Feb. 20, 1968 P. BRUNETTE 3,370,291

INDICIA WHEEL DISPLAY DEVICE HAVING A SELECTIVELY ROTATED WHEEL SHAFT

Filed June 3, 1965 2 Sheets-Sheet 1

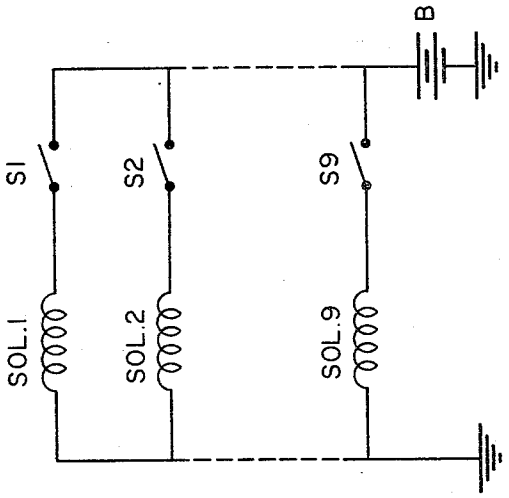


FIG. 4

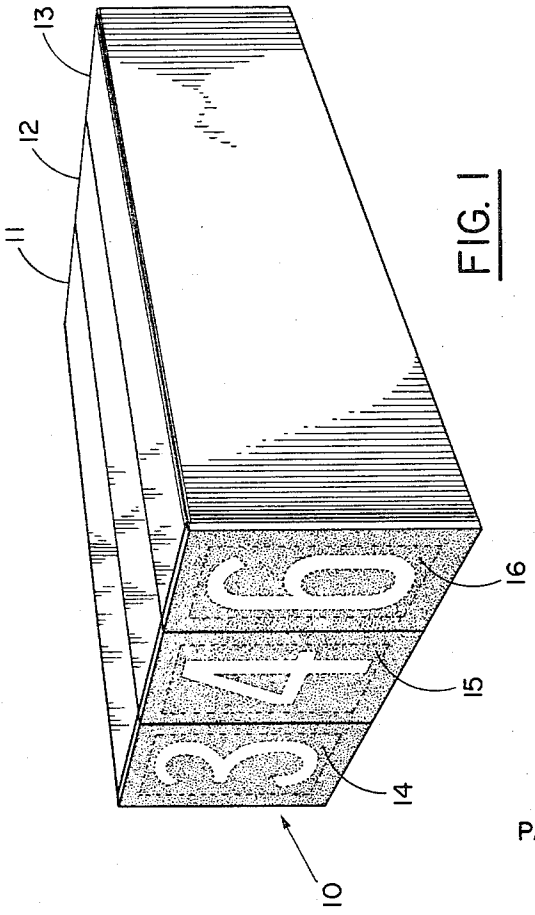


FIG. 1

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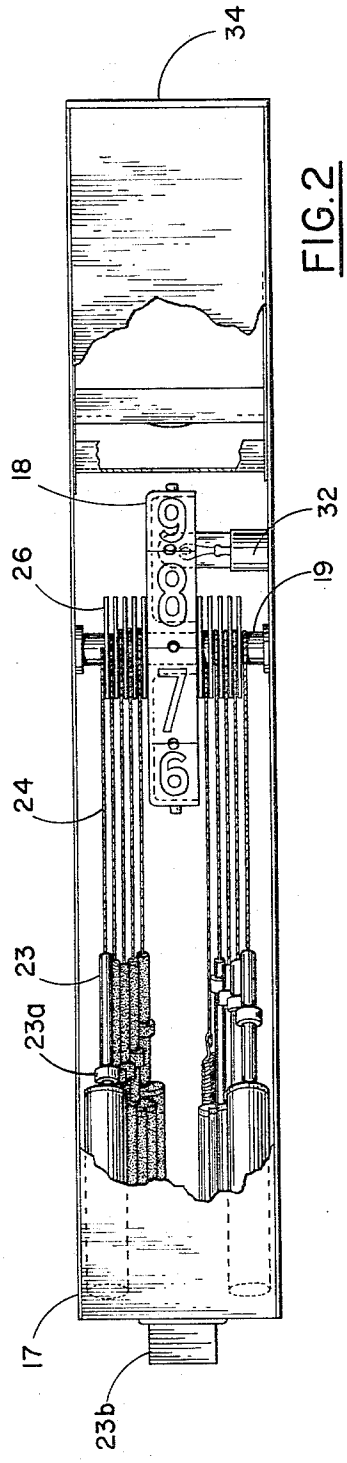


