July 1, 1941. G. E. WEEKS 2,247,737

INSPECTION APPARATUS

Filed Jan. 11, 1940

FIG. 1

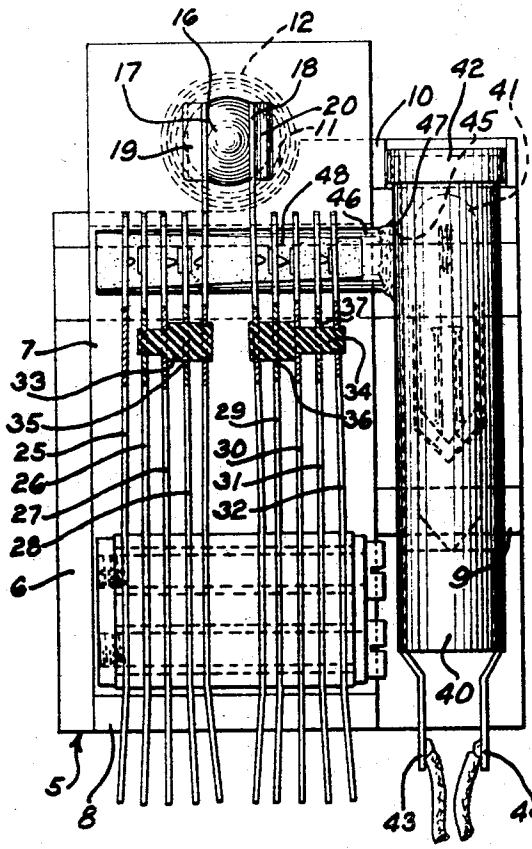


FIG. 2

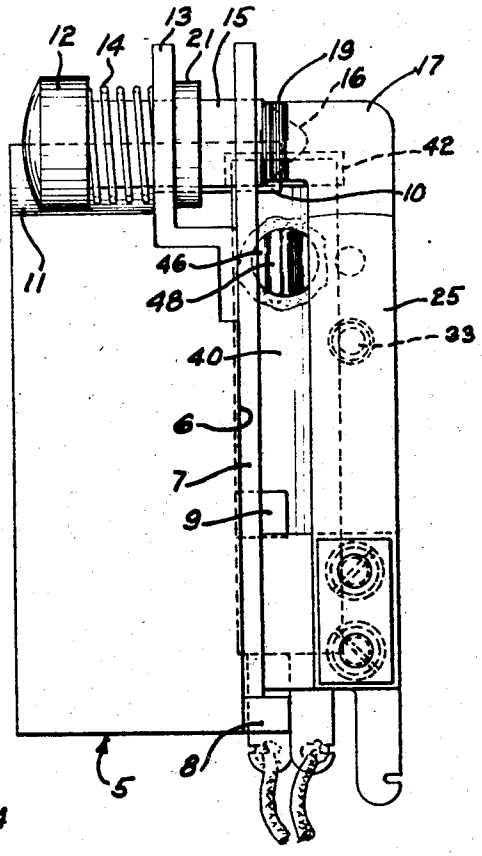
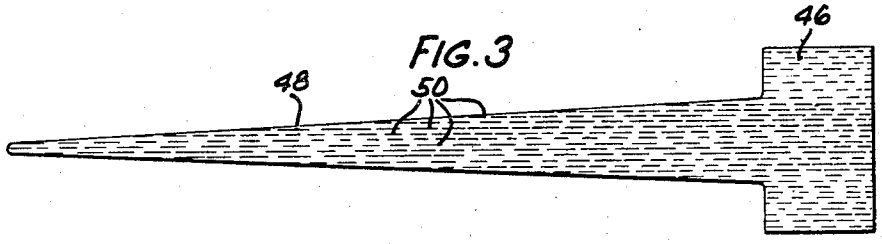


FIG. 3



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INSPECTION APPARATUS

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2 Claims. (Cl. 88—14)

This invention relates to inspection apparatus and more particularly to apparatus for facilitating visual inspection of electrical contacts during their adjustment.

In adjusting various types of apparatus, for example, key actuated contact springs, it is, at times, quite difficult to see the apparatus being adjusted due to the position in which the apparatus is mounted and the closeness of other apparatus which renders it impossible to so direct a beam of light that it will properly illuminate the apparatus being adjusted.

It is an object of the present invention to provide a simple apparatus for facilitating the visual inspection of articles during their manufacture.

In accordance with one embodiment of the invention, apparatus is provided for facilitating the inspection of key contact springs, which apparatus comprises a lamp bulb mounted in a suitable casing which has an aperture in it for receiving the flattened end of a rod of methyl methacrylate, a substance known commercially as "Lucite" or "Plexiglas" and having the capacity to transmit light throughout its length. The methyl methacrylate rod is ground or otherwise reduced in the portion thereof extending away from the casing so that it may enter into a relatively narrow space between the base and contact springs of a key. The extending portion of the rod is sand blasted on its upper surface, thereby to break up the light rays transmitted through the rod and provide a lighted, as well as a light-colored, background for the contacts on the contact springs to render them more clearly visible.

