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H. B. McCaINE

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DIRECTION INDICATOR WITH SWINGABLE ARROW

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2 SHEETS—SHEET 1

Fig. 1

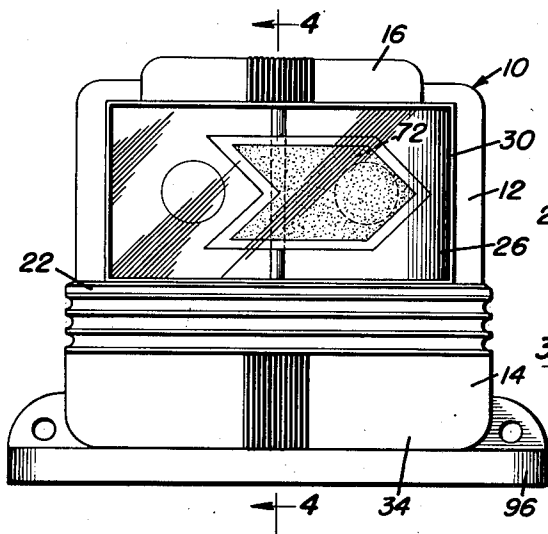


Fig. 2

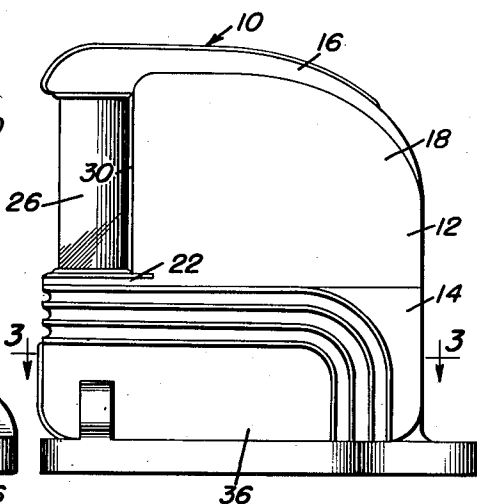
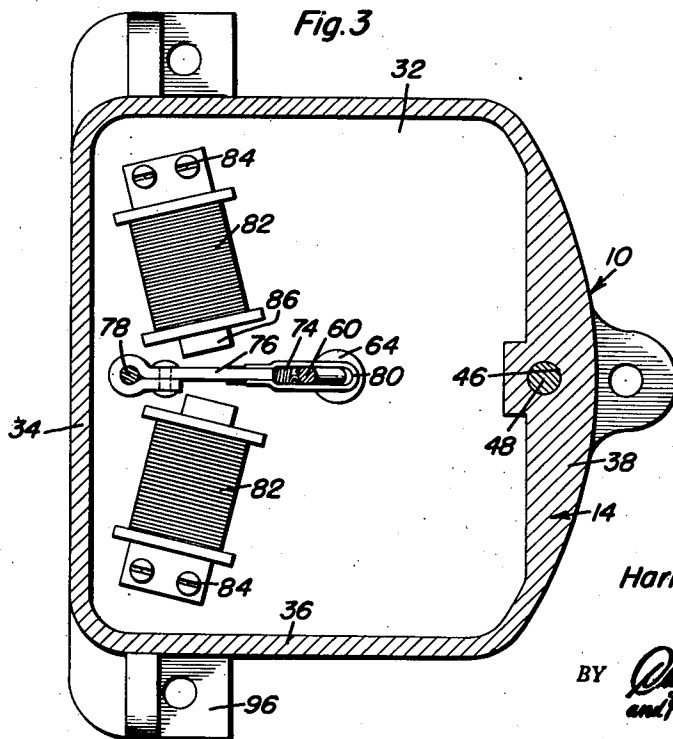


Fig. 3



Harry B. McCaIne
INVENTOR.

BY *Oliver A. Wilson*
and *Harvey B. Jacobson*
Attorneys

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DIRECTION INDICATOR WITH SWINGABLE
ARROW

Harry B. McCaine, Atlantic City, N. J.

