Sept. 13, 1966 J. Y. FOSTER ET AL 3,273,140

COMBINATION MESSAGE AND IMAGE DISPLAY UNIT

Filed July 19, 1963 3 Sheets-Sheet 1

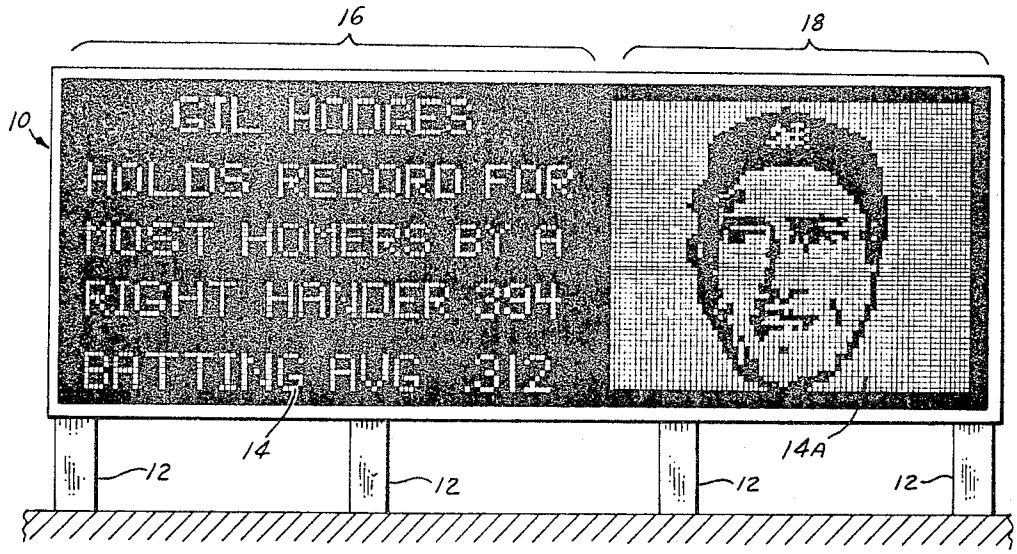


Fig. 1



Fig. 2

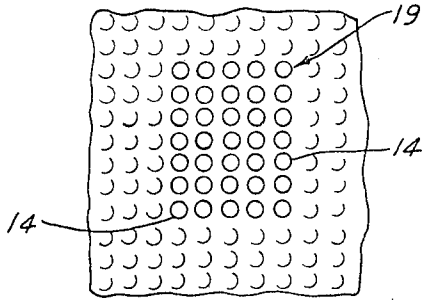


