May 19, 1959 W. R. AIKEN 2,887,085

SIGNALLING DEVICE

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Fig. 1

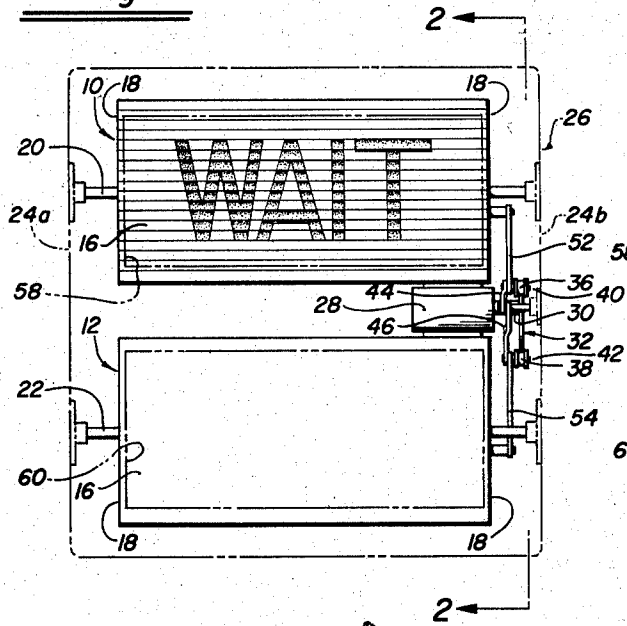


Fig. 2

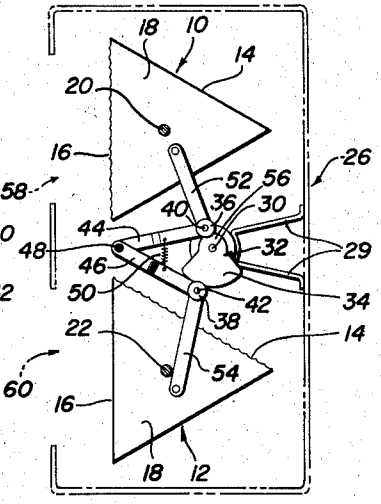


Fig. 3

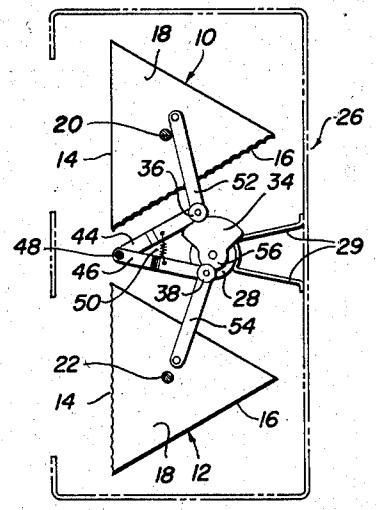


Fig. 4

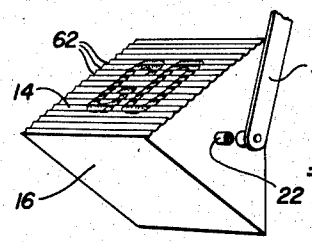


Fig. 5

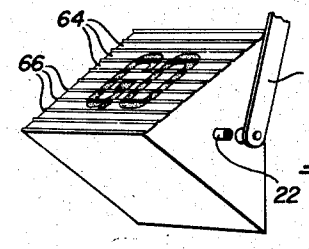
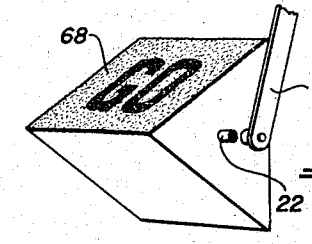


