J. FRIIS.

ELECTRIC CIRCUIT CONTROLLING DEVICE.

APPLICATION FILED NOV. 2, 1914.

1,234,534.

Patented July 24, 1917.

3 SHEETS—SHEET 1.

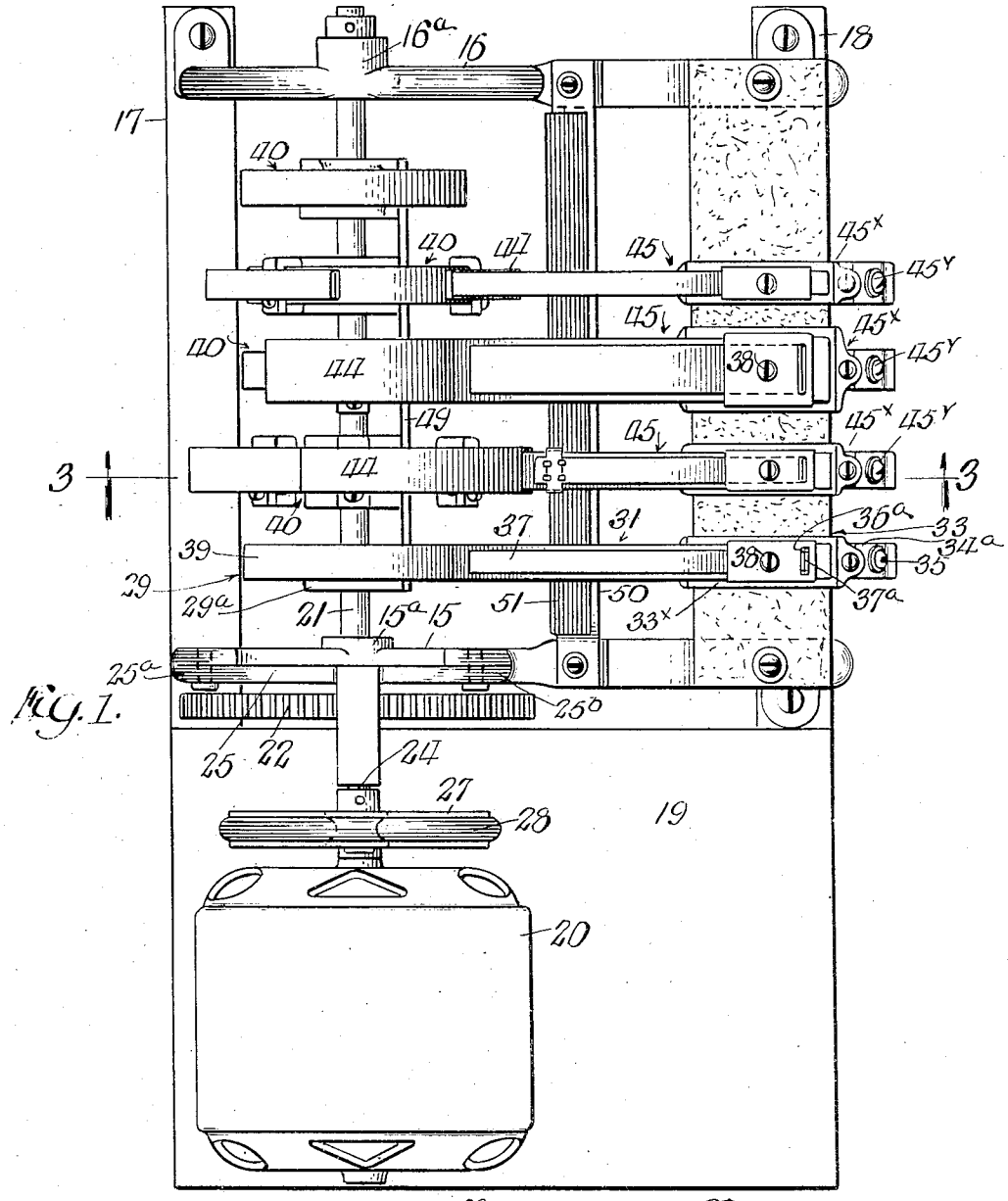


Fig. 1.

