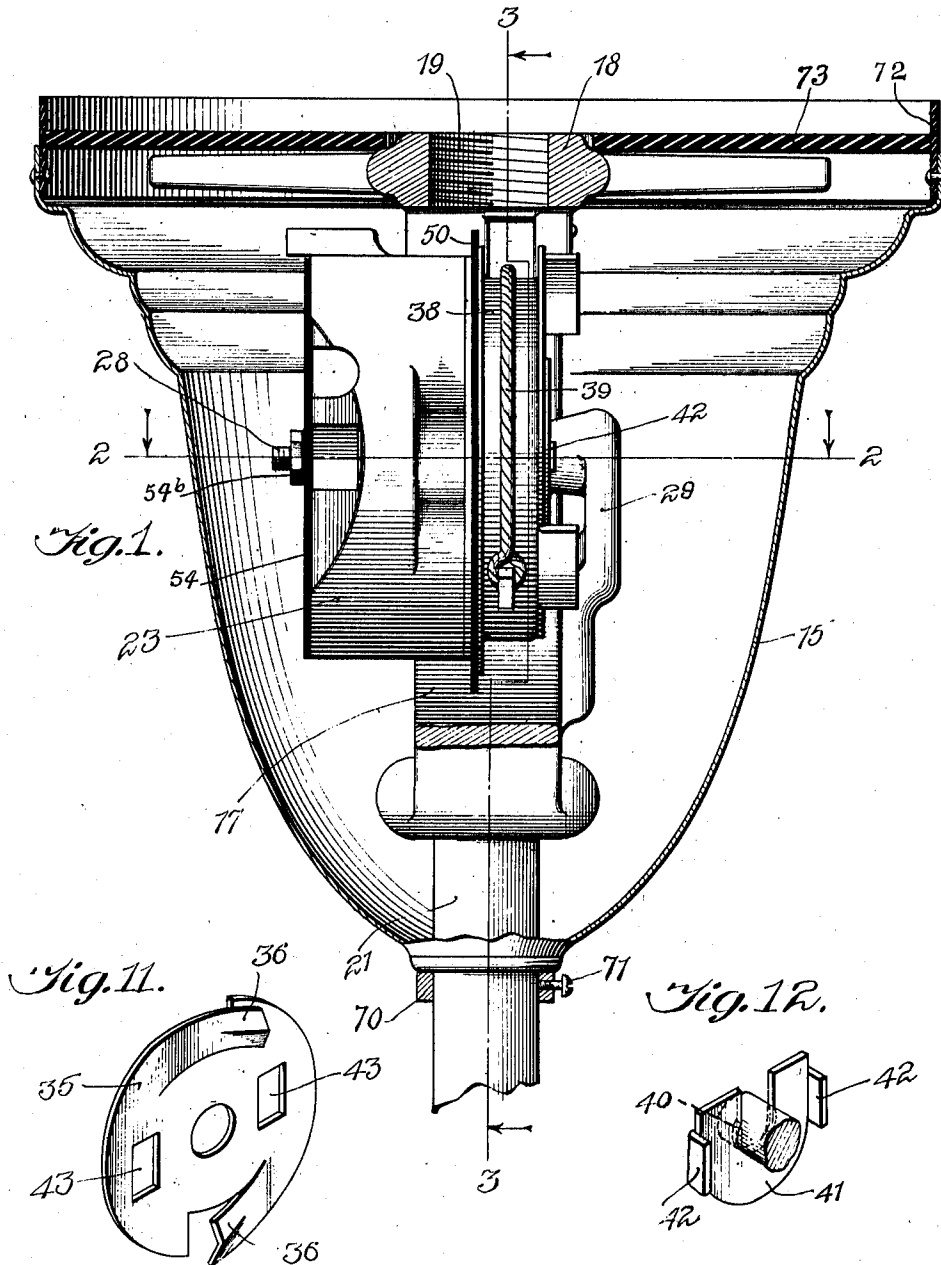


R. B. BENJAMIN.
CANOPY SWITCH.
APPLICATION FILED DEC. 28, 1907.

982,345.

Patented Jan. 24, 1911.

