

Feb. 27, 1934.

L. K. WRIGHT

1,948,896

TRAFFIC REGULATING DEVICE

Original Filed Feb. 16, 1929

4 Sheets-Sheet 1

FIG. 1.

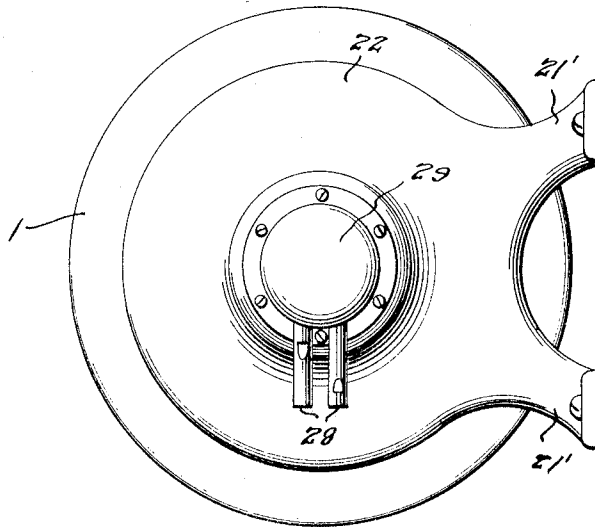
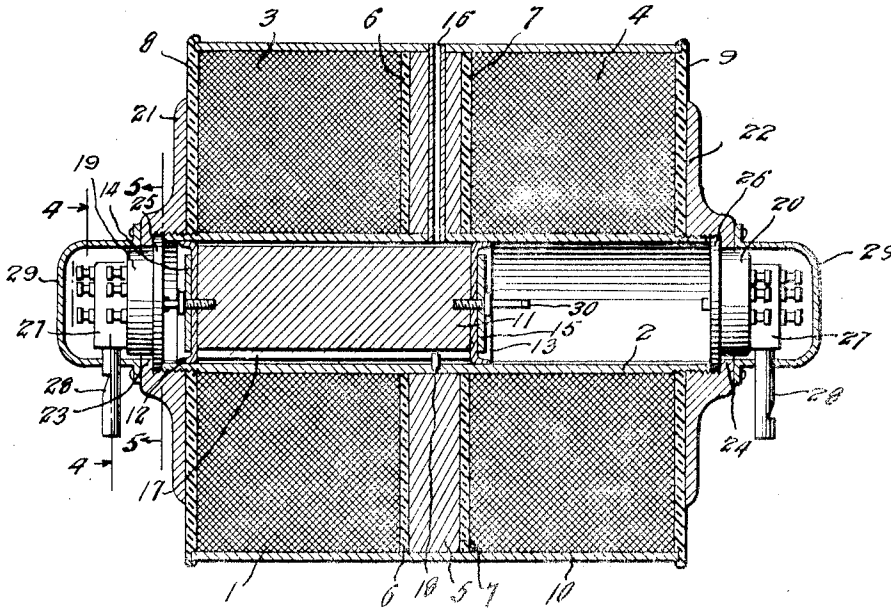


FIG. 2.



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FIG. 3.

