H. W. LAWRENCE.

ELECTRIC LAMP HOLDING SOCKET.

APPLICATION FILED JULY 16, 1909.

964,281. Patented July 12, 1910.

Fig. 1.

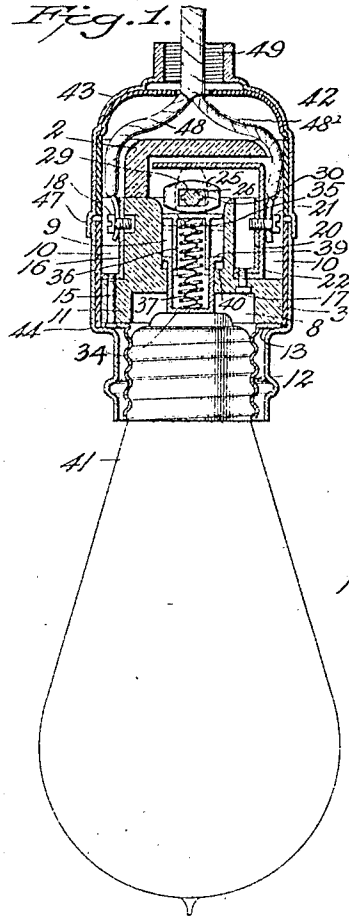


Fig. 2.

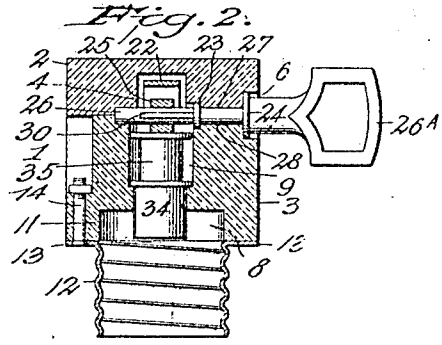


Fig. 3.

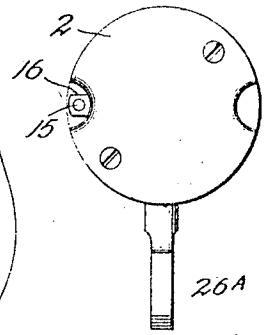


Fig. 4.

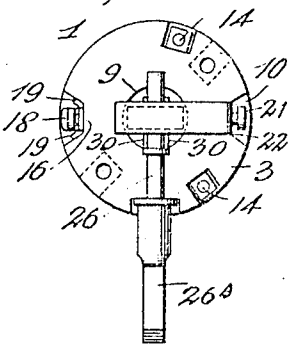


Fig. 6.

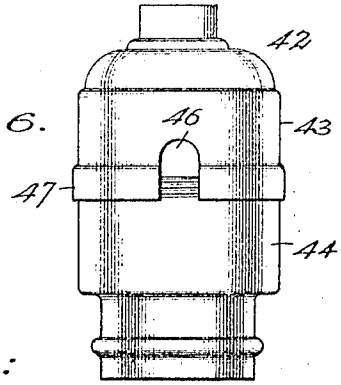
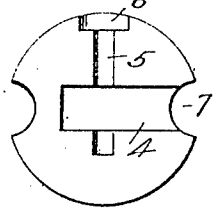


Fig. 5.



Witnesses:
G. Sargent Elliott.
Adella M Fowle

Inventor:
Harry W. Lawrence.
By
H. S. Bailey Attorney.

UNITED STATES PATENT OFFICE.

HARRY WALLACE LAWRENCE, OF DENVER, COLORADO.

ELECTRIC-LAMP-HOLDING SOCKET.

964,281. Specification of Letters Patent. Patented July 12, 1910.

Application filed July 16, 1909. Serial No. 507,947.

To all whom it may concern:

Be it known that I, HARRY WALLACE LAWRENCE, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented a new and useful Electric-Lamp-Holding Socket, of which the following is a specification.

