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J. R. HANSEN

2,141,980

AUTOMATIC SIGNALING APPARATUS

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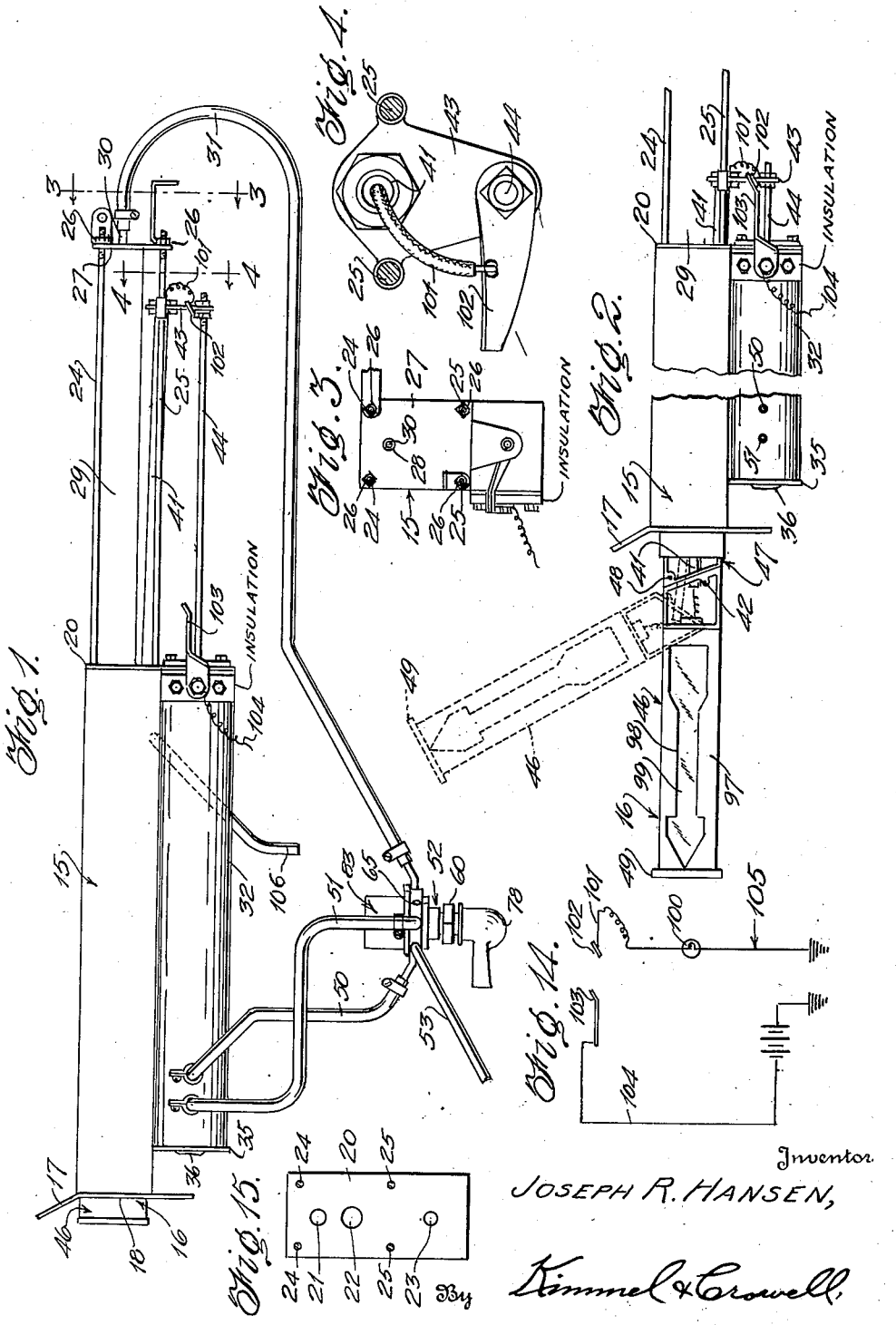

