K. VON DREGER.

ELECTROMAGNETIC IGNITING DEVICE FOR ARC LAMPS.

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1,006,069. **Patented Oct. 17, 1911.**

Fig. 1

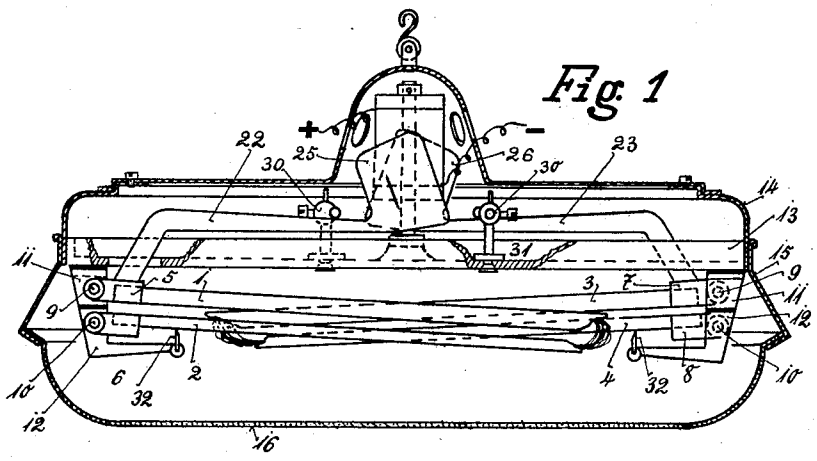


Fig. 2

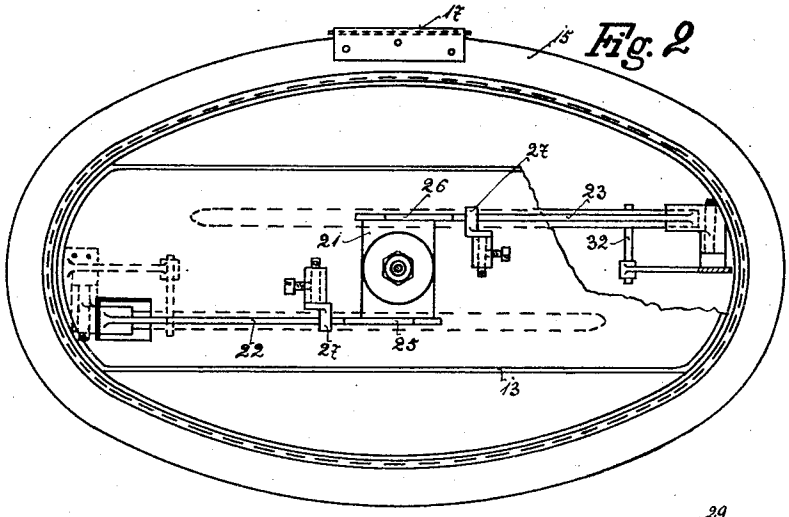


Fig. 3

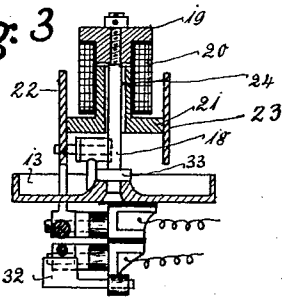
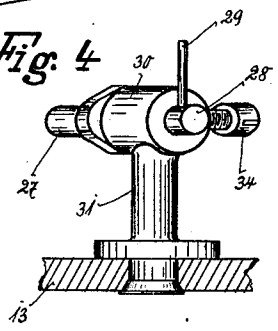


Fig. 4



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UNITED STATES PATENT OFFICE.

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ELECTROMAGNETIC IGNITING DEVICE FOR ARC-LAMPS.

1,006,069. Specification of Letters Patent. Patented Oct. 17, 1911.

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To all whom it may concern:

Be it known that I, KARL VON DREGER, residing at 92 Belle-Alliancestrasse, Berlin, Germany, a subject of the Emperor of Austria-Hungary, have invented certain new and useful Improvements in Electromagnetic Igniting Devices for Arc-Lamps, of which the following is a full, clear, and exact description.

In arc lamps in which the carbons are arranged side by side, and in which one of said carbons is moved transversely, after the switching in of the lamp, for producing the arc, the lever for moving such carbon has hitherto been jointedly connected with the armature of the electro-magnet designed for causing such movement. It is found in practice, however, that the ash formed through the burning of the carbon, reduces the mobility of these joints, which disadvantage is increased by the moisture of the air. Consequently it frequently happens that the magnet, after the switching in of the lamp, will not act, or will not act with certainty, on account of the friction in the joints, and therefore the electric arc will not be produced correctly.

This invention is designed to remedy this defect and aims to avoid jointed connections between the armature of the magnet and the switch lever. The latter is constructed and arranged in such a manner that an extended surface is provided adjacent the side of the magnet armature which has a suitably enlarged lower flange. When therefore the lamp is switched in, not only is the movable armature of the magnet magnetized, but also the lever situated beside it, which also is constructed of iron. Therefore the lever will rest firmly against the side of the armature of the magnet and is carried with it by friction.

This arrangement has several other advantages which will be referred to hereinafter.

