

July 10, 1934.

U. S. RUSH

1,965,751

SIGNALING DEVICE

Original Filed June 27, 1927

3 Sheets-Sheet 1

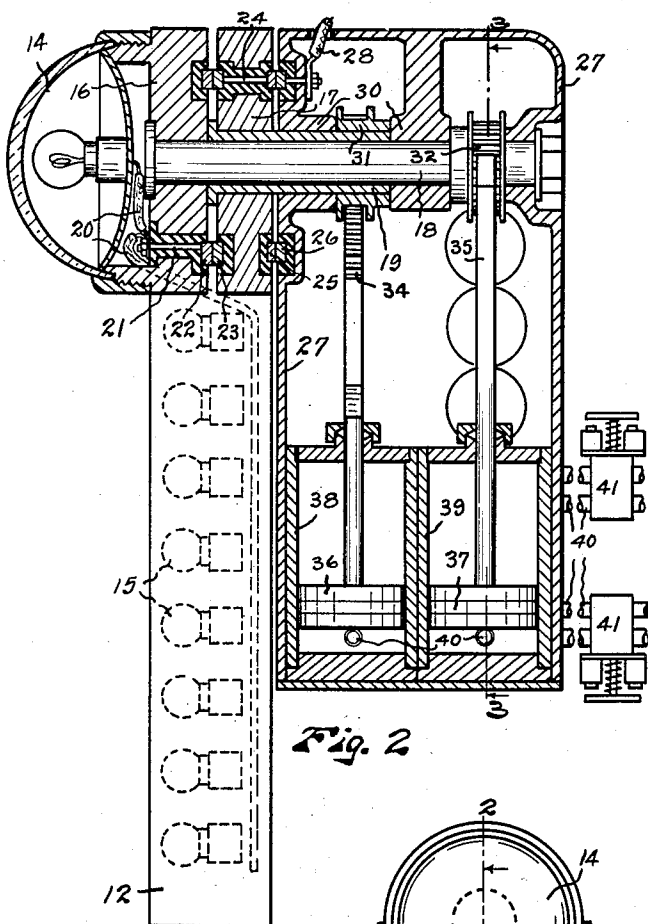


Fig. 2

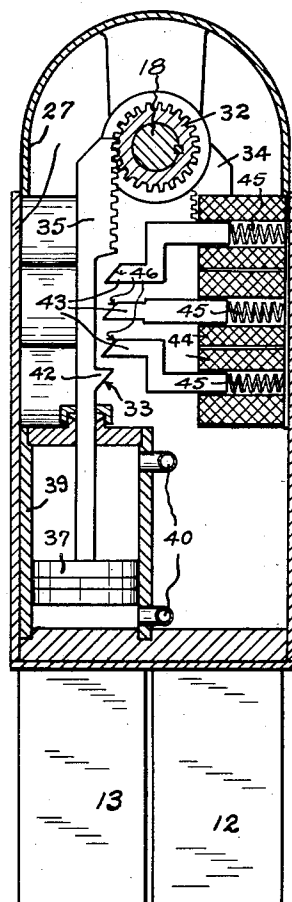
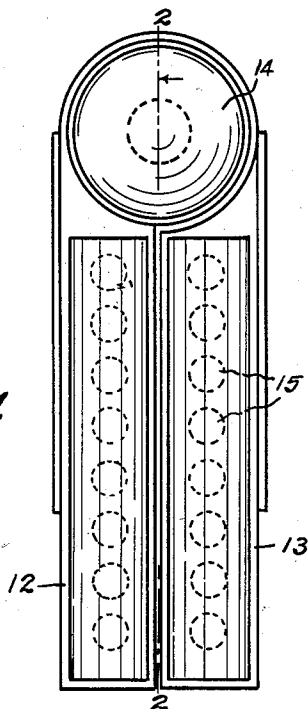


