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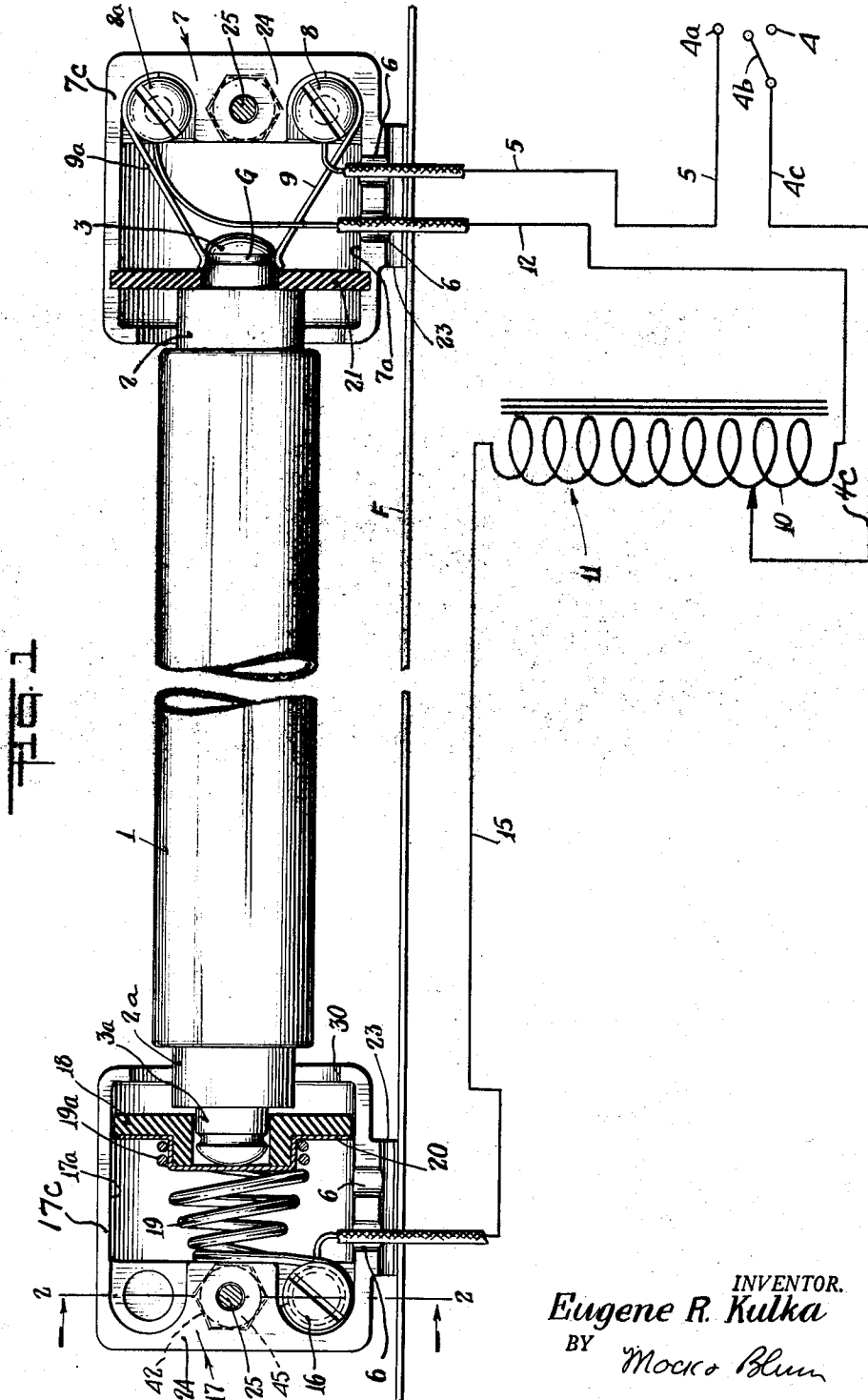
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HOLDER FOR GASEOUS DISCHARGE LAMPS

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HOLDER FOR GASEOUS DISCHARGE LAMPS

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My invention relates to new and improved holder-socket means for holding "fluorescent" lamps and other gaseous discharge lamps, and for connecting said lamps to an alternating current power circuit.

