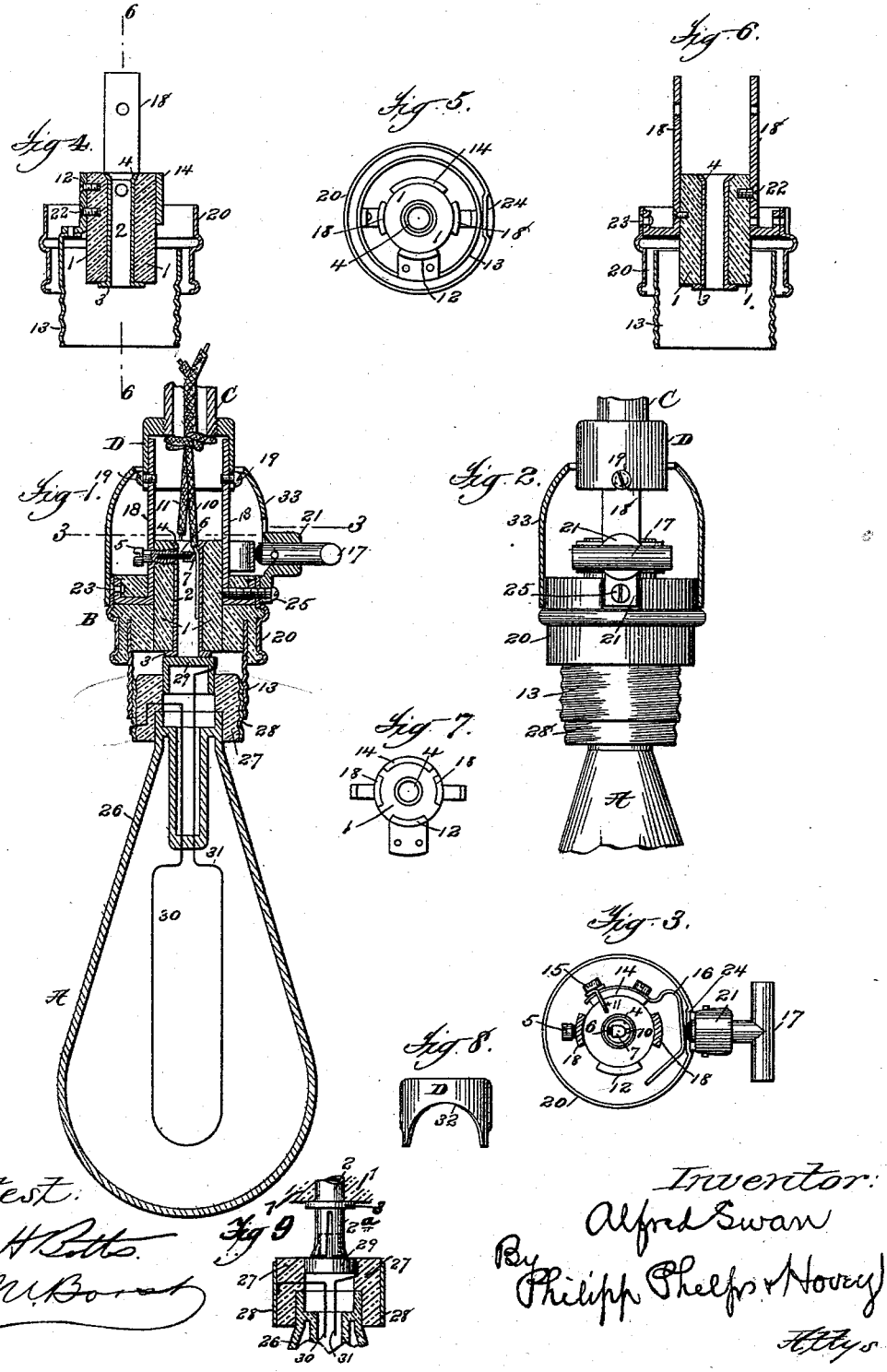
(No Model.)

A. SWAN.

INCANDESCENT LAMP SOCKET.

