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J. F. COLLINS

TRAFFIC SEMAPHORE OR SIGNAL DEVICE FOR USE AT ROAD INTERSECTIONS.

Filed May 16, 1922

2 Sheets-Sheet 1

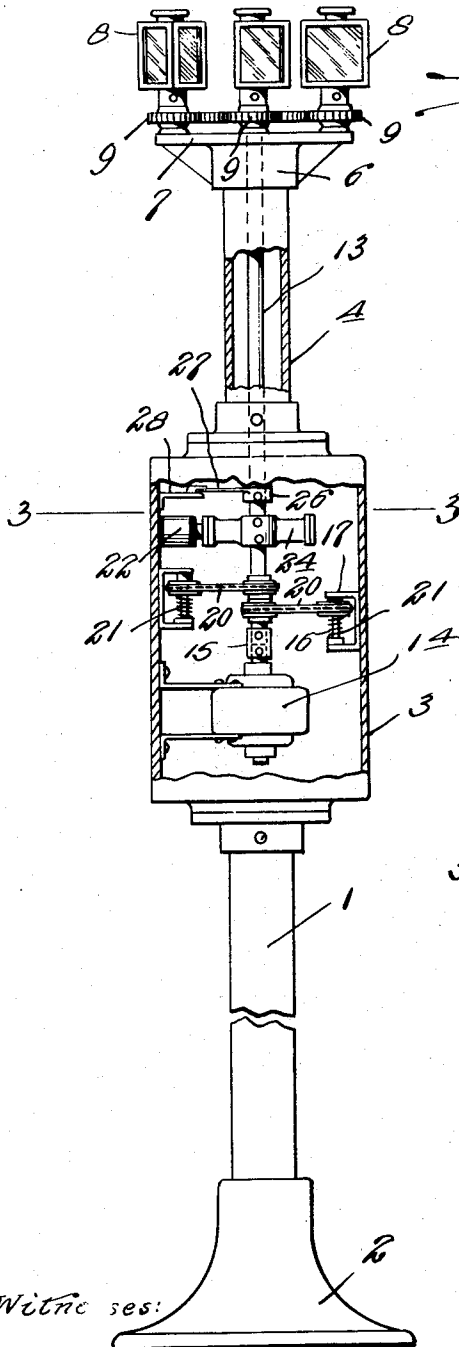


Fig. 1.

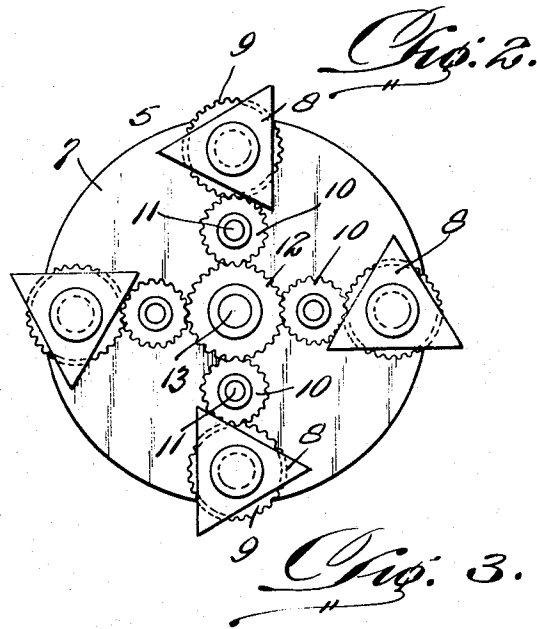


Fig. 2.

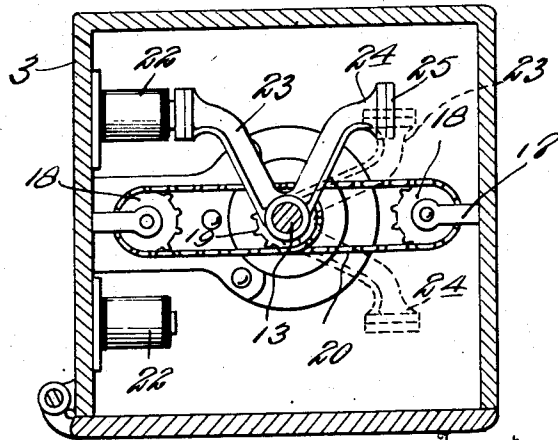


Fig. 3.

