Sept. 21, 1948. P. L. BRATTAIN 2,449,765

MULTIPLE CIRCUIT STAND LAMP

Filed Jan. 2, 1945

2 Sheets-Sheet 1

Fig. 1.

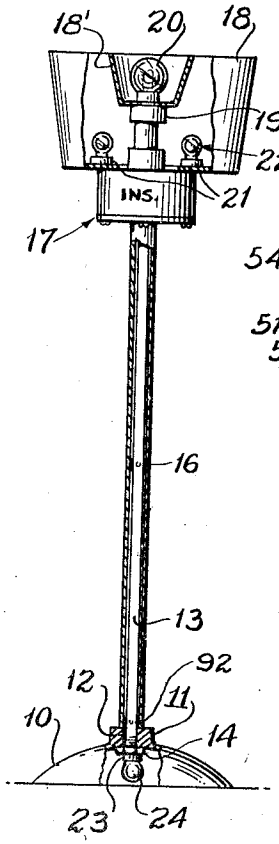


Fig. 2.

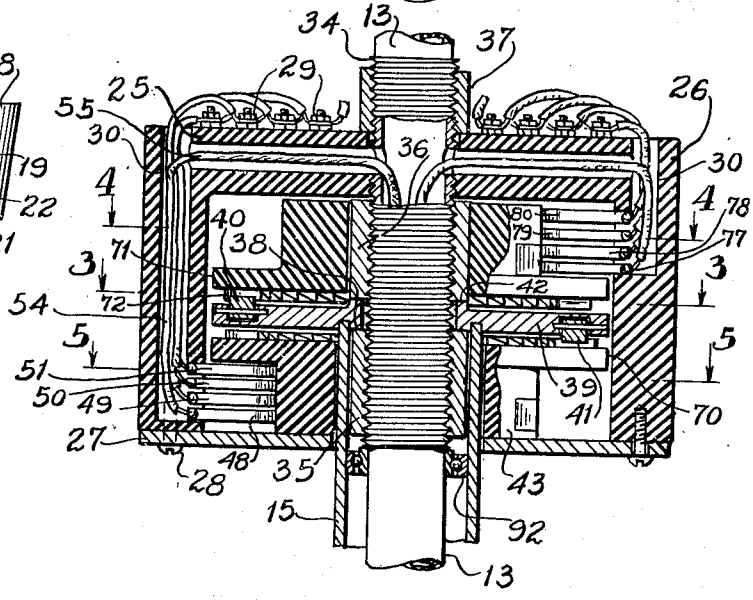
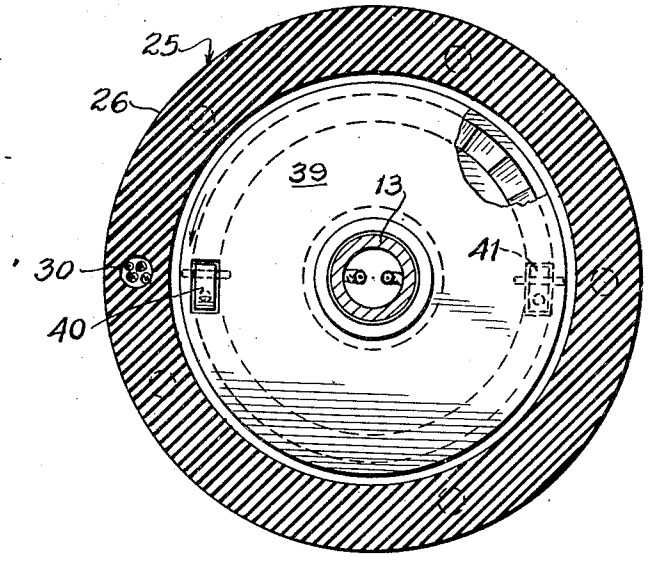


Fig. 3.



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Fig. 4.

