T. J. MURPHY.

ELECTRIC FLASHING DEVICE.

APPLICATION FILED MAY 17, 1910.

1,097,871.

Patented May 26, 1914.

*Fig. 1.*

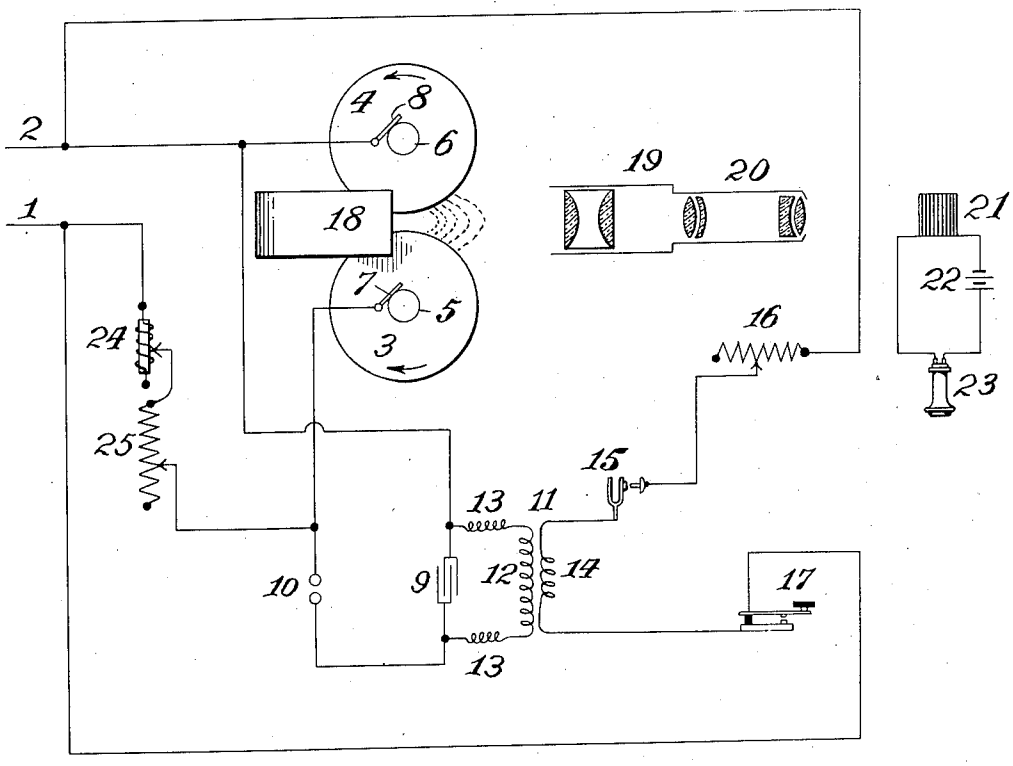
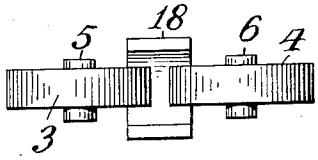



*Fig. 2.*




Attest:

Edgeworth Greene

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Thomas Joseph Murphy, Inventor:

by E. A. Crampton Atty.

# UNITED STATES PATENT OFFICE.

THOMAS JOSEPH MURPHY, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-FOURTH TO JAMES P. B. DUFFY, OF ROCHESTER, NEW YORK.

## ELECTRIC FLASHING DEVICE.

1,097,871. Specification of Letters Patent. Patented May 26, 1914.

Application filed May 17, 1910. Serial No. 561,842.

*To all whom it may concern:*

Be it known that I, THOMAS JOSEPH MURPHY, a subject of the King of Great Britain, and a resident of the city of Rochester, State of New York, have invented certain new and useful Improvements in Electric Flashing Devices, of which the following is a specification.

My invention relates to a lighting means. It has for its object to produce a light which will be exceedingly intense without causing any substantial deterioration or burning out of any of the parts of the apparatus used.

My invention more particularly relates to producing a flashing arc which may be controlled by a simple switch such as, for example a Morse key.

The invention consists in a device which causes arcs to be flashed as desired between electrodes. The electrodes have points which separate from each other thereby increasing the lengths of the arcs. A means is provided for causing the arcs to bulge and flash outward from between them.

The invention also consists in producing a means for starting the arcs between the electrodes and a means for causing the arc to bulge outward from between the electrodes.

Referring to the drawings, Figure 1 is a diagrammatic arrangement of the parts of my invention showing a plan of the arcing device and Fig. 2 illustrates a front end view of the said arcing device.

