No. 733,135. PATENTED JULY 7, 1903.

F. BUCHANAN.

ELECTRIC ARC LIGHT.

APPLICATION FILED JAN. 2, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

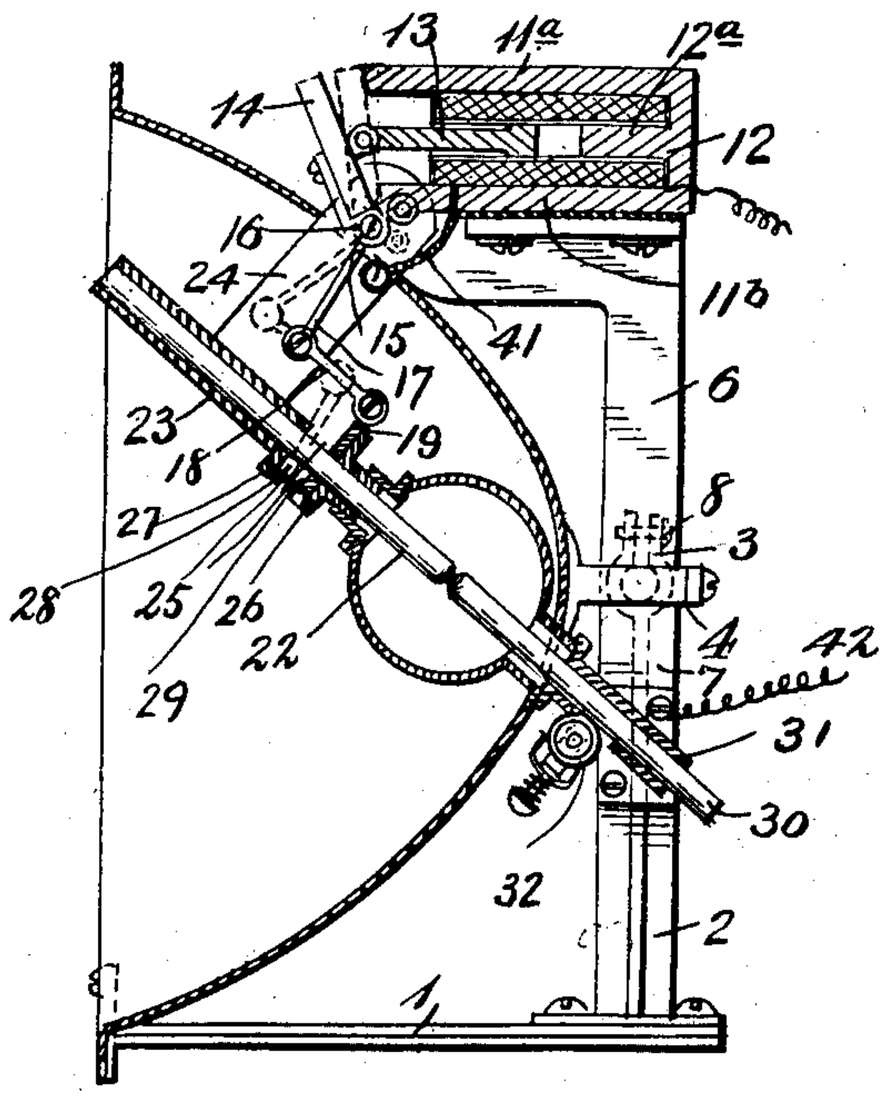


Fig. 3.

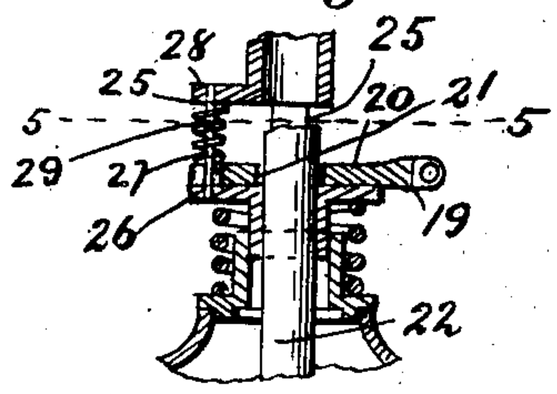
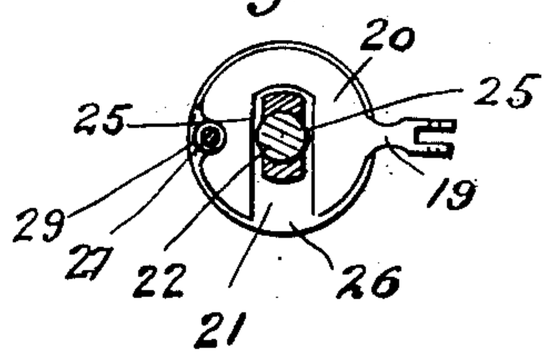


Fig. 5.



