April 28, 1931. L. TEBBS ET AL 1,802,684

AUTOMATIC TRAFFIC SIGNAL

Filed Sept. 13, 1928

Fig. 1.

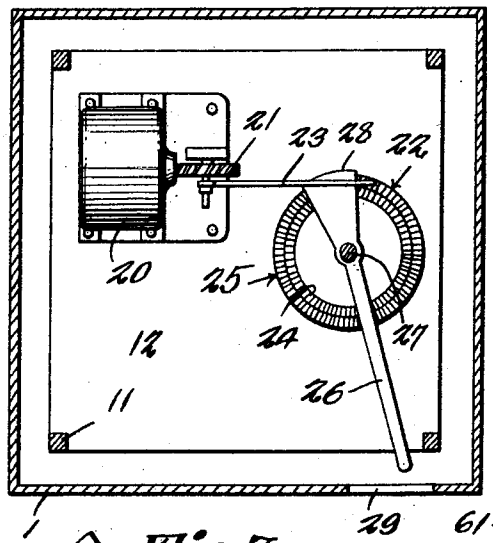


Fig. 6.

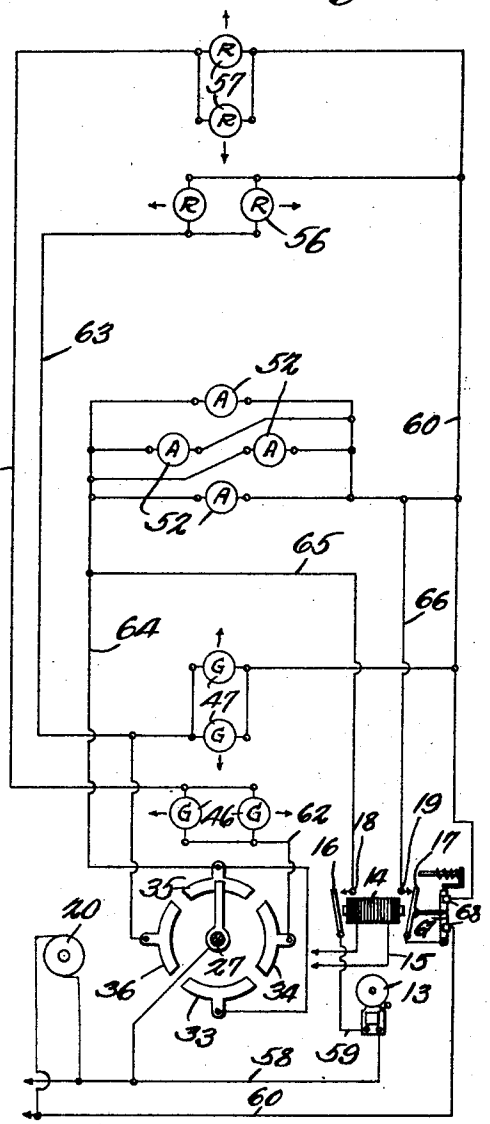


Fig. 4.

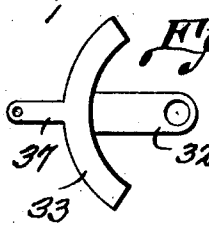


Fig. 5.

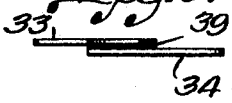


Fig. 2.

