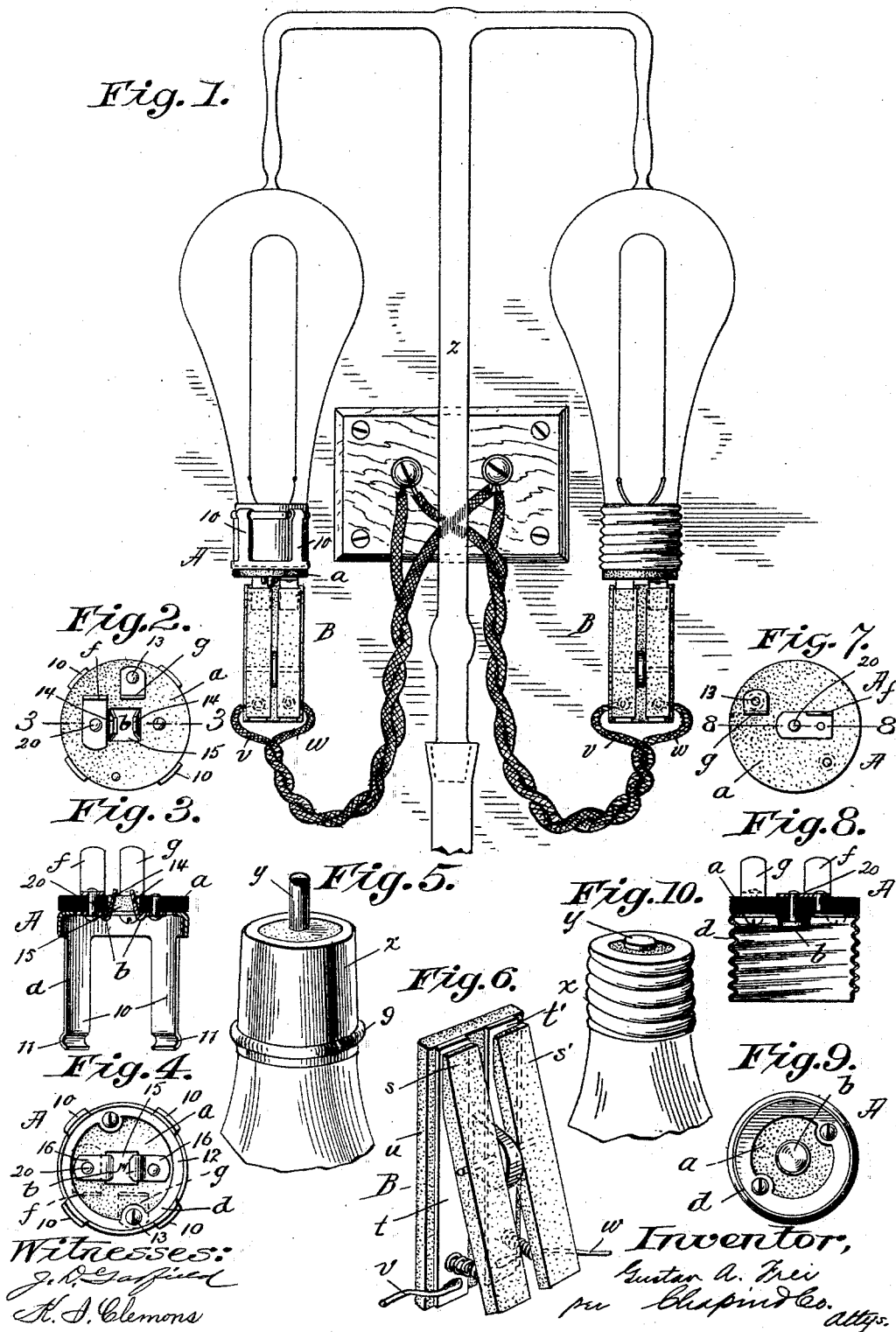


(No Model.)

G. A. FREI.
TEMPORARY CIRCUIT CONNECTOR FOR INCANDESCENT ELECTRIC LAMPS.

No. 497,955.

