F. B. BOWERS.

ELECTRIC SWITCH.

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1,012,240.

Patented Dec. 19, 1911.

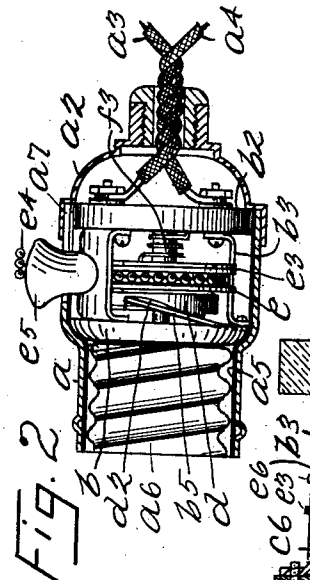

Fig. 2

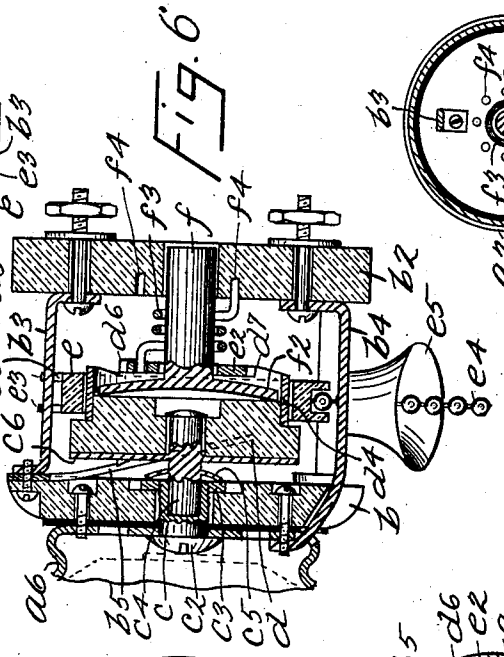

Fig. 6

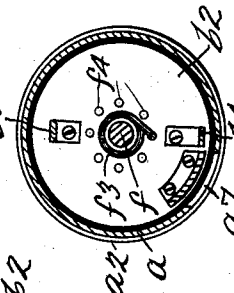

Fig. 5

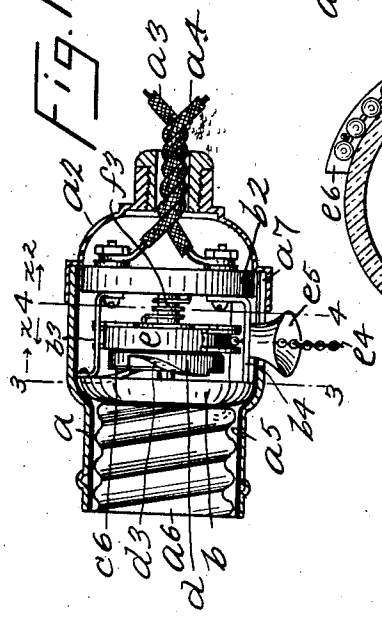

Fig. 1

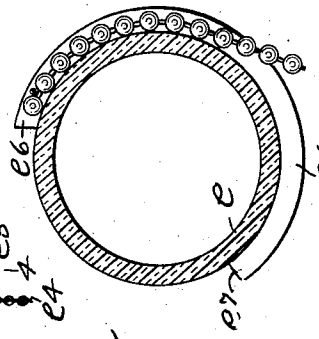

Fig. 7

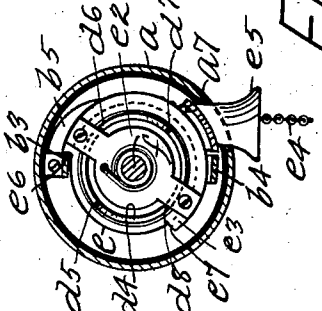

Fig. 4

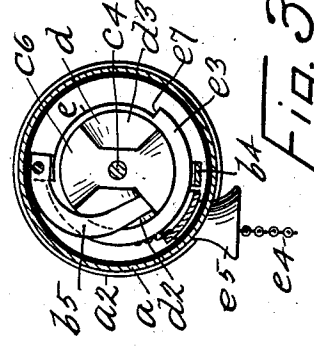

Fig. 3

Witnesses

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ELECTRIC SWITCH.

