

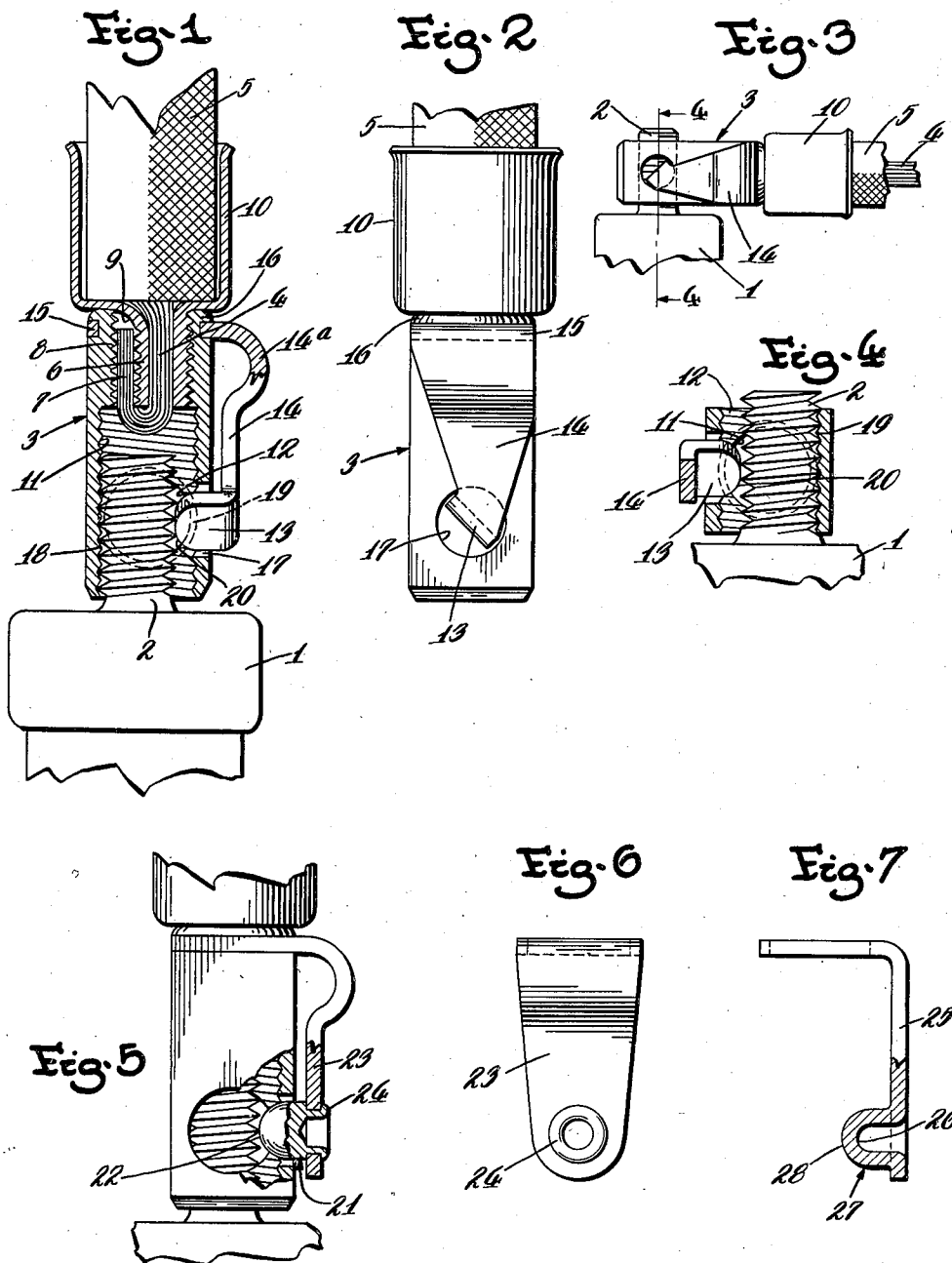
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CONNECTING MEANS

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CONNECTING MEANS

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1 Claim. (Cl. 173—269)

This invention relates to connecting means, more particularly for electrical conductors, and the principal object of my invention is to provide new and improved connecting means of this type. Other objects will appear hereinafter as the description of the invention proceeds.

