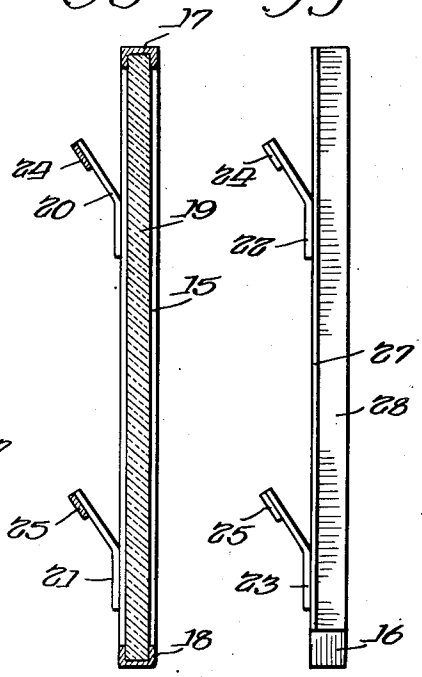


Fig. 7.

Inventor.
Erwin Wagner.
By. Atty.

Patented Aug. 19, 1952

2,607,143

UNITED STATES PATENT OFFICE

2,607,143

CHANGEABLE DISPLAY SIGN

Erwin Wagner, Chicago, Ill., assignor to Wagner Sign Service, Incorporated, Chicago, Ill., a corporation of Illinois

Application July 9, 1949, Serial No. 103,851

5 Claims. (Cl. 40—132)

1

This invention relates to display signs or boards, and is particularly concerned with changeable signs for displaying characters in combinations to convey desired messages, as may be required, for example, in scoreboards of the type used in baseball, football and other games. The term "characters" as used herein is intended to include display units such as letters, figures, numerals or any other desired symbols that may be employed for conveying messages.

The principal object of the invention is to produce a display sign comprising a housing forming a plurality of individual display openings, an individual display frame movably and removably disposed in said housing in back of each display opening, each frame for removably supporting a character, and a panel carried by each frame forming a background against which its character or display unit appears in sharp silhouette outline.

Another object is to provide a display sign as noted in the preceding paragraph, in which the display panels are translucent, and means in said housing for illuminating the display panels of the various display areas or frames from the rear so that the corresponding characters or display units may appear in sharp and clearly visible outline.

A further object is to provide a sign as intimated above, in which each display frame is pivotally or hingedly mounted for rearward angular displacement relative to the portion of the housing forming the corresponding display opening, to permit servicing, that is, to permit changing characters, from the rear, by an operator who may be stationed within the housing of the sign.

Still another object is to provide shielding means for each display frame to confine illumination to its frontal panel, and shielding means within the housing of the sign to inhibit undesired projection of light in angular direction from one display area to the other so as to avoid blinding of persons observing the sign from a position at an angle to the plane of the front wall of the housing.

The foregoing objects and other objects and features will appear from the detailed description which is rendered below with reference to the accompanying drawings. In these drawings,

Fig. 1 is a diagrammatic frontal elevational view of a portion of a sign made in accordance with the invention;

Fig. 2 illustrates a portion of the sign from the top, as seen when looking in the direction of the arrows along lines 2—2 of Fig. 1, the front wall of the housing being shown in section;

2

Fig. 3 represents diagrammatically a transverse section taken approximately along lines 3—3 in Figs. 1 and 2, showing a display frame and the character carried thereby in display position;

Fig. 4 is a transverse section similar to the one shown in Fig. 3, but taken along lines 4—4 of Figs. 1 and 2 and showing the corresponding display frame tilted rearwardly into position for changing the corresponding character carried thereby;

Fig. 5 shows a display frame in diagrammatic frontal elevational view;

Fig. 6 is a section through the display frame taken approximately along lines 6—6 of Fig. 5; and

Fig. 7 is an end view of the display frame as seen from the right when looking in the direction of the arrows along lines 7—7 of Fig. 5.

Like parts are numbered alike throughout the drawings. Known elements and details will be discussed only to the extent required for conveying an understanding of the invention.