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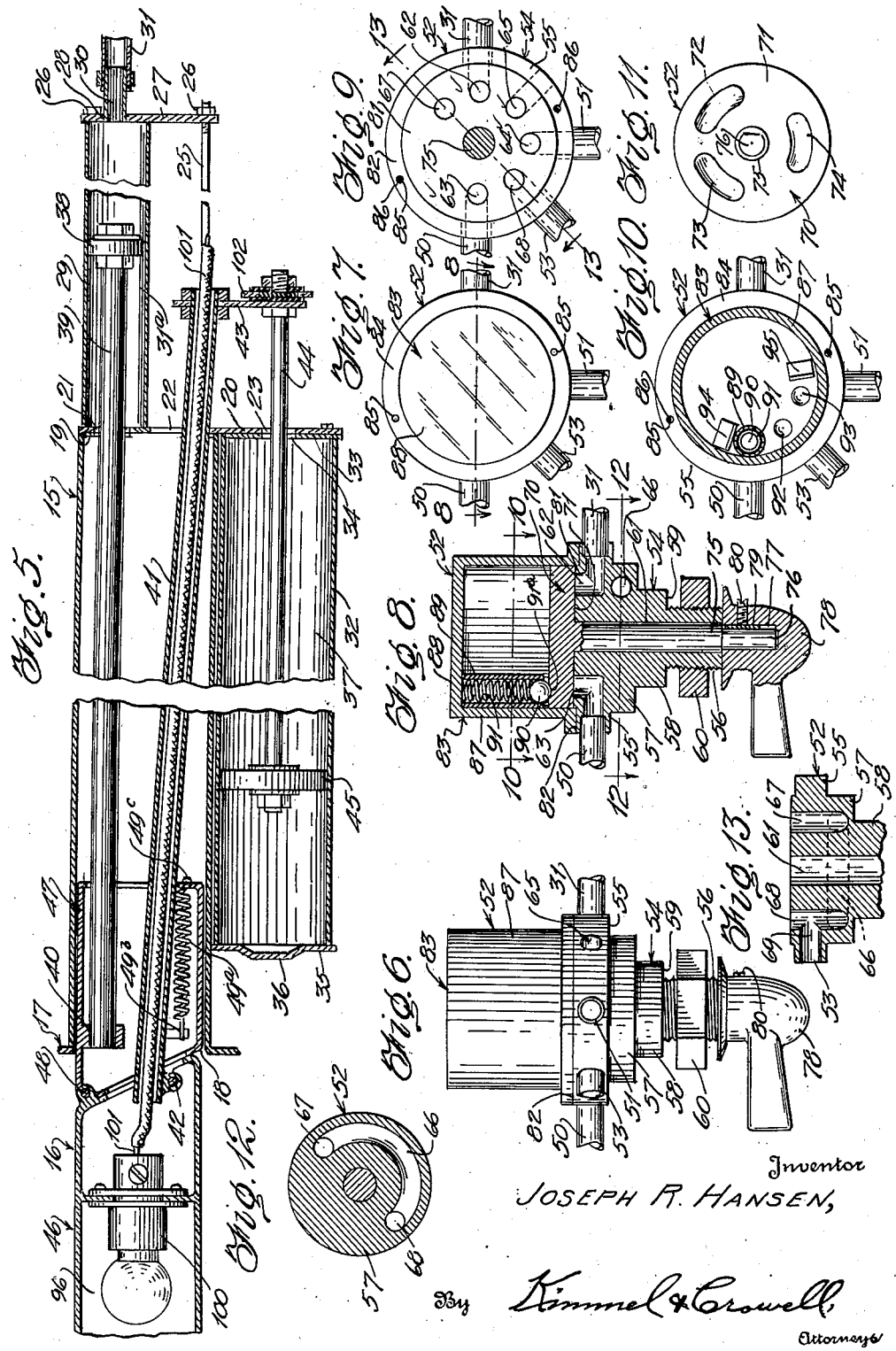
2 Sheets-Sheet 2



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AUTOMATIC SIGNALING APPARATUS

Joseph R. Hansen, Hanford, Calif.

Application [redacted] Serial No. 145,837

4 Claims. (Cl. 116—39)

This invention relates to an automatic signaling apparatus designed primarily for use on automobiles, trucks and trailers, but it is to be understood that an apparatus in accordance with this invention is to be used in any connection for which it is found applicable.

The invention has for its object to provide, in a manner as hereinafter set forth, a signaling apparatus including a signal arm capable of being extended to different signaling positions and with the positions of the arm selectively controlled by a vacuum created by the propulsion means for the vehicle with which the signaling apparatus is associated.

The invention has for its further object to provide, in a manner as hereinafter set forth, a signaling apparatus including a projectable and retractable signal arm having its projected and retracted movements controlled from a vacuum created by the propulsion means for the vehicle with which the signaling apparatus is associated.

