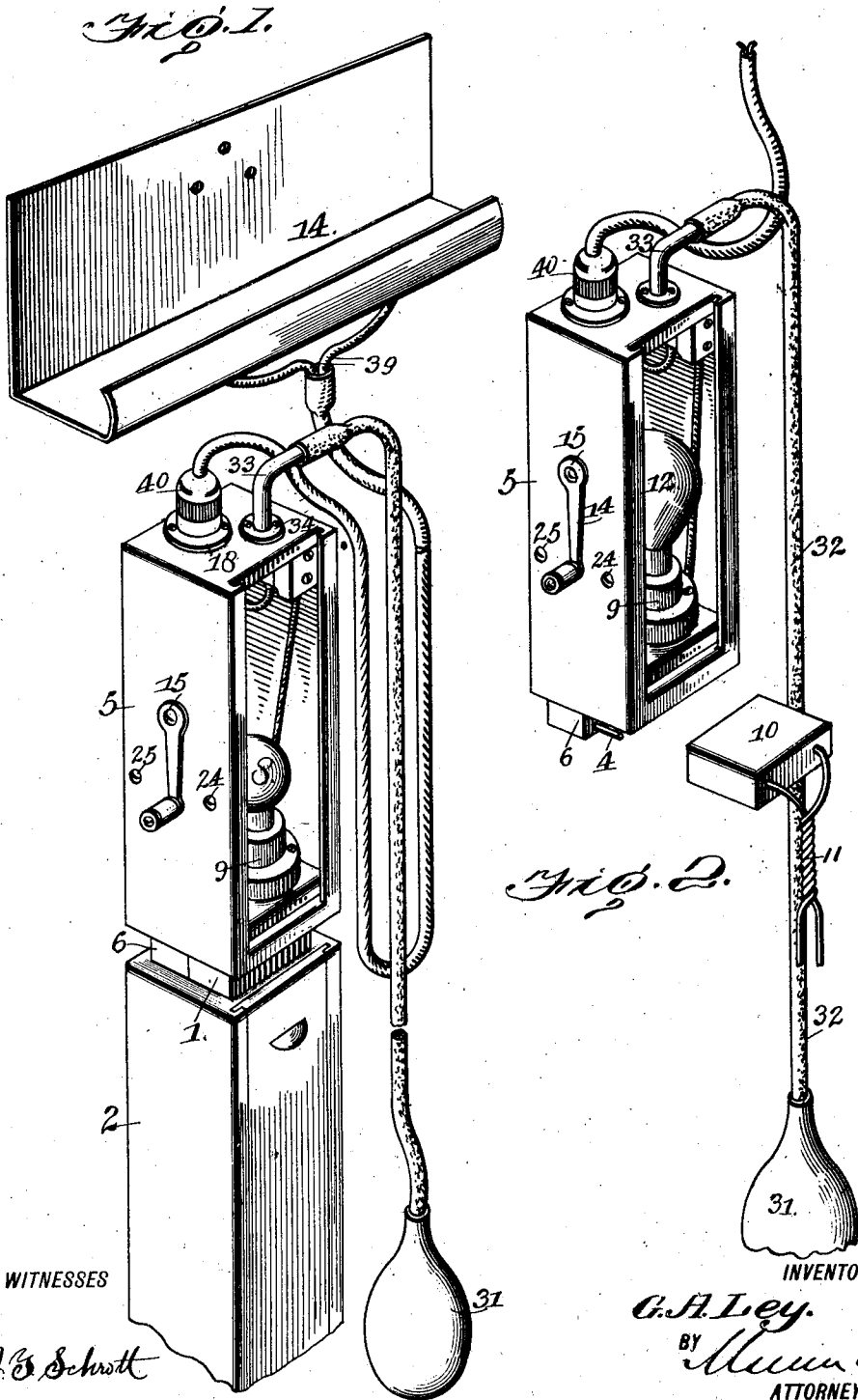


G. A. LEY.
FLASH LIGHT TESTING APPARATUS.
APPLICATION FILED OCT. 27, 1917.

1,345 201.

Patented June 29, 1920.
3 SHEETS—SHEET 1.



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Fig. 4.

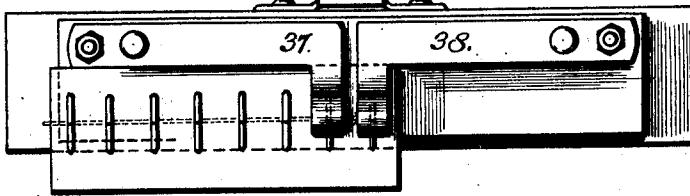


Fig. 5.