In the accompanying drawings which form a part hereof: Figure 1 illustrates by way of example a lamp constructed according to the present invention. The casing of sheet metal and the glass globe are shown in a vertical longitudinal section through the center. The essential interior parts of the lamp are mostly shown in side view. Fig. 2 is a plan of the lamp, the upper part of the sheet metal casing being removed, so that the interior parts of the lamp can be seen. The supporting plate is also partly broken off in order to show more clearly the holders for one pair of carbons. Fig. 3 shows a central vertical section through the interior parts of the lamp, at a right angle to the plane of section of Fig. 1. Fig. 4 shows, to an enlarged scale, an adjusting device by means of which may be regulated the position of the carbon which is moved relative to the stationary carbon when the lamp is switched in.

In the constructional example shown in the drawings two pairs of carbons have been arranged, which are switched in by a single electro-magnet.

Two pairs of carbons 1, 2, and 3, 4 are situated in holders 5, 6, and 7, 8, adapted to rotate around fixed horizontal pins 9 and 10. The blocks in which the pins are situated consist of two fixed parts 11, 12, insulated from each other and from the horizontal plate 13. The latter is immovably mounted in a lamp casing 14, 15, formed of sheet metal. To the lower part 15 of the casing a lamp globe 16 is connected by a hinge 17, so that it may be turned down for the purpose of cleaning the lamp internally and for the insertion of new carbons.

The parts which are required to secure the globe in the closed position have been omitted in the drawing, because they are unessential.

As shown in Fig. 3, a column 18 is immovably fixed in the center of the plate 13, said column being preferably of brass and carrying a fixed iron armature 19. To the latter is rigidly connected an electro-magnet coil 20 within which the armature can move vertically; said armature being provided with a square flange 21.

Levers 22 and 23 are firmly connected to the two positive carbon holders 5 and 7 and have broad lugs 25, 26, arranged upon opposite sides of the magnet armature flange 21. The rod or column 18 passes through an axially disposed aperture 24 in said armature.

The lugs 25, 26 must be constructed of iron, but the levers 22, 23 may be made of other material. The two pairs of carbons are illustrated in the active position, therefore the lamp is assumed to be switched in. The projections or stops 27, shown in detail in Fig. 4, which are connected to but are off-

set from the axles 28, somewhat after the fashion of crank pins, prevent the two levers from being pulled upward by the magnet armature 21 beyond the determined amount. The axles 28 can be rotated by means of small handles 29 and are journaled in bearings 30 in which also they can be clamped by screws in any desired position. The bearings 30 are carried by columns 31, fixed to the plate 13.

When the lamp is switched out, the upper carbons rotate down around the pins 9 until they come into contact with the lower carbons 2 and 4, which are prevented from sinking as long as they are of sufficient length and the arc shall not have approached the holders 5, 6 or 11, 12 respectively so closely as to injure the same. When the carbons are long, the levers 22, 23 will sink a little and when the carbons are short they will sink considerably more. However the armature 21 will always rest in its downmost position on the stop or projection 33.

When the lamp is switched in the armature 21 is magnetized and at the same time the two lugs 25, 26, are magnetized, therefore the latter are drawn firmly against the square flange of the armature 21 and are thereby carried upwardly with it until their upward movement is impeded by the projections 27. The armature 21 may then continue its upward movement in case it has not reached its highest position when the two levers encounter their stops.

The provision of but a single electromagnet for the service of the two pairs of carbons is a practical simplification, possessing obvious advantages over any construction in which the two levers are connected to the magnet armature by small guides. In such latter construction, for example, it would be difficult to insure simultaneous contact between the respective carbons in the different sets, when the armature is relaxed. In the present arrangement in which a plurality of levers are connected with the armature 21 by magnetic action only, such levers are completely free after the switching out of the lamp and they can therefore each descend separately and independently until the upper carbons have contacted with the lower carbons without regard to whether one pair of carbons happens to be long and another considerably shorter.

Having described my invention, what I claim, is:

1. In an electric arc lamp, a plurality of pairs of carbons, holders for said carbons, an electro-magnet having an armature, relatively independent operating devices connected to some of said holders whereby said holders may be moved relative to others of the same which are normally stationary, said devices being disposed adjacent said armature and having parts thereof of magnetizable material, said devices being adapted for frictional engagement with a part of said armature when the latter is energized, said armature and devices being thereby movable together.

2. In an electric arc lamp, a plurality of pairs of carbons, holders for said carbons, an electro-magnet having an armature, relatively independent operating devices connected to some of said holders whereby said holders may be moved relative to others of the same which are normally stationary, said devices being disposed adjacent said armature and having parts thereof of magnetizable material, said devices being adapted for frictional engagement with a part of said armature when the latter is energized, said armature and devices being thereby movable together, and independently adjustable stops for each of the carbons carried by the movable holders.

3. In an electric arc lamp, a support, two pairs of carbons, pivotally mounted holders for said carbons carried by said supports, each pair of carbons projecting laterally from their respective holders, the carbons of one pair projecting in one direction and the carbons of the other pair projecting in a substantially opposite direction, said carbons being insulated from each other and from said support, one carbon being disposed above another carbon in each pair, each pair of carbons being movable in a vertical plane, rigid levers attached to the upper carbons, said levers having magnetizable free ends, an electro-magnet having an armature disposed between said free ends, said ends being adapted to be drawn into close contact with said armature when the electro-magnet is energized and to be carried along by the movement thereof by friction, and adjustable stops for limiting the movement of said free ends, substantially as described.

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