The invention has for its further object to provide in a manner as hereinafter set forth, a signaling apparatus including a signal arm capable of being selectively extended to signaling positions i. e., in a horizontal plane to indicate left turn and in an inclined plane with respect to the horizontal to indicate right turn and slow, and automatic operable means controlled by the vacuum created by the propulsion means of the vehicle with which the signaling apparatus is associated for extending the arm from normal to its selected signaling position and for retracting it from signaling position to normal.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a signaling apparatus for the purpose referred to which is comparatively simple in its construction and arrangement, strong, durable, for installation within the vehicle with which it is to be associated, selectively controlled, vacuum operated, automatic in its action, thoroughly efficient in use, readily assembled and comparatively inexpensive to manufacture.

With the foregoing and other objects which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as more specifically referred to and illustrated by the accompanying drawings wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a side elevation of the signaling apparatus,

Figure 2 is a fragmentary view in side elevation showing the signal arm, in full lines in left turn signaling position and in dotted lines in right turn and slow signaling position,

Figure 3 is a section on line 3—3, Figure 1,

Figure 4 is a section on line 4—4, Figure 1,

Figure 5 is a fragmentary view in longitudinal section of the apparatus,

Figure 6 is a side elevation of the controlling valve structure,

Figure 7 is a top plan view of the controlling valve structure,

Figure 8 is a section on line 8—8, Figure 7,

Figure 9 is a top plan view of the controlling valve structure with the cap thereof removed,

Figure 10 is a section on line 10—10, Figure 8,

Figure 11 is an inverted plan of the valve member of the controlling valve structure,

Figure 12 is a section on line 12—12, Figure 8,

Figure 13 is a section on line 13—13, Figure 9,

Figure 14 is a diagrammatical view of the illuminating circuit, and

Figure 15 is an elevation looking towards the outer face of the closure plate for the rear end of the combined guide and housing element for the signal arm.

The apparatus includes a horizontally disposed combined guide and housing element 15 for an extendible, retractable and angularly adjustable signaling arm or element 16. The element 15 is to be installed within the vehicle with which the apparatus is associated in a manner to enable for the arm 16 to be extended laterally to signaling position from one side of the vehicle and retracted from such position. When used in connection with a motor vehicle it is preferably arranged forwardly of the instrument board, but disposed in the same manner aforesaid in connection with a side of the motor vehicle. That side of the vehicle with which the apparatus is to be associated is to be so formed to permit of the element 16 being extended and retracted laterally with respect to such side. The outer end of the element 15 may be either fastened permanently to a side of the vehicle or provided with a cap piece 17 drawn firm against and secured to said side. The inner end of element 15 may be anchored to the body of the vehicle by any suitable means. The element 15 preferably will be of square cross section. The outer end 18 of element 15 is open. The inner end 19 of element 15 is closed by a rectangular closure plate 20

which depends from the bottom of element 15. The plate 20 is formed with superposed spaced upper, intermediate and lower openings 21, 22, 23 respectively which are intersected centrally by the vertical median of said plate. Integral with the outer face of plate 20 is a pair of parallel rearwardly extending upper tie bars 24 and a pair of lower rearwardly extending combined guide and tie bars 25. The bars 24 are arranged at the upper corners of plate 20. The bars 25 are disposed centrally of plate 20 and align with the bars 24. The rear ends of the bars 24, 25 are threaded and carry clamping nuts 26. Mounted on the rear ends of the bars 24, 25 is a vertical clamping plate 27 formed near its upper end centrally thereof with an opening 28. Clamped between the plates 20, 27 is a piston cylinder 29 having its forward end abutting plate 20 and surrounds in spaced relation the opening 21. The rear end of cylinder 29 abuts the plate 27 and surrounds in spaced relation the opening 28. Anchored to the wall of opening 28 is the intake nipple 30 of a combined air supply and suction line 31. The cylinder 29 forms a combined air intake and suction chamber 31a.

Suspended below the element 15 is a cylinder 32 having its inner end formed with an axially apertured closure head 33. The opening in head 33 is indicated at 34. The outer end of cylinder 32 is closed by a head 35 having its central portion offset as at 36 to provide a clearance. The head 35 is anchored to the bottom of and depends from element 15 in proximity to the outer end of the latter. The cylinder 32 in connection with the head 35 provides a combined air intake and vacuum chamber 37. The cylinder 32 is arranged between and anchored to the head 35 and the lower portion of plate 20. The opening 34 in head 33 registers with the opening 23 in plate 20.