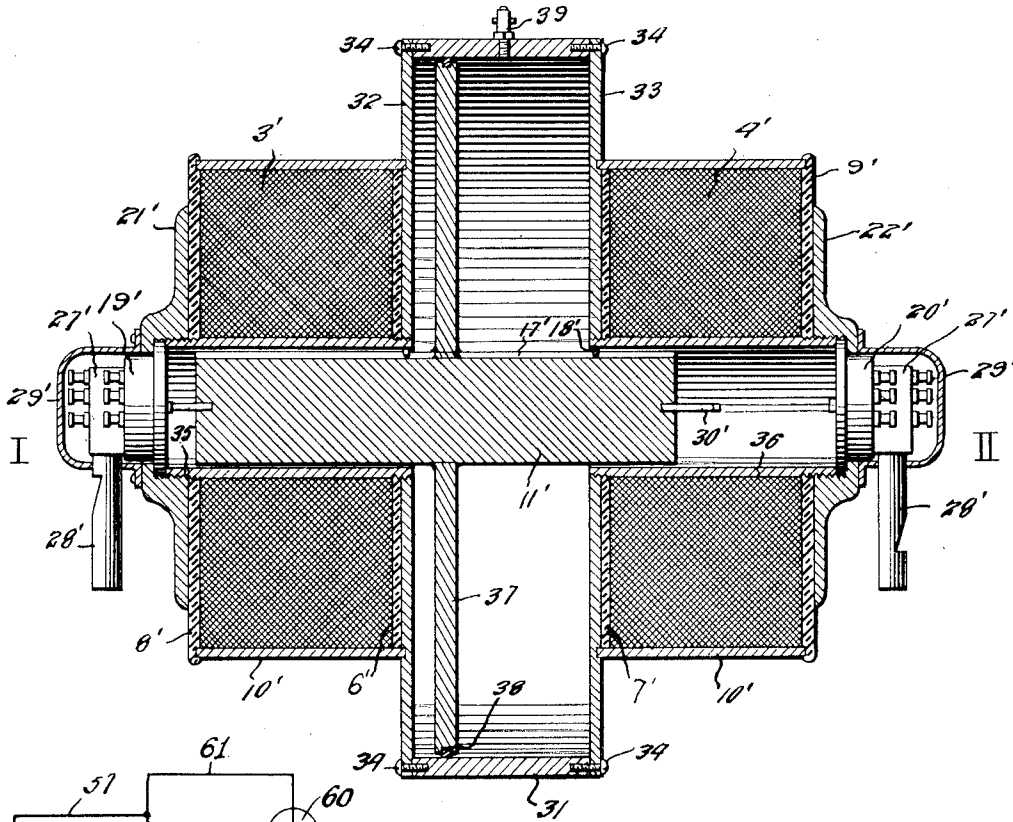
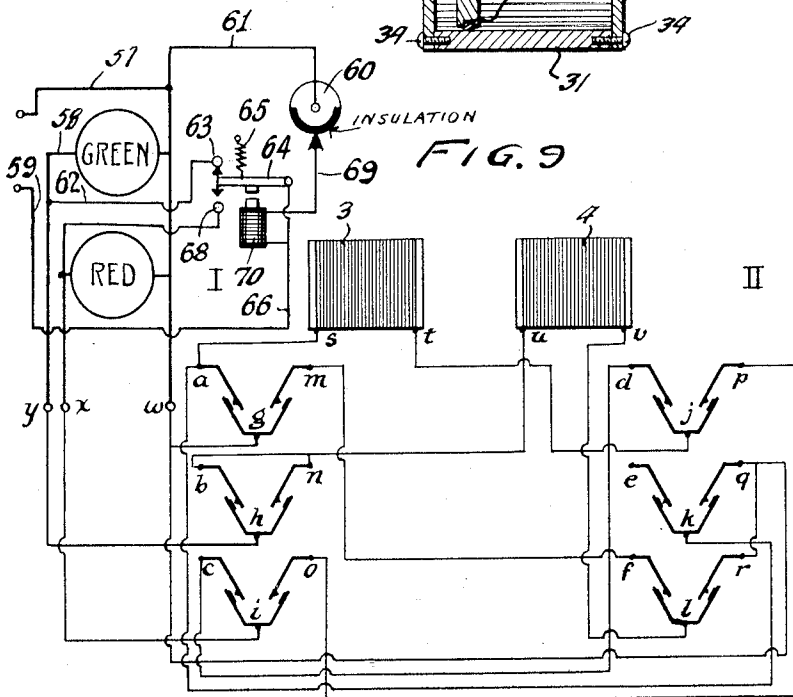


FIG. 9



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FIG. 4.

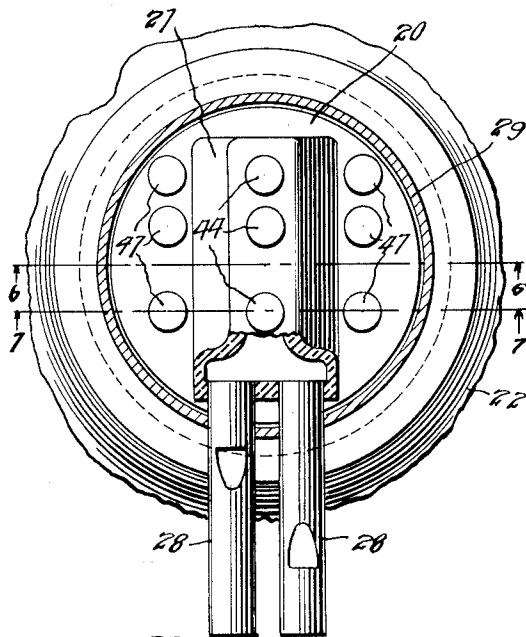


FIG. 5.

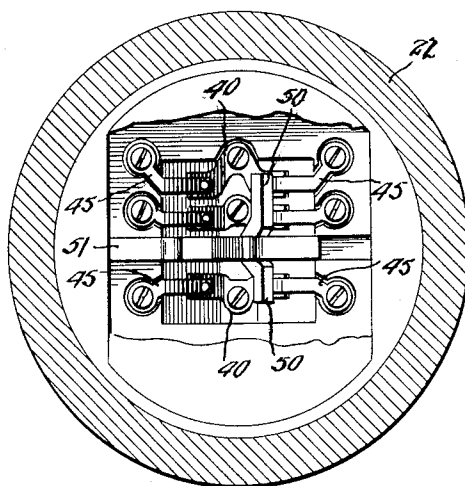


FIG. 6.

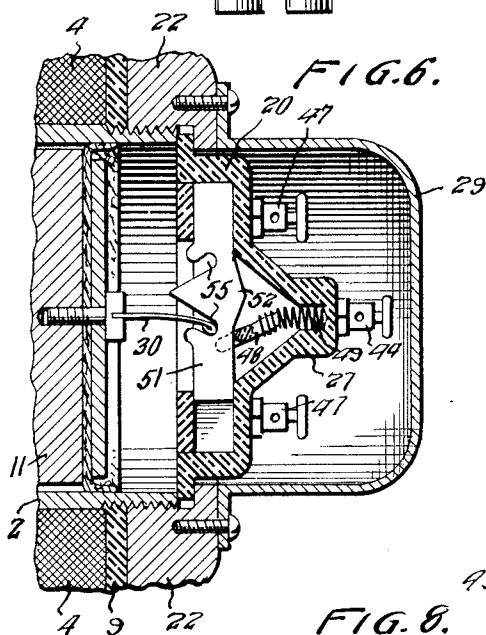


FIG. 7.