4 SHEETS-SHEET 1.



Witnesses:
A. A. Thomas
C. L. Hopkins

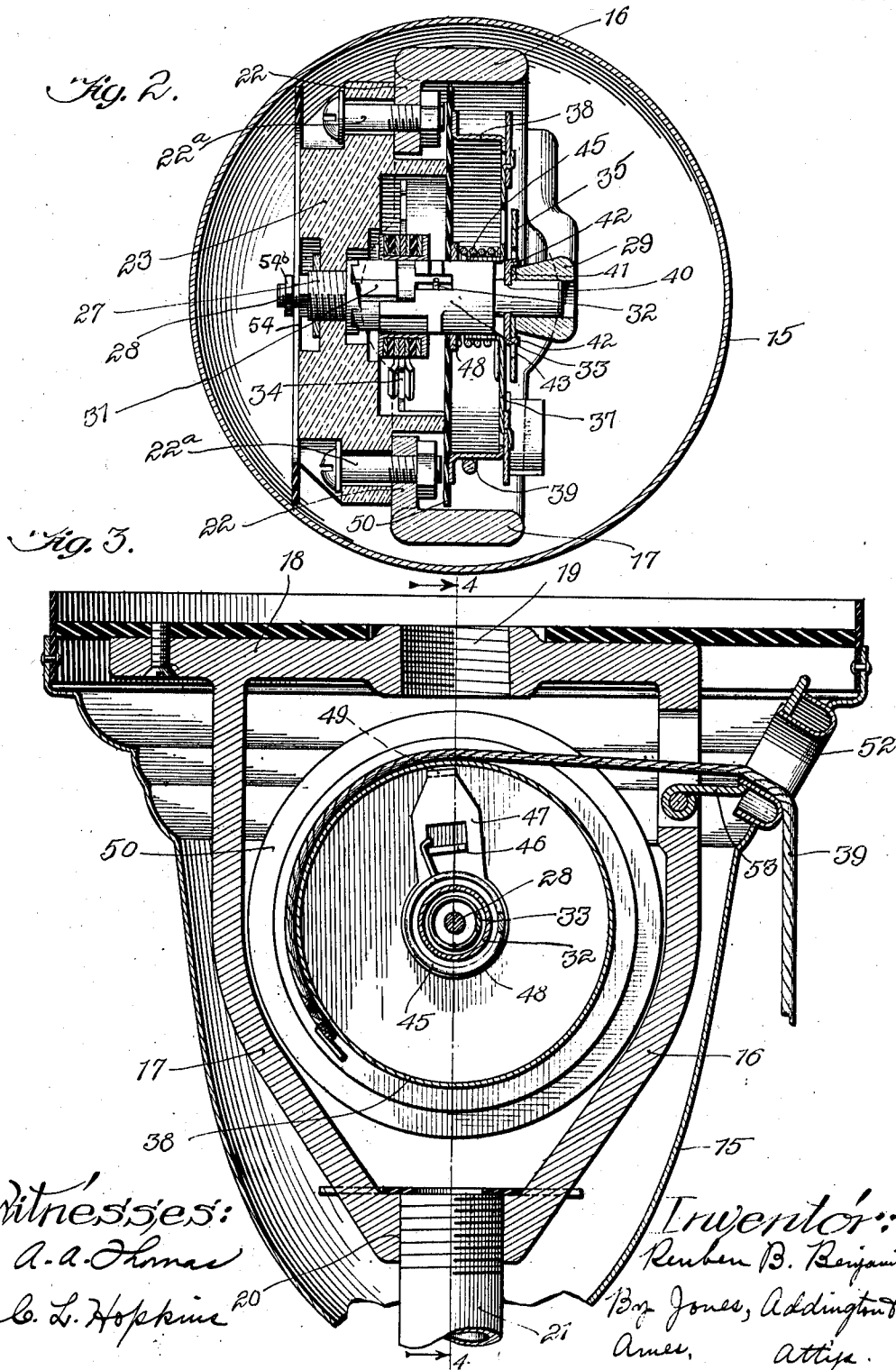
Inventor:
Reuben B. Benjamin,
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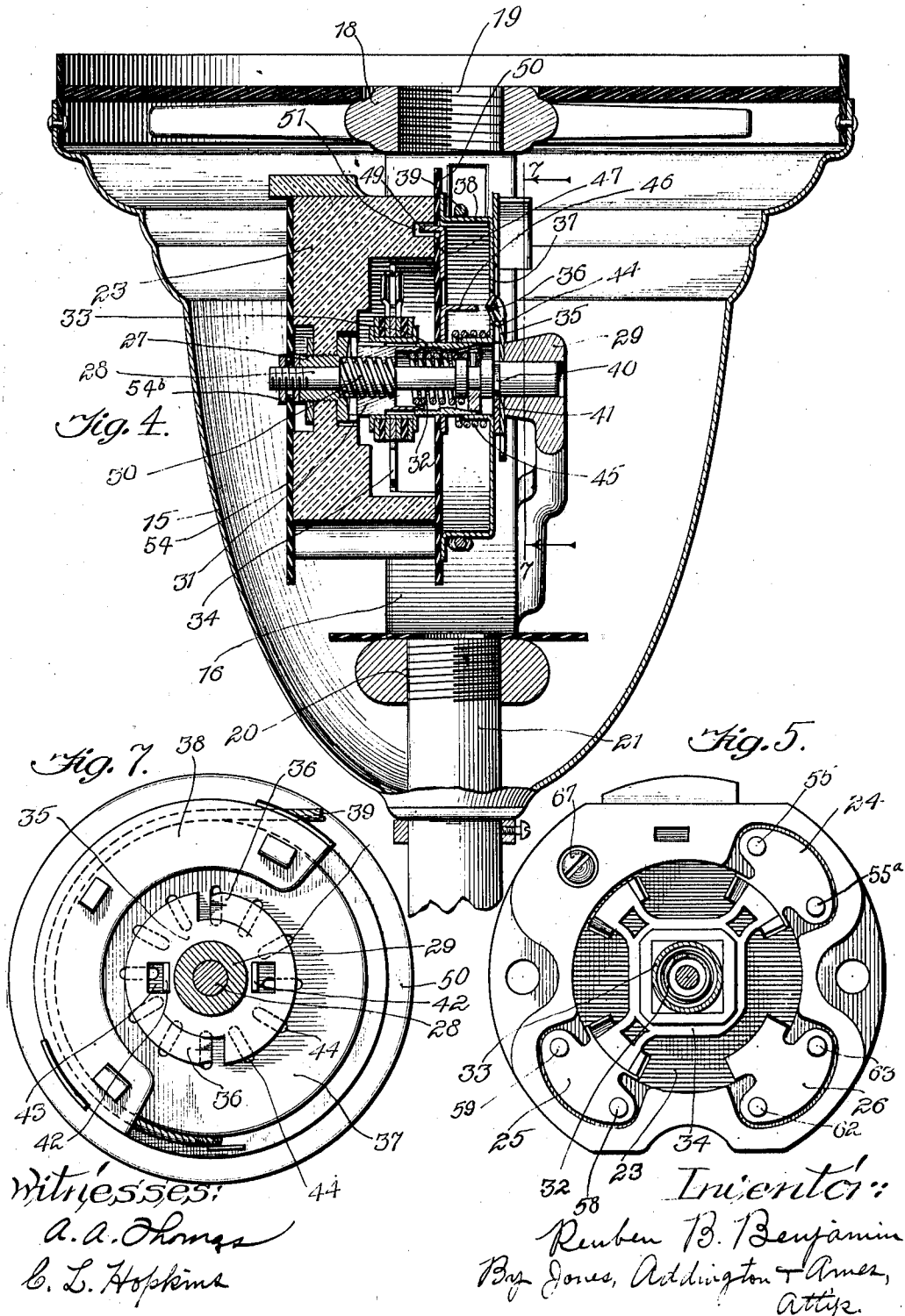
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4 SHEETS—SHEET 3.