Fig. 3

Fig. 1



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3 Sheets-Sheet 2

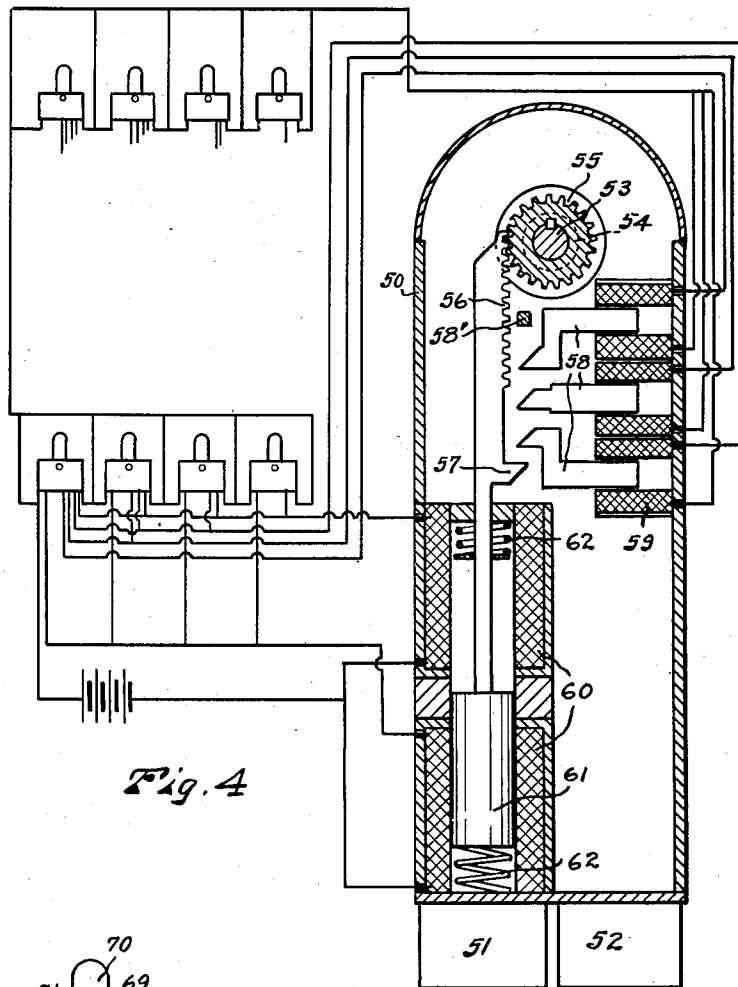


Fig. 4

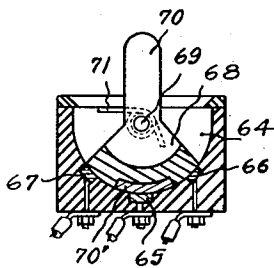


Fig. 5

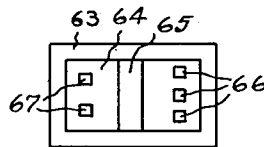


Fig. 6

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3 Sheets-Sheet 3

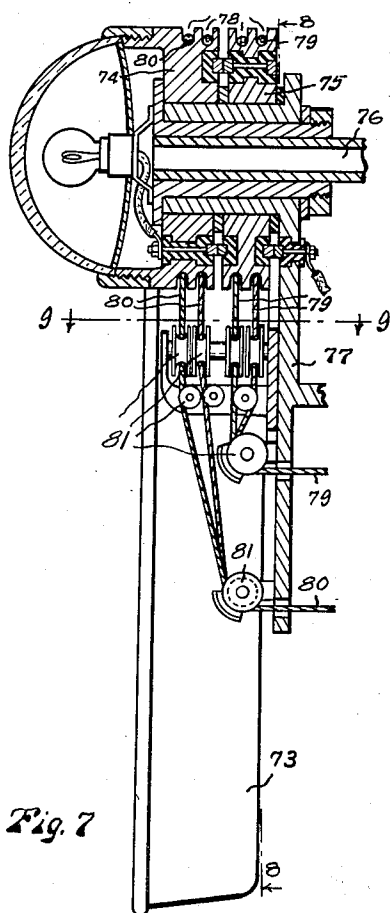


Fig. 7

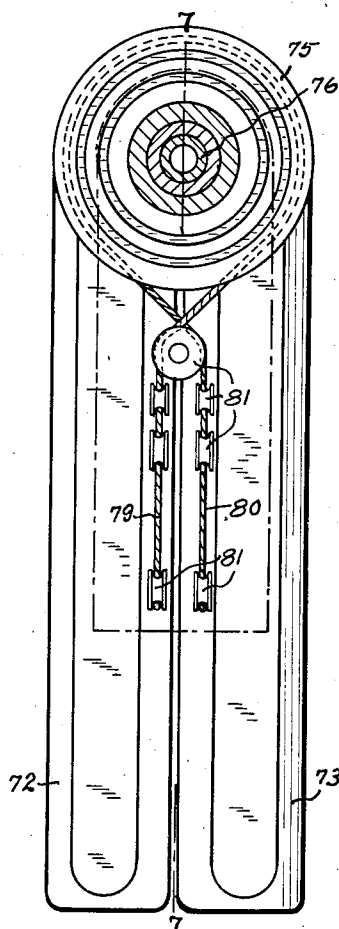


Fig. 8

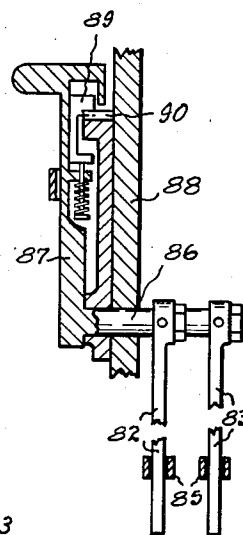


Fig. 11

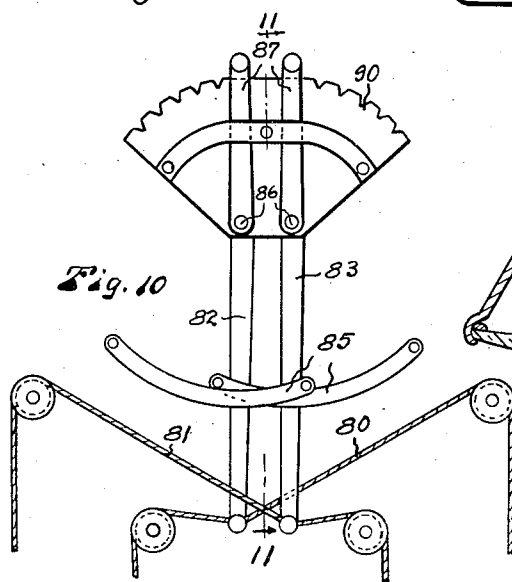


Fig. 10

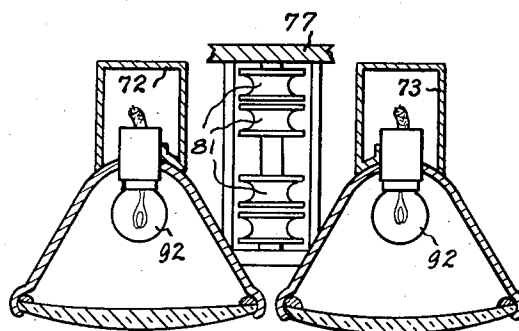


Fig. 9

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UNITED STATES PATENT OFFICE

1,965,751

SIGNALING DEVICE

Ulysses S. Rush, Salchuck, Territory of Alaska

Original application June 27, 1927, Serial No. 201,802, now Patent No. 1,852,540, dated April 5, 1932. Divided and this application July 2, 1928, Serial No. 289,706

4 Claims. (Cl. 177—329)

My invention relates to improvements in signaling devices and my present application constitutes a division of my prior application Serial Number 201,802 filed June 27, 1927, patented April 5, 1932, No. 1,852,540.

The object of this invention is to provide means by which pre-arranged, mutually understood, signals may be produced, to communicate desired information to persons within the range of vision of the signaling device.

This signaling device is especially well adapted to be installed on movable conveyances, as motor vehicles, or air or water craft, for the purpose of giving signals required by law, or signals established by common usage, relative to the intentions and wishes of the person operating the vehicle or air or water craft. The signaling device may, however, be adapted for various other uses.

An important object of my invention is to provide a compact and efficient signaling device in which two signal arms are pivotally mounted for swinging movement in the same plane, each of said signal arms being in the form of a receptacle of substantial thickness to afford room within the signal arm for a plurality of lamp bulbs, the mounting of said two signal arms so that they will swing in the same plane affording a very compact construction which may be installed and operated in a relatively small space.

Another object of my invention is to provide a signal embodying a plurality of arms or semaphores mounted for swinging movement from a neutral position into various signaling positions and arranged to be moved by means that may be controlled by an operator located at any desired distance from the signal, said control embodying both signal operating means, and stop means for predetermining the amount of movement of the signal.