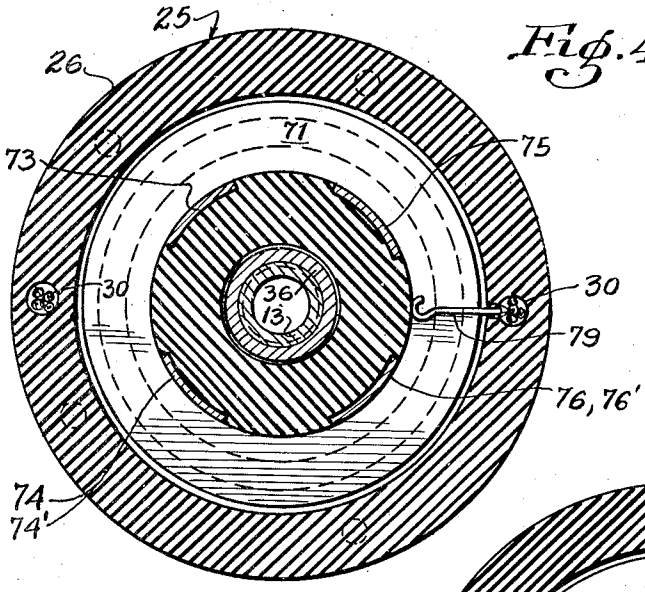


Fig. 5.

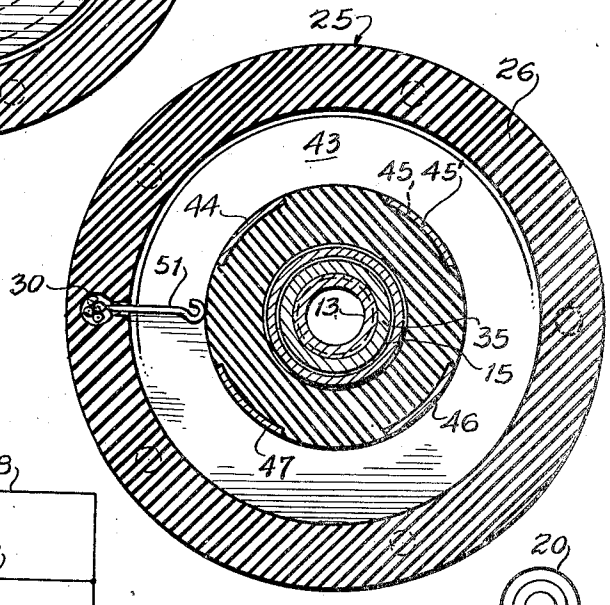
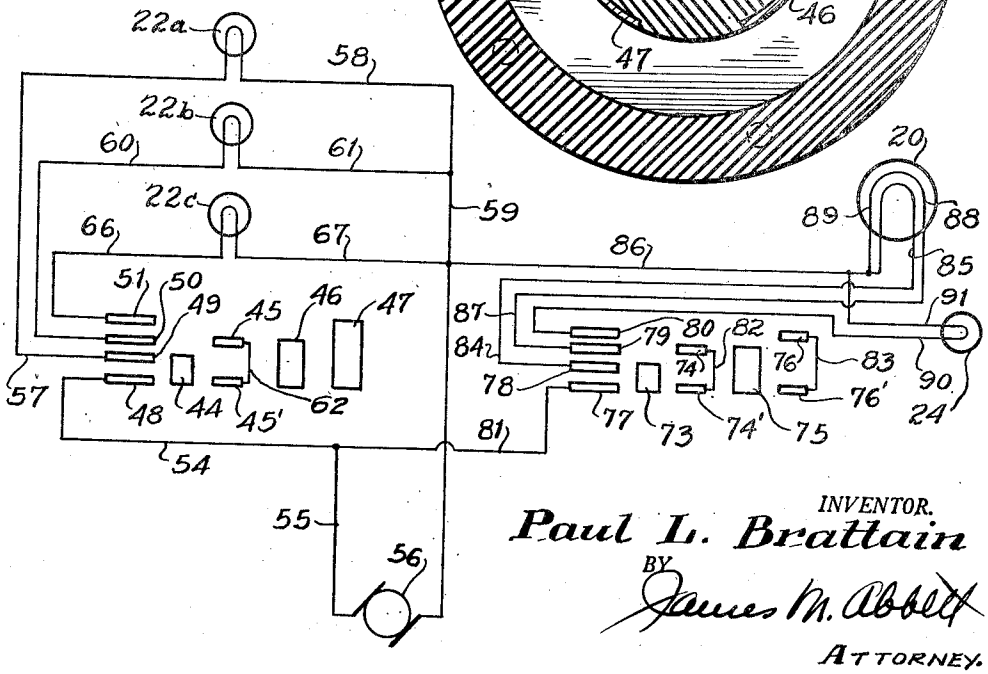


Fig. 6.