The invention relates particularly to holder-socket means for a gaseous discharge lamp which is operated at high voltage, such as 600 volts-1,000 volts or more. The accidental touching of such a high-voltage contact results in serious injury or death.

A lamp of this type has a single external metal contact head or prong, at each end thereof. Such lamps do not require starters. I provide a primary holder-socket and a secondary holder-socket for each lamp. The high and dangerous voltage is applied to the terminal of the secondary holder-socket. This high voltage is secured for example, from the secondary section of a step-up auto-transformer. This high-voltage secondary circuit remains open, until a lamp is inserted into the two holder-sockets, whereby the secondary circuit is closed through the lamp itself. When the lamp is inserted, it covers and obstructs the high-voltage contact, thus preventing accidents.

Numerous additional objects and advantages of my invention will be stated in the annexed description and drawings, which illustrate one embodiment thereof.

Fig. 1 is a side-elevation, partially in vertical section, which shows a lamp held operatively in a secondary holder and a primary holder. In this view, the front section of each holder 7 and 17 has been omitted.

Fig. 2 is a section on the line 2-2 of Fig. 1.

Fig. 3 is an end elevation of the secondary holder, showing the two halves of the secondary holder detached from each other.

Fig. 4 is a side elevation of the secondary holder, taken at the left of Fig. 2.

Fig. 5 is a bottom plan view of Fig. 1, looking from below.

The primary holder 7 and the secondary holder 17 have casings which are made of suitable insulating material.

The casings of these holders 7 and 17 are structurally the same, so that it is necessary only to describe the construction of the casing of the secondary holder 17.

Said casings of secondary holder 17 comprises equal halves or sections 17c and 17b, which are shaped to abut each other along adjacent vertical and planar walls. The section 17b is the front section, whose representation is omitted in Fig. 1. Each section 17c and 17b has a bottom flange 40,

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which has a respective vertical, tapped hole 46. These sections are transverse sections, instead of being longitudinally aligned. This greatly lowers the cost of manufacture.

The outer convex walls of said transverse sections 17c and 17b have respective transverse median recesses 42 and 42a. Said recesses 42 and 42a are aligned with respective transverse bores. The inner vertical, planar walls of said sections 17c and 17b are held in abutting relation by a transverse clamping bolt whose shank 25 is located in said bores. Said bolt has a slotted head 41a, which is located in recess 42a of section 17b. The bolt has a clamping nut 45, which is located in recess 42 of rear section 17c. Said rear recess 42 is of hexagonal cross-section, so that nut 45 is non-turnable in the rear recess 42.

A metal contact or thimble 41 is embedded in the material of the rear section 17c. The interior wall of thimble 41 is tapped. The threaded metal shank of a metal contact member 16 can be screwed into and out of thimble 41.

The bottom walls of the assembled primary and secondary holders 7 and 17 have respective wire-inlets or grooves 6.

The internal walls 7a of the sections 7c and 7b of the primary holder 7, have grooves in which an insulating washer 21 is clamped when said sections are assembled. The rear transverse section 7c is provided with primary metal terminals 8 and 8a. The respective bare end of wire 5 is conductively fixed to metal terminal 8. This can be done by soldering or in any other way. The respective bare end of wire 12 is fixed to terminal 8a. These wires are insulated from each other, inwardly of primary holder 7 and also externally thereto. Each contact spring 9 and 9a, which is made of phosphor-bronze or other resilient and conductive material, has one end thereof fixed to a respective primary terminal 8 or 8a. Said wires 5 and 12 are covered with insulation, externally of primary holder 7, save where wire 5 is fixed to power terminal 4a, and where wire 12 is fixed to an end of the auto-transformer coil 11, which has a primary section 10. This auto-transformer 11 functions to step up the ordinary house voltage of 110-115 volts, to 600-1,000 volts or more.