Fig. 4

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COMBINATION MESSAGE AND IMAGE DISPLAY UNIT

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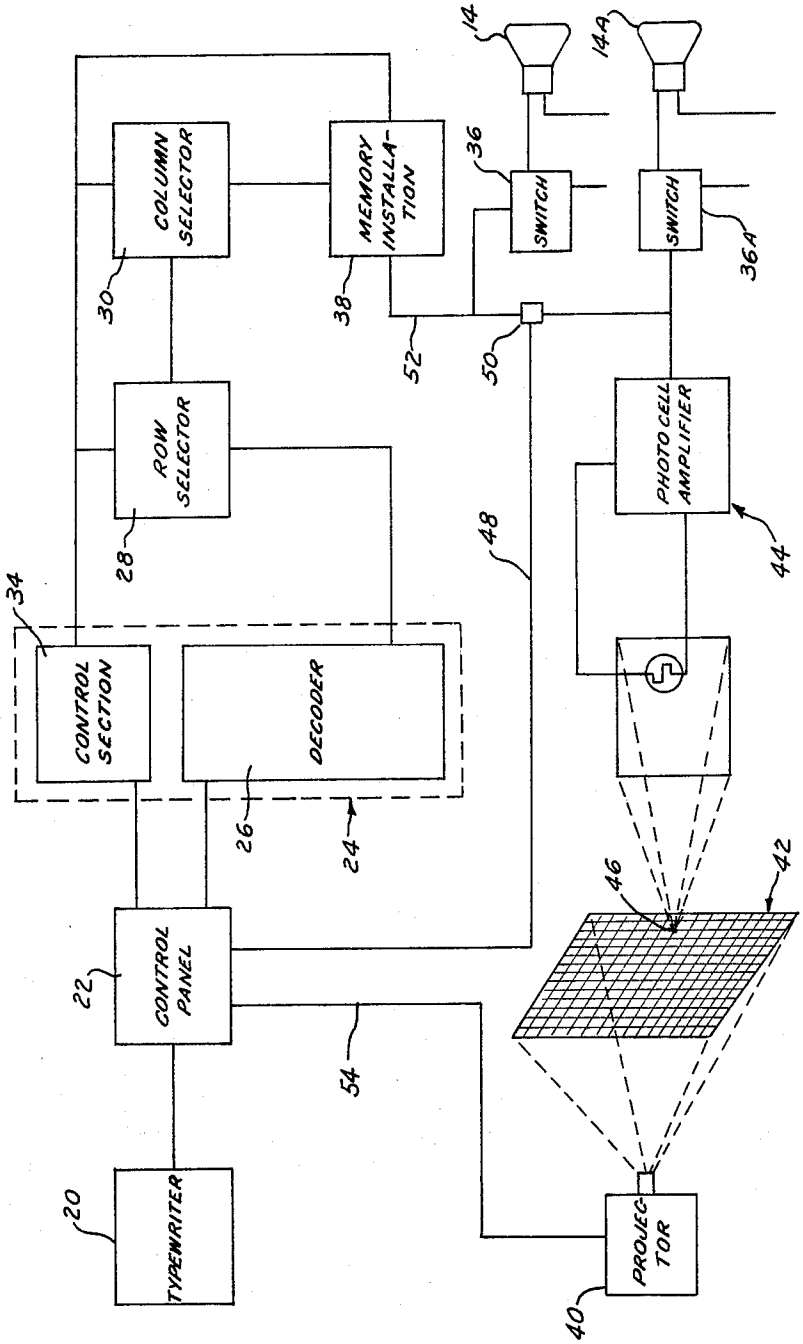