Further objects are to provide a signalling device of this nature which may be operated and controlled either by electric means, by fluid pressure means or by hand power means, and to provide a signal which is adapted either for day or night use.

A still further object is to provide a signal of this nature which may be equipped with two or more signal arms, movable to various different signaling positions to thereby produce different signaling combinations which may conform to any predetermined signal code. A great number of signals is not necessary for ordinary motor vehicle use but may be desirable in some other uses to which this signal may be adapted.

With the above and other objects in view, as

will be apparent from the following description, the invention consists in the novel construction adaptation and combination of parts of a signal, as will be more clearly described and claimed.

In the drawings Figure 1 is a view in end elevation of a signaling device constructed in accordance with my invention.

Fig. 2 is a view in vertical section of the same substantially on broken line 2—2 of Fig. 1.

Fig. 3 is a sectional view substantially on broken line 3—3 of Fig. 2.

Fig. 4 is a combined sectional view and wiring diagram of a signaling device similar to the one shown in Figs. 1, 2 and 3 except that the device shown in Fig. 4 is operated and controlled electromagnetically instead of by fluid pressure means.

Fig. 5 is a sectional view of one form of electric switch which may be used in connection with the signal device shown in Fig. 4.

Fig. 6 is a plan view looking down into the housing of said switch with the cover plate and throw member of the switch removed.

Fig. 7 is a sectional view on broken line 7—7 of Fig. 8 of a modified form of this signal device which is adapted to be operated by hand by means of a cable control.

Fig. 8 is a view partly in rear elevation and partly in section substantially on a broken line 8—8 of Fig. 7.

Fig. 9 is a sectional view on a larger scale on broken line 9—9 of Fig. 7.

Fig. 10 is a somewhat diagrammatic detached elevation of a lever control for the cable operated devices shown in Figs. 7, 8 and 9.

Fig. 11 is a fragmentary detached sectional view of said lever control devices taken substantially on a broken line 11—11 of Fig. 10.

Like reference numerals designate like parts throughout the several views.

Referring to Figs. 1, 2 and 3 I show a signaling device constructed in accordance with my invention and embodying two swingingly mounted signal arms 12 and 13 adapted to hang vertically when no signal is being given and to be swung in opposite directions in giving a signal. The arms 12 and 13 are independently movable to different signaling positions and make possible the display of a large number of different signals which can not be shown or displayed by the use of a single arm, it being obvious many different signals may be formed by varying the relative positions of the two arms.

The signal arms 12 and 13 are provided with a single large lamp or bulls eye 14 arranged in

prolongation of the axis about which said arms swing, said lamp 14 being common to the two arms. The arms 12 and 13 are of hollow construction and are provided with a plurality of smaller lamps 15 distributed longitudinally along said arms. The signal arms 12 and 13 have hubs 16 and 17 respectively formed at their upper ends, the hub 16 being secured to a shaft 18 and the hub 17 being secured to a sleeve 19 that is rotatable on the shaft 18. Current for the lamps 14 and the lamps 15 is supplied through circuit wires 20 connected by an insulated post 21 with a contact ring 22 on the back of the hub 16. The contact ring 22 is engaged by a contact ring 23 which is connected by a post 24 with another contact ring 25 that rubs against still another contact ring 26 on the front of a housing 27. All of the contact rings and posts are necessarily embedded in insulating material and current may be supplied to the ring 26 through a wire 28. The shaft 18 and sleeve 19 are both rotatably mounted in suitable bearings 30 in the upper portion of the housing 27. Due to the fact that the sleeve 19 is rotatable on the shaft 18 and said shaft 18 is rotatable within the sleeve 19 it will be apparent that the bearings for the sleeve help to support the shaft and the bearings for the shaft help to support the sleeve. The housing 29 is arranged parallel with the signal arms 12 and 13 and contains the means for operating said signal arms. In this form of signaling device the operating means disclosed in the drawings comprise two flanged gearwheels 31 and 32 secured to the sleeve 19 and shaft 18 respectively and engaged respectively by gear racks 34 and 35. The gear racks 34 and 35 are positioned on opposite sides of their respective gearwheels 31 and 32 for rotating the shaft 18 and the sleeve 19 oppositely to swing the signal arms upward in opposite directions, and said gear racks are respectively connected with pistons 36 and 37 in cylinders 38 and 39. Fluid under pressure is admitted to and exhausted from the cylinders 38 and 39 through conduit pipes 40 that are connected with electromagnetically operated valves 41 which may be controlled by the opening and closing of switches, not shown, which are located at any desired distance from the signal, the wiring and switch mechanism used in connection with this form of the invention not being shown in detail. The rack bars 34 and 35 each have a ratchet lug 42 provided thereon that is adapted to be engaged by a plurality of stop plungers 43 arranged in the path of movement of said lug to predetermine the position or the amount of the rack bar. The plungers are slidable within electromagnets 44 one electromagnet being provided for each plunger, the electromagnets being adapted, when energized, to retract the plungers and the plungers being normally held outwardly in the path of the lug 42 by springs 45. The plungers 43 act as positive stops to limit the upward movement of the rack bars 34 and 35 except when they are retracted by the electromagnets 44 but the ends of said plungers are inclined on their upper sides as at 46 so that the inclined lower sides 33 of the ratchet lugs 42 will ride over and retract the plungers as the rack bars move downwardly.

