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SPARK PLUG ADAPTER ASSEMBLY

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Fig. 1.

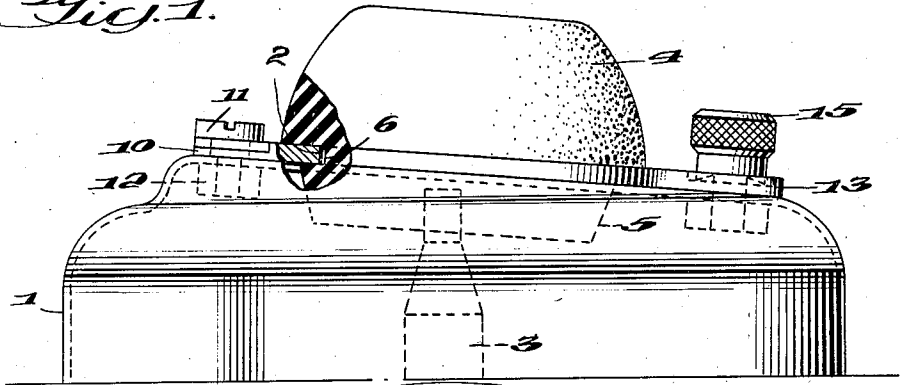


Fig. 2.

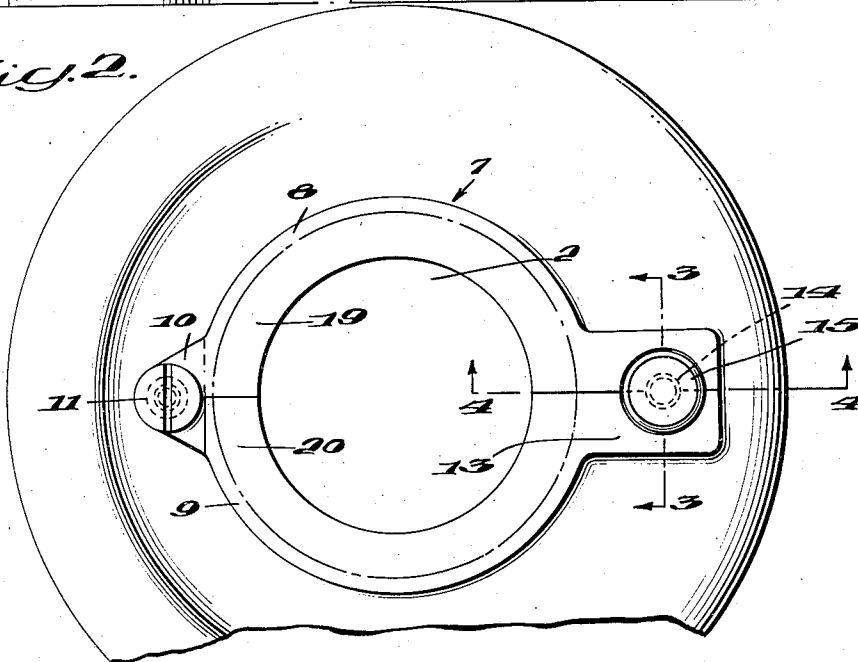


Fig. 3.

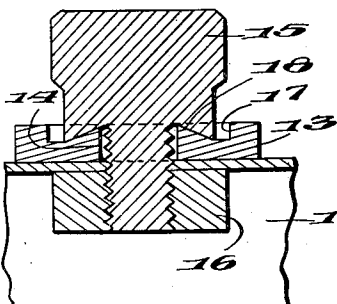
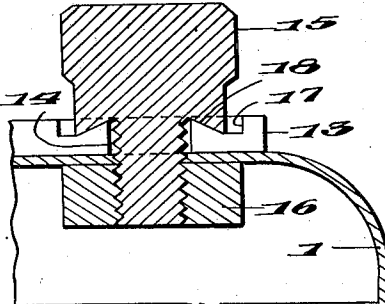


Fig. 4.



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SPARK PLUG ADAPTER ASSEMBLY

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7 Claims. (Cl. 51—8)

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My invention consists in new and useful improvements in spark plug cleaning apparatus and relates more particularly to a spark plug adapter assembly for use in connection with apparatus of the type shown and described in my copending application Serial No. 692,947, filed August 26, 1946.

In that application, I have described a spark plug cleaner employing air under pressure to force a powdered or granulated abrasive against the spark plug gap elements and upon the inner end of the plug to remove carbon encrusted oil and like deposits which accumulate when the plug is in use. I also described in that application a particular type of adapter designed for use with spark plugs of various diameter threads, the adapters being arranged within an opening in the top of the casing of the apparatus and turnable thereon to variously position the inner end of a spark plug over a cleaning blast nozzle to more efficiently clean the spark plug.