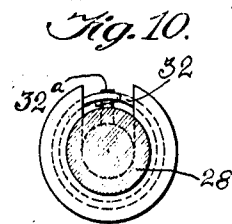
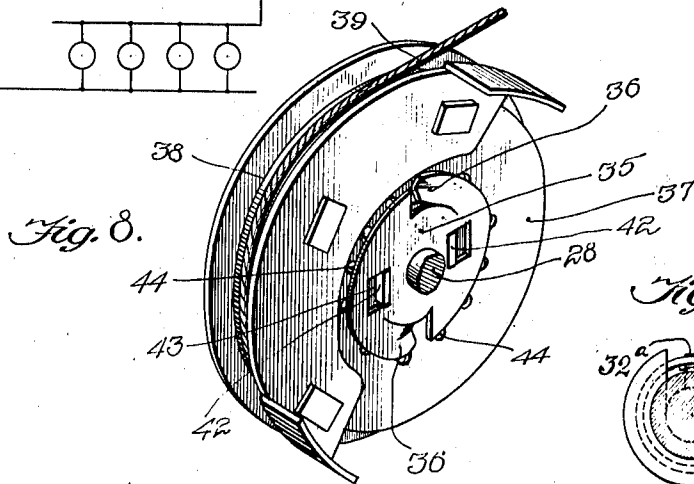
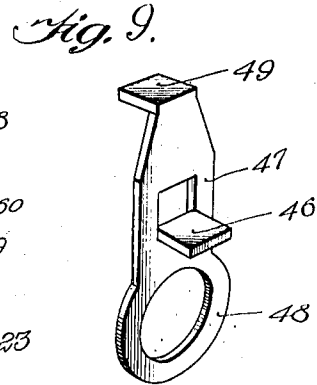
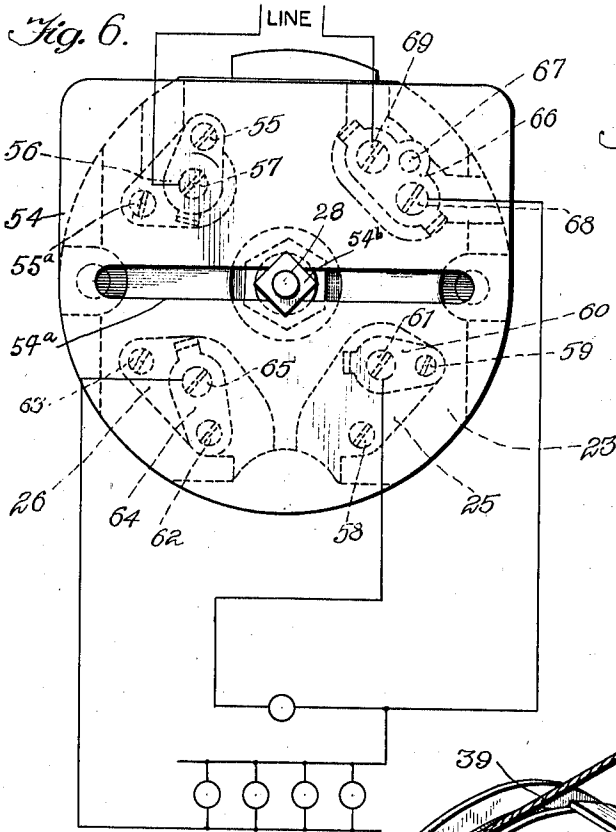


