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CONTROLLING MECHANISM FOR DIRECTIONAL SIGNALS

Filed March 21, 1929

2 Sheets-Sheet 1

Fig. 1.

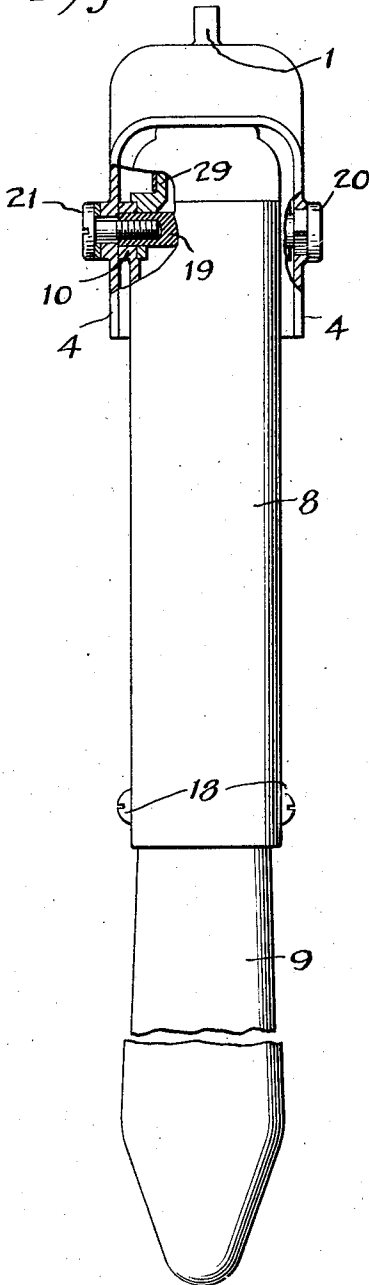
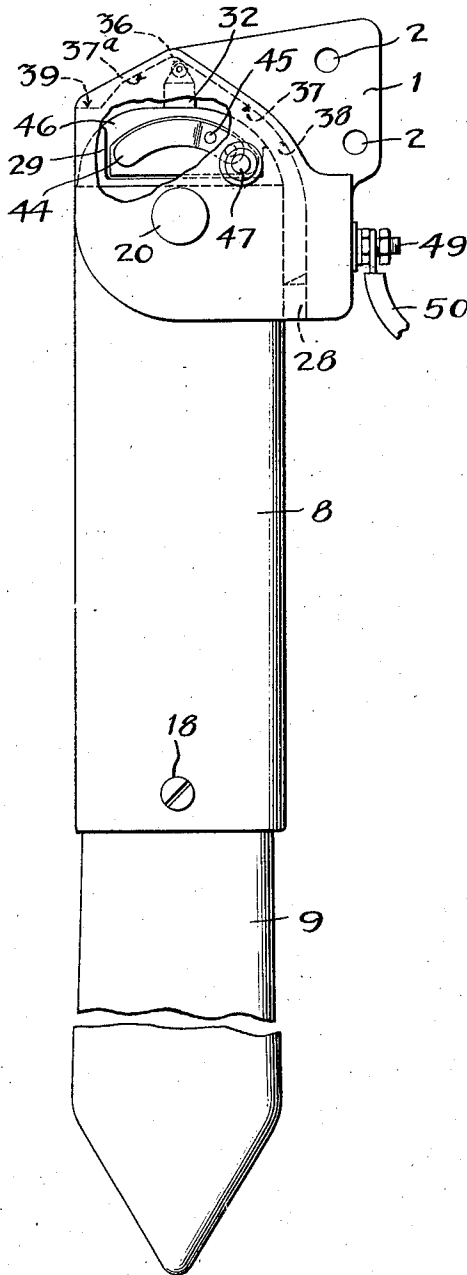


Fig. 2.