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MULTIPLE CIRCUIT STAND LAMP

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1 Claim. (Cl. 200—8)

1

This invention relates to lighting equipment, and particularly pertains to a multiple circuit stand lamp.

Heretofore various types of stand or pedestal lamps have been made in which a plurality of light circuits are embodied. These circuits, for example, control a light in the base of the pedestal, as well as a flood light for indirect lighting, and other lights which have more than one intensity. The lighting circuits embodying these different lighting units are controlled by separate switches which usually are concealed beneath the canopy of the light and which must be manipulated at different places. These switches make it necessary for the operator to reach to them and selectively operate them. Sometimes this makes it necessary for the operator to stand in order to close and open the switches. This is an inconvenience, particularly if the operator has been seated, and it is desirable, therefore, to provide a light structure of the pedestal type in which the switch is constructed in a manner to be easily operated by grasping the standard of the light and manipulating the various light switches selectively. It is the principal object of the present invention, therefore, to provide an electric lamp of the pedestal type embodying a plurality of lighting units and separate electric circuits which may be separately and selectively manipulated by the movement of one element, such for example as the standard upon which the light units are supported.

The present invention contemplates the provision of a base resting on a desired support and carrying a standard at the upper end of which a plurality of light units are mounted, said light units having separate circuits and switches therefor which may be selectively controlled by movement of the standard, either to selectively open or close the electric circuits to the various units.

The invention is illustrated by way of example in the accompanying drawings in which:

Figure 1 is a view in central vertical section showing a form of the present invention and indicating the relation of the operating mechanism of a multiple circuit pedestal lamp.

Fig. 2 is an enlarged fragmentary view in central vertical section showing the details of construction of the switch mechanism of the lamp.

Fig. 3 is a view in transverse section as seen on the line 3—3 of Fig. 2 and shows the ratchet operating mechanism for the switch.

Fig. 4 is a view in transverse section as seen on the line 4—4 of Fig. 2 and shows the arrangement of the switch segments controlling the upper light units.

2

Fig. 5 is a view in transverse section as seen on the line 5—5 of Fig. 2 showing the switch segments controlling the lower light units.

Fig. 6 is a wiring diagram indicating the lighting circuits and switches for the different lighting units.

Referring more particularly to the drawings, 10 indicates the base of a light structure with which the present invention is concerned. It is understood that this pedestal lamp may be of a height such as employed in a table lamp, or may be of a greater height to form a floor lamp. In either event the lighting units may be the same and the controlling switches may be arranged in the same manner. The base, as here shown, is convex in shape having a flat portion resting upon the floor or other support, and is formed with a hub 11 which is disposed centrally of the top of the base 10 and has a threaded bore 12 to receive the lower end of a fixed central standard 13. The lower threaded end of the standard receives a lock nut 14. The standard is tubular and thus will provide a conduit for electric conductors to be hereinafter described. Mounted upon the vertically disposed standard 13 is a switch control sleeve 15. The switch control sleeve forms a housing for the lamp column and is rotatably supported thereon by guides or bearings 16, which make it possible for the sleeve to be easily rotated around the standard. This rotational movement is for the purpose of operating a multiple control switch 17. It should be explained that the lamp may be provided with lighting units in the base 10 and also adjacent the upper end of the standard 13. If desired, the sleeve 15 may be formed in upper and lower sections, and the switch 17 may be also formed in two sections, one for each section of the sleeve so that the circuits of the upper lighting units will be controlled by rotation of the upper sleeve length, and circuits of the lower lighting units will be controlled by the lower sleeve length. For the purpose of convenience in disclosing the present invention, this form of structure is not shown in the drawings, but a switch unit is provided as generally indicated at 17, and which unit embodies upper and lower switch sections which may be selectively manipulated by the rotation of the one-piece sleeve 15. Fixed at the upper end of the standard 13 is a reflector or shade 18, which is here shown as being directed with its open end upwardly so that indirect illumination will be provided. Mounted directly upon the upper end