FIG. 2

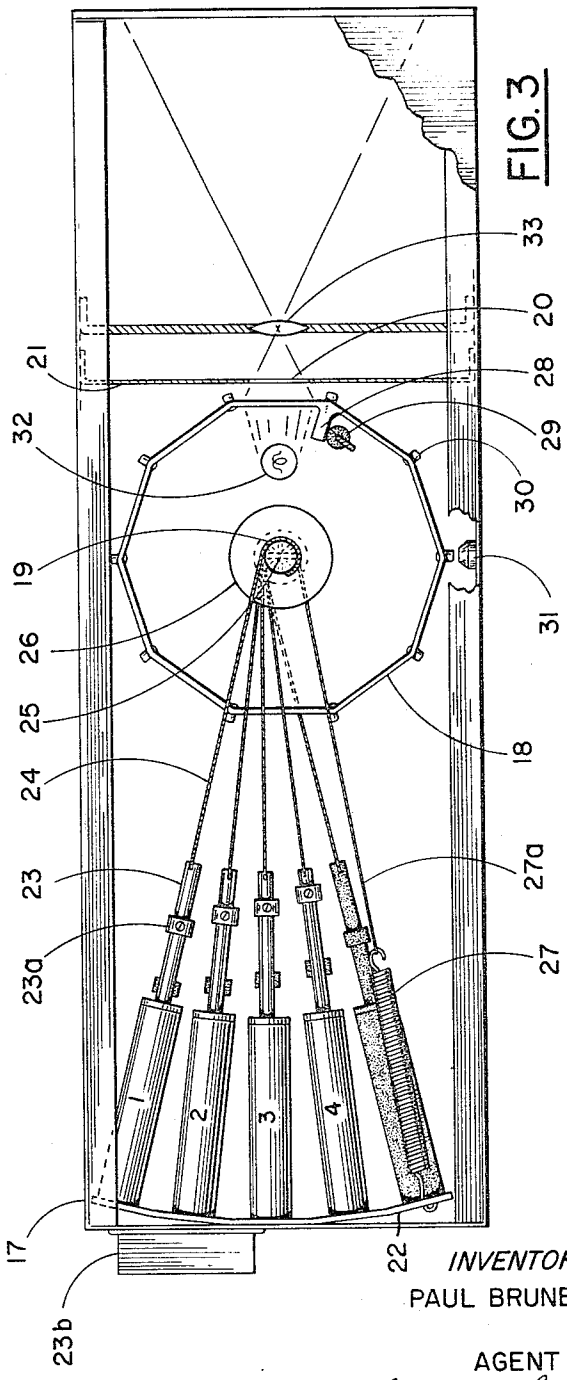


FIG. 3

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INDICIA WHEEL DISPLAY DEVICE HAVING A SELECTIVELY ROTATED WHEEL SHAFT

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7 Claims. (Cl. 340—378)

This invention relates to display devices and more particularly to character display devices.

The display device of the invention might be incorporated in stock exchange marketing boards, airline, railroad or ship's arrival and departure boards, sports score boards, police car patrol location boards, elevator floor location reading, instrumentalities, etc.

Another application for the above device might be in visual signalling applications between battleships or ground forces.

A number of devices exist in the prior art for displaying characters. A first display device which is well known comprises a plurality of lights which may be individually and selectively energized by electrical circuits for forming the outline of a particular character.

A second group of prior art devices contemplates a single source which is directed toward a stack of movable plates, each carrying a particular character outline, and each of which may be displayed by displacing it from the common stock so that it alone is properly positioned for direct observation.

A third prior are display device contemplates the use of a single light directed toward a stack of overlapping plates, each of which is perforated in selected areas and selected ones of which are movable so as to let the light pass successively through each of the plates to form the outline of a particular character on a screen.

The above first prior art device requires multiple illumination sources and therefore develops a large amount of heat specially when used indoor. The second and third prior art devices require complex and expensive mechanisms for moving the stacked plates. Furthermore the third prior art display device is not very bright because the light has to pass through a series of superimposed plates.

The disadvantages of the above prior art devices are overcome in accordance with the present invention by providing a wheel having the characters to be displayed spaced about its periphery. The wheel is mounted on a shaft for rotation and actuated by a plurality of solenoids one for each character on the wheel. The wheel may take the form of a drum and a light may be positioned within the drum for illuminating the characters when required.

A preferred embodiment of the invention will now be described with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of three display devices grouped together;

FIG. 2 is a top view of the display device in accordance with the invention with the top part of the housing cut away;

FIG. 3 is a side view of the display device with the side cover taken off; and

FIG. 4 is a circuit diagram for energizing the display device.

Referring to FIGURE 1, there is shown a three digit display device **10** consisting of display devices **11**, **12** and **13** grouped together. Display devices **11**, **12** and **13** have screens **14**, **15** and **16** respectively each of which displays an individual digit. It is understood however that any number of these devices may be grouped together dependent on each particular application.

In FIGURES 2 and 3, there is shown a single display device comprising a housing **17** containing a wheel or drum **18** mounted for rotation on a shaft **19** secured to housing **17**. The drum **18** is preferably made of opalescent plastic material and has digits 0–9 spaced about its periphery. The area around each digit is usually black and the digits white. The digits inscribed on the periphery of the wheel are arranged to be displayed for viewing individually through a window **20** in a wall **21** of housing **17**.

