H. D. GRINNELL.

INCANDESCENT LAMP REMOVER AND REPLACER.

APPLICATION FILED DEC. 8, 1917.

1,288,873.

Patented Dec. 24, 1918.

2 SHEETS—SHEET 1.

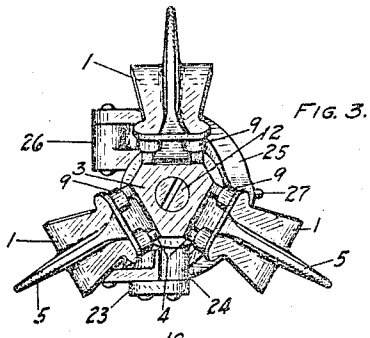


FIG. 3.

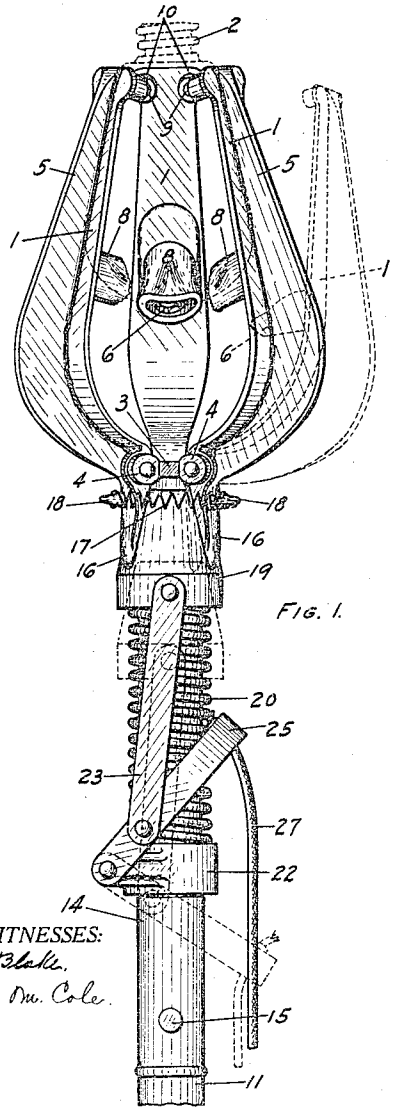


FIG. 1.

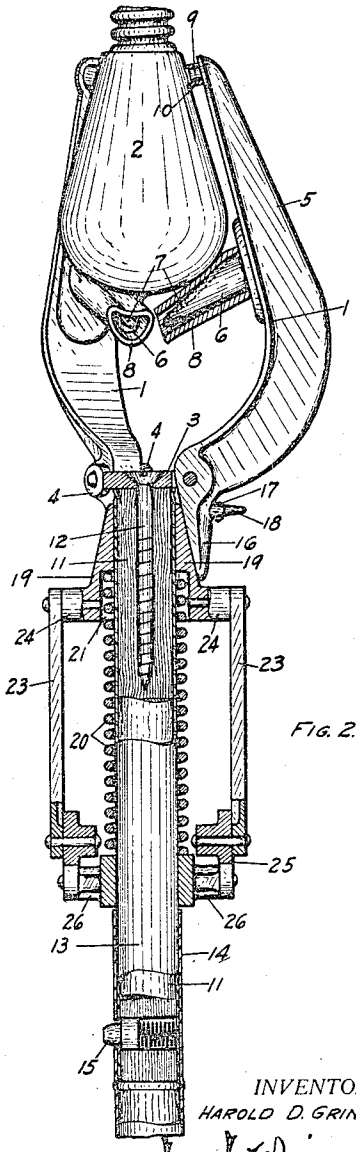


FIG. 2.

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2 SHEETS—SHEET 2.

FIG. 4

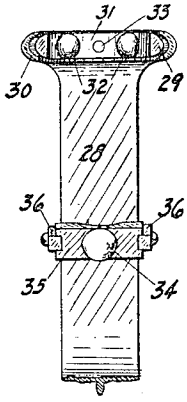


FIG. 5

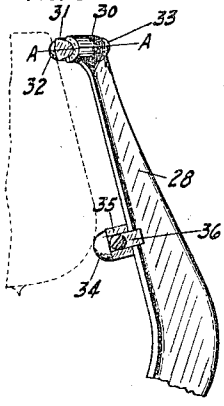


FIG. 6.

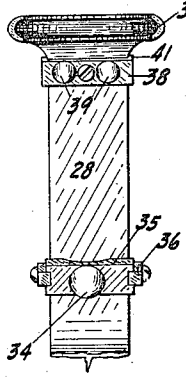


FIG. 7.