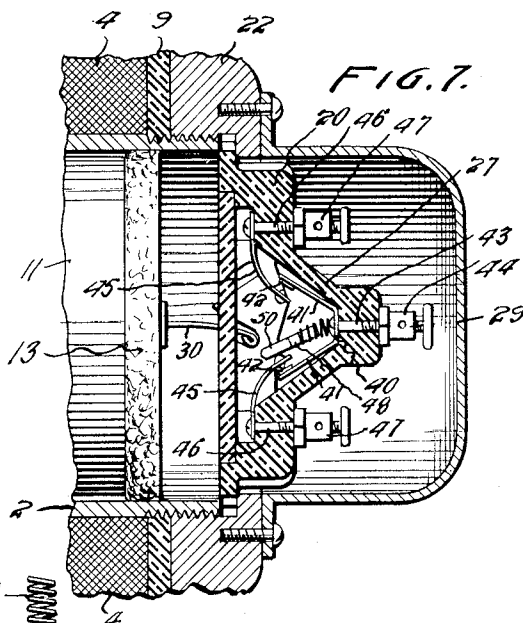
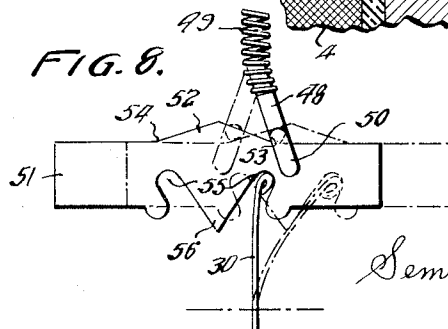


FIG. 8.



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FIG. 10.

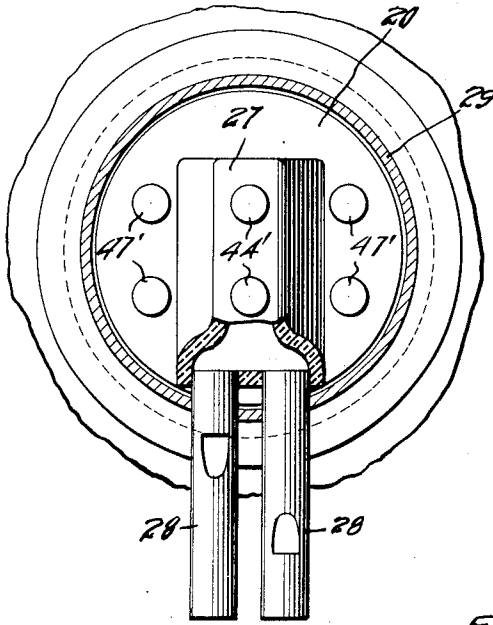


FIG. 11.

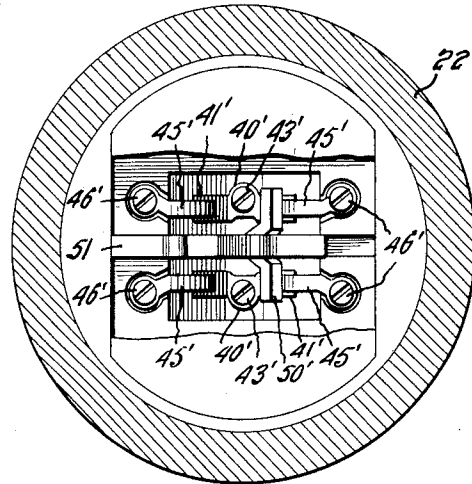
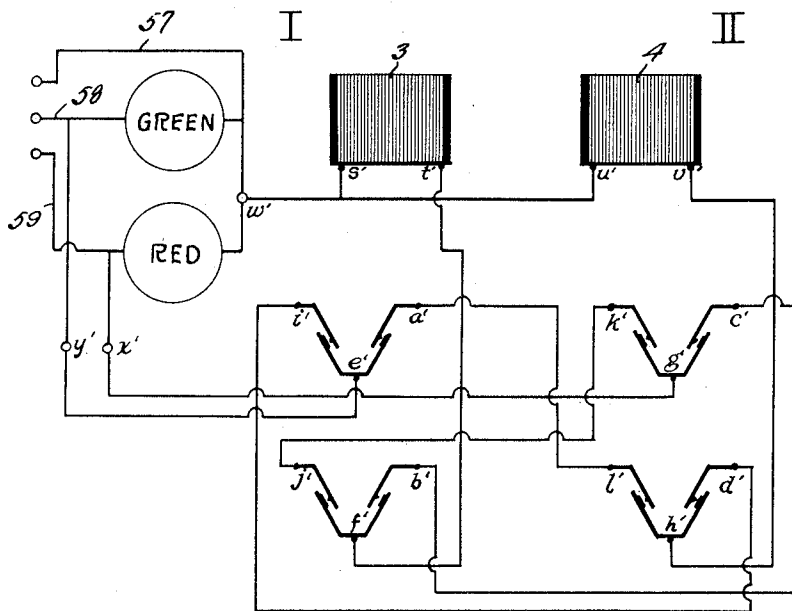


FIG. 12.



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UNITED STATES PATENT OFFICE

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TRAFFIC REGULATING DEVICE

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Application February 16, 1929, Serial No. 340,413

Renewed July 27, 1933

6 Claims. (Cl. 177—324)

This invention relates to traffic-regulating devices and more particularly has reference to an audible signal adapted to be placed in operation when the traffic-regulating device indicates that traffic is to change its direction of movement.

