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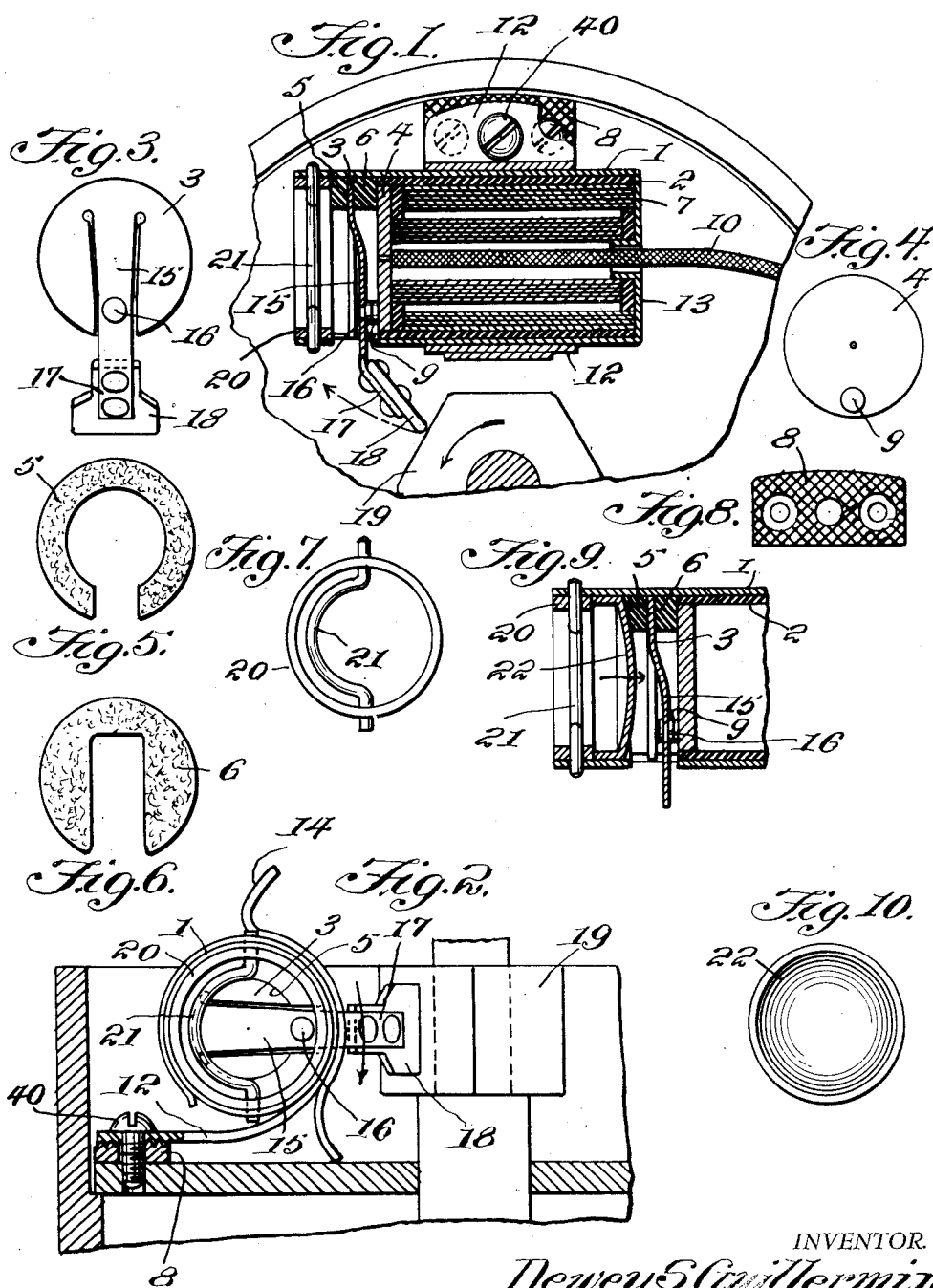
D. S. GUILLERMIN