of the standard 13 is an electric light socket 19 carrying an electric light bulb 20. Mounted within the shade is a plurality of electric light sockets 21 carrying electric light bulbs 22 which may be used for reading purposes. The plurality of light bulbs 22 are provided so that one or more may be illuminated as desired. A separate reflector 18' may be mounted around the flood-light bulb 20 to direct the light rays from this bulb upwardly so that when the light bulbs 22 are not illuminated the lighting will be indirect.

Mounted upon the lower end of the standard 13 is a light socket 23 carrying a light bulb 24. It is common practice to make all or portions of the base 10 of a translucent material so that the base may be illuminated when the electric circuit through the light bulb 24 is closed. The various electric light circuits for the different lighting units will be described in detail hereinafter.

Referring to Fig. 2 of the drawings, it will be seen that the switch unit 17 comprises an outer housing formed of a top wall 25 and a circumscribing side wall 26. The side wall 26 is preferably cylindrical and is closed at its lower end with a plate 27 removably held in position by screws 28. The housing is preferably made of dielectric material and has a wall thickness sufficient to accommodate the different electric conduits to be hereinafter described. The upper end wall of the switch housing carries binding posts 29 for the different conductors, as will be hereinafter described. The side wall of the housing is formed with a series of passageways 30 to receive the conductors leading from the binding posts 29 to contact fingers.

The standard 13 is provided with a threaded section 34 which receives a threaded lower collar 35, a threaded intermediate collar 36, and a threaded top collar 37. The collar 35 fits within the upper end of the sleeve 15 and provides an upper end face against which a shoulder 38 rests. The shoulder 38 is formed as a part of a ratchet disc 39 which is fastened to the upper end of the sleeve 15 and which rotates with the sleeve 15. The ratchet disc 39 carries an upper ratchet pawl 40 and a lower ratchet pawl 41. These pawls are disposed to operate in opposite directions and are yieldably held in their outermost positions by suitable springs. A shoulder 42 occurs on the upper face of the disc 39 and is engaged by the lower face of the threaded sleeve 36. It will thus be seen that the sleeves 35 and 36 limit the longitudinal movement of the sleeve 15 upon the standard 13, and at the same time permits the sleeve 15 to rotate with relation to the standard and the switch unit 17. The threaded collar 37 rests with its lower face against the upper face of the end wall 25 of the switch housing.

Mounted to rotate around the portion of the sleeve 15 which occurs between the ratchet plate 39 and the plate 27 of the switch housing is a switch rotor 43. This rotor may be made of a dielectric material, such as Bakelite for example, and may carry any desired number of electrical contact plates, although as shown in Fig. 5 of the drawing it is fitted with metal contact segments 44, 45, 45', 46 and 47. The intermediate segments of the cylindrical surface of the rotor are formed by the dielectric material and thus provide an interval of rotation of the rotor during which electric contacts will not be made. Secured to the wall 26 of the switch housing are a plurality of contact fingers, here indicated as being four in number. These contact fingers are disposed at a contact station at a point along the inner circumference of the switch wall 25 and are positioned at different levels. A contact finger 48 is designed to register with the segments 44, 45', 46 and 47. A contact finger 49 is designed to register with the segments 44, 46 and 47. A contact finger 50 is designed to register with the segments 45, 46 and 47, and a contact finger 51 is designed to register with the segment 47. A feed wire 54 is attached to contact finger 48 and to a wire 55 leading to a source of electric energy 56.