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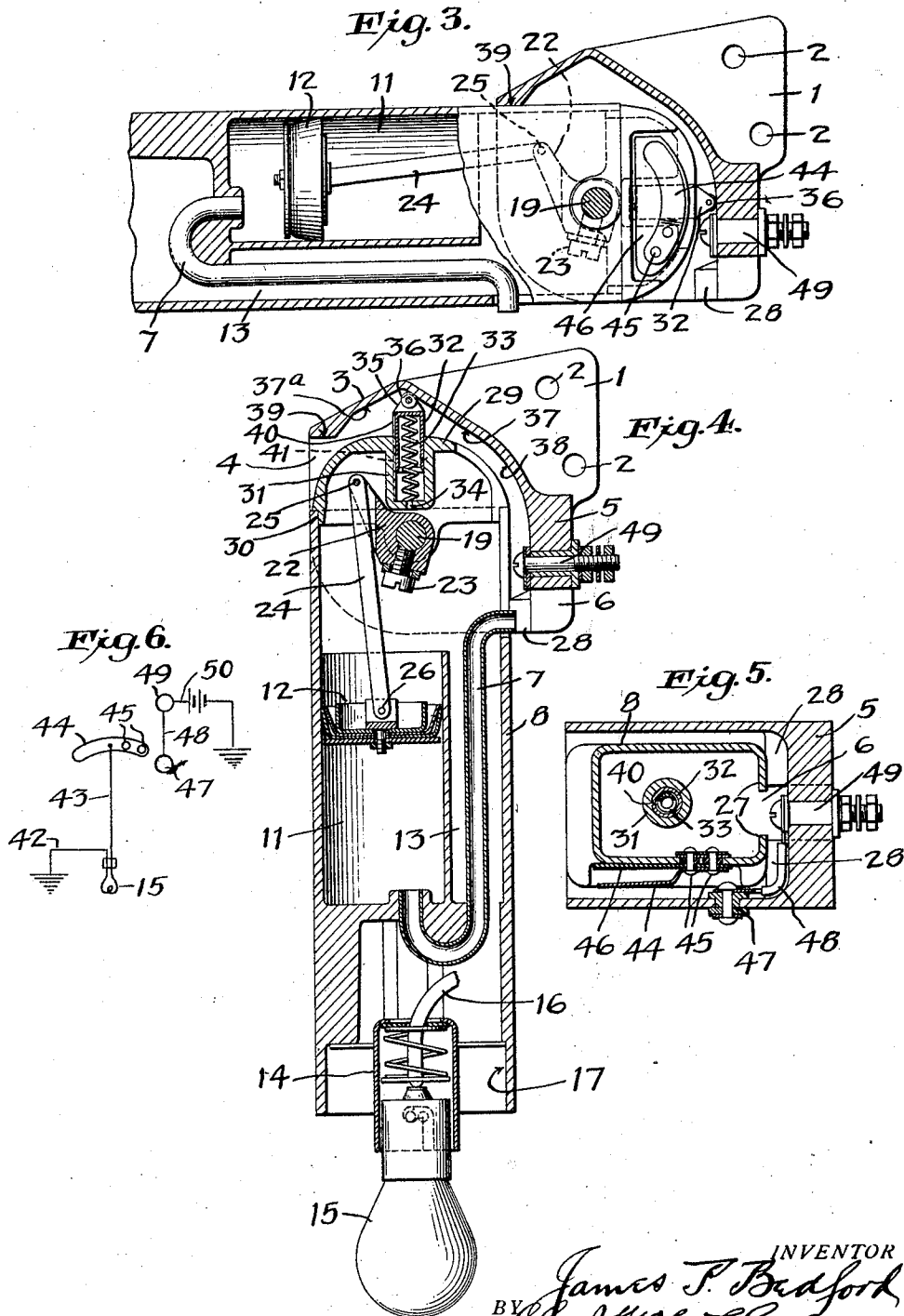
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

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CONTROLLING MECHANISM FOR DIRECTIONAL SIGNALS

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This invention relates to directional signals of the semaphore type, and particularly has reference to mechanism for actuating the arm, controlling the same in its movements, holding the same while in its pendent or inactive position, and producing a light in the end of the arm when and as required.

Among the objects of my invention may be noted the following: To provide a directional signal arm whose impulses or activity are contributed to by the suction created in a motor of the hydrocarbon type; to provide a signal arm which may be oscillated, or vibrated, or lifted into signaling position positively, and which drops to its inactive or non-signaling position gravitally; to provide a positive connection between the shaft on which the arm swings and the piston of the suction cylinder which creates the activity of the arm; to provide a means for very firmly holding the arm in its pendent or inactive position so that it cannot swing outwardly, vibrate or rattle during the operation of the car or vehicle carrying the same due to the jolting, jarring or movements of the latter; to provide means by which the arm may be normally held in its pendent position, but which will permit the arm to rise to its functional position under gradually decreasing tension; to provide a means for holding the arm in its pendent position, the resistance of which decreases as the arm rises to its functional position; and to provide certain details of construction for performing the functions noted in the foregoing, which are strong, durable, effective and economical to manufacture.

With the above objects in view and others which will be detailed during the course of this description, my invention consists in the parts, features, elements and combinations thereof hereinafter described and claimed.