1,012,240. Specification of Letters Patent. Patented Dec. 19, 1911.

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To all whom it may concern:

Be it known that I, FRED B. BOWERS, a citizen of the United States of America, and residing at Penn Yan, in the county of Yates and State of New York, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to switches for electrical circuits, preferably for use in connection with electric lights, and the object thereof is to provide what is known as a chain switch for electric incandescent lamps.

A further object is to provide abrupt and positive means for opening or closing such switches.

A further object is to construct such switches of few parts whereby breakage or disarrangement thereof is rendered less liable.

A further object is to provide the main elements in such switches of materials such as porcelain or the like whereby the cost thereof is reduced and uniformity results.

A further object is to so construct the said switches as to insure a constant electrical contact of the operative parts in the event of a fall, jarring, and the like, of the lamp.

A further object is to provide simple and readily adjustable means for the chain attachment; and a still further object is to provide an adjustable tension device whereby any length of chain may be used and the weight thereof not interfere with a proper operation of the switch.

My invention is fully set forth in the following specification, of which the accompanying drawings form a part, in which the separate parts are designated by the same reference characters in each of the views, and in which:—

Figure 1 is a view of one side of my invention in position for use in an incandescent lamp socket; said socket being in section; Fig. 2 is a similar view of the opposite side thereof; Fig. 3 is a section taken on the line 3—3 of Fig. 1; Fig. 4 is a section taken on the line 4—4 of Fig. 1, looking in the direction of the arrow x; Fig. 5 is a section taken on the same line and looking in the direction of the arrow x^2; Fig. 6 is an enlarged sectional showing of my invention, on a central line therethrough, from the side shown in Fig. 1; and Fig. 7 is a central section taken through one of the parts which I employ.

In the drawings forming a part of this application I have shown an electric lamp socket, comprising the usual shell a with removable cap a^2 into which the wires a^3 and a^4 pass, said shell being provided with the usual fiber or other insulator a^5 and with the screw shell a^6 for the reception of the lamp, and said shell is also provided with a slot a^7 on one side thereof for a reason hereinafter pointed out.

Within the shell a is arranged the switch which comprises two disks b and b^2 of non-conductive material, such as porcelain, rubber, fiber, and the like, joined by means of a plurality of posts, but two of which are shown in the drawings, b^3 and b^4, any number of which may be employed, however, the posts shown comprising a part of the electrical circuit, that one b^3 being in connection with the wire a^3 and that b^4 with the wire a^4 by means of bolts and nuts in the usual or any desired manner, and it will be seen that the post b^4 passes through the disk b and is secured thereto through the screw shell a^6 and with which it is in electrical connection, whereas the post b^3 is secured in position through a segmental, spring, conductive, plate b^5 and with which it is in electrical contact, the said posts forming the poles of the switch, in the present case a single pole switch.

Arranged centrally of the disk b, and passing therethrough, is a stud c, having a head c^2 forming the center lamp contact, and being held in position by means of a nut c^3 on the inner side of the said disk, said stud being also provided with a recess therein for the lower end of a stub shaft c^4 which carries a cup shaped spring plate c^5, at all times in contact with the nut c^3, and a double winged plate c^6 held upon the lower face of a rotatable disk d of non-conductive material within which the said shaft is secured by riveting or otherwise. The disk d is provided, on its lower face, with two diametrically opposite inclined surfaces, one end of each of which is on a higher and

the other end on a lower plane than the winged plate c^6 thus forming ratchet teeth, these surfaces being clearly shown in Figs. 1, 2 and 3, and as will be observed the segmental plate b^5 bears against the lower face of the disk d, either upon the said non-conductive surfaces d^2 and d^3 or upon the plate c^6, said plate, as well as the shaft e and other connected parts being all of conductive material and, the spring b^5 being in electrical connection with one of the wires a^3, the center contact c^2 is also in connection therewith when the said spring rests upon the winged plate c^6 but not when the spring rests upon either of the surfaces d^2 or d^3 and, because of the cup shaped spring plate c^5, a constant electrical contact is maintained between the shaft c^4, and connected parts, and the center contact c^2 despite sudden jars and the like.

