

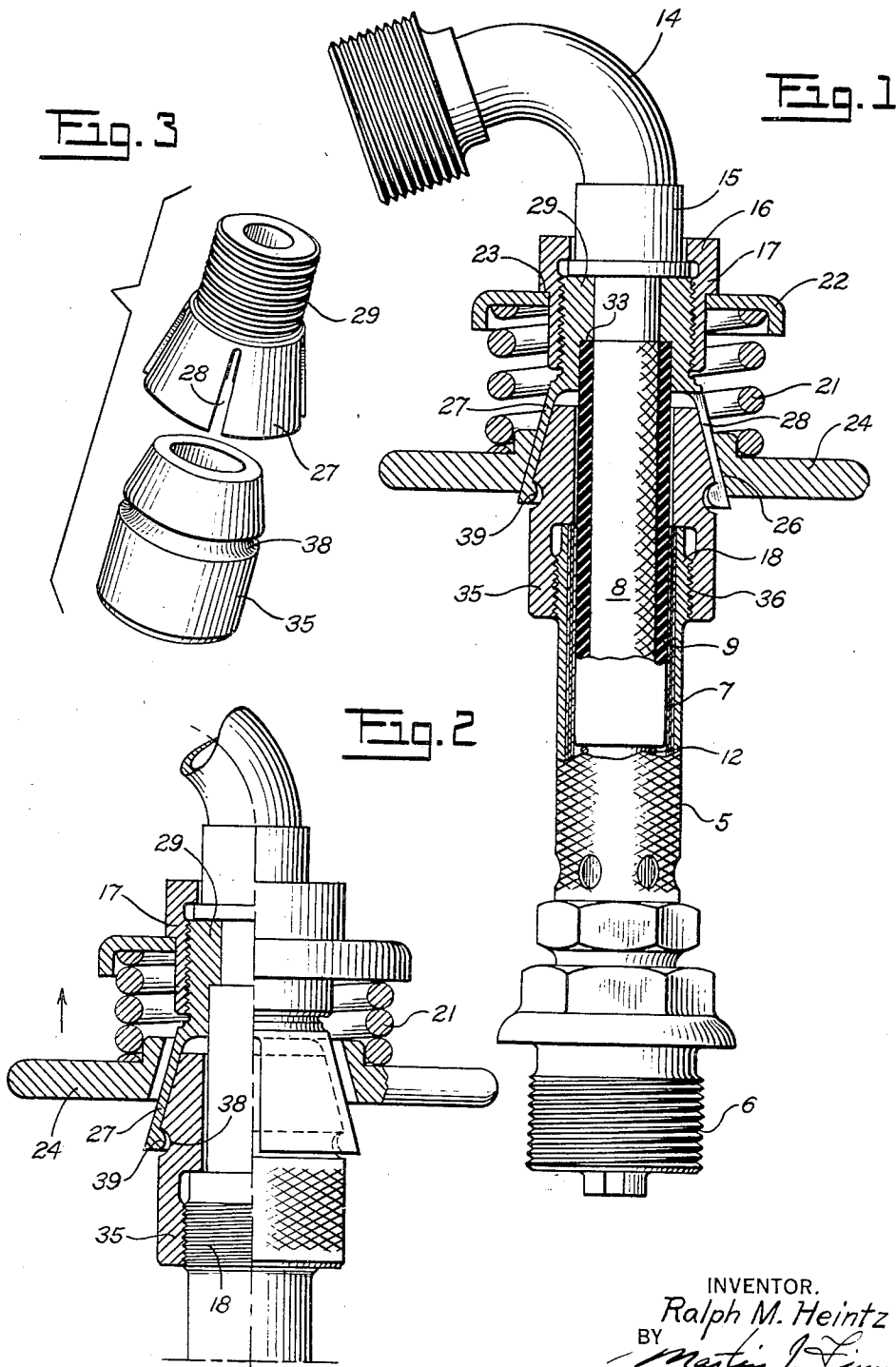
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R. M. HEINTZ

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IGNITION MECHANISM

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INVENTOR.
Ralph M. Heintz
BY *Martin J. Linnegan*
ATTORNEY.

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IGNITION MECHANISM

Ralph M. Heintz, East Orange, N. J., assignor to
Eclipse Aviation Corporation, East Orange, N. J.,
a corporation of New Jersey

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This invention relates to ignition mechanism and more particularly to a connection between an ignition cable and a stationary element of the ignition system, as for example, one of the spark plugs or one of the outlets from the current distribution section of the ignition system such as the magneto distributor or conductor manifold.

An object of the invention is to provide a more readily attachable and a more readily removable type of connection between the ignition cable and the stationary part above referred to.

Another object is to provide a readily detachable yet a sufficiently firmly held coupling assembly for insuring continuity of the ignition circuit at the point of termination of the ignition cable.

These and other objects of the invention will become apparent from inspection of the following specification when read with reference to the accompanying drawing wherein is illustrated the preferred embodiment of the invention. It is to be expressly understood, however, that the drawing is for the purpose of illustration only, and is not designed as a definition of the limits of the invention, reference being had to the appended claims for this purpose.

