O. L. BRITTON.

DIRECTION INDICATOR.

APPLICATION FILED MAR. 28, 1916.

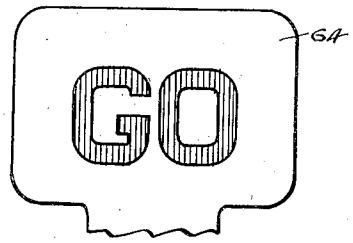
1,242,516.

Patented Oct. 9, 1917

2 SHEETS—SHEET 1.

Fig. 2.

Fig. 3.



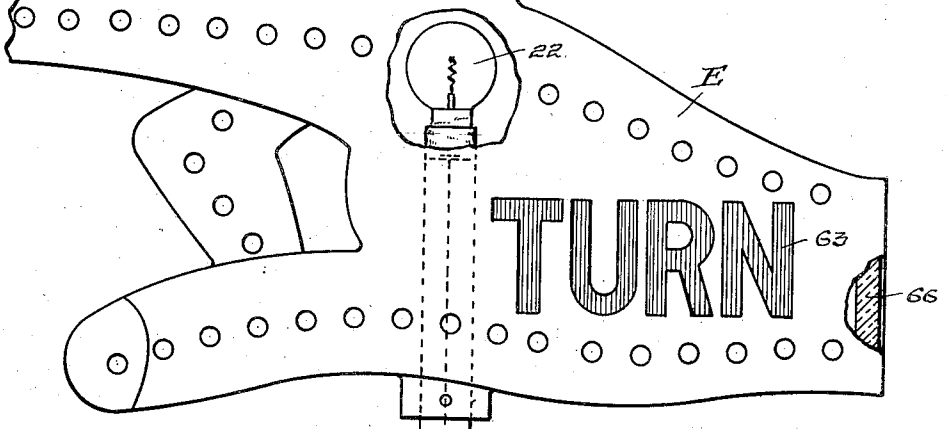


Fig. 1.

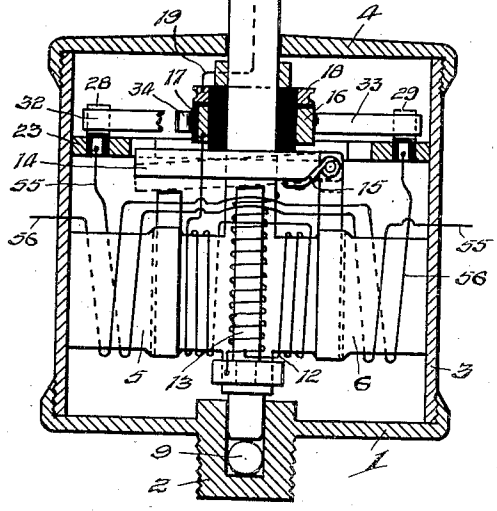
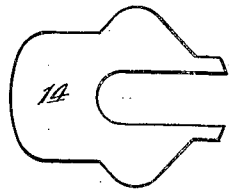