In order that my invention may be clearly understood, I provide drawings wherein:

Figure 1 is an edge elevation of a form of directional signal arm embodying my invention, parts being broken away to show details of construction and the length of the figure being curtailed, due to the limitations of the sheet;

Figure 2 is a side elevation of my signal arm, the characteristics of the figure being the same as those of Figure 1;

Figure 3 is a sectional elevation of a portion of my signal arm shown in its elevated or signaling position;

Figure 4 is a view similar to Figure 3, the tip of the arm being removed, and the latter being shown in its pendent position;

Figure 5 is a sectional view taken on an irregular line transversely of Figure 4 above the supporting shaft, the details shown being those of the contact making and breaking device for the electric circuit, and the limiting stops for the arm; and

Figure 6 is a diagram of the circuit for lighting the lamp.

Referring to the drawings, the numeral 1 indicates the supporting bracket which may be of any form or shape for attachment to either the wind-shield supporting post of an automobile, the body of the latter, either front or rear, or to some other support, may be, applied to the car. The apertures 2 are for the passage of screws or bolts for securing the bracket in place. In the instance shown, the supporting bracket is hood-like in its formation, having a top member 3, two side wings 4, and a back member 5 slotted at its bottom as indicated at 6 for the passage or reception of a connection to the air tube 7 for conveying pressure (suction), as hereinafter described.

The signal arm consists of the main supporting portion 8 and the tip 9, the supporting portion being hollow and provided with a hollow bearing 10 on its opposite sides on which the arm is adapted to swing. Interiorly the arm is provided with the suction cylinder 11 entered at its bottom by the air tube 7, and in which works the piston 12. Beside the cylinder 11 is the chamber 13, in which is disposed the tube 7; and below the cylinder the arm is provided with a chamber in which is located the socket 14 for the incandescent lamp 15. An electric connection 16 runs through the socket for the usual contact when the plug of the bulb 15 is set in place. The bulb extends through the end of the arm and to the shouldered rim 17 of the

arm the tip 9 is secured, as by a plurality of screws 18. The tip is translucent or transparent and may be made of celluloid, or any similar material, which is light and yet will withstand the ravages of the weather and changing temperatures.

The main member 8, at its journals 10, is mounted on the fixed shaft 19, the opposite ends of which are held by the cap 20 bearing against the frame member 4 at one side and the screw 21 bearing against the frame member 4 at the opposite side, the body of the screw being threaded into the end of the shaft so that, by turning the screw, the cap 20 on the one side and the head 21 on the other side will clamp the shaft rigidly to the supporting bracket. Applied approximately centrally to the shaft 19 is a crank arm 22, the same being fixed in place on the shaft by screw 23 so as to hold the same rigidly in the desired position. The crank arm, at its upper end, has a link 24 pivotally secured thereto at 25, the lower end of the link being pivotally connected at 26 to the piston 12. This linkage makes a loose connection with and between the crank arm 22 and the piston 12 so that, when suction is applied to the piston within the cylinder 11 through the tube 7, the link will have freedom of movement relatively to the crank and piston whereby to cause the latter to lift the signal arm because the crank arm is rigidly fixed and cannot move. The result is that the signal arm will be lifted, upon the application of suction to the cylinder 11, from the position shown in Figure 4 to the position shown in Figure 3. When the suction is relieved, the arm will fall gravitally back to the position of Figure 4. Viewing Figure 5, it will be seen that, when the signal arm drops to the position of Figure 4, its two lateral intumed wings 27, which are disposed on opposite sides of the slot 6 through the bracket and also through the arm, will engage with the two rigid stops 28 extending inwardly from the back member 5 of the bracket. This stop feature, limiting the movement of the arm gravitally, is an important feature of my invention by itself, as well as in combination with the friction detent mechanism about to be described.

At the top of the signal arm there is a cap piece 29 provided with tubular bearings which surround the shaft 19 and engage snugly through the medium of interacting flanges 30. This cap closes the upper or inner end of the signal arm, and provides a central tubular socket 31 for the reception of a tubular slide 32 supported on a coiled spring 33 within said socket, the bottom of which latter has a small vent 34. The slide 32 is formed at its top, or outer end, with a U-shaped bearing 35 in which is journaled an anti-frictional roll 36 adapted to bear on the inverted, spread, V-shaped surface indicated

