June 7, 1927. 1,631,914

M. U. CAILLAU

ELECTRICAL CONNECTER

Filed Sept. 26, 1924

Fig. 1

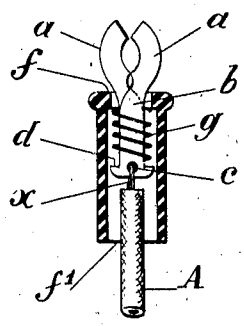


Fig. 2

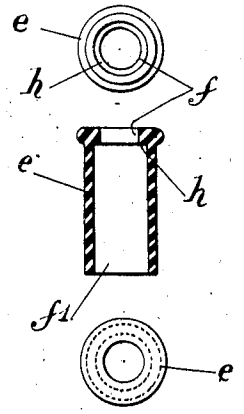


Fig. 3

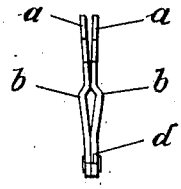


Fig. 4

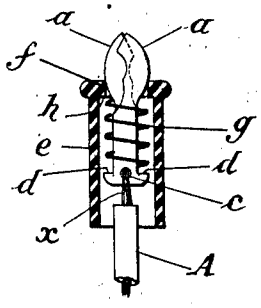
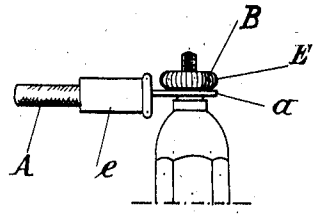


Fig. 5



Inventor
M. U. Caillau
By

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UNITED STATES PATENT OFFICE.

MARCEL URBAIN CAILLAU, OF BILLANCOURT, FRANCE.

ELECTRICAL CONNECTER.

Application filed September 26, 1924, Serial No. 740,075, and in France September 27, 1923.

My invention relates to conducting wire connectors of the tongs-like form and has for its object to provide an improved connecter of the class set forth for rapidly and efficiently connecting and disconnecting an electric conducting wire to or from an electric terminal of any conventional type such for instance as the terminals of spark plugs used on internal combustion engines, wireless telegraphic or telephonic devices or other terminals comprising a stem adapted for being embraced by the tongs of the connecter.

The primary object of the invention is to provide a connecter of the class specified constituted by a minimum number of parts, simple in construction and operation, readily mountable on and dismountable from the end of the lead-wire, easy to manufacture, of low cost and of great strength, durability and efficiency in use.

With the foregoing object in view and such others as will appear hereinafter, the invention consists in the novel construction, combination and arrangement of parts as will now be described in detail with reference to the accompanying sheet of drawing exemplifying same.

In the drawing:—

Figure 1 is an elevational view partly sectioned of the improved connecter in operating position.

Figure 2 is a fragmentary sectional view thereof.

Figure 3 is an edge view of the two flexible blades constituting the connecter proper.

Figure 4 illustrates the connecter in a half retracted position.

Figure 5 is an elevational view illustrating the application of the connecter to the spark plug of an internal combustion engine.

Like characters of reference designate like parts throughout the several views.

According to the invention, the connecter comprises a pair of equally sized flat companion blades *a* constituted by a flexible metal and suitably cut out at their outer ends according to an arcuate convex shape to form coperating claws, as illustrated; these blades are arranged with their inner or shank portions in juxtaposed or overlapping relation; moreover they are elbowed or cranked outwardly substantially midway of their length at *b*, as shown, and united at their inner ends by a riveted metallic eyelet *c* supporting them swingingly. Through said eyelet is passed and twisted securely in position the uncovered end portion *x* of the conducting wire A supplying the current. Owing to their flexibility and to the provision of the outward elbows *b*, the two blades are capable of being flexed to a slight extent whereby they can be brought together in juxtaposed relation as shown in Figs. 3 and 4 for a purpose which will appear hereinafter or alternately extended apart with their outer ends or claws *a* located, so to speak, in the same plane and providing a free lens-shaped space centrally between their inner edges, as clearly illustrated in Fig. 1 also for a purpose which will appear hereinafter. The shank or inner portion of each blade is enlarged at its free end to provide one or two side shoulders or lugs *d*.

The shanks of the two juxtaposed blades are enclosed in a sheath or casing *e* preferably cylindrical made of an insulating material, the length of which is preferably equal to the one of the said blades. This sheath *e* has its upper opening, that is the opening through which the claws are adapted to emerge, made circular as shown at *f* and this opening is provided of a cross-sectional size somewhat smaller than the bore of the said sheath to constitute an inner shoulder *h*. Between said shoulder *h* and the lugs *d* formed on the inner ends of the blades is confined a spiral spring *g* coiled around the shanks of said blades and holding them together yieldingly.