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

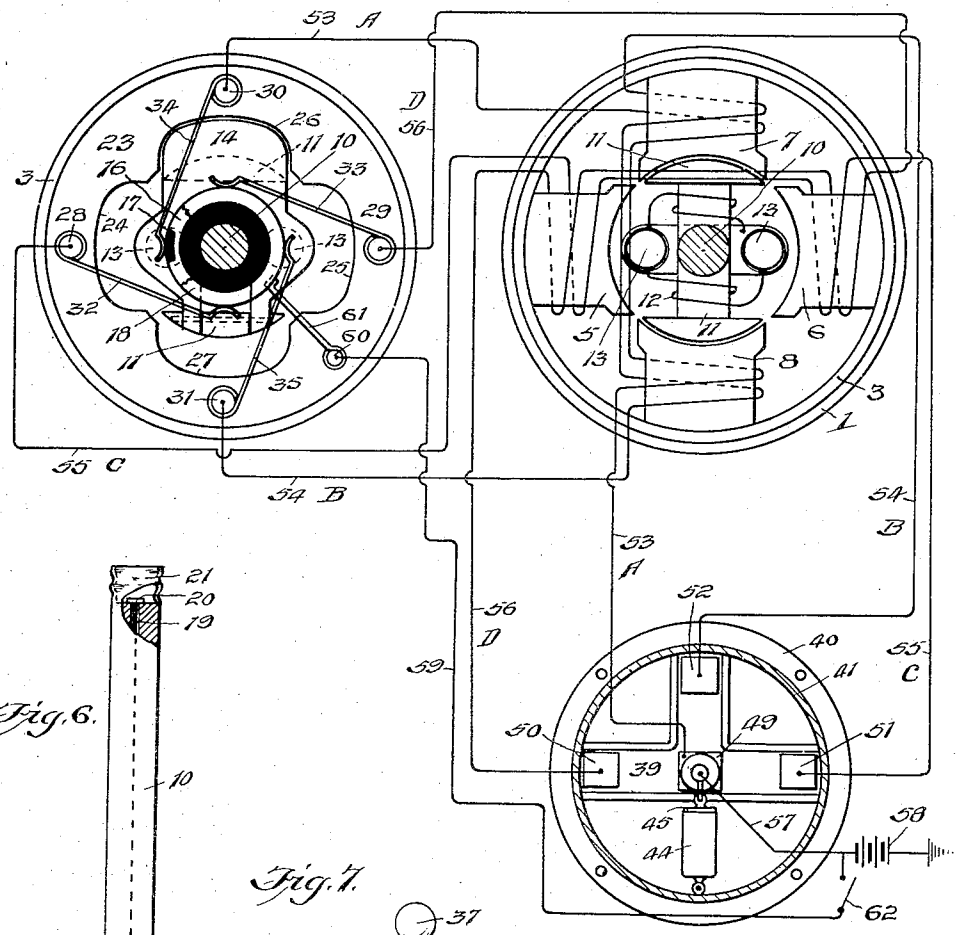


Fig. 6.

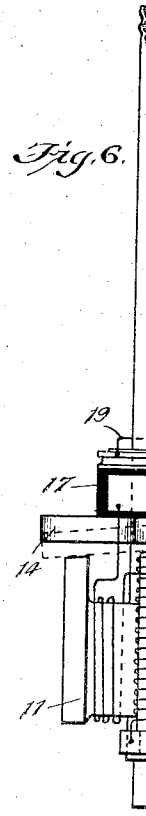
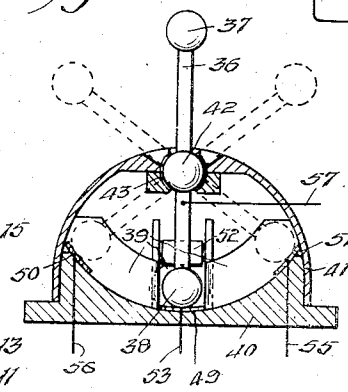


Fig. 7.



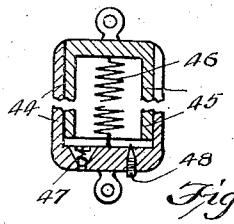


Fig. 8.

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DIRECTION-INDICATOR.

1,242,516. Specification of Letters Patent. Patented Oct. 9, 1917.

Application filed March 28, 1916. Serial No. 87,216.

To all whom it may concern:

Be it known that I, OSA LEO BRITTON, a citizen of the United States, residing at El Paso, in the county of El Paso and State of Texas, have invented certain new and useful Improvements in Direction-Indicators, of which the following is a specification, such as will enable others skilled in the art to which the invention relates to make and use the same.

My present invention relates to direction indicators and has reference more particularly to an electrically actuated indicator for vehicles to indicate or signal their proposed movements to following vehicles and approaching pedestrians, and I herein describe and illustrate in the drawings my invention as thus adapted, although it will be understood that the invention is not limited to such embodiments, but susceptible to various other adaptations and uses.

The object of my invention is to provide an electrically operated direction indicator which will be comparatively inexpensive in manufacture, simple, compact, durable, and efficient whereby the anticipated movements of the vehicle are indicated or signaled by a pointer, the movement of which pointer is controlled by the party controlling the course of the vehicle thus permitting the safety of the vehicle against accidental collision in traffic when stopping or turning suddenly, thus warning pedestrians and vehicles as to the intended course of the vehicle, and, therefore, making traffic safer.

The above and various other objects and features of novelty will be apparent from the following description taken in connection with the various drawings.