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4 SHEETS—SHEET 4.



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C. L. Hopkins

Inventor:
Reuben B. Benjamin,
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UNITED STATES PATENT OFFICE.

REUBEN B. BENJAMIN, OF CHICAGO, ILLINOIS, ASSIGNOR TO BENJAMIN ELECTRIC MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CANOPY-SWITCH.

982,345.

Specification of Letters Patent.

Patented Jan. 24, 1911.

Application filed December 28, 1907. Serial No. 408,406.

To all whom it may concern:

Be it known that I, REUBEN B. BENJAMIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Canopy-Switches, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to improvements in electrical switching mechanism and particularly to a type of such mechanism wherein rotary make-and-break switching means are adapted to be actuated by pull-operated means extending therefrom to a point convenient of access for the operator.

My invention is of particular utility when used in combination with a cluster electric lamp socket. In the use of these plural lamp-holding devices, it is common to secure the cluster to the ceiling or to arrange the same upon the lower end of a depending pipe forming a conduit through which the circuit wires extend to the binding terminals of the cluster. For switching the lamps off and on or, when desired, controlling the number of lamps which are burning at one time, it is usual to provide switching means located at a distant point and to lead wires therefrom to the cluster.

My improved switching mechanism is adapted to be associated directly with the lamp cluster. It may be connected to a suitable support secured to the ceiling, in which case the cluster will depend from the bottom of the device, being either secured directly thereto or arranged upon the lower end of a pipe which is secured at its upper end to the device. A cord, chain or the like will extend through the casing of the device to a convenient point for grasping by the person operating the switch. To turn on or extinguish the lamps or to change the number of lamps that are burning, this cord will be given a pull, and when released will be drawn back by suitable means provided for the purpose within the device.

