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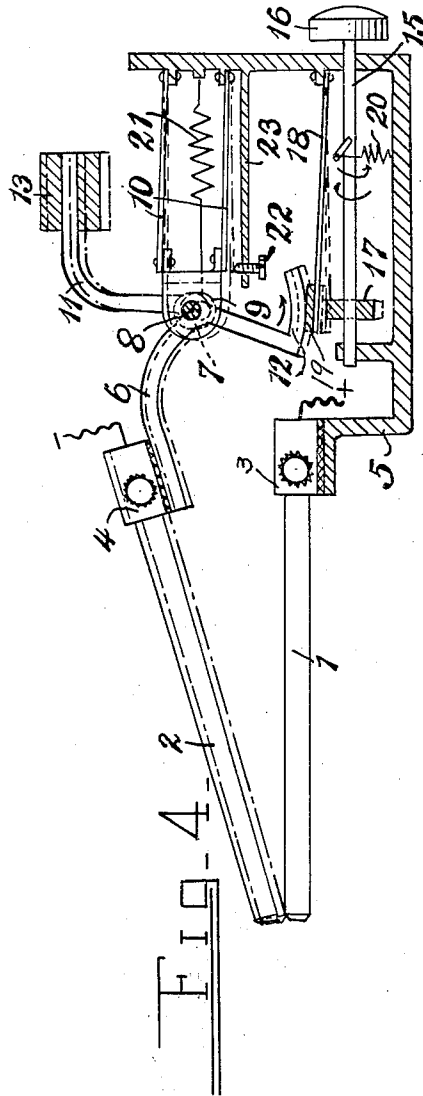
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ARC LAMP

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ARC LAMP

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My invention relates to electric arc lamps, more especially of the kind in which the electrodes are arranged in parallel or at an angle to one another, one electrode or both of them being movable so that their free ends, between which the arc forms, can be moved automatically into contact with each other.

It is an object of my invention to provide means whereby, when the ends of the electrodes have moved into contact, they are moved automatically in the opposite direction, being caused to stop at a predetermined distance from each other, which is best adapted for the maintenance of the newly formed arc.

In order to attain this, I couple the movable electrode with a movable member which is acted upon by a pawl or other engaging mechanism capable, on being actuated by hand against the action of a spring or the like, of first releasing and thereafter automatically re-engaging and moving, for instance displacing or turning the movable member through the distance required to shift the point of the movable electrode into a predetermined distance from the other electrode.

In the drawings affixed to this specification and forming part thereof arc lamps embodying my invention are illustrated diagrammatically by way of example.

In the drawings

Fig. 1 is an elevation of a lamp of this kind, while

Fig. 2 is a section on the line II—II in Fig. 1.

Fig. 3 is a view similar to that of Fig. 2 illustrating a modification.

Fig. 4 is an axial section of another modification, and

Referring to the drawings and first to Figs. 1 and 2, *a* is an arm forked at both ends which is fixed to the standard *z*. *b—b* are electrode holders articulated to the ends of arm *a* and carrying electrodes *y* mounted in sleeves *c*. The electrode holders *b* are coupled by links *d* pivoted by means of crank pins *e* to the crank disk *f* which here forms the coupling member. A spring *g* acting on the outer arm of one of the electrode holders *b* tends to pull the points of the electrodes towards each other, the disk *f* being turned by the spring *g* in clockwise direction.

During operation of the lamp such rotation of disk *f* is prevented from taking place by the pawl or locking member, which has the form of two jaws *h* and *i*, the latter being movable towards and away from the former, these jaws

gripping the disk *f* between them. The fixed jaw *h* forms part of a slide *k* mounted for vertical movement in a standard *x*, wherein it is supported by springs *p* tending to force it upwards. The movable jaw *i* forms part of a double-armed lever *m* pivoted to the slide *k* and provided with a knob *o*. A spring *n* tends to hold the movable jaw *i* in operative position, i. e. in contact with the disk *f*.