In view of the increased automotive vehicle traffic, particularly in cities, it has been found advantageous, and in some instances necessary, to utilize automatic traffic-regulating devices. These regulating devices are economical, in that they may be substituted for policemen, and thus save the community the cost of salaries paid to traffic policemen. Also, automatic traffic-regulating devices have been found to be highly efficient in controlling congested traffic and in avoiding so-called traffic jams.

Modern traffic-regulating devices usually consist of two or more lights erected at street corners or intersections. Many of the light systems consist of two lights; that is, a red light, serving as a "stop" signal, and a green light, serving as a "go" signal. Some traffic-regulating devices are equipped with a yellow or amber colored light, which flashes in all directions when traffic is about to be stopped or started.

It has been found, however, that traffic-regulating devices equipped with yellow or other colored warning lights are disadvantageous, in that when these lights are flashed to warn traffic that the signal is about to be changed, there is a tendency for the traffic which is moving to try to beat the "stop" signal, and for the traffic which is about to move to rush the "go" signal by starting on the warning signal. This situation, while entirely caused by the human element in traffic, nevertheless, gives rise to traffic congestion resulting in delays and sometimes in collisions.

Traffic-indicating devices of the signal-light type are silent in operation and are sometimes placed in such positions that, when a driver stops his vehicle, it is under or close to the light so that it is impossible for him to have a clear view of the same. This necessitates the driver leaning out of the automobile or crouching low to observe when he will be allowed to proceed. Pedestrians also find it inconvenient to watch signal lights, especially when they are placed high above the level of the street. On very busy corners the policeman in charge encounters difficulty in watching automobile and pedestrian traffic and at the same time keeping his eye on the light signals.

In many installations of this type it is necessary for the policeman to blow a whistle to indicate that the lights have been changed. It will be appreciated, therefore, that the traffic-regulating

devices now employed, particularly those utilizing signal lights, are inadequate to properly regulate traffic, and that some audible means of indicating that the lights are about to change would be decidedly advantageous.

An object of this invention is to devise a traffic-regulating device which lacks many of the disadvantages inherent in the types of construction heretofore used.

Another object of this invention is to provide a traffic-regulating device equipped with an audible warning signal, which is operable upon the regulating device indicating a change in the direction of movement of traffic.

Another object of this invention is to provide an electrically operated traffic-regulating device having a "stop" signal and a "go" signal and an electrically operated audible warning mechanism operable for a given time upon supplying current to either of the signals.

Another object of this invention is to provide an electromagnetic blower adapted to be associated with a traffic-regulating device and connected therewith in such a manner that when the regulating device indicates the direction of movement of traffic is to change, the electromagnetic blower will be operated to produce an audible signal.

Still another object of this invention is to provide an electromagnetic blower adapted to be intermittently operated.

A still further object of this invention is to devise a novel switching mechanism adapted to be operated to supply current to either of two electrically operated devices.

With these and other objects in view which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements comprising my invention, may be varied in construction, proportions and arrangement, without departing from the spirit and scope of the appended claims.

This invention resides in an automatic signalling mechanism, which may be constructed as a part of traffic-regulating devices, or may be installed in conjunction with existing traffic regulating devices. It is particularly applicable to those devices which regulate traffic by means of an electrically operated "stop" signal and "go" signal. The signalling mechanism consists, in the preferred embodiment of my invention, of an electromagnetically operated blower adapted to force a blast of air through a whistle or other

pneumatically operated sound-producing device.

Blowers suitable for the purpose may be constructed in any desired manner, such as by providing a cylinder having a magnetically susceptible core mounted therein, which may serve as a piston to draw air into the cylinder and force it therefrom. In some installations it may be desirable to handle a larger volume of air, in which case a larger cylinder may be placed in communication with the core-containing cylinder, and a piston connected to the core may be positioned in the larger cylinder.

In either construction solenoid coils are positioned about the core-containing cylinder so that magnetic flux produced by current in the coils will affect the magnetically susceptible core to move the same and cause air to flow into and out of the cylinder. One coil is so positioned as to draw the core to one end of the cylinder, and the other coil is so positioned as to draw the core to the other end of the cylinder. One of the coils is adapted to be connected in parallel with the "stop" signal, and the other coil is adapted to be similarly connected with the "go" signal.

Suitable switch mechanisms are provided at each end of the core cylinders to disconnect a coil from the signal circuit after the coil has functioned to draw the core to the end of the cylinder at which it is located, and to connect the other coil with the other signal circuit so that, when that circuit is energized, the core will be drawn to the other end of the cylinder. With this construction an audible signal will be given upon energizing either circuit and will serve as a warning to indicate that the signal has changed from "go" to "stop" or vice versa.

In order to make my invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect, without limiting the improvements in their useful applications to the particular constructions, which for the purpose of explanation, have been made the subject of illustration.

In the drawings:

Figure 1 is an end elevation of the audible signal unit employed in my traffic-regulating device.

Figure 2 is a sectional view showing the manner in which the unit is constructed.

Figure 3 is a sectional view of a modified form of unit.

Figure 4 is a fragmentary end view showing the manner in which whistles or other audible signaling devices are attached to the blower unit.

Figure 5 is another fragmentary view showing the construction of the switch mechanism.

Figure 6 is a sectional view taken on line 6—6 of Figure 4 showing the constructional details of the switch operating mechanism.

