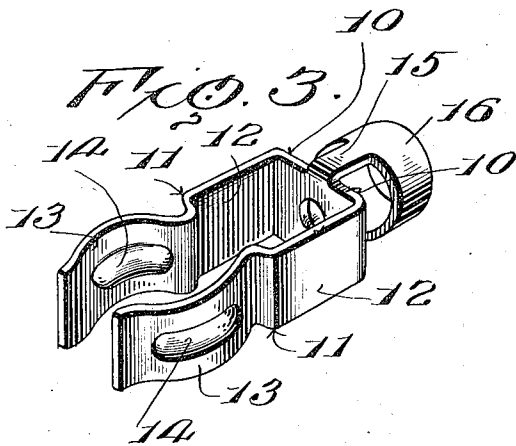
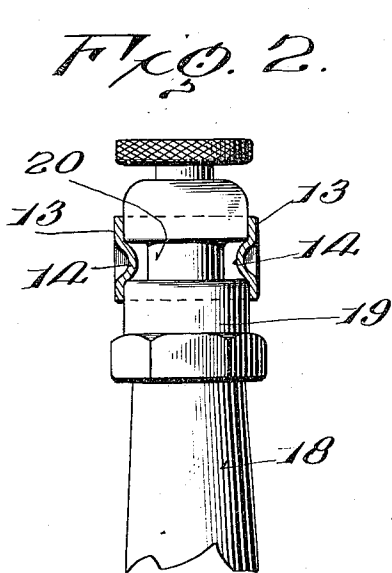
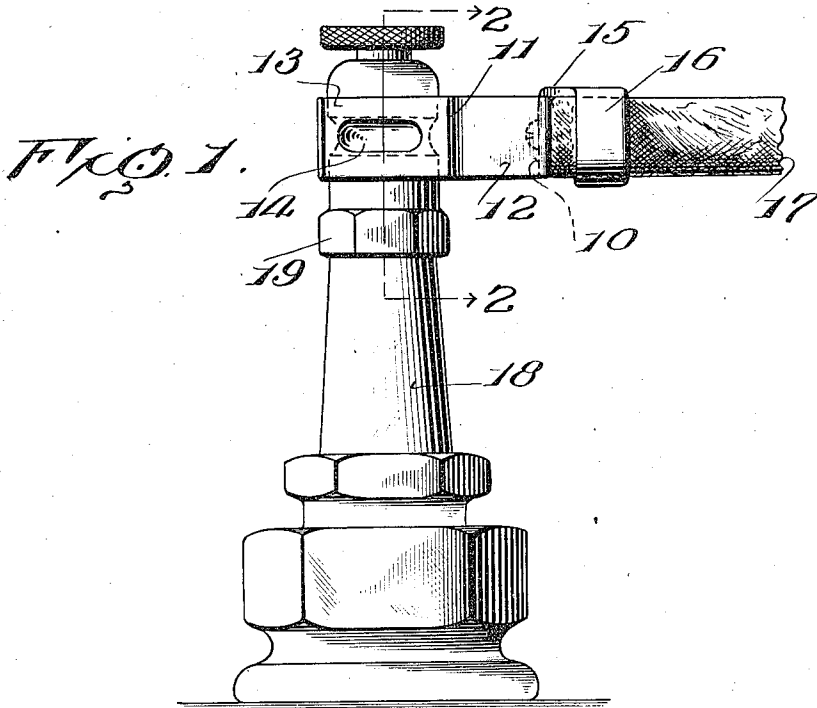


A. G. GROENENSTEIN.
 TERMINAL CLIP FOR ELECTRIC WIRES.
 APPLICATION FILED JULY 13, 1917.

1,297,560.

Patented Mar. 18, 1919.



Inventor
A. G. Groenestein
 By *Lucy Tracy* Attorneys

UNITED STATES PATENT OFFICE.

ARNOLD G. GROENENSTEIN, OF ELYRIA, OHIO.

TERMINAL CLIP FOR ELECTRIC WIRES.

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Specification of Letters Patent.

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Application filed July 13, 1917. Serial No. 180,406.

To all whom it may concern:

Be it known that I, ARNOLD G. GROENENSTEIN, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Terminal Clips for Electric Wires, of which the following is a specification.