In the operation of the signal shown in Figs. 1, 2 and 3 when a signal is to be given the proper electromagnet 44 is first energized by the closing of a suitable switch to retract one or more of the plungers properly for the signal. The valve or valves 41 are then opened to admit the nec-

essary motive agent and raise the signal arms until they are stopped by the previously positioned plunger or plungers 43. After the signal is given the valves 41 are opened to exhaust the signal arms are allowed to return to neutral and the electromagnets 44 are de-energized allowing the springs to return the plunger 43 to normal.

In Figs. 4, 5 and 6 I show a modified form of signal and operating mechanism therefor which conforms substantially with the signal shown in Figs. 1, 2 and 3 except that this device is entirely electrically operated. In said Fig. 4, I show a housing 50 having two signal arms 51 and 52 connected therewith for swinging movement in opposite directions in the same manner as shown in Fig. 1, said arms being secured to a shaft 53 and a sleeve 54 respectively that have gearwheels 55 only one of which is shown secured thereon. Said gearwheels 55 are engaged by rack bars 56 having pawls 57 arranged to be engaged by stop plungers 58 operated by electromagnets 59. The rack bars 56 extend downwardly into double electromagnets or solenoids 60 and are connected with cores 61 that are adapted to be moved by the electromagnets 60 to transmit movement through the rack bars 56, gearwheels 55 and shaft 53 or sleeve 54 to one or both of the signal arms 51 or 52. In each electromagnet there are upper and lower buffer springs 62 to cushion what otherwise might be a shock at the end of travel of the core 61. In this form of device I show three of the positioning electromagnets 59 in connection with each rack bar and provide positive fixed stops 53' only one of which is shown to limit the maximum upward movement of the rack bars. The wiring and electrical connections to the various electromagnets shown in Fig. 4 is not herein described in detail. In the diagram a portion of the wiring is omitted. The switches for controlling the circuits to the electromagnets 59 and 60 may be of the form shown in Figs. 5 and 6 so that the current may be conveniently switched from one to the other of said electromagnets to reverse the direction of movement of the core 61 or to return said core to the inoperative position. This switch comprises a housing 63 having an arcuate receptacle 64 in the bottom of which is embedded a common terminal or contact 65 and two sets of contacts 66 and 67. An oscillating contact member 68 pivoted at 69 and having finger piece 70 is provided with an insert of conductive material 70' adapted to bridge the common terminal 65 and either one of the sets of contacts 66 and 67 when said contact member moved to either side of the central position. A spring 71 normally holds the contact member 68 in the inoperative position shown in Fig. 5.

In Figs. 7 to 10 inclusive I have shown a form of signal adapted to be operated by hand, said signal embodying two signal arms 72 and 73 having cylindrical hubs 74 and 75 respectively that are rotatably mounted on a tubular bearing member 76 which is supported by a frame plate 77. The hubs 72 and 73 are each provided with grooves 78 around which, operating cables 79 and 80 respectively are looped. The operating cables 79 and 80 pass outwardly between the signal arms 72 and 73 preferably to the rear, over guide sheaves 81 that are supported from the frame bracket 77 and said operating cables are conducted to a remote point and there connected with the bottom ends of operating levers 82 and 83 that are movable between guides 85. The upper ends of operating levers 82 and 83 are con-

connected with stub shafts 86 Fig. 11 on hand levers 87. The stub shafts 86 are pivotally mounted in fixed plates 88 and the hand levers 87 are provided with spring pressed detent members 89 movable over notched segments 90.