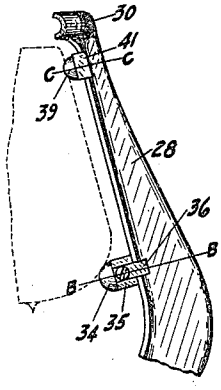


FIG. 8

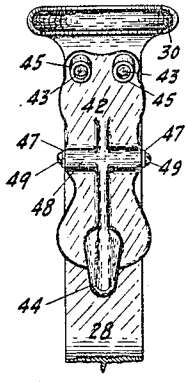


FIG. 9.

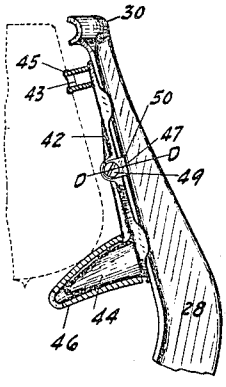
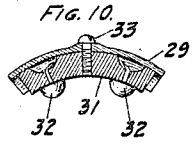


FIG. 10.



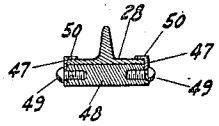
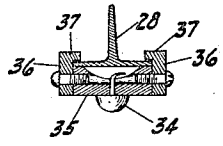


FIG. 12.

FIG. 11.



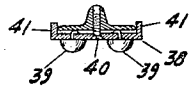


FIG. 13.

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INCANDESCENT-LAMP REMOVER AND REPLACER.

1,288,873. Specification of Letters Patent. Patented Dec. 24, 1918.

Application filed December 8, 1917. Serial No. 206,142.

To all whom it may concern:

Be it known that I, HAROLD D. GRINNELL, a citizen of the United States, residing at Pittsfield, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Incandescent-Lamp Removers and Replacers, of which the following is a specification.

This invention relates to improvements in apparatus for removing and replacing incandescent electric lamps, and has for its primary object the provision of a manually operable device adapted for quickly and safely removing and replacing incandescent lamps placed in elevated positions.

While similar in general structure, operation and design to the device described in U. S. Letters Patent No. 1,121,759, issued to F. H. Printiss, December 22, 1914, the present invention is more particularly adapted for application to lamps having a screw connection with the lamp-socket.

Referring to the accompanying drawings, Figure 1 is a side elevation of the assembled device operatively engaging an incandescent lamp of the screw-stem type, the dotted lines indicating the relative positions of the parts moved in operating; Fig. 2, a longitudinal vertical section of the same rotated 90°; Fig. 3, a top plan view; Fig. 4, a face view of the upper extremity of a modified form of clamp; Fig. 5, a side view of the same; Fig. 6, a view similar to Fig. 4, showing a modification thereof; Fig. 7, a side view of the same; Fig. 8, a view similar to Fig. 4, showing a further modification of the clamps; Fig. 9, a side view of the same; Fig. 10, a detail section on the line A—A of Fig. 5; Fig. 11, a detail section on the line B—B of Fig. 7; Fig. 12, a detail section on the line D—D of Fig. 9; and Fig. 13, a detail section on the line C—C of Fig. 7.

The clamping portion of my invention comprises a plurality of arms or clamps 1, 1, etc., preferably three in number and of curved formation, which are suitably constructed and arranged to grip the lamp bulb 2 with sufficient firmness to rotate the same in the lamp-socket without injury. These clamps are pivotally secured at their lower ends to a horizontally arranged support, herein shown in the form of a metal plate 3, provided with laterally offset ears 4, 4, etc., which are arranged in pairs and distributed at equi-distant points around the margin of the plate for the support of the clamps. As shown, the clamps 1 are preferably reinforced on the back throughout their length by a web structure 5, while the face is provided with gripping devices for direct contact with the glass bulb. These gripping devices in the preferred form herein shown comprise an integral metal finger 6, provided at a central point on the inner face of each clamp and inclined somewhat downward, the outer end being graduated and grooved on the upper side 7 to conform to the rounded surface of the bulb. Said fingers 6, 6, etc., are arranged to converge at their outer extremities to form a base or support for the bulb, the gripping or frictional force of the fingers being improved preferably by a sheathing of rubber tubing 8, which also operates as a buffer to prevent breakage of the lamp. Additional contact members are provided in the form of studs 9, 9, etc., arranged in pairs on the inner face of the clamps at their upper extremities, said studs being preferably integral with the clamps and covered with rubber tubing 10 in the manner of the fingers 6, and for the same purpose.