Referring to the accompanying drawings forming a part of this specification wherein like characters of reference denote similar parts throughout the several views:

Figure 1 is a side elevation of a direction indicator constructed in accordance with my present invention, various parts thereof being shown partly in cross-section.

Fig. 2 is a detail of a portion of the direction pointer.

Fig. 3 is also a detail of a portion of the direction pointer.

Fig. 4 is a plan view of the locking armature.

Fig. 5 is a diagrammatic view of my improved electric indicator including circuits, locking mechanism and commutator device.

Fig. 6 is a detail in side elevation of the revolving fields, the revolving field shaft and connected parts.

Fig. 7 is a sectional view of the commutator device, the shifting commutator lever being shown in full lines.

Fig. 8 is a detail of the device for returning the shifting commutator lever to its neutral position after having been moved for closing a circuit.

In carrying out the aim of my present invention I employ a specially designed, electric indicator apparatus preferably of a vertical type. Preferably one apparatus is attached to the front end of a vehicle and one at the rear end thereof.

The reference numeral 1 designates the base which is preferably provided with a screw-threaded stud 2 which is adapted to be secured to the radiator cap, or to some convenient rear portion of a vehicle. 3 designates a housing or shell, while 4 designates the upper cap. Secured to the housing 3 are a plurality of stationary armature poles arranged in pairs and designated 5 and 6, 7 and 8.

Rotatably mounted upon a roller bearing 9 is a revolving field shaft 10 provided with the series wound revolving fields 11. The revolving fields 11 are preferably provided with a second magnetic circuit connected in series with the windings 12 of the revolving fields 11. The second magnetic circuit consists of a substantially U shaped series wound member 13 supported by the revolving field shaft 10, the poles of which member 13 are located adjacent the central portion of a pivotally supported locking armature 14. A suitable resilient element 15 is employed for normally holding the locking armature out of contact with the poles of the U shaped member 13 when the circuits are open. One end of the above windings 12 are grounded to the revolving field shaft 10, while the other end is connected to a collector ring 16.

The collector ring 16 is suitably secured to the revolving field shaft 10 preferably above the locking armature 14. This collector ring 16 is provided at a suitable point with an insulated portion hereinafter known as a neutral plate 17.

A light collector ring 18 is also suitably secured to the revolving field shaft 10 and suitably insulated therefrom. This collector ring 18 is connected in circuit by

means of the conductor 19 with the contact 20 of a lamp socket 21, which socket is adapted to receive an ordinary incandescent lamp 22.

Suitably secured to the interior of the housing 3 is a suitable locking ring 23. This locking ring 23 is preferably provided with the cutaway or recess portions 24, 25, 26 and 27, each of which is arranged directly above the stationary armature poles 5, 6, 7 and 8, respectively.

Suitably secured to the locking ring 23 are a plurality of brush terminals 28, 29, 30 and 31. These terminals 28, 29, 30 and 31 are also arranged directly above each of the stationary armature poles 5, 6, 7 and 8, respectively. Resilient brushes 32, 33, 34 and 35 are adapted to be connected to the brush terminals 28, 29, 30 and 31, respectively, and the free ends of the brushes are adapted to be in contact with the collector ring 16. It will be understood that one of the brushes is always in contact with the neutral plate 17 whenever the motor is at rest and the circuits are open, which circuits are four in number, and from an illustrated standpoint are designated A, B, C and D.

To manually control the indicator circuits A, B, C and D which will be more clearly described hereinafter, I employ a suitable manually operated switch lever 36. This switch 36 consists of a handle 37 formed at one end of the lever, and a contact head 38 at the opposite or lower end of the switch lever. This contact head 38 is adapted to travel within, and be guided by, a three way race 39 formed in the base 40 of the switch 41. The intermediate portion of the switch lever 36 is preferably in the form of a ball 42 and is preferably supported by means of a socket 43 in the top of the switch casing 41. The natural tendency of the switch lever it will be understood is to stand in a vertical position when in neutral. When the switch lever 36 is in this neutral position, the pointer E is locked in its neutral position, and the finger of the pointer is pointing in the direction of the movement of the vehicle, which is forward.