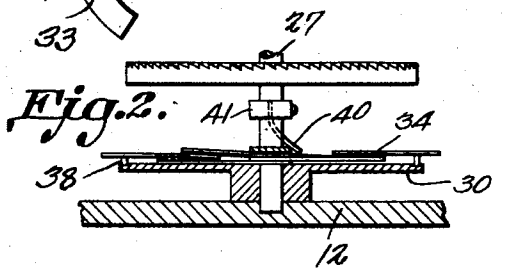
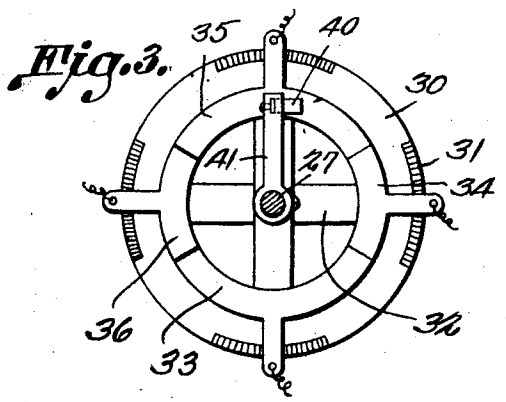


Fig. 3.



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UNITED STATES PATENT OFFICE

LEWIS TEBBS AND GEORGE M. BOLL, OF WICHITA, KANSAS

AUTOMATIC TRAFFIC SIGNAL

Application filed September 13, 1928. Serial No. 305,797.

This invention relates to an automatic traffic signal for use at street intersections, one of the objects being to provide a signal which can be displayed automatically by a timing mechanism which can be adjusted readily to lengthen or shorten the period of display of any one of the signals.

Another object is to provide a novel form of timing switch for the apparatus.

With the foregoing and other objects in view which will appear as the description proceeds the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings,

Figure 1 is an enlarged transverse section through the housing of a signal showing the switch operating mechanism in plan.

Figure 2 is a view partly in section and partly in elevation of the timing switch.

Figure 3 is a plan view of said switch.

Figure 4 is a plan view of one of the segmental contacts.

Figure 5 is an edge view of portions of two contacts showing the insulation therebetween carried by one of them.

Figure 6 is a view showing in diagram the wiring of the signal.

Referring to the figures by characters of reference, 1 designates a housing preferably rectangular in cross section. All of the sides of the housing are provided with the same arrangement of signals, each side having a series of superposed lenses. The upper lens can be red. The intermediate lens can be yellow or amber. The lower lens can be green.

The mechanism constituting this invention is located in the housing 1 but is best shown by diagram in Figure 6. It includes an electric bell 13 and a circuit closer in the form of an electromagnet 14 included in a circuit 15 extending to a point outside of the housing 1. This magnet has two armatures 16 and 17 normally spaced from contacts 18 and 19.

Mounted in the housing is an electric motor 20 adapted to transmit motion through worm gearing 21 to a ratchet wheel 22, there being a pawl 23 adapted to be reciprocated by the worm gearing and to intermittently engage the ratchet wheel intermittently in one direction only. As shown in Figure 1 the ratchet wheel may be provided with concentric series of ratchet teeth 24 and 25 and by positioning the pawl for engagement with one or the other series of teeth the speed of rotation of the ratchet wheel can be varied. Furthermore, and as shown in the drawings, an adjusting lever 26 may be fulcrumed on the vertical shaft 27 which carries the ratchet wheel, this lever having a segmental arm 28 constituting a support for the pawl 23. By adjusting this segmental arm toward or from the free end of the pawl, the time during which the pawl remains in engagement with a tooth of the wheel can be lengthened or shortened.

In further explanation of the foregoing operation it might be stated that one edge of the segmental arm 28 constitutes a fulcrum or bearing on which pawl 23 will rock as it is reciprocated and oscillated and the position of said edge relative to the free end of the pawl will determine the length of time the pawl will remain in engagement with a tooth while it is pulling thereon and before it is compelled to ride upwardly on the segmental arm. One end of lever 26 can be reached through an opening 29 formed in the housing.

The shaft 27 rotates with ratchet wheel 22 and is journaled in the platform 12. Mounted on this shaft is a disk 30 formed of non-conducting material and provided adjacent its edge with series of notches 31. Superposed arms 32 of insulating material are mounted for independent rotation on the shaft 27 and to the outer end of each of these arms is secured an arcuate contact strip. The strips on the respective arms have been indicated at 33, 34, 35, and 36. A finger 37 is extended outwardly from each contact strip and has a tooth 38 adapted to be seated

in any one of the adjacent notches 31. One end of each strip extends over the adjacent end of the next adjoining strip.

