July 24, 1928. 1,678,496

C. BERNASCONI ET AL

ELECTROMECHANICAL LAMP

Filed July 28, 1927

FIG. 4.

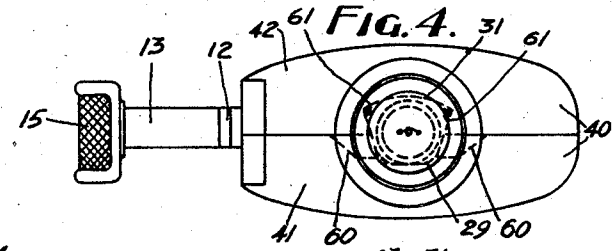


FIG. 1.

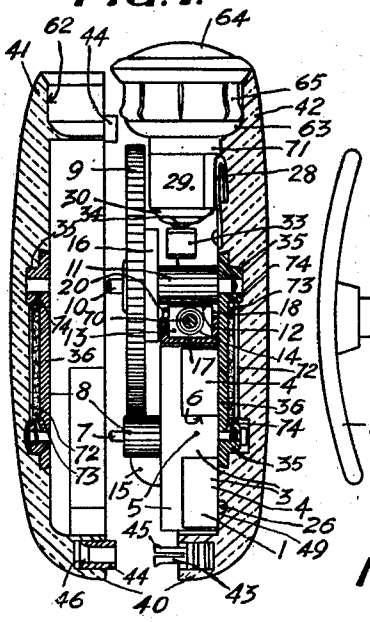


FIG. 3.

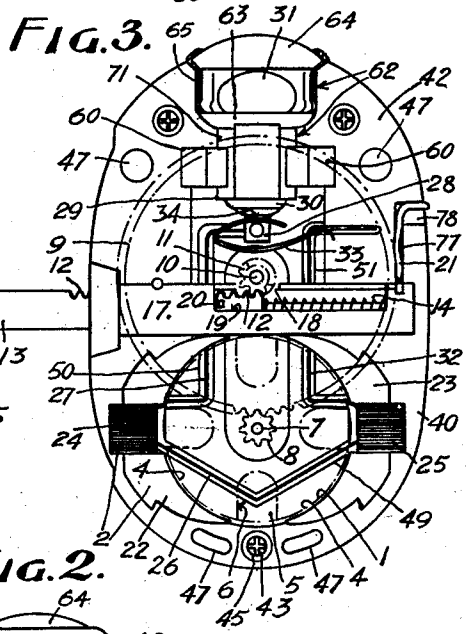
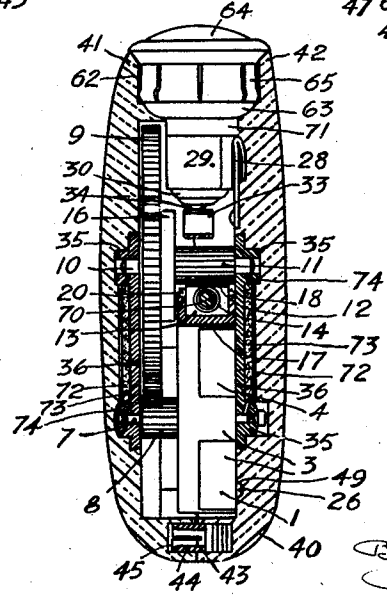


FIG. 2.



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UNITED STATES PATENT OFFICE.

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ELECTROMECHANICAL LAMP.

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The object of the invention is an electromechanical lamp, that is to say a lamp comprising a magneto-electric machine, a mechanism serving to set into motion the movable portion of the machine, an incandescent lamp, a casing shrouding the whole.

It is characterized by the fact that the casing is divided into several shells made of moulded material and by the fact that the fixed portion of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of that the connecting members connecting the machine to the incandescent lamp are maintained in position solely by their confinement in the material forming the casing at the moment of moulding, with the object of simplifying the manufacture of the lamp.

A method for the manufacture of this lamp is characterized by the fact that the material which is to form each of the shells of the casing is placed in an open mould, the necessary holes and compartments are obtained with the aid of a primary punch for the fixed portion of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of that the connecting members, by compressing the material, this fixed portion of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of that the connecting members are subjected provisionally to one or several other punches which place them in the previously prepared compartments, and are secured by compressing the material a little more, the provisional subjection being then such that it breaks down.

The accompanying drawing represents by way of example one embodiment of the lamp constituted by a pocket lamp.