The present application is a division of my co-pending application, Serial Number 652,290, filed January 18, 1933.

In the drawing accompanying this specification, and forming part of this application, I have shown, for purposes of illustration, several forms which my invention may assume. In this drawing:

Figure 1 is an axial section of one form of connecting means embodying my invention, certain parts being shown in elevation,

Figure 2 is an elevational view of the socket portion of the connecting means shown in Figure 1,

Figure 3 is an elevational view on a smaller scale showing the connecting means of Figure 1 in use in transverse position,

Figure 4 is a section taken on the line 4—4 of Figure 3,

Figure 5 is an elevational view of another embodiment of my invention, parts being broken away to show a different embodiment of a spring detent or biasing means,

Figure 6 is an end view, in separated relation, of the spring detent or biasing means shown in Figure 5, and

Figure 7 is a side view, partly in section, of a different embodiment of a spring detent.

In the illustrative construction, I have shown a conventional spark-plug 1 such as is commonly used in internal combustion engines and having the usual central electrode terminating at the top of the plug in a threaded stud 2 to which, in accordance with customary practice, is connected the high tension lead of the electric ignition system, by means of a nut (not shown) screwed upon the stud 2. In certain motor block constructions, for example, where the spark-plug is received in rather a deep pocket in the motor block, it is frequently difficult to attach the lead to the stud 2 by ordinary connecting means in which the lead approaches the stud in a transverse direction. In accordance with a more specific aspect of my invention, I have provided improved connecting means by which without the addition of any parts to the spark-plug, the lead may be connected thereto by the simple rectilinear movement of a snap socket or terminal either axially, as shown in Figure 1, or transversely as shown in Figure 3.

For this purpose I have shown a hollow metallic jack or socket portion 3 to which the lead wire 4 is axially connected. In this instance, the end of the wire 4 is bared of its insulation 5 and is passed through an exteriorly threaded sleeve 6 and folded back as at 7 upon the exterior of this sleeve. The sleeve 6 is then threadedly received in the interiorly threaded socket 3 in the base of the jack 3, the wire thus being securely clamped between the threads of the parts 6 and 3 affording a good mechanical and electrical connection between the wire and the jack. To provide room for the bent over portion 7 of the wire, the sleeve 6 in the region of this portion of the wire, may be longitudinally grooved as at 9, in accordance with my patent, Number 1,339,694, issued May 11, 1920. The sleeve 6 is desirably enlarged as at 10 to receive a portion of the insulation 5 and the jack 3 when screwed upon the sleeve portion 6 desirably abuts the enlargement 10.

The jack 3 is here shown as having a plurality of transversely related bores or recesses therein, one of said bores, such as the bore 11, being coaxial with the jack and the other, the bore 12, being transverse thereto. In this instance these bores desirably intersect perpendicularly and are served by a single spring pressed detent 13. As shown in Figures 1 to 4, inclusive, the detent 13 may be formed upon the free end of a leaf spring 14 riveted at its base 15 to the base of the jack by the rivet flange 16, the leaf spring thus providing a spring arm which extends along the exterior of the jack, normally spaced therefrom, and having its free end turned at right angles thereto, to project through a detent aperture 17 in the jack, in the form of the integral detent 13. The aperture 17 intersects both the bores 11 and 12. As will be noted, the spring arm 14 extends tangentially, that is, generally in the direction of a tangent to the bore 12. The spring arm 14 may be bowed, as at 14a, to enhance its spring effect.