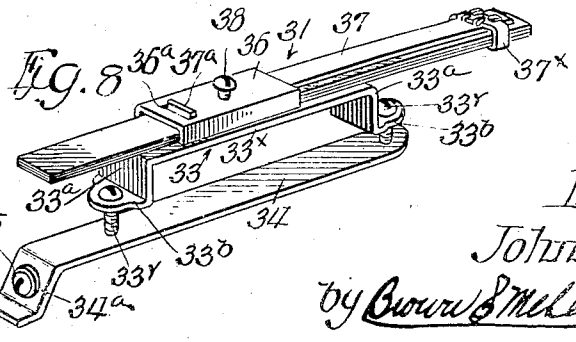


Fig. 8

Witnesses:
F. N. Alfredo. 35
Mary McCarthy

Inventor
John Friis
by Brown & Mellhope Attys

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3 SHEETS—SHEET 2.

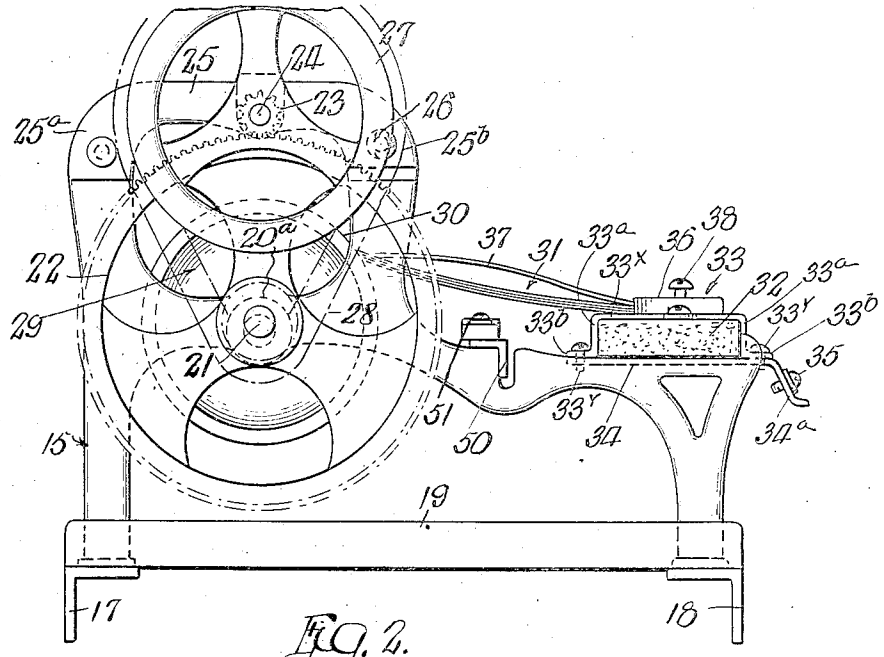
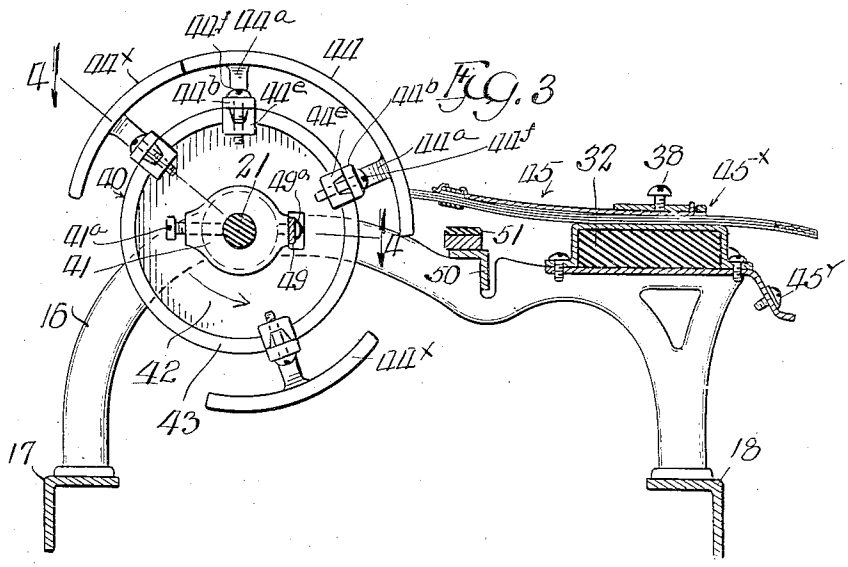


Fig. 2.



Witnesses:
F. H. Ufford
Mary McCarthy

Inventor
John Friis
by Brown & Mikkelsen Attys

J. FRIIS.

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3 SHEETS—SHEET 3.