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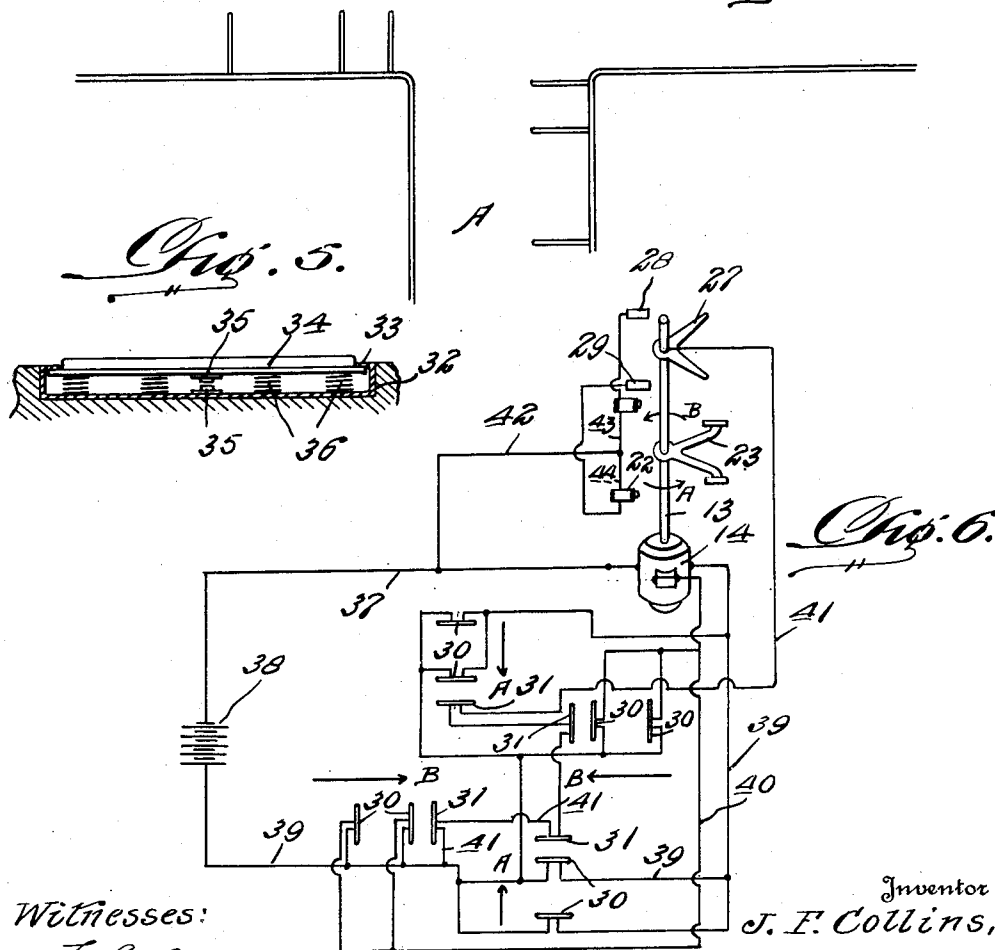
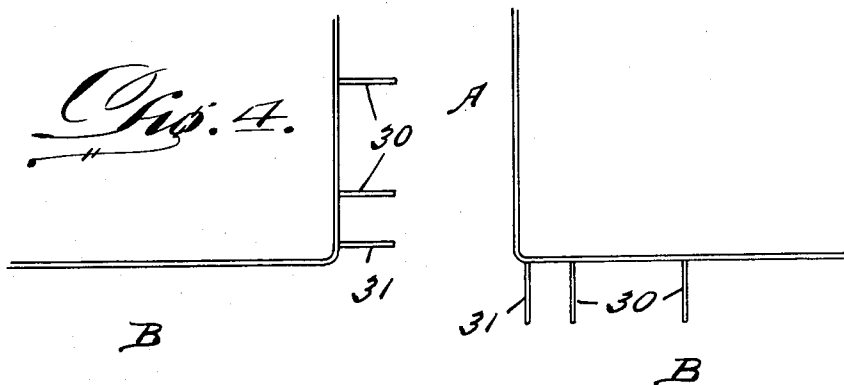
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2 Sheets-Sheet 2



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES F. COLLINS, OF PATERSON, NEW JERSEY.

TRAFFIC SEMAPHORE OR SIGNAL DEVICE FOR USE AT ROAD INTERSECTIONS.

Application filed May 16, 1922. Serial No. 561,545.

To all whom it may concern:

Be it known that I, JAMES F. COLLINS, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented new and useful Improvements in Traffic Semaphore or Signal Device for Use at Road Intersections, of which the following is a specification.