The present invention consists of an improvement in the spark plug adapter and comprises an adapter element generally similar to that described in said copending application but designed for use in combination with a novel clamping unit which not only serves to retain the spark plug adapter in place in the casing opening while permitting its rotation during the cleaning of the plug, but acts to prevent the escape of dust particles and abrasives past the adapter.

Another object of my present invention is to provide an adapter clamp and abrasive guard which is simple in construction and operation and one which is readily adaptable to various known types of spark plug cleaning apparatus.

Still another object of my invention is to provide a clamp comprising a pair of separable sections hinged together and pivotally mounted adjacent the casing opening for opening and closing movement for engagement and disengagement with a spark plug adapter and having novel means for retaining said sections in closed position.

With the above and other objects in view which will appear as the description proceeds, my invention consists in the novel features herein set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

Referring to the drawings in which numerals of like character designate similar parts throughout the several views.

Figure 1 is a view in side elevation of the upper end of the spark plug cleaner housing with my improved adapter assembly in place thereon, a

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portion of the adapter and clamp being broken away and shown in section to illustrate the particular structure of these parts;

Figure 2 is a plan view of the top of the casing showing the clamping unit with the adapter removed;

Figure 3 is a fragmentary sectional view taken on line 3—3 of Figure 2 and showing the locking means on an enlarged scale; and

Figure 4 is a similar view taken on line 4—4 of Figure 2.

In the drawings, 1 designates the upper end of a casing similar to that shown in my said copending application and used primarily as a support for the component parts of the cleaner and for the abrasive container. The top face of the casing is inclined and provided with an opening 2 adjacent which is arranged a blast nozzle 3 shown in dotted lines in Figure 1, said opening 2 being adapted to receive the reduced end of a spark plug adapter 4 as and for the purpose set forth in my former application. This arrangement permits the spark plug to be presented to the nozzle at an angle as in my other case.

The spark plug adapter 4 consists of an annular body member preferably composed of rubber, or similar material, and being reduced at its lower end 5 to fit into the opening 2 in the top of the casing 1. The adapter is provided with a central axial opening for receiving the threaded end of a spark plug to be correctly presented to the blast nozzle 3. Between the reduced end 5 and the main body portion of the adapter 4, I provide an annular recess 6 of a depth and width to receive the adjacent sections of the clamping ring as will be hereinafter described.

My improved clamping ring designated generally by the numeral 7 is in the form of a split ring consisting of two separable sections 8 and 9 hinged together at one side by means of a pair of complementary overlapping ears 10 through which extends a pivot or screw 11. The screw 11 extends through a suitable opening in the top of the casing 1 where it is secured in place by a nut 12 shown in dotted lines in Figure 1. Diametrically opposite the ears 10, the sections 8 and 9 of the split ring 7 are provided with projecting lugs 13 lying in the same plane with the ring sections, the adjacent edges of said lugs being cut out to form a vertically extending opening 14 for the reception of the threaded end of a locking screw 15. The threaded end of the locking screw 15 extends through the top of the casing 1 where it is provided with a nut 16 for retaining the same in place.

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In order to facilitate the locking of the separable sections 8 and 9 in clamping engagement, the adjacent upper surfaces of the lugs 13 are provided with an annular recess 17, one half of which lies in each of the lugs 13 to form a continuous recess. This recess is inclined upwardly as at 18 toward the axis of the opening 14 to form an annular ridge or lip adapted to engage a complementary inclined surface on the underside of the head of the screw 15 as shown in Figures 3 and 4. Thus, when the sections 8 and 9 are in closed position with the lugs 13 in engagement, the tightening of the screw 15 brings the complementary inclined surfaces of the nut 15 and the lugs 13 into wedging engagement to firmly retain the sections 8 and 9 together, and at the same time clamp the two sections 8 and 9 against the top of the cleaner cover.

When in this closed position the respective semi-annular portions 19 and 20 of the sections 8 and 9 respectively, lie within the annular recess 6 of the adapter 4 as shown in Figure 1, thus retaining the adapter 4 in position against movement in the direction of its axis but at the same time permitting rotary movement of the adapter for the purpose of cleaning the plug when the blast nozzle 3 is in operation. Further, this interlocking relation of the semi-annular portions 19 and 20 with respect to the recess 6 of the adapter 4 acts to prevent the escape of dust particles and abrasives between the opening 2 and the outer periphery of the adapter 4.

As an added means for preventing the escape of dust, it may be desirable to employ a soft gasket between the split ring 7 and the top of the cleaner casing 1. However, this is not considered essential to the successful operation of my invention.