A better understanding of the apparatus will be had by reference to the following detail description when considered in conjunction with the accompanying drawing, wherein

Fig. 1 is a plan view of a key having a series of contacts thereon, which are to be adjusted, the key being positioned in an inverted position on a support on which there is mounted apparatus for illuminating the contacts;

Fig. 2 is a side elevational view of the apparatus shown in Fig. 1; and

Fig. 3 is an enlarged detail view of the light transmitting rod in side elevation.

Referring to the drawing, wherein like reference characters designate the same parts throughout the several views, a base 5 is provided upon which a key to be adjusted may be positioned during the adjustment of the spring tension thereof. The base 5 comprises a flat bed portion 6 on which the main body portion of a key mounting plate 7 may be positioned during the adjustment of the contact springs of the key. The base 5 is provided with portions 8, 9 and 10, against which the lower and right edges of the mounting plate 7 may be abutted during adjustment of the key. These abutments extend upwardly from the support 5, which is cut out, as shown at 11, to receive the operating button 12 of the key. Fixed to the mounting plate 7 is a substantially S-shaped bracket 13, against which a spring 14 of the key will abut to normally urge the operating button 12 of the key to the left (Fig. 2) due to the engagement thereof with the underside of the head of the key. The spring 14 surrounds a shank 15 of the key, which is made of non-conducting material and is tapered as shown at 16, for cooperation with the main springs 17 and 18 of the key. The springs 17 and 18 are bent over, as shown at 19 and 20, so that they will engage with the pointed end of the shank 15 in such manner as to be actuated thereby when the button 12 is operated. A collar 21, fixed to the shank of the key, prevents the spring 14 from moving the head and shank of the key to the left beyond a predetermined position (Fig. 2). Included in the key, which has been chosen as a type of key which may be readily inspected and adjusted by utilizing the apparatus of the present invention, are a series of contact springs 25 to 32, inclusive, which cooperate with the springs 17 and 18. The contacts on the various springs 17, 18 and 25 to 32, inclusive, are adapted to either make or break with their associated springs when the operating button 12 is operated. In the key selected as an illustration, a pair of studs 33 and 34, made of insulating material, are fixed to the springs 17 and 18, respectively. The stud 33 passes through an aperture 35 in the spring 28 and is fixed to the springs 26 and 27. In a similar manner, the stud 34 is fixed to the springs 18, 30 and 32 and passes freely through apertures 36 and 37 in the springs 29 and 31. It is believed to be apparent that, upon operation of the operating button 12, contact will be made between the springs 17 and 28, 26 and 25, 18 and 29 and the contact will be broken between springs 27 and 28, 29 and 30, and 31 and 32.

Due to the fact that the mounting plate 7 of the key is positioned directly beneath these contacts, it becomes exceedingly difficult to adjust the tension of the contacts so that they will make in the proper sequence and, accordingly, the abutments 9 and 10 support a lamp casing 40, which may be made of opaque material, and supports a lamp 41. A cap 42 is attached to one end of the casing 40 and terminals 43 and 44

extend outwardly from the other end of the casing **40** for attachment to a current source. The casing **40** is provided with a circular aperture **45** in which the end of a rod **46** of methyl methacrylate may be secured by cementing the end of the rod **46** to the casing as shown at **47**. The rod **46** is provided with a flattened portion **48** and may be formed by milling a circular rod to provide the relatively thin flattened portion **48**. It will be understood that such a rod could also be molded or otherwise formed to the shape shown.

Since it is a characteristic of the material, methyl methacrylate, used in the rod **46** that it will transmit light lengthwise through it, the flattened portion **48** is tapered, as most clearly shown in Fig. 3, so that the light rays will pass through the rod in the direction indicated by the lines **50** and will pass out of the rod at the points where the lines **50** intersect the edges of the portion **48**. Since the portion **48** is sand blasted or otherwise roughened, the light will be diffused and will illuminate the contacts. After the rod has been milled to the configuration shown and just described, the upper surface and/or lower surface of the rod may be sand blasted or roughened in some other manner to break up the light rays which are transmitted through the rod and to illuminate the contacts on the springs **17**, **18** and **25** to **32**, inclusive, during their adjustment. If the rod **46** in this form does not throw sufficient light on the contacts, it may be advisable to paint the lower surface of the portion **48** white to reflect more light on the contacts.

Although a specific type of key has been described in some detail herein, it will be understood that the apparatus covered by the present invention is not applicable solely to keys of this type, but by modification may be adapted for other types of inspection and adjusting apparatus without departing from the scope of the invention, which is to be limited only by the appended claims.

What is claimed is:

1. In an inspection apparatus, a support, means on said support to position part of an article to be inspected in a plane parallel to said support and in spaced relation thereto, a light source mounted on said support and laterally displaced from the position of an article on the support, and a vane of methyl methacrylate of tapering configuration extending at right angles to the light source and between the support and the part of the article to be insepected to conduct light thereto, said vane having the surface thereof which is away from the support roughened to diffuse light throughout the length of the vane.

2. In an inspection apparatus, a support, means on said support to position an article to be inspected in a plane parallel to the support with a portion of the article spaced from the support, a light source mounted on said support in laterally spaced relation to the article and in a plane between the support and said portion of the article, and a vane of methyl methacrylate of tapering configuration extending at right angles to the light source in the plane between the support and said portion of the article to be inspected to conduct light thereto, said vane having its surface adjacent the support colored white to form a light background and having its surface adjacent the said portion of the article roughened to diffuse the light throughout its length.

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