Operating in the cylinder 29 is a piston head 38 which is connected to the rear end of a piston rod 39. The latter extends through opening 21 into the element 15 and into element 16. The forward end of rod 39 is connected to element 16, intermediate the ends of the latter, as at 40. The piston head 38 and rod 39 constitutes a suction operated retractor for the element 16. The retractor is held by suction in a retracted position when the element 16 is inactive, but moves with the latter when element 16 is shifted to active position.

Extending through opening 22 into element 15 and into element 16 is a spring controlled tube 41 which inclines upwardly from its inner to its outer end. The outer end of tube 41 is pivotally connected to element 16, as at 42. The rear end of tube 41 is secured, to a depending combined guide, suspension and coupling plate 43 which is slidably mounted on the rods 25 and encompasses and is anchored to the rear end of a piston rod 44. The latter extends through the registering openings 23, 34 into the vacuum chamber 37 and has its forward end anchored to a piston head 45 operating in chamber 37. The tube 41 in connection with the plate 43, rod 44 and head 45 constitutes a suction operated projector for the element 16.

The element 16 is hollow, of rectangular cross section and formed of an outer and an inner section 46, 47 respectively. The section 46 is of greater length than and hinged at its inner end, as at 48 to the outer end of section 47. The inner end of section 46 and the outer end of section 47 are disposed at like forward inclinations from the bottom to the top of element 16. The outlet end of section 46 is closed and formed with a lateral stop flange 49 which coacts with the outer end of element 15 for arresting the retractive movement of element 16. The point of connection 40 between rod 39 and element 16 is within section 47 of element 16 in proximity to the forward end of such section. The point of connection 42 between tube 41 and the element 16 is within section 46 of element 16 in proximity to the rear end of such section. The point of connection 40 is arranged in the upper portion of section 47. The point of connection 42 is arranged in the lower portion of section 46. Arranged within section 47 is a coiled spring 49a anchored at its forward end with tube 41, as at 49b and at its rear end with the rear end of section 47, as at 49c which acts to normally retain tube 41 in a non-active position.

A pair of suction lines are indicated at 50, 51 which are coupled to cylinder 32 and are for selectively establishing communication between a section source and the chamber 37 forwardly of piston head 45. The line 50 opens into chamber rearwardly of the line 51. When one of the lines 50 or 51 is open to chamber 37 from a suction creating source, the piston head 45 is pulled forwardly which movement will provide for the tube 41 moving in the same direction to extend or project the element 16 relative to the outer end of element 15. When line 50 is active, the element 16 will be extended or projected to the full line position, (Figure 2). When line 51 is active the element 16 will be extended to the dotted line position (Figure 2). When line 51 is active it provides for a greater extent of movement to element 16 than that afforded by line 50 when the latter is active. Lines 50 and 51 open into cylinder 32 at different points, 51 being nearest the suction end. When line 50 is exhausted, the piston 45 will of course only move as far as the attachment of line 50 and the signal arm is projected but not raised. When line 51 is exhausted piston 45 travels to the point where 51 is attached, and this further movement raises the arm to the dotted line position in Fig. 2.

The apparatus includes a controlling valve structure 52 which is interposed between the lines 31, 50, 51 and a suction line 53 leading from a vacuum point on the propulsion means (not shown) for the vehicle. The valve structure 52 includes a stationary body part 54 formed of a pair of end portions 55, 56 and a pair of intermediate portions 57, 58. The inner end of portion 55 merges into the outer end of and is of greater diameter than that of portion 57, the latter at its inner end merges into the outer end of and is of greater outer diameter than that of portion 58 and the latter merges at its inner end into the outer end of and is of greater diameter than that of portion 56. The junction of the portions 56, 58 forms body part 54 with a peripheral shoulder 59 intermediate its end. The outer periphery of portion 56 is threaded for receiving a clamping nut 60 for a purpose to be referred to. The body part 54 is of circular cross section and is formed from end to end thereof with an axial bore 61. The portion 55 is formed respectively with an angle-shaped port 62 having a vertical leg opening at the outer end and a horizontal leg opening at the outer edge of such portion, an angle-shaped port 63 having a vertical leg opening at the outer end and a horizontal leg opening at the outer edge of such portion, an

