

May 19, 1964

J. MONROE
DESK LAMP STRUCTURE

3,133,703

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2 Sheets-Sheet 1

FIG-1

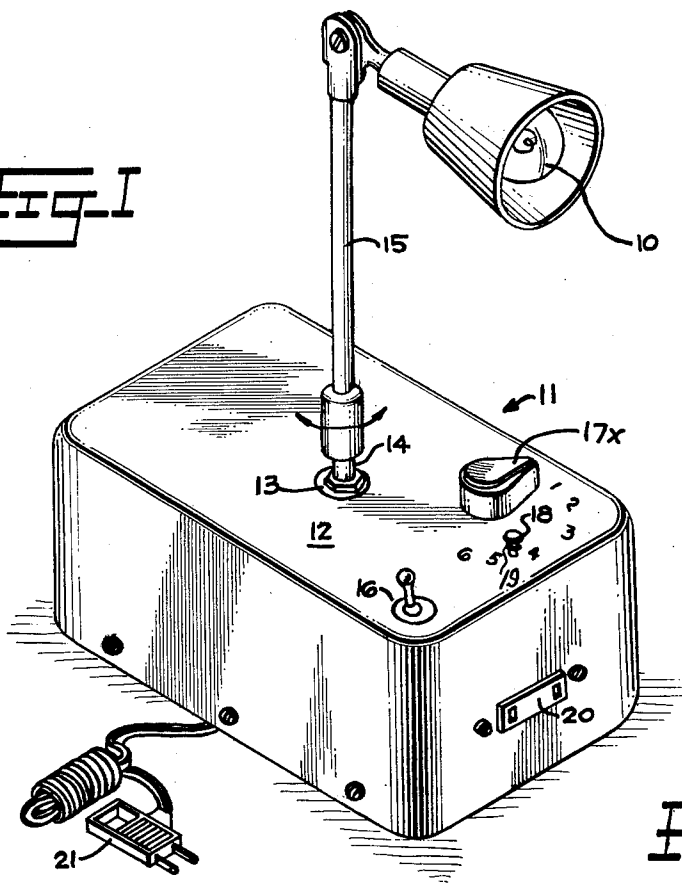


FIG-3

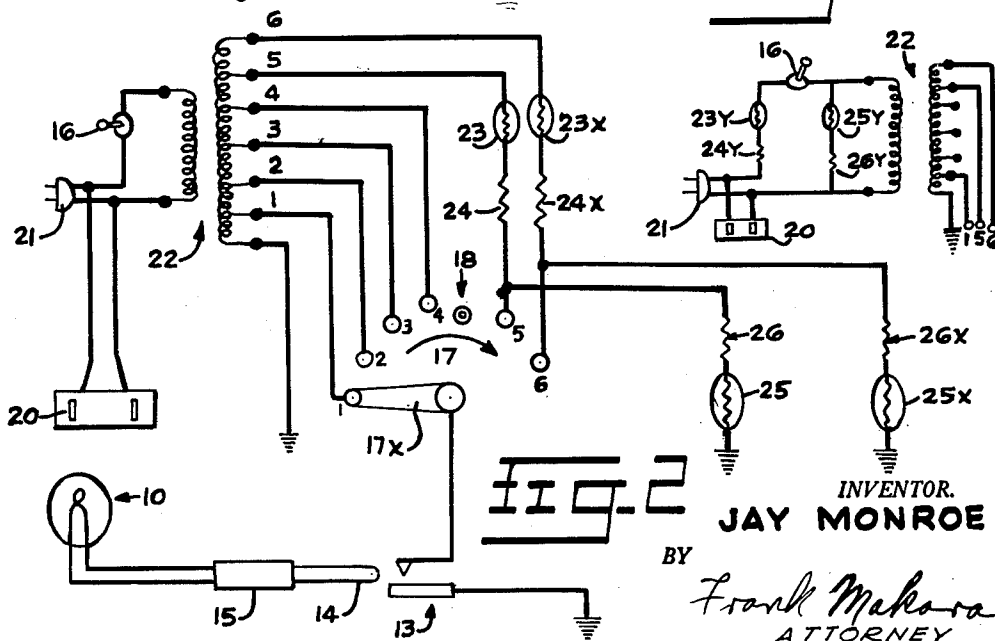


FIG-2

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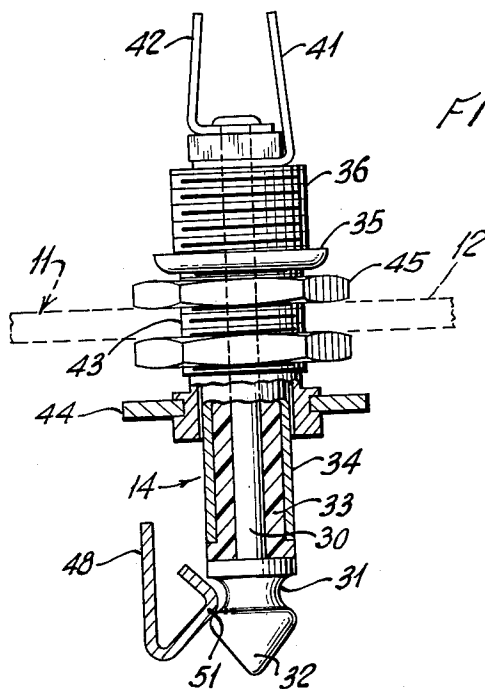
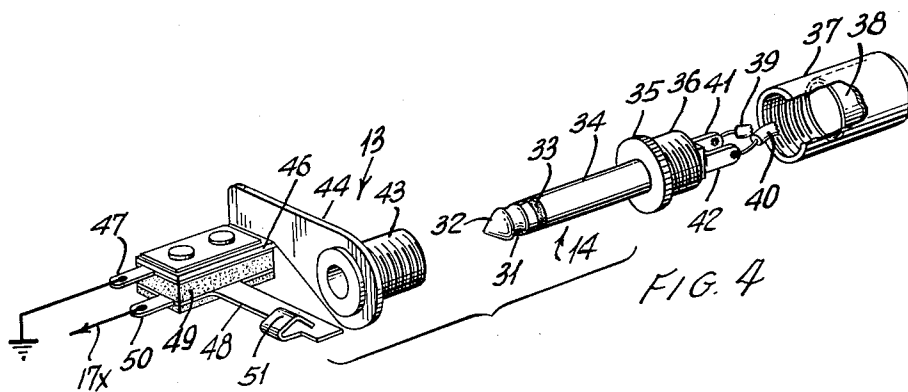
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2 Sheets-Sheet 2



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3,133,703

DESK LAMP STRUCTURE

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1 Claim. (Cl. 240-2)

This invention relates to a desk lamp and, in particular, the invention concerns the use of a telephone jack and mating plug connector structure adapted to serve as an electrical connector swivel connection and structural support.

This application is a continuation-in-part of my co-pending application Serial No. 51,752 for Variable Illumination Lamp, filed August 24, 1960.

It is a principal object of the instant invention to employ a telephone jack and telephone plug structure in a desk lamp stem, wherein the telephone jack is attached to the lamp base such that upon mating the jack and plug, the connector structure serves the triple purpose of electrical connector, swivel connection means and also provides the structural support for maintaining the lamp stem structure upright with respect to the lamp base.

Further objects and advantages will become apparent from the following description of the invention taken in conjunction with the figures, in which:

FIG. 1 is a perspective view of the lamp showing the means for swivel rotation of the lamp;