The jack 3 is thus adapted to receive the member to be connected thereto, represented in Figures 1, 3, 4, and 5, by the stud 2 of the spark-plug 1, within either the axial bore 11 of the jack or the transverse bore 12, so that the lead 4 may be connected thereto either axially, as shown in Figure 1, or transversely as shown in Figures 3 and 4. At the same time, the detent 13 is in position to yieldingly engage the stud regardless of which of the bores receives the stud. It will be noted that the bore 12 extends all the way

through the jack, so that the stud may be inserted therein from either side as described.

To enhance the security of the connection between the jack and a cooperating plug when the plug is a threaded stud such as the stud 2, I roughen the walls of the bores 11 and 12 which may be economically and advantageously accomplished by screw-threading them as indicated by the screw threads 18 of the bore 11 and the screw-threads 19 of the bore 12. The screw-threads 18 and 19 are desirably of the same pitch as the conventional pitch for the screw threads of the stud 2, but are of less height, so that the threads of the stud 2 may slide over the threads 18 or 19 as the case may be, but be pressed into intimate intercalation therewith by the spring detent 13.

In the illustrated embodiment of my invention the detent 13 desirably has an arcuate tip 20 to slide resiliently over the threads of the stud 2 and while this tip is shown flat in this instance, I advantageously dispose it diagonally to both of the axes of the bores or recesses 11 and 12, that is at an angle to both of the general directions of movement of the stud 2 into the respective bores or recesses 11 and 12, as best shown in Figures 2 and 3, so that its edges will neither undesirably catch the end of the stud 2 as it is inserted into either of the bores 11 or 12, nor undesirably catch in the threads of the stud 2. As shown in Figure 5, however, this same result may be accomplished by providing a detent 21 having a dome-shaped tip 22 and secured to a spring arm 23 (corresponding to the spring arm 14) as by being riveted thereto at 24, or, as shown in Figure 7 a spring arm 25 may be circularly depressed as at 26 to provide an integral detent 27 also having a dome-shaped tip 28.

While I have illustrated my invention as embodied in a relatively stationary plug or stud, and, particularly, the threaded stud of a spark-plug cooperable with a relatively movable threaded jack or socket means, it will be understood that neither the stud nor the jack need be threaded, but, if desired, the socket and plug may be otherwise relatively so constructed and arranged as to give a snap or holding action. Also, that the jack, or socket means, on the one hand, may be the relatively stationary part, and on the other hand, the stud, or plug, the relatively movable part.

From the foregoing it will be apparent to those skilled in the art that each of the illustrated embodiments of my invention provides a new and improved connecting means readily and conveniently constructed and assembled, and accordingly, each accomplishes the principal object of my invention. On the other hand, it also will be obvious to those skilled in the art that the illustrated embodiment of my invention may be variously changed and modified, so that in a given combination the jack or socket means, and the plug or stud, and the biasing means may assume individually different forms, some of which are further illustrated in my co-pending application Serial Number 652,290, filed Jan. 18, 1933, and in my co-pending application Serial Number 107,978, filed Oct. 28, 1936, from which it will be further apparent that said elements of the combinations, singly or collectively, may be embodied in other combinations than those illustrated, without departing from the spirit of my invention, or sacrificing all of the advantages thereof, and that accordingly, the departures may be made without departing from the spirit and scope of the invention and what is claimed.

I claim:

Means, for receiving and holding a plug conductor terminal, comprising: socket means, having intersecting recesses for receiving a plug conductor terminal in either of said recesses, and having an aperture communicating with each of said recesses; movable means, extending into said aperture, constructed and arranged to constrict said recesses at their intersection, said movable means having cam surfaces cooperable respectively with a plug conductor terminal inserted in either of said recesses, to cause repression of said movable means as said plug conductor terminal is inserted in either of said recesses; and resilient means for resiliently biasing said movable means in a direction to constrict said recesses, to press the plug conductor terminal laterally against a wall of that recess in which the plug conductor terminal is disposed; said resilient means and said movable means being constructed integrally from a single sheet metal stamping and said movable means comprising a flat portion the general plane of which extends at an angle to the axes of both of said recesses.

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