Fig. 3

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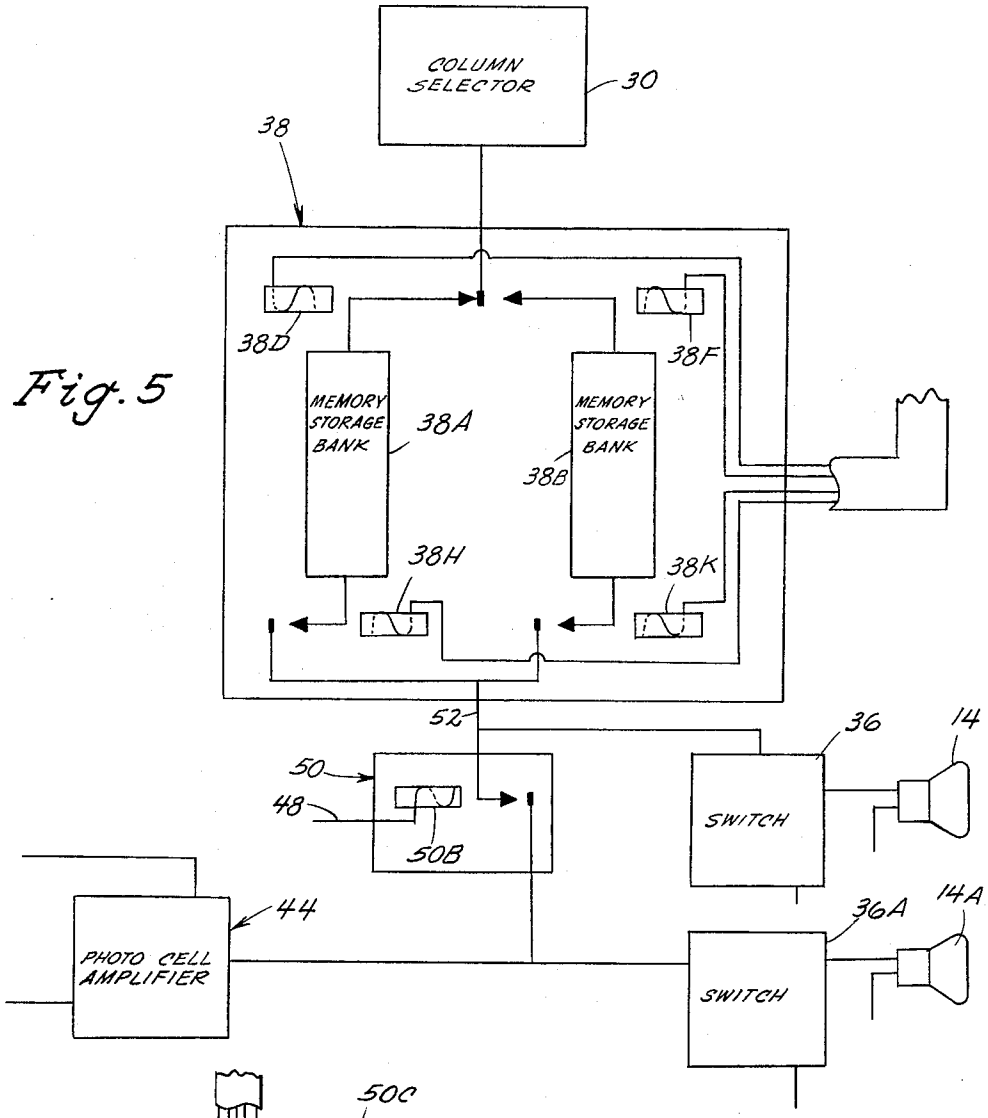
Sept. 13, 1966 J. Y. FOSTER ET AL 3,273,140

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Fig. 5



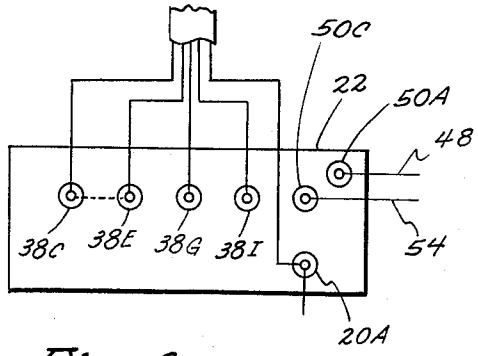


Fig. 6

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COMBINATION MESSAGE AND IMAGE DISPLAY UNIT

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1 Claim. (Cl. 340—334)

Electrical scoreboard and sign units employing various combinations of lamp patterns have been employed heretofore. This invention relates generally to such a structure, but embraces specifically the concept of utilizing at least a portion of the lamps of a message-type sign for also presenting movable or stationary images.

A principal object of this invention is to provide a combination message and image display unit whereby a portion of the lamps in the unit can be selectively used for the projection of either images or messages.

A further object of this invention is to provide a combination message and image display unit which can present both messages and images and which can instantly replace a pictorial image at any time with a written image, and vice versa.

These and other objects will be apparent to those skilled in the art.

Our invention consists in the construction, arrangements, and combination, of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in our claim, and illustrated in the accompanying drawings, in which:

FIGURE 1 is a front elevational view of a scoreboard employing the instant invention, wherein a message and pictorial image are being simultaneously presented;

FIGURE 2 is a front elevational view of a scoreboard similar to that of FIGURE 1, but illustrating the case where the pictorial image has been replaced by the written message;

FIGURE 3 is a schematic layout of the various components of this invention;

FIGURE 4 is a partial elevational view of typical lamps disposed on the scoreboard;

FIGURE 5 is a more detailed view of the memory storage facility; and

FIGURE 6 is a more detailed view of the control panel.