My invention relates to improvements in electric light holding sockets; and the objects of my invention are: first, to provide a lamp holding socket provided with resiliently operating reciprocal thimbles that exert a frictional resilient pressure against the terminal contacting point of the lamp and also of the switch key; second, to provide an electric lamp holding socket that is provided with a threaded receiver shell that engages the entire threaded plug end of the lamp, and that is provided with a resiliently yielding contact terminal that is in make and break relation to the switch-key and that exerts a resilient frictional pressure against the terminal center of the threaded plug end of the lamp when the lamp is screwed into the receiver shell into operative circuit relation with it; and third, to provide a lamp holding socket having an axial resiliently contacting terminal arranged in axial alinement with the lamp and the switch key of the socket. I attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a vertical sectional view through the improved lamp holding socket. Fig. 2, is a vertical sectional view of the core of the lamp socket removed from the casing, the section being taken at right angles to the section shown in Fig. 1. Fig. 3, is a plan view of the core. Fig. 4, is a plan view of the core with the cap removed. Fig. 5, is a plan view of the under side of the cap. And Fig. 6, is a side elevation of the two part casing for the core.

Similar characters of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1, designates a core or body portion of my socket. This core is made of molded and cast porcelain, and consists of two short round portions 2 and 3. The part 2 of this core forms the cap of the core, and is provided with a radial and diametrical recess 4, and also with a cross recess 5, each of which extends partially across it, and registers with recesses 6 and 7, formed partially in the peripheral edge of the cap and base. The part 3 of the core I term the body or base of the core. It is provided with a recess 8, in its bottom end, and with an axial aperture 9, through its center. The peripheral edge of the body portion is also provided with recesses 10, which receive the terminal circuit and other parts of the socket's make and break mechanism.

The recess 8 in the bottom of the body portion leaves a narrow rim portion 11, at the bottom edge of the body portion of the core, and a rolled externally and internally threaded electric lamp receiving and holding shell 12 is secured to the rim by means of a right-angled flange 13, which is formed on the upper edge of the shell and which is secured to the bottom rim edge of the body of the core by screws 14. I preferably use flat-headed screws for securing this flange to the rim of the core, as they extend into countersunk holes formed in the flange, and consequently give a larger contacting terminal surface area than a flat bottom headed screw. One of these screws 14, extends through the porcelain into one of the recesses 10, and is screwed into a terminal contact strip of metal 16, which acts as the outgoing circuit terminal from the lamp holding shell. This contact conductive terminal comprises a strip of conductive metal, that is seated in one of the recesses 10. One end of this terminal strip is bent over at right angles, and is provided with a threaded aperture adapted to receive the end of the terminal circuit screw 15. The opposite end portion of this terminal strip is provided with a threaded aperture, in which a binding screw 18 is threaded. The strip is provided with two lug portions 19, which are formed on its edges on opposite sides of the binding screw, and these lugs project upwardly at an outward angle and are adapted to give an increased contacting surface between the terminal strip and the end of the circuit wire. On the opposite side of the body or base of the core from this terminal strip 16, the opposite recess 10 is formed, in which one end of a terminal contact strip 20 is placed, which is similar in form, shape and size to the terminal strips 16, and is secured to the base of the recess 10 of the base by a screw 17. This strip is also provided with a terminal binding screw 21, which in addition to being used to secure the terminal end of a

