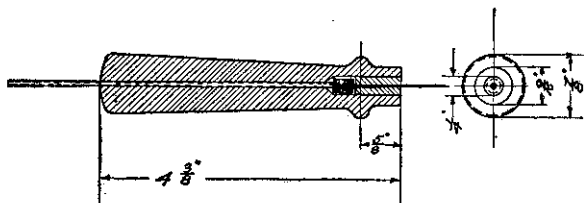


DEVICE FOR TESTING ELECTRIC WIRING.¹

BY HOWARD M. NICHOLS.

In testing electric wiring for open circuits, grounds, or short circuits, it is often necessary to skin the insulation from the wires under test, in a number of places, so as to connect them to a magneto or other testing device. The accompanying illustration shows a device which does away with this necessity; for it contains a sharp needle point, which can be



easily pushed through the insulation until it makes a good electrical contact with the wire within. The device is made out of a hard wood handle, bored throughout its whole length to the diameter of flexible lamp cord. The small end is then counterbored to a larger diameter and a plug is made that will drive tightly into the counterbore. The next step is to procure a large-sized sewing needle, which is driven through the plug as shown in the sketch. The eye end of the needle is soldered to a length of lamp cord which is passed through the handle. The plug is then driven into place and the testing handle is ready for use.

¹Scientific American.**GEISSLER TUBES FROM ELECTRIC LIGHT BULBS.¹**

BY JAMES BAILEY.

Many people have wished to perform experiments with Geissler tubes, but owing to their high cost have not been able to do so.

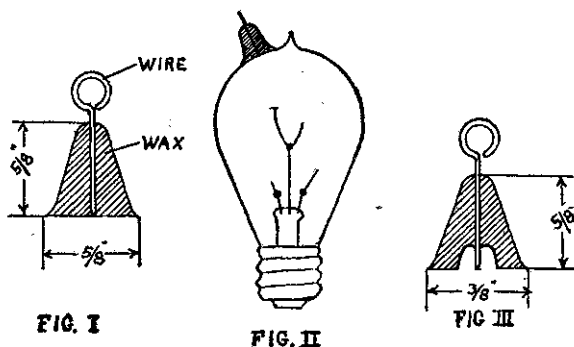
By the following simple and inexpensive method anyone who possesses a one-inch, or larger, induction coil can make a very good substitute for a Geissler tube from any of the standard electric light bulbs. Burned-out lamps or lamps in which the filaments are broken give the best results, and can be had for next to nothing. The effect is much better if the filament is broken into fine pieces, as it then does not interfere with the discharge in the bulb. Metal filaments can easily be broken by striking the lamp with the hand, but in carbon lamps the filament is sometimes so tough that it cannot be broken without injuring the bulb.

First make a cone-shaped lump of sealing-wax with a wire or a pin through the center, as shown in Fig. 1. Then heat the bulb enough to make the wax stick to it, and press the cone against the bulb, holding it there until the wax has set. The end of the wire will now press against the glass, as shown in Fig. 11. Great care should be taken to get the wire and glass stuck in the wax perfectly air tight, as the permanence of the completed tube depends entirely upon this. When the wax is cool, connect the wire to one terminal of the coil and the socket end to the other terminal. The current will puncture the glass directly in front of

¹Scientific American.

the wire and a light bluish glow will fill the bulb. If the wax was stuck to the glass and wire perfectly air tight, no air can leak in through the fine hole made by the spark, and the vacuum will not be destroyed. If air does leak in, the whitish blue color will gradually change to a pinkish glow, and when just the right amount has leaked in, striations will occur as in real Geissler tubes.

Allowing just the right amount of air to leak in is a rather difficult process, but it can be done most simply as follows:



Instead of making a wax cone as in Fig. 1, make a bell-shaped piece, as in Fig. 3. With a sharp file nick the bulb where the end of the wire will come. The purpose of this nick is to help the spark puncture the glass. It should not be made deep enough to allow any air to enter the bulb. Next stick the wax bell on the bulb so that the end of the wire rests in the nick. Connect to the coil as before, and turn on the current. The spark will jump through the glass and whatever air is in the bell will leak into the bulb. By varying the size of the bell different colored glows may be obtained. The wax bell in Fig. 3 shows about the size for the best results with 16-candle-power lamps. Different lamps give different results, so that the exact size of the bell cannot be determined, and striations are more or less a matter of luck. Almost every bulb made as above will show beautiful color effects, each different from the other, and the results are well worth the trouble.

Among the many helpful publications issued by the Carnegie Foundation for the Advancement of Teaching is Bulletin No. 3 on "Standard Forms for Financial Reports of Colleges, Universities, and Technical Schools." The suggestions should be followed by those institutions which are tax-supported and are therefore obliged to submit annually reports of their financial condition. If these reports could be gotten out in such a form that the tax-paying constituency would be interested in reading them, it would work toward strengthening these same institutions in the minds of the public. Boards of Education in some of our cities can profitably take good lessons from this splendid bulletin in presenting their reports to the citizens whom they represent. The bulletin cannot help but assist in making educational institutions more business-like in their management.