FIG. 2 is a wiring diagram of the lamp showing the six selector contact point switch of FIG. 1, and the means for controlling uniformly the voltage impressed across the light bulb from a source of fluctuating line voltage;

FIG. 3 is a modification, showing a wiring diagram for effecting a uniform voltage on the lamp bulb at all selected contact points of the selector switch;

FIG. 4 is an exploded view in perspective partly in section and cut-away illustrating the connector structure; and

FIG. 5 is a vertical view in section of the mated connector structure of the invention.

In the operation of a desk lamp for doing precision work, for example, in the jeweler's trade, or for camera assembly work or assembly and inspecting intricate radio and television apparatus, etc., it is necessary at certain times to have extreme brightness for short time intervals. At other and more normal times a conventional light intensity is desired. According to the illustrated embodiment, the high intensities are obtained by operating the lamp for short periods at voltages above its normally used voltage. Use of the lamp at the higher voltages of course shortens the lamp life, but the gained time intervals of intense illumination are often more desirable than longer life at the lesser intensities. It has been learned that at the high intensities where the bulb is burned at voltages above those normal for the bulb, the bulb filament will be burned out in a shorter time where fluctuating line voltage is encountered than is the case where the line voltage is held constant across the bulb filament during high intensity or overrated voltage use of the bulb. To maintain a constant voltage during such high intensity use where the bulb life is normally relatively short, this invention preferably uses thermistors and thereby increases the life of the bulb.