The sign may be of the type used, for example, in baseball or football games, which is mounted on a suitable structural framework (not shown). The front wall 11 is provided with a number of individual display openings, three being shown at 12—13—14 in Fig. 1. A desired character may be displayed from each display opening. It is assumed in the illustrated case that three numerals are displayed, forming the message "222". Letters or other characters may of course be used as desired, depending on the game and on the messages which are to be formed for display. The characters are of the silhouette slotted type, as shown, for example, in U. S. Patent No. 2,048,040, dated July 21, 1936. In back of each display opening 12—13—14 is disposed an individual display frame for removably supporting a desired character or display unit.

The display frame is shown in Figs. 5–7, and by referring now to these figures, it will be seen that it comprises a marginal cross-sectionally U-shaped channel forming a holder having the side walls 15—16, the top wall 17 and the bottom wall 18. Mounted within this holder is a panel 19 forming a display background for its character. The panel may be translucent; e. g., it may be made of frosted glass or the like, if illumination from the rear is desired, or it may be made of opaque material in cases were illumination is not necessary.

Secured to the side walls 15—16 of the holder in any desired manner, for example, by welding, are angular brackets 20—21 and 22—23, respectively. Each bracket has a forwardly tilting angular portion, as is particularly shown in Figs.

6 and 7, and suitably secured, for example, by welding, to the free ends of the angular portions of each pair of brackets 20—22 and 21—23, respectively, is a crossbar, as indicated at 24—25, respectively. The two vertically spaced crossbars 24—25 constitute the mounting means for a silhouette character of the slotted type mentioned before.

Secured to each of the opposite side walls 15—16 of the holder of the frame is an angular shielding member. Each shielding member forms a laterally outwardly directed shield portion and a rearwardly directed portion which is suitably secured, for example, by spot-welding, to the corresponding side wall 15 or 16 of the frame. The angular shielding member secured to the side wall 15 thus forms the laterally outwardly projecting shield portion 26, and the corresponding shielding member secured to the side wall 16 forms the angular laterally outwardly projecting shield portion 27. The rearwardly directed portion of the shielding member forming the shield 27 is visible in Fig. 7 and indicated by numeral 28. The corresponding rearwardly directed portion of the shielding member forming the shield 26 is not visible in Fig. 5, but is of course similar to the portion 28 of Fig. 7. These shielding members may be made, for example, of thin sheet material so as to have a certain amount of resilience. The purpose of the shields 26—27 formed thereby is to prevent seepage of light peripherally of the frame to the outside through the corresponding display opening.

The function of the shielding members may be explained with reference to Figs. 1, 2 and 3 where it is assumed that the display frame of Figs. 5, 6 and 7 is the one carrying the numeral "2" visible through the right hand display opening 14 indicated in Fig. 1. Accordingly, examining Fig. 2, we see the top portion or channel 17 of the display frame, and along its side walls we see the shields 26—27 attaching to the rear of the front wall 11 of the housing of the sign. In Fig. 3, we see the rearwardly projecting portion 28 and the laterally outwardly directed portion 27 of the shield which is secured to the side wall channel 16 of the display frame. Light from the light sources such as 30—31 thus is prevented from seeping peripherally of the display opening 14, which might produce a disturbing halo effect.

It will be observed that the display frame extends appreciably above and below the top and bottom edges of the display opening, thus forming shielding means for undesired peripheral radiation of light to the outside at the top and bottom of the display opening.

Each individual display frame for each individual character is constructed alike, and the foregoing description of one frame and its function will suffice for all.

The housing, as has been said before, forms the front wall 11 with its various display openings such as indicated at 12—13—14. Suitably secured to the front wall in back thereof is a horizontally extending platformlike member 35. This member carries a casing comprising the rear wall 36, the top wall 37 and the end walls 38—39. Each end wall extends forwardly into engagement with the inside of the front wall 11 of the housing, as shown in Figs. 2, 3 and 4. Secured to the rear wall 36, inside thereof, is a generally U-shaped member 40 forming a longitudinal channel which may carry the wiring for the light sources 30—31, 41—42 and similar light sources suitably distributed on the channel 40 within the casing between the end walls 38—39.