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7 Claims. (Cl. 177-327)

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This invention comprises novel and useful improvements in automotive direction indicators, and more particularly pertains to improvements in direction indicators of the type disclosed in my previous Patent 1,861,126.

In my Patent 1,861,126, there was disclosed a direction indicator which included a horizontally swingable arrow, which arrow was electrically actuatable to cause the same to swing in the direction in which the driver intends to turn. The construction disclosed in the patent, referred to above, however, precludes movement in a complete semi-circle, viz. one-quarter turn in both directions from the neutral position of the arrow and consequently limited the effectiveness of the device for signalling purposes. It is accordingly a primary object of this invention to provide a signal device in which the arrow may be swung a quarter turn in both directions from the neutral position.

Another important object of this invention is to provide an improved housing for the signal device constructed in accordance with the foregoing object, which will facilitate the assembly and disassembly of the same.

An important feature of this invention resides in the provision of a crankshaft having an arrow adjacent one end thereof with a pivotally mounted armature slidably receiving the crank-throw portion of the shaft, and which armature is so dimensioned that when the latter is pivoted by solenoids disposed on opposite sides thereof, the arrow carried by the shaft will be oscillated through substantially one-quarter turn in each direction from a predetermined neutral position.

Another feature of this invention resides in the provision of a housing for the direction indicator constructed in accordance with the foregoing feature, which housing includes upper and lower sections, the crankshaft being journaled in the top and bottom wall of the upper and lower section respectively and with a pair of lights disposed on the back wall of the upper section, each of which lights is disposed in registry with the direction arrow when the latter is in either of its turn indicating positions.

A further feature of this invention resides in an improved means for securing the sections of the housing together.

These, together with various ancillary objects and features are attained by this device, a preferred embodiment of which has been illustrated by way of example only in the accompanying drawings wherein:

Figure 1 is a front elevational view of the housing;

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Figure 2 is a side elevational view of the housing;

Figure 3 is a horizontal sectional view, taken on the plane 3-3 of Figure 2;

Figure 4 is a longitudinal vertical sectional view of the housing, taken on the plane 4-4 of Figure 1;

Figure 5 is a schematic wiring diagram for a single direction indicator; and,

Figure 6 is a schematic wiring of the circuit for actuating a plurality of direction indicators by a common control.

Reference is now made more specifically to the accompanying drawings wherein the direction indicator is denoted generally by the numeral 10.

The housing of the direction indicator includes upper and lower sections 12 and 14 respectively. The upper section includes a top wall 16, side walls 18 and a rear wall 20, each preferably being molded or otherwise formed integrally with the top wall. A horizontally disposed shelf 22 is formed integrally with the side walls 18 adjacent the forward lower edge thereof. A longitudinally arcuate pane or shield 26, of transparent material, has the upper edge thereof disposed in abutting relationship with an arcuate depending flange 28 carried by the undersurface of the wall 16, the lower edge of the shield resting upon shelf 22. A suitable longitudinally arcuate frame 30 is secured to the upper section in any desired manner, to retain the shield in position. The ends of the shield 26 are received in recesses 31 in the side walls 18 of the upper section whereby the shield, which is preferably slightly resilient, will be retained in position.

The lower section includes a hollow wall 32, a front wall 34, side walls 36, and a rear wall 38, each of which is molded or otherwise formed integrally with the bottom wall. The forward wall has an inwardly directed flange 40 on the upper edge thereof, and the shelf 22 has an offset lip 42 on the lower face thereof which engages the flange 40 to retain the forward portions of the upper and lower sections together.