The clamp-supporting plate 3 is detachably secured to the upper extremity of a handle 11 preferably by means of a screw 12, the handle herein shown being constructed of wood formed of a series of detachably connected sections fitted end to end by means of metal bushings or casings 13, 14 which are of unequal diameter and adapted to fit into one another, a spring actuated push-button catch 15, seated transversely in one of the handle sections and registering with a suitable opening provided in the overlapping bushing of the connecting handle section, being employed to prevent accidental displacement.

The lower ends of the clamps 1 are provided with feet 16, 16, etc., forming depending extensions which normally engage the sides of the handle and operate to limit the outward swing of the clamps. Said feet are held in yielding contact with the handle preferably by means of coil springs 17, secured at opposite ends to spurs 18, 18, etc., provided on the outer face of the feet 16, the tension of the springs operating normally to spread the clamps 1, 1, etc.

To reverse the action of the clamps 1, 1, etc., I provide a thrust 19 in the form of a metal sleeve slidably mounted upon the handle below the clamps, the sides of the sleeve

being tapered inward toward the feet 16 of the clamps. The thrust 19 is forced upward on the handle by means of a coil expansion main spring 20 mounted on the handle below the thrust and seated at its upper end in a suitable recess 21 provided in the lower end of the thrust, the lower end of the spring 20 being supported by a fixed collar 22 mounted on the handle.

The upward movement of the thrust 19 under the force of the spring 20 operates to force the feet 16 outward against the action of the springs 17, thus closing the clamps 1, in which position the clamps are normally retained.

To operate the clamps 1 for adjustment to a lamp bulb, I provide a pair of pull-bars 23, 23, which are pivoted at their upper ends to lugs 24, 24, provided on opposite sides of the base of the thrust 19, said pull-bars being extended downward and pivotally secured at their lower ends to opposite sides of a yoke-like lever 25. The lever 25 is arranged to freely inclose the handle 11 at the lower end of the main spring 20, the rear ends of the lever being extended rearward beyond the points of attachment of the pull-bars 23 and pivoted to apertured lugs 26, 26, provided on opposite sides of the collar 22. The forward end of the lever 25 is projected beyond the handle 11 and is controlled by the operator preferably by means of a flexible cord 27 of non-conductive substance which is attached at one end thereto and extends downward to a point within the reach of the operator. The lever 25 normally assumes an upward inclination under the force of the main-spring 20 acting through the medium of the pull-bars 23, so that in reversing the position of the thrust 19 for the purpose of spreading the clamps 1 the free end of the lever is pulled downward by means of the cord 27. The foregoing mechanism for operating the thrust 19 possesses superior advantages in effectiveness, simplicity and compactness. In comparison with the corresponding mechanism shown in the Letters Patent before alluded to, the lateral extension of the operating lever 25 is much reduced, thereby involving a corresponding reduction in the length of pull required for operation and the liability to breakage.

In the modification of the clamp structure 28, shown in Figs. 4 and 5, and fully described in the Letters Patent hereinbefore alluded to, I provide one form of auxiliary finger attachments adapted thereto for removing and replacing lamps having a screw-stem connection with the lamp-socket. These auxiliary attachments are detachably secured to the clamp and comprise an arcuate channel member 29 (illustrated in detail in Fig. 10) which is arranged to be seated in the grooved jaw 30 formed at the upper end of the clamp, a separate metallic insert portion 31 provided with soft or yielding contact members 32, 32, mounted on its exposed face, being removably seated in the jaw 30 and secured therewith in position on the clamp preferably by means of a screw 33. In substitution for the fixed finger 6 of the preferred form, I provide a removable soft button 34 mounted on a bridge piece 35 (illustrated in detail in Fig. 11), said bridge piece being secured centrally to the inner face of the clamp by means of adjustive clamps 36, 36, terminally secured to the bridge piece and provided at their rear ends with shoulders 37, 37, engaging the rear face of the clamp 28. This lower contact button 34 with its mounting may be readily adjusted in position on the clamp to engage the lamp bulb at a convenient point for support near its base, as illustrated in Fig. 5.

In the further modification shown in Figs. 6 and 7, I provide a substitute structure for the support of the upper contact members on the modified clamp 28. This substitute (illustrated in detail section in Fig. 13) is of simplified construction and comprises a flat plate 38 upon which a pair of contact members 39, 39, similar to the contact members 32, are mounted for engagement with the neck or reduced portion of the lamp bulb, as shown in Fig. 7, said plate being secured to the clamp preferably by a screw 40, and provided at opposite ends with shoulders 41, 41, which engage the edges of the clamp.