circuit wire to the strip, is used to secure the vertical member of a spring 22 to the contact strip. This spring is a right angular shaped piece of spring conductive metal, such as copper, which is preferably used, and the lower end of its portion that is secured to the terminal strip 20, is bent inwardly at right angles and extends under the bent end of the terminal strip, and the screw 17 extends through an aperture formed in it to receive it loosely, and this end is clamped by this screw and the end of the strip 20 to the end wall of the recess 10 in the body of the core. The opposite end of this spring is also bent inwardly and extends diametrically across the center of the bottom of the body of the core and beyond its center, and is positioned at a short distance from but within operative engaging relation to a cam-block 25, which is secured to or forms a part of the switch key's stem 26, and of the thumb and finger plate 26^A, which are rotatably mounted in recesses 27 and 28 formed partially in the bottom of the body and partially in the cap of the core portion of the lamp holder, and are arranged to receive the stem and hub portions of the switch key. The stem is provided with two washers 23 and 24, the washer 23 being placed in a recess formed in the body of the core so that the key portions of the stem will abut against it, and prevent the displacement or removing of the stem from the core when its base and body portion are secured together. The washer 24 is placed on the stem at the end of the hub portion of the finger plate, in a circular recess 6 formed half in the base and half in the cap to receive it. This cam-block comprises a small block of conductive metal, provided with tapering blunt opposite end portions, and provided with an oblong shaped center aperture 29 through it, through which the stem 26 of the switch key projects preferably loosely. The stem is provided with key portions 30, which project from its opposite sides, but which fit loosely into the aperture in the cam block and secure it to the stem so that it is rotated by the stem of the switch key. The cam block and the spring are confined in the recess 4 formed in the cap of the body or base of the core, and the stem 26 is loosely inserted in the aperture of the cam block or withdrawn from it when assembling or separating the parts of the socket.

Through the axial center of the body of the core, the aperture 9 is formed. In this aperture I fit reciprocally and loosely two thimbles 34 and 35, the open ends of which are arranged to register opposite and in alinement with each other, and their closed end portions are positioned at a short distance apart by a steel coiled expansion spring 36, which fits snugly but loosely against the inner wall of the thimbles, and against their inner ends, and within this coiled spring an additional coiled spring 37 is placed, the opposite ends of which are soldered or otherwise secured, to the inner ends of the two thimbles. This inner coiled spring is preferably made of copper or other conductive wire, and is adapted to act as a direct positive electrical circuit connection between the thimbles. The thimble 34 I term the lamp engaging thimble, as it projects into and is engaged by the plug end of the lamp, and is moved a short distance by the plug end of the lamp to compress the spring 36, as it is screwed down into the receiver shell. The thimble 35 I term the switch key cam engaging thimble, as it is held by the spring 36 in resilient contact at all times against the cam block. The thimble 35 is preferably provided with a flanged rim portion surrounding and forming a part of its closed end portion, which with its head portion rests on and is arranged to be engaged by the cam-block of the switch key's stem, when the cam block is turned endwise against it by turning the switch key. The body of this thimble 35 is arranged to fit slidably and telescopically within the body of the lamp engaging thimble 34, the upper edge of which is preferably provided with a flange 39, which is adapted to be held against a shoulder 40 formed in the core to receive it by the spring 36, and thus define its position and movement relative to the lamp 41. These thimbles telescope on each other only a slight distance of their length when not in operative circuit relation with a lamp, but they are so arranged that when a lamp is screwed into the receiver shell, the lamp thimble is engaged by the end of the plug of the lamp and is forced down into the thimble that engages the cam block, and when the switch key is turned to cause the cam block to engage the spring 22, which is so arranged that it stands normally out of contact with the cam block and at a distance from it equal to a little less than the distance of the opposite ends of the cam block from its center, the position of the cam engaging end of the spring relative to the cam block is such that the distance between them is sufficient to prevent any possibility of the cam blocks coming in contact with the spring except when the cam block is turned upon its ends against its thimble, and between the thimble and the spring, the spring being arranged so that when the cam block is turned up on end in engaging relation to the cam block, the spring will bear on the cam block with sufficient resilient pressure to form a friction pressure contact that will be of sufficient pressure to form a perfect terminal circuit connection.

