The invention relates to a screw lamp replacer and extractor. In such places as machine shops and printing shops, an electric screw lamp, out of reach from the floor, which has burned out or which has been destroyed or damaged while in its socket, cannot be safely removed by hand during the operation of adjacent machines. As good lighting is often imperative for the operative control of such machinery, this means that all adjacent machinery must be brought to a standstill while ladders or other makeshift and often dangerous erections are transported and set up to enable a useless lamp to be reached and replaced. Such erections have then to be removed or dismantled before the machinery can be safely restarted.

These and other disadvantages apply also in such places as operating theatres and buildings in which the general public assembles. A further difficulty arises in the case of a lamp which has been accidentally broken in its socket since the remains of the jagged glass bulb are liable to cause injury to the person attempting to unscrew the broken glass and cap from the lamp socket.

Another undesirable consequence of previous lamp removal methods is that in order to minimize the standstill of adjacent machinery, the electric power may be kept on in the mains during the removal of a single broken lamp. This endangers the person effecting the removal or replacement of the lamp, since by accidentally connecting with the exposed lamp filaments, the charge from the mains may find a path through the body of such person and cause a severe shock.

These and other serious disadvantages hitherto, inherent in lamp removing and replacing are overcome by the present invention which comprises a screw lamp replacer and extractor of the type having a base, at least two lamp gripping members hinged to the base and returned by spring means, support means connected to the base and flexible means in connection with the gripping members to move the latter towards each other against the action of the spring returning means and including control means for the flexible means comprising a collar adjustably secured to the support means, a projecting member connected to the collar and forming a curved rack, a handle pivoted to the projecting member and engageable with the curved rack, said handle being connected with the flexible means to operate the latter.

In the preferred embodiment, the control means includes automatic means to prevent pivoting of the handle in a direction to permit open-
desired length. To the innermost portion 10 of each gripping member is secured a link member 28. The links are connected at their lower ends to a common tension spring 21 disposed inside member 18. To the lower portion of spring 21 is a secured a flexible member 22, passing down the tube 18 and out of the latter through an orifice 23 adjacent to the control means generally represented by the numeral 24. For illumination, electric light bulbs of different contours, the gripping members 14 are provided with horizontally aligned detachable bulb grips 29 and 26 disposed adjacent to the inner edge of the members 14. An annular supporting member 27 is detachably secured to the inner edge of one gripping member to form a support for round-surfaced bulbs. Members 25, 26 and 27 are preferably provided with padded surfaces so as to prevent damage to the glass of the bulb during extracting or replacement.

It will be understood that bulb support members such as 25, 26 and 27 having various curvatures and shapes may be secured to the gripping members so that the latter can securely grip a screw bulb of any contour, as required. For example, these may take the form illustrated at 28 in Figure 6, being pivotally secured as at 29 to members 14. Also, since the gripping members 14 are easily detachable from the pivots 13, gripping members having other shapes than those illustrated may be employed to deal with particular bulbs.

By reference to Figures 1 and 2 it will be seen that a control means 24 for the flexible means is disposed below the orifice 23. This means comprises a member in the form of a split collar 32, detachably secured to the tubular supporting member 18 by the screws 31 through projections 32 and 33 on the collar. Projecting from the split collar and fixedly secured between the members 32 and 33, is a semicircular projecting member 34 having ratchet teeth 35 disposed around its periphery. Pivoted to the member 24 as at 36 is a handle formed of adjacent arms 37 each disposed on one side of the semicircular member 34. The arms 37 are spaced from each other by the member 38 secured to them by rivets 39, thus forming a convenient pivotal and restricted handle 42.

Adjacent to the toothed edge of member 34 and disposed in the recess 19 between the arms 37, is a pawl 45 pivoted on a member 46 secured through arms 37. The pawl has a portion 45 which is shaped to correspond with the teeth 35 and an extended rear portion 42 formed as a trigger. The pivot member 44 projects laterally of one arm 37 to form a boss 46 to which the lower end of the flexible member 22 is secured. Adjacent to the pawl in recess 19 is a spring 43 disposed to bear against the rear portion 42 of the pawl. The tension of the spring is arranged to urge the portion 45 of the pawl into engagement with the teeth 35 and automatically prevent upward movement of the handle when the spring is not counteracted by pressure on the trigger.