In the accompanying drawings, in which I have illustrated an embodiment of my invention, Figure 1 is an elevational view of the device with the casing thereof in section, one of the legs of the supporting frame be-

ing broken away; Fig. 2 is a cross-sectional view of the same, the section being taken on the line 2—2 of Fig. 1, looking in the direction of the arrows; Fig. 3 is a vertical-sectional view, the section being taken on the line 3—3 of Fig. 1, looking in the direction of the arrows; Fig. 4 shows a vertical section taken on the line 4—4 of Fig. 3, looking in the direction indicated by the arrows; Fig. 5 is an elevational face view of the insulating base which carries the stationary switch contacts; Fig. 6 is an elevational view of the rear side of the base shown in Fig. 5, and shows the binding terminals by means of which the connections are made; Fig. 7 is an elevational view of the pulley to which is secured the operating cord, showing the shaft and a portion of the frame in section on line 7—7 of Fig. 4; Fig. 8 is a perspective view showing this pulley and the means whereby rotation imparted to the same is transmitted to the shaft of the switch mechanism; and Figs. 9, 10, 11 and 12 are detail views of members which are employed in making up the device.

In the several figures of the drawings, 15 is a canopy consisting of a casing having the general form of an inverted bell and inclosing the switch mechanism and means for operating the same. Arranged within the casing is a frame comprising a pair of upwardly-diverging legs 16 and 17 united at their upper ends by a cross-piece 18. The cross-piece 18 is formed with an opening 19, screw-threaded for the reception of the threaded end of a pipe or the like for supporting the device. The lower portion of this frame is formed with a similar opening 20, threaded for the reception of the stem 21 which leads downward to the electrolier, cluster, or other lamp-carrying device.

Each of the legs 16 and 17 of the supporting frame is provided with an inwardly projecting lug 22 to which is secured the porcelain contact-carrying base 23 by means of bolts 22^a, 22^a. The base 23 carries the stationary contacts of the switch mechanism, three such contacts being shown and indicated 24, 25 and 26 respectively. The base 23 is provided with a central aperture in which is disposed a bushing 27 forming one of the bearings for the shaft 28 of the switch

mechanism. The opposite end of this shaft is supported in a bracket 29 which is secured to the leg 16 of the frame.

The switch mechanism may be of any of the well-known forms of switch mechanism in which the rotation of the shaft causes the make and break of the circuit to be accomplished suddenly. In the drawings I have shown a preferred form of such switch mechanism, in which the rotation of the shaft places a spring under tension, the tension being increased until the shaft has been rotated to a predetermined position, whereupon the movable contacts are released and are suddenly thrown by the stored-up energy of the spring to a new position. In this switch mechanism the shaft is provided with a portion having a screw-thread 30 of steep pitch and upon this threaded portion is arranged a nut 31 which, when the shaft is rotated in one direction, moves along on the threaded portion until it is disengaged from a suitable cooperating locking member. This locking member is formed by providing the bushing 27 with a series of teeth which normally interlock with corresponding teeth on the nut 31. Surrounding this shaft 28 is a spring 32 having one of its ends secured to a pin 32^a on the shaft and its opposite end secured to a suitable barrel 33 which carries the movable contacts of the switch. This barrel and the nut 31 are so connected together that the nut may move lengthwise of the shaft but is not permitted to rotate independently of the barrel 33 and switch blade 34. When the shaft 28 is revolved in a right-hand direction the spring 32 is put under increased tension and at the same time the nut 31 is caused to move inward on the shaft by reason of its screw-thread connection therewith. When the shaft has rotated to a predetermined position, preferably through about one-fourth of a revolution, the nut has been so far moved along on the shaft that it is permitted to disengage itself from the teeth of the bushing 27, whereupon the barrel and nut, as well as the switch blade, are caused to suddenly revolve under the influence of the spring 32. As these parts turn on the shaft the nut is caused to run outward on the screw thereof and again engages the bushing 27. This prevents the switch blade from rotating further. By reason of this arrangement a continuous rotation imparted to the shaft would cause the switch blade to move forward intermittently or with a step-by-step movement. As the blade is retarded until the shaft has moved through a quarter of a revolution and is then released and permitted to suddenly jump forward, the make or break of the circuit is very quickly accomplished and destructive sparking is prevented.

The above-described form of snap-switch mechanism is well known, and is illustrated

and described herein merely for the purpose of showing one form of such mechanism which may be employed.