To render the switch lever 36 automatic in its self-return movement to neutral position after having been moved to the right, left, or rearward positions, I employ a tubular casing 44 within which is slidably carried a tubular plunger 45, both of which members have one open end, which open ends are known as their inner ends. The tubular plunger 45 is pivotally secured to the switch lever 36 preferably at a suitable point below the ball portion 42, while the tubular casing 44 is pivotally connected to the switch casing 41. A suitable coiled spring or equivalent 46 is arranged within the casing 44 and tubular plunger 45. One end of the spring 46 is secured to the closed end of the casing 44, while the opposite end of the spring is secured to the closed end of the tubular plunger 45, so that when the switch lever 36 is moved in either of the above named three directions the spring 46 immediately expands and is adapted in contracting to pull the switch lever 36 back into its vertical or neutral position within a predetermined period of time after having been moved for closing a circuit to change the position of the pointer E for signaling the anticipated movement of the vehicle. This arrangement it will be observed enables the lever 36 to return to its vertical or neutral position without the operator of the vehicle having to move the lever 36, or give any further thought concerning the position of the pointer. The operator merely moves the switch lever 36 to the right if he wishes to turn the vehicle to the right, and within a reasonable period of time after the pointer E has displayed the intended movement of the vehicle the switch lever 36 will gradually work its way back to neutral position, causing the revolving field shaft 10 to carry the pointer E back to its neutral or forward position just as soon as the head 38 closes the circuit A.

To permit the switch lever 36 to return gradually to its vertical or neutral position, the end of casing 44 is provided with a suitable check valve 47 to permit of an intake of air into the casing as the casing 44 and plunger 45 withdraw from one another. The casing 44 is further provided with a suitable needle valve 48 to permit the escape of the air confined within the casing 44 and plunger 45, respectively. The needle valve 48 may be adjusted and so regulated as to cause the automatic movement of the switch lever 36 to neutral position within any set or predetermined period of time after a circuit has been closed for moving the pointer E to an anticipated signal position.

The base 40 of the switch 41 is provided with the contacts which will be known hereinafter as stationary commutator segments 49, 50, 51 and 52, as clearly shown in Fig. 5. It will be observed and understood that these commutator segments 49, 50, 51 and 52 are located in the bottom of the three-way race. The contact 49 which controls the neutral position of the switch lever 36 and the forward position of the pointer E is arranged at the junction point of the three-way race, while contact 50 is located at the left end of the race, contact 51 at the right end of the race, and contact 52 at the forward end of the race.

The conductors and magnetic circuits, will now be described: A conductor 53 is connected at one end to the neutral commutator segment 49 and leads to and around stationary armature pole 8, then across and around

stationary armature pole 7, and terminating at brush terminal 30. This forms the normally open circuit A.

A conductor 54 is connected at one end to the commutator segment 52 and leads to and around stationary armature pole 7, then across and around stationary armature pole 8, terminating at brush 31. This forms the normally open circuit B.

A conductor 55 is connected at one end to the commutator segment 51 and leads to and around the stationary armature pole 6, then across and around stationary armature pole 5 terminating at brush terminal 28. This forms a normally open circuit C.

A conductor 56 is connected to commutator segment 50 and leads to and around stationary commutator pole 5, then across and around stationary armature pole 6 terminating at brush terminal 29. This forms the normally open circuit D.

The reference numeral 57 designates a conductor which is connected to the switch lever 36 terminating at a suitable source of electrical supply, such for instance as a battery 58, or its equivalent, the opposite pole of the supply being grounded. One side of the source 58 is grounded and the circuits which operate the pointer and also the light circuits are all completed through a metallic ground connection with the indicator casing or the like.

From the foregoing description it will be readily seen that each conductor 53, 54, 55 and 56 forms an independent circuit, and these circuits are closed whenever the contact head 38 of switch lever 36 comes in contact with the commutator segments 49, 50, 51 or 52, having connection with said conductors 53, 54, 55 and 56, respectively.

The reference numeral 59 designates a conductor which is connected at one end to the source of electrical supply 58, and at its opposite end to a terminal 60 secured to and preferably insulated from the locking ring 23. A resilient finger or its equivalent 61 connects the terminal 60 with the light-collector ring 17 for completing the circuit for lighting the lamp 22. A suitable switch 62 is connected at some convenient point along the light circuit preferably near the switch 41.

The direction pointer E which is removably secured to the upper end of the revolving field shaft 10, is preferably in the form of a hollow hand of the same design on either side, and is provided on either side with the word Turn, the letters of which word are preferably covered by a red transparent material 63 secured to the inner side of the hand. The outer edge of the hand and fingers are preferably provided with suitable openings through which the light rays of the lamp 22 may pass or reflect at night for outlining the pointer E.

