

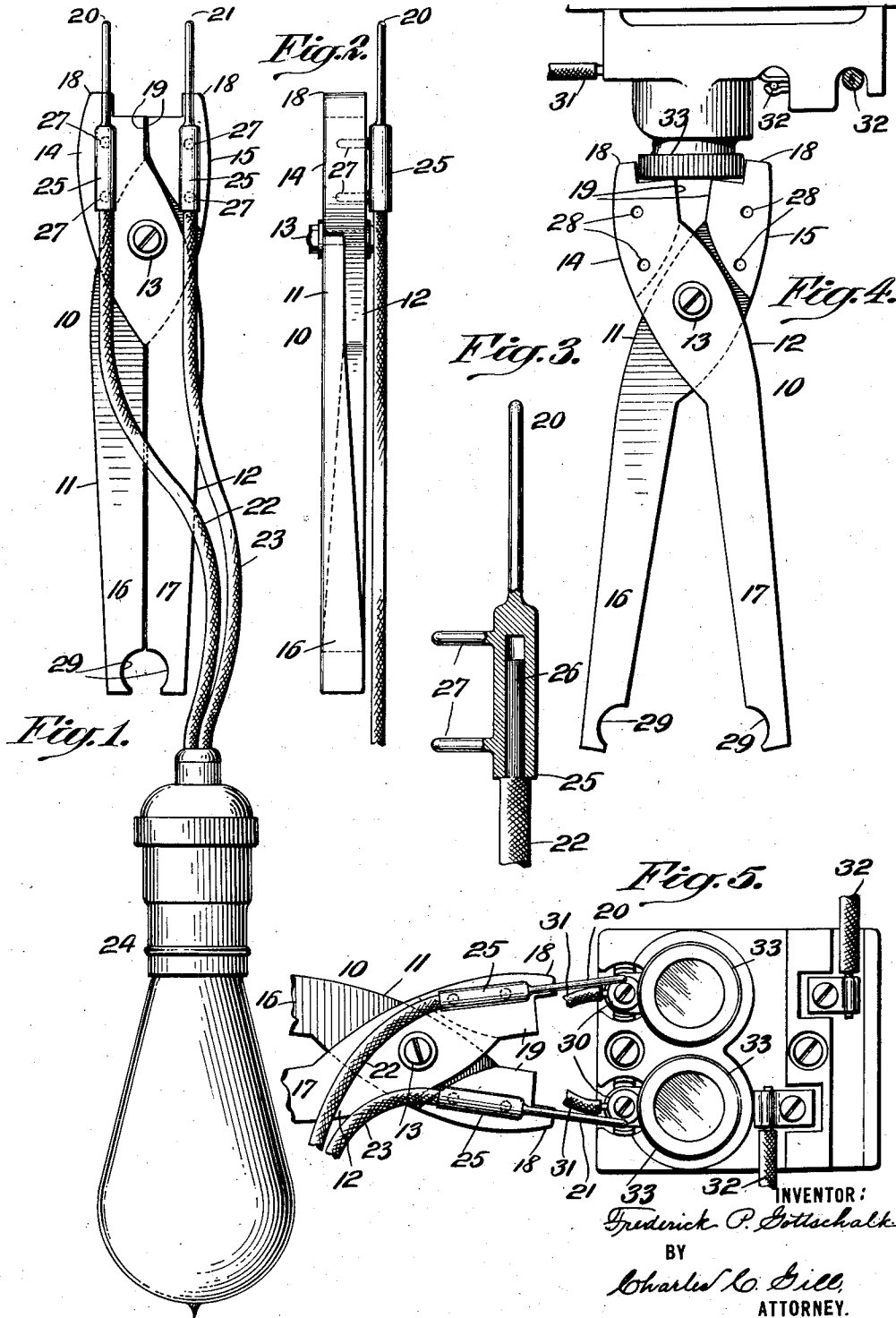
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TOOL FOR THE USE OF ELECTRICIANS.

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The invention pertains to testing tools for the use of electricians in locating a defective fuse in an electric circuit, the tool also being adapted for the removal of a defective fuse and its replacement by a new fuse.