No. 439,365. Patented Oct. 28, 1890.



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INCANDESCENT-LAMP SOCKET.

SPECIFICATION forming part of Letters Patent No. 439,365, dated October 28, 1890.

Application filed November 27, 1889. Serial No. 331,808. (No model.)

To all whom it may concern:

Be it known that I, ALFRED SWAN, a subject of the Queen of Great Britain, residing in the United States, at Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electric Lamps, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to incandescent-lamp sockets, and has for its object to provide a simpler and cheaper socket than those heretofore in use, and one which shall permit of more convenient attachment of the line-wires and more ready access to the same, at the same time affording a more complete insulation of the parts.

With these objects in view my invention consists in various details of construction and combinations of parts and in an improved method of making a socket, all of which will be more particularly described, and pointed out in the specification and claims.

The sockets herein shown and described are the same in some respects as those of my earlier applications, Serial Nos. 301,841 and 301,842, filed March 5, 1889, and Serial No. 308,056, filed April 22, 1889; and the invention in the present case covers improvements upon those sockets, but are of general application in this class of constructions.

Referring now to the annexed drawings, forming a part of this specification, Figure 1 is a vertical section showing a complete socket with lamp attached. Fig. 2 is a partial elevation at right angles to Fig. 1. Fig. 3 is a cross-section taken on the line 3 3 of Fig. 1. Fig. 4 is a sectional view of my improved socket prior to molding. Fig. 5 is a plan view of Fig. 4. Fig. 6 is a section taken on the line 6 6 of Fig. 4. Fig. 7 is a plan view showing a molded core. Fig. 8 shows a modified form of nozzle, and Fig. 9 shows a modified form of contact for the base of the lamp.

A is the lamp; B, the socket, which is connected to the line-wire carrier C by the nozzle D.

The holder B consists of the central core 1 of insulating material, having an opening through the center, in which is inserted the metallic tube 2, into one end of which passes the line-wire 10, the other end forming a contact for the base of the lamp. The tube 2 may be secured in the core in any suitable manner, but is preferably provided with a shoulder 3, abutting against one end of the core and forming an extended contact for the lamp, and is secured against movement in the other direction by countersinking the other end of the core and expanding the end of the tube after insertion, as shown at 4 in Fig. 4. The line-wire 10 is pressed into contact with the inside of the tube 2 by the screw 5, which, as shown in Figs. 1 and 3, passes through the core and tube, and is provided with an insulating-plug 6, to the end of which is preferably attached a metal cap 7 in direct contact with the wire 10, thus securing a better contact between the wire and tube than would be obtained by direct pressure of the insulating-plug.

To the side of the central core 1 is attached the supporting and contact piece 12, which carries the metallic screw-threaded thimble 13, in which the base of the lamp is inserted. Upon the other side of the core from the supporting and contact piece 12 is attached the metallic contact-piece 14, which carries the binding-screw 15, to which the line-wire 11 is connected, and which supports the contact-spring 16 for completing the circuit, the other end of the spring being brought into contact with supporting and contact piece 12 by the motion of the key 17.

To each side of the core 1 is attached a standard 18, provided with a screw-threaded opening near the upper end to receive a screw 19, by which connection is made with the nozzle D. These standards 18 are provided at the lower ends with arms by being bent twice at right angles, as shown in Fig. 1, and to the arm of one standard is attached the metallic collar 20, forming the outer wall of the socket. The standards and contact-pieces may be attached to the core by screws 22, as shown, or in any other suitable manner; or the core may be formed of plastic non-conducting material, and all or some of the parts shown and described as attached to the core be molded and embedded therein. The collar 20 is shown as attached to the vertical arm of standard