Fig. 9.

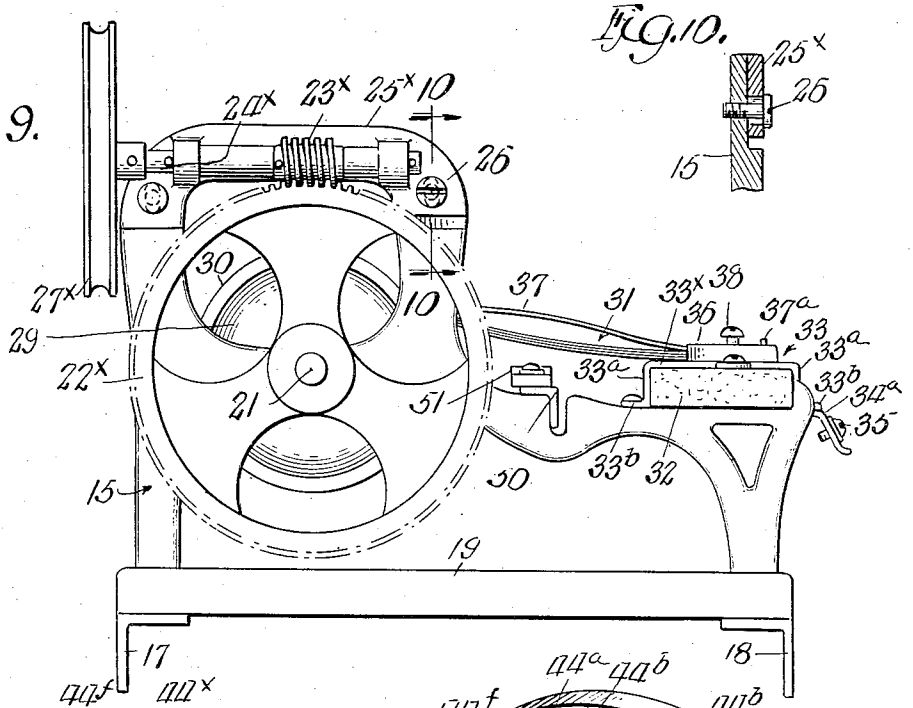


Fig. 10.

Fig. 4.

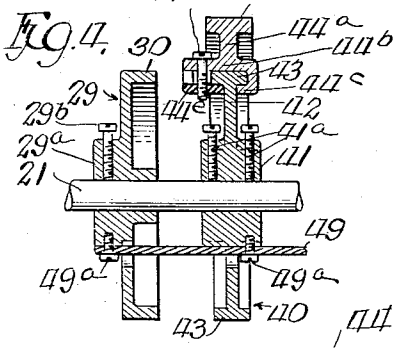


Fig. 5.

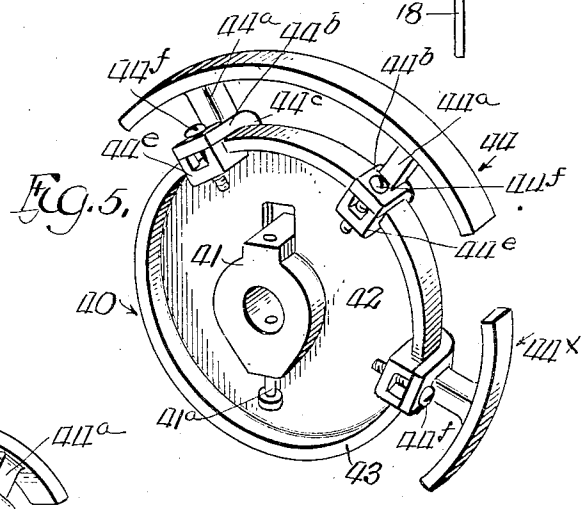


Fig. 6.

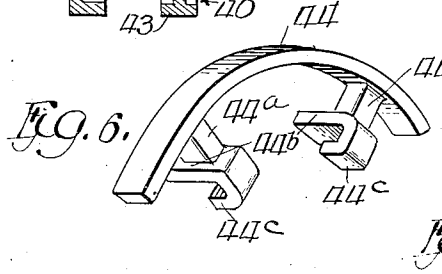
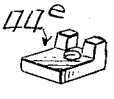


Fig. 7.