Turning now to the drawing, there is shown an electric desk lamp adapted for six selective light intensities of the light bulb 10. Of course, the number of contact points may be more than six or less than six as desired. In the above example where six contact points are provided for six different levels of intensity of illumination, the number six contact point may be for 290 foot candles at twelve inches while the number five contact point may be for 190

foot candles at the same distance. In this instance, the number one contact point may be set for 13 foot candles, the number two contact for 43 foot candles, the number three contact for 80 foot candles and the number four contact for 120 foot candles, all readings being at a distance of twelve inches. The illustrated embodiment uses a plurality of thermistors in the circuit. One of the thermistors is used to prevent changes in the over voltage due to surges of voltage current when the lamp is first turned on and the other is used to regulate line voltage fluctuations after the lamp is turned on.

As shown in FIG. 1, the desk lamp consists of a base 11, preferably of sheet steel and having a flat top wall 12. A plug-in swivel contact base 13 is disposed substantially in the center of the top wall 12 and a removable co-acting swivel contact jack 14 is plugged into base 13 to effect electrical contact with selective rotation of rod 15 and lamp 10 throughout 360 degrees.

Base 11 is provided with a conventional wall plug 21 and with a conventional on-off switch 16 to energize the desk lamp and with a rotary switch 17 to select the six different light intensities described above.

As shown in FIGS. 1 and 2, switch 17 is provided with a finger knob 17X and a spring loaded depressable pin 18 is disposed between contact points four and five to separate the high intensities of short life, namely contact points five and six, from the contact points one to four of relatively low intensities and therefore longer life.

Thus, finger knob 17X upon hitting stop pin 18 reminds the operator of the knob being at the threshold of high light intensity and also it prevents accidental turning on of the said high intensity illuminations.

Pin 18 is disposed in an aperture of the top wall 12 with a top flange disposed above said base top wall 12, and a bottom flange disposed below said top wall 12. Thus, the rod is captively held in base wall 12 and is continuously urged outwardly thereof by a coil spring 19. Thus, to permit switch knob 17X to pass beyond pin 18, the pin is depressed against spring 19 toward wall 12 to permit the knob to pass over it.

As shown in FIG. 1, the numerals 1 to 6 on the top wall are indicative of the contact points and not the points themselves which are located within base 11. To add greater usefulness to the desk lamp, an auxiliary outlet plug 20 is provided.

Turning now to the wiring diagram, FIG. 2, wherein the ground is designated by a conventional symbol, the electrical power is supplied through line plug 21 to a multi-stage transformer 22 which provides at its secondary winding the six contacts for the six pre-selected voltages described above.

Regulation of the voltage to lamp 10 may be done in two ways, for example, it may be done by disposing regulation means in the fifth and sixth position of the secondary (FIG. 2) or the regulation may be done by placing the voltage regulation means in the primary circuit (FIG. 3).

Turning now to FIG. 2, when selector knob 17X is disposed in position 5, the secondary circuit consists of transformer 22 in series with thermistor 23, and resistor 24 and lamp 10 is shunted by thermistor 25 in series with resistor 26. If the line voltage at plug 21 increases, the current increases causing the resistance of thermistor 25 to decrease. This in turn causes a larger percentage of the input voltage to appear across thermistor 23 and the conventional resistance 24. The values of elements 24, 25 and 26 are chosen so that the change in resistance of the thermistor is exactly the correct amount to cause the lamp voltage to remain uniform or constant at the desired pre-selected value.

Thermistor 23 functions as a surge protector for lamp 10. When lamp 10 is first turned on, thermistor 23 has a fairly high resistance which limits the initial voltage across

lamp 10. However, as thermistor 23 heats up due to its current, its resistance decreases to a small value and after a short time interval the full voltage appears across the lamp 10 filament.

For contact position number 6, the voltage regulation works in a manner identical to that described for contact position number 5 described above. The numerals 23X, 24X, 25X and 26X refer to the equivalent elements 23, 24, 25 and 26.

Turning to FIG. 3, the voltage regulation is brought about as in the case for contact point number 5. In this case, thermistor 23Y functions as a surge protector for lamp 10. As an example of the use of lamp 10 for high intensity illumination, the voltage at contact position number 5 is held uniform at 8.3 volts and the voltage at contact point number 6 is held uniform at 9.6 volts.