In the drawing:

Fig. 1 is a view partly in elevation and partly in longitudinal section, of a device embodying the invention as applied to the function of connecting an ignition cable with one of the spark plugs;

Fig. 2 is a view of some of the parts shown in Fig. 1 as said parts appear during the operation preparatory to disconnecting the cable from the stationary element, such as a spark plug, whenever such a disconnection is desired as for purposes of inspection of the terminal end of the cable, or for any other reason; and

Fig. 3 is an exploded view in perspective of two of the elements shown in Figs. 1 and 2.

Referring to the drawing, reference character 5 designates the outer shell or barrel of a metal enclosed spark plug of a type now commonly used to insure elimination of interference between the ignition circuit and adjacent radio receiving apparatus, and reference character 6 indicates the threaded base of the plug by which attachment is made to the engine cylinder not shown. The barrel 5 is shown as lined with a wrapping 7 of insulating material such as sheet mica, forming a socket for insertion of the insulated ignition cable 8, and the socket thus formed corresponds to the socket formed by the mica-lined upper

portion of the corresponding barrel in Patent No. 1,950,408 granted to Lawrence A. Hyland on March 13, 1934. As shown the portion of the cable which extends within the socket formed by the lining 7 is surrounded by a spacer sleeve 9 of suitable insulating material such as Bakelite or its equivalent, and the said sleeve 9 extends beyond the outer end of the barrel 5 for a purpose presently to appear. Connection of the conductors within the cable 8 to the central electrode of the plug may be brought about by any conventional means, as by anchoring said conductors to a metal base underlying the lower end of the spacer 9 and making electrical contact with the central electrode of the plug either directly or by intermediate conductors such as the coil spring indicated at 12.

The metal thimble or elbow by which the metal covering of the major portion of the cable is electrically and mechanically connected with the shielding of the plug, and corresponding to the metal thimble or elbow 37 of the Nowosielski Patent No. 2,079,561, is indicated at 14 and is shown provided with a flanged ring 15 at its base, corresponding to the flanged ring 38 of the said Nowosielski patent, the said ring being secured by the overlying upper portion 16 of the coupling nut 17 corresponding in some respects to the coupling nut 52 of the said Nowosielski patent; but instead of threading the said coupling nut directly to the threaded upper portion 18 of the barrel 5 (and corresponding to the threaded upper portion of the barrel 16 in the Nowosielski patent) my invention includes the concept of interposing between said threaded parts 17 and 18, a combination of elements which renders it unnecessary to proceed with a screwing or unscrewing operation on every occasion when temporary disconnection of the cable, as for inspection purposes, is desired. As shown in Fig. 1 this combination of elements includes a coil compression spring 21 having abutment at its upper end against a retaining plate 22 fitting under the shoulder portion 23 of the nut 17, and having abutment at its lower end against a second plate 24 whose tapered central bore 26 cooperates with the correspondingly tapered fingers 27 formed in any suitable manner as by slotting (as shown at 28 in Fig. 3) the tapered skirt of the externally threaded sleeve or coupling screw 29 to which the above described coupling nut 17 is threaded, as a preliminary step in the complete process of securing the cable. As shown in Fig. 1 the screw 29 has one portion of smaller bore and another portion of slightly larger bore, forming a shoulder

33 against which the upper end of the spacer 9 abuts when the parts are in proper relationship, as shown in Fig. 1.

The coupling combination of the present invention further includes a third major element 35 which, to distinguish it from the upper coupling nut 17, may be termed the lower coupling nut, it being internally threaded at its lower end as indicated at 36 for engagement with the threaded portion 18 of the barrel 5. The upper portion of this lower coupling element 35 is tapered to a degree corresponding to the taper of the elements 24 and 27 and is adaptable to be received within said elements 27 in such a manner that the central neck portion 38 will cooperate with the inwardly protruding tips 39 of the fingers 27 to provide a quickly releasable mechanical connection between the upper and lower portions of the coupling assembly, and hence a ready means of withdrawing the cable 8 as for inspection of its lower end or of the inner parts of the plug.

It will be noted that while this connection between the parts 39 and 35 is of a readily detachable nature, such detachment can be effected only by exerting an upwardly directed pressure upon the plate 24 for the purpose of releasing the wedging grip which normally prevails between the parts 24 and 27 as shown in Fig. 1, such upward pressure being necessary to overcome the normal tendency of the compression spring 21 which exerts the wedging pressure in the opposite direction. Fig. 2 illustrates the releasing operation as brought about by upward pressure to raise the plate 24 sufficiently to permit release of the tips 39 of the fingers 27 from the neck portion 38 in which they are normally held. When thus released the upper assembly including the cable 8 may be withdrawn, it being noted that this action can take place without disturbing the threaded relationship existing between the parts 17 and 29 and likewise without disturbing the threaded relationship existing between the parts 18 and 35. In other words the screwing and unscrewing operation which is necessary in the prior art as exemplified in the parts 52 and 10 of the above identified Nowosielski patent, is made unnecessary by the combination of elements of the present invention, while at the same time there is provided a normally prevailing wedging grip between the elements 27 and 35 which positively insures against any unintended separation of the parts—the pressure exerted by the compression spring 21 being more than sufficient to prevent any such unintended separation of said parts, since the direction of such pressure exertion is such as to tend at all times to increase the wedging action.