Movement of either hand lever 87 will move the operating lever that is connected therewith, causing it to transmit movement through the cable 80 or 81 to the signal arm 72 or 73 that is connected therewith. In this way the signal arms 72 and 73 are moved into various signaling positions. The signal device of Figs. 7 to 11 has a larger, axially arranged signal lamp 91 and the signal arms 72 and 73 are each provided with a plurality of smaller lamps 92. Contact and conductor means similar to that described in connection with Figs. 1, 2 and 3 is provided for supplying current to the lamps.

In all of the signal devices hereinbefore described the same principle of operation is maintained, the signaling being accomplished by two swinging arms arranged to be held in a plurality of different positions to give different signals.

The lights in the several signals may be varied as to color, number, size and arrangement as desired.

The foregoing description and accompanying drawings clearly disclose a preferred embodiment of my invention, but it will be understood that this disclosure is merely illustrative and that such changes may be made as are fairly within the scope and spirit of the following claims.

What I claim is:—

1. In a signal device of the class described, a housing having three aligned bearings positioned respectively in the front wall in the rear wall and substantially medially between the front and rear wall of said housing, a tubular shaft extending from the exterior of said housing inwardly through the bearing in said front wall and abutting against said medial bearing, a relatively thick hollow signal arm secured to said tubular shaft on the exterior of said housing in close proximity to the front wall of said housing, another shaft extending through said tubular shaft and journaled in said medial bearing and said rear wall bearing, another relatively thick hollow signal arm secured to said last named shaft external to said housing, said two signal arms being respectively offset to opposite sides of a plane passing through the common axis of said tubular shaft and said other shaft and said last named signal arm being positioned alongside of said first mentioned signal arm in the same plane as said first mentioned signal arm, lamp bulb means in each of said signal arms, operating means, and devices connecting said operating means with said signal arms for angularly moving said signal arms.

2. In a signal device of the class described, a housing having three aligned bearings positioned

respectively in the front wall in the rear wall and substantially medially between the front and rear wall of said housing, a tubular shaft extending from the exterior of said housing inwardly through the bearing in said front wall and abutting against said medial bearing, a relatively thick hollow signal arm secured to said tubular shaft on the exterior of said housing in close proximity to the front wall of said housing, another shaft extending through said tubular shaft and journaled in said medial bearing and said rear wall bearing, another relatively thick hollow signal arm secured to said last named shaft external to said housing, said two signal arms being respectively offset to opposite sides of a plane passing through the common axis of said tubular shaft and said other shaft and said last named signal arm being positioned alongside of said first mentioned signal arm in the same plane as said first mentioned signal arm, lamp bulb means in each of said signal arms, an operating member on said tubular shaft between said front bearing and said medial bearing; another operating member on said other shaft between said medial bearing and signal arm moving means connected with said operating members.

3. In a signal device of the class described, two hollow signal arms of substantial thickness each affording a lamp receptacle, lamp globe means mounted within each of said signal arms, a light conductive front side on each of said signal arms, a support, pivot means mounting said two signal arms on said support in side by side relation for swinging movement in the same plane, said two signal arms being respectively offset to opposite sides of a plane passing through the axis of said pivot means, and signal arm operating means connected with said two signal arms, whereby said two signal arms may be moved angularly in the same plane.

4. In a signal device of the class described, a housing, two co-axial pivot shaft members protruding unequal distances from said housing, one of said shaft members extending through the other shaft member and projecting beyond the outer end of said other shaft member, two hollow signal arms of substantial thickness secured on the respective shaft members externally of said housing and positioned in side by side relation in the same plane, said two signal arms being respectively offset to opposite sides of a plane passing through the axis of said pivot means, lamp globe means mounted in each of said signal arms, a light conductive front side on each of said signal arms, operating means within the housing connected with the shaft members whereby said two signal arms may be moved angularly in the same plane, and stop means connected with the operating means whereby the amount of movement of the operating means may be predetermined.

ULYSSES S. RUSH.