The cam block normally stands, when

the switch key is turned to stand out of circuit with the lamp contact terminals of the core, with one of the sides of its narrowest part engaged by the resilient pressure of the adjacent thimble, and when the switch key is turned to turn on the light and to move its cam block in circuit with the terminals of the lamp contact terminals, the cam block moves the thimble 35 telescopically within the lamp thimble, and compresses the coiled springs within the thimble; consequently the lamp thimble is forced by the resilient pressure of the steel coiled spring to engage the terminal contact point at the center of its plug end with a constant direct pressure that insures positive pressure contact, and at the same time the cam block of the switch key receives the resiliently expanding pressure of its thimble, and when the switch key is turned to turn the ends of the cam block in contact between the thimble and the terminal spring, positive resilient pressure frictional bearing and contacting circuit connecting terminals are formed between both the switch key and the lamp, and also between the switch key and the spring terminal contact of the core of the socket.

The core 1 of the socket is incased by a shell or casing 42, preferably made of brass, which is divided into two parts, comprising a cap portion 43 and a body portion 44. Both the cap and body portion of the shell are lined with a suitable insulating material 41A. The cap of the shell extends over the cap portion of the core onto its body portion, a slot 46 being formed in it of suitable size to permit it to extend a short distance beyond the switch key's hub, and its inner end is slightly enlarged and is provided interiorly with a threaded portion 47, which is adapted to receive a threaded terminal end portion of the body of the shell, which fits over the threaded lamp receiving shell end of the core and screws into the cap.

The circuit wires 48 enter an opening 49 in the end of the cap of the shell, and extend through the recesses 10 in the cap and body of the core, and are secured to the binding posts of the contact strips 16 and 21, as is well understood.

The lamp receiving shell of the core is made of a length to fully cover the entire threaded surface of the threaded plug end of the lamp, and the recess in the top of the core is made enough larger than the interior diameter of the shell to permit the terminal end of the threaded plug of the lamp to screw through the receiver into the chamber or aperture in the core below the flange of the receiver that is formed by the recess in the core, and engage the end of the lamp thimble, which is arranged to project a short distance above the bottom of the recess into the downwardly moving path of the threaded end of the lamp when it is screwed into the receiver shell, its position relative to the end of the lamp being defined by the flange 39 at its end, which is held against the shoulder 40 formed in the core by the expansive steel spring 36.

The operation of my improved resiliently contacting center engaging lamp holding socket, is as follows: The current flows through the circuit wires 48 and 48A to the binding posts 18 and 21 and flows through the contact strip and terminal spring and also flows into the contact strip 16 and through its screw into the receiver-shell, and when a lamp is screwed into the receiver shell, the full length of its thread, the threaded end of the lamp engages the lamp terminal contact thimble 34, thus insuring an electric conducting circulation from the binding post through the lamp receiver shell and lamp and the two thimbles to the cam-block. Then when the switch key is turned to turn on the lamp, the cam is tilted from its side-wise position against the adjacent thimble to an end to end position between its adjacent thimble, and the terminal contact spring, both of which are sprung away from their normal positions, the thimble being pushed axially into the body of the core and telescopically into the lamp thimble, and the spring being pressed and sprung into its recess 4; consequently the cam-block when turned into end to end contact with these two terminal contacts, the thimble and the spring, is clamped between them by the resilient pressure of each, and engages them with a frictional pressure sliding movement against their surfaces which insures a direct frictional pressure contact. The lamp also as it is screwed into the receiver shell, as the center of the terminal end of its threaded plug end engages the adjacent contact terminal thimble, turns on its closed end and rubs or slides on its surface as it is screwed fully into the receiver shell the full length of its thread, and consequently engages the thimble with a frictional resilient pressure as it pushes it down into the cam thimble, and the two thimbles being compressed telescopically together by the lamp and the cam compress the steel expansion spring within them and they are held under constant spring pressure in axial center alinement with the terminal and axial center of the plug end of the lamp, and with the cam-block, thus insuring direct positive forcible frictional terminal contacts between the lamp and the switch key and its contact terminals.