Rotary snap-switch devices are usually operated by revolving the shaft manually by means of a key affixed to one end thereof. In the device forming the subject of the present invention, the key is omitted, and in place thereof I provide means whereby a pull exerted on a cord, chain or the like will impart revolution to the shaft, each successive pull moving the contact-making part forward from one operative position to the next. Each pull given to the cord revolves the shaft through one-fourth of a revolution, the switch blade being held back until the shaft has nearly reached the limit of its quarter revolution, and then being suddenly moved forward as above described.

On the shaft 28 I arrange a plate 35 (shown in perspective in Fig. 11) having spring tongues 36 extending therefrom and adapted to engage a suitable ratchet plate 37. This ratchet plate 37 is secured to and turns with a suitable pulley 38, to which is secured one end of the operating cord 39. A convenient method which I employ for securing the plate 35 upon the shaft consists in flattening a portion 40 of the shaft near its outer end, as best shown in Figs. 4 and 12, and straddling on this flattened part a clip 41. This clip 41 has a pair of lugs 42 bent at an angle with its body portion and projecting through suitable openings 43 in the plate 35. When the cord 39 is pulled to unwind the same from the pulley 38, the ends of the spring tongues 36, carried by the plate 35, engage in the notches or openings 44 of the ratchet-disk 37, and as this ratchet disk is secured to and turns with the pulley, and the disk 35 is secured to and turns with the shaft, the latter is dragged around with the pulley. When the cord is released the pulley is moved back to its normal position by means of a spring 45, the ratchet plate 37 turning freely under the spring ratchets 36 of the plate 35. This returning spring 45 is secured at one of its ends to the pulley 38 and at its other end to a lug 46 formed on an anchor plate 47 (see Fig. 9). This anchor plate has a ring-shaped portion 48 surrounding the shaft and a lug 49 which extends through an opening in an insulating disk 50 and into a depression 51 in the insulating base 23, by means of which the anchor plate is prevented from turning. The insulating disk 50 forms a non-conducting cover for the switch-contact-carrying side of the base and serves as a partition for separating all of the live parts of the device from the pulley, returning spring, ratchet and other operating mechanism. The operating cord 39 is led to and outwardly through a suitable bushing 52 in an opening in the casing 15 and from this point may be led in any direction to a

point convenient of access by a person operating the device. This bushing 52 is secured to the leg 16 of the frame by means of a plate 53 secured thereto and hinged to the leg 16. When the casing is to be removed or replaced, this bushing may be swung inwardly out of the way to permit such manipulation of the casing.

The rear side of the base is formed with depressions in which are located terminal plates connected with the contacts on the opposite side thereof, these plates carrying binding-screws for making connection with the leads and the conductors which extend downward through the stem to the lamps. The arrangement of these plates is shown in Fig. 6, which is a rear view of the base. A movable insulating cover 54 is arranged over this side of the base, being provided with a transverse slot 54^a through which projects the end of the shaft 28. The cover 54 is held on the shaft by a nut 54^b, and can be moved toward one side or the other to afford access to the binding-screws on either half of the base at one time. It will be seen that the cover 54, when moved to disclose one of the binding terminals, will project beyond the side of the insulating base; thereby preventing the casing 15 from being placed in position when the cover 54 is in such a condition. By preventing the casing 15 from being placed in position unless the cover 54 is closed, danger of short circuiting by reason of a loose wire end touching the casing is avoided.

The stationary contact 24 is secured in place by means of suitable screws 55 and 55^a passing through the base. (See Figs. 5 and 6.) The screw 55 extends into a plate 56, this plate carrying a binding-screw 57. The contact 25 is similarly secured by screws 58 and 59, the screw 59 passing through a plate 60 which carries a binding-screw 61. The contact 26 is secured by screws 62 and 63, the screw 62 extending into a plate 64 carrying a binding-screw 65. A connecting plate 66 is secured in place on the base by means of a screw 67 and is provided with a pair of binding-screws 68 and 69. This last-named plate is not connected with any contact and serves merely as a connecting plate for convenience in wiring up.

When the device forming the subject of this invention is employed in connection with a cluster lamp-holding device, electroluer, or the like, various groupings of the lamps may be had as hereinabove explained, by making the proper wiring connections.

