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FLASHLIGHT AND ELECTRICAL TESTING DEVICE

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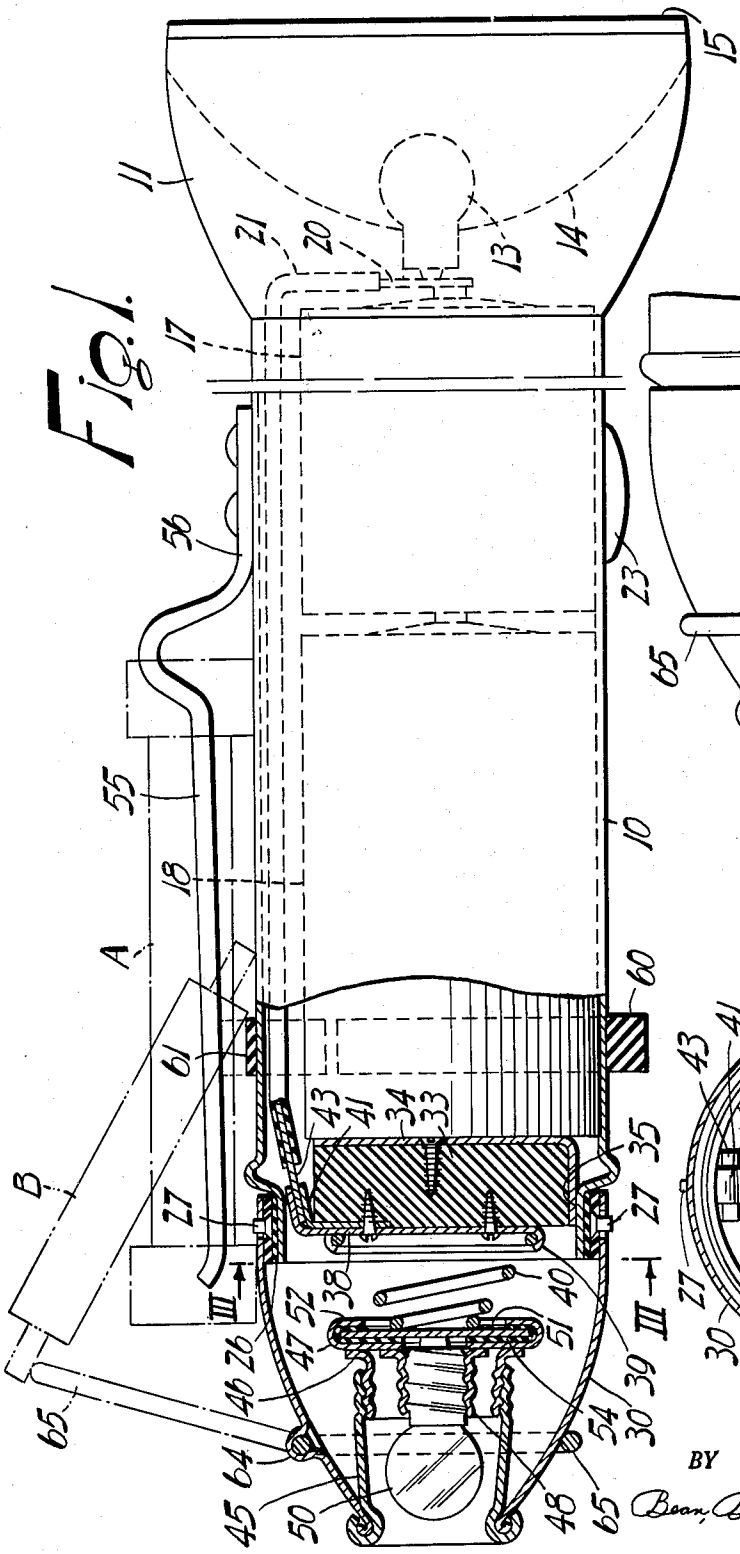


Fig. 1.

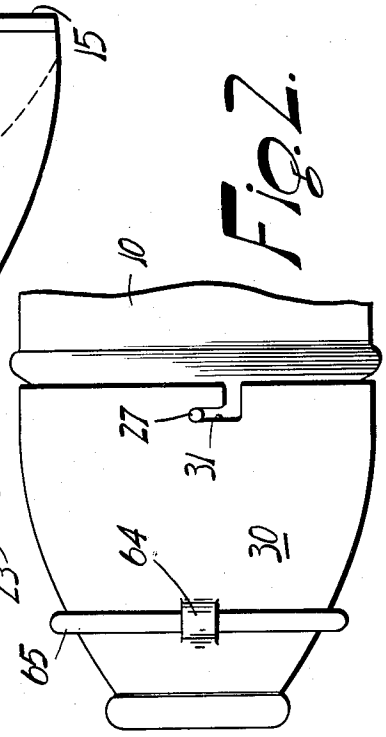


Fig. 2.

