(No Model.)

E. A. COLBY.

COMBINED INCANDESCENT ELECTRIC LAMP SOCKET AND ELECTRICAL CONVERTER.

No. 376,583. Patented Jan. 17, 1888.

Fig. 1.

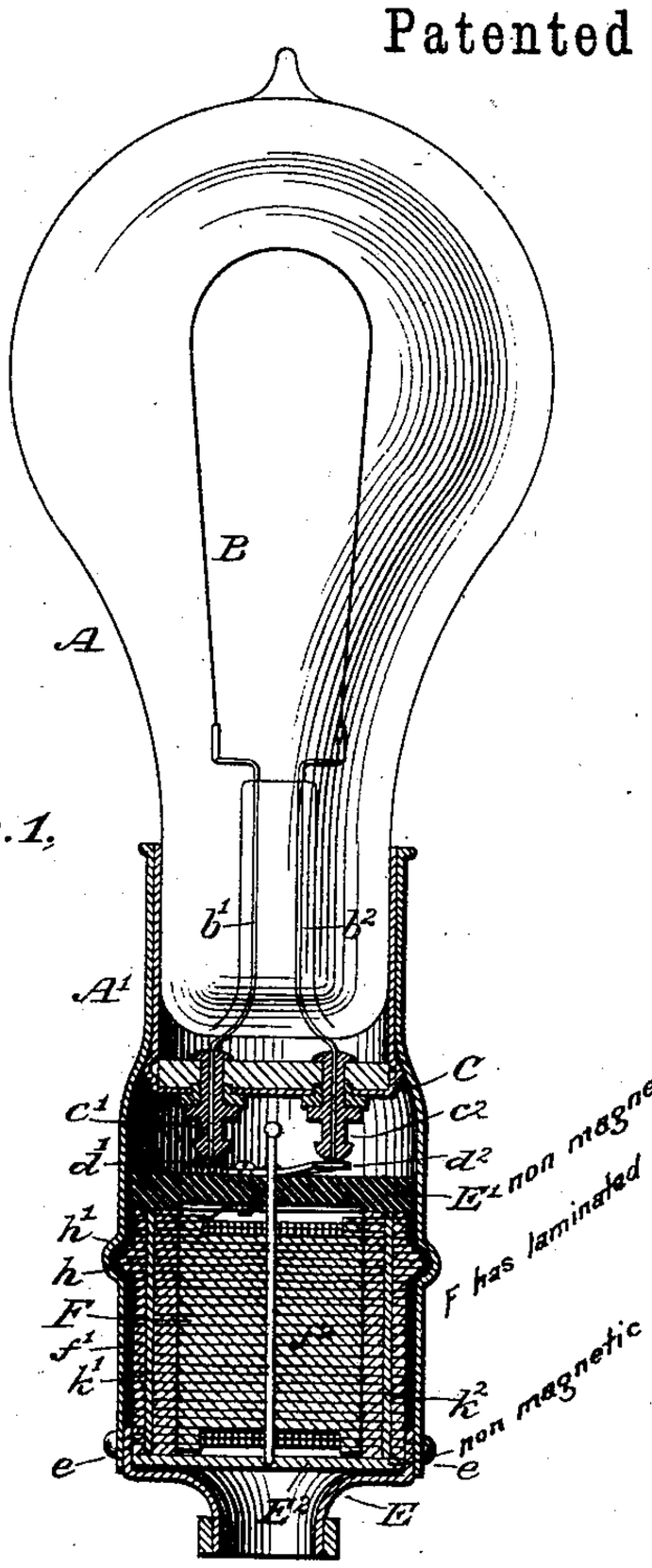


Fig. 2.