In carrying out the present invention it is my purpose to provide a traffic signal which will be found especially useful at the intersection of streets or roadways and which may be operated automatically by traffic approaching the signal, so that as traffic approaches the intersection over one street the signal will be automatically operated to indicate danger to traffic on the other street, thereby enabling the drivers of cars on the latter street to control their cars accordingly.

It is also my purpose to provide a traffic signal wherein the signal unit may be operated automatically by traffic approaching the signal over one street to warn traffic approaching the signal on the other street, and which will be returned to normal position as the traffic leaves the intersection, such return to normal position being controlled by the vehicles or traffic, thereby enabling the device to be restored automatically thus eliminating the human element in the operation of my improved traffic signal.

A further object of my invention is to provide a traffic signal of the class described which will embrace the desired features of simplicity, efficiency and durability, which will operate effectively under all conditions and wherein the component parts will be so arranged and correlated as to reduce the possibility of derangement to a minimum.

With the above recited objects in view, and others of a like nature, the invention resides in the construction, combination and arrangement of parts set forth in and falling within the scope of the appended claims.

In the accompanying drawings:

Figure 1 is a view in elevation, partly in section, of my improved traffic signal.

Figure 2 is a top plan view thereof.

Figure 3 is a horizontal sectional view on the line 3—3 of Figure 1.

Figure 4 is a diagrammatic view of the intersecting streets or roads showing the control devices for the signal.

Figure 5 is a fragmentary sectional view through one of the circuit closers.

Figure 6 is a diagrammatic view showing the wiring.

Referring now to the drawings in detail, 1 designates a column or post mounted upon a base 2 that is adapted to be located at the center of the intersection of the streets or roads. On the upper end of the column 1 and suitably fastened thereto is a casing 3, and uprising from the top of the casing 3 in open communication therewith is a sleeve 4.

On the upper end of the sleeve 4 is my improved signal designated as an entirety by the numeral 5. In the present instance this unit comprises a collar 6 rigidly mounted on the top end of the sleeve 4 and carrying at its upper edge a circular disk 7. Rotatably mounted upon the top of the circular disk 7 and spaced apart equidistant around the disk are signal lamps 8. The base portion of each signal lamp 8 is equipped with a spur gear 9, and these gears 9 mesh with pinions 10 journaled upon stub shafts 11 secured to the upper surface of the disk 7. The pinions 10 in turn mesh with a central gear 12 that is fixed to the upper end of a vertical shaft 13 that extends through the sleeve 4 and into the casing 3, as clearly illustrated in Figure 1 of the drawings.

In the present instance each signal lamp 8 is triangular in horizontal section and the sides thereof are closed by glass plates colored respectively, red, white and green to denote danger, clear and caution.

The lamps 8 are so arranged upon the disk 7 that the green glass or caution signals are normally presented to all approaches to the intersection and when the shaft is rotated in one direction then the lamps are revolved through the train of gears hereinbefore described, so that all of such lamps present red glass or danger signals to the approaches to the intersection on one street or road and the other two lamps present white glasses or clear signals to the approaches to the other street or road. When the direction of rotation of the shaft 13 is reversed, then the first mentioned lamps present clear signals to the corresponding street and the second lamps present danger signals to the other street.

It will be noted that when one approaches the signal from a street or road, that por-

tions of three of the lamps will be visible, and it is therefore, necessary that the public be educated to follow the signal given by the lamp appearing to the right, and this
5 lamp appearing to the right will be more readily visible to the person approaching the signal device.

Suitably mounted within the casing 3 is an electric motor 14 of the reversible type,
10 and in the present instance the armature shaft of the motor 14 is in axial alinement with the shaft 13 and connected thereto by a coupling 15, so that when the motor is turned in one direction, corresponding motion will be imparted to the shaft 13, while
15 when the direction of rotation of the motor is reversed a similar movement will be imparted to the shaft 13.

In order to hold the shaft 13 in normal position, that is to say, in a position to
20 present caution signals to all approaches, suitable holding means is provided. In the present instance this holding means comprises vertical shafts 16 journaled in bearing
25 brackets 17 secured to opposite sides of the casing 3. Fixed to each shaft 16 is a sprocket wheel 18 and fixed to the shaft 13 are sprocket wheels 19 alining respectively, with the sprocket wheels 18. Over these
30 alining sprocket wheels are trained endless chains 20, and encircling each shaft 16 is a restoring spring 21 having one end fixed to the shaft and the other end secured to the bearing bracket. These springs act to main-
35 tain the shaft 13 in normal position and when the shaft is operated out of normal position in one direction or the other, then the springs are placed under tension, and as soon as the shaft 13 is released, the
40 springs 21 re-act to restore the shaft 13 to normal position and hold the same in such position.