The contact finger 49 is provided with a conductor 57 which leads to one side of a reading lamp 22a. The opposite side of this lamp is connected by a conductor 58 to feed wire 59, which is connected to the source of electric energy 56. Contact finger 50 is provided with a conductor 60 connected to one side of a light bulb 22b. The opposite side of this bulb is connected with the feed wire 59 by a conductor 61. The contact finger 51 is provided with a conductor 66 connected to one side of an electric light bulb 22c. The opposite side of this bulb is provided with a conductor 67 connecting with the feed wire 59. In alignment with the segment 45 is the segment 45', which is at the same level as the contact finger 48. These are connected by a conductor 62.

It should also be pointed out that the non-conducting segment of the rotor 43 which occurs circumferentially between the contact segments will insure that the electric circuits of the various light combinations may be completely interrupted at two places between any two segments without making it necessary to pass through the entire cycle of operation of the rotor 43. It should also be mentioned that the ratchet teeth carried by the members 70 and 71 extend along complete circles concentric with the axis of the standard 13 and engageable by the complementary pawls 40 and 41. These teeth are spaced so that the pawls will engage them at appropriate points to insure that rotation of the ratchet disc 39 in one direction will move one of the rotors so that the contact fingers for that rotor will either be in a position to engage a contact segment on the rotor or be disposed in engagement with the dielectric material occurring between contact segments. This insures that when the rotor is moved in either direction it will immediately cause a circuit to be completed without making it necessary for the rotor to be moved through a complete cycle of rotation before initiating movement of the switch mechanism.

The rotor 43 is provided with a ratchet plate 70 which has teeth to be engaged by the ratchet pawl 41 carried by the plate 39. These teeth are formed so that their engaging shoulders are all disposed in the same direction. Thus, travel of the ratchet pawl in a direction counter to the face of the teeth will cause the rotor 43 to be revolved when the sleeve 15 is rotated in a similar direction. If the sleeve 15 is rotated in a counter direction it is obvious that the rotor 43 will be inactive, and this action may be brought about without disturbing any electric circuits which have been made or broken by registration of segments on the rotor 43 with contact fingers carried by the housing.

Disposed above the plate 39 is a rotor 71 of a switch unit. The rotor 71 is fitted with a ratchet wheel or disc 72 having teeth which are engaged by the ratchet pawl 40. The abutting faces of the teeth on the disc 72 are opposite from the faces on the teeth of the disc 70 which is a part of the rotor 43. This arrangement is so that rotation of the sleeve 15 in one direction will rotate

the rotor 43 while counter-rotation will rotate the rotor 71 and permit the other rotor to stand motionless. Mounted in the circumferential face of the upper switch rotor 71 may be any desired number of contact segments. However, in the present instance this switch controls a multiple filament flood-light 20, here shown as involving three electric circuits and the floor light 24. It is to be understood that other electric circuits might be controlled by this structure, although not shown in the drawings. The rotor 71 is therefore fitted with contact segments 73, 74 and 74', 75, 76 and 76', which are spaced circumferentially around the surface of rotor 71.

Secured to the side wall 26 and within the housing are spring contact fingers 77, 78, 79 and 80. The contact finger 77 is connected to the lead wire 55 by a conductor 81, and thus acts as a distributor for a current from one side of the source of electric energy 56. The contact 78 is at a level to be engaged by the switch segments 73 and 75. The contact finger 79 is at a level to engage the switch segments 74 and 75, and the contact finger 80 is at a level to engage the switch segment 76. The segments 74 and 74' are connected by a conductor 82, and the segments 76 and 76' are connected by a conductor 83. It is to be understood that the connecting conductors 82, 82 and 83 are suitably imbedded or concealed in the wall of the rotor so that the contact fingers will not engage them. The contact finger 78 is connected to a conductor 84 leading to a filament 85 of the multiple filament flood-light 20. The opposite side of this filament is connected to a conductor 86 secured to a filament 88 of the flood-light 20. The opposite side of this filament is provided with a conductor 89 connected with the wire 56. The contact finger 80 is provided with a conductor 90 connected with the base light 24. The opposite side of this light is provided with a conductor 91 connected with the wire 86.

As previously explained, it is intended to control the switch rotors by rotation of the sleeve 15 upon the standard 13. In order to properly support the sleeve anti-friction bearings 92 are mounted upon the standard 13 and carry the sleeve so that it will rotate freely.