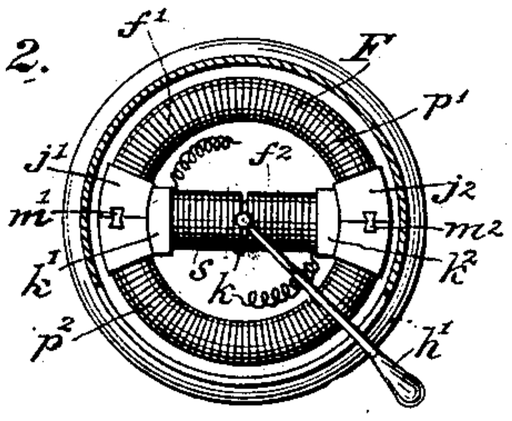


Fig. 4.

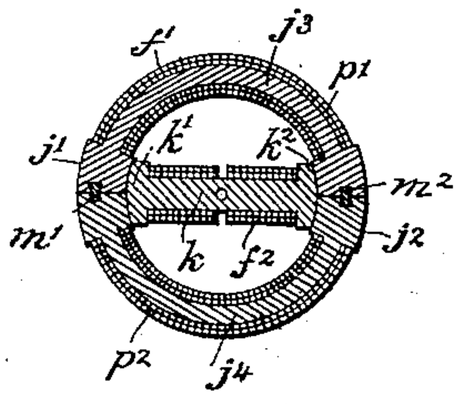
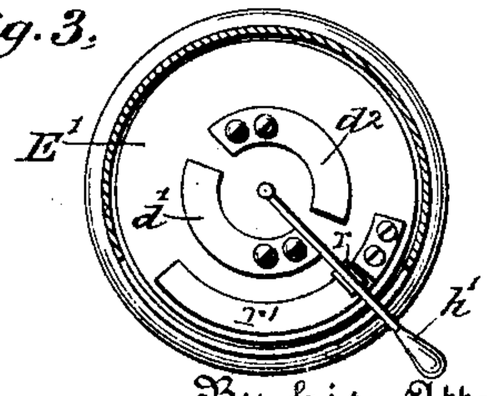


Fig. 3.



Witnesses

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COMBINED INCANDESCENT-ELECTRIC-LAMP SOCKET AND ELECTRICAL CONVERTER.

SPECIFICATION forming part of Letters Patent No. 376,583, dated January 17, 1888.

Application filed March 18, 1887. Serial No. 231,367. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. COLBY, a citizen of the United States, residing in New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Combined Incandescent-Electric-Lamp Socket and Electrical Converter, of which the following is a specification.

The invention relates to the construction of an electrical converter and the locating of it in the socket of an incandescent electric lamp.

The object of the invention is to combine with the socket of an incandescent electric lamp an electrical converter adapted to so modify the currents transmitted through the conductors supplying a system of translating devices with electric currents that the derived or induced currents shall be of the proper character for operating the light, and also to provide means for varying or modifying the value of the induced current, so that the lamp may be burned at whatever brilliancy may be desired.

The invention consists, in general terms, in placing within a suitable lamp-socket and wholly exterior to the lamp-globe an electric converter, preferably consisting of an annular core provided with coils of insulated wire. Within this core there is placed a second core, preferably of the shape of a so-called "Siemens shuttle-armature." This second core is also provided with a coil of insulated wire. The annular core is provided upon opposite sides with two enlargements projecting inwardly beyond the coils, and the inner core is mounted in such manner that its ends may be turned toward and from such projections. By turning this inner core a greater or less distance away from the projections the current induced in its coils by reason of a given current traversing the coils upon the annular core may be varied.

There are numerous modifications which may be adopted; but the general method of carrying out the invention will be described in connection with the accompanying drawings, in which—

Figure 1 is a transverse section of a combined socket and converter embodying the features of the invention, and Fig. 2 is a plan view of the adjustable converter. Figs. 3 and 4 illustrate certain details.