In order to hold the shaft 13 against return to normal position until the desired
45 time, I employ a retaining mechanism which in this instance comprises electro-magnets 22—22 secured to one side wall of the casing 3 at opposite sides of the center line of the shaft 13 and a V-shaped arm 23 fixed to the
50 shaft 13 at the apex of such arm 23. The outer ends of the arm 23 are turned outwardly as at 24 and equipped with armatures 25 adapted to be disposed under the influence of the respective magnets 22 when the shaft
55 13 is rotated in one direction or the other, and when the particular armature 25 comes within the zone or influence of the magnet 22 the latter when energized acts to hold the shaft 13 against return to normal position under the action of the springs 21.

As shown in Figure 3 of the drawings, in the full line position of the V-shaped arm 23, the shaft 13 is held in one position, and
65 when the shaft returns to normal position under the action of the springs 21, then the

arm 23 resumes the position shown in dotted lines.

Also fixed to the shaft 13 above the V-shaped arm 23 is a collar 26, and extending
70 radially from the collar 26 in the form of a V are contact arms 27 engageable respectively with contact blocks 28 and 29 according to the direction of rotation of the shaft. The arms 27 are so arranged relative to the
75 V-shaped arm 23 as to engage the contacts 28, 29 at the same time that the particular armature 25 approaches the influence of the corresponding magnet 22.

Arranged on the right hand side of each street or road at the approach to the inter-
80 section are circuit closers 30 arranged one in advance of the other and a circuit breaker 31 arranged to be engaged by a vehicle after such vehicle has operated the circuit closers
85 30. Each circuit closer comprises an elongated casing 32 embedded in the roadway and having its upper end formed with inwardly extending flanges 33, and a bar 34 arranged within the upper end of the cas-
90 ing and confined therein by means of the flanges 33. The bar 34 and the bottom of the casing 32 carry contacts 35 respectively normally held out of engagement with each
95 other by springs 36 that act to hold the bar 34 at its limit of upward movement. From this it will be seen that as vehicles roll over the circuit closers 30 the bars 34 thereof
100 will be depressed to engage the contacts 35.

Each circuit breaker 31 is similar in construction to the circuit closers 30, except that
105 the contacts of the circuit breakers 31 are normally in engagement with each other and adapted to be moved out of engagement when the bars are depressed under the weight of traffic.

The electric motor 14 is connected in a circuit including conductor 37, connected at
110 one terminal at one side of the motor and at its other terminal to a battery 38 and a conductor 39 leading from the other side of the battery to the other terminal of the
115 motor. This circuit also includes a conductor 40 leading from the motor and connected to the conductor 39.

In Figure 4 of the drawings I have shown
120 a roadway or street A arranged at right angles to and intersecting a second roadway or street B and at the center of the intersection of these streets my improved traffic
125 signal is adapted to be located while the circuit closers and breakers are arranged at the approaches of the intersection, as illustrated.

In the present instance, the circuit closers
130 30 of the street A are connected in parallel with the conductors 39 and 40, as clearly illustrated in Figure 6, while the circuit closers of the street B are also connected in parallel with the conductors 39 and 40. When the circuit closers in the street A are

operated by the wheels of the vehicle as such vehicle approaches the intersection, then current flows from the battery 38 through the motor 14 in one direction, so as to turn the shaft 13 in the direction of the arrow A in Figure 6, while when the circuit closers in the street B are operated the direction of flow of the current from the battery 38 is reversed through the motor 14, so that the direction of rotation of the shaft 13 will be reversed, as indicated by the arrow B in Figure 6.

The circuit breakers 31 are connected in series with each other in a conductor 41, one terminal of which is connected to the contact fingers 27 and the other terminal is tapped onto the conductor 39. Tapped onto the conductor 37 is one end of a conductor 42 and the other terminal of the conductor 42 is connected with branch wires 43 and 44. One of these branch wires 43 extends through one magnet 22 and the corresponding contact 28 while the branch wire 44 extends through the other magnet 22 and the corresponding contact 29.