2,570,797

IGNITION CONTROL

Filed Oct. 16, 1946

2 Sheets-Sheet 1



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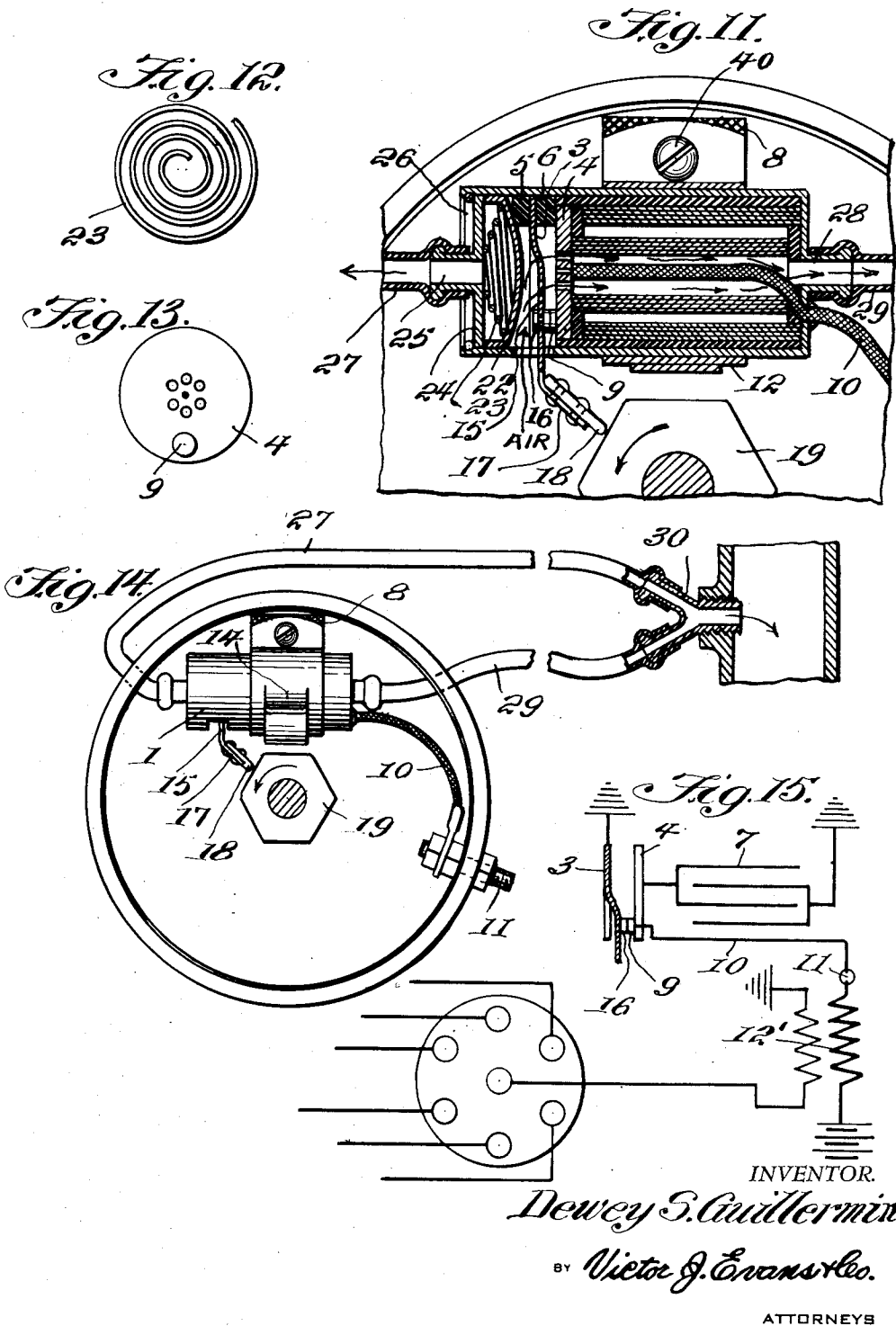
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UNITED STATES PATENT OFFICE

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IGNITION CONTROL

Dewey Sampson Guillermin, Conway, Pa.