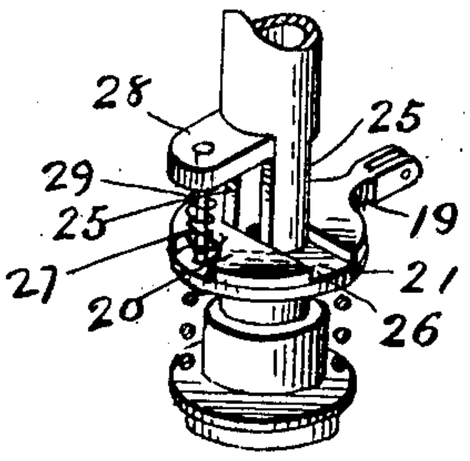


Fig. 4.

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ELECTRIC ARC LIGHT.

APPLICATION FILED JAN. 2, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

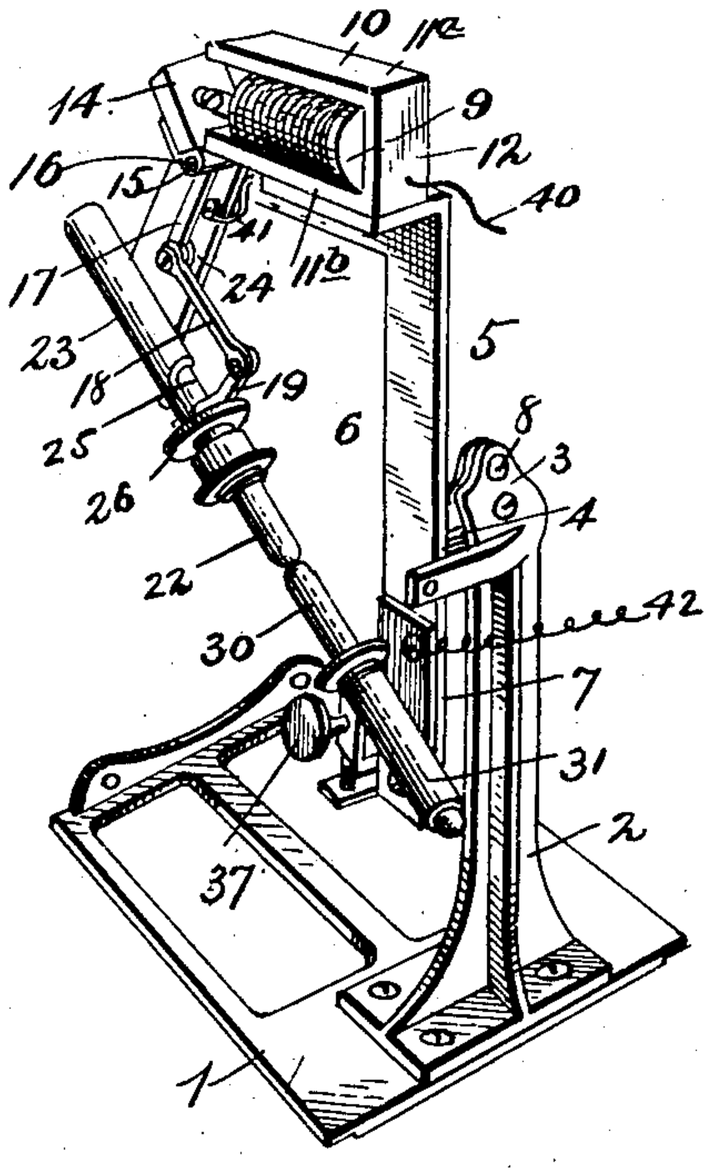


Fig. 6.