In the operation of the device, when the electrodes have been consumed by the burning arc to such an extent that the gap between their free ends becomes excessive, hindering the maintenance of a steady arc, the knob *o* is depressed by hand and the disk *f* is thereby released so that the spring *g* is free to turn the disk clockwise, whereby the free ends of the electrodes are swung into contact with each other so that the arc is formed again. The pressure exerted by the hand onto the knob *o* has also forced the slide *k* downwardly against the action of springs *p*, and on the knob *o* being released again the movable jaw *i* will now grip the disk *f* near the point, at which it had gripped it before, and the springs *p* in lifting the slide *k* carrying the jaws will now turn the disk *f* back into its initial position, thereby pulling the rear ends of the electrode holders *b* towards each other against the action of spring *g*, while at the same time spreading the free ends of the hitherto contacting electrodes, so that the arc is drawn out between them.

Thus the pawl or locking member *k, i, h*, after having been depressed by hand, will first release the oscillatory crank disk *f* and, after the same has been rotated through a predetermined angle by the spring *g*, will grip it anew and will rotate it back into its former position. Thus the mere depressing and instantaneous releasing of the knob *o* will cause the free ends of the electrodes to make contact with each other and to be thereupon spread apart a predetermined distance, whereby the arc is reestablished.

The width of the gap to be formed between the free ends of the electrodes can be regulated nicely by means of the set screw *r* which acts as a stop for the slide *k* and thus limits its movement and the angular displacement of disk *f*.

In the modification illustrated in Fig. 3 two oscillatory disks *f, f'* are arranged in close juxtaposition, each disk controlling a separate pair of electrodes, and both disks are acted upon by the jaws *h* and *i* which force one disc into frictional contact with the other disc so as to couple the discs. Obviously the operation of this de-

vice is the same as that described with reference to Figs. 1 and 2.

While in the drawing both electrodes are shown as being oscillatable, it goes without saying that the same arrangement can be applied to a lamp in which one electrode is fixed, only the other electrode being mounted for oscillation and acted upon by an oscillatory member such as the disk *f*.

The oscillatory movement on the electrodes may be regulated in a well known manner by means of a suitable brake device, for instance a pneumatic brake (not shown) which may for instance cooperate with the slide *k*.

Instead of providing a rotatable crank disk for coupling the electrodes with each other other coupling means may be provided, for instance a swinging member arranged so as to be displaced together with its pivotal axis through a predetermined distance in order to spread the electrodes apart.

A lamp of this type is illustrated in Fig. 4, where 1 and 2 are the electrodes and 3 and 4 are the electrode holders. The holder 3 is fixed to, but insulated from the support 5, while the holder 4 is fixed to and insulated from a curved arm 6 mounted on a hub 7, which is mounted for oscillation about journals 8 supported in bearings 9. The bearings are fixed to the ends of two parallel leaf springs 10 extending in horizontal direction from the structure 5 and forming a movable parallelogram. 11 is a curved arm and 12 is a segment extending in opposite directions from the hub 7. 13 is a counterweight mounted on the end of arm 11. The segment 12 has its centre in the axis of oscillation of the electrode holder 4, which is arranged on the middle line subdividing the angle formed by the electrodes 1 and 2. The bearings 9, hub 7 and the arms fixed to the hub are capable of substantially vertical displacement, since the leaf springs 10 supporting them will give way to pressure.

A spindle 15 supported in the structure 5 below the segment 12 has mounted thereon a knob 16 and a cam 17. Above the spindle is mounted a horizontal leaf spring 18 carrying on its free end the gripper plate 19. A coil spring 20 tends to turn the spindle 15 in the direction in which the end of spring 18 rests on the longest radius of the cam 17, which then holds the gripper plate 19 applied from below against the segment 12 and lifts the bearings 9 supporting the hub 7 free of their rest constituted by a set screw 22 mounted in an arm 23 of the structure 5. A coil spring 21 extending between the structure 5 and the hub 7 tends to turn the hub in such manner, that the electrode 2 contacts with the electrode 1.