Secured to the disk d is a ring d^4, in the form shown of metal but it may be integral with the said disk as will be understood, being made in the manner shown to gain strength in the original hand-made device, said ring being provided upon its upper edge with four ratchet teeth d^5, d^6, d^7 and d^8, as shown in Figs. 4 and 6, and said ring is adapted to rotate with the disk d within a non-conductive ring e provided with a transversely arranged plate e^2 bearing against the upper edge of the ring d^4, as also shown in Fig. 4, and coöperating with the ratchet teeth on the said ring d^4, said ring e having two concentric and parallel flanges e^3 thereon forming a groove for a chain e^4 passing out of the shell a and being guided by means of a bell e^5 secured to the disks b and b^2 in any desired manner and projecting through the slot a^7, thus permitting the withdrawal of the switch mechanism when desired, and because of the shoulders formed by the flanges e^3, as shown at e^6 and e^7, the movement of the said ring e is limited in either direction by the post b^3 which is within the periphery thereof, as clearly shown.

Passed loosely through the plate e^2 is a shaft f which is also loosely held in the disk b^2 and is provided with a plate f^2 on the bottom thereof bearing against the disk d and which maintains the said shaft in position and, as clearly shown in Figs. 1, 2, 4, 5 and 6, a wire spring f^3 is coiled around the shaft f, one end thereof being held in the plate e^2 and the other end in one of a plurality of holes f^4 in the disk b^2 thus permitting adjustment of the tension thereof under varying conditions, and it will be seen that, when the ring e is rotated by pulling upon the chain e^4, the plate e^2 thereon is also rotated and is returned to normal position by the coil spring f^3, the adjustable tension of the latter being for the purpose of adapting my device to chains of varying lengths, it being necessary, in devices of this class at present in use, to substitute cord for the chain when a material increase of length is required because of the weight of the chain and the inability of the spring f^3 to raise the same, this feature being particularly important in devices of this class as it cannot be foretold what length of chain will be needed on different jobs, and, a spring of medium tension being provided in the manufacture of the switches, it is necessary to take the entire mechanism apart, secure or make a new spring, and substitute it for the original one and, if it is later desired to move the position of the said switch, this spring substitution again becomes necessary, but with my adjustable spring tension I am enabled to meet all ordinary requirements. When the plate e^2 is rotated by pulling upon the chain, as just described, the disk d is also rotated because of the coöperation between the said plate and the teeth on the ring d^4 and the segmental spring b^5 bearing against the under face of the said disk d passes from the conductive winged plate c^6 to the non-conductive inclined surfaces, or vice versa, the passage from one to the other being very abrupt, because of the shoulders formed by the said surfaces, and a quick make or break occurs, according to the original position of the spring b^5 and plate c^6 and, the limit of movement of the chain having been reached because of the shoulder e^7 striking the post b^3, strain on the chain is released and the plate e^2 returns to normal position because of the coil spring f^3 but the disk d remains stationary because of the position of the end of the segmental spring b^5 with relation to the shoulders on the lower face thereof, the movement of the said plate e^2 being through an arc slightly greater than the arc from one shoulder to another on the face of the disk d, and the electrical circuit is correspondingly opened or closed in each chain operation.

The elements of my device being of standard form are readily interchangeable or replaceable and being few in number are readily assembled and taken apart, for any reason, and, while I have shown one form of embodiment of my invention, it will be evident that various changes in and modifications of the details thereof may be made without departing from the spirit of my invention or sacrificing its advantages.

By reference to Fig. 7, which is a central section taken through the non-conductive ring e, my preferred method of chain length adjustment will be seen, comprising merely a pin e^8 held in the flanges e^3 and nearer the inner surface of the groove than the diameter of the chain links or elements, the simple withdrawal of the said pin permit-

ting a new chain adjustment, said method not alone being very easy of adjustment but being also a positive holding means, and the chain tension adjustment is readily made with a screw driver or other tool by merely changing the upper end of the spring f^3 to another hole f^4 without taking the mechanism apart.