Axially aligned bores 44 and 46 are formed in the rear walls 20 and 38 respectively, the bore 44 being internally threaded to receive the threaded end of the bolt 48. The bore 46 slidably receives the bolt 48, and a counter bore 50 is formed on the lower end of the bore 48 to receive the head 52 of the bolt 48. It will thus be noted that the lip 42 engages the flange 40 to retain the forward portion of the upper and lower sections together, while the bolt 48 secures the rear sections together. In order to insure proper registry of the contiguous edges of the upper and lower sections,

one of the sections such as the lower section 14 may be formed with a marginal flange 54, which flange seats in a corresponding recess 56 in the bottom edge of the upper section.

A shaft 58, having a crankthrow 60 adjacent the lower end thereof, has its upper end journaled in the recess 62 in the top wall 16, while the lower end of the shaft is journaled in the apertured boss 64 on the bottom wall 32.

A horizontally disposed panel 66 has the forward edge thereof received in a channel 68 in the shelf 22, the ends of the panel being supported by suitable ribs 70 carried by the lower edge of the side walls 18. An arrow 72, of a transparent material such as plastic, has the rear portion thereof non-rotatably secured to the shaft 58 above the panel 66, and a spring 74 is attached to the crankthrow and the bottom wall to urge the shaft 58 and arrow carried thereby into a position parallel to the longitudinal axis of housing.

An armature 76 is horizontally pivotally mounted on the stub shaft 78 and a U-shaped yoke 80 is carried by the end of the armature for slidably receiving the crankthrow. It is intended that the length of the armature and yoke be such that when the crankthrow is disposed one-quarter turn out of its neutral position, shown in Figures 3 and 4, the end of the yoke will engage the crank throw to limit further turning thereof.

A pair of solenoids 82 are secured, as by fasteners 84 to the bottom wall 32, the solenoids each preferably being disposed so as to lie normal to the armature 76 when the latter is in either of its extreme laterally displaced positions. The cores 86 of the solenoids are adapted to abut the armature, when the latter is in either extreme laterally displaced positions, whereby the armature will be firmly retained in that position when either of the solenoids is energized, and consequently the arrow 72 will be firmly retained normal to the longitudinal axis of the housing.

A longitudinally arcuate reflector 88 has the end portions thereof retained in the channels defined by the vertical ribs 90 carried by the side walls 18 of the upper section, the intermediate portion of the reflector being supported by the lamp sockets 92 which are carried by the rear wall 20 of the upper section, and which sockets extend through suitable apertures in the reflector. The sockets 92 and lamps 94 carried thereby are each disposed so as to be in registry with the forward portion of the arrow 72 when the latter is in either turn indicating position, as is clearly apparent from a consideration of Figure 1.

Obviously suitable apertured lugs 96 may be secured to or formed integrally with the lower section, whereby the direction indicator may be secured to a vehicle.

In the wiring diagram shown in Figure 5 for a single direction indicator unit, each of the solenoids 82 and the lamp corresponding to that solenoid are electrically connected in series by conductors 98 and 99 to a single pole double throw switch 100, which switch is otherwise connected to a source of power 102, such as the vehicle battery. In the diagram shown in Figure 6, each of the solenoids 82 and lamps 94 corresponding thereto are connected in series, the corresponding solenoids and lamps of each of the units being electrically connected in parallel with each other, as by conductors 104 and 106, which conductors are connected to an actuator switch 108 which is otherwise connected to the source of power 110.

In operation, whenever the switch 100 or 108, dependent upon whether a single or multiple unit is utilized, is moved to actuate one of the solenoids 82 and the lamp 94 corresponding thereto, then the armature will be attracted by the solenoid and horizontally pivoted into engagement with the projecting end of the solenoid core 86. When the armature is in this position, the crank throw will be pivoted thereby one-quarter turn into a position substantially normal to neutral position of the crankthrow. When in this position, the end of the yoke 80 will engage the crankthrow to limit further rotary movement thereof. Since the lamp 94 corresponding to the actuated solenoid will also be energized, it will be appreciated that the arrow 72 will be disposed in registry with an illuminated lamp. When the solenoid and lamp are deactuated, the spring 74 returns the crankthrow and arrow carried thereby to its neutral position.