The portions of the end walls 38—39, which extend forwardly, form inwardly directed lips 43—44, respectively, as shown in Figs. 2–4. End shields or deflectors 45—46 are formed within the casing, as indicated in Fig. 2, which slant downwardly and forwardly from the front edge 47 of the top wall 37, and intermediate shields or deflectors 48—49 are provided which slant similarly downwardly and forwardly from the front edge 47 of the top wall 37 of the interior casing. Each end shield or deflector 45—46 has an inwardly and rearwardly directed lip or flange, as indicated, for example, at 50 in connection with the end shield 46 in Fig. 3, and each intermediate shield or deflector 48—49 has on each side an inwardly and rearwardly turned lip or flange, as indicated, for example, at 51 in Fig. 4 in connection with the shield 48.

These shields or deflectors 45, 48, 49 and 46 (reading from left to to right in Fig. 2) and their inwardly and rearwardly turned flanges or lips such as 50—51 shown in connection with the shields 46 and 48, respectively, and similar inwardly turned flanges formed by the remaining shields, have the function to direct the radiation of light from the various light sources forwardly, principally to concentrate illumination upon the translucent panels of the various display areas or frames mounted in the corresponding display openings of the sign. The feature is considered important because, as will be described later on, each display frame may be tilted rearwardly so as to gain access to its character for the removal and changing thereof, and in such circumstance radiation of light at such an angle to the outside as might catch the eye of a player and blind him must of course be avoided. While the blinding of a player would have to be considered a serious shortcoming in a sign of this type, it is understood of course that the convenience of the public also has to be considered, and spectators seated on the sidelines watching a game should not be subjected to a blinding effect when the scoreboard is being manipulated.

At the bottom of each display opening 12—13—14, in the rear of the front wall of the housing 11, is disposed an angular member such as indicated in Figs. 2 and 3 at 60 and in Figs. 2 and 4 at 61, forming just underneath and in back of the bottom margin of each display opening a hinge or pivot channel for the corresponding display frame or display unit which is to be used in conjunction with such display opening. The bottom edge of each display frame is inserted into its hinge or pivot channel from the rear, and after placing the desired character on the crossbars of the frame, the frame is tilted forwardly into display position in which the display frame having shields 27—28 is shown in Fig. 3. The frame is then secured in display position by means of a latch member indicated at 65. The character or display unit supported on the frame is now likewise in display position projecting forwardly from the plane of the front wall of the housing, as shown in Fig. 3, and is thus clearly visible against its background formed by the corresponding display panel, no matter from what angle it may be viewed. Latch members 66—67 are provided for the remaining display frames coacting with display openings 12—13, respectively.

The bottom wall 35 of each sectional housing may be extended rearwardly, as indicated at 68 in Figs. 3 and 4, to provide a platform for the operator. The exact vertical position of this platform may be as desired; it has been shown

on the same level as the bottom wall of the interior casing only for convenience of description. The operator is informed of a score which he has to display during the game, and whenever a change is indicated he operates the corresponding latch 65—66—67 to release the desired display frame, tilting it rearwardly on its hinge or pivot channel into the position shown in Fig. 4 so as to obtain access to the corresponding display unit. He thereupon removes the unit in a motion generally following the prominent arrow shown in Fig. 4 and inserts another character or unit as may be indicated by the progress of the game, whereupon he tilts the frame forwardly again into the display position shown in Fig. 3, and latches it in position.

It will be observed that, while the change takes place, the translucent panel is in tilted position at an angle at which it will project diffused light upwardly, that is, away from the field of observation of the public and the players, thereby avoiding glare. Lateral projection of light through the partially exposed display opening such as 13 in Fig. 4 is inhibited by the shielding means already discussed.

A sectional interior casing comprising the top wall 37 and the end walls 38—39 for the three display units or areas shown in the figures has been included for the sake of convenience. If desired, each display opening may have its individual casing containing illuminating means and, conversely, a greater number of display areas or openings than those shown may have illuminating means housed in common.