The specific construction of the various components of this invention will not be presented in detail as the invention is deemed to lie in the combination and could operate successfully even if the structure of a given component were altered. In this connection, conventional electrical components are employed as elements of this combination, as will be appreciated from the following description.

The numeral **10** generally designates a scoreboard structure having supporting posts **12**. The scoreboard or sign **10** can assume any convenient or desired shape but often assumes the general proportions of 140 feet long and 20 feet high. A plurality of lamps **14** and **14A** are electrically connected to board **10** in a plurality of vertical columns and horizontal rows. For purposes of description, the lamps **14** and **14A** mounted on the board **10** are located in two separate rectangular groups or banks designated by the numerals **16** and **18**. In addition, the banks **16** and **18** are normally subdivided into bank units **19** which range from 18 to 36 inches high. Each unit includes 35 gas filled lamps **14** or **14A** of 40, 60 or 75 watts encased in individual aluminum reflector tubes behind sun filter screens. The individual lamps **14** and **14A** are positioned in horizontal rows and vertical columns, as are the units **19**.

An operator's electric typewriter **20** and control panel **22** are normally remotely positioned from the scoreboard **10**, at least in the athletic field environment. The typewriter is used to program the message display on board **10**, and it is controlled through appropriate switches on the control panel **22**, such as the switch **20A** shown in FIGURE 6. Although this specific phenomenon does not embrace the instant invention, the typewriter **20** can be used to prepare punched paper tape or punched cards for permanent storage of messages. This punched material can be used in a "memory" installation, to be discussed hereafter, wherein the stored message can be selectively imposed on the scoreboard **10**. The output signals from the typewriter are in an 8-channel coded format. The typewriter provides at least all 26 letters of the alphabet, 10 numbers, and 6 or more punctuation symbols.

The numeral **24** designates a decoder and control assembly which normally is located at or near the scoreboard **10**. As schematically shown in FIGURE 3, the decoder **26** in the assembly **24** accepts the 8 channel coded output signals of the typewriter **20** through the control panel **22**. The decoder **26** converts these coded signals into signals required to illuminate the proper lamps on the board **10** to create the desired figure or numeral. Thus, if the letter "R" is struck on the typewriter, the decoder **26** interprets the coded signal for "R" from the typewriter and transforms it into the necessary signals to illuminate an "R" on the scoreboard. Again, it should be pointed out that the precise construction of such a decoder is of the type presently in use and on the market today. The decoder **26** also generates control signals for the operation of the lamp row and column selector switches **28** and **30**, respectively, and provides signals for the various display, erase, and programming functions (not involved here) as dictated by the control panel **22**. The row switch or selector **28** is controlled by the decoder **24** in conjunction with the control panel **22** and typewriter **20**, and switch **28** selects the row into which the programmed information will be entered. The column switch **30** is similarly controlled and it selects the lamp bank unit **19** in a particular row into which the programmed information is to be placed. As schematically shown in FIGURE **3**, the row and column selectors or switches **28** and **30** are also connected to the control panel **22** through the control section **34** of assembly **24**.

The display lamps **14** in the "message" bank **16** are electrically connected to solid state display switches **36** which serve to control the individual lamps. Solid state switches assume numerous designs and are particularly adaptable to display lamp usage. They normally utilize transistors or silicon controlled rectifiers and serve to handle the high initial inrush current much better than conventional relays. Relays have a very short life, and the mechanical parts thereof are subjected to wearing and consume valuable time in completing their function. The solid state switches, which act instantaneously, overcome the problems presented by the conventional relays.