The wheel is operated by solenoids **1–9** attached to a bracket **22** secured inside housing **17**. There is one solenoid for each digit 1–9 on wheel **18**. Each solenoid comprises a coil which when a current flows through it, will act as a magnet and tend to pull a movable iron core **23** to a central position within the coil. Iron coils **23** are provided with adjustable stops **23***a* which are positioned at predetermined locations along the length of each core. Solenoids **1–9** are connected to a terminal **23***b* at the rear of housing **17**.

A flexible cable **24** is attached to each iron core **23**. The other end of each cable is wound a few turns around shaft **19** and secured thereto. Shaft **19** carries a number of holes **25** through which passes the end of each cable to be secured thereto. The various holes **25** are separated by washers **26** between which the flexible cables are wound.

A return spring **27** is attached at one end to bracket **22** and at the other end to a flexible cable **27***a* which is wound a few turns around shaft **19** and secured thereto. When solenoids **1–9** are not energized, return spring **27** urges wheel **21** clockwise to a position in which a dog **28** on wheel **18** engages an abutment **29** on the side of housing **17**. At such a position digit "0" appears at window **20**.

FIGURE 4 shows a circuit diagram suitable for energization of solenoids **1–9**. Solenoids **1–9** are connected in series with switches S1–S9 respectively and adapted to be selectively energized by a battery B upon closure of a selected switch.

In response to energization of a predetermined solenoid the associated core **23** is drawn within the solenoid until stop **23***a* abuts the edge of the coil. The flexible member **24** attached to core **23** will rotate wheel **18** through an arc proportional to the distance between stop **23***a* and the edge of coil of the solenoid. The arc through which wheel **18** is rotated will determine the digit to be displayed at window **20**.

In order to more accurately position the digits 0–9 at window **20**, drum **18** may carry soft iron rivets **30** between each digit. The rivets **30** cooperate with a permanent magnet **31** positioned on the bottom of housing **17**.

In most instances, it is desirable to illuminate the displayed numbers. Therefore a lamp and socket assembly **32** is provided within drum **18** for illuminating the opalescent digits 0–9.

The display device may also include a lens **33** positioned in front of window **20** to magnify the outline of each digit appearing at window **20** and project its image to a depolished screen **34** of glass or plastic.

While the invention has been described with reference to a preferred embodiment, it is understood that various changes in form and details may be made without departing from the scope of the invention. For example, the optical system may not be needed, in which case the housing **17** would terminate at wall **21** and the characters would be seen at the window **20**. In this case, the characters could be printed on the periphery of an ordinary wheel and lamp assembly **32** eliminated.

In another form of the invention drum **18** could be made of metal with plastic digits around the periphery.

What is claimed is:

1. A display device comprising a frame, a shaft rotatably journalled on the frame, a wheel secured to the shaft and having characters spaced around its periphery, a

wall mounted on the frame adjacent the wheel periphery and having a window therein, and means for rotating the wheel to selectively position the characters at said window, said means comprising an elongated flexible member for each character having one end secured to the shaft and being wound thereon, and separate pulling means for each flexible member mounted on the frame, each member being attached at its other end to the respective pulling means, said pulling means being selectively operable to unwind the flexible member from the shaft predetermined differential amounts whereby the wheel is rotated to position the respective character at the window.

2. A display device comprising a housing, a shaft rotatably journalled in said housing, a wheel mounted on the shaft, said wheel having opalescent characters spaced about its periphery, said housing having an inside wall having a window therein, and means for rotating said wheel to display a character at said window, said means comprising an elongated flexible member for each character having one end secured to the shaft and being wound thereon, and separate pulling means for each flexible member mounted on the frame, each member being attached at its other end to the respective pulling means, said pulling means being selectively operable to unwind the flexible members from the shaft predetermined differential amounts whereby the wheel is rotated to position the respective character at the window, said housing further including means for illuminating the opalescent characters, optical means positioned in front of the window for magnifying the character at the window and a depolished

transparent screen forming a front wall of the housing for viewing the magnified image of the character appearing at the window.

3. A display device as defined in claim **2** in which said pulling means are solenoids having movable armatures, each armature including adjustable stop means positioned at predetermined locations along the length thereof to control its stroke.

4. A display device as defined in claim **2** including cooperating abutments on said wheel and said housing and spring means urging said wheel against the action of said pulling means to return said wheel after each energization thereof to a position where the above abutments contact each other.

5. A display device as defined in claim **2** including means to separate the flexible members wound on said shaft.

6. A display device as defined in claim **2** including means to accurately position each character in front of the window comprising soft iron rivets regularly spaced about the wheel and adapted to cooperate with a permanent magnet secured to the housing.

7. A display device as defined in claim **1** in which the characters on the wheel are made of opalescent material and further including means for illuminating the opalescent characters.

No references cited.

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