Patented May 23, 1893.



UNITED STATES PATENT OFFICE.

GUSTAV A. FREI, OF SPRINGFIELD, MASSACHUSETTS.

TEMPORARY CIRCUIT-CONNECTOR FOR INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 497,955, dated May 23, 1893.

Application filed December 19, 1892. Serial No. 455,615. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV A. FREI, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Temporary Circuit-Connectors for Incandescent Electric Lamps, of which the following is a specification.

This invention pertains to improvements in the renewing of burned-out electric incandescent lamps, more particularly to that part of the renewal which comprises the sending of an electric current through the replaced filament, for driving out the occluded gases during the exhaustion of the air from the globe or bulb, and while the lamp is suspended by the fragile glass stem, or a branch thereof, to which the vacuum pump is attached. New lamps are usually, at this stage of the manufacture, which is before the metallic terminals are applied, connected to the circuit by means of spring-clips attached to the leading-in wires, to proper portions of which spring-clips the current wires are connected. Old lamps, in which the filament has been replaced by a new one, cannot be connected in this particular way as these lamps are provided with caps or mounts securely fastened and having the terminals permanently cemented or connected. The use of the ordinary socket, which would fit to these terminals is out of the question, as it would so increase the weight as to cause the breaking off of the frangible tubes, which connect the bulb to the pump, while the temporary soldering of wires onto the terminals would be too slow and expensive to be considered. And, therefore, to the end of temporarily and effectively connecting the filament-renewed lamps, having the mounts and terminals permanently thereon, with the current wires, I have provided devices which are light, easily put in place on, or removed from, the lamp, and which are very cheap and simple of construction; and to this end the invention consists in combinations of parts, all substantially as will hereinafter fully appear and be set forth in the claims.

In the accompanying drawings the present improved device and the manner of its utilization are illustrated.

Figure 1 is a view in front elevation showing two filament-renewed electric incandes-

cent lamps supported by the connection with the bulbs of branches of the glass-stem which is understood as leading to the vacuum pump, 55 and also showing the present novel temporary connectors, the spring-clips, and the current wires in operative relations. Fig. 2 is a view of one side, and Fig. 4 a view at the other side of the temporary connector, Fig. 3 60 being a central section taken on the line 3—3, while Fig. 5 is a view of the shank or capped end of a Sawyer-Mann lamp for the reception of which the said last illustrated connectors are especially designed. Fig. 6 is a perspective 65 view of the spring-clip. Figs. 7, 9, and 8 are respectively views similar to Figs. 2, 4, and 3 (the section here being taken on line 8—8) but these views show the connector as especially designed for the temporary recep- 70 tion of a lamp of the Edison form, and Fig. 10 is a view of the portion of an Edison lamp having the terminals.

Similar characters of reference indicate corresponding parts in all of the views. 75

Now, first describing the improved temporary connectors, referring to the drawings, (and which are indicated in a general way by the letter, A,) *a* represents the body or disk thereof and *b* and *d*, represent the metallic 80 contact-pieces, the one, *d*, being insulated from the contact, *b*, and these are the ones which are to be placed in the temporary electrical connection with the terminals of the electric lamp; and *f* and *g* are the metallic contact- 85 pieces which are supported by and extended from the disk or body at its other side and which are in metallic connection, respectively, the contact *f* with *b*, and the contact *g* with *d*.

It will be observed that, as the terminals of 90 the different lamps, here illustrated, are of different forms, so also correspondingly different, in detail, are the arrangements of the contacts, *b* and *f*, although no difference in principle or the ultimate effect will be found. 95