The operation of this device is as follows:

With the cam in the position shown in the drawing, the hub 7 is lifted a predetermined distance above the point of set screw 22, the leaf springs 11 acting like a movable parallelogram and the coil spring 21 being unable to pull the electrode 2 down on electrode 1, since the gripper plate 19 prevents segment 12 from oscillating. In this position of the parts the points of the electrodes are spaced from each other correctly for the formation of the arc. After the electrodes have burnt down to the extent that the arc begins to flicker, the knob 16 is turned against the action of spring 20, bringing the shortest radius of cam 17 below the gripper plate 19, which is pressed down on the cam by the spring 18. The gripper plate 19 now releases the segment 12 and the electrode 2 will now be pulled

down into contact with electrode 1 by spring 21, the springs 10 at the same time returning into the position, in which the bearings 9 rest on the point of set screw 22. Thus the turning of knob 16 suffices to allow the points of the electrodes to contact with each other for the fresh formation of the arc. On the knob 16 being released, the spring 20 turns the spindle 15 back into the position, where the longest radius of cam 17 lifts the gripper plate 19 into contact with the segment 12 and at the same time lifts the bearings 9 free of the set screw 22, whereby the axis of oscillation of the electrode 2 is raised through a predetermined distance defined by the difference in the shortest and longest radii of cam 17, which also determines the distance between the points of the electrodes when in operative position. Thus a mere turning of the knob 16 in one direction will release the oscillatable electrode so as to allow its point to make contact with the point of the stationary electrode, while the release of the knob will cause the point of the oscillatable electrode to be lifted free of the stationary electrode and spaced therefrom in the correct operative position. While the contacting of the two electrodes is brought about by the manual handling of the knob 16, the spacing of their points is effected automatically and in a uniform way, whatever may be the length of the electrodes.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

I claim:

1. An arc lamp comprising in combination, two electrodes extending at an angle and arranged to oscillate relative to and into contact with each other, an oscillatable member positively connected with said electrodes and spring controlled mechanism arranged to arrest and hold said oscillatable member, to release it, when actuated by hand, to thereafter automatically re-engage said member and to automatically shift the tips of said electrodes away from each other and a check limiting said shifting movement.

2. An arc lamp comprising in combination, two electrodes extending at an angle to each other, one of which is arranged to oscillate relative to and into contact with the other, an oscillatable member positively connected with and arranged to follow the oscillations of said electrode and spring controlled manually operated pawl mechanism for clutching said oscillatable member and, when actuated by hand, releasing and thereafter automatically re-engaging it and shifting the tip of the oscillatable electrode an exactly predetermined distance away from the other electrode.

3. An arc lamp comprising in combination, two electrodes extending at an acute angle to each other, one of which is pivoted for oscillation, but secured against separate axial movement, self-acting means for oscillating and means for arresting and holding the tip of the oscillatable electrode in spaced relation to the tip of the other electrode and manually operable spring controlled means for releasing said electrode to establish contact with the other electrode and for thereafter automatically shifting the pivotal axis of said oscillatable electrode so as to space the tip of said latter electrode an exactly predetermined distance from the tip of the other electrode.

4. An arc lamp comprising in combination, two electrodes extending at an angle to each other,

one of which is pivoted for oscillation, self-acting means for oscillating and means for arresting and holding the tip of the oscillatable electrode in spaced relation to the tip of the other electrode, cam means for releasing said oscillatable electrode to establish contact with the other electrode and for thereafter automatically shifting the pivotal axis of said oscillatable electrode so as to space its tip an exactly predetermined distance from the tip of the other electrode.

5. An arc lamp comprising in combination, two electrodes extending at an angle to each other, one of which is pivoted for oscillation, a bearing for said oscillatable electrode arranged for reciprocation at an angle to the electrode axis and manually operable spring controlled means for automatically shifting said bearing and said electrode into and holding same in a position, where the tip of said electrode is spaced an exactly predetermined distance from the tip of the other electrode.

6. An arc lamp comprising in combination, two electrodes, one of which is pivoted for oscillation, a bearing for said oscillatable electrode arranged for rocking motion at an angle to the electrode

axis, two substantially parallel leaf springs fixed each at one end and forming a resiliently movable parallelogram and a support for said bearing between their free ends, and manually operable spring controlled means for automatically shifting said bearing and said electrode into and holding same in a position where the tip of said electrode is spaced an exactly predetermined distance from the tip of said other electrode.

7. An arc lamp comprising in combination, two electrodes extending at an acute angle to each other, one of which is arranged to oscillate relative to and into contact with the tip of the other one, but is secured against axial movement, a freely oscillatable member connected with said oscillatable electrode for positive operation, and manually operable spring-controlled mechanism arranged to arrest and hold said member, to release it, when manually operated, to automatically re-engage it, when released, regardless of the changes in length of said electrode, and to automatically shift the tip of the oscillatable electrode an exactly predetermined distance away from the tip of the other electrode.

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