Figures 1 and 2 are two longitudinal sections showing certain parts in different positions.

Figure 3 is a front elevation after removing a shell.

Figure 4 is an end view.

The magneto-electric machine of this embodiment comprises a rotatable inductor 1 and a fixed armature 2.

The inductor 1 has a permanent magnet 3 in the form of a disc cut away at 6 in such a manner as to have four peripheral poles 4 and a body 5 of a heavy metal such as lead intended for increasing the mass of the armature, having also the form of a disc and otherwise filling the cut-away portions 6 of the magnet; the whole constitutes a cylinder terminating in two plane circular faces. It is scotched to a shaft 7 carrying a pinion 8 meshing with a toothed wheel 9 rigidly mounted on a shaft 10 provided with a loose pinion 11 with which engages a toothed rack 12. This is indented in a bar 13 which on the one hand is submitted to the action of a spring 14 effecting the compression, on the other hand is provided with a curved handle 15 upon which the hand holding the lamp acts to put the inductor 1 into rotation; the spring 14 is disposed on a rod 70 running in the bar 13. Between the pinion 11 and the wheel 9 is interposed a coupling device 16 which enables the pinion to drive the wheel while it moves in a direction corresponding to the displacement of the rack 12 under the action of the hand. The bar 13 is partially located in a guide 17 of rectangular tubular section cut away at 18 for the passage of the pinion 11 and at 19 for that of a cleat 20 limiting the run of this bar 13 towards the exterior under the action of the spring 14.

A bolt 21 in the form of a square enables the fixation of 13 at will in its interior position by penetrating into one of the intermediary teeth. Its long shank is located in a groove 77 of the casing 40 and is slightly curved-in in such a manner as not to be capable of displacement too easily; its short end is located in a recess 78 opening towards the outside and makes a projection outside so that it may be acted upon with the aid of the finger.

The ends of the shafts 7, 10 lie in sockets 35 of metal plates 36 presenting both of these sockets.

The fixed armature 2 comprises two parts 22, 23 of magnetic material in the form of crescents and surrounding the inductor 1 as well as two bobbins 24, 25. These latter are in series by means of a conductor 26; the bobbin 24 on the other hand is connected by a conductor 27 to a folded resilient foil in engagement with which is a peripheral contact 29 of a socket 71 having an internal thread receiving the screwed bottom 30 of the electric lamp 31; the bobbin 25 on its side is in relation by a conductor 32 with a resilient foil 33 in the shape of a U which a central insulated contact 34 of the bottom 30 touches.

In the casing 40 use is made of a cavity

62 having the general shape derived from a body of revolution and receiving the socket 71, a circular reflector 65 rigid therewith, a lens 64 located in a split casing 65 maintained in position in the cavity by elasticity and in turn holding the socket 71 in place. In order to be certain that this socket 71 always occupies the desired position to ensure connection between the foil 28 and the contact 29 it is provided with two cheeks 60 and the cavity 62 has two corresponding recesses 61.

The casing 40 is divided into two shells 41, 42 of which the exact removable assembly is obtained by the aid of three hollow split plugs 43 carried by one of these as well as by integral sockets 44 in the other shell and receiving the plugs; these latter terminate at their free ends in a truncated conical part 45 of which the major base is located on the outside and which resides in an enlarged part 46 of the corresponding socket 44 in order to prevent the separation of 41, 42 from taking place too easily. The more the shell is provided with cavities 47 the less depth is there on that of its faces which attends the other shell; they contain an adhesive material maintaining the two shells 41, 42 assembled.

The portions 22, 23 carrying the bobbins 24, 25, the plates 36, the guide 17, the foils 28, 33, the conductors 26, 27, 32, the plugs 43, the sockets 44 are fixed in the shells 41, 42 by the fact that they are embedded, while moulding, in the material of which these are made, an insulating synthetic resin for example, the conductors 26, 27, 32 are located in grooves 49, 50, 51 of the interior face of the shell 42.

Behind the plates 36 are the cavities 72 receiving a spongy material 73 steeped in oil which does not become rancid or thick, and communicating by channels 74 with the inside of the sockets to ensure lubrication of the shafts 7, 10.

In this manner of assembly of the entire lamp and the assembly of the two shells 41, 42, it takes place without the aid of any threaded or screwed portion with the exception of socket 29 and the bottom 30.