angle-shaped port 64 having a vertical leg opening at the outer end and a horizontal leg opening at the outer edge of such portion and an angle-shaped port 65 having a vertical leg opening at the outer end and a horizontal leg opening at the outer edge of such portion. The portion 57 is formed therein with a horizontally disposed channel 66 of arcuate form. The portion 55 is provided with a pair of diametrically opposed ports 67, 68 which at their outer ends open at the outer end of such portion and at their inner ends open into the ends of channel 66. The portion 55 is formed with a radially disposed port 69 which opens at its outer end at the outer edge of portion 55 and at its inner end into the port 68 intermediate the ends of the latter. The suction line 31 is connected to the horizontal leg of the port 62. The suction line 50 is connected to the horizontal leg of the port 63. The suction line 51 is connected to the horizontal leg of the port 64. The port 65 opens into the atmosphere and constitutes an air outlet when communicating with pipe 31 for cylinder 29 rearwardly of piston head 38 and air through lines 50, 51 when communicating with port 65 for cylinder 37 forwardly of piston 45. The line 53 is connected to the port 69.

The valve structure 62 includes a horizontally revoluble valve member 70 which is seated upon the portion 55 of body part 54 and is of disc-like form. The lower face 71 of member 70 is formed with a circular row of depressions or cavities of arcuate contour arranged concentric to the axis thereof. The depressions constitute by-passes and are indicated at 72, 73, 74. Formed integral with the lower face 71 of member 70 axially thereof is a valve stem 75 of a length to extend through and to depend from the inner end of the bore 61 in body part 54. That portion of stem 75 which depends from bore 61 is reduced, as at 76 and extends into a socket 77 formed in a handle piece 78 slidably engaging with the lower end of body part 54. Within the socket 77 is a flat 79 for engagement by a binding screw 80 engaged in handle piece 78 whereby the latter and stem 75 are secured together to move in unison. The handle piece 78 provides means for manually adjusting the valve member 70 for selectively throwing into active position the suction lines 31, 50, 51.

The portion 55 of body part 54 is formed with an inset or reduced circular part 81 at its upper or outer end whereby the portion 55 is formed with a peripheral shoulder 82. The valve member 70 seats upon and corresponds in diameter to that of part 81. Mounted on the shoulder 82 and encompassing part 81 and valve member 70 is an upstanding cap member 83 formed at its lower end with an outwardly directed flange 84. The latter is secured to shoulder 82 by holdfast means 85 extending through the flange and engaging in sockets 86 formed in the shoulder 82. Arranged within and anchored to the inner face of the body 87 of cap member 83, as well as having its upper end abutting the inner face of the top 88 of member 83 is a sleeve 89, having its lower end spaced from the valve member 70. Positioned in the lower portion of sleeve 89 is a globular retainer 90 against which bears a forcing spring 91 arranged within the sleeve 89 and interposed between the retainer 90 and the inner face of cap top 88. The retainer 90 functions to releasably retain the valve member 70 in its adjusted position. The retainer 90 is associated with a series of spaced depressions 91a, 92, 93 in which the retainer selectively engages to form its retaining function. The upper face of valve member 70 is formed with a pair of spaced upstanding stops 94, 95 which selectively abut the sleeve 89 for limiting the revolving movement of the valve member 70 in opposite directions.

The sides 96, 97 of the section 46 of the element 16 are formed lengthwise thereof with arrow-shaped cutouts 98 across which extend light-emitting plates 99 secured against the inner faces of such sides. The plates 99 are translucent and may be of any color desired. Secured within the section 46 is a normally inactive electrical illuminated means 100 to which is attached circuit conductor 101 extending rearwardly therefrom and passing through and projecting from the rear end of tube 41. The conductor 101 is connected to contact 102 which is secured upon and insulated from rod 44, as well as being insulated from the combined guide, suspension and coupling plate 43. The contact 102 is disposed substantially at right angles to the lower end of plate 43. Anchored to the rear end of one side of the cylinder 32, as well as being insulated from the latter is a rearwardly extended resilient contact 103 arranged in the path of contact 102. Attached to contact 103 is a circuit conductor 104. The contacts 102, 103 are so formed to provide for their coaction to close the circuit for the means 100 when the suction line 50 or 51 is made active by the establishing of communication between it and the suction line 53.