The lamps **14** in the message bank **16** are electrically connected to the row and column selectors **28** and **30**, respectively, through their respective solid state switches **36** and through the message "memory" or storage installation **38**. The installation **38** contains stored information in "memory" banks from typewriter **20**, and this information can be selectively imposed on the lamps **14** by the control panel **22**. Memory banks **38A** and **38B** have been shown in FIGURE 5, and a "short" message such as that imposed on group of lamps **16** in FIGURE 1 can be stored on bank **38A**, while a "long" message such as that imposed upon groups of lamps **16** and **18** in FIGURE 2 can be stored on lamp **38B**. The selection of memory bank **38A** is made at the control panel **22** by closing

switch 38C to energize relay 38D thereupon. Similarly, switch 38E on control panel 22 can be ganged to switch 38C whereby the closing of switch 38E will open switch 38C, whereupon memory bank 38B will be selected by the energization of relay 38F. Relays 38D and 38F are electrically connected to switches 38C and 38E, respectively, on control panel 22 by any convenient and conventional electrical means. Message signals are permitted to by-pass or pass through the installation 38 when it is desired to allow the typewriter 20 to directly transmit a message to the board 10. This is accomplished by closing switch 38G on control panel 22, which will energize relay 38H, and the memory bank 38A will then be connected to line 52 and hence, will be connected to the lamps 14. It is assumed at this point that neither a "long" nor "short" message has been stored on memory bank 38A. The closing of switch 20A on the control panel 22 will then directly connect the typewriter to the lamps 14 in group 16. The operator could thereupon directly type a "short" message of the type shown in FIGURE 2, and it would be fed directly onto the group of lamps 16. If it was desired to type a "long" message of the type shown in FIGURE 2, it would be necessary to close switch 50A on control panel 22 to actuate relay 50B of switch 50 to cut in the remaining group of lamps 18. The stored message signals in installation 38 can be selectively imposed on the lamps 14 (and 14A) in lieu of the typewriter signals at the option of the control panel operator. If a "short" message has been imposed on memory bank 38A, switch 38G on control panel 22 can be closed to energize relay 38H to connect the memory bank 38A to line 52, and hence, to lamps 14 of the group of lamps 16. If it is desired to impose a stored "long" message of memory bank 38B on both groups of lamps 16 and 18, switch 38I on control panel 22 is closed to energize relay 38K, whereupon memory bank 38B is connected to output line 52. With switch 50 closed in the manner described above, the resulting output from memory bank 38B will be imposed over lamps 14 and 14A in groups of lamps 16 and 18, respectively. Again, the precise functional details of the installation 38 are presently available and in use on the market, and the details thereof have not been shown since they, of themselves, do not constitute a part of this invention.

The lamps 14A in "image" bank 18 are also electrically connected to individual solid state switches 36A, and are also in communication with the message transmitting signals of typewriter 20 and the message storage installation 38, as described above. The lamps 14A in the image bank 18 are independently controlled from the control panel 22, as schematically shown in FIGURE 3, so that the message circuit, as defined by elements 20, 22, 24, 28, 30 and 38, can be instantaneously removed from the lamps 14A. This is accomplished by opening the switch 50A on control panel 22, which will remove lamps 14A in group 18 from the message circuit even if a portion of a "long" message from storage bank 38B was on these lamps.

An image circuit is comprised of projector 40, photo cell grid 42, and photo cell amplifier 44. The projector 40 is adapted to project from a film or the like an image on the grid 42, which is comprised of a plurality of photo electric cells 48 which are each electrically connected to one of the lamps 14A in the image lamp bank 18. The projector may be a motion picture type, still-slide type, or any other device suitable for projecting either still or moving pictures. As indicated, the photo cell grid contains one photo-cell for each display lamp 14A used in image lamp bank 18, and the photo cells are correspondingly arranged in the same pattern as the lamps 14A in the bank 18. The optical pattern of light and dark from the projector energizes the various photo-cells to form electrical signals corresponding to the visual image of the projected picture. Thus, the light intensity of the lights in the bank 18 will vary in accordance with the optical pattern of light and dark from the projector. The photo-cell amplifiers 44 increase the electric signal from the photo-cell to enable it to control the solid state switches 36A to which each amplifier is electrically connected.