In practice, when one of the circuit closers is approached the circuit through the motor 14 is closed and the shaft 13 rotated to actuate the signal lamps and in the operation of the shaft 13 the contact arm 23 and the arms 27 move with the shaft, and as the particular armature 25 approaches the pole face of its magnet 22 the corresponding contact arm 27 engages the particular contact 28 or 29, thereby closing the circuit through such magnet, so as to retain the shaft in actuated position subsequent to the release of the particular circuit closer. As the vehicle leaves the crossing the circuit breaker 31 is depressed and as the particular circuit breaker 31 is depressed the circuit through the magnet 22 is broken, thereby permitting the springs 16 to restore the parts to normal position.

While I have herein shown and described one preferred form of my invention by way of illustration, I wish it to be understood that I do not limit or confine myself to the precise details of construction herein shown and described, as modifications and variations may be made within the scope of the claims and without departing from the spirit of my invention.

Having thus described the invention, what is claimed as new, is:—

1. A street intersection traffic signal including a post, a plurality of relatively rotatable signal members mounted on the upper end of said post for signalling traffic in all directions, a shaft rotatable in the post, driving connections between the shaft and each signal member for relatively rotating said signal members in the rotation of the shaft, means for rotating the shaft in opposite directions, means normally acting

on the shaft for holding said shaft normally in one position to position said signal members to display the same signal in all directions, and means for limiting the rotation of the shaft in each direction and for holding the shaft in its limit of movement in said direction for holding said signal members in relatively different signalling positions.

2. A street intersection traffic signal including a post, a casing arranged intermediate the ends of said post, a plurality of relatively rotatable signal members mounted in spaced relation on the upper end of said post for signalling traffic in all directions, a shaft rotatable in the post and extending into the housing, driving connections between the shaft and each signal member for relatively rotating said members in the rotation of the shaft, a motor mounted in the casing and connected with the shaft for rotating said shafts in either direction, means mounted in the casing for holding the shaft in a normally fixed position to position said signal member for signalling the same signal in all directions, means mounted on the shaft for limiting the rotation thereof in each direction, means mounted in the casing cooperating in the last mentioned means for holding the shaft at its limit of movement in either direction for holding the signal members positioned at relatively different signalling positions, and means for controlling the last mentioned means and the motor.

3. A street intersection traffic signal including a post, a casing interposed between the ends of said post, a plurality of relatively rotatable signal members on the upper end of said post for signalling traffic in all directions, a shaft rotatable in the post and extending within the casing, driving connections between the shaft and each of the signalling members for relatively rotating the signal members in the rotation of the shaft, a motor mounted in the casing and connected with the shaft adapted for rotation of said shaft in either direction, means for normally holding said shaft in a fixed relative position to position all of said signal members for displaying the same signal in all directions, a V-shaped arm mounted on said shaft within said casing and adapted to rotate therewith, means mounted in the casing adapted to cooperate with said V-shaped arm for limiting the rotation of the shaft in each direction, said means being also adapted for holding said shaft at its limit of rotation in each direction for holding the signalling member in a different signalling position with respect to each other and the normal signalling position above mentioned, and means for controlling the operation of said cooperating means and the motor by controlling the operation of said signal.

4. A street intersection traffic signal in-

cluding a post, a casing interposed intermediate the ends of said post, a plurality of relatively rotatable signal members on the upper end of said post for signalling traffic in all directions, a shaft rotatable in the post and extending within the casing, driving connections between said shaft beneath the said signal member for relatively rotating said members in the rotation of the shaft, a motor mounted in the casing and connected with the shaft for rotating the shaft in either direction, cooperating means mounted on the shaft and in the casing adapted for cooperation to limit the rotation of the shaft in each direction and for holding said shaft at the limit of said rotative movement, means for controlling the operation of said cooperating means and the motor, a pair of shafts arranged parallel to the first mentioned shaft and rotatable in the casing, means on each shaft for normally rotating it opposite to the other shaft of the pair, and connections between the first mentioned shaft and each shaft of the pair adapted for transmitting the rotative movement of each

shaft to the pair to the first mentioned shaft for normally holding said first mentioned shaft in a relatively fixed position.

5. A street intersection traffic signal including a post, a plurality of relatively rotatable signal members on the upper end of said post for signalling traffic in all directions, each signal member including signalling means for indicating a clear signal, a caution signal, and a stop signal, and operating means within the post having connection with each of said signal members for relatively rotating said members and normally holding them in a fixed relation position for displaying a caution signal in all directions, and controlling means for said operating means adapted to permit the operation thereof for rotating said signal members relative to each other for changing the signal from "caution" to "stop" in one direction, and "clear" in the other direction, and vice versa.

In testimony whereof I affix my signature.

JAMES F. COLLINS.