Figure 7 is a sectional view taken on line 7—7 of Figure 4 showing the constructional details of the switch mechanism.

Figure 8 is a diagrammatic view illustrating the operation of a portion of the switch mechanism.

Figure 9 is a somewhat diagrammatic view showing the electrical connections between the blower unit and the traffic-regulating device.

Figure 10 is a view similar to Figure 4 showing a modified form of the invention.

Figure 11 is a view similar to Figure 5 showing a modified switch construction.

Figure 12 is a diagrammatic view of a modified circuit including the modified switch mechanism.

Referring to the drawings, there are shown in Figures 1 and 2 several views of the warning signal

unit 1. As shown in the drawings, this unit comprises an electromagnetically operated blower, which is operable to cause blasts of air to flow through pneumatically operated audible signaling devices. The electromagnetically operated blower comprises a cylinder 2 on which are positioned two solenoid coils 3 and 4, one adjacent each end of the cylinder 2. A disk-like partition 5, of any suitable amount of conducting material, is mounted on the cylinder and serves to space the coils 3 and 4 the proper distance apart. Disks 6 and 7, preferably formed of fiber, phenolic condensation products or other insulating material, are arranged on each side of the spacing disk 5 to properly insulate the windings of coils 6 and 7 from the member 5. External screw threads are provided on each end of the cylinder 2, onto which disks 8 and 9 are threaded. These disks may be formed of any suitable material and serve as end supports for the solenoid coils. Disks 8 and 9 are each provided with an annular groove adjacent the periphery, into which is fitted the end of a tubular casing 10. The tubular casing 10 and the end disks 8 and 9 form a housing for the solenoid coils, which protects them from any detrimental exposure.

Slidably mounted in cylinder 2 is a core member 11 formed of iron or other material susceptible to magnetism. As shown in Figure 2, the ends of the core or piston 11 are provided with glands 12 and 13 formed of leather or other suitable material and held in operative position by means of the disks or washers 14 and 15. I wish it to be clearly understood, however, that any means for providing a leak-proof joint between the core or piston 11 and the cylinder wall, such as piston rings, packing material or other means may be employed.

It will be noted that the separating disk 5 is provided with a duct 16 by means of which oil or other material may be introduced into the cylinder for sealing the packing means carried by the piston 11 to the cylinder wall.

If desirable, the piston 11 may be provided with an axially extending slot 17 into which projects a pin or lug carried by the cylinder 2. This mechanism serves to prevent rotation between the piston 11 and cylinder 2. With certain types of reversing mechanisms for the electromagnetic operating means it is necessary that there be no rotation between the piston and cylinder.

Cylinder heads 19 and 20 are mounted on each end of cylinder 2. As shown in the drawings, these cylinder heads are held in place by means of end-members 21 and 22, which are threaded onto the threaded ends of cylinder 2. These end-members are provided with flanges 23 and 24, which cooperate with flanges 25 and 26 to retain the cylinder-heads in their proper positions. Members 21 and 22 are also provided with supporting brackets 21' by means of which the unit 1 may be attached to a wall or support.

Cylinder-heads 19 and 20 are provided with chambers 27, in which are positioned switches for connecting the solenoid coils with the proper circuit to effect operation of the device. Piston, or core, 11 has secured to each end thereof a flexible member 30, which cooperates with the switch mechanism at each end of the cylinder for operating the same.

As shown in the drawings, the members 30 are secured to the core 11 by means of screws, which also serve to retain the glands 12 and 13 in operative position. These members 30 may, however, be secured to the core 11 in any desired manner,

so long as they are held in the proper positions to effectively operate the switch mechanisms.

The walls of chambers 27 are provided with apertures in which are mounted suitable audible signaling devices such as whistles 28. I wish it to be clearly understood that any type of whistle or pneumatically operated audible signal may be employed, and that they may be mounted directly on the chambers 27 as shown in the drawings, or located remotely thereto and connected with the chambers 27 by suitable conduit means.

In order to increase the audibility of the signal two whistles may be placed at each end of the cylinder; that is, one that operates upon air being forced out of the cylinder, and another that operates when air is drawn into the cylinder.

A housing 29 is mounted on each end of the cylinder so as to protect the signaling devices 28 and the switch mechanism from exposure to weather.

The solenoid coils 3 and 4 are adapted to be connected with and disconnected from electric signaling circuits by means of switch mechanisms positioned in the chambers 27 in such a manner that, when one circuit is energized, one of the coils will be energized, thus setting up a magnetic field into which the core 11 will be drawn. As the core moves, a suction will be created on one side thereof, which operates one whistle at one end, and a pressure will be built up on the other side thereof, which operates one whistle at the other end. When the core reaches the end of the cylinder, the switch at that end will be operated to disconnect the energized coil from the energized circuit and to connect the other coil with the other circuit. When the other circuit is energized, the core will be drawn to the other end of the cylinder causing air to flow through the whistles and operating the switch mechanism at that end.

A somewhat modified form of blower unit is shown in Figure 3. This device differs essentially from that shown in Figures 1 and 2 in that the core is not used as the piston for moving the air. In this form of my invention a tubular member 31 is provided, which serves as an air-moving cylinder. End walls 32 and 33 are attached to the cylinder 31 by screws 34 or by any suitable means. In some instances the cylinder 31 may be provided with flanges to which the end walls 32 and 33 may be secured.