Witnesses:
F. H. Ufford
Mary McCarthy

Inventor
John Friis
by Brown & Mitchell Atty's

UNITED STATES PATENT OFFICE.

JOHN FRIIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THOS. CUSACK COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

ELECTRIC-CIRCUIT-CONTROLLING DEVICE.

1,234,534. Specification of Letters Patent. Patented July 24, 1917.

Application filed November 2, 1914. Serial No. 869,742.

To all whom it may concern:

Be it known that I, JOHN FRIIS, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric-Circuit-Controlling Devices; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in electric circuit controlling devices commonly known as flashers, and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

Flashers are generally used in connection with a plurality of incandescent lights, to control the "on" and "off" periods of such lamps, as for instance, in electrically illuminated signs wherein the lights are periodically illuminated and extinguished in various combinations.

Flashers as now made must be of especial size for different voltage, and one of the objects of my invention is to produce a flasher construction containing parts which may be replaced by like parts of a different size, so that the same flasher may be used in connection with currents of different voltages, thus decreasing the cost to the consumer. Said parts are so arranged that the relative periods of illumination of any lamp or lamps of the group of lamps controlled by the flasher, with respect to those of any other lamp or lamps of the same group may be easily and quickly changed without disturbing the adjustment of the other lamps in the group. Another object of my invention is to produce a contact brush for use in connection with a flasher which will permit said brush to be adjusted to compensate for wear due to its engaging with its associated contact member. Other objects will appear as I proceed with my specification.

In the drawings:

Figure 1 illustrates a top plan view of a flasher embodying my invention.

Fig. 2 is a view in end elevation of the same as viewed from the lower end of Fig. 1, with the motor removed for the sake of clearness.

Fig. 3 illustrates a transverse section through the same, said section being indicated by lines 3—3 of Fig. 1.

Fig. 4 illustrates a detail sectional view, the plane of said section being indicated by the line 4—4 of Fig. 3.

Fig. 5 is a detail view in perspective of one of the rotary contact making and breaking members used in connection with my invention.

Figs. 6 and 7 are detail views in perspective of parts which will be more fully referred to later.

Fig. 8 is a detail view in perspective illustrating one of the contact brushes used in connection with my invention.

Fig. 9 is a view similar to Fig. 2, illustrating a modified form of my invention.

Fig. 10 is a detail sectional view, the plane of the section being indicated by the line 10—10 of Fig. 9.

Referring more particularly to that embodiment of my invention illustrated in the accompanying drawings, 15 and 16 illustrate upright end frame members or standards. Said frame members or standards are spaced a suitable distance apart and are rigidly attached at their bottom ends to laterally spaced, longitudinally extending angle bars 17 and 18, which provide a base for the flasher. The angle bars 17 and 18 extend outwardly beyond the frame member 15 and these support a platform 19, upon which is mounted a motor 20 for driving the flasher.

21 indicates a shaft which extends parallel to the angle bars 17 and 18. Said shaft is journaled at its ends in suitable bearings 15^a and 16^a formed in the end frame members 15, 16 in a manner preventing endwise movement of said shaft. That end of the shaft 21 which projects beyond the end frame member 15 has a relatively large gear 22 fixed thereto and said gear meshes with a smaller gear 23 fixed to a short shaft 24 located vertically above and in parallel relation to the shaft 21. Said short shaft 24 has rotative bearing in a yoke 25, one arm 25^a of which is pivotally secured to the end frame member 15 and the other arm 25^b of which has a pin and slot connection 26 therewith. This construction provides for adjustment of the yoke to accommodate different sizes of the gear 23. To the outer end of the shaft 24 is fixed a grooved pulley wheel 27 which is driven by means of a

belt 28 from the driving pulley 20^a of a motor 20.

Fixed to the shaft 21, adjacent the inner face of the end frame member 15 is a wheel 29. Said wheel is provided with a hub 29^a which is secured to the shaft 21 by means of a set screw 29^b.

The peripheral rim of said wheel has a broad flat face 30, upon which one end of a contact brush 31 has a wiping contact. The said brush 31 is suitably supported at its opposite end in a brush holder 33, said holder being attached to a bar 32 of suitable insulating material which extends in a plane parallel to the shaft 21. Said bar is preferably rectangular in cross section and is attached at its ends to the end frame members 15, 16. The brush holder 33 extends transversely of the bar 32, in the plane of the wheel 30 and of the brush 31 and comprises a U-shaped flat strip 33^x having downwardly extending leg portions 33^a which engage the lateral edges of said bar. The lower ends of said leg portions are bent outwardly to form flanges 33^b which are attached by means of screws 33^y to a flat plate 34 engaging the bottom of the bar 32. The outer end 34^a of the bar 34 extends beyond the outer flange 33^b and carries a binding screw 35 to which is attached one terminal of the main circuit.