at 37 and 37^a, Figure 4. Normally, the roll 36 bears upon the straight portion 37 of the V-shaped surface, this being with the arm in a pendent position and the stop members 27 and 28 in contact. It will thus be seen that the roll normally does not enter the vertex of the angle of the inverted V-shaped surface. The inner end of the straight portion 37 of the said surface is concentric with the axis of the fixed shaft 19, or, in other words, is the arc of a circle struck from said axis as a center. This concentric portion is indicated at 38 and has an important function in connection with the operation of the signal arm, as hereinafter described. The outer end of the surface 37^a is formed into a stop portion 39 for the engagement of the flat front edge of the arm member 8 when the latter is elevated to high signaling position, said stop acting to prevent the overthrow of the arm and permitting it to rise to exactly or approximately a horizontal position. The tubular slide 32 along its length is provided with a rib 40 which enters a groove 41 in the socket 31. Thus, the slide 32 can work longitudinally in the socket without turning therein as the result of jolting, jarring or other action of either the car or the mechanism of the arm which would have a tendency to turn the roller in such wise as to create friction on the surfaces 37 and 38.

So far, I have described the mechanism of my mechanical directional signal. My invention includes an electrical signal in combination with the mechanical signal, the two interacting as the signal arm rises and falls under the impulses given from the engine under the usual controller carried by the steering post, the steering wheel, or on some other part of the vehicle convenient for ready and quick operation when required. The electrical signaling means comprise the incandescent lamp 15 having a usual form of socket 14, into which the lamp is plugged in any usual way, and the lead from which is indicated at 16, said lead extending longitudinally of the arm 8 within the chamber containing the suction tube 7. One branch of the lead 16 is grounded in any suitable way, as shown by the diagram of Figure 6, said grounded lead being indicated at 42, and the positive lead being indicated at 43 extending to a contact plate 44 carried by the upper part of the arm member 8, see Fig. 5. The plate 44 is riveted at 45 to said signal arm, being insulated therefrom in any suitable manner, the insulation being in part indicated by 46, it being understood that the contact plate 44 is resilient and that it normally stands in the position shown in Figure 5 so as to move in a path, upon actuation of the signal arm, enabling it to engage the insulated binding post or contact 47 secured to the bracket portion 4 adjacent the said arm. This contact has a lead 48 extending there-

from to the binding post 49 in the rear portion 5 of the bracket above the slot 6 thereof, said binding post having connected thereto the lead 50 extending to source, which may be the battery circuit of the vehicle carrying the arm, or an independent battery circuit enabling the light to be set in action, regardless of whether the vehicle battery circuit is energized or cut off. As shown in Figure 6, the battery may be grounded upon the chassis or some part of the car.

The mode of operation of my signaling mechanism is as follows: Assuming the cylinder 11 to be connected with the intake side of the engine of the vehicle, and the engine to be in action, and assuming a control interposed between the engine and my signaling device, when the control is open the pulsation of the engine, creating suction in the cylinder 11, will draw upon the piston 12, which in turn will draw upon the link 24 pivoted at 25 to the crank arm 22. Since the latter cannot move, the signal arm will be acted upon to the piston and its cylinder, and will be caused to swing about the fixed shaft 19. Thus the signal arm will be raised for signaling purposes and, if allowed to go to its fullest extent, the arm portion 8 will contact with the stop 39 of the bracket and remain in signaling position until the controller is closed. This will enable the arm to gravitally return to its pendent position shown in Figures 1, 2 and 4, the signaling position just referred to being shown in Figure 3. When the arm starts to move to its signaling position, the anti-frictional roll 36 is caused to move along straight surface 37 of the bracket and the tubular slide 32 is caused to slide within the socket 31 without turning therein, because it is held from turning by the rib and groove 40, 41. This action compresses the spring 33 storing power therein; and as the arm continues to move to signaling position the roll 36 constantly maintains its contact with the straight surface portion 37 with gradually increasing friction due to the resistance of the spring 33, until said roll has reached the concentric portion 38 of said surface, retardation being then decreased, and the roll bearing but lightly upon the concentric surface 38, thus allowing the arm to finish its upward movement into contact with the stop 39 with but little friction or retardation. Thus, it will be seen that, when the arm is first caused to rise or move to its signaling position, considerable and increasing friction or retardation is imposed thereon by the spring-controlled slide 32, and this friction increases slightly continually until the concentric surface 38 is reached. From this point on, the arm has but little resistance beyond its own weight and the natural mechanical friction of its parts until it reaches its highest signaling position in contact with the stop 39. It will also be under-

stood that, when the arm is in its pendent position against the rigid stops 28, the spring-controlled slide 32, because of the bearing of its roll upon the straight surface 37, is held approximately rigidly, and quite strongly against outward movement. Hence, jarring of the vehicle, bumping and other vibration thereof has no material effect upon the arm, which is held quite firmly in its pendent position and requires a considerable effort to cause it to rise to signaling position. Thus, the first strong impulses of the engine are resisted, while the tapering off of the engine's impulses is compensated by the concentric surface 38 on which the roll travels. The result is that the arm, in point of its movement, is moved with an approximately uniform speed from start to finish.

