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J. H. BETTS
ELECTRICAL APPARATUS FOR ILLUMINATING AND DECORATING CHRISTMAS
TREES AND SIMILAR USES
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Fig. 2.

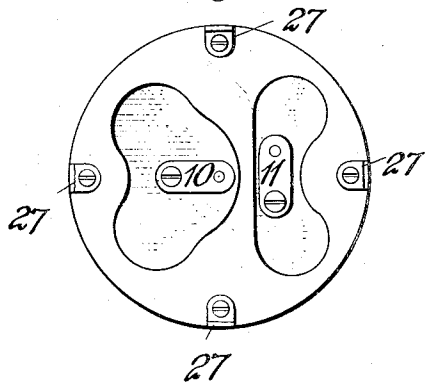
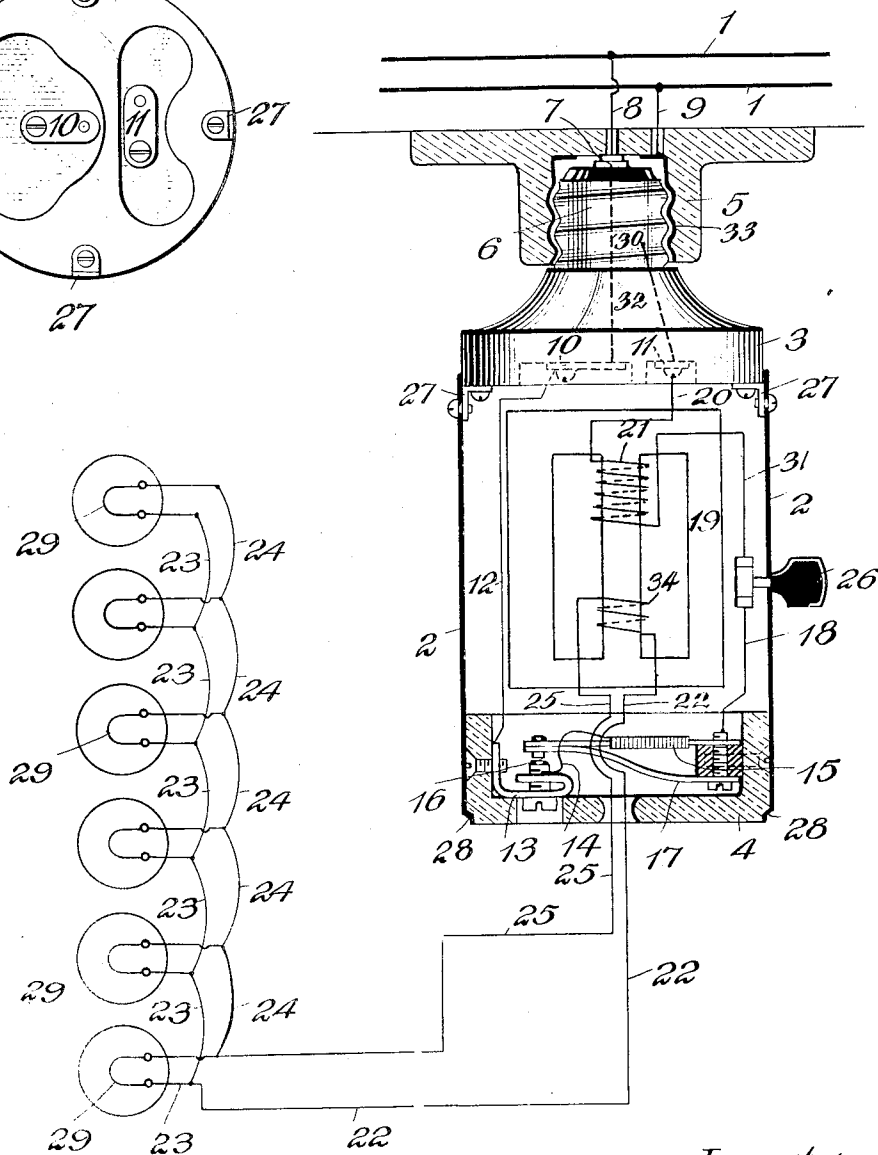


Fig. 1.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL APPARATUS FOR ILLUMINATING AND DECORATING CHRISTMAS TREES AND SIMILAR USES.

Application filed February 12, 1919. Serial No. 276,476.

To all whom it may concern:

Be it known that I, JAMES H. BETTS, a citizen of the United States, and a resident of Brightwaters, county of Suffolk, and State of New York, have invented a new and useful Improvement in Electrical Apparatus for Illuminating and Decorating Christmas Trees and Similar Uses, of which the following is a specification, reference being had to the accompanying drawings.

Heretofore small lamps, usually arranged in series of eight, have been utilized for the lighting of Christmas trees and similar uses. While these are a great improvement over the former use of candles, in that, among other things, they are much safer and more cleanly, yet since in practically every case the usual house current was utilized without being transformed, there has always been a serious fire risk involved because of the high voltage and possible faulty insulation and many disastrous fires have resulted.

The small lamps used for this purpose, usually 12-14 volts, are very fragile, and of short life owing to this usual voltage, as the use of more lower voltage lamps in series, as 16 across 110 volts, is more objectionable still because failure of one puts all out, and it is very difficult to identify the failed one in a series. This danger is well recognized and in some instances has heretofore been avoided by the employment of a transformer to reduce the voltage of the current, but this necessitated the employment of an electrician or one having adequate skill not only to do the requisite mechanical work but also select from the general market the proper elements to constitute a completely safe system, and this, owing to the necessary attendant expense, has for ordinary domestic use usually been prohibitive as a permanent installation is not desired.