The number of display openings or areas may vary and their relative mutual positions may vary as desired or required in any given instance of use.

A display unit is not necessarily limited to a single and unitary character, such as a numeral, letter or other symbol, but may be a composite symbol or may comprise a plurality of individual symbols.

Silhouette characters or display units of the slotted type have been shown for convenience of description only, because it is apparent that other specific types of characters or units may be used within the scope of the invention.

The advantages of the various features of the invention, particularly when used in a sign of the scoreboard type for games, will be appreciated from the following observations.

The characters or display units may be of considerable size, in fact, they may be over 30'' in height, depending on the overall size of the scoreboard. The manipulation of characters of such size may be a hazardous task, particularly when they must be handled from the outside of the sign, by the operator who has to move along a scaffolding, as is the case in most scoreboards of the general type discussed. The invention practically eliminates all hazards and greatly facilitates the changing of the characters.

It should be noted also that the characters may be made, e. g., molded of synthetic materials to produce relatively lightweight units which are easily handled.

The manipulation of a scoreboard by an operator moving along a scaffolding in front of the scoreboard and in sight of the spectators and players may distract attention from the game. Such distraction is eliminated by the invention.

The characters used at present in scoreboards of the class discussed are usually made of flat stock and cannot be read at all or only with difficulty when struck by direct light, e. g., when struck directly by sunlight. The characters used in the present invention extend in two planes, vertical and horizontal; that is, they have surface and also depth, and are always clearly visible from any angle of observation and under any condition in which sunlight or light from an artificial source may strike them.

Illumination of the display panels of the various display units or areas from the rear thereof, by the light sources disposed in the interior of the sign, may be used only when desired, e. g., during games played after daylight. The use of exterior illuminating sources such as spotlights is thus eliminated.

The scoreboard may include any desired combination of display areas in addition to those shown in the drawings, as may be required by the rules of the game or games for which it is intended.

The front wall of the scoreboard which forms the display openings is not necessarily part of a rearwardly closed housing, but may be a wall formed in front of a rearwardly open structure. The term "housing" as used herein is intended to include such structure.

The invention has been described particularly in connection with signs of the scoreboard type, but it will be understood that this is not intended to denote an inherent limitation. Features of the invention may be used in display signs of various types apart from the specific sign for scoreboard use as disclosed and described herein.

Changes may be made within the scope and spirit of the accompanying claims in which I have defined what is considered new and desired to have protected by Letters Patent of the United States.

I claim:

1. A changeable display sign for displaying a message composed of a plurality of individual individually removable and exchangeable display symbols comprising a casing, said casing having a front wall, a bottom wall, end walls and a top wall, said top wall extending over part of the space between the rear wall and the front wall leaving a permanently open top opening through which access may be gained to the interior of said casing, a plurality of display openings in said front wall of said casing, one for each individual display symbol, bracket means in said casing in back of each display opening below the bottom edge thereof and substantially aligned with said bottom wall forming with the adjacent portion of the front wall an upwardly open horizontally extending pivot channel, a guide member extending from each end of each pivot channel at an angle rearwardly and upwardly into engagement with the front edge of said top wall, a display frame for each display opening comprising a marginal frame structure framing a display panel and having supporting means extending in front thereof for removably supporting an individual display symbol, said panel forming a display background for said symbol, each frame being removably disposed with its bottom edge loosely resting in its associated pivot channel, whereby the entire display frame may be tilted rearwardly to rest on its opposite sides against the associated rearwardly and upwardly extending guide members to place the display symbol carried thereby in rearwardly tilted position in which said symbol is accessible for removal and exchange through the top opening formed by said top wall, and latch means for each display open-

ing in back of the top edge thereof for securing the associated display frame in upright position for the display of the corresponding display symbol against said panel.