Walls 32 and 33 are provided with centrally positioned threaded openings into which are threaded tubular members 35 and 36. The latter are axially aligned and cooperate to serve as a cylinder in which a magnetic susceptible core 11' is adapted to reciprocate. Secured to core 11' is a disk-like piston, which is of a size to function as a piston for cylinder 31. Piston 37 may be secured to core 11' in any suitable manner, or it may be formed integrally therewith. A piston ring 38 constructed of metal, leather or other suitable material is carried by piston 37 to insure a leakproof seal between the piston 37 and cylinder 31. A valve 39 is mounted on cylinder 31 through which oil or other fluid for lubricating the piston and for forming a seal between the packing material and the walls of the cylinder may be introduced.

Core 11' is provided with a slot 17' into which pins or lugs 18' project. Pins 18' are of a size which will permit a large portion of the slot to be unobstructed. In this form of my invention the slot serves a dual function; that is, to pre-

vent rotation of the core and to conduct air from cylinder 31 to the whistles 28' mounted in the heads 19' and 20' of the cylinders 35 and 36. As the structure of the device shown in Figure 3 is otherwise identical with that shown in Figures 1 and 2, and since corresponding parts are indicated by the reference numerals used on Figure 2, except that they are primed, it is thought that a detailed discussion of this structure is unnecessary. The operation of the structure shown in Figure 3 is also similar to that described in connection with Figures 1 and 2.

As previously mentioned, the cylinder heads 19 and 20 are equipped with switch mechanisms for connecting and disconnecting the solenoids with the several signal circuits. The cylinder heads are preferably formed of fiber, phenol condensation products or other suitable insulating material so as to provide an insulated base upon which the switch elements may be mounted. The switches found suitable for the purpose are of the double-throw triple-pole type, or double-pole double-throw, and any style of switch of these types susceptible of operation by the piston may be used.

A particular form of switch mechanism found to be suitable for the purpose is shown in Figures 5 and 8 of the drawings. Each of these switches comprises 3 single-pole double-throw switch elements aligned to afford a triple-pole switch. Each of the single-pole switches consists of a central member 40 having a pair of resilient arms 41. The member 40 is formed of conducting material, and the arms 41 are provided with contact points 42 formed of material that will withstand arcing. Members 40 are mounted in the chamber 27 of the cylinder heads, and are secured in place by means of bolts 43, to which are attached binding posts 44.

Positioned on each side of member 40 is a member 45 formed of flexible conducting material. These members are secured to the wall of chamber 27 by bolts 46 on which are threaded binding posts 47. Members 45 are provided with contact points and are so shaped that the contact points will be adjacent contact points 42 on the arms of member 40. To make an electrical connection between binding post 44 and either binding post 47, it is merely necessary to effect contact between the desired set of contact points.

Any desired means can be employed for effecting contact between the contact points. One particular means found to be effective is shown in the drawings and consists of a resiliently mounted lever, which is operated by a sliding bar. Lever 48 has a portion about which is positioned a coil spring 49. Spring 49 is received in a cavity formed in the cylinder head. Lever 48 is also provided with an arm 50 adapted to engage the ends of members 45 to effect contact between members 40 and 45.

Arm 50 is provided with a notch, which engages with a sliding bar 51. A triangular projection 52 is formed on the surface of bar 51, which engages with the notched portion of arm 50. Bar 51 is of such dimensions and is so positioned in a slot formed in the cylinder head, that, when moved to one extreme position, the contacting edge of arm 50 will engage with the bar 51 at one juncture of the triangular projection and the flat surface of the bar indicated by reference numeral 53 in Figure 8. When in this position, contact will be provided between members 40 and one set of members 45. As the bar 51 is moved toward its other position, (Figure 8), the projection

52 will force lever 48 upwardly against the action of spring 49. When the apex of projection 52 passes the engaging edge of lever 48, the spring will force the lever 48 downwardly.

Due to the inclined surface of the projection 52 the lever 48 will be forced into engagement with the other set of members 45, establishing contact between member 41 and the other members 45. The action of the spring-pressed lever 48 on the inclined surface will also tend to force the bar 51 to the extreme position shown in dotted lines in Figure 8. Thus it will be seen that to cause the bar to slide from one extreme position to the other it merely has to be moved a little over half way. This gives a "snap action" to the lever 48, which is desirable in switching mechanisms.

Bar 51 is formed with a pair of spaced recesses 55 separated by a triangular projection 56 disposed directly opposite projection 52. These recesses 55 are adapted to receive the end of flexible member 30, which forces the bar 51 to shift from one position to another. The bar 51 is so constructed that, when in one position, the apex of projection 56 will be above the axis of core 11 in which the flexible member lies, and when the bar is in the other position, the point of projection 56 will be below the axis of the core. When the core 11 moves toward the bar 51, the end of flexible member 30 engages the inclined surface of the projection 52 and is deflected slightly. As the core moves further, the member 30 flexes more and forces the bar 51 to move to its other position. The core may then move away without affecting the position of the bar 51. When the core again moves toward the bar 51, the flexible member 30 will be flexed in the other direction, and the bar will be moved to the other extreme position. Of course, each time the bar 51 is moved from one position to the other, the electrical connections operated by lever 48 are changed. This construction provides a positive acting switch having few parts and which is extremely simple to manufacture and assemble and which is not likely to get out of order. It is thoroughly efficient in that contact is made and broken suddenly.