Fig. 6



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Fig. 9

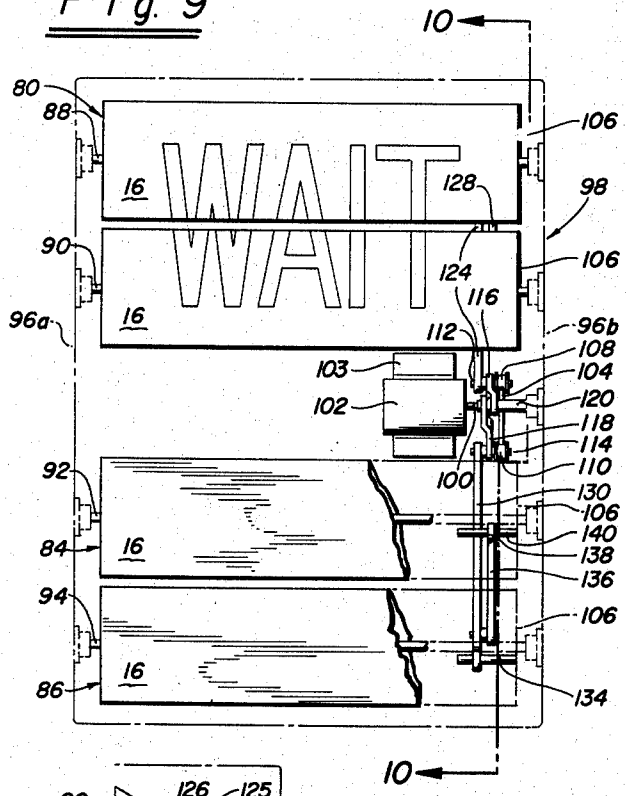
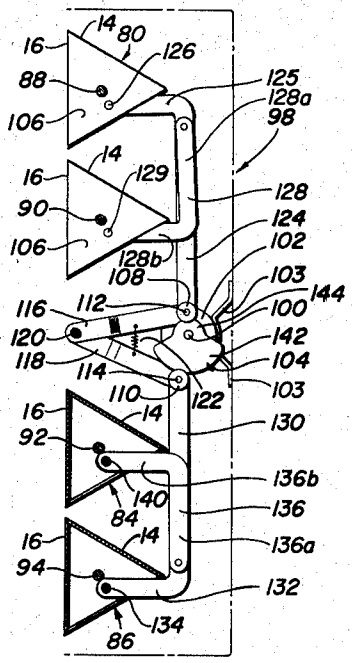


Fig. 10



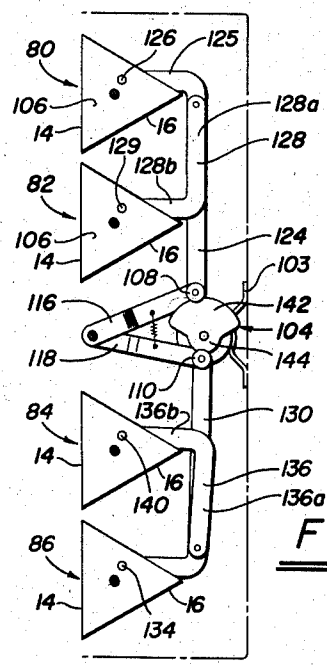


Fig. 11

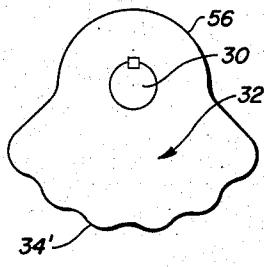


Fig. 7

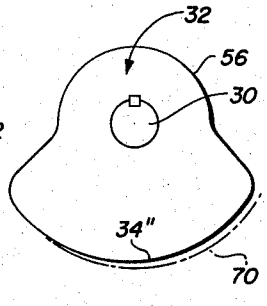


Fig. 8

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2,887,085

SIGNALLING DEVICE

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Application April 8, 1957, Serial No. 651,343

3 Claims. (Cl. 116—63)

The present invention relates to adjustable signalling devices of the type employed as traffic signs.

It is an object of my invention to provide a signalling device, of the type referred to, that is of simple construction, yet dependable in operation.

Another object of my invention is to provide a signalling device, of the type referred to, that is of compact construction.

More particularly it is an object of my invention to provide a signalling device, of the type referred to, that occupies a space of minimum width in a direction perpendicular to its display area.