Power terminal 4 of the source of primary current can be connected through switch 4b to wire 4c, which is adjustably connected at 10 to the coil 11, intermediate the ends of coil 11, in order to regulate the ratio between primary voltage and secondary voltage.

One end of the coil 11 is connected by wire 15,

to the thimble or insert 41, by means of the contact member 16, which is a headed screw.

The inner end of metal biasing spring 19 is located in a groove of metal thimble 41, which is a secondary terminal. The free end of thimble 41 is upset, to provide a rivet-like connection between spring 19 and thimble 41. Fig. 2 shows an additional thimble 41, which can be omitted.

A bushing 18, which is made of insulating material, has a piston-head which fits slidably against the inner walls 17a of the secondary holder sections 17b and 17c. A metal cup 20 is fixed to the inner end of bushing 18, as by a drive fit or in any other manner. This cup 20 is a bushing contact member. Said cup 20 has a plate-portion which crosses and also closes the central bore of slidable bushing 18. The spring 19 biases said bushing 18 and its attached cup 20, to move towards the open insert end of the secondary holder 17. The secondary holder-sections 17b and 17c have flanges 30, which limit the movement of the slidable bushing 18, so that bushing 18 is retained. The spring 19 has one or more turns 19a which firmly grip the cup 20.

The lamp 1 has the usual envelope which is made of glass or other insulating material. Said lamp 1 has the usual hollow heads 2 and 2a, which are made of insulating material. The usual metal contact heads or contact-prongs 3 and 3a, project outwardly of said heads 2 and 2a. Said contact heads 3 and 3a are connected in the usual manner to the internal electrodes of the lamp. Said heads 3 and 3a are longitudinally aligned.

In order to connect the lamp to the secondary current circuit, it is necessary first to insert the contact head 3a into the secondary holder 17 through its open insert end and to push the bushing 18 inwardly against the biasing force of spring 19. This is done by the pressure of head 3a against the respective wall or portion of metal cup 20 which crosses the bore of the bushing 18. The bushing 18 must be pushed inwardly of the position shown in Fig. 1, in order that the lamp 1 can be horizontally located, with its head 3 located externally to the primary holder 7. The head 3 is then inserted into the primary holder 7, through its open insert end, so that said head 3 projects through the bore of the fixed insulating partition or washer 21, which then abuts head 2, to act as a stop. The free ends of the contact springs 9 and 9a then enter the groove G of head 3, thus making good contact.

The primary holder 7 and the secondary holder 17 are fixed to the wall of a fixture F, by the screws S which pass through bores of said fixture wall. Said screws S are screwed into the tapped bores 46 of the flanges 40. When so fixed, the open inlet or insert ends of the casings of the holders 7 and 17 are longitudinally aligned, and said inlet ends face each other.

Each wire groove 6 is located at the junctions between the abutting walls of the holder sections.

When switch 4b is closed, the lead 4 of the alternating primary current, which may be ordinary house current of 110-115 volts and 60 cycles, is connected through wire 4c to the inner end of the primary section 10 of the auto-transformer coil 11. Said auto-transformer coil 11 also functions as a ballast for the lamp. The free end of the primary section 10 is connected by wire 12 to terminal 8a and contact spring 9a. The lead 4a of the alternating primary current is connected by wire 5 to the terminal 8 and contact spring 9a. The primary circuit is thus closed

through the primary section 10 and the contact head 3.

One end of the coil 11 is connected through wire 15, contact member 16, thimble 41, spring 19 and metal cap 20, to the contact head 3a. The high secondary voltage discharges through the lamp 1 to head 3, and through spring 9a, terminal 8a, and wire 12, to the respective end of the auto-transformer coil 11.

The high voltage secondary circuit therefore remains open, until the lamp 1 is in operative position, when it obstructs the exposed high-voltage terminal 20 of the secondary holder. If the exposed wall of metal cup 20 is touched, even when switch 4b is closed, there can be no shock.