It will be understood that the purchase of the gripping members on a bulb of given size depends on the proper tensioning of member 22 in relation to the movement of handle 47. This is controlled by the location of the collar member 38. For any given bulb the tensioning may be correctly adjusted by first slackening the members 31 to loosen the collar relative to member 18. The member 47 is then depressed until the pawl on the latter is engaged in one of the lower teeth of the ratchet at 35a and, simultaneously, the grips 26 are in contact with each other. Member 30 is tightened on to member 18, and is then properly positioned in combination with its flexible member 22 so as to make full use of the range of movement of member 47.

The operation of the lamp-extracting and replacing part of the device, thus far described, is as follows. Assuming, that it is required to remove a damaged lamp, the device is positioned by means of the supporting member or members 14 so that the bulb is approximately centered between the members 14 and preferably with the bulb base resting in the padded ring 27. By depressing the pivoted member 47, the lower ends 16 of members 14 are drawn downwardly.

But in the centre of the upper surface of means of pivots 13, disposed intermediate the ends of members 14, this results in the grips 25 and 26 on the upper portions of members 14, being drawn down towards the common point A so that eventually they make contact with the bulb surface. When this occurs, through operation of the spring-urged pawl 46, the purchase of the grips on the bulb will be maintained automatically. The device may then be rotated in an unscrewing direction while maintaining grip on the bulb which is thus removed from the socket and lowered to the ground without breaking away from the gripping means. It will be evident that new bulbs may be inserted into sockets by reversing the procedure described.

Figures 4 and 5 illustrate the broken lamp cap remover. This comprises a particular base 50 having truncated corners as at 51. Normal to each truncating edge and radial to the centre of the base are slots 52 each adapted to engage a substantially horizontal corresponding slot 53 in the upper inner edge of each member 14. In the centre of the upper surface of the base 50 is a socket 54 into which is secured a shank member 55 made of dielectric material such as a suitable plastic. To the upper portion 56 of the shank member is secured a corresponding socket member 57. The latter is formed with radial slots 56, into which are inserted and secured fin like members 59. These are symmetrically arranged about the axis of the socket and shank. The fin like members 59 are each provided with a curved knife edge 61. All such edges preferably terminate in a common edge or substantially aligned with the axis of the shank.

In use, the cap extractor is mounted in connection with the gripping members by engaging the corresponding slots 52 and 53. The control member 47 is adjusted so that the gripping members exert sufficient purchase on the slots 52 of member 50 to form a stable extractor assembly, in which the member 50 is substantially parallel to the member 10. It is to be noted that the slots 53 are positioned in relation to the shank member 55 so that when the extractor assembly is inserted as described, the apex 60 will project well beyond the uppermost portions of members 14. It will be evident that by operation of the spring-urged pawl, the tension of the resilient member 22 is automatically maintained so that the purchase of members 14 on the base 50 is sufficient to maintain the extractor assembly rigid when rotated.

To remove a broken lamp cap, the apex 60 of the ratchet assembly is inserted into the cap. The assembly is then rotated in an unscrewing direction according to the thread of the cap in its socket.

The knife-edges 61 make contact with the inner portions of the cap which may thus be safely
withdrawn from its socket. It will be appreciated that on account of the dielectric portion 55 of the shank, the fin like members and upper socket 54 are insulated from all other portions of the apparatus which may thus be safely used regardless of whether the electrical connections of the broken cap are live or not. It will be evident that by means of the apparatus any type of bulb whether broken or otherwise can easily and safely be removed or replaced from distances up to forty to fifty feet.

What I claim is:

1. A screw lamp extractor and replacer comprising a base, support means connected to the base, at least three lamp-gripping members hingedly connected to the base intermediate their ends, a horizontal tension spring tending to move said lamp-gripping members to their open position, means for moving said lamp-gripping members towards each other against the action of said horizontal tension spring comprising a flexible control member, a vertical tension spring connected thereto, a link connecting each gripping member with said vertical tension spring, and control means for the flexible control member adjustably secured to the support means.

2. In a screw lamp extractor and replacer of the type having at least two lamp-gripping members, detachable means for extracting a broken lamp cap comprising a base having slots therein.

corresponding slots provided in the lamp-gripping members, said base being mountable by said slots to form an assembly with the gripping members, a shank projecting upwardly from said base and having a dielectric portion intermediate its ends, and fin like members, each having a curved knife edge terminating in a common apex at the upper end of the shank and adapted when inserted into a broken lamp cap to engage and unscrew the latter when the said assembly is rotated in an unscrewing direction.

EDWARD LEIGH.

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