Referring to the figures, A represents an incandescent electric lamp, and A′ its socket. The filament B of the lamp is supported upon two leading-in wires, b' and b^2, which are led to suitable contact-points, c' and c^2, carried in the thimble C, which is applied to the neck of the lamp in any suitable manner. The contact-points c' and c^2 are designed to respectively make contact with two insulated contact springs or plates, d' and d^2, supported in any suitable manner within the socket A′. This socket consists of a shell of any suitable character adapted to receive the thimble C and to hold the same in position when the contact-points are against their respective contact-plates. The lower end of the shell is preferably closed by a cap, E, fastened in any suitable manner—as, for instance, by one or more screws, e—and provided with means for attaching the device to a fixture.

Within the shell there is placed a converter, F, consisting in this instance of an annular or cylindrical core, f', having its axis parallel to the axis of the shell and wound with coils p' p^2, of insulated wire. This core and its coil are supported in the shell and secured in position in any convenient manner—as, for instance, by lugs h, entering a corresponding enlargement, h', in the shell. The support E′ of the contact-points d' d^2 may be mounted upon the end of this core. A plate, E^2, of non-magnetic material, is preferably fastened to the opposite end of the core, and there extends from the plate E′ to the plate E^2 an axis or support for a second core, f^2, wound with a coil, s, of insulated wire. This latter core is preferably of the form known as the "Siemens shuttle-armature core," and consists of a central portion, k, having two widened ends, k' and k^2. The outer surfaces of these end pieces are curved to correspond to the curved faces of two projecting portions or lugs, j' and j^2, of the outer annular core. The axis of the core f^2 is provided with a suitable handle, h', by means of which the core may be turned within the annular core f'. In this manner the ends k' and k^2 may be carried away from the projecting lugs, separating the magnetic material a greater or less distance. Normally the two cores are preferably in magnetic contact with each other, thus completing the magnetic circuit. The extent of the surface thus in con-

tact will vary the inductive effect exerted by one coil upon the other through the iron.

In order to obtain as great an efficiency as possible from an electric converter, it is desirable that the coils should act upon the iron, forming a complete magnetic circuit, and as this circuit is rendered more or less complete the inductive effect is increased or diminished, and the complete interruption of the magnetic circuit materially diminishes the inductive effect. Therefore, by having the two cores f' and f^2 so that they may when the greatest efficiency is desired have their poles in magnetic contact throughout their entire surfaces, a much greater inductive effect is produced than would be the case were they separated from each other by an intervening space, however narrow. In addition to this another practical advantage is secured, namely: the friction which exists between the two parts prevents the accidental movement of the inner core, so that it will stay in whatever position in which it may have been purposely placed.

The armature-core f' and the core f^2 are both preferably made of thin magnetically-separated plates of soft iron. These may be stamped out or formed in any other convenient manner. This permits of rapid change in magnetic condition without undue heating.

The outer core, f', is preferably made in two sections, j^3 and j^4, which permit it to be more readily wound with the coils p' and p^2, of insulated wire. These two sections are then keyed together, as shown at m' m^2, the confrontings ends together constituting the projections or lugs j' j^2.

The coils p' and p^2 are so wound and connected that when placed in an electric circuit consequent poles are produced at the lugs j' and j^2. The two coils p' and p^2 and s are so proportioned to each other and connected in circuit that the one which is used as the secondary coil may be connected in circuit with the filament of the lamp, while that which is designed to be employed as the primary coil may be connected in the circuit with the supply-conductors. It is evident that either the inner or the outer coil may be used as the primary coil, as desired. Preferably the outer coil serves as the primary and the inner coil as the secondary. In such construction the terminals of the latter coil are connected with the contact springs or plates d' and d^2, while the terminals of the coils p' and p^2 are connected in any convenient manner with the supply-conductors. It may be desired to complete the circuit of the primary coil through a circuit-interrupting device which will cut the coil out of circuit when the lamp is to be extinguished. A plate, r, upon the lever h' and a contact-surface, r', may for this purpose be interposed in the primary circuit. When the core f^2 is turned at right angles to the position shown in the drawings, the plate r will leave the surface r' and thus interrupt the circuit.