Furthermore it is an object of the invention to provide a signalling device for use as traffic sign which is of such construction that its signs draw automatically the attention of the public.

Yet another object of my invention is to give to the display areas, of traffic signs of the type referred to, a shimmering appearance during operation of the devices.

These and other objects of my invention will be apparent from the following description of the accompanying drawing which illustrates certain preferred embodiments thereof and wherein—

Figure 1 is a front elevation of a traffic sign embodying my invention;

Figure 2 is a side elevation of the assemblage shown in Figure 1;

Figure 3 is a side elevation, similar to Figure 2, illustrating a different operational position of the device;

Figure 4 is a perspective of one of the signalling members of the assemblage illustrated in Figures 1, 2, and 3;

Figures 5 and 6 are perspectives of modified signalling members, such as may be used in the assemblage illustrated in Figures 1, 2, and 3;

Figure 7 is a side elevation of the cam employed to operate the signalling members of the assemblage illustrated in Figures 1, 2, and 3;

Figure 8 is a side elevation of a modified form of a cam that may be employed to operate the signalling members of the assemblage illustrated in Figures 1, 2, and 3;

Figure 9 is a front elevation of a modified form of a traffic sign embodying my invention; and

Figures 10 and 11 are side elevations thereof, illustrating different operational positions.

The embodiment of the invention illustrated in Figures 1, 2, and 3 comprises two vertically superposed signalling members **10** and **12**. Each of said members is formed by two walls **14** and **16** respectively, which are of rectangular shape and which are disposed relative to each other in the manner of a V (Figure 4). Said walls are joined along their side edges by webs **18** that may be of trapezoidal shape and through said webs extend horizontally disposed parallel spindles **20** and **22** upon which the members are mounted for rotation. The spindles in turn may be suitably secured in the side walls **24***a* and **24***b* of a cover or casing in the form of a flat upright box **26** indicated in phantom lines in Figures 1, 2, and 3.

The outer surface of rectangular wall **14** of the upper signalling member **10** presents a neutral field that may be painted in a plain color, while the outer surface of the other wall **16** may have marked thereon the instruction "Wait" as shown in Figure 1. As to the lower signalling member **12**, however, the outer surface of its wall **14** may have marked thereon the instruction "Go" as shown in Figure 4, while the outer surface of its wall **16** presents a neutral field that is painted in a plain color.

In accordance with my invention I provide cyclically operable means whereby the signalling members of the device are alternately adjusted to the position illustrated in Figures 1 and 2, wherein the upper signalling member **10** displays the instruction "Wait," while the lower signalling member displays its neutral field, and the position illustrated in Figure 3, wherein the upper signalling member displays its neutral field while the lower signalling member displays the instruction "Go." For this purpose a small electric motor **28** is suitably mounted within the casing **26**, such as by means of a bracket **29**, in the space and at a level between the upper and lower signalling members **10** and **12**, and is arranged, during operation of the device, to turn continuously a horizontally disposed shaft **30** that extends parallel to the spindles **20** and **22** of the signalling members **10** and **12**. Firmly mounted upon said shaft in a plane parallel and outwardly adjacent to one side of the signalling members is a cam **32** whose edge forms a single lobe **34** extending over one half of its circumference. Opposite points of said cam above and below the axis of its shaft are engaged by cam follower rollers **36** and **38** which are pivoted by means of studs **40** and **42** to the free ends of a pair of arms **44** and **46**, respectively, that are of equal length and which are rotatably mounted upon a common spindle **48**. Said spindle extends parallel to the spindles **20** and **22** and the cam shaft **30** and may suitably be held in one of the side walls of casing **26**. A spring **50** tensioned between the arms **44** and **46** holds the cam follower rollers **36** and **38** dependably in engagement with the edge of cam **32**. Pivotally engaged over the same studs **40** and **42** that connect the cam follower rollers **36** and **38** to the arms **44** and **46** respectively, are straight links **52** and **54** of equal length. The opposite or remote end of the upper link **52** is pivotally connected to the adjacent web **18** of the upper signalling member **10** at a point spaced from its spindle **20** in a direction radially opposite to the trace formed by its converging fields **14** and **16** and the remote end of the lower link **54** is pivoted to the adjacent web **18** of the lower signalling member **12** at a point radially removed from the spindle **22** of said member in a direction opposite to the trace formed by the converging fields thereof (Figure 4).