By making each holder casing in two transverse sections and fixing the respective terminal or terminals to one such section, I greatly reduce the cost of manufacture and assembly.

I have disclosed a preferred embodiment of my invention, but numerous changes and omissions and additions can be made without departing from its scope.

For example, the invention is not limited to the use of an auto-transformer. In Fig. 1, the entire coil 11 is the secondary coil, and the section 10 is the primary coil.

The invention applies to any type of lamp, including discharge lamps in which the space current results from electronic flow, as distinguished from an ionization discharge, and also including non-discharge lamps.

In effect, the contact blades 9 and 9a constitute a switch device or switch means, whereby the primary circuit is automatically closed when the lamp is inserted into the holder 7, and said primary circuit is automatically opened when the lamp is removed from holder 7. This switch device is operated or controlled by head 3. In this aspect of my invention, it is not limited to the preferred structure illustrated herein, in which all the internal parts of the holder 7 are fixed, save for the bending of springs 9 and 9a when head 3 is inserted.

For convenience, the terminal 41-16 may also be designated as a first terminal, and the terminals 8 and 8a may be designated as second terminals. The members 19-20 then constitute a first contact for the first terminal 41-16, and the members 9 and 9a constitute second contacts. These contacts are located so that when the lamp is in operative position, the first contact 19-20 abuts one contact-head of the lamp, and the second contacts 9 and 9a abut the other contact-head of the lamp. The lamp may be of a type which has more than two contact-heads. Hence, when I specify a lamp which has a pair of contact-heads, the invention is not limited in this respect, as it includes a lamp which has more than two contact-heads.

I claim:

1. In gaseous discharge lamp service assemblages, wherein the lamp presents its external contacts at the ends of the lamp with the contacts axially aligned, wherein the lamp is supported within secondary and primary holder casings with the holders positioned respectively within the external contact zones of the lamp, and wherein the lamp is rendered active by controlled alternating current supply activity applied thereto through said holders with the supply including an auto-transformer assembly operatively connected with the holders to provide the primary and secondary circuits utilized in rendering the assemblage active, an assemblage of such

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type characterized in that the secondary and primary holder casings are of insulating material and are secured in definitely spaced relation and each operatively related to the auto-transformer circuits to apply the secondary and primary circuit values to a positioned lamp through the respective holders, each holder including an inlet opening for receiving a lamp external contact end zone with the inlet openings facing each other, each holder also having an internal supporting member of insulating material for a lamp external contact with the members located relative to the inlet openings, the supporting member for the primary holder being fixedly positioned, the supporting member for the secondary holder being movable yieldably away from its inlet opening and carrying a contact member carried by and movable with the supporting member, said contact member being spaced from the holder inlet opening by its supporting member, said movable supporting member being supported by a biasing spring operatively connected to the secondary circuit and to said contact member to form an element of the secondary circuit, said primary holder having a pair of individual permanently-spaced contact springs positioned for operative contact with an external contact of the positioned lamp and mounted for primary circuit activity in presence of such positioned lamp with one of said contact springs active within both primary and secondary circuits.

2. An assemblage as in claim 1 characterized in that the direction of yielding of the movable supporting member of the secondary holder is in correspondence with the longitudinal axis of the inlet opening of such holder, the supporting spring for such member being conductive and forming a portion of the current path of the secondary circuit, said path portion condition being maintained in all positions of such member movement, with the spring active to move the member toward the holder inlet opening.

3. An assemblage as in claim 1 characterized in that the movable supporting member includes an axial opening to receive a zone of an external contact of the lamp, the member having the wall of such opening of increased length to thereby provide an annular shoulder, the contact member borne by the supporting member overlying the inner open end of such opening and fitting said shoulder with the spring having an end zone cooperative with the contact member in such shoulder zone, the yielding movement of the supporting member being provided by the end face of the inserted external contact of the lamp cooperating with the overlying contact member during lamp activity, the opposite end of the spring being connected with a secondary circuit terminal carried by the holder.