Fixed to the top of the U-shaped bracket strip 33^x intermediate its ends is a housing 36 through which one end of the brush 31 extends. Said brush is made in the usual laminated form and comprises a plurality of strips of thin sheet metal, which are secured together at that end which extends through and beyond the housing 36, by means of solder. The opposite end of said brush engages the flat face 30 of the wheel 29. To maintain the contact between the brush and wheel I provide a flat spring, 37, which has one end arranged to bear upon the brush 31 near its contact end and has its opposite end engaged within the housing 36. As shown said spring has an upturned end 37^a which projects into a transverse slot 36^a formed in the top wall of the housing 36. A screw 38, threaded through an aperture in the top wall of the housing 36, bears downwardly upon the spring 37 and the brush 31 so as to hold said parts in proper position.

40 indicates a plurality of contact wheels attached to the shaft 21 and spaced suitable distances apart from each other. Each of said wheels comprises a hub 41 having set screws 41^a, by means of which said wheel is fixed to the shaft and a central web 42 having annular, laterally extending flanges at its periphery to form a flat faced rim 43 (see Fig. 5). Said wheels are electrically connected to the contact wheel 30 by means of a bus bar 49 which extends through suitable openings in the web 42 of each wheel 40 and is held in place by means of set screws 49^a (see Figs. 1 and 4). The number of wheels 40 used, depends upon the number of incandescent lamps to be controlled, there being one wheel for each lamp or for each set of lamps that are to be simultaneously on or off. Each wheel is arranged to control the off and on period of its associated lamp or lamps in the following manner:

Adjustably attached to the flanges 43 of each wheel 40, are arcuate plates 44 of a radius larger than that of the rim 43, but concentric therewith. Each arcuate plate 44 has one or more radial, inwardly extending posts 44^a with bases 44^b adapted for engagement with the flat face of the wheel rim 43 (the number of said posts depending upon the arcuate length of the plate supported thereby). Said base extends laterally beyond the edges of the rim 43, and is provided with a hook member 44^c which engages the bottom surface of one of the flanges forming said rim.

A jaw block 44^e engages the bottom face of the other flange and is attached to the base 44^b by means of a clamp screw 44^f. This construction makes it possible to quickly and readily attach or detach the arcuate plate 44.

A number of plates 44 of different arcuate lengths and of different widths are supplied with each flasher,—the arcuate length of said plates determining the length of the period of time during which the associated lamp or lamps are "on" and the different widths accommodating different voltages in the electric circuits which supply the lamps.

Co-acting with each wheel 40 to control the on and off period of the associated lamp or lamps, is a contact brush 45. Said contact brush is attached to and supported upon the insulation bar 32 by means of brush holders 45^x, identical in construction with that of the brush 31 heretofore described. Each brush holder 45^x has a binding screw 45^y to which is connected a line wire of the lamp or lamps associated therewith, the other line wire of said lamp or lamps being connected to the brush 31 as already described.

In Fig. 8 is shown a perspective view of a slightly modified form of brush. This brush is identical in construction with the brush 31 which has heretofore been described, the only difference being that the inner end of the flat spring member 37 is provided with a clip 37^x which embraces and holds in alinement the contact ends of the thin flat metallic strips forming the brush.

In Fig. 9 is illustrated a modified form of gearing for driving the main shaft 21. In said view, 22^x indicates the large gear on the shaft 21 and in this case said gear is driven at a slower speed by a worm gear 23^x fixed on a shaft 24^x which extends parallel to the

plane of said gear 22^x. Said shaft has suitable bearings in a yoke 25^x corresponding to the yoke 25 before described and one end of said shaft 24^x is provided with a grooved pulley 27^x which may be driven from any suitable source of power.

The yoke 25^x which carries the shaft 24^x is interchangeable with the yoke 25 heretofore described, and is furnished in addition to the rest of the flasher as a whole, so that the main shaft may be driven at a slower speed if desired.

The operation of the flasher is as follows: In the rotation of the shaft 21 in the direction of the arrow in Fig. 3, the arcuate contact bars 44 upon the periphery of the wheels 40 will engage and disengage with their associated brushes to "make and break" the circuit of the lamp or lamps connected to said brushes.