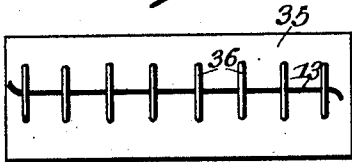


Fig. 3.

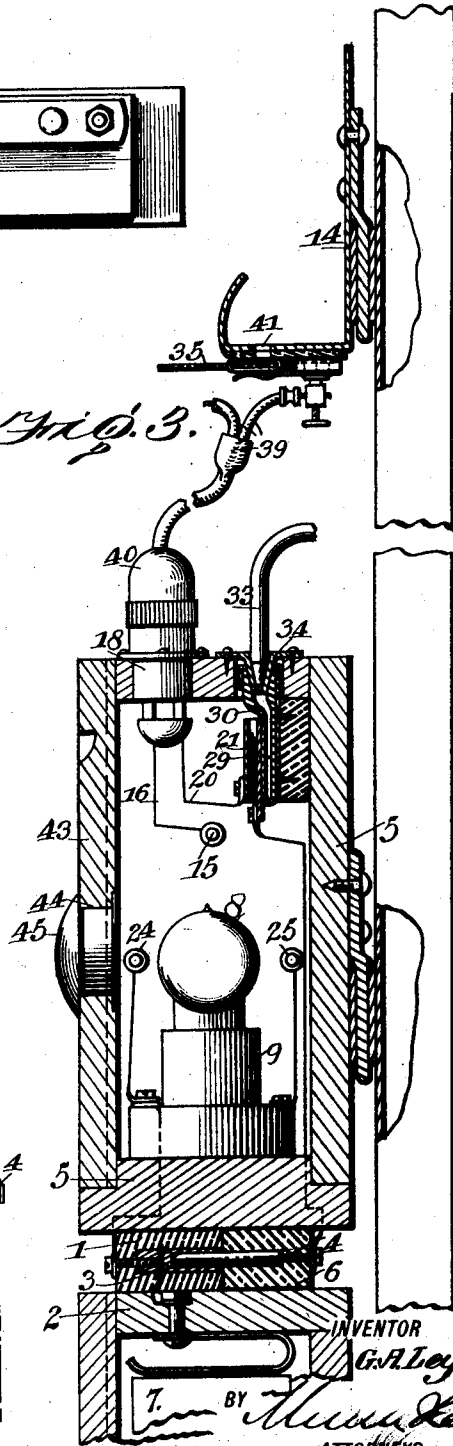
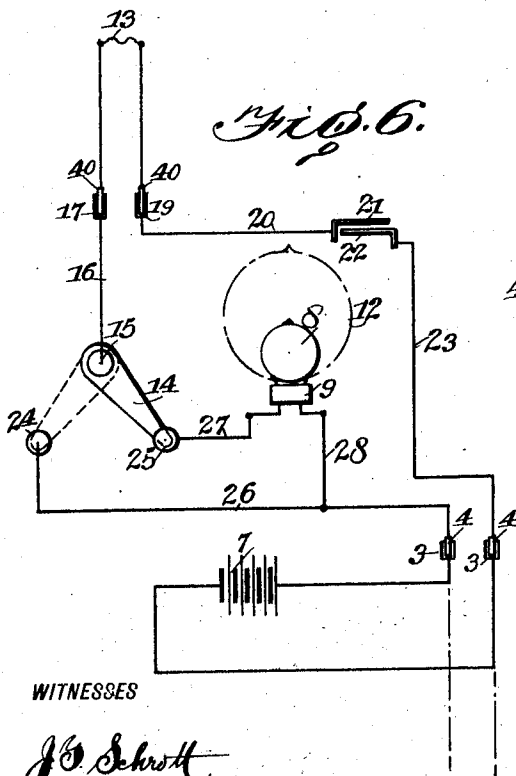


Fig. 6.



WITNESSES

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Fig. 7.