It will be evident that by turning the core f^2 upon its axis its ends will be moved gradually away from the polar projections of the annular core, and that the inductive effect exerted by one coil upon the other will thereby be lessened. This affords a very convenient and efficient device for turning down the lamp and causing it to burn at whatever brilliancy may be desired and with a correspondingly-lessened consumption of electrical energy.

Lamps of the construction here described may be used in connection with the various systems of secondary electric distribution. Preferably, however, they are applied to tertiary circuits, so that the currents of very high potential may not be led into the immediate vicinity of the places to be illuminated.

I claim as my invention—

1. The combination, with an incandescent electric lamp and its socket, of a converter wholly exterior to the lamp-globe and within the socket, and connections between one coil of the converter and the filament of the lamp.

2. The combination, with an incandescent electric lamp and a socket therefor, of an adjustable electric converter wholly exterior to the lamp-globe and within the socket.

3. The combination, with an incandescent-electric-lamp socket and electric contacts for the lamp, of an adjustable converter within the socket and wholly exterior to the lamp-globe, and consisting of an annular core, coils of wire wound thereon, a movable core placed within said annular core, and coils of wire wound upon the inner core.

4. An electric converter consisting of an annular core having inwardly-projecting lugs or pole-pieces, and a movable inner core in metallic contact therewith and extending from one of said pole-pieces to the other, and coils of wire upon said cores.

5. In an electric converter, an annular core having inwardly-projecting lugs or pole-pieces, an inner core extending from one of said pole-pieces to the other and in metallic contact therewith, and means for adjusting the position of the latter core.

6. An electric converter consisting of two cores, one adjustable with reference to the other and in metallic contact with each other, and coils of insulated wire wound upon the respective cores.

7. The combination, with an electric-lamp socket, of a cylindrical laminated core of soft iron within the socket and wholly exterior to the lamp-globe, coils of insulated wire wound thereon, and a second set of coils inductively affected by the magnetization of said core.

8. The combination, with an incandescent-electric-lamp socket, of a converter within said socket and wholly exterior to the lamp-globe, and consisting of an annular core having polar projections within said socket, coils of insulated wire wound upon said core, and a second set of coils adjustable with reference to said coil.

9. The combination, with an incandescent-

electric-lamp socket, of a converter within said socket and wholly exterior to the lamp-globe, and consisting of an annular core having bare pole-pieces, supports or plates of non-magnetic material at the respective ends of said core, insulated wire wound upon said core, an adjustable core supported between said end plates, and coils of wire wound upon the last-named core.

10. The combination, with an incandescent-electric-lamp socket, of a converter within said socket and wholly exterior to the lamp-globe, and consisting of an annular core having bare pole-pieces, supports or plates of non-magnetic material at the respective ends of said core, insulated wire wound upon said core, an adjustable core supported between said end plates, coils of wire wound upon the last-named core, and means for placing the last-named coils in circuit with an incandescent-electric-lamp filament.

11. The combination, with a consequent-pole ring-magnet, of a straight magnet placed between the poles thereof, means for connecting the coils of one magnet in one circuit and for connecting the coils of the other magnet in another circuit, and an incandescent-electric-lamp socket containing both of said magnets.

12. An electric converter consisting of two semicircular magnets having enlarged ends, said magnets being fastened together with their ends confronting, and an independent magnet placed within the circle thus formed, substantially as described.

13. The combination, with an incandescent-electric-lamp socket, of an electric converter consisting of two cores in metallic contact with each other and adjustable with reference to each other, whereby the extent of such contact may be varied, and coils of insulated wire inductively acting upon and acted upon by such cores.

14. An electric converter consisting of two cores in metallic contact with each other, one of said cores being adjustable with reference to the other, whereby the extent of contact-surface may be varied, and coils of insulated wire upon the respective cores.

In testimony whereof I have hereunto subscribed my name this 12th day of March, A. D. 1887.

EDWARD A. COLBY.

Witnesses:
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