During the foregoing operation of the mechanical part of my signaling mechanism, the electrical part is brought into action as follows: The position of the resilient contact strip 44 will determine the moment of glow of the lamp or bulb 15, so that, as the arm is rising to signaling position, resilient strip 44 engages the contact 47, and is maintained in engagement all during the signaling action of the arm, and until a predetermined point has been reached in the return movement of the arm, at which point the lamp circuit is broken. According to my invention, the contact plate 44 may be positioned so that contact will be made at 47 instantly upon the movement of the arm for signaling purposes, or at any time during such movement between the starting position and the stopping position, the latter being at the point 39. If the battery circuit of the vehicle is depended upon, the switch thereof will, of course, control; but, if an independent circuit is employed for the lamp 15, its action may be controlled as desired.

From the foregoing it will be seen that I have provided a combined mechanical and electrical and directional signal for motor vehicles, the actions of which can be controlled according to predetermination; that I have provided a mechanical signaling arm which may be maintained in its pendent, inactive position approximately rigidly, without the provision of a positive lock or stop, and which cannot be put out of commission or broken, if tampered with, or pulled or strained accidentally, as could an arm provided with a positive lock; that I have provided a means by which a mechanical directional signal can be actuated which compensates for the tapering off of the impulse or power by which the arm is actuated; and that I have provided effective, simple and economical means by which to accomplish the foregoing important results, together with others which have been heretofore pointed out.

In the foregoing description, I have set

forth, as a means for actuating the signal arm, the utilization of engine suction; but, I do not wish to be limited to such means for actuating the arm, since other suction means may be employed. I may utilize, as an actuating means for the signal arm, electrical means involving a solenoid, or a combination of electrical and mechanical means; and all such means as may be employed for actuating the arm may be under control of the operator and readily accessible to his hand or fingers while he is driving the car. It will be understood, therefore, that, so far as actuating means are concerned, I do not purpose limiting my claims beyond the statements of means contained in my claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A directional signal having, in combination, a signal arm, a bracket for supporting the same, means for actuating the arm, and means between the latter and the bracket for imposing variable resistance to its movement.

2. A directional signal having, in combination, a signal arm, a bracket on which said arm may swing, means for actuating the arm relatively to the bracket, and means interposed between the arm and bracket for resisting the movement of the arm with gradually diminishing force.

3. A directional signal having, in combination, a signal arm, a bracket on which said arm may swing, means carried by the arm acting automatically upon the bracket for imposing friction upon the latter to resist the movement of the arm, said friction means including means by which the friction thereof is gradually decreased as the arm rises to its limit.

4. A directional signal having, in combination, a signal arm, a bracket for supporting the same, means for actuating the arm, and a plurality of stop devices carried by the bracket and disposing for engagement with the arm at its extremes of movement within and out of the bracket.

5. A directional signal having, in combination, a signal arm, a bracket for supporting the same, means for actuating the arm, and a device carried by said arm and slidingly engaging the bracket for retarding the action of the arm with gradually diminishing force.

6. A directional signal having, in combination, a signal arm, a bracket on which said arm may swing, means for actuating the arm, and means for resisting the movement of the arm with gradually diminishing force including a rigid track carried by the bracket, and a yielding device carried by the arm and yieldingly engaging the track throughout the entire movement of the arm.

7. A signaling device of directional type

having, in combination, a semaphore arm, a supporting bracket, and means for actuating the arm including a suction device whose power for actuation of the arm gradually tapers off, and means between the arm and bracket compensating for the tapering off of said actuating power whereby the action of the arm is approximately uniform throughout its movement.

8. A directional signal having, in combination, a signal arm provided with a suction chamber, a bracket for supporting the arm including a rigid shaft around which the arm swings, a crank fixed to the shaft, a piston operating in the suction chamber, and a link pivotally connected to the crank and the piston whereby, when power is applied to activate the piston, the arm will be swung upon its axis by inverse action upon the latter.

9. A directional signal having, in combination, a bracket provided with an inverted V-shaped track, a signal arm mounted to swing on the bracket, said arm having a cap provided with a socket, and an anti-frictional device mounted in the socket in position to automatically cooperate with said track, whereby to impose friction adapted to control the action of the arm.

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