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

1. A direction indicator comprising a housing including a top, a bottom and a rear wall, a vertically disposed rod journaled in said top and bottom walls, said rod including a U-shaped crank throw adjacent the lower end thereof, said crank throw including an offset vertical portion, an armature horizontally pivotally attached to said bottom, said armature including a U-shaped yoke thereon slidably and rotatably receiving the offset vertical portion of said crank throw, the closed end of said yoke engaging the crank throw to limit the sliding motion of the crank throw thereon, a pair of solenoids mounted on said bottom for selectively pivoting said armature, and a direction arrow carried by the upper end of said rod, the length of said armature and yoke being such that when the crank throw is rotated one-quarter turn out of its neutral position the end of the yoke will engage the crank throw to limit further turning thereof whereby said armature will pivot said rod through substantially one-half revolution.

2. The combination of claim 1 wherein said solenoids engage said armature when said rod is in a position whereby the arrow carried thereby is substantially normal to the plane defined by said rod and the axis of rotation of said armature.

3. The combination of claim 1 wherein said solenoids engage said armature when said rod is in a position whereby the arrow carried thereby is substantially normal to the plane defined by said rod and the axis of rotation of said armature, spring means attached to said crankthrow and said base yieldingly urging said arrow into its neutral position.

4. A direction indicator comprising a housing having a top, a bottom and a rear wall, a vertically disposed rod journaled in said top and bottom walls, said rod having a U-shaped crankthrow adjacent the lower end thereof, an armature horizontally pivotally attached to said bottom, said armature having a U-shaped guide thereon slidably and rotatably receiving the offset vertical portion of said crankthrow, a pair of solenoids mounted on said bottom for selectively pivoting said armature, a direction arrow carried by the upper end of said rod, the length of said armature and said yoke being greater than the distance between the axis of rotation of said rod and the axis of rotation of said armature whereby said armature will pivot said rod through substantially one-half revolution, a

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pair of lamps carried by said back wall, each of said lamps registering with said arrow when the latter is in either of its turn indicating positions paralleling said back wall.

5. A direction indicator comprising a housing including upper and lower sections, said lower section including a bottom wall, front and rear walls secured to said bottom wall, said upper section including a top wall, rear and side walls secured to said top wall, said front wall of said lower section having an inwardly directed flange, attaching means carried by said side walls of said upper section and engageable with said flange to retain the forward portion of said sections together, means carried by said rear wall of said lower section and engageable with said rear wall of said upper section for locking the rear portions of said sections together.

6. A direction indicator comprising a housing including upper and lower sections, said lower sections including a bottom wall, front and rear walls secured to said bottom wall, said upper section including a top wall, rear and side walls secured to said top wall, said front wall of said lower section having an inwardly directed flange, attaching means carried by said side walls of said upper section and engageable with said flange to secure the forward portions of said sections together, means carried by said rear wall of said lower section and engaging with said rear wall of said upper section for locking the rear portions of said sections together, a crankshaft journaled in said top and bottom walls, a horizontally disposed panel carried by said attaching means and engaging said crankshaft intermediate the ends thereof to laterally brace said

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crankshaft, an arrow carried by the upper end of said crankshaft, and means disposed in said lower section below said horizontally disposed panel and engageable with said crankshaft for selectively oscillating the same.

7. A direction indicator comprising a housing having a top wall, a bottom wall, an opaque rear wall, side and front walls having a window therein, a transparent panel in said window, a shaft journaled in said top and bottom walls, said shaft having a U-shaped crank throw adjacent the lower end thereof, an armature mounted for horizontal oscillatory movement on said base, a slotted yoke secured rigidly to said armature and slidably receiving said crank throw in said slot, a pair of solenoids mounted on said bottom wall for selectively oscillating said armature, a direction arrow mounted on said shaft, in proximity to said window said arrow being composed of colored light transmitting material, a pair of light bulbs mounted on the rear wall behind said shaft for selectively supplying light through said arrow.

HARRY B. McCAINE.

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