In operation, the procedure is the same as that in connection with the invention disclosed in my copending application, except that in the present instance, after selecting the correct adapter for the size of plug to be cleaned, the screw 15, which may be provided with a knurled surface as shown in Figure 1, is loosened and the sections 8 and 9 of the adapter clamp are retracted. The adapter with the plug therein is inserted in the opening 2 and the clamp sections 8 and 9 are closed, bringing the semi-annular portions of said sections into engagement with the annular recess in the adapter. The screw 15 is then tightened, bringing its inclined lower face into wedging engagement with the complementary inclined surfaces 18 of the lugs 13 thus firmly retaining the separable sections in locked position during the operation of the blast nozzle 3. The annular groove 6 in the adapter is just enough wider than the thickness of the split ring to allow the adapter to be turned freely during the plug cleaning operation yet at the same time to hold the adapter against longitudinal movement.

Although I have shown and described one particular type of locking means in the form of the screw 15 and its cooperating parts, it will be understood that I do not intend to limit my invention to that structure. Obviously, various means may be employed for locking the separable sections of the split ring together. Furthermore, in some instances, where it is desired only to clean one size of plug permanently, the rubber adapter may be clamped permanently to the top of the cleaner by means of a generally similar ring arranged in interlocking relation with the adapter for purposes of retention and preventing the escape of dust particles and abrasives.

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From the foregoing, it is believed that my invention may be readily understood by those skilled in the art without further description, it being borne in mind that numerous changes may be made in the details of construction without departing from the spirit of the invention as set forth in the following claims.

I claim:

1. In spark plug cleaning apparatus including a casing, a blast nozzle, an opening in said casing adjacent said nozzle and an adapter insertable in said opening for receiving a spark plug and presenting the same to said nozzle, an adapter clamp comprising a split ring formed of two separable adapter engaging sections, means pivotally mounting said sections on said casing adjacent said opening for relative opening and closing movement in a plane transverse to the axis of said adapter, and means for locking said sections in closed position in engagement with said adapter.

2. In spark plug cleaning apparatus including a casing, a blast nozzle, an opening in said casing adjacent said nozzle and an adapter insertable in said opening for receiving a spark plug and presenting the same to said nozzle, an adapter clamp comprising a split ring formed of two separable adapter engaging sections, means pivotally mounting said sections on said casing adjacent said opening for relative opening and closing movement in a plane transverse to the axis of said adapter, means on said sections for retaining said adapter against movement in a direction parallel to its axis while permitting rotation thereof about its axis, and means for locking said sections in closed position in engagement with said adapter.

3. In spark plug cleaning apparatus including a casing, a blast nozzle, an opening in said casing adjacent said nozzle and an adapter insertable in said opening for receiving a spark plug and presenting the same to said nozzle, an adapter clamp comprising a split ring formed of two separable adapter engaging sections, means pivotally mounting said sections on said casing adjacent said opening for relative opening and closing movement in a plane transverse to the axis of said adapter, means on said sections interlocking with said adapter for locking the adapter in place and for preventing the escape of dust from said blast nozzle between said adapter and casing opening, and means for locking said sections in closed position in engagement with said adapter.

4. Apparatus as claimed in claim 3, wherein said adapter is provided with an annular recess arranged for engagement by the separable sections of said adapter clamp.

5. An adapter assembly for spark plug cleaning apparatus, comprising in combination an adapter element for receiving a spark plug and presenting the same to the nozzle of a spark plug cleaner, said adapter element having an annular recess in its periphery, a clamping element comprising a split ring formed of two separable sections arranged for engagement with said annular recess, means pivotally mounting said sections for relative opening and closing movement toward and away from said adapter, and means for locking said sections in closed position around said adapter.

6. A device as claimed in claim 5, wherein said locking means comprises a pair of cooperating projections, one carried by each of said sections, and wedge means acting on said projections for

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urging said sections together and locking the same in closed position.

7. An adapter assembly for spark plug cleaning apparatus, comprising in combination, an adapter element for receiving a spark plug and presenting the same to the nozzle of a spark plug cleaner, said adapter element having an annular recess in its periphery, a clamping element comprising a split ring formed of two separable sections arranged for engagement with said annular recess, means pivotally mounting said sections for relative opening and closing movement toward and away from said adapter,

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a pair of cooperating projections, one carried by each of said sections and lying in a common plane, a common annular indentation in the adjoining upper faces of said projections with its bottom inclined upwardly toward the axis of the indentation, and a locking screw having a complementary inclined surface adapted to engage the inclined surface of said bottom for urging said sections together and locking the same in closed position.

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No references cited.