The upper end of the pointer E is preferably provided with a housing 64. One face of the housing is provided with the word Go, while the other face is provided with the word Stop, the letters of wich word are preferably backed by a suitably transparent material 65.

The pointer E is further provided with the preferably red glass end 66, which is adapted to act and take place of a tail lamp for the vehicle.

The operation of my direction indicator is as follows:

In the operation of the indicator assuming that the driver desires to turn the vehicle to the right, he shifts switch lever 36 to the right which will cause the closing of the circuit D through conductor 56 and energize the U shaped electrical magnetic element 12 which attracts the locking armature 14, thereby withdrawing the same from the recess of the locking ring 23 within which it has seated itself and simultaneously therewith cause the neutral plate 17 to revolve to a point directly in contact with the free end of the brush 33 which opens the circuit and releases the locking armature 14 so that the spring 15 will force the free end of the locking armature into the notch or recess 25 of the locking ring 23, which is the recess it enters from the illustration shown in Fig. 5 to cause the pointer E to signal to the right. After a circuit has been opened, it is understood that the pointer E will retain its new position only until such time as it takes the switch lever 36 to return to its vertical or neutral position, and whenever the switch lever 36 is in neutral position it will be understood that the pointer E is pointing forward.

It is to be understood that it makes no difference in what position the revolving fields or pointer are in, or to what position the switch lever 36 is moved, the revolving fields will rotate to the selected signal position in the shortest path of travel due to the selectivity of the compound-wound differentially connected stationary armature windings.

The windings of the stationary armature are as follows, for each pair of armature poles:

The mode of connection in one pair of armature poles tend to magnetize poles 5 and 6 north and south, respectively, while the second winding on the same poles tend to magnetize poles 5 and 6 south and north, respectively, or in the reverse polarity. The other set of poles 7 and 8 operate likewise due to the windings thereon. The conductor, such as 56, it will be observed enters around the armature pole 5 from a commutator segment 50 and connects at its opposite extremity to the brush terminal 29, while the second conductor 55 starts from

commutator segment 51 traveling in the same path as conductor 56 and terminates at a brush terminal 28, thus it will be observed the lines of force in one winding are in one direction, while the lines of force in the second winding around the same pair of armature poles are in the opposite direction. The object of the compound differentially connected winding is to reverse the rotation selectively, as heretofore described, causing the neutral plate 17 of the collector ring 16, when a circuit is closed, to move in the shortest path of travel. The neutral plate 17 when coming in contact with the brush in circuit causes the revolving fields to stop rotating and display the pointer E in its selected and anticipated signal position, which position is controlled by the movement of the switch lever 36.

From the foregoing description it will be observed that I have produced a specially designed electric indicator which is simple, novel, and highly efficient as an electrical operated direction indicator for use in connection with vehicles.

It will be understood that various changes may be made in the minor details of construction within the scope of the appended claims, and therefore I do not wish to limit or be limited to the precise details shown and described, but wish it to be distinctly understood that any modified constructions are simply modifications of my electric apparatus, and such modifications as come under the scope of this specification and the appended claims I consider within the spirit of my invention.

What I claim is:

1. In a direction indicator for vehicles, a source of electrical supply, a pointer, a plurality of normally open circuits, means for closing any one circuit at a time for rotating said pointer to a selected signal position to indicate the anticipated movement of the vehicle, means for automatically locking said pointer in its selected signal position, and means for automatically releasing the locked pointer after having signaled the anticipated movement of the vehicle and returning it to its normal position which indicates the forward movement of the vehicle.

2. In a direction indicator for vehicles, a source of electrical supply, a pointer and means for illuminating said pointer, a plurality of circuits for controlling the forward, right, left and stop movements of the pointer, means for closing any one circuit at a time to cause the pointer to indicate the anticipated movement of the vehicle in the shortest path of travel of the indicator, and said travel not to exceed one-half revolution in any one movement thereof, means for automatically opening the closed circuit after the anticipated movement of the vehicle has been signaled by the pointer, and means for automatically closing the circuit controlling the forward position of the pointer, and when the pointer has returned to said forward position, open the circuit, and automatically lock the pointer in its forward signaling position.

