Berry, of the first year's cost of the installation at the Prince's Theatre, London, and he remarks that the Siemens dynamo "is in as good condition as when it was first put down, with the exception of the wear on commutator (which, on being measured after 12 months' wear, was found to be 5-16ths of an inch). The machine has used in that time 5½ pairs of brushes four inches wide." From the number of dynamos we have seen at various times, we should consider that in this case the "depreciation" of the dynamo and the cost of maintenance above the average. It was only a short time before this case met our attention that we carefully examined a dynamo, which was also used for a theatrical installation in order to see what the loss had been on the commutator. It was a 250-light Edison machine, and had been constantly running for nearly 2½ years, and from the feel of the hand over the commutator, it was almost impossible to perceive that there was any wear. Applying a straight-edge, it was possible to perceive that the surface had been reduced to the extent of the thickness of a piece of writing paper. As regards the brushes, these were the same as originally fixed, and would still last for a longer period. In this machine (running at 820 revolutions per minute) sparking was never observed; the same may be said of the other Edison machines of the same type belonging to the same installation.

The wear and tear of this dynamo was practically almost *nil*, and granted that it received in the future the same attention it has had in the past, it would be almost impossible to fix the limit when the occasion would have arrived to replace the commutator with a new one. The average life of a dynamo may, therefore, be considered to be at a high figure, provided that due care be taken of the adjustment of the brushes; and its cost of maintenance as that of an occasional pair of brushes, and the removal of the commutator, the cost of which would have to be spread over a number of years.—*Mechanical World.*

WESTON INCANDESCENT LAMP FITTING.

THE contact obtained with hook-and-eye connections in the original form of socket and lamp brought out by Mr. Edward Weston, Newark, N.J., was somewhat imperfect, particularly in cases where there was much vibration. Large percentages of lamp with the eye terminals were rendered useless by the breaking off of the eyes during handling in the last stage of manufacture in packing and unpacking, in fitting, and in the attempts of the uninitiated to twist the lamp swhilst in their sockets or in their removal for the purpose of cleaning and in short-circuiting by the wire being brought into contact by twisting. These defects led Mr. Weston to design a new holder, in which he retained the switch action and, in some measure, the external form of the old one. The change necessitated a modification in the neck or base of the lamp, which, however fitted well with the desire to separate the conductors to a distance sufficient to prevent the liability of the current to jump across, when the increased resistance of the later lamp called for increased electromotive force. The base or neck of the lamp is drawn out and firmly cemented into a thin metallic shell, leaving space for the reception of a block of insulating material, teeshaped in section, carrying contact plates or washers, to which the terminals of these lamp conductors are soldered. These contact plates are fastened respectively to the underside of the main portion of the tee and to the bottom of its leg. The lamp-holder consists of a base or flange of metal tapped with a standard thread for its attachment to gas and electric light fittings. This supports a block of insulating material fitted with contact springs and a switch action for opening and closing the lamp circuit. The whole is enclosed by a metal shell attached to the base. Fig. 1, is an elevation of the lamp socket and lamp actual size. In wiring and fitting fixture, the base is screwed to the bracket or to the branch of an electrolier and the wires brought through two holes provided in the base, as shown in Fig. 2; that is when the wires are run outside the fixture, which is not provided with means for concealing them, and where they are still retained for gas purposes, which prevents the wire from being run through the tubes with electric light fixtures, the wires are brought through the centre of the base from the pipe to which the holder is attached. The insulating block with switch and contact springs is then secured to the base, and the wires fastened by screws to plates which are connected with the positive and negative contact springs, one directly and the other through the switch or cut-out. The metal shell is finally slipped over all and secured to the base. A groove is spun in the upper end of the shell slotted at oposite ends of its diameter to receive two corresponding pins or projections punched up in the base shell of the lamp, and at right angles to the slots there are two indents in the grooves into which the contact springs press the pins in the lamp base, being inserted into the holder and given a quarter turn; by this means the lamp is locked in position not so firmly as to prevent its turning readily to right or left for the unlocking and removal of the lamp, but sufficiently so to prevent its jarring out by vibration, as happens with lamps which are screwed at the base or simply held by friction. A new lamp may readily be inserted even in a dark room, no matter if the circuit be closed or open through the switch. In this holder a good surface contact is obtained, and every time the lamp is turned either for insertion or removal the contacts are scraped clear of dirt or oxide, and at the same time the breakage of lamps by clumpsy attempts to twist them in their sockets is prevented.

The switch action is similar to that in the earlier form of holder, and to the gang switches modelled from it. The switch action itself, which is shown in Fig. 3 removed from the holder consists of a metallic frame or bracket to which is hinged by one end, a lever having contact surfaces at the other, and a small friction roller intermediate between the two. An oval cam indented at the extremities of its longer axis is engaged by the roller on the lever, and retained in that position by the pressure of a spring which acts between the bracket and the lever, and contact is made between the contact and the two contact springs, which are inserted in one leg of the branch to the lamp. The cam is mounted on a spindle having its bearings in the bracket, and a portion of one of the bosses of the cam is cut away or slotted, the spindle has fitted to it a projection or pin, whose function is to bear against one end of the slot and carry the cam around with it when it is turned by the spindle. As soon as the indent of the cam is disengaged, the lever flies off with a trigger-like action, the cam offering no resistance, being free to turn upon the spindle to the extent of the slot. No matter in which direction the switch is turned the action is the same, and the circuit is broken with great rapidity. The quick action of the switch so reduces the amount of spark that the durability of the contact surface is much greater than that of any other form of switch. The circuit is closed by turning the spindle till the cam acting on the lever brings it into the position illustrated, and the scraping action of the lever over the spring keeps the contact surface clean and bright.

The electrical joint for swinging brackets is without the usual sliding contacts which entail complicated and expensive details to insure good insulation, and to take up the wear of the sliding surfaces which produces defective contacts and instability of the bracket. Brackets with one, two, or more joints may be wired throughout by continuous conductors. In appearance the joint resembles the ordinary gas joint, and lends itself readily to ornamentation. The interior is fitted with a spool of insulating material around which flexible conductors are coiled in a double spiral (see Fig. 4) leaving sufficient space between the core of the spool and the inner walls of the joint for the expansion and the contraction for the diameter of the coils when twisted by the turning of the joint to right or left. The spool is made in two parts, one with a core and flange which is fixed by a set screw to the lower or stationary part of the joint, and an upper flange fitted loosely over the end of the core and attached to the upper or swinging part of the joint by a screw, in order that it may turn with it. The upper moving part of the joint is held in position vertically by a set screw projecting into a groove cut in the lower part so that there is freedom to move only horizontally. The joints are screwed with standard gas thread and can be used by any intelligent mechanic in the construction of fittings as readily as the ordinary gas joint. The wiring of brackets fitted with these joints can readily and quickly be accomplished; flexible conductors are threaded through the fixture, the spool removed from the joint through the opening in the upper part of the joint, the wires brought through holes in the lower flange coiled around the core of the spool and through holes in the loose flange, the coil is then returned to the cavity in the joint and the conductors passed through the fixture to the next joint, if there be one, or to the lamp socket.

Wall Plate and Flange.—The wall plate or block (Fig. 5) is of insulating material and carries two contact springs to which the branch wires are attached. The flange is of metal, iron or brass; (Fig. 5*a* a back view) the front view being shown on the wall plate in Figs. *b* and *c*, which are respectively a face