The following may be taken as an example for the manufacture of the embodiment above:

The material to form the shell 42 for example is placed in an open mould and is maintained in a pasty condition, then with the aid of a primary punch descending into the mould are produced the necessary holes and the desired compartments for receiving the plates 36 with the spongy material for steeping in oil the portion 22, 23, the bobbins 24, 25, the foils 28, 33, the conductors 26, 27, 32, the spring 21, the guide 17, the plugs 43. Then upon a second punch these different parts are disposed at the desired position and are secured provisionally thereto, the armature 2 by means of an electromagnet, the other parts with the aid of an adhesive. Once this is done the second punch is caused to descend into the mould a little lower than the first; the different parts enter the prepared compartments, penetrate to a certain extent into the material and are retained by this which fixes them in place; at the moment when the second punch rises the circuit of the electro-magnet is broken; on the other hand, the resistance of the adhesive is less great than the adherence of the compressed material, so well that all the parts leave the second punch and remain in the positions taken.

The moulding of the shell 41 is proceeded with in the same manner.

There only remains then to put the bolt 21 in its compartment, an adhesive in the cavities 47, to assemble the two shells 41, 42 with the aid of the plugs 43 and the sockets 44, to put in place the socket 29, then the lamp 31 in the same and finally the case 65 which maintains the whole.

The moulding of the shells may be effected either cold or hot, with a varying pressure according to requirements. The material may, during moulding, be liquid, semi-fluid, solid (in powder form for example). For bringing the various parts into the mould one may utilize not only a single punch, but several each carrying some of these parts and descending in succession into the mould.

The control mechanism for the lamp may of course differ from that which is illustrated. The machine could comprise a fixed inductor and a rotating armature.

The lamp need not be a pocket lamp and could be for example a guard lamp, a lamp for lighting cycles and motor cycles.

What we claim is:

1. In an electro-mechanical lamp the combination, with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding.

2. In an electro-mechanical lamp the combination, with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material and provided with cooperating projections and cavities for ensuring the exact position of the shells one

with relation to the other, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding.

3. In an electro-mechanical lamp the combination, with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material and provided with hollow split plugs and with sockets receiving the plugs for ensuring the exact position of the shells one with relation to the other, the plugs, the sockets, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding.

4. In an electro-mechanical lamp the combination, with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material and provided with hollow split plugs with enlarged free end and correspondingly shaped sockets receiving the plugs, said plugs, the sockets, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine, and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding.

5. In an electro-mechanical lamp the combination, with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding, cavities being formed between the bearings of the shafts and the material of the casing, receiving a lubricant and communicating by channels with the interior of the bearings.

6. In an electro-mechanical lamp the combination with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding, cavities being formed between the bearings of the shafts, and the material of the casing containing a spongy material impregnated with lubricant and communicating by channels with the interior of the bearings.

7. In an electro-mechanical lamp the combination with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding, the members connecting the machine to the incandescent lamp being located in grooves formed in the interior face of one of the shells.

8. In an electro-mechanical lamp the combination with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material, one of which presents on its interior face cavities containing an adhesive preventing the easy separation of the shells, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding.

9. In an electro-mechanical lamp the combination with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding, a compartment obtained by moulding in the casing receiving a bolt intended to lock the mechanism at one

position of rest and being in the form of an L, one arm of which acts upon the mechanism and is slightly curved in so that it cannot be too easily displaced in the compartment, while the other arm forms a projection outside the casing and may be actuated by hand.

10. In an electro-mechanical lamp the combination with a magneto-electrical machine, mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding, a cavity provided in the casing receiving a socket in which resides the bottom of the incandescent lamp and which is maintained in place in a removable manner by a split casing bearing against the wall of the cavity.

11. In an electro-mechanical lamp the combination with a magneto-electric machine, a mechanism serving to put into movement the movable portion of the machine, an incandescent lamp, of a casing enveloping the whole and divided into several shells made of moulded material, the fixed part of the machine, the fixed members of the mechanism, the bearings of the shafts of the machine and of the mechanism, the members connecting the machine to the incandescent lamp being maintained in position solely by their confinement in the material forming the casing during moulding, a cavity provided in the casing receiving a socket in which resides the bottom of the incandescent lamp and which is maintained in place in a removable manner by a split casing bearing against the wall of the cavity, said socket being provided with two cheeks located in corresponding recesses of the cavity, so that it must always occupy a determined position.

In testimony whereof we affix our signatures.

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RENÉ-MARIE BERTHIER.