18 by rivet 23; but this connection may be made in any other suitable manner, and the standards 18 may be of any other desired form. The collar 20 is recessed at 24, as shown in Fig. 5, to receive the shoulder 21 for supporting the key 17, the shoulder being attached by screw 25 passing through the collar and into the vertical arm of one of the standards 18, the other side of the collar, as stated above, being attached to the other standard. By recessing the collar to receive the shoulder the latter is brought nearer the center of the socket, reducing the size of the latter, and the shoulder is supported against lateral movement by the walls of the recess. The space between the parts from the lower side of the contact-spring to the other end of the collar 20 will be filled with insulating material, preferably molded therein, thus holding the parts firmly in place and forming a socket, consisting, essentially, of an enlarged base, to which the lamp is connected, and a contracted neck affording space for movement of the parts forming contact with the line-wires, the standards for supporting the socket from the line-wire carrier forming an extended open neck through which the line-wires pass, and which affords free access to the wires without removing any permanent parts of the socket. It will be seen that this construction is light and simple and provides for all contacts and attachments within a small space, affording convenient access thereto.

For attaching the socket to the line-wire carrier C the nozzle D has a screw-threaded opening, by which the nozzle is screwed upon the carrier, and each of its side walls is slotted from the rim, as shown in Figs. 1 and 2, to receive the screws 19, passing through the standards 18. The standards are shown as but two in number, and this is the most convenient form, as affording the freest access to the line-wires for connection or for purposes of repair. It will be understood, however, that the number may be varied, if desired, so long as the essential feature of my construction is retained, consisting of an open neck affording access to the line-wires. The standards will preferably be constructed so as to be bent inward a little, owing to the spring of the metal, and the nozzle being tightly fitted upon them the spring of the standards assists in holding them in place. If desired, the collar may be recessed on the inside to receive the ends of the standards, or the position of the slots and openings may of course be reversed, the standards being provided with the slots and the nozzle with openings, and other changes in details of construction may be made without departing from my invention. The sides of the nozzle D may be cut away, as shown at 32 in Fig. 8, in case it is desired to use this connection with a low-necked socket. The construction shown in Fig. 2, however, is preferable, on account of its greater strength.

33 is the cap which covers the neck and body of the socket below the nozzle and may be raised to permit access to the wires, it sliding readily over nozzle D.

The lamp consists of the flask 26, inserted in a base 27 of insulating material, which is surrounded by a metallic collar 28, screw-threaded upon the outside. In the end of the base is inserted a contact-plug 29, which forms a contact with the shoulder 3 of the tube 2 when the lamp is inserted in the socket. The filament-wires 30 31 are connected, respectively, with the screw-collar 28 and plug 29, and the lamp is attached to the socket by screwing the base into the screw-thimble 13, the circuit between the line-wires and the lamp being completed through contact-screw 15, contact-spring 16, support and contact piece 12, thimble 13, and metallic collar 28, filament-wires 30 31, contact-plug 29 in the base of the lamp, tube 2, and line-wire 10. It is evident that if a keyless socket is desired, piece 14 will be omitted and wire 11 will be connected direct to support and contact piece 12, shoulder 21 and the key being dispensed with, standard 18 on that side being still attached to the collar by screw 25.

Fig. 9 shows a modified form of contact for the base of the lamp, it being intended for use with lamps provided with a base-nipple adapted for side contact. In the construction previously in use with such lamps the nipple is in sliding contact with one or more light springs, and it is found in practice that there is great danger of short-circuiting by the ease with which these springs are thrown out of position by being bent back by accidental or other movement of the flask. In my improved construction the contact-piece is in the form of a split tube 2^a, the rigidity of which is such that while it enables the nipple 29 at the base of the lamp to be pressed between the two parts of the tube the resistance to a force tending to press the two parts of the tube out is so great as to practically remove all danger of short-circuiting. As shown, this contact is applied to my tube 2 by simply extending the same below the shoulder 3 and splitting the elongation. It is evident, however, that this split tube contact may be used with any other form of connections with the line-wire, it being immaterial how the circuit is completed from the springs formed by the split portion.