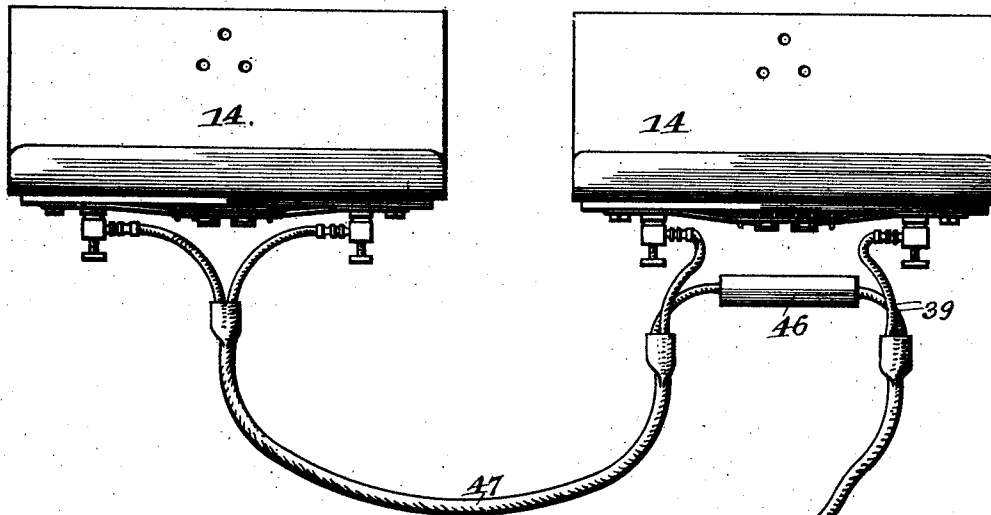
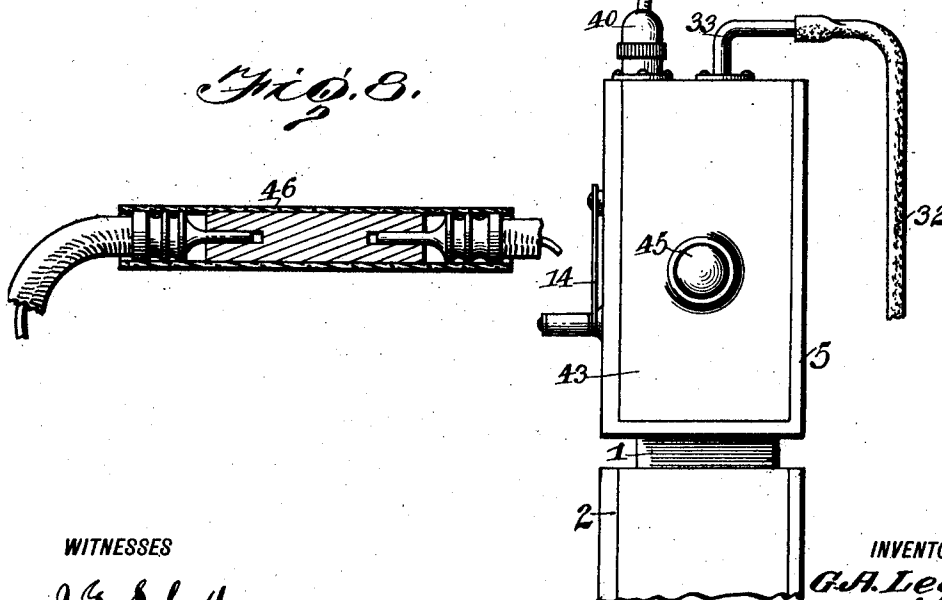


Fig. 8.



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UNITED STATES PATENT OFFICE.

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FLASH-LIGHT-TESTING APPARATUS.

1,345,201.

Specification of Letters Patent. Patented June 29, 1920.

Application filed October 27, 1917. Serial No. 198,829.

To all whom it may concern:

Be it known that I, GEORGE ALBERT LEY, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Flash-Light-Testing Apparatus, of which the following is a specification.

My invention relates to improvements in flashlight testing apparatus, being more particularly an improvement on my Patent Number 1,217,026, dated February 20, 1917, and it consists in the constructions, combinations, and arrangements herein described and claimed.

An object of the invention is to provide a flashlight testing device including a lamp box having a lamp socket mounted therein and adapted to receive either a high or low voltage lamp, a plug receptacle being fixed on the bottom of the lamp box to receive either a connector plug for lighting a high voltage lamp, or the connector plug of a battery box adapted to be thereby affixed to the bottom of the lamp box, and light a low voltage lamp.

Another object of the invention is to provide a flashlight testing device which is adapted to operate interchangeably from one current to another, such as battery current, and direct or alternating current.

Another object of the invention is to provide a flashlight testing device, having a removable battery box, so that when it is not desired to use the battery, a connector plug from the ordinary city current supply may be inserted.

Another object of the invention is to provide a device as described, wherein a plurality of flash pans may be connected in series and the flash powders ignited simultaneously.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings, in which:

Figure 1 is a perspective view of the device, the sliding door of the battery of the lamp box being removed.

Fig. 2 is a detail perspective view of the lamp box showing it removed from the battery box and a connector plug being about to be inserted in place.

Fig. 3 is a vertical section of the device illustrated in Fig. 1.

Fig. 4 is an inverted plan view of one of the flash pans.