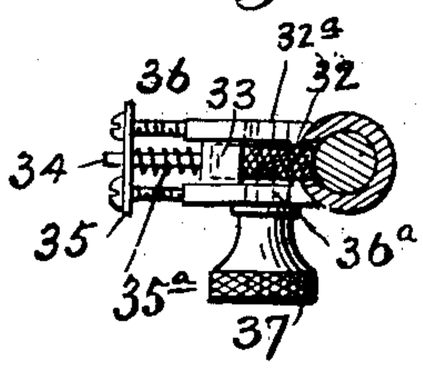
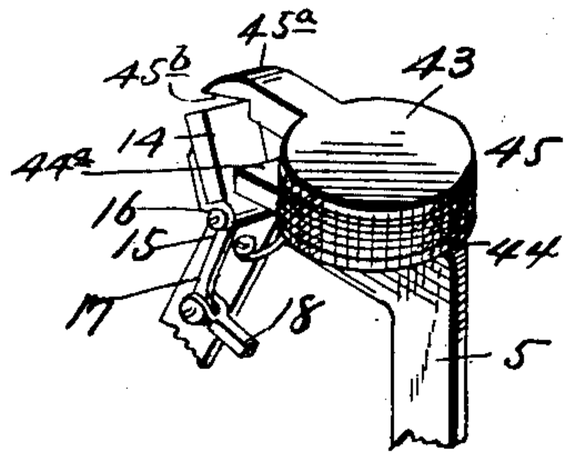


Fig. 7.



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No. 733,135. Patented July 7, 1903.

UNITED STATES PATENT OFFICE.

FRANK BUCHANAN, OF DAYTON, OHIO.

ELECTRIC-ARC LIGHT.

SPECIFICATION forming part of Letters Patent No. 733,135, dated July 7, 1903.

Application filed January 2, 1903. Serial No. 137,549. (No model.)

To all whom it may concern:

Be it known that I, FRANK BUCHANAN, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented new and useful Improvements in Arc-Lights, of which the following is a specification.

My invention relates to electric-arc lights, and has for its object to construct a simple and efficient carbon-feed mechanism.

The novel construction employed by me in carrying out my invention is fully described and claimed in this specification and illustrated in the accompanying drawings, forming a part thereof, in which—

Figure 1 is a vertical section of a headlight containing my improved light. Fig. 2 is a perspective of the carbon-feed mechanism and the support therefor. Fig. 3 is a detail transverse section of the floating clutch. Fig. 4 is a detail perspective of the upper-carbon holder. Fig. 5 is a plan view of the floating clutch. Fig. 6 is a detail of the lower-carbon clamp. Fig. 7 is a detail perspective of a modified form of electromagnet.

Like numerals of reference designate like parts in the different views of the drawings.

The numeral 1 designates a base which supports a standard 2. A split bearing 3 is formed in the head of the standard 2 to accommodate a stud 4, formed on a member 5, having oppositely-extending arms 6 and 7. A screw 8, fitted in the head, serves to force the two jaws 3^a and 3^b of the bearing 3 together and clamp the stud 4 against all movement, but permits angular adjustment of the member 5 in a vertical plane to adjust the angle of inclination of the carbons.

The upper arm 6 supports a solenoid 9, adjustably mounted in a yoke 10, having unequal arms 11^a and 11^b and a cross-bar 12, bearing a lug 12^a, which extends into the solenoid 9. A core 13 is slidingly mounted in the solenoid 9, and the outer end is pivoted to an armature 14, which forms one arm of an elbow-lever 15, fulcrumed on a fixed pin 16. The arms 11^a and 11^b limit the upward swing of the armature, which is inclined backwardly to enable it to drop by gravity when released by the solenoid. The other arm 17 of the lever 15 is pivotally connected to one end of a link 18, the opposite end of which is pivotally connected to an arm 19, formed on a carbon-clutch member 20. The clutch member 20 has a square notch 21 therein which embraces an inclined carbon 22, slidingly mounted in a tubular carbon-holder 23, carried by an arm 24, rigidly secured to the arm 6 of the member 5. The holder 23 is cut away at 25 on both sides to accommodate the clutch 20 and has a collar 26 formed thereon, which serves as a stop to limit the downward movement of the clutch 20 and also as a support. A pin 27, supported by the collar 26 and an ear 28, is surrounded by a spring 29, which bears on the clutch 20 and holds the free end in contact with the collar 26.

A lower carbon 30 is located in alinement with the carbon 22 and is mounted in a holder 31, supported by the arm 7. The carbon 30 is yieldingly held against movement by a knurled roller 32, journaled in a bracket 33, bearing a stem 34, slidingly mounted in an apertured cross-bar 35 of a yoke 36. A spring 35^a surrounds the stem 34 and bears on the bracket 33, thereby holding the roller 32 in engagement with the lower carbon 30. The ends of the shaft 32^a, on which the roller 32 is secured, extend through slots 36^a in the side bars of the yoke 36, and mounted on one end of this shaft is a thumb-nut 37 for turning the roller 32 to feed the lower carbon. By this device the carbon 30 is yieldingly held and all danger of slipping avoided.