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

1. A switch for electric lamp circuits, comprising two non-conductive disks, conductive posts connecting the same, one of which is in electrical connection with one wire of said circuit and with said lamp, a non-conductive rotatable ring provided with a groove on its periphery, a chain held in said groove and extending beyond said switch, a spring for holding said ring and chain in normal position, a non-conductive disk rotatable in said ring having a ring thereon provided with ratchet teeth on the upper edge thereof and having two inclined non-conductive surfaces forming ratchet teeth and two conductive surfaces on the lower face thereof, said conductive surfaces being in constant electrical contact with said lamp, and a conductive spring pawl in electrical connection with another of said posts and with the other wire of said circuit, and bearing against the lower face of said rotatable disk, on the non-conductive and conductive surfaces, alternately.

2. In a switch for electrical circuits comprising non-conductive disks held together by conductive posts, one of which is in constant electrical connection with one of the wires of said circuit, a spring returned pulley and a chain thereon; a non-conductive disk rotatable in said pulley and having a ring thereon provided with ratchet teeth on the upper edge thereof, a plate on said pulley coöperating with said teeth, a conductive plate on the lower face of said disk in constant electrical connection with the other wire of said circuit, and a spring conductive pawl in electrical connection with another post and adapted to make and break contact with said conductive plate, alternately.

3. In a switch for electrical circuits provided with means for a make and break connection with the poles thereof; a rotatable ring in operative connection with said means to actuate the same, and provided with a groove, a chain in said groove and extending beyond said switch, means for maintaining said ring in normal position, and means for adjusting the tension of said maintaining means.

4. In a switch for electrical circuits provided with means for a make and break connection with the poles thereof; a rotatable ring in operative connection with said means to actuate the same, said ring being provided with flanges on a part of the periphery thereof forming a groove, a chain in said groove and extending beyond said switch, a pin passed through said flanges and engaging the links of said chain for adjusting the same, and means for returning said ring to normal position after a chain operation.

5. In a switch for electrical circuits provided with means for a make and break connection with the poles thereof; a rotatable ring in operative connection with said means to actuate the same, said ring being provided with flanges for a part of the periphery thereof, said flanges forming shoulders and a groove, means for engagement with said shoulders to limit the movement of said ring in either direction, a chain in said groove and extending beyond said switch, and means for returning said ring to normal position after a chain operation.

6. In an electric lamp socket provided with the usual feed wires and screw shell; a switch, comprising two non-conductive disks, conductive posts connecting the same, one of said posts being in constant electrical contact with said screw shell a conductive spring pawl in electrical connection with the other post, said posts being in electrical connection with corresponding feed wires, a non-conductive, rotatable, disk provided with a plurality of inclined surfaces on the lower face thereof and having a ring thereon provided with ratchet teeth on the upper edge thereof, a conductive plate arranged over a portion of the lower face of said disk, and in constant electrical connection with the center lamp contact of said socket, said spring pawl bearing against said plate and said disk, alternately, in the rotation of the latter, a chain extending beyond said socket, means in operative connection with said chain and the ratchet teeth on the upper face of said disk, whereby said disk is rotated through an arc of a circle in the pulling of said chain, and means for returning said chain and disk operating means to normal position after each chain operation.

7. In an electric lamp socket, a non-conductive disk provided with a plurality of inclined surfaces on the lower face thereof and having a ring thereon provided with ratchet teeth on the upper edge thereof, a conductive plate provided with members arranged between said inclined surfaces on said lower disk face, said plate being in constant electrical connection with the center lamp contact, feed wires, means in electrical connection with one of said feed wires for alternate contact with said conductive plate wings or members and said non-conductive, inclined, disk, surfaces, the other feed wire being in electrical connection with the other

lamp contact, and means, exterior of said lamp socket, for rotating said disk through an arc of a circle corresponding to the distance between said conductive and non-conductive disk surfaces.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 3rd day of October 1910.

FRED B. BOWERS.

Witnesses:
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N. S. DAILEY.