This invention relates to improvements in terminal couplings for electric wires, and has for one of its objects to provide a simply constructed device which may be readily attached or detached.

And a further object of the invention is to provide a device of this character which will be held in position with sufficient force to prevent accidental displacement in any direction.

With these and other objects in view, the invention consists in certain novel features of construction, as hereinafter shown and described and then specifically pointed out in the claim.

The improved device is designed more particularly for coupling a conductor wire to a spark plug, and for the purpose of illustration is shown thus applied. In the drawings:

Figure 1 is a side elevation of a conventional spark plug with the improvement applied;

Fig. 2 is a fragmentary elevation of a portion of a plug with the attachment in section on the line 2—2 of Fig. 1; and

Fig. 3 is a detached perspective view of the coupling clip.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The improved device comprises a clip formed from a single strip of metal bent into substantially U-shape to provide a base portion 10 having spaced resilient arms 11 projecting laterally therefrom at substantially right angles. Adjacent their inner extremities the said arms extend in substantial parallel relation to provide a pair of confronting straight gripping jaws 12 and are thence bent in reverse directions to provide a pair of confronting arcuate gripping jaws 13 at the outer extremities of said arms. Formed in the jaws 13 are inwardly directed longitudinal ribs 14. As particularly shown in Fig. 3 of the drawings, the arms 11 are, at the inner ends of the jaws 13, bent inwardly toward each other to provide a re-

duced throat between the pairs of jaws. Extending laterally from the base 10 of the clip is an arm 15 carrying at its outer end a sleeve 16. This sleeve is, as shown in Fig. 1, designed to receive a conductor there-through, as conventionally shown at 17, the circuit wires of the conductor being connected to the base 10 of the clip, and will reinforce the connection between the clip and the conductor.

In Figs. 1 and 2 of the drawings, I have shown my improved device in connection with a conventional type of spark plug 18. At its upper end this plug is equipped with a head 19 in which is formed an annular channel 20. As will be seen, the arcuate gripping jaws 13 of the clip are adapted to engage around the head at the channel 20 therein, so that the ribs 14 of said jaws will engage within the channel. The jaws will possess sufficient resiliency to retain the clip upon the plug by friction only and will thus grip the plug for preventing accidental longitudinal displacement of the clip from the plug. At the same time, the ribs 14 of the jaws will bear within the channel 20 for preventing accidental vertical displacement of the clip from the plug. The clip will thus be firmly held against movement in both a lateral and longitudinal direction with respect to the plug as well as against any pressure or strains which would be imparted thereto in use. However, the clip may, nevertheless, be rotated upon the plug or readily detached therefrom by simply exercising a pulling strain thereon sufficient to overcome the resiliency of the arcuate gripping jaws.

It is now to be observed that the jaws 12 of the clip are adapted to receive the squared head of a spark plug or electrode therebetween to resiliently engage with opposite flat faces of said head for connecting the clip therewith. When these jaws are so engaged with a squared head, the inwardly turned portions of the arms 11 at the inner ends of the pair of arcuate jaws 13 will engage the outer side of the head to prevent accidental rearward displacement of the clip through the reduced throat between the pairs of jaws. The clip may thus not only be connected to a spark plug or other electric terminal having a circular head but may, with equal facility, also be connected to a spark plug or terminal having a squared head. The adaptability of the device is accordingly enhanced materially while, at the

same time, the resilient arms of the clip will act to frictionally hold the clip against accidental displacement without regard as to whether the clip is engaged by the straight jaws thereof or is engaged by its arcuate jaws.

Having thus described the invention, what is claimed as new is:

10 A terminal clip for electric conductors including a straight base portion, a pair of spaced resilient jaws extending at right angles from the ends of the base portion in substantially parallel relation, a pair of outwardly bowed resilient arcuate jaws. off set

portions extending from the outer ends of the straight jaws inwardly therebetween and connecting the inner ends of the arcuate jaws therewith, a sleeve, and an arm connecting the sleeve with the base portion and supporting the said sleeve spaced at its inner end from the said portion whereby a conductor wire may be fitted through the sleeve and connected with the base portion through the space between the sleeve and the said base portion.

In testimony whereof I affix my signature.

ARNOLD G. GROENENSTEIN. [L. S.]