Now in the form of temporary connector, shown in Figs. 2, 3 and 4,—which is adapted for the reception of such a lamp as seen in Fig. 5, (in which the metallic cap or ferrule, *x* constitutes one terminal and the axially extended spindle, *y*, the other, as well known) the contact, *d*, is constituted by a circularly arranged series of arms, 10, 10, which are carried by an annular base, 12, making a very

light spring socket. The extremities of the arms are curved or hooked, as seen at 11, to engage the head, 9, on the lamp. The base is riveted or screwed to the insulating disk, one of the rivets, as seen at 13, passing also through, and serving to confine, the base-member of the light metallic L-formed contact, *g*, on the disk. And in this connector the contact for the lamp terminal, *y*, is constituted by the two spring fingers, 14, 14, which are supported obliquely, and the one convergent to the other, within an aperture, 15, in the center of the disk. These fingers, 14, 14, have the foot-lugs, 16, whereby they are held in their positions by rivets which pass through such lugs and the disk, *a*. One of these rivets, as seen at 20, also passes through the foot-lug of the contact, *f*. The small end of the lamp, of course, on being forced into this connector, as seen at the left in Fig. 1, immediately has one of its leading-in wires brought into connection with the contact-piece, *g*, by reason of the cap, *x*, lying against the spring-socket, *d*, which, as explained, through the rivet, 13, is in connection with the said piece, *g*; and the other leading-in wire of the lamp, which is understood as in connection with the metallic spindle, *y*, is brought into connection with the contact-piece, *f*, by reason of the latter being united, by the rivet, to one of the fingers, 14, against which the said spindle, *y*, has a bearing. In the other form of lamp, seen in Fig. 10, in which the terminal, *x*, is constituted by a thin, spun-up, screw-threaded ferrule or cap, the contact, *d*, of the temporary-connector is constituted by a screw-socket, connected with the contact-piece, *g*, the same as the spring socket in the other connector, and for the other terminal, *y*, of this lamp, which is seen as a metallic disk or button, the contact, *b*, of the temporary connector is constituted by the disk or head of the rivet, 20, which passes through the central (here solid) portion of the disk, *a*, and through the foot-lug of the contact, *f*. Now, when the lamps with the replaced filaments have been united to the branches of the glass-stem, *z*, which is understood as having a connection with the vacuum pump, and these temporary connectors are applied, substantially as shown in Fig. 1, and the spring-clips, B, B, to which the current wires, *v* and *w*, are connected, are placed in engagement with the contacts, *f* and *g*, the flashing of the lamps may be readily performed. The spring-clip is illustrated in Fig. 6, and consists of a suitable body, *u*, of insulating material pro-

vided with separate metallic strips, *t*, *t'*, (to which the current wires, *v* and *w*, are brought) and the spring-jaws, or fingers, *s*, *s'*, of insulating material, or any suitable material, mounted in insulation.

It will be perceived that the contacts, *f* and *g*, are arranged with their members which are extended right angularly from the disk, *a*, in a common plane, corresponding to the plane of grasp by and between strips, *t*, *t'*, and fingers, *s*, *s'*, of the clip, B; and so by manipulating the clip by the fingers of one hand the one contact, *f*, may be grasped between clip-parts, *s* and *t*, while the other contact, *g*, is grasped between clip-parts, *s'* and *t'*.

The temporary connectors, A, A, and the spring-clips, B, together are of an inconsequential weight and constitute no liability of breaking the fragile branches of the exhausting stem.

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

1. A temporary connector for electric lamps consisting of a disk or body which has at one side thereof metallic contact-pieces insulated the one from the other and adapted to be placed in contact with the terminals of the lamp and contact-pieces on the other side of the body, which are in metallic connection with the first-named contact-pieces and a spring-clip detachably connected to the second set of contact pieces, and current wires connected thereto, substantially as and for the purpose set forth.

2. A temporary connector for electric lamps consisting of a disk or body of insulating material having at one side a light metallic device for grasping the shank of the lamp and for being placed in contact with one of its terminals, and also having at said side a contact-piece for the other lamp terminal, metallic connections passing from said contact-pieces in insulation through the body, and two separate contact-pieces at the other side of the body engaged by said metallic connections having portions arranged in a common plane in combination with a spring clip which consists of a body having the insulated metallic pieces, *t*, *t'*,—with current wires, *v* and *w*, connected thereto,—and a spring-finger for bearing on both of said metallic pieces, substantially as and for the purpose set forth.

GUSTAV A. FREI.

Witnesses:

WM. S. BELLOWS,
J. D. GARFIELD.