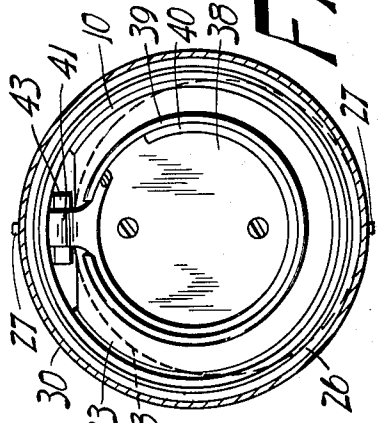


Fig. 3.

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FLASHLIGHT AND ELECTRICAL TESTING DEVICE

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1 Claim. (Cl. 324—53)

This invention relates to a combination flashlight and electrical testing device.

In the prior art various electrical testing devices energized by means of dry cells have been proposed. Some of these prior art devices have been generally more or less in the form of a conventional flashlight and, further, some of the prior art proposals have included means whereby they may be used either as a flashlight or as a testing device. In these prior art proposals it has generally been necessary to incapacitate the flashlight function in order to utilize the apparatus as a testing device. However, since electrical testing must often be carried out in dark places or where the light is poor, it is unsatisfactory to use a device where the illuminating function of the flashlight must be interrupted to permit use of the testing arrangement.

The present invention provides means whereby the device may be continuously used for illuminating purposes without interruption for testing purposes. The device of the present invention further provides means whereby a wide variety of devices, such as fuses of various sizes and shapes, may be tested by direct application and without the necessity for connecting terminal wires or the like.

While a single complete embodiment of the principles of the present invention is shown in the accompanying drawing and described in detail in the following specification by way of example, it is to be understood that such embodiment is merely illustrative, and that the principles of the invention are not limited thereto or otherwise than as defined in the appended claim.

In the drawings:

Fig. 1 is a longitudinal elevational view of one form of the device of the present invention with portions thereof broken away and partially shown in longitudinal cross-section;

Fig. 2 is a similar view but showing only one end portion of the device of Fig. 1 in elevation; and

Fig. 3 is a cross-sectional view on the line III—III of Fig. 1.

In the several figures of the drawing like characters of reference denote like parts, and the numeral **10** designates a metallic tubular main casing member. One end of the casing **10** is provided with an enlargement **11** which is attached to the casing **10** in any conventional manner and houses a conventional lamp **13**, reflector **14**, and lens arrangement **15**. The casing **10** contains a pair of conventional end-to-end dry calls **17** and **18**.

The central electrode of dry cell **17** is in permanent electrical contact with the central terminal of lamp **13** in the usual manner, excepting that, for purposes which will presently appear, the bare end **20** of an insulated conductor **21** is interposed between the dry cell electrode and the lamp terminal. The switch indicated only in outline at **23** in Fig. 1 is likewise entirely conventional and controls only the condition of lamp **13** in the usual manner.

Reference will now be had chiefly to the opposite end of casing **10** which is provided with testing and illuminating means which, while energized by dry cells **17** and **18**, operates entirely independently of lamp **13** and regardless of whether lamp **13** is energized or not. Such opposite end of casing **10** is reduced in diameter as shown in Fig. 1 and is provided with an encircling insulating band **26** which is preferably cemented or otherwise fixed to the reduced end portion of casing **10**, and in the present instance is laminated and gives fixed support to a pair of pins **27** in such manner that pins **27** are insulated from casing **10**.

An end cap member which is generally of dome shape is designated **30** and has an end portion which fits over the insulated end of casing **10** and is provided with bayonet slots **31** for removable engagement with pins **27**. A generally circular insulating block is designated **33** in Fig. 1, and a cup-shaped encasing member **34** is fixed to block **33** in any desired manner.

The radial face of cup member **34** is in electrical engagement with the bottom end of dry cell **18**, and the circular wall of member **34** is in permanent electrical engagement with the interior of casing **10** as indicated at **35** in Fig. 1.