What is claimed is:

1. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, and a third coupling element interposed between said first two coupling elements and yieldably held thereby, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel.

2. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered coupling element secured to the upper end of the barrel, an internally tapered cou-

pling element movable longitudinally of the barrel, a third coupling element interposed between said first two coupling elements and yieldably held thereby, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, and means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable.

3. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, a third coupling element interposed between said first two coupling elements and yieldably held thereby, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable, said last named means including a coiled spring surrounding said coupling elements, and means associated with said tubular extension to form an abutment for the end of said spring opposite that which bears against said second-named coupling element.

4. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, and a longitudinally slotted, resilient coupling element interposed between said first two coupling elements and yieldably held thereby, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel.

5. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, a longitudinally slotted, resilient coupling element interposed between said first two coupling elements and yieldably held thereby, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, and means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable.

6. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, a longitudinally slotted, resilient coupling element interposed between said first two coupling elements and yieldably held thereby, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position pre-

venting accidental withdrawal of the cable, said last named means including a coiled spring surrounding said coupling elements, and means integral with said tubular extension to form an abutment for the end of said spring opposite that which bears against said second-named coupling element.

7. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered peripherally grooved coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, and a third coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel.

8. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered peripherally grooved coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, a third coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, and means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable.

9. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered peripherally grooved coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, a third coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable, said last named means including a coiled spring surrounding said coupling elements, and means associated with said tubular extension to form an abutment for the end of said spring opposite that which bears against said second-named coupling element.

10. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered peripherally grooved coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, a longitudinally slotted, resilient coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element be-

ing secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel.

11. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered peripherally grooved coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, a longitudinally slotted, resilient coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, and means constantly pressing upon said second named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable.

12. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, an externally tapered peripherally grooved coupling element secured to the upper end of the barrel, an internally tapered coupling element movable longitudinally of the barrel, a longitudinally slotted, resilient coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable, said last named means including a coiled spring surrounding said coupling elements, and means associated with said tubular extension to form an abutment for the end of said spring opposite that which bears against said second-named coupling element.

13. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, a coupling element secured to the upper end of the barrel, a second coupling element movable longitudinally of the barrel, a third coupling element interposed between said first two coupling elements and yieldably held thereby, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, and means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable.

14. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, a coupling element secured to the upper end of the barrel, a second coupling element movable longitudinally of the barrel, a third coupling element interposed between said first two coupling elements and yieldably held thereby, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental

withdrawal of the cable, said last named means including a coiled spring surrounding said coupling elements, and means associated with said tubular extension to form an abutment for the end of said spring opposite that which bears against said second-named coupling element.

15 15. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, a peripherally grooved coupling element secured to the upper end of the barrel, a second coupling element movable longitudinally of the barrel, a third coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, and means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable.

25 16. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, a peripherally grooved coupling element secured to the upper end of the barrel, a second coupling element movable longitudinally of the barrel, a third coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable, said last named means including a coiled spring surrounding said coupling elements, and means associated with said tubular extension to form an abutment for the end of said spring opposite that which bears against said second-named coupling element.

40 17. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, a peripherally grooved coupling element secured to the upper end of the barrel, a second coupling element movable longitudinally of the barrel, a longitudinally slotted, resilient

coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, and means constantly pressing upon said second named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable.

10 18. A cap for spark plugs having a barrel adapted to receive an ignition cable, said cap comprising, in combination with a tubular metal extension, a peripherally grooved coupling element secured to the upper end of the barrel, a second coupling element movable longitudinally of the barrel, a longitudinally slotted, resilient coupling element interposed between said first two coupling elements and yieldably held in engagement with the peripherally grooved portion of said first-named coupling element, said third coupling element being secured to said tubular extension, and movable therewith to insert or withdraw the cable from the spark plug barrel, means constantly pressing upon said second-named coupling element to wedgingly lock said extension in a position preventing accidental withdrawal of the cable, said last named means including a coiled spring surrounding said coupling elements, and means associated with said tubular extension to form an abutment for the end of said spring opposite that which bears against said second-named coupling element.

30 19. A cap for spark plugs having a barrel adapted to receive a shielded ignition cable, said cap comprising, in combination with the cable shield, a coupling element engageable with the barrel, and having a depression in its outer surface, means engageable with said depression to releasably hold the cable shield in predetermined relationship to said barrel, means for preventing movement of said holding means by any pull exerted longitudinally of the cable, said preventing means comprising a wedging member which, in operative position, exerts pressure upon said holding means in a direction radially of said coupling element and thereby opposes release of the holding means from said depression, and resilient means for holding said wedging member in operative position.

RALPH M. HEINTZ.