In the modification shown in Figs. 8 and 9, I employ a unitary contact structure in the form of a plate 42, which is removably secured at a middle point to the modified clamp 28 and carries at its upper end studs 43, 43, and at its lower end a contact finger 44, said studs and finger being similar in form and arrangement to the corresponding parts shown in the preferred form hereinbefore described, and being also protected by suitable cushion coverings 45, 46, respectively, in the manner and for the purpose before described. The removable plate 42 may be secured in any suitable manner to the modified clamp 28, preferably by means of side clamps 47, 47, (illustrated in detail section in Fig. 12) secured to the edges of the plate which is thickened centrally as at 48, for the purpose, by screws 49, 49, the rear ends of the side clamps 47 being provided with an inturned shoulder 50 which engages the rear side of the clamp 28.

It will be understood that the modified form of clamp 28, with or without the foregoing auxiliary attachments provided for lamps of the screw-type connection, may be permanently mounted on my device in substitution for the preferred type of clamp illustrated in Figs. 1, 2, and 3.

I claim:

1. The combination with a rod, of arms pivotally secured to the rod and having free

ends extending beyond the rod and arranged to be swung into and out of a gripping position, each of said arms having an extension at its inner end below the point of pivotal support for controlling the movements of the free end; a reciprocatable sleeve member carried on the rod and having a reduced end adapted to be projected under the inner extensions of the arms for spreading the same; means operating normally to spread the free ends of the arms; an expansion spring carried on the rod and operating normally to force the sleeve member outward; and means for reversing the position of the sleeve member, including a fulcrum member carried on the rod, a lever pivoted to the fulcrum member and extending laterally beyond the rod, and a bar pivoted at one end to the sleeve member and pivoted at its opposite end to the lever at a point intermediate the extremities of the lever.

2. In a device of the class described, the combination with a rod, of fulcrum members carried by the rod; a gripping arm pivotally mounted on each fulcrum member and having a free end extending beyond the rod, each of said arms having an extension below the fulcrum member for engagement with the rod to limit the outward swing of its free end; auxiliary gripping members provided on the free ends of the arms and adapted to coöperate in seating and gripping a lamp globe when the arms are arranged in the closing position; a sleeve member slidably carried on the rod and having a reduced end adapted to be projected under the inner extensions of the arms for throwing the free ends of the arms into the closing position; means operating normally to spread the free ends of the arms; an expansion spring carried on the rod and operating normally to force the sleeve member outward; and means, including a lever carried on the rod and pivotally connected to the sleeve member, for reversing the position of the sleeve member.

3. In combination, a rod; gripping arms pivoted at one end to the rod and having free ends extending beyond the rod; auxiliary means provided on the free ends of the arms adapted to coöperate in gripping an object when the arms are arranged in the closing position; a sleeve member slidably mounted on the rod; spring means for removing the sleeve member in one direction to operate the free ends of the arms into a gripping position; and means for reversing the action of the sleeve member to spread the free ends of the arms, including a lever pivoted to the rod below the sleeve member and having a free portion extending laterally beyond the rod, and a bar pivoted at one end to the sleeve member and pivoted at its opposite end to the lever at a point intermediate the extremities of the lever.

4. In a device of the class described, the combination with a rod; arms pivoted at one end to the rod and having opposite ends free to be swung toward and away from an object to be inclosed; and means for moving the arms into and out of a gripping position; of auxiliary means provided on the arms for engaging said object, and including a series of angularly disposed fixed members carried on the arms and having free ends arranged in convergent relation to each other when the arms are in the closing position to form a seat for said object.

5. In a device of the class described, the combination with a rod; arms pivoted at one end to the rod and having opposite ends free to be swung toward and away from an object to be inclosed; and means for moving the arms into and out of a gripping position; of auxiliary means provided on the arms for engaging said object, and including a series of angularly disposed fixed fingers carried on the arms and arranged to form a seat for said object when the arms are in the closing position, each of said fingers having a bearing surface conformed to the surface of said object and provided with a yielding substance adapted to form a cushion therefor.

6. In a device of the class described, a series of clamping arms for inclosing a lamp globe, means for moving the arms into and out of a closing position, a series of contact members provided on the arms for gripping the lamp globe, and a separate series of angularly disposed fingers carried on the arms and having convergent free ends adapted to seat the lamp globe when the arms are in the closing position.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

HAROLD D. GRINNELL.

Witnesses:
JNO. J. WHITTESEY,
LE ROY E. SHAW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."