The tool of my invention comprises a pair of bars pivoted together, in the nature of pliers, having specially-shaped jaws and equipped with detachable conductors connected with an electric lamp bulb, said conductors being intended for application to circuit connections in which fuse plugs or other fuses are interposed, so as to determine whether or not the fuse has become defective, the electric lamp lighting, due to the circuit, when the fuse has not become defective and remaining dark when the fuse is defective. The fact that the electric lamp remains dark in the testing of a fuse plug or fuse, is an indication to the operator that the circuit has become broken at the fuse. The tool of my invention is, therefore, intended for locating defective fuses and also for removing a defective fuse, when found, and replacing the same with a new fuse. The pivoted bars constituting the body of the tool are each in one piece and are of insulating material, and said bars may be opened out and closed together, similar to other tools, such as pliers, shears and the like.

The conductors for locating a defective fuse are detachably connected with the members of the tool for convenience in carrying, packing and utilizing the tool.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Fig. 1 is a top view of a testing tool constructed in accordance with and embodying the invention;

Fig. 2 is an edge view, partly broken away, of the same;

Fig. 3 is a sectional view, partly broken away, of one of the testing conductors detached from the tool;

Fig. 4 is a top view illustrating the application of the tool for applying or removing a fuse plug, and

Fig. 5 is a top view, partly broken away, illustrating the method of applying the tool for testing fuses of one character located in an electric circuit.

In the drawings, 10 indicates the testing tool as a whole, and 11, 12 designates the two bars comprising the body of the tool, said

bars being pivoted together at 13, and forming jaws 14, 15 at their forward ends and handles 16, 17 at their other ends. The bars 11, 12 may be opened and closed, after the manner of an ordinary pair of pliers, said bars turning on the pivot 13 and being shown as closed together in Fig. 1 and spread open in Figs. 4 and 5. The bars 11, 12 may be of suitable outline in exterior form, but in accordance with my invention the inner edges of the jaws 14, 15 and handles 16, 17 are straight and parallel with each other and normally come together, or substantially so, in the closed position of the tool, as I illustrate in Fig. 1. The jaws 14, 15 correspond with each other, except that they are in reversed relation, and each jaw has a forwardly projecting member 18, and an inner straight edge 19 extending inwardly toward the pivot of the tool. The forwardly projecting members 18 constitute jaws adapted for one class of work, and the straight edge portions 19 constitute jaws for a different class of work, and hence the jaws 14, 15 are of special construction intended to facilitate the necessary work of an electrician in applying and removing fuse plugs or fuses.

The jaws 14, 15 are primarily intended to carry the testing conductors 20, 21 which are in electrical connection with conductors contained in insulating material 22, 23 leading to an electric lamp 24 of customary character. The conductors 20, 21 are formed at their rear ends with sleeves 25 into which the wires 26 contained in the cables 22, 23 are inserted, as shown in Fig. 3, as a means for electrically connecting the lamp conducting wires with the conductors 20, 21. The sleeves 25 are formed with laterally extending pins or projections 27, and these projections are adapted for insertion within the recesses or sockets 28 formed in the faces of the jaws 14, 15 so as to connect the conductors 20, 21 with the tool 10 and permit of the use of said conductors for testing plugs, wires and other connections placed at varying distances apart. The tool 10 detachably receives the conductors 20, 21, and said conductors are used only for testing purposes and may be moved outwardly from each other to varying distances by the opening out or spreading of the handles 16, 17 and jaws 14, 15, as will be understood on reference to Fig. 5. I prefer the employment of two projections 27 on each conductor 20 and 21 and two recesses or sock-

ets 28 in each of the jaws 14, 15 so as to very securely connect the said conductors with said jaws and prevent any swiveling of the conductors at their connection with the jaws. The conductors 20, 21 project forwardly beyond all of the other portions of the instrument so that they may reach the various locations required without interference from the body portions of the tool. I prefer to connect the lamp circuit wires with the conductors 20, 21 in the manner shown in Fig. 3, but obviously this connection may be formed in various ways which will be readily understood by an electrician. The construction shown in Fig. 3 is however, one of efficiency and capable of being carried into practical effect.

The rear ends of the handles 16, 17 are correspondingly recessed out in their facing inner edges, as at 29, so as to form a pair of gripping jaws adapted to seize a cartridge fuse for withdrawing the same from its supports, and also to receive a new cartridge fuse for application to the supports therefor. The jaws formed by the recesses 29 are useful in connection with cartridge fuses because with their use the electrician is not compelled to place his hands in any position likely to result in his receiving a shock from the current.