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8 Claims. (Cl. 123—146.5)

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This invention relates to improvements in ignition systems for internal combustion engines, and more particularly to the provision of an attachment which effectively replaces the usual distributor interrupter.

It is an object of the invention to provide an attachment which takes the place of the usual interrupter contact points.

A further object is to provide an interrupting device in which a variable pressure is applied at point of contact by a vacuum.

A further object is to provide an attachment for a distributor to replace the usual interrupter, which attachment has means for cooling a condenser and points of contact by an air stream created by varying pressure in the intake manifold of an internal combustion engine.

A further object is to provide an attachment for a distributor which can be installed by unskilled persons in a few seconds.

A further object is to provide an interrupting device which reduces the amount of wire used in a distributor.

A further object is to provide an interrupting device having a closely coupled circuit, and in which the contact surfaces are always parallel when together, the device having long life and giving less trouble than the usual interrupter.

These and other objects are attained by the novel construction and arrangement of parts hereinafter described and illustrated by the accompanying drawings, forming a part hereof, and in which:

Fig. 1 is a sectional view of an interrupting device embodying the invention.

Fig. 2 is an end view of the device showing its mounting on a distributor plate.

Fig. 3 is a plan view of a contact element used in the device.

Fig. 4 is a plan view of another contact element.

Fig. 5 is a plan view of a washer.

Fig. 6 is a plan view of another washer.

Fig. 7 is an end view of a spring used in the device.

Fig. 8 is a plan view of a roughened surface used to attach the device.

Fig. 9 is a sectional view of a modified form.

Fig. 10 is a plan view of a pressure block used in the modified form.

Fig. 11 is a sectional view of a modified form in which the device is air cooled, and vacuum regulated.

Fig. 12 is a plan view of a spring used in the modified form shown in Fig. 11.

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Fig. 13 is a plan view of a contact disc with air holes used in the modified form shown in Fig. 11.

Fig. 14 is a plan view showing the modified form of Fig. 11 connected to the intake manifold of an internal combustion engine.

Fig. 15 is a wiring diagram of the circuit used in the device.

Referring to the drawings, the interrupting device is shown to comprise a metallic shell 1, in which is telescoped a non-metallic sleeve 2 of insulating material, and in which is positioned a condenser 7. Making contact with the condenser at one end is a disc 4 having a contact point 9. Attached to the disc 4 is a wire 10 which is connected to a terminal 11, leading to the primary coil 12' of an induction coil (see Fig. 15).

A bracket 12 is provided to adjustably mount the casing 1 on the engine distributor. The bracket is held at one end to a roughened surface 8 to the distributor plate by a screw 40 and extends substantially around the casing to hold it by virtue of spring in the metal of the bracket. The bracket carries a thumb piece 14 which can be pressed to open the bracket sufficiently to release the casing for adjustment. Thus in the embodiment shown in Figure 2 the casing 1 is released by pressing the thumb piece 14 to the right (viewing Figure 2). The casing can then be rotated or moved longitudinally. It will be noted from Figure 2 that the thumb piece 14 extends partially around the bracket 12 and down to the plate of the distributor. When the thumb piece 14 is pressed at its upper end to the right (Figure 2) it rotates about its lower end and therefore the bracket 12 is opened along substantially its entire length around the casing rather than being bent adjacent its lower end. Likewise the screw 40 which holds the bracket 12 to the distributor plate can be loosened and the bracket and the casing pivoted about the screw 40 for an additional adjustment.

The end 13 of the casing away from the disc 4 is in contact with the casing and is thereby grounded by the casing through the bracket 12.

A washer 6 spaces the disc 4 from a disc 3, the washer being made of insulating material. Cut from the disc 3 is a spring arm 15 having a contact point 16 arranged to engage point 9. The arm 15 is angularly bent at 17, and has attached thereto a fiber strip 18 which engages the rotating interrupter cam 19. The disc 3 engages the casing 1 and consequently is also grounded.

A washer 5 of insulating material spaces disc 3

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from a collar 20 in which is positioned a spring 21, the ends of which pass through the casing 1.