Fig. 5 is a detail plan view of one of the fuse cards.

Fig. 6 is a diagrammatic view of the second connections.

Fig. 7 is a detail view showing how a plurality of flash pans may be connected in series, and

Fig. 8 is a section of the connector illustrated in Fig. 7.

It will be observed in the drawings, that many features of the present invention are essentially the same as those in the prior patent referred to, but these features are illustrated in order that a clearer understanding of the operation of the present device may be more readily gotten. The principal difference in the present invention, resides in the provision of a separate battery box which may be removed from the lamp box so that the lamp in the box may be illuminated by the ordinary city current. To accomplish this purpose, either a low voltage lamp capable of ignition from a battery, or a high voltage lamp capable of ignition from a city current connection, may be screwed in place in the lamp box.

Therefore, a plug receptacle 1 is fixed in place on top of a battery box 2, and is provided with a pair of metal sockets 3 into which the plugs 4 carried by a lamp box 5, are adapted to be fitted. The plugs 4 are mounted in dielectric blocks 6 on the bottom of the lamp box 5, the plug receptacle 1 in which the sockets 3 are located, being also made of some suitable dielectric material.

The connection of the battery box 2 with the lamp box 5 through the insertion of the plugs 4 in the sockets 3, simultaneously completes a portion of an electric circuit, and makes a dependable connection for one box on the other, which will hold through considerable handling of the device.

It will be understood that the boxes 2 and 5 are separable. When the battery box 2 is fitted in position as just described, current from a battery 7 located in the box 2 is supplied to a low voltage lamp 8 screwed into a lamp receptacle 9 in the lamp box 5. The arrangement of the parts at such a time is illustrated in Figs. 1 and 3. Should the use of battery current to light a lamp in the lamp box 5 be undesirable, the low

voltage lamp 8 and the battery 2 are removed. A plug receptacle 10 is slipped over the plugs 4, instead. The receptacle 10 has the usual wires 11 which are connected to any suitable source of the ordinary city current. A high voltage lamp 12 is screwed in position in the lamp receptacle 9 in place of the low voltage lamp 8.

In either case, *i. e.*, when the lamp 8 or the lamp 12 is in position, the resistance of the lamp is sufficiently high to prevent the fuse 13 carried by the flash powder pan 14, from becoming hot enough to ignite the flash powder. In other words, the lamps 8 and 12 used in either connection, are of a sufficiently greater resistance than the igniting fuse 13, so that only as much current will pass through the fuse as the lamp will consume in lighting the lamp. It will thus be understood that when the fuse 13 is properly adjusted so that upon reversing the switch connections presently to be described, the flash powder will be ignited, either the lamp 8 or the lamp 12 will be lighted and thus indicate to the operator that the fuse is in such proper position and will not fail to ignite the flash powder at the proper time.

The circuit connections may be best understood from Fig. 6. A switch arm 14^a is pivoted at 15 on the outside of the lamp box 5. A wire 16 connects the pivot 15 with one socket 17 of a plug receptacle 18 in the top of the box. The other socket 19 of the same plug receptacle, connects through a wire 20 with one member 21 of a pneumatic switch. The other member 22 of the pneumatic switch, is connected through a wire 23 with one of the plugs 4 mounted in the block 6 on the bottom of the box 5. The switch arm 14^a is adapted to engage either one of a pair of contacts 24 and 25. The contact 24 is connected to the other plug 4 carried by the block 6, by a wire 26. A wire 27 connects the other contact 25 with one terminal of the lamp receptacle 9. The other terminal of the lamp receptacle, is connected to the wire 26 through the wire 28.

The pneumatic switch referred to above, consists essentially of the two members mentioned, of which the member 21 is fixed upon a dielectric block 29 secured in the lamp box 5, as illustrated in Fig. 3. The member 22 of the switch is movably mounted and is arranged to be pressed into engagement with the contact 21, upon the distension of a rubber teat 30 located between the contact 22 and the base of the contact 21.

The teat 30 is distended by pressing a rubber bulb 31 connected through a tube 32 to a nozzle 33 frictionally held in the mouth of the teat 30 by a metallic plate 34 with a tapered collar upon which the end of the teat 30 is slipped.

The fuse 13 above referred to, as well as the flash pan 14, is of substantially the same construction as that illustrated in my former patent. The fuse 13 consists of a relatively long wire held on a card 35 by a plurality of metallic clips 36. The clips are spaced equal distances apart and are adapted to be fitted into place beneath the flash pan 14, in engagement with one of a pair of spring contact arms 37 and 38. The contact arms 37 and 38 have binding posts as shown, to which wires 39 which have the plug 40 at the other end, are connected. The plug 40 includes the plug members which are slipped into the sockets 17 and 19 of the plug receptacle 18 in the top of the lamp box 5. As each section of the fuse 13 between the metallic clips 36 is burnt out, the card 35 is simply moved up until the next fuse section is in place and the metallic clips 36 at the side, are in engagement with the ends of the spring arms 37 and 38.