In Fig. 6 I have shown diagrammatically a circuit arrangement by the use of which the following effects may be secured: With the switch blade in one of the four possible positions, the lamps will be all turned off: upon the cord being given a pull to move

the switch blade to the next position, one lamp or group of lamps will be lighted: upon the next forward movement of the switch another lamp or group of lamps will be lighted, the first group being turned off: upon the next movement the first group will be again turned on so that all the lamps are burning, and upon the next movement the lamps will be all extinguished. This is of great convenience and utility where a cluster lamp-holding device is employed having a single central lamp and a circularly-arranged series of lamps. The first group turned on may consist of but the single centrally-disposed lamp. The next operation of the switch would then extinguish this lamp and light the circularly-arranged lamps: the next operation would relight the central lamp, and the next operation would extinguish all the lamps.

It will be observed that both of the line leads are brought to binding-screws on the base, the necessity for carrying a lead or leads down through the stem to the cluster being thus obviated. This is of practical value as it renders unnecessary the splicing of wires upon the short ends of the leads which are ordinarily left extending from the ceiling when the wiring of the building is done. If the device is to be removed for repairing or for any other purpose it is necessary merely to detach the ends of these short wires from their binding-posts, when the whole structure, including the cluster and lamps, may be taken down without disturbing any of the other wire connections. Access to the parts of the device is readily obtained by lowering the canopy 15 on the stem 21. The canopy is normally moved up against the ceiling and is held in this position by means of a ring 70 surrounding the stem and held up against the lower end of the canopy by a set-screw 71. As these devices are frequently employed upon metal ceilings I provide means for insulating the canopy therefrom, this means comprising an insulating ring 72 arranged within the upper edge of the canopy. As a further insulating means, and to prevent dirt from dropping down into the device I also provide an insulating disk 73 in the upper portion of the canopy.

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

1. The combination of a frame, a cup-shaped insulating base carried thereby, snap switch mechanism in said base, binding terminals on the rear of said base located in depressions therein, electrical connections extending through said base to said terminals, an insulating cover closing the open side of said base, a conduit extending downwardly from said frame, a casing inclosing said frame, ratchet and pawl mechanism in front

of said cover, and means for manually operating said ratchet and pawl mechanism, said means extending through said casing and being operated by a pull imparted thereto.

2. The combination of a frame, a base carried thereby having stationary contacts on one of its sides and depressions in its opposite side, binding terminals in said depressions, electrical connections extending through said base to said terminals, a slidable insulating cover for closing said depressions, a rotatable contact-making member adapted to alternately make and break electrical connection between said stationary contacts, a conduit extending from said frame, a casing inclosing said frame, and means extending outwardly through said casing for intermittently advancing said rotatable member from one operative position to another, said insulating cover and casing being so formed as to prevent the casing being put into position before the cover has been closed.

3. The combination of a cup-shaped base, rotary switch mechanism in said base, an insulating cover closing the open side of the base and inclosing said switch mechanism and having an opening for the shaft thereof, oscillating pull-operated means in front of said cover for advancing said shaft, a one-way clutch for locking said shaft to said pull-operated means when the same is oscillated in one direction, and means for returning said pull-operated means.

4. The combination of a frame, a conduit extending from said frame, an insulating base carried by said frame, snap switch mechanism upon one side of said base, binding terminals upon the other side of said base, an insulating cover for protecting said binding terminals, a pulley supported by

said frame, a casing movable along said conduit for inclosing said frame, means extending to the exterior of said casing for oscillating said pulley, and ratchet and pawl connection between said pulley and said switch mechanism, said cover being arranged to prevent said casing being moved along said conduit to normal position before the cover is closed.

5. The combination of a frame, an insulating base carried thereby, stationary contacts on said base, a rotatable shaft, a contact making and breaking member carried by said shaft and arranged to rotate in a perpendicular plane, a pulley, means for oscillating said pulley, ratchet and pawl connection between said pulley and said shaft, a conduit extending downwardly from said frame, a casing inclosing said frame, said casing having its upper edge formed by an insulating ring, and an insulating disk carried by said frame and arranged to close the space within said ring.

6. The combination of a frame, snap switch mechanism carried thereby, pull-operated means for intermittently operating said switch mechanism, a conduit extending from the bottom of said frame, a casing normally inclosing said switch mechanism and having the upper portion of its side walls parallel, said casing being movable along said conduit, and an insulating disk secured to said frame and fitting closely the open side of said casing.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

REUBEN B. BENJAMIN.

Witnesses:

M. L. FARRAR,

CHARELOS L. HOPKINS.