Under my invention I obviate all the objections above suggested and supply a properly assembled, safe apparatus embodying in a compact, attractive and simple manner all the desired elements at a cost that adapts it to even unimportant domestic use, and in addition thereto it embodies a flasher whereby twinkling of the lamps can be secured, if desired; and the parts are so constructed and arranged that the lamps are in multiple arc, not in series, thus avoiding the annoying incident that if one lamp is burned out or

removed for any reason the entire series is useless.

In the drawings Figure 1 is a view, partly in section, of my entire system as assembled, ready for operation; Figure 2 is a detail.

1, 1, represent the main line wires, 2 a casing, preferably but not necessarily of non-conducting material, provided with an insulating upper or plug piece 3 and a lower piece 4, both preferably of porcelain. 5 is the usual lamp socket having the metallic lining 33. 6 is the usual threaded exterior contact for the plug, 7 is the central contact for the plug, 8 and 9 are wires for the plug contacts, 10 and 11 are contacts in the insulation 3 connected to 7 and 6 by the wires 30 and 32 respectively. 12 is a wire leading from contact 10 to contact 13, which, in this instance, is located in the lower insulation 4. From the contact 13 a small resistance heating wire 14 extends to a resistance 15, which, when heated, closes the circuit at 16, whereupon the current passes through a metallic connection 17 and wire 18 through key 26 and wire 31 to primary winding 21 of transformer 19. 20 is a wire connecting contact 11 with the other terminal of winding 21. 22 and 25 are wires which conduct the transformed current to the lamps. As stated, they are arranged in multiple arc as shown, and not in series. 23 is the outgoing wire extending from lamp to lamp and 24 the return wire likewise extending from lamp to lamp, both in a manner well understood. The return wire 24 connects with wire 25, which, as shown, takes the secondary current back to the coil 34. 26 is a key which controls the entire system. The shell 2 may be connected to the upper and lower insulations 3 and 4 in any desired manner. I have shown the connection between the shell and the upper insulation 3 as small metallic angle pieces 27 and the connection between the shell and the lower insulation 4 by an inwardly pressed annular rib 28. 29 represents miniature decorative low voltage lamps.

In operation, line current is passed through the primary circuit as follows: from upper line wire 1 through wire 8, contact 7, wire 30, contact 10, wire 12, contact 13, wire 14, resistance 15, wire 18, key 26, wire 31, primary winding 21, wire 20, contact 11, wire 32, threaded plug con-

tact 6, threaded socket contact 33, and wire 9 to lower line wire 1.

The flow of current through resistance 15 heats the bar carrying the latter, and resulting thermal expansion warps said bar, bringing contacts 16 and 13 together and shunting the greater part of the current through conducting bar 17, whence it passes to wire 18 as before. Resistance 15 and the bar carrying the same now have an opportunity to cool, and assume their original position; thus separating contacts 16 and 13, whereupon resistance 15 is again heated and the operation is thus repeated indefinitely. The movement caused by such alternate heating and cooling assumes a more or less definite period, which may be varied by adjustment of contact 13, the latter being made accessible from the outside for that purpose. The periodic interruption or variation of the secondary circuit resulting from the relative movement of contacts 16 and 13 in the primary circuit causes a twinkling of lamps 29, which if not desired, may be prevented by adjusting contact 13 into permanent contact with 16.

The secondary winding 34 supplies current to wires 22 and 25, and thence to lamps 29 in parallel, thereby making each lamp independent and permitting the use of durable low voltage lamps of various designs not attainable in ordinary 12-14 volt lamps, because of the excessive heat developed by the latter.

It will be particularly noted that the construction and arrangement of the parts as illustrated and described provide a remarkably compact, attractive, safe and relatively inexpensive apparatus for the purpose stated; that the flashing or twinkling of the lamps greatly enhances the attractiveness of such apparatus and may be used or not as desired, and that since the lamps are arranged in multiple arc and not in series, an injury

to any particular lamp will not have any effect upon the others.

I claim:

1. A low voltage multiple lamp decorative lighting system for use with alternating current, comprising a plug adapted for insertion in a standard lamp socket in a lighting circuit, said plug having the usual contacts, a casing carried by said plug, a transformer having a line voltage primary and a low voltage secondary winding within said casing, said primary winding being connected to the plug contacts, a pair of leads connected to said secondary winding and extending outside said casing, and a plurality of low voltage miniature decorative lamps connected in parallel across said leads.

2. A combined transformer and interrupting device, comprising a plug adapted for insertion in a standard lamp socket in a lighting circuit, said plug having the usual contacts, a casing carried by said plug, a transformer having a line voltage primary and a low voltage secondary winding, said primary winding being connected to the plug contacts, a flasher comprising a resistance heater in one of said primary winding connections, a shunt connection around said heater having therein a pair of relatively movable contacts, an expansion member actuated by said heater to close said relatively movable contacts when current passes through said heater, and to open said contacts when the current through said heater is interrupted, said transformer and said flasher being located within said casing and a pair of service leads from said casing connected with said secondary winding.

In testimony whereof I have signed my name to this specification.

JAMES H. BETTS.