Figure 9 of the drawings shows diagrammatically how the several binding posts of the switch devices are connected with the signal circuits and the solenoids. In this figure reference numeral 57 indicates a common wire connected with one terminal of both lights and with terminal *w*. Wire 58 is connected with the other terminal of the green light and with terminal *y*, and wire 59 is connected with the other terminal of the red light and with terminal *x*.

There is also shown means to selectively and alternatively energize the signals. As illustrated a disk 60, adapted to be rotated by any suitable means, is provided with insulation extending around the periphery of the disk a predetermined distance. The disk 60 is connected to the common wire 57 by a wire 61. A wire 62 connects the terminal 58 of the green light to a contact 63. Adapted to engage the contact 63 is an arm 64 of a relay held in engagement with the contact 63 by means of a spring 65. The arm 64 is in turn connected by a wire 66 to the terminal 59. A wire 67 connects one of the terminals of the red light to a contact 68 similar to contact 63. A wire 69 connects a magnetic element 70 to the disk 60 and is provided with any suitable means for maintaining contact with the rotating disk.

In the position shown, current flows to the green light from terminal 59, to arm 64 in contact

with contact 63, through the green light and out over wire 57. When the disk 60 is rotated a predetermined length of time, the uninsulated part of the disk establishes an electric circuit with wire 69 which magnetizes the element 70 thereby drawing the arm 64 in contact therewith. The circuit to the green light is broken and current is supplied to the red light from terminal 59, to arm 64 in contact with contact 68, through the red light and out over wire 57.

While I have shown a conventional means for selectively energizing the signals, other well known selective devices may also be used without departing from the scope of my invention.

With the connections as shown in Figure 9 the operation of the device can be readily understood from the following description. For purposes of convenience reference will be made to Figure 3. It should be clear, however, that the device shown in Figure 2 operates in the same manner.

With the core 11 in the position shown in Figure 3, that is, the position indicated by I, the switch mechanism will be in a position to effect the following circuit:

$w-g-m-f-l-v-u-n-h-y.$ (1)

When current is supplied to the green light, the solenoid 4 will be energized, and the core 11 will be drawn to the position II.

When the core 11 reaches the position II, the flexible member 30 will enter into one of the recesses 55 formed in bar 51 and cause the switch mechanism to shift to another position to break circuit (1) and to complete the following circuit:

$w-q-k-a-s-t-j-p-o-i-x.$ (2)

When the electrical connection to the green light is broken by automatic or manual means, and electrical energy is supplied to the red light, solenoid 3 will be energized, and the coil will be drawn back to position I.

When the position I is reached, the flexible member 30 will operate to force bar 51, of the switch mechanism at position I, to move to change the position of the switch and break the circuit (2) established between the source of energy and the solenoid 3. In breaking the circuit (2) connecting the source of energy with solenoid 3, solenoid 4 is again reconnected with the $w-y$ circuit as follows:

$w-q-r-l-v-u-b-h-y.$ (3)

Thus, when current is supplied to the green light, the core 11 will be again drawn to the position II. In moving to the position II the switch mechanism at this position will be operated so as to break the circuit (3) and will establish a connection between the red light circuit and the solenoid 3. Then when energy is supplied to the red light, current will flow to solenoid 3 in the following manner:

$w-g-a-s-t-j-d-c-i-x.$ (4)

Upon the core 11 reaching position I, circuit (4) will be broken and circuit (1) reestablished. The operation will continue as described in cycles, circuits (1) and (3) operating in conjunction with the green light, and circuits (2) and (4) with the red light.

If desired, the blower unit may be equipped with a double-pole double-throw switch at each end of the core cylinder similar to the double-throw triple-pole switch hereinbefore described. In Figures 10 and 11 there are shown views of the modified form of my invention in which

double-pole double-throw switches are employed. In these figures parts similar to those shown in Figures 4 and 5 are indicated by the same reference numerals used in Figures 4 and 5, with

the exception that the reference numerals in Figures 10 and 11 are primed. The construction of the switch mechanism shown in Figure 11 is very similar to that shown in Figure 5, the only difference is in the number of sets of switch elements employed. In Figure 5 three sets of switch elements are combined to form a triple-pole switch; whereas in Figure 11 only two sets of switch elements are employed, since it is only necessary to have a double-pole switch.

The operation of the switch mechanism shown in Figure 11 is identical with that of the switch mechanism shown in Figures 5, 6, 7 and 8. The operating means, such as the sliding bar 51 and the flexible element 30 for moving the bar 51, is of the same construction as described in connection with the devices shown in Figures 5 to 8.

In Figure 12 of the drawings there is shown a diagrammatical circuit by means of which the coils 3 and 4 of the solenoid are connected with the circuit for operating the traffic light device.

The means for selectively and alternatively energizing the signals shown in Figure 9 may also be used in the arrangement shown in Figure 12. Other types of selective energizing means may also be employed without departing from the scope of this invention.