Referring to Fig. 1, 1 and 2 are the terminals of an electric circuit. The system is connected to a direct current circuit preferably a 110 volt circuit. 3 and 4 are rotatable electrodes made in the form of disks and are preferably made of considerable thickness. They may be made of graphite impregnated with any of the oxids of the earth alkalis or similar earth metals. The disks shown are located in a horizontal position, that is, they turn about a vertical axis. They are separated by a gap but they are located sufficiently near to enable an arc to be started across the narrow portion of the gap. They are rotated by a suitable mechanism in opposite directions, that is, the opposing portions move forward and away from each other. The electrodes 3 and 4 are connected to the terminals 1 and 2 of a source of current through their bearings or rings 5 and 6 and contacts 7 and 8. Arcs are formed between the electrodes and maintained a short period of time by the source of current. When an arc is established across the electrodes 3 and 4 the circuit between the terminals 1 and 2 will be completed. The flow of current will be very large since the resistance of the circuit is small. The greater the speed the more rapid will the fluctuations be and consequently the greater attenuation will be produced. The electrodes may be made adjustable with respect to each other to vary the effects produced. A means is provided for causing a spark to pass across the electrodes 3 and 4 in order to start the arc. In order to accomplish this a condenser 9 is connected in shunt with the electrodes 3 and 4. The discharge of the condenser is regulated by the terminals 10 which also coöperate in the production of an oscillatory discharge across the electrodes. The condenser is charged by means of the induction coil 11. The secondary 12 of the induction coil 11 is connected to the condenser 9 through the choke coils 13. The primary 14 is connected through the vibrator 15 and adjustable resistance 16 to the external circuit on one side and through the key or other circuit closing device 17 on the other. The current passing through the primary 14 causes the vibrator to break the circuit and the potential in the secondary 12 rises to a sudden peak which charges the condenser 9. An oscillatory discharge takes place across the terminals 10 and the electrodes. The difference of potential of the main line then starts the arc which forms a conductive bridge for the current of high amperage across the gap between the electrodes. The arc clings to the points of the two surfaces at which it is first started and is carried outward by the rotation of the electrodes. The arc tends to curve outward in the direction that it is carried by the movement of the electrodes, as it tends to maintain a position perpendicular to the surfaces of the electrodes. The arc is further directed outward by the operation of the field of the magnet 18. The arc is carried a short distance when it is finely ruptured by being stretched too far by the rotation of the electrodes. Successive arcs are formed in the same way. The arcing is controlled by means of the Morse key which is located in the circuit having the source of high tension current which produces the spark between the electrodes, which reduces

the resistance and permits the arcing. The Morse key 17 may be pressed as desired to flash the arc. The key may be used to control a tuning fork, such as that shown at 15. Contact will be made at regular intervals so that regular periods of arcing will be produced. In order to direct the light a considerable distance the usual form of lenses 19, 20 may be used as in the manner well known in the art. A reflector may also be used.

I have also shown a means for reproducing the signals of light into signals of sound. The rays of light coming from the arcs may be directed upon a selenium cell 21. The resistance of the cell varies as the light changes and consequently the current that passes through the cell will vary. A battery 22 is connected to the cell and to a telephone receiver 23. The resistance of the circuit of the battery and consequently the flow of current of the battery being varied by the change in the resistance of the cell the diaphragm of the telephone receiver will vibrate and change its position relative to the ear piece as the current fluctuates.

In order to regulate the flow of current between the electrodes an impedance coil 24 and resistance coil 25 is connected in series with the electrodes. The fluctuations due to the breaking of the arcs in the direct current circuit will produce counter electromotive force in the coil 24 which has to be overcome, that is, the current requires time to increase to its maximum after it begins to increase. These coils may be made adjustable if desired. The flow of the current may also be regulated by the speed of the electrodes.

The system and apparatus shown is selected as one of the structures which embody the invention for the purpose of illustrating a practical application of the invention. The invention may be embodied in many forms of apparatuses and systems and devices in order to accomplish many results without departing from the spirit of the invention.

What I claim as new and desire to secure by Letters Patent is as follows:—

1. In a light flashing device the combination of a source of direct current, a pair of rotatable electrodes located in the circuit of the said source, means for rotating the said electrodes in opposite directions to carry arcs formed between the electrodes outward in the direction in which the light is to be flashed, means for periodically forming sparks across the said electrodes.

2. In a light flashing device the combination of a source of direct current, a pair of rotatable electrodes located in the circuit of the said source, a source of high potential current for starting arcs between the said electrodes, means for rotating the said electrodes in opposite directions to carry the arcs formed between them outward as they are developed.

3. In a light flashing device the combination of a source of direct current, a pair of rotatable electrodes located in the circuit of the said source, means for rotating the said electrodes in opposite directions, a magnet for directing the arcs produced between the electrodes outward and in the same direction that it is carried by the said electrodes.

4. In a light flashing device the combination of a source of direct current, a pair of rotatable electrodes, a magnet having a field located in the vicinity of a point between the said electrodes, means for rotating the said electrodes in opposite directions and so that opposing parts of the electrodes move away from the said magnet.

5. In a light flashing device the combination of a low resistance circuit having source of direct current and a pair of rotatable electrodes connected in the circuit of the said source, means for rotating the said electrodes in opposite directions, a condenser and terminals in shunt with the said electrodes, means for charging the said condenser, the said condenser adapted to be discharged across the said electrodes and terminals, a Morse key for controlling the said charging means, the said electrodes adapted to carry the arcs formed between them outward in the direction they are to be flashed and as they are developed, a magnet for bending the said arcs in the same direction that the opposing faces of the electrodes carry the arcs.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

THOMAS JOSEPH MURPHY.

Witnesses:

R. M. F. LARIN,

GOULD S. TAYLOR.