In operation of the present invention the lamp is assembled as particularly shown in Fig. 1 of the drawing, although it is to be understood that any desired lamp combination may be used, and that appropriate changes in the parts of the switches could be made without departing from the spirit of the invention. By reference to the wiring diagram it will be recognized that when the switch rotors 70 and 71 stand so that the contact fingers are between and out of contact with contact segments on the rotors the electric circuits will be broken at two points. When it is desired to establish a circuit through one of the lamps the sleeve 15 is appropriately rotated, assuming that rotation of the sleeve in a clockwise direction will cause the dog 41 to engage the ratchet teeth on the rotor 70. The switch segment 44 will move in contact with the fingers 48 and 49, thus establishing a circuit through the electric light bulb 22*a*. Further rotation of the rotor 70 will bring the finger 50 into contact with segment 45, and finger 48 into contact with segment 45'. Thus, an electric circuit will be completed through the electric light bulb 22*b*. This bulb is of greater candle power than the bulb 22*a*. Further rotation of the rotor 70 will

bring contact fingers 48, 49 and 50 into contact with the segment 46. This will act to illuminate both the bulbs 22*a* and 22*b*. When the rotor 70 is moved to bring the contact segment 47 into contact with the finger 48 it will also register with the fingers 49, 50 and 51, and will thus simultaneously illuminate all three of the light bulbs 22*a*, 22*b* and 22*c*.

When the sleeve 15 is revolved in the opposite direction its dog 40 will engage the ratchet teeth on the disc of the rotor 71. This will move the switch segment 73 into contact with the fingers 77 and 78 and will establish an electric circuit through filament 85 of the lamp 20. Continued rotation of the rotor 71 will cause the fingers 77 and 79 to engage the switch segments 74 and 74'. This will establish a circuit through the filament 88 of the lamp 20. When the rotor 71 is further moved contact fingers 77, 78 and 79 will engage the switch segment 75, and thus the filaments 85 and 88 will be simultaneously energized. When the rotor 71 is rotated further the contact finger 77 will engage the segment 76' and the contact finger 80 will engage the segment 76. This will establish an electric circuit through the base lamp 24.

It will thus been seen that the invention here disclosed provides a simple and compact switch and stand lamp construction in which a plurality of electric circuits may be separately and optionally opened and closed by the manipulation of one control member which may be easily reached and operated, since it is an integral part of the entire supporting column of the lamp.

It will be recognized that while the present invention has been shown as controlling the electric circuits of specifically designated electric units, it will be understood that this type of switch may be used to control a large number of independent electric circuits, part of them being opened and closed when the switch is rotated in one direction, and part of them opened and closed when the switch is rotated in the opposite direction.

While I have shown the preferred form of my invention as now known to me, it will be understood that various changes may be made in combination, construction and arrangement of parts by those skilled in the art, without departing from the spirit of my invention as claimed.

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

A rotary multiple circuit switch comprising a housing, a rotatable member extending axially thereof, a disc fixed upon the rotatable member within the housing, a pawl carried by said disc and projecting above the upper face thereof, a pawl carried by said disc and projecting from the lower face thereof, a pair of rotors, one disposed on each side of said disc and freely rotatable around the axis thereof, a continuous circular row of ratchet teeth projecting from the opposed faces of said rotors, one set of teeth to be engaged by the upwardly projecting pawl, and the other set of teeth to be engaged by the lower projecting pawl, the respective sets of teeth and pawls being faced in opposite directions, and providing for movement of the rotors a desired increment of rotation in opposite directions, a plurality of electric contact segments arranged circumferentially on each of said rotors, the contact segments on each of the rotors being separated from each other by intermediate

dielectric surfaces, a set of contact fingers mounted within the switch housing and standing in the path of travel of the contact segments and dielectric surfaces of each of said rotors as the same is rotated, and a separate group of electric circuits including each set of contact fingers and adapted to be completed successively by the contact segments of the rotor directly associated therewith and interrupted by the intermediate dielectric segments of said rotor.

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