The normal operation of the device of this invention is as follows: When it is desired to use both of the lamp banks 16 and 18 for messages, as indicated in FIGURE 2, the image circuit of elements 40, 42 and 44 are withdrawn in the manner described from influencing the lamps 14A in the image lamp bank 18. This withdrawal of the image circuit is effected at the control panel 22 by switch 50C. Switch 50C can close off the projector 40 and hence remove the source of energy for lamps 14A. Messages can then be fed to both lamp banks 16 and 18 either from the typewriter 20 or the message storage center 38 in the manner described.

The message signal impulse to lamps 14A can be interrupted at the control panel as described above. The opening of switch 50 can protect the lamps 14A from message signals at all times, regardless of whether message signals are being fed to the lamps during or subsequent to the actuation of this control. The image circuit is then actuated from the control panel 22 through lead 54 and the image circuit thereupon sends signals to the image lamp bank 18 and to the lamps 14A therein in the manner described. Message signals can be simultaneously directed to the message lamp bank 16 and lamps 14 to create the effect shown in FIGURE 1. This is accomplished by actuating a stored "short" message from memory bank 38A in the manner indicated; or by directly typing a "short" message on lamps 14 through blank memory bank 38A, as described above. Obviously, the message and image circuits can be independently energized or can be both simultaneously energized. The full or "long" message depicted in FIGURE 2 is created by actuating a stored "long" message from memory bank 38B in the manner indicated, or typing a "long" message on lamps 14 and 14A through blank memory bank 38A with switch 50 closed, as described above. The simultaneous image and message shown in FIGURE 1 is accomplished by utilizing a "short" message, as previously described, and energizing the image circuit by switch 50C as previously discussed. By opening switch 50C, the image circuit is withdrawn from the sign, and the "short" image shown in FIGURE 1 would normally be withdrawn by opening switch 38G.

From the foregoing, it is seen that the instant invention does accomplish its major objectives of providing a sign structure employing groups of display lamps that can be selectively actuated to present either message or image productions, or a combination thereof.

Some changes may be made in the construction and arrangement of our combination message and image display unit without departing from the real spirit and purpose of our invention, and it is our intention to cover by our claim, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

We claim:

In a device of the class described,

a sign structure,

a first group of electrical display lamps mounted on said sign structure,

a second group of electrical display lamps mounted on said sign structure adjacent to said first group of electrical display lamps,

a first electrical control circuit electrically connected to each of said lamps in each group of lamps,

first means electrically connected to said first electrical circuit for selectively illuminating various of said lamps whereby said illuminated lamps will formulate only a message in the form of letters and numerals,

a second electrical control circuit electrically connected only to said second group of lamps,

second means electrically connected only to said second electrical control circuit for illuminating various of said lamps whereby said illuminated lamps will formulate an image in the form of pictures, said second means including means for projecting a light image having varying degrees of light intensity on a photo-cell grid comprised of a plurality of individual photo-cells, with each photo-cell being electrically connected only to a single lamp in said second group of lamps; said photo-cells and the corresponding lamps to which they are connected being positioned in an identical pattern,

and a control means electrically interconnecting said first and second control circuits to control and coordinate the illumination of said first and second groups of lamps, said control means including means for selectively limiting the energization of said first electrical control circuit to said first group of lamps while said second electrical control circuit is energized to form an image on said second group of lamps, whereby a message in the form of numerals and letters is formed only on various lamps in said

first group of lamps, and an image is simultaneously formed only on various of said lamps in said second group of lamps.

References Cited by the Examiner

UNITED STATES PATENTS

1,072,152	9/1913	Ocampo	340—339
1,103,294	7/1914	Jones	340—339
1,359,274	11/1920	Recke.	
1,394,565	10/1921	Long	340—339
1,973,539	9/1934	Morton et al.	340—339 X
2,069,851	2/1937	Rosenberg	340—339
2,121,987	6/1938	Rosenberg.	
2,146,576	2/1939	Haselton et al.	340—337
2,148,450	2/1939	Eitzen	340—339
2,154,110	4/1939	Parks	340—339 X
2,221,109	11/1940	Reid	340—339 X
2,221,525	11/1940	Rosenberg	340—339
3,146,436	8/1964	Crow	340—336

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