Referring now to my improved method, it is to be understood that the invention presented in this application consists in part of improvements upon that presented in my applications, Serial Nos. 301,841 and 301,842, previously referred to, in which is described and claimed a socket consisting of plastic non-conducting material in which the metallic parts may be molded and embedded. I desire to facilitate the process of manufacture of such sockets molded from plastic non-conducting material by providing means for holding the metallic parts forming the base of the socket in their proper position during

the process of molding. I accomplish this by combining in a single construction some or all of the parts of the socket that are necessarily in place previous to molding by the use of a central core of insulating material to which the parts are attached. This central core may be of wood or other suitable material, and the parts attached thereto after its formation by screws or in any other suitable manner; or the core may be formed of non-conducting plastic material, to which the parts are attached during the process of formation of the core by molding them and the core material together.

Figs. 4, 5, and 6 show the socket ready for molding, the central core being of wood or other suitable material, and the parts attached thereto, as previously described. Fig. 7 is a plan view similar to Fig. 5, except that the collar 20 and thimble 13 have not been attached to their respective supports, and shows a molded core 1, with the standard 18 and contact-pieces 12 and 14, molded and embedded in the core.

In making the socket shown the tube 2, contact-pieces 12 and 14, and standards 18 will first be attached to the central core 1 or molded therein, as previously described. The thimble will then be attached to the piece 12 and the collar 20 to one of the standards 18 by rivets, as shown, or in any other suitable manner. The parts thus attached to the core form the contact and supporting parts of the socket. The socket is now ready for the insulating material, which will be molded around and between the parts, as shown in Fig. 1, thus completing the body of the socket. Any of the well-known processes of molding may be employed both for the formation of the central core, if a molded core be used, and in the final molding, and need not be described herein. After the final molding, the parts necessary to complete the socket will be added the shoulder 21, carrying the key 17, being attached by screw 25, binding-screw 15, and contact-spring 16, attached to the contact-piece 14 and the screw 5, inserted through support 18 and the core into tube 2, these parts, with nozzle D and cap 33, completing the socket. It is evident that the number or form of the parts attached to the central core or added after molding is immaterial and will vary with the form of the socket being made.

The invention consists in the method of forming a socket, and may be applied to sockets using different forms of supporting and contact parts, the essential steps in the process being providing a supporting-core of insulating material for the parts which need to be held in place during the process of molding and molding the insulating material around and between the parts to form the base of the socket.

It is obvious that all the parts to be molded and embedded in the non-conducting material need not be attached to the core, but only those which are more difficult to hold in place—as, for instance, the contact-pieces and central tube.

As a part of the same invention is included the special method of forming the supporting construction previous to the final molding, consisting in attaching the metallic parts to the core during the formation of the latter by molding them in the plastic non-conducting material of which the central core in this case is formed.

In the sockets now in common use there is frequently a necessity for protection against short-circuiting additional to that afforded by the insulating material of which the socket is made, the material thus in use for insulating purposes being frequently of inferior insulating quality. In order to afford such protection I propose to coat all metallic parts, or such of the metallic parts of such sockets as are in danger of causing short-circuiting, with a rubber, japan, or other insulating enamel, thus making it impossible for the current to be transmitted except through the regular connections of the socket. A socket thus constructed has this additional advantage, that its metallic parts need not be made of brass to prevent rusting, but may be made of a cheaper material—such as tin, iron, or sheet metal of any kind having the proper conducting quality—thus reducing greatly the cost of the socket.

In assembling the parts of my lamp the cap 33 is placed over the nozzle D and the latter screwed onto line-wire carrier C. The socket is then connected to the nozzle by standards 18 and screws 19, the latter being carried by the standards and sliding into the slots in the nozzle, the tightening of the screws binding the parts firmly together. The line-wire 11 being attached to screw 15, the lamp is screwed into the thimble 13, forming contact therewith and with the shoulder 3 on tube 2, and wire 10 is forced against the inside of the tube 2 by screw 5, thus completing the circuit when the key is turned. As above stated, the socket may be used without a key, if desired, the wire 11 then being attached directly to contact and supporting piece 12.