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

1. An electric lamp holding socket, comprising a non-conductive core, provided with suitable contact strips provided with circuit

wire binding posts, a recess in one end of said core, a lamp receiving shell attached to the end of said core above said recess, a contact terminal make and break rotary movement switch key in said core at its opposite end portion, a resilient contact terminal connected to one binding post, a terminal contact arranged to stand normally out of contact with but in make and break relation to said switch key, a lamp threaded to said receiver and projecting through said receiver into said recess, a pair of terminal contacts conductively connected together and provided with a spring arranged to hold them under constant separating resilient pressure away from each other in said core, one of which is arranged to project into said recess into the path of said lamp's threaded end and be engaged and pushed against its spring as said lamp is screwed into its receiver shell, and the other terminal of which is arranged and adapted to bear with a constant resilient pressure against said make and break switch key, whereby said spring actuated contact terminals bear with resilient yielding pressure in opposite directions in said core against said lamp and said switch key.

2. An electric lamp holding socket, comprising a non-conductive core, provided with an operative contact terminal switch key at one end and a lamp receiving shell at its opposite end, said core being provided with a pair of spring actuating contact terminals reciprocally mounted in said core and conductively connected together, one of which is arranged to bear with constant resilient pressure against said contact terminal switch key, and the other of which is adapted to project into the path of and engage and be moved against its spring by the threaded end of an electric lamp when screwed in said threaded shell to the end of said lamp's threaded end, a spring contact arranged in operative make and break relation to said terminal contact switch key, and suitable binding post circuit wire terminal contacts operatively connected to said spring contact and to said lamp receiving shell.

3. In an electric lamp holding socket, comprising a non-conductive core, a switch key in said core provided with a terminal contact at one end of said core, a recess in the opposite end of said core, a threaded lamp receiver shell secured to the end of said core concentric to said recess, a binding post contact strip provided with a binding post secured to said post in circuit with said shell, an electric lamp in said shell extending into said recess, a pair of telescoping thimbles in said core, a spring arranged to exert a resilient pressure on said thimbles to press one with a constant pressure against said lamp and the other against said key's terminal contact, a conductive wire connected at its opposite ends to said thimbles, and a contact terminal spring in operative make and break relation to said switch key's contact terminal, provided with a contact strip and a suitable binding post secured to said spring terminal contact.

4. In an electric lamp holding socket, the combination of an electric lamp provided with a threaded plug end, with a socket for holding said lamp, comprising a porcelain core provided with a recess in one end, a threaded lamp receiving conductive shell secured to said core and adapted to receive the threaded plug end of said lamp, a rotatable switch key in said core, provided with a terminal contact, a pair of thimbles telescopically mounted in said core, one of which is in constant pressure contact with said switch key's terminal contact, a coiled spring within said thimbles, said core and spring being arranged to permit said thimbles to have a limited reciprocal resilient movement in said core between said switch key's terminal contact and the terminal contact point of the center of said lamp's plug, contact terminal strips on opposite sides of said core, one of which is connected in circuit with said receiver shell, a spring blade of conductive material secured to the other contact terminal and arranged in make and break relation to the conductive portion of said switch key, said switch key being arranged to stand normally out of contact with said terminal contact spring when said lamp is out of circuit, but arranged so that when said key is turned to connect said lamp in current with said spring terminal contact to engage said terminal spring and at the same time to engage and move its adjacent thimble into said lamp thimble and to compress said coil spring within said thimble and force said lamp thimble with resilient pressure against the central terminal contacting point of the end of said lamp's threaded end, and a coiled conductive wire within both thimbles connected to each thimble.