3. In a device having a direction pointer of the class described, an apparatus for subjecting the pointer to selected movements to indicate the anticipated movement of a vehicle electrically by causing a selected circuit to be closed and automatically opened after the pointer has reached its anticipated signal position and signaled the anticipated movement of the vehicle, means for normally locking the pointer in its selected position, and means for automatically closing a circuit to unlock the pointer and revolve it to its normal position and again automatically open the circuit and lock the pointer from rotation until another circuit has been closed for signaling the anticipated movement of the vehicle.

4. In a device of the class described, a casing, a source of electrical supply, a direction pointer, a plurality of compound-wound differentially connected stationary armature poles, revolving fields, a revolving field shaft, a collector ring having a peripheral contact face fixed to said shaft and in circuit with said fields, a neutral plate fixed to the periphery of said collector ring, a stationary commutator, a plurality of normally open circuits leading from said stationary commutator to said revolving fields, lever actuated circuit closing means for closing any one circuit at a time to revolve said fields, not to exceed one-half revolution in any one direction for finding the selected signal position, a locking ring fixed to the casing near the upper edge thereof having a plurality of locking armature receiving recesses, an electrically actuated armature pivotally supported by one of the revolving fields, and means for opening one of the circuits for returning the direction pointer to its forward pointing position after the fields have been revolved to move the direction pointer to a selected signal position.

5. In a direction indicator comprising an electric apparatus consisting of a casing, a direction pointer, compound-wound and differentially connected stationary armature poles arranged in opposed pairs and providing for normally open circuits, namely, forward, stop, left and right; series wound fields adapted to rotate not to exceed one-half revolution in any one direction between said armature poles, a collector ring having a peripheral contact face in circuit with said fields and adapted to rotate with the fields, a neutral plate fixed to the periphery of said collector-ring, a source of electrical supply, a locking ring fixed to the casing near the upper edge thereof having a plurality of

locking armature receiving recesses, a locking armature pivotally supported by one of the revolving fields, and adapted to seat its free end in one of said recesses for locking the direction pointer against movement when the circuits are open, and means for closing the forward circuit and returning the direction pointer to its forward pointing position after a turning or stop signal has been indicated by the pointer.

6. An indicator comprising an electric apparatus consisting of a plurality of opposed pairs of compound-wound differentially connected stationary armature poles, series wound revolving fields adapted to move between said armature poles having an extended field shaft, a source of electrical supply, a pointer secured to said field shaft, a collector ring secured to said shaft and in circuit with said revolving fields, a neutral plate secured to said collector ring, a plurality of brushes in contact with said collector ring, a normally open circuit leading to each brush, means for closing any one circuit at a time for revolving said fields and said pointer to a new signal position, means for automatically opening the circuit when the pointer has reached its anticipated signal position, and means for automatically closing a circuit for returning the indicator to its normal forward signal position and locking it against rotation until another circuit has been closed.

7. In an electrical indicator apparatus, a source of electrical supply, a plurality of compound-wound differentially connected stationary armature poles, a plurality of normally open indicator circuits, series wound revolving fields normally in open circuit with said indicator circuits, means for closing any one circuit at a time for revolving the fields, not to exceed one-half revolution in any one direction, means for opening the circuit and stopping the rotation of the fields at a predetermined position for displaying a traffic signal, and means for automatically closing a circuit for returning the fields to their normal position.

8. An electric apparatus comprising stationary armature poles arranged in pairs, compound-wound and differentially connected, a plurality of normally open circuits, series wound revolving fields normally in open circuit with said plurality of normally open circuits, a stationary commutator having means for controlling the closing of any one circuit at a time and revolving the fields, means for opening the closed circuit at a predetermined time, means for locking the fields against rotation simultaneously with the opening of any closed circuit, and means for automatically unlocking the fields and closing a circuit for returning the fields to their normal position after the closed circuit, which revolved them, has been opened.

9. An electric apparatus comprising stationary armature poles arranged in pairs, compound-wound and differentially connected, to form four normally open circuits, revolving fields in normally open circuits with said four normally open circuits, magnetically actuating locking means in circuit with said fields, automatic means for returning the fields to their normal position after having moved to a predetermined position by closing a circuit, and a direction pointer, the movement of which is controlled by the movement of the fields.

In testimony whereof, I have hereunto signed my name to the specification.

OSA LEO BRITTON.