With the connections shown in Figure 12, the operation of the device can be readily understood from the following description: For purposes of illustration reference will be had to Figures 2 and 3 of the drawings. With the core 11 at the position I the switch mechanism will be in a position to effect the following circuit:

$$w'-u'-v'-h'-d'-i'-e'-y'. \quad (5)$$

When the current is supplied to the green light, the solenoid 4 will be energized, and the core 11 will be drawn to the position II. When the core 11 reaches the position II, the switch mechanism at that end will be operated to effect the following circuit:

$$w'-s'-t'-f'-j'-k'-g'-x'. \quad (6)$$

When current is supplied to the red light, coil 3 will be energized, and core 11 will be drawn to position I. When the core 11 reaches the position I, the switch mechanism at that point will be operated to complete the following circuit:

$$w'-u'-v'-h'-l'-a'-e'-y'. \quad (7)$$

Upon energizing the green light circuit current will be supplied to solenoid 4, which will cause core 11 to again be drawn to position II. Upon reaching position II, the switch mechanism at that end of the cylinder will be operated so as to effect the following circuit:

$$w'-s'-t'-f'-b'-c'-g'-x'. \quad (8)$$

When current is supplied to the red light, current will flow to solenoid 2, and the core 11 will be drawn to position I. Upon reaching position I, the switch mechanism at that end will be operated to complete the circuit (5) above described. The operation of the switch mechanisms with the circuit shown in Figure 12 will continue to complete circuits (5), (6), (7) and (8) as described, in cycles just as in the case with the circuit shown in Figure 9.

It will be obvious that each time the core 11 is moved from one position to another a blast of air

will be drawn through the whistle at one end and another blast of air will be forced through the whistle at the other end, producing a loud, audible warning signal.

While, for purposes of illustration, the warning device has been shown as connected with a single signal device, it is obvious that as many signal lights as desired may be connected with a single warning device, or as many warning devices as is desirable or necessary may be connected to a single traffic light. For instance, at noisy street intersections, it may be found advisable to place a warning signal on each corner.

The warning signal unit may be built into traffic-regulating systems or may be installed in existing systems. The device is sturdy and simple, requiring only a three-wire electrical connection with a traffic-regulating system and has no gears or parts that require attention. It is also so encased that it is weather-proof and cannot be tampered with.

This novel, audible warning device may be installed under, on, or adjacent the light signal box tower or pole, or in any other suitable location. When in operation an audible signal is produced when traffic on one street is stopped and traffic on the cross street is allowed to proceed. Thus vehicle drivers and pedestrians are immediately warned without any inconvenience on their part. This results in a saving of time, as traffic is handled in a most expeditious manner.

While I have shown and described the preferred embodiment of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth, by way of illustration, as it is apparent that many changes and variations may be made therein, by those skilled in the art, without departing from the spirit of the invention, or exceeding the scope of the appended claims.

I claim:

1. An electromagnetically-operated fluid compressor comprising a cylinder, a solenoid mounted on said cylinder adjacent each end thereof, a magnetically-susceptible piston reciprocally mounted in said cylinder, a plurality of double-throw switches mounted in each end of the cylinder and means carried by the piston for operating said switches, an electric circuit for each solenoid including the switches, one of which is adapted to be connected to one solenoid when both switches are in similar positions and the other of which is adapted to be connected to the other solenoid when the switches are in unlike positions.

2. A blower comprising a cylinder, cylinders of smaller diameter mounted on each end of said first mentioned cylinder and axially aligned therewith, solenoids surrounding said cylinders of small diameter, a magnetically-susceptible core mounted in said smaller cylinders, a disk-like piston mounted on said core and adapted to reciprocate in said first mentioned cylinder to move bodies of fluid, all of said cylinders being communicatingly connected and means adjacent the free ends of each of the small cylinders through which fluid is adapted to be drawn into and exhausted from said first mentioned cylinder.

3. A traffic regulating device comprising stop and go signals, means to selectively and alternatively energize said signals, a paramagnetic element, a solenoid mounted adjacent each end of said element, means for mounting said element for movement from a position adjacent one sole-

- noid to a position adjacent the other, a plurality of double throw switches mounted adjacent each end of the element, means carried by the element for operating said switches and electric connections between the first mentioned means, the switches and the solenoids to move the element from one position to another upon initial energization of one of said signals.
4. A traffic regulating device comprising stop and go signals, means to selectively and alternatively energize said signals, a cylinder, a solenoid mounted adjacent each end of said cylinder, a piston reciprocally mounted in said cylinder, a plurality of double throw switches mounted adjacent each end of the cylinder, means carried by the piston for operating said switches and electric connections between the first mentioned means, the switches and the solenoids to reciprocate the piston from one position to another upon initial energization of one of said signals.
5. A traffic regulating device comprising stop and go signals, means to selectively and alternatively energize said signals, a paramagnetic element, a solenoid mounted adjacent each end of said element, means for mounting said element for movement from a position adjacent one solenoid to a position adjacent the other, a plurality of double throw switches mounted adjacent each end of the element, means carried by the element for operating said switches, electric connections between the first mentioned means, the switches and the solenoids to move the element from one position to another upon initial energization of one of said signals, means adjacent the ends of the element through which fluid is adapted to be drawn into and exhausted from said cylinder upon movement of said element.
6. A traffic regulating device comprising stop and go signals, means to selectively and alternatively energize said signals, a cylinder, a solenoid mounted adjacent each end of said cylinder, a piston reciprocally mounted in said cylinder, a plurality of double throw switches mounted adjacent each end of the cylinder, means carried by the piston for operating said switches, electric connections between the first mentioned means, the switches and the solenoids to reciprocate the piston from one position to another upon initial energization of one of said signals, and means adjacent the ends of the cylinder through which fluid is adapted to be drawn into and exhausted from said cylinder upon movement of said piston.

LEONARD KAY WRIGHT.

30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150