When contact is broken between one arcuate bar and its associated brush, said brush will move downwardly under the action of its flat spring 37 and to arrest the downward movement of said brush there is provided intermediate the shaft 21 and the bar 32, a bar 50 which is located approximately in the same horizontal plane as said shaft 21 and bar 32, and extends parallel therewith. Said bar is attached to the end frame members 15 and 16 and is provided on its top surface with a strip of resilient material 51, such as rubber, to lessen the shock or jar to said brush, and also to reduce the noise when said brushes strike the bar. When in the rotation of the shaft 21 an arcuate bar 44 is brought into engagement with an associated brush 45, the advancing end of said contact bar will raise said brush away from the stop bar 50 and the circuit is then closed to the associated lamp or lamps and said circuit will remain closed as long as the brush member is in engagement with its associated arcuate contact bar.

Should the contact end of a brush wear to any appreciable extent, the associated set screw 38 may be loosened and the brush member proper is moved inwardly through its housing to present a new contact surface to its associated contact bar, after which the set screw is again tightened to hold the parts in the adjusted position. This adjustment will in no manner affect the associated flat spring 37, which is held in place by its upturned end 37^a as described.

It is apparent from the foregoing description that the length of the period of time during which the lamp or lamps connected to any brush 45 is to be "on" may be lengthened or shortened by attaching to the associated wheel 40 an arcuate contact plate or shoe 44 of a longer or shorter arcuate length, as the case may be, and that this change may be made without in any way disturbing either the arrangement or the timing of the parts of the flasher which control the other lamps of the group of lamps controlled by the flasher. If desired both the brushes and the arcuate contact plates may be replaced by brushes and contact plates of a greater or less width, according to the load to be accommodated.

An additional advantage of my improved flasher is that it provides great flexibility in the matter of varying or changing the "on" and "off" periods of the lamp or lamps connected to any of the brushes 40. For example, as shown in Fig. 5, a long, arcuate, contact member 44 may be attached to the peripheral rim of the associated wheel 40 and then another shorter, arcuate contact member attached to the said rim 44^x with a longer or shorter arcuate space between the two arcuate contact members. By this arrangement, a long "on" period of the lamp or lamps controlled by the brush associated with the said wheel will be followed by a short "off" period which will in turn be followed by a short "on" period.

While in describing my invention, I have referred to certain details of mechanical construction and arrangement, it is to be understood that the invention is in no way to be limited thereby except as may be pointed out in the appended claims.

I claim as my invention:

1. A flasher comprising a rotative shaft, supports in which said shaft has rotative bearings, spaced wheels fixed to said shaft, each wheel comprising a web, an integral annular flange on said web forming a flat peripheral rim, arcuate contact members adapted for attachment to said rim and means removably attaching said contact members to said rim, said means comprising a radially extending post integral with said arcuate members, a base at the inner end of said post adapted for detachable and adjustable connection with the outer face of said rim, and with the under side thereof at one lateral edge, a jaw block engaging the under side of the other lateral edge thereof and means for clamping said base and jaw block to said rim.

2. A contact device adapted to be attached to the shaft of a flasher, said contact device comprising a wheel having a flanged rim, arcuate contact shoes adapted for attachment to said rim, said shoes including a radial post having an arcuate contact plate at one end and a hooked flange at its other end which is engaged with one edge of the wheel rim, and a jaw block associated with said hooked flange and engaged with the other side of said wheel rim, said hooked flange and jaw block clamping said shoe to the rim of said wheel.

3. A contact device adapted to be attached to the shaft of a flasher, said contact device comprising a wheel having a flat, flanged

rim, arcuate contact shoes adapted for removable and arcuate adjustable attachment to said flat flanged rim, each shoe including a radial post having an arcuate contact plate at one end and a flat flange at its other end, said flange having a hook at one end adapted to hook about one lateral edge of said wheel rim and at its other end extending beyond the other lateral edge of said wheel rim, a clamping jaw block associated with the last named end of said hooked flange, and a screw passing through said last named end of said hooked flange and jaw block to clamp the arcuate contact shoe as a whole to said wheel rim.

In testimony, that I, claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 3rd day of October A. D. 1914.

JOHN FRIIS.

Witnesses:
T. H. ALFREDS,
KARL W. DOLL.