5. In an electric lamp holding socket, the combination of an incasing shell with a porcelain core, a lamp receiving socket secured to one end of said socket and arranged to receive a lamp, an axial aperture in said core, a pair of thimbles mounted reciprocally in said core's axial aperture, with the open end of one thimble telescoping into the open end of the opposite thimble, and with their closed ends facing the opposite end portions of said core, an expansive spring in said thimbles arranged to exert an outer resilient pressure from each other, means including a wire for forming a conductive connection between said thimbles, one of said thimbles being arranged to project into the path of and to be engaged by said lamp and compressed against said coiled spring, means for limiting the out-

ward movement of said thimbles, a switch key operatively mounted in the opposite end of said socket, provided with a conductive cam block in engagement with the opposite thimble from the lamp engaging thimble, a terminal contact spring secured to said core and arranged in make and break relation to said switch key's cam block, said cam block being loosely keyed to said switch and arranged when manually turned to engage with one part said terminal contact spring and receive the pressure of said spring and to compress its adjacent thimble against said coiled spring, a terminal contact strip operatively connected to said terminal contact strip, a contact strip operatively connected to said receiver shell, binding screws connected to said contact strips, and an incasing shell operatively mounted on said core, provided with a circuit wire entrance aperture, and recesses in said core arranged to form passages for said circuit wires to said binding screws from said shell's circuit wire entrance.

6. In an electric lamp holding socket, the combination of a porcelain core provided with a body and a cap portion, said body and cap portion being provided with contact terminal strips provided with circuit wire binding posts and with projecting lugs on the opposite sides of said contact strips opposite to said binding posts, said contact strips being secured in recesses formed in said core, a recess in said cap, a spring blade of conductive metal adapted to form a terminal contact secured at one end to one of said contact terminal strips and having its opposite end extending in said cap's recess across the central portion of said cap, recesses formed partially in said cap and body portion of said core, a switch key rotatably mounted in said recesses, provided with a stem portion and a non-conductive finger grasping portion, a key portion on the stem of said switch key, an oblong-shaped cam-block of conductive metal loosely keyed to said stem to be partially rotated thereby, a lamp receiving shell having an outward projecting flange portion at its lower end, secured to the opposite end of said core from its cap portion, said flange portion being arranged to rest on the end of said core around said recess, and means including bolts extending through said flange and the recesses of said core for securing said flange to said core, a flat-headed conductive bolt extending through said flange and core through the terminal contact strip that lies opposite to the spring holding contact strip, a recess in said core below said shell, adapted to receive the terminal contact end of said electric lamp when said lamp is screwed through said shell to the end of said lamp thread, with a pair of conductive thimbles reciprocally seated in a shouldered axial aperture formed through the body portion of said core, and arranged to telescope one within the other within said aperture, said thimbles being provided with flanges at their open ends fitting slidably in said apertures, a coiled steel expansive spring in said thimbles arranged to exert a separating resilient pressure on both thimbles, one of said thimbles being limited in its outward movement by the engagement of its flanged end with the shoulder of said aperture, and said thimble being arranged to project from said aperture and being held by said spring in said recess in the path of the terminal end of said lamp and adapted to be engaged by the central portion of said lamp's terminal contact end, and pushed backward against the resilient tension of its spring when said lamp is screwed down into said shell to the end of said lamp's threaded portion, and the other thimble of which is held by the expansive tension of said coiled spring with resilient constant pressure against said switch key's contact terminal cam block, and a coiled conductive wire within said thimbles and within said coiled steel spring secured at its opposite ends to said thimbles, whereby said terminal contact resiliently cushioned thimbles exert a constant resilient frictional bearing pressure in opposite directions against said lamp terminal contact end and said switch key's cam-block, and when said switch key is turned to cause its cam block to engage said spring terminal contact blade, a resilient frictional circuit contact is formed with said spring contact terminal, said circuit contacts being in direct axial alinement through said core and switch key to the said lamp, and a suitable incasing shell for said core and said lamp receiver shell.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY WALLACE LAWRENCE.

Witnesses:
G. SARGENT ELLIOTT,
ADELLA M. FOWLE.