The bars 11, 12 constitute the body of the tool and will be formed of wood or other non-conducting material, and hence the tool may be employed for testing purposes and for the other duties to which it is adapted without danger of electric shock to the person handling the tool.

In Fig. 5 I illustrate one use of the tool for testing fuse plugs so that a defective plug may be located, and in Fig. 5 it will be seen that the handles 16, 17 have been opened outwardly to spread the jaws 14, 15 and so position the conductors 20, 21 that they may be applied to the binding portions 30 from which the incoming circuit wires 31 extend, 32 denoting the main or feed wires. Between the main and incoming wires are the customary fuse-plugs 33. The application of the conductors 20, 21 to the binding portions 30, in the manner shown in Fig. 5, is for the purpose of determining whether the hidden fuses have been blown out, and in the event that a fuse has become defective, the circuit between the wires 32, 31 will become broken and this fact will be determined by the lamp bulb 24 which will remain dark if the hidden fuses have become defective, since then no current can pass through the conductors 20, 21 to the lamp which will light if the said fuses are in perfect condition, since the current will then pass through the conductors 20, 21 and light the lamp. If it should be found that the fuse is defective, by the lamp remaining dark, the fuse-plug should be removed and a new plug

substituted therefor, and the process of removing and re-applying the fuse-plug is indicated in Fig. 4, in which it may be seen that the jaws 14, 15 have been applied to the top or outer end of the plug in position to be employed as a wrench or pair of pliers for unscrewing the plug and removing it from the base or of applying a new plug in position on the base. The jaws 14, 15 are opened out and applied against the fuse-plug cap in such manner that the members 18 of the jaws will grip the edges of the cap and that the outer end of the cap may lie within the recess formed at the forward end of the tool between the jaw members 18. When the presence of the conductors 20, 21 and lamp 24 result in any inconvenient use of the tool for removing or applying a fuse-plug, said conductors and lamp may be readily detached from the tool by withdrawing the pins 27 from the recesses 28 of the jaws 14, 15, and thereafter the conductors 20, 21 may be reapplied to the jaws 14, 15 for further use in testing. If in testing for a defective cartridge fuse it should be found necessary to remove a fuse, the jaws formed at the rear ends of the handles 16, 17 will be employed, as hereinbefore mentioned. If the fuse should be a plain wire fuse of the kind commonly employed, it may be removed by gripping the same between the plain surfaces 19 of the jaws 14, 15, said edges by coming close together in the manner shown in Fig. 1 adapting the jaws 14, 15 for the extraction or withdrawal of a wire fuse.

The conductors 20, 21 and lamp 24 may be removed from the tool 10 for convenience in packing and carrying the instrument and may also be removed when their presence interferes with the convenient use of the instrument as a pair of pliers. In the construction presented the conductors 20, 21 may with entire convenience be applied to and removed from the jaws 14, 15, and said conductors by being on the upper face of said jaws are exposed and their application to the opposite points of a circuit connection may be readily performed. The mounting of the testing conductors 20, 21 on the jaws 14, 15 is of considerable importance because the separation between testing points in electric circuits vary, and the present tool permits of the lateral movement of the conductors 20, 21 so as to adapt the tool for testing circuits under all usual conditions.

The tool of my invention, as will be understood from the foregoing description, is of special use to electricians in locating defective fuses, and removing such fuses and replacing the same with new fuses, the one tool serving for the detection of the defective fuses, and facilitating the work of removing defective fuses and replacing them with new fuses.

The tool is so formed that it possesses great durability and compactness, and by reason of the inner facing edges of the two bars normally coming together, said bars are not liable to become broken or distorted when placed with other tools and relieve the pivot of strain except when the tool is in actual use, and in addition said construction of the bars permits of the use of both ends of the tool for removing or applying fuses.

What I claim as my invention and desire to secure by Letters Patent, is:

A hand-tool of the character described

for the use of electricians, comprising a pair of pivoted together crossed bars affording handles at one end and jaws at the other end, forwardly projecting testing conductors mounted on said jaws and an electric lamp in circuit with said conductors, said conductors having laterally extending pins on their rear portions, and said jaws having sockets to detachably receive said pins.

Signed at New York city, in the county of New York and State of New York, this 30th day of November, A. D. 1920.

FREDERICK P. GOTTSCHALK.