2. The structure defined in claim 1, together with illuminating means in said casing in back of said display openings for illuminating the display panels corresponding thereto, and shield means in said casing and carried by said guide members, respectively, for substantially blocking the escape of light through a display opening which is partially exposed to the outside frontally of said sign at times when the associated display frame and its panel is tilted rearwardly to effect removal and exchange of the corresponding display symbol, thereby preventing blinding of the observer of the sign during the exchange of display symbols and confining the effect of the illuminating means substantially to the respective display areas covered by said display panels during times when said panels and the display symbols in front thereof are in effective display position.

3. In a changeable display sign, a casing comprising a substantially horizontally extending bottom wall, a substantially vertically extending front wall, a rear wall extending substantially in parallel with and rearwardly spaced from said front wall, a top wall extending from the top edge of said rear wall forwardly toward said front wall substantially in parallel with said bottom wall, the forward edge of said top wall being spaced from the back of said front wall, a plurality of horizontally spaced forwardly and downwardly slanting intermediate wall members extending from the forward edge of said top wall each with its bottom edge substantially in engagement with the inside of said front wall at the juncture thereof with said bottom wall, illuminating means in said casing, said intermediate wall members forming in back of said front wall a plurality of horizontally spaced openings for the passage of light forwardly toward said front wall, marginal strips formed along edges of said intermediate wall members which form said openings and rearwardly extending therefrom, a display opening formed in said front wall substantially in rearward alignment with each opening formed by said intermediate wall members, an angular bracket disposed in back of each display opening and downwardly spaced from the bottom edge thereof to form a horizontally extending bottom channel thereat, a display panel for pivotal engagement at its bottom edge with said channel, said display panel being adapted to support removably a character for display through the associated display opening in said front wall, whereby said display panel may be tilted rearwardly with its marginal portions resting against the marginal portions of the associated opening formed by adjacent intermediate wall members to position it for receiving a character for display, and means for securing said panel in upright position in back of its associated display opening in said front wall to display said character therethrough, said intermediate wall members and said marginal strips thereon forming shield means to inhibit passage of light angularly outwardly of the openings formed thereby.

4. The structure defined in claim 3, together with strip means extending laterally from the sides of said display panel to shield the associated display opening in said front wall against marginal angular outward passage of light when said panel is in rearwardly tilted position for the exchange and replacement of a character for display.

5. A changeable display sign comprising a box-like casing having a bottom wall, a rear wall, a top wall, a front wall and end walls, an intermediate downwardly and forwardly slanting wall disposed in back of said front wall, said intermediate wall forming with said front wall a downwardly converging upwardly open front chamber and forming with the remaining walls an enclosure in back of said front chamber, illuminating means disposed in said enclosure, horizontally spaced light-passage openings being formed in said intermediate wall for the passage of light from said enclosure forward toward said front wall, a display opening formed in said front wall in rearward alignment with each light-passage opening in said intermediate wall, a display panel for cooperation with each pair of openings comprising one of said display openings in said front wall and an associated light-passage opening in said intermediate wall, means for pivotally upporting each display panel at the bottom thereof, whereby each such panel may be brought into display position in back of said front wall in parallel therewith and extending in back of and covering one of said display openings therein or in alternate rearwardly angularly slanting servicing position in front of said intermediate wall in parallel therewith and covering the associated light-passage opening therein, said display panel being in said servicing position accessible through said front chamber for the servicing thereof, shield means extending rearwardly from said intermediate wall into said enclosure for shielding the light-passage openings therein each against the projection of light angularly forwardly marginally of the corresponding opening during the pivotal displacement of the associated panel into its servicing position, and shield means carried by each panel for shielding the associated display opening in said front wall against the projection of light marginally thereof during such rearward displacement of said panel into its servicing position and while such panel is in its servicing position.

ERWIN WAGNER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
2,069,368	Horinstein	Feb. 2, 1937
2,113,285	Wamser	Apr. 4, 1938
2,114,639	Preddey	Apr. 19, 1938
2,230,873	Wagner	Feb. 4, 1941
2,313,723	Adler	Mar. 16, 1943
2,313,724	Adler	Mar. 16, 1943
2,527,679	Krueger	Oct. 31, 1950