The flash pan 14 has a hole 41 in the bottom. The fuse section 13 is disposed directly beneath this hole. The flash powder is then heaped upon the flash pan 14, some of it entering the hole 41 and surrounding the fuse 13. By heating the fuse 13 red-hot, the flash powder, of course, ignites.

As incidental features of construction, the front wall of each of the boxes 2 and 5, is in the nature of a slide 42 and 43, respectively. The lateral edges of the sides of the boxes are suitably rabbeted to receive tongues on the slides. Each slide also has a thumb notch so that it may more readily be removed. The slide 43 of the lamp box 5 has a window 44 which may either be open or be provided with a lens 45, as shown in Fig. 3 of the drawings.

Another feature of the invention resides in connecting a plurality of the flash pans 14 in series, as illustrated in Fig. 7. The construction of each of the flash pans and its cooperating parts, is in each instance the same. A connector 46 is made use of for connecting certain portions of the wires. A connector wire 47 joins each pair of the flash pans. Obviously, were another flash pan 14 added, one of the ends of the connector wire 47 at the left, would be inserted into another connector 46, and so on. The fuse of each of the flash pans is tested in precisely the same manner as it would were there only one flash pan.

The operation of the device is as follows: A quantity of flash powder is heaped upon the bottom of the flash pan 14, covering the opening 41 and surrounding the fuse 13 disposed at the bottom of the opening. It is now desired to be known whether the fuse 13 is in proper position to complete an electrical circuit therethrough to heat the fuse and ignite the powder. The fuse 13 is in such proper position, when the spring arms

37 and 38 properly bear on the metallic clips 36 at the sides of the fuse section. Obviously, should a particle of dirt get between one of the metallic clips 36 and its coating
5 spring arm, the circuit would be interrupted, and when the time came to ignite the flash powder, a failure to do so would result.

If a low voltage lamp is to be used in connection with the battery 7, the battery box 2
10 is slipped in place by fitting the plugs 4 in the metal sockets 3, which thereby simultaneously form connectors for supporting the battery box, and also complete a portion of the electrical circuit to the lamp from the
15 battery. The switch arm 14^a is then moved into engagement with the contact 25.

The bulb 31 of the pneumatic switch is also pressed to close the circuit at the contact members 21 and 22. Current then flows
20 from the positive pole of the battery 7 over the wire 28 to the low voltage lamp 8, over the wire 27, switch arm 14^a, wire 16, through fuse 13, over wire 20, through contacts 21 and 22, over wire 23, and back to battery.
25 The lamp 8 will be lighted, but the fuse 13 is supposed not to get hot enough to ignite the flash powder. When a high voltage lamp 12 is used, the battery box 2 is, of course, taken out and the plug receptacle 10
30 leading to the city current is slipped in place. The low voltage lamp 8 is also removed and the lamp 12 screwed in place of it. The switch arm 14^a is moved over to the contact 24, when the passage of the current from the
35 source through the fuse 13 will be substantially the same as it was before.

While the construction and arrangement of the device as illustrated in the accompanying drawings is that of a generally
40 preferred form, obviously modifications and

changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a testing device interchangeably 45 usable with high and low voltage currents, a lamp box having a receptacle for a lamp, a plug on the bottom, a battery box, and a plug socket on the top of the battery box joining said boxes when the plugs are fitted 50 together, the battery box being detachable by separating the plugs when high voltage current is used.

2. In a flashlight testing device, the combination of the igniting mechanism, a light 55 box containing a lamp in circuit with said mechanism, an attachable battery box containing a battery, and a connector plug and socket on the bottom and top of the respective boxes, adapted to be fitted together to 60 join said boxes and simultaneously complete the battery circuit.

3. A flashlight fuse testing apparatus comprising an electrical circuit terminating in plugs, a flashpowder igniting fuse of an 65 adopted gage embodied in the circuit and adapted to enable the operation of the apparatus regardless of the voltage of the current employed, a lamp receptacle in the circuit for receiving a lamp of either high or low 70 resistance to enable the operation of the apparatus by either lighting or battery current, and a battery box containing a battery, provided with a plug receptacle for completing the low voltage circuit and providing 75 means for attaching the box.

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Witnesses:

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JOS. H. HEIM.