An important feature of my construction is that the make and break of the switch by key 17 is upon the pole connected with the outside contact formed by the thimble 13. The advantage of this construction over that heretofore in use, in which the switch is connected with the central contact, is evident. In the old sockets the outer shell being always a pole there is danger in taking hold of this part, especially if the person is standing on damp ground, that a shock will be received. With the key 17 closing contact with thimble 13 the latter, when the circuit is open, is not a conductor, and may be handled with safety.

I do not claim herein a socket molded from plastic non-conducting material, as this forms a part of the subject-matter of my applications, Serial Nos. 301,841 and 301,842, above referred to.

I do not claim herein the special form of contact key and spring shown, for this is covered in my application, Serial No. 301,842, above referred to; nor do I claim the socket having an enlarged base and contracted neck, affording space for movement of the contact key and spring, for this is covered in my application, Serial No. 308,056, filed April 22, 1889.

What I claim is—

1. In an incandescent-lamp socket, the combination, with the body provided with contacts for the line-wires, of a neck forming a part of the socket and supporting the body from the line-wire carrier, said neck being open at the side to permit of access to the line-wires inside the neck, substantially as described.

2. In an incandescent-lamp socket, the combination, with a body provided with contacts for the line-wires, of standards 18, forming a part of the socket and supporting the body from the line-wire carrier, said standards being placed at suitable distances apart to form an open neck and permit of access to the line-wires inside the neck, substantially as described.

3. In an incandescent-lamp socket, the combination of an enlarged base and contracted neck, a contact-piece for one of the line-wires on the outside of said neck, a switch moving about said neck within the circumference of the base, and an extended open neck through which the line-wires pass, and by which the socket is supported from the line-wire carrier, substantially as described.

4. In an incandescent-lamp socket provided with an enlarged base and contracted neck, the combination of a central conducting-piece forming a contact for the lamp and connected with one of the line-wires, a contact-piece on the outside of the neck for attachment of the other line-wire, a switch moving about the neck within the circumference of the base, and an extended open neck through which the line-wires pass, and by which the socket is supported from the line-wire carrier, substantially as described.

5. An incandescent-lamp socket consisting, essentially, of an enlarged base and a contracted neck, the neck being provided with a central opening through which one of the line-wires passes to a central contact and with a contact-piece to which the other line-wire passes outside the neck, a lamp-support on the base at the end opposite the neck, and a switch moving about said neck within the circumference of the base, substantially as described.

6. In an incandescent-lamp socket, the combination, with a central tube forming a contact for the base of the lamp and entered by one of the line-wires, of a binding-screw passing through the side of the socket into the tube for pressing said wire into contact with the tube, substantially as described.

7. In an incandescent-lamp socket, the combination of the line-wire, a contact-piece for said line-wire, and a screw provided with an insulating-plug and metal cap pressing said wire against the contact-piece, substantially as described.

8. In an incandescent-lamp socket, the combination, with a body consisting of an enlarged base and contracted neck, the outer wall of the base being provided with a depressed portion or recess, of a shoulder mounted in and constructed to fit said recess and a switch-key carried by said shoulder, substantially as described.

9. An incandescent-lamp socket consisting of a central core of non-conducting material, to which are attached some or all of the contact and supporting parts, and having its base formed of plastic non-conducting material in which said core and parts are molded and embedded, substantially as described.

10. An incandescent-lamp socket consisting of a central core of plastic non-conducting material, to which some or all of the contact and supporting parts are attached by being molded and embedded therein, and having its base formed of non-conducting plastic material in which said core and parts are molded and embedded, substantially as described.

11. In an incandescent-lamp socket, the combination, with a central contact-piece connected to one line-wire and forming one contact for the lamp, of an outside contact-piece for the other pole of the lamp and a switch for making and breaking circuit between the outside contact-piece and the other line-wire.

12. In an incandescent-lamp socket, the combination, with a central contact-piece connected to one line-wire and forming one contact for the lamp, of an outside thimble, as 13, forming a contact-piece for the other pole of the lamp, and a switch for making and breaking circuit between the thimble and the other line-wire, substantially as described.

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

ALFRED SWAN.

Witnesses:
C. J. SAWYER,
T. H. PALMER.