It will be understood that, when once the outer ends or claws *a* of the two companion blades have been, thanks to their flexibility and their elbowed shape as at *b*, brought to the expanded position illustrated in Fig. 1, owing to the inward push exerted by the spiral spring *g* on their shanks, the edge of the upper opening *f* of the sheath *e* constituting a bearing surface will exercise a certain stress on the flaring portion of the outer edge of each of said claws, whereby the latter will be maintained closed as represented in Fig. 1 thus providing innerly a lens-shaped space in which may be securely imprisoned the contact terminal with which it is desired to establish the connection, such for example as the stem of a spark plug or a nut screwed upon the said stem (see Fig. 5). In view of the above arrangement, it will be readily appreciated that the antagonist action of the spring *g* exercising itself permanently, all risk of the thus connected

terminal disconnecting itself accidentally, that is through "hooking off" of the claws of the connecter is precluded. Thus a very efficient connection not liable to be disturbed by vibrations even in the long run (this being of great value particularly on motor cars) is provided inasmuch as the greater the traction on the conducting wire A and consequently on the claws *a* is, the more securely they are held closed around the terminal which they connect.

The setting of this improved connecter will be apparent from the foregoing description:—When it is desired to set the connecter in place for the purpose of effecting a connection between a conducting wire (such as the secondary wire supplying current from a magneto) and a spark plug for example, all that is necessary is to pull with either hand the sheath *e* inward, i. e. in the direction of the wire A whilst simultaneously holding said wire with the other hand in the neighbourhood of said sheath. Such traction compresses the spiral spring *g* between the lugs *d* and the shoulder *h* and allows the claws *a* to move apart and to become opened, whereby they may be pushed against the metal stem of the spark plug or against the nut screwed upon said stem (see Fig. 5). By then relaxing the sheath *e*, the action of the spring *g* pushes it onward and closes the claws *a* as hereinbefore described. From this moment, a secure connection is established between the wire A and spark plug (or other terminal) and the improved connecter will in no event disconnect itself. If now it is desired to separate the connecter from the terminal, it is merely necessary to pull the sheath *e* inwardly whilst holding the adjacent portion of the wire A. The claws *a* immediately open, thus freeing said terminal and allowing same to be disengaged.

It will be appreciated that the invention provides a connecter of most simple construction, low cost of manufacture and of great efficiency in that it is actually constituted by three parts only which can be machined very easily in large series and comprises no screw-threaded portions whatsoever, this lessening the cost to a large extent.

While I have described the preferred construction of connecter embodying my invention and the operation of same, I am aware that certain slight changes of construction or certain omissions of parts may be made without departing from the spirit of the invention and the scope of the appended claims.

What I claim is:—

1. An electrical connecter comprising a pair of flat companion blades disposed in superimposed relation and pivotally connected at one shouldered end, the opposite end of each blade being of arcuate form to provide a gripping section, said blades being in contact at substantially midlength and divergent from the point of contact and then elbowed back to their pivotal point and divergent from the point of contact to the ends of the gripping sections, an insulating sheath having an opening to receive and hold the blades together inwardly of their gripping sections and of a length to extend beyond the point of pivotal connection of the blades, and a spiral spring yieldingly encircling both blades and held between the blade shoulders at one end and the inner end wall of the sheath at the other, said spring acting to normally maintain the relative positions of the blades and sheath so as to cause the gripping sections to be firmly held together by the edge of the opening in the sheath.

2. A connecter of the type described including an insulating sheath having a headed end and formed in said end with an opening of less diameter than the interior of the sheath, and a connecter member comprising two blades elbowed midway of their length, shouldered at their inner end and arranged in superimposed relation with a pivot at said shouldered end, the opposite end of the blades being of arcuate form to provide gripping sections, the blades being arranged in the sheath with the gripping sections disposed immediately beyond the opening in the head of the sheath, a spring yieldingly encircling the blades within the sheath and bearing between the shouldered ends of the blades and the head of the sheath, the pivot of the blades being hollow to provide for the connection thereto of an electrical conductor, the sheath being of a length to at all times cover the connection between said electrical conductor and the blades.

In testimony whereof I have signed my name to this specification.

MARCEL URBAIN CAILLAU.