When the cam **32** is in the rotary position illustrated in Figure 2, wherein it presents its sector of small radius **56** to the upper cam follower roller **36** and its lobe **34** to the lower cam follower roller **38**, the lower fields of the two signalling members **10** and **12** are both disposed in a common vertical plane and are presented to the outside through suitable windows **58** and **60** (Figure 1) in casing **26**, while their upper fields **14** are removed from said windows and completely within the casing **26** and therefore invisible. In the case of the upper member the lower field **16** exhibits the instruction "Wait," while in the case of the lower member the exhibited field is a neutral area, as shown in Figure 1. However, when further rotation of cam **32** forces the upper cam follower roller **36** to climb upon its lobe **34** and causes the lower cam follower roller **38** to drop onto its sector of reduced radius under the force of spring **50**, the signalling members **10** and **12**, through the action of links **52** and **54** respectively, assume the positions illustrated in Figure 3, wherein both place their fields **14** into a common vertical plane and expose

them through the windows 58 and 60 to the outside. Since the field 14 of the lower member 12 bears the inscription "Go" and the field 14 of the upper member 10 is a neutral field, it is now the instruction "Go" that is brought to the attention of the public. It will be understood that by employing a cam whose lobe extends over more than 180° the device of the invention may be made to include a third position of adjustment wherein both the signalling members exhibit their neutral fields to the public.

In accordance with my invention I provide means that is automatically effective to draw the public's attention to the instruction appearing through the windows of casing 26. For this purpose I arrange the inscription-bearing fields of the signalling members in such a manner that different areas thereof reflect impinging light in different directions and I provide for gradual rotary, or oscillatory, movement of the signalling members when they are in the position in which they expose their inscription-bearing surfaces, such that the onlooker's eye is continually met by light reflected from different areas of the instruction-bearing surfaces. This causes a shimmering effect that draws the attention of motorists and pedestrians alike, so that the instructions of traffic signs embodying my invention are not likely to be overlooked. For this purpose the inscription-bearing fields of the signalling members may be formed by a polished metal surface that is fluted, i.e., is provided with adjacently positioned parallel grooves 62, as illustrated in Figure 4. Alternatively, the inscription-bearing surfaces may be formed by, or covered with, adjacently positioned differently edged strips 64 and 66, with each two adjacent strips made of a material of different light-reflecting characteristics, such as for instance, metal foils of different brightness, as illustrated in Figure 5. As a third alternative, the inscription-bearing fields may be arranged to present irregular surfaces to the outside, such as may be formed by crinkled foil, as shown at 68 in Figure 6. To oscillate, or gradually turn, the inscription-bearing surfaces of the signalling members when they are exposed to the public, in order that their fluted, striped, or crinkled surfaces may produce a shimmering effect upon the onlooker's eye, the lobe 34 of their common actuating cam 32 may have a sinuous or wavy edge as shown at 34′ in Figure 7, or the edge of said lobe may be arranged to be of a gradually increasing or decreasing radius, as shown at 34″ in Figure 8, wherein the course of a truly circular arc is indicated at 70 in dotted lines for comparison. Thus, when the lobe 34′ engages the cam follower roller of a signalling member and causes its inscription-bearing surface to be exposed through one of the windows in casing 26, the sinuous edge of the lobe will cause the member to oscillate slightly as it exposes its inscription-bearing surface. Alternatively, the deviation of the lobe edge 34″ from a strictly circular conformation, will effect a very slight rotary increment of the signalling member and hence of its exposed surface, and as a result the exposed inscription-bearing area will exhibit a peculiar shimmering effect that is difficult to overlook. This increases substantially the safety in the use of traffic signals of the type here under consideration.