4. An assemblage as in claim 1 characterized in that the primary holder carries a pair of terminals individual to the contact springs of the holder with the terminals adapted to be active in the primary circuit, one of said terminals being operatively connected to the auto-transformer winding to thereby place its contact spring as active in the completion of both primary and secondary circuits in presence of a positioned lamp the external contact of which is cooperative with both contact springs to complete the circuits.

5. An assemblage as in claim 1 characterized in that the primary holder carries a pair of terminals individual to the contact springs of the

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holder with the terminals adapted to be active in the primary circuit, one of said terminals being operatively connected to the auto-transformer winding to thereby place its contact spring as active in the completion of both primary and secondary circuits in presence of a positioned lamp the external contact of which is cooperative with both contact springs to complete the circuits, each of said contact springs extending toward the secured lamp supporting member with the free end zone of each spring adapted to cooperate with an annular groove carried by the external contact of the lamp supported by the supporting member to thereby aid in completing both circuits.

6. An assemblage as in claim 1 characterized in that the auto-transformer includes a winding having an end connected with a terminal cooperative with the biasing spring of the secondary holder and having its other end connected with a terminal cooperative with one of the springs of the primary holder, the terminal of the second spring of the primary holder being connected with the power source, the auto-transformer also including an adjustable contact controllably connected with the power source and cooperative with the winding to present the latter as of primary and secondary zones to thereby complete the primary circuit through both terminals of the primary holder and the primary zone of the winding and to complete the secondary circuit through one of the spring terminals of the primary holder and the secondary zone of the winding by way of the winding primary zone.

7. For use with gaseous discharge lamp service assemblages operative with primary and secondary circuits and with the lamp having lamp borne external contacts at its ends and mounted in an individual holder assembly at each end, a holder assembly serviceable as either holder of the lamp assemblage and comprising a holder casing formed of insulating material and presenting a front end inlet opening for the reception of a lamp borne external contact and having the rear end closed, said casing being divided into two substantially mating sections with the division line approximately bisecting said opening to thereby present the division plane as extending in the lengthwise axis of the opening, said casing having means for removably securing the sections in such mating relation, said holder assembly having an internal annular supporting member for the lamp end zone with the member formed of insulating material and supported by the holder sections, the active service position of the member being within the holder adjacent to but spaced from the inlet opening, one section of said casing having its mating face provided with at least one metallic member secured in embedded relation to the section with the member projecting relative to the mating line, said metallic member having an axial threaded opening for cooperation with a threaded member to constitute the two members as a lamp circuit terminal, said casing having means internal of the assembled sections for electrically connecting the terminal assembly with a lamp borne external contact of the lamp, said holder having at least one radial opening in the side wall of the assembled sections for the passage of external power connections to such terminal with the latter opening or openings located at such mating line, and said holder having means for fixedly

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positioning it relative to the lamp during lamp service.

8. A holder assembly as in claim 7 and adapted to serve specifically as the primary holder of the lamp assemblage, said holder assembly being characterized in that the assembly has its internal supporting member fixedly positioned, the terminal carrying section being provided with a pair of individual spaced apart terminals with each such terminal carrying an individual spring contact extending in the direction of the internal supporting member and adapted to cooperate with a lamp borne external contact, the cooperating pair of spring contacts and the external contact being active in the completion of the primary circuit and with the circuit inactive in the absence of the external contact.

9. A holder assembly as in claim 7 adapted to serve specifically as the secondary holder of the lamp assemblage, said holder assembly being characterized in that the assembly has its internal supporting member yieldable in the direction of its axis and away from the inlet opening, said member being supported by a conductive biasing spring one end zone of which is secured to a terminal of the holder and its opposite end zone cooperative with a sheet metal contact posi-

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tioned on the rear side of the supporting member to thereby constitute said spring and sheet metal contact as active portions of the secondary circuit of a positioned lamp, whereby the supporting member may yield for the positioning and removal of the lamp without affecting the integrity of the spring as a part of the secondary circuit path.

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