A conductor 40 is connected to one end of the windings of the solenoid 9 and with some source of electricity. A conductor 41 is connected to the opposite end of the windings on the solenoid 9 and to the conducting-arm 24, which is insulated from the arm 6. The lower-carbon holder 31 is insulated from the arm 7 and is connected to the before-mentioned source of electricity by means of a conductor 42. A circuit would therefore be completed through the carbons when in contact, which would trace as follows: source of electricity, conductor 40, winding on solenoid 9, conductor 41, arm 24, carbon-holder 23, upper carbon 22, lower carbon 30, carbon-holder 31, and through conductor 42 back to the source.

Suppose the circuit above traced has been established. The solenoid will then become magnetized, which will cause it to attract its

core 13 and armature 14, thereby operating the elbow-lever 15 and lifting the clutch 20, which will assume the position shown in dotted lines and grip the carbon 22, thereby drawing it up and separating it from the lower carbon 30. As soon as this separation has been effected an arc will be established between the carbons, which will persist until the burning off of the upper carbon 22 increases the interval between the carbons sufficient to break the arc and circuit. The breaking of the circuit will cause the solenoid 9 to release its core 13 and armature 14, thereby operating the clutch 20, which will in turn release the carbon 22 and permit it to slide down in contact with the lower carbon 30 and reëstablish the circuit, after which the cycle of operation will be repeated.

In the modified form illustrated in Fig. 7 a solenoid 43 is employed which is set vertical and is provided with conducting-heads 44 and 45. The lower head 44 has an arm 44^a formed thereon, which extends adjacent to the armature 14, and the upper head 45 bears an arm 45^a, having a notch 45^b therein, which serves to engage and limit the swing of the upper end of the armature 14. When the circuit is completed through the solenoid 43, it operates in substantially the same manner as the preferred form, as will be readily understood by those skilled in the art.

I do not wish to be limited as to details of construction, as these may be modified in many particulars without departing from the spirit of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a carbon-feed mechanism, the combination of a casing, a solenoid mounted in said casing, an elbow-lever fulcrumed on said casing, one arm of said lever bearing an armature for said solenoid, a core pivoted to said armature and extending into said solenoid, a clutch member, and a link connecting said clutch member and said elbow-lever, substantially as described.

2. In a carbon-feed mechanism, the combination of a yoke-shaped casing, a solenoid mounted in said casing, an elbow-lever fulcrumed on a support carried by said yoke-shaped member, one arm of said lever serving as an armature for said solenoid, a carbon-holder carried by said support, a clutch member mounted to engage a carbon fitting said holder, and a link connecting said clutch to the other arm of said elbow-lever, substantially as described.

3. In a carbon-feed mechanism, the combination of a yoke-shaped member bearing an elongated lug, a solenoid mounted in said yoke with said lug forming a core therefor, a core slidingly mounted in said solenoid, an elbow-lever supported by said yoke, one arm of which carries an armature for said solenoid, located to come in contact with the arms of said yoke, said armature being pivoted to said sliding core, a clutch, and a link connecting said lever and said clutch, substantially as described.

4. In a carbon-feed mechanism, the combination of a holder for the upper carbon comprising a tube cut away on its opposite sides to form apertures and bearing a collar located just below the apertures formed therein, a floating clutch mounted on said collar and constructed to engage the projecting sides of a carbon mounted in said holder, and means for operating said clutch to feed the carbon mounted in said holder, substantially as described.

5. In a carbon-feed mechanism, the combination of a tubular carbon-holder having opposed apertures therein and bearing a collar located below said apertures, a notched clutch member resting on said collar and set to engage the sides of the carbon projecting through said apertures, a spring bearing on one end of said clutch, a solenoid provided with a pivoted armature, and means connecting said armature and the opposite end of said clutch to operate it to feed said carbon, substantially as described.

6. In a carbon-feed mechanism, a yoke, a bracket bearing a knurled roller journaled therein and a stem slidingly mounted in the cross-bar of said yoke, a spring surrounding said stem and bearing on said bracket and said yoke, and a thumb-nut fitted on one of the spindles of said roller, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK BUCHANAN.

Witnesses:
A. C. BUCHANAN,
WM. A. BUDROE.