Figures 9, 10, and 11 illustrate the manner in which a traffic signal embodying my invention may be constructed, when it is desired that the device be of particularly narrow width in a direction perpendicular to the front face of the traffic sign. In such a case each of the inscription-bearing fields of the apparatus may be formed by the corresponding areas of two superposed signalling members of the same construction as, but smaller size than, the signalling members illustrated in connection with the first discussed embodiment of the invention. To this end the embodiment of the invention illustrated in Figures 9, 10, and 11, comprises two pairs of superposed, vertically spaced, signalling members 80, 82, and 84, 86, that are mounted for rotation in alignment upon two pairs of vertically superposed, parallel spindles 88, 90, and 92, 94, respectively. Said spindles are held in the side walls 96*a* and 96*b* of an elongated casing 98 above and below and slightly forwardly of a horizontally disposed cam shaft 100 that is driven by an electric motor 102 which is supported from the casing 98 by a suitable bracket 103. Mounted upon shaft 100 is a cam 104 which may be of the same conformation as any one of the cams described in connection with the initially discussed embodiment of the invention and which may be located at a point intermediately of the vertical planes determined by the end or side webs 106 of the signalling members, as shown in Figure 9, to keep the frontal width of the device at a minimum. At opposite points the edge of the cam 104 is engaged by cam follower rollers 108 and 110 which turn upon studs 112 and 114 respectively, that project laterally from the ends of arms 116 and 118. These arms are rotatably mounted upon a common horizontal spindle 120 that extends inwardly from one of the side walls of casing 98. A spring 122 tensioned between the arms 116 and 118 maintains the cam follower rollers in contact with the edge of cam 104. Pivotally engaged over the upper stud 112 is the lower end of an actuating link 124 that extends upwardly to the level of the upper signalling member 80 and whose upper end is bent in the manner of an L or elbow, as shown at 125, to reach into the interior of said member wherein it is pivotally engaged over a stud 126 that projects inwardly from the adjacent side web 106 of said member 80. To actuate the lower twin 82 of the upper pair of signalling members in unison with said last mentioned member 80, an L-shaped link 128 is pivotally connected with the free end of its long bar 128*a* to the main actuating link 124 near the elbow bend thereof, as shown in Figure 10 and its short bar 128*b* reaches into the interior of the lower signalling member 82, where it is pivotally engaged over a stud 129 that projects inwardly from the adjacent side web 106 of said member. The linkage train for aligned actuation of the lower pair of signalling members 84 and 86 is of symmetrically identical construction and comprises a main actuating link 130 that is pivotally engaged over stud 114 and which has an elbowed end 132 that reaches into the interior of the lower twin 86 of said pair of members, where it is pivotally engaged over a stud 134 (Figure 10) that projects inwardly from the adjacent side web 106 of said member. Pivoted to said main link 130 is an auxiliary link 136 in the shape of an inverted L whose shorter bar 136*b* reaches into the interior of the upper twin 84 of said members, where it is pivotally engaged over a stud 140 that projects inwardly from the adjacent side web of said member.

In operation all the signalling members 80, 82, 84, and 86, present their lower fields 16 to the outside when the cam 104 presents its lobe 142 to the lower cam follower roller 110 and its sector of reduced radius 144 to the upper cam follower roller 108. In the case of the upper pair of signalling members these fields 16 bear the instruction "Wait," as shown in Figure 9, while in the case of the lower pair of signalling members the fields 16 are neutral and carry no inscription. As the cam 104 turns and moves its lobe 142 underneath the upper cam follower roller 108, while permitting the lower cam follower roller 110 to drop onto its sector of reduced radius 144, the resultant upward movement of link 124 turns the uppermost signalling member upon spindle 88 into the position illustrated in Figure 11, wherein it presents its neutral upper field 14 to the outside. The upward thrust of link 124 is also effective, through auxiliary link 128, to turn the member 82 into the same position as member 80 so that both upper members present their neutral fields to the outside. At the same time, however, the spring 122 raises the lower link 130 which pulls the lowermost member 86 into the position illustrated in Figure 11, wherein it presents its upper field 14 to the outside; and the auxiliary link 136 forces the upper one 84 of the lower sig-

nalling member to follow suit. Inscribed over both said fields may be the instruction "Go" which is now exhibited to the public. As in the case of the device illustrated in Figures 1, 2 and 3, the device of the invention illustrated in Figures 9, 10 and 11 may employ a cam of such conformation as to provide a third position of adjustment wherein all the signalling members present their neutral fields to the outside.