A generally circular plate of conducting material **38** is secured to the opposite face of block **33** and is flanged throughout most of its circumference as at **39** to provide an anchoring seat for a coil spring **40**. At one part of its periphery plate **38** is provided with a radial extension which is offset and formed to provide a socket member **41**. Block **33** and cup-shaped member **34** are notched to accommodate socket **41**, the latter being out of electrical conductance with cup-shaped member **34**.

The insulated conductor **21** described previously extends through casing **10** between the casing and the walls of the dry cells and has its opposite end **43** disposed in socket **41** so as to establish permanent electrical connection between the central electrode of dry cell **17** and plate **38** and spring **40**.

The outer reduced end of cap member **30** has fixed thereto, as by curling or spinning, a metallic sleeve member **45** which is threaded at its inner end to receive complementary threads formed on an annular flange element **46**, the latter being fixed to a circular plate **47** which likewise has fixed thereto a threaded socket formation **48** for receiving the threaded base of a lamp **50**. A contact plate **51** is clamped between a peripheral return bent flange **52** on plate **47**, and a sheet of insulating material **54** is interposed between contact plate **51** and plate **47** so that they are permanently insulated from each other.

The plate **47** has a central opening of such size that the central terminal of lamp **50** passes freely therethrough for electrical engagement with contact plate **51** and the outer end of coil spring **40** engages against the opposite face of contact plate **51**. Thus, the assembly of cap member **30** with casing **10**, through the intervention of spring **40**, presses the insulating cup-shaped member **34** of block **33** firmly against the bottom of dry cell **18**.

An elongate resilient clip **55** is fixed to casing **10** as at **56** and extends throughout most of the length of casing **10** to provide, among other things, a pocket clip. It will be noted that pressing the outer free end of clip **55** against cap member **30** completes an electrical circuit for lamp **50** by way of the clip **55**, cap **30**, sleeve **45**, flange member **46**, plate **47**, lamp socket **48**, through the filament of lamp **50**, the central terminal of the lamp, contact plate **51**, spring **40**, plate **38**, socket **41**, through conductor **21**, to the positive terminal of the dry cell **17**, through the dry cells, cup-shaped member **34**, and casing **10**, back to clip **55**.

An insulating ring **60** encircles casing **10** and is rotatable thereon. Ring **60** is notched as at **61** and when notch **61** is in registry with clip **55**, the latter may serve as a switch for energizing lamp **50**. If ring **60** be rotated to any sub-

stantial degree, its main body portion prevents unintentional engagement of the outer end of clip **55** with cap member **30**.

The present apparatus may be used to test a wide variety of plug and cartridge fuses. Where the terminals of the fuse are in close proximity, as in plug fuses, the terminals of the fuse may be engaged directly against casing **10** and cap member **30**, whereupon lamp **50** will illuminate if the fuse is sound. The manner in which longer cartridge fuses are positioned for test purposes is indicated in dot-and-dash lines at A in Fig. 1.

Cap member **30** is provided with a hinge formation **64** which gives pivotal mounting to a ring **65**. In the position shown in Fig. 2 and in full lines in Fig. 1, ring **65** is in a stored or parked position. Ring **65** may be swung out to attach the device to any desired support or for securement to a belt or other apparel of a user. The ring **65** further serves as a movable electrical terminal for cap member **30**. Some fuses, such as the one shown at B in Fig. 2, have reduced end terminal portions, and in such case the ring **65** may be swung to facilitate engaging the opposite terminals of the fuses with casing **10** and cap member **30** for testing purpoes.

What is claimed is:

In combination with a flashlight comprising a cylindrical casing, a head assembly comprising a lamp housing and an incandescent lamp therein, dry cell means in said casing in series contact with one of the terminals of said lamp and with said casing, and manual switch means operable to connect said casing selectively with the other terminal of said lamp; an alternative line continuity testing circuit energized by said dry cells and comprising auxiliary casing means at the end of said cylindrical casing opposite to the head assembly and attached to said cylindrical casing but insulated therefrom, a lamp supported in said auxiliary casing with one of its terminals in contact with said auxiliary casing, and conductor means between the other terminal of said last-mentioned lamp and the said one terminal of the first-mentioned lamp, whereby temporarily electrically connecting the cylindrical casing and the auxiliary casing establishes a circuit for the second-mentioned lamp, said alternative testing circuit operable independently of said flashlight.

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