In operation, the fiber strip 18 wipes over the cam 19 and makes and breaks contact between points 9 and 16 to energize and deenergize the primary coil 11 (see Fig. 15) in the usual manner employed in interrupters. The unit is compact, reducing the amount of wire used in a distributor, and the device can be quickly adjusted to regulate the position of the fiber strip relative to the cam. In the forms of the invention shown in Figs. 9 and 11, pressure of the contact points is regulated by hose connections to the intake manifold.

In the modified form of the invention shown in Figure 9 the disc 3 and the spring arm 15 are held in place by a cup 22, a collar 20 and a spring 21. This form of the invention can be further modified to provide for cooling of the contact points and for regulation of the pressure between the points by vacuum created in the intake manifold. This construction is shown in Figure 11.

As shown in Figure 11 the casing 1 is sealed at one end by a disc 24 which carries a short tube 25, the disc being held in the casing by a split ring 26 in a groove in the casing. The other end of the casing 1 carries a short tube 28. The tubes 25 and 28 are connected by hoses 27 and 29 to a coupling 30 which in turn is connected to the intake manifold of the engine. A spiral spring 23 is placed between the cup 22 and the disc 24 and tends to press the cup 22 inwardly towards the spring arm 15. Inward movement of the cup can exert a force against the disc 3 through the washer 5 and thereby increase the pressure between the contact points 9 and 16. As is well known, when an internal combustion engine is running slowly the pressure in the intake manifold of the engine is relatively low and this pressure increases as the speed of the engine increases. When a high vacuum (low pressure) is created in the manifold (and therefore in the tube 25), the cup 22 acting as a piston tends to move to the left (viewing Figure 11) thereby relieving pressure exerted by the cup against the disc 3. When the engine speed increases and the vacuum in the tube 25 decreases, the spring 23 moves the cup against the disc 3. From this it follows that whenever the engine speed increases the pressure between the contact points 9 and 16 is increased. In Figure 11 the cup 22 is shown in the position which it assumes at high engine speed, i. e., when the pressure in the manifold is relatively high and the spring 23 is exerting its strongest force. When the engine is running slow the cup moves to the left, there being a slight clearance between the cup 22 and the disc 24. Necessarily the movement of the cup 22 is slight and therefore this clearance cannot be shown in Figure 11.

Vacuum created in the tube 28 will draw air through the device as shown by the arrows in Figure 11. This air passing over and around the contact points 9 and 16 tends to cool them.

It will be seen that there has been provided a simple and effective attachment for distributors to replace the usual interrupter. The device can be quickly attached, and reduces the amount of wire in the distributor. Also, it provides means for controlling the pressure of contact points, for cooling the condenser and contact points, thus insuring proper operation of the interrupter at all speeds.

The above description is to be considered as illustrative and not limitative of the invention of which modifications can be made without de-

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parting from the spirit and scope of the invention as set forth in the appended claims.

The invention having been described, what is claimed is:

1. In an attachment for interrupters, a casing, a grounded bracket supporting the casing and grounding the casing, a condenser positioned in the casing and having one end grounded by engaging the casing, a disc engaging the other end of the condenser and having a contact point thereon, a wire connected to the disc and passing through the casing and condenser, a second disc grounded by engaging the casing, a spring arm projecting from the second disc and having a contact point engageable with the contact point on the first disc, a fiber strip on the arm adapted to engage a cam, and resilient means in the casing bearing against the second disc.

2. A combined condenser and switch unit for use in an ignition circuit for internal combustion engines, comprising a condenser having a casing, means for connecting one terminal of the condenser to ground, a switch contact member carried by the casing and connected to the other terminal of the condenser, and a switch arm carried by the casing and movable into and out of circuit-closing engagement with the contact member, the arm being yieldably held in circuit-closing position and projecting from the casing a distance which renders it engageable by a timer cam to effect periodic opening movements of the arm in opposition to said yieldable means during rotation of the cam and means for mounting the casing so that the casing can be adjusted to adjust the relationship of the arm to the cam.

3. In an interrupting device for internal combustion engines, a metal casing, means for supporting and