The signalling devices of my invention are of the simplest construction requiring but a single cam and the simplest linkage trains for actuation. Both embodiments of the invention illustrated in the drawings and described hereinbefore are extremely compact and require a minimum of space. This is due to the fact that the cams **32** or **104** respectively, the cam shafts **30** and **100**, and the motors **28** and **102** are disposed intermediately of the signalling members. The embodiment of the invention illustrated in Figures 1, 2, and 3, requires only straight links for actuation due to the position of the cam **32** in a plane parallel and outwardly adjacent to one of the sides of the signalling members. The embodiment of the invention illustrated in Figures 9, 10, and 11, requires even less space than the embodiment shown in Figures 1, 2, and 3, if compared on the basis of letters of equal size, because of the fact that the rotary orbits of the signalling members **80**, **82**, **84**, and **86**, are much smaller than those of the signalling members **10** and **12**. Hence the width of the cover or casing **98** in a direction perpendicular to the display area of the device may be made substantially smaller than in the case of the embodiment of the invention illustrated in Figures 1, 2, and 3. Also, its frontal width may be made substantially smaller for letters of equal size because of the disposition of the control cam **104** and of the actuating linkages in the space intermediately of the vertical planes determined by the side or end webs **106** of its signalling members. This reduction in the frontal width of the device may be accomplished without materially increasing the depth of the casing beyond the depth required by the orbits of the signalling members due to the L-shaped conformation of the links **124**, **130**, and **128**, **136**, respectively, which make it possible for the long bars of said links to be located in a vertical tangential plane behind and closely adjacent to the rotary orbits of the signalling members, as illustrated in Figures 10 and 11.

Another most important advantage of the signalling devices of my invention is the shimmering effect of its instruction-bearing fields which I obtain with a minimum of added expense, and which imparts to the devices of my invention a degree of safety that is far superior to other signalling devices of comparable cost and simplicity of construction.

While I have explained my invention with the aid of certain exemplary embodiments thereof, it will be understood that the invention is not limited to the specific constructional details shown by way of example, which may be departed from without departing from the spirit and scope of the invention.

I claim:

1. A signalling device comprising a signalling member mounted for rotation and having at one side thereof a light-reflecting outer display surface of uneven conformation, and a mechanism including a rotary cam and a linkage interposed between the cam and the signalling member for rotating said member into a display position wherein said display surface thereof faces in a predetermined direction, said mechanism including means effective to oscillate said member while it is in said display position so as to cause its display surface to shimmer while it faces in said predetermined direction.

2. A signalling device comprising a rotary signalling member having at one side thereof an outer light-reflecting display surface of uneven conformation, means mounting said member for rotation into a display position wherein said display surface thereof faces in a predetermined direction, and a cyclically operable mechanism for moving said member into said display position, maintaining it in said display position for a predetermined period of time and moving it out of said display position, said mechanism including a rotary cam and an actuating linkage interposed between said cam and said member, the sector of the cam circumference corresponding to the display position of said member being of sinuous conformation to cause said member to oscillate slightly, while it is in said display position, and thus impart a shimmering appearance to said display surface thereof.

3. A signalling device comprising a rotary signalling member having at one side thereof an outer light-reflecting surface of uneven conformation, means mounting said member for rotation into a display position, and a cyclically operable mechanism for moving said member into said display position, maintaining it in said display position for a predetermined period of time and moving it out of said display position, said mechanism including a rotary cam and an actuating linkage interposed between said cam and said member, the sector of the circumference of said cam corresponding to the display position of said member being of such conformation as to depart slightly from a circular arc so as to effect a slight rotational movement of said member, while it is in said display position, and thus impart a shimmering appearance to said display surface thereof.

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