As seen hereinbefore, telephone plug 14 at the end of lamp rod 15 is plugged into telephone jack 13 fastened to lamp base 11. In accordance with the invention, these connector components serve three basic functions in the operation of the lamp structure. First, these components serve as means for connecting electrical power to lamp 10, as depicted schematically in FIG. 2. In addition to this normal function, the mated connector components 13, 14 also serve as a structural support for holding rod 15 and the lamp structure at its upper end in upright condition during use of the lamp. Thirdly, the mated jack and plug structure provides a swivel connection to allow rod 15 to swivel about the vertical axis, as shown in FIG. 1. The jack spring grip pressure against a telephone plug contact tip provides sufficient friction to hold rod 15 and the lamp carried by it in a desired and set position about the vertical axis after rod 15 is turned to such position.

FIGS. 4 and 5 illustrate the components of connector jack 13 and connector plug 14 for accomplishing the foregoing results. Telephone plug 14 has a first conductive member 30 provided with a pointed head followed by a restricted neck 31 defining the contact tip 32. Member 30 is insulated by an insulator 33 from a second conductive member 34 mounted over insulator 33. Member 34 has an outer cylindrical sleeve and also has a flange 35 and a threaded upper section 36 for holding an outer conductive jacket 37, which jacket 37 is lined with an insulator 38. A lamp socket for lamp 10 is connected by wires 39, 40 to individual ones of terminals 41, 42, wherein one terminal 41 is connected to conductive member 34 and the other terminal 42 is connected to conductive member 30.

Telephone jack 13 has a hollow threaded conductive nipple 43 fastened to the outer end of conductive upper arm 44, which arm 44 at such end is clamped by a nut 45 to the top face 12 of base 11, whereby only nipple 43 extends up from base face 12. The remainder of jack 13 is in the interior of base 11. The inner end of arm 44 has a conductive lug 46 provided with a terminal 47 which in accordance with FIG. 2 is connected to ground. A second and resilient arm 48 of conductive material is fastened to lug 46, but arm 48 is electrically insulated therefrom by an insulator 49. Second arm 48 has a terminal 50 for connecting same to selector 17X, as depicted in FIG. 2. Arm 48 extends below arm 44 and

has a V-shaped probe 51 at its outer end. Upon mating of plug 14 in jack 13, V-shaped probe 51 snaps into engagement with restricted neck 31 of plug tip 32. This engagement is maintained by the spring action of arm 48 and provides sufficient friction to hold telephone jack 13 and the attached rod and lamp structure 15, 10 fixed in position until rod 15 is manually turned about its vertical axis to allow swivel action to any position over the 360 degree range. In addition, the combination of the spring grip probe 51 against contact tip 32 while cylindrical section 34 of plug extends through jack nipple 43 provides the mechanical support for rigidly holding lamp 10 and rod 15 upright for use. When the connector members 13, 14 are mated, plug member 34 makes electrical contact with nipple 43 to ground one side of lamp 10 connected thereto, whereas tip 32 is connected to spring arm 48 to connect the other side of lamp 10 to one of the transformer taps 1, 2, . . . 56.

It is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

A desk lamp comprising, a base for supporting a desk lamp with respect to a supporting surface, said base having a top surface, a telephone jack connector mounted in said base and having a hollow conductive sleeve opened at its outer end, the open end of said jack sleeve being exposed with respect to said top surface to receive a telephone plug connector, a rigid and axial lamp stem and lamp bulb means attached at one end thereof, a telephone plug connector at the other end of said stem and having a substantially tubular conductive member for insertable and swivel connection in said jack sleeve, said telephone plug having a contact tip at its end electrically insulated from the remainder of its substantially tubular member thereof, electrical wire means for conductively connecting one side of said bulb to said contact tip and the other side of said bulb to the substantially tubular member of said plug connector, said jack connector also including grip spring conductive means in the interior of said base for slidably snapping over said plug contact tip upon telescopic insertion of said plug into said jack, said grip spring means being electrically insulated from said jack sleeve, and means in said base for conductively connecting an electrical voltage potential between said jack spring means and said jack sleeve for illuminating said bulb, said telephone plug member being in conductive and also swivel engagement with said jack sleeve upon mating of said connector members, said jack also serving as a structural support for holding said stem and bulb attached thereto relatively upright with respect to said base when said connector members are mated and also permitting rotation of said stem and lamp about the axis of the mated connector members to any selected position, said spring means normally providing friction for holding said stem and lamp in desired position about said axis.

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