When the valve structure 52 is in normal position the depression 72 couples ports 62, 67 together, the depression 73 couples the ports 64, 65 together and the depression 74 is idle. When ports 62, 67 are connected together line 31 communicates with line 53 through channel 66 and ports 68, 69 and suction is applied to the retractor. When line 50 is to be made active the valve member 70 is shifted in an anticlockwise direction to provide for the depression 74 to couple ports 63, 68 together whereby line 50 will be in communication with line 53 and which shift will provide for the depression 73 coupling ports 62, 65 together and line 31 will then communicate with the atmosphere forcing the retractor from suction. When line 51 is to be made active, the valve member 70 is shifted in a clockwise direction to couple ports 64, 68 together whereby the line 51 will be in communication with line 53 and which direction of shift will cause depression 72 to couple ports 62, 65 together and line 50 will then communicate with the atmosphere. When line 50 or 51 is active the retractor will be carried with the projector. When stop 95 abuts sleeve 89 it will indicate that line 51 is active with depression 73 coupling ports 64, 68 and depression 72 coupling ports 62, 65 and the abutting of stop 95 with sleeve when valve 70 is moved in a clockwise direction. With valve 70 moving in clockwise direction stop 94 will abut sleeve 89 to indicate that line 50 is active with depression 74 coupling ports 63, 68 and depression 73 coupling ports 62, 65.

When line 51 is active for suction, it will move the element 16 to an extent whereby the tube 41 will cause the section 46 of element 16 to be swung upwardly, on the connection 42, at a forward inclination with respect to section 47 of element 16 as indicated in dotted lines, Figure 2.

The element 16 may be, if desired, of the reflecting type, preferably it will be of the illuminable type.

The depression 91a coacts with the retainer 90 for latching line 50 in communication with line

53; the depression 92 coacts with the retainer 90 for latching valve 70 in its normal position and which is the establishing communication between lines 31; 53; and the depression 93 coacts with the retainer 90 for latching line 51 in communication with line 53.

It is also to be understood that the apparatus may be set up of duplicate form whereby it may be employed at both sides of the vehicle. The illuminating circuit is generally indicated at 105, Figure 14. The shoulder 59 coacts with the nut 60 for clamping the valve structure to a support. The housing 15 has a drain pipe 106.

What I claim is:

1. In a signaling apparatus, a normally horizontally disposed retracted hollow signal element formed of an outer and an inner section hinged together at their tops and normally disposed in endwise abutting relation, a suction operated outwardly shiftable projector for said element extending through said inner section into and pivotally connected at its outer end to said outer section, a suction operated rearwardly shiftable retractor extending into and fixed at its outer end of said inner section, and means for controlling the extent of the outward shift of the projector to change the signaling position of said element.

2. In a signaling apparatus, a normally horizontally disposed retracted hollow signal element formed of an outer and an inner section hinged together at their tops and normally disposed in endwise abutting relation, a suction operated outwardly shiftable projector for said element extending through said inner section into and pivotally connected at its outer end to said outer section, a suction operated rearwardly shiftable retractor extending into and fixed at its outer end to said inner section, means for controlling the extent of the outward shift of the projector to change the signaling position of said element, a housing for said element, and said projector and retractor being arranged within and extending rearwardly from said housing.

3. In a signaling apparatus, a hollow signal element formed of outer and inner sections hinged together, a housing for said element, a projector extending into the housing, through said inner section into said outer section and pivotally connected at its forward end to said outer section, a retractor extending into the housing and into and fixed at its forward end to said inner section, said housing being open at one end, said element being arranged for projecting and retracting it with relation to said open end, a suction operated means acting on the projector for shifting the latter forwardly to project said element to signaling positions, controlling means for said suction operated means for varying the extent of the forward shift of the projector to dispose said element in selected signaling position, and suction operated means acting on the retractor for shifting the latter rearwardly to retract said element for signaling position.

4. In a signaling apparatus, a hollow signal element formed of outer and inner sections hinged together, a housing for said element, a projector extending into the housing, through said inner section into said outer section and pivotally connected at its forward end to said outer section, a retractor extending into the housing and into and fixed at its forward end to said inner section, said housing being open at one end, said element being arranged for projecting and retracting it with relation to said open end, a suction operated means acting on the projector for shifting the latter forwardly to project said element to signaling positions, controlling means for said suction operated means for varying the extent of the forward shift of the projector to dispose said element in selected signaling position, suction operated means acting on the retractor for shifting the latter rearwardly to retract said element for signaling position, and a controlling spring within said inner section, said spring being fixed at one end to the projector and at its other end to the rear end of said inner section.

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