The contact strips are all provided, on their lower faces at one end with insulating blocks 39 adapted to prevent flow of current from one contact strip to the other. A contact brush 40 is carried by an arm 41 secured to and rotating with shaft 27 and this brush is so located that, during the rotation of the shaft, it will successively engage the arcuate contact strips.

Pairs of green lamps 46, amber lamps 47, and red lamps 56 and 57 can be arranged in the housing. Obviously lamps of other colors can be used in lieu thereof.

By referring to Figure 6 it will be noted that one of the wires 58 of an electric circuit leads to the shaft 27 and to the bell 13. This bell is electrically connected at 59 to armatures 16. The other wire 60 of the main circuit leading into the housing is electrically connected to armature 17 and to the respective lamps 46, 47, 52, 56, and 57. The lamps 46 are in parallel and the same is true of the lamps 47, 52, 56, and 57. From the lamps 57 a conductor 61 leads to the lamps 46 which, in turn, are electrically connected at 62 to the contact strip 34. A conductor 63 leads from the lamps 56 and 47 to the contact strip 36. The lamps 52 are electrically connected at 64 to the contacts 35 and 33. An additional electrical connection 65 is provided between contact 18 and conductor 64 while another electrical connection 66 is provided between the wire 60 and the contact 19.

The motor 20 is constantly in circuit with the wires 58 and 60. The armature 17 is connected to a switch 67 which normally engages contacts 68 to which the wire 60 is connected.

Under normal conditions the motor 20 is intermittently rotating the shaft 27 by means of the mechanism shown in Figure 1. As this shaft rotates it moves the brush 40 along the arcuate contact strips in regular succession. When the brush is in contact with strip 35 a circuit is closed therethrough to all of the lamps 52 so that they will be simultaneously illuminated. After the display of this caution signal the brush 40 will move onto the strip 36. This will close a circuit through the lamps 47 at two sides of the housing and the lamps 56 at the other sides of the housing. After a predetermined interval the brush will slide off of contact 36 onto contact 33 thereby illuminating the lamps 52 following which the brush will move into engagement with contact strip 34 and illuminate the lamps 46 while at the same time lamps 57 will be illuminated.

By adjusting the contact strips 33, 34, 35, and 36 relative to each other the time during which each illumination takes place can be varied. For example, by withdrawing one of the strips 34 from beneath the strip 33 and extending it farther over the strip 35 the exposed active area of contact strip 34 will be increased and the lamps controlled thereby will be illuminated for a longer period. The same result can be obtained by adjusting the other contact strips. Should it be desired to caution traffic, as in the event of approach of fire apparatus, a circuit to the magnet 14 can be closed. The two armatures 16 and 17 will thus be attracted and brought against the contacts 18 and 19. This will close the circuit to lamps 52 and at the same time break the circuit to the other lamps through wire 60 by shifting switch 67 away from the contacts 68.

What is claimed is:

1. A switch element including lapping arcuate strips insulated from each other, a brush element for successive contact with the strips, means for rotating one of said elements relative to the other, and means for adjusting the strips of the brush element annularly relative to each other to vary the area of the exposed active contact surface of each strip.

2. A switch including a shaft, a non-conductive disk mounted for rotation on the shaft, insulating arms mounted for independent rotation on the shaft, an arcuate contact strip carried by each arm, said strips being disposed in lapped relation and co-operating to form a contact ring, insulating means interposed between the lapping faces of the strips, co-operating means on the strips and disk for holding the strips against free relative movement, and a brush rotatable with the shaft and adapted to successively engage the arcuate strips, said strips being adjustable annularly relative to each other to vary the areas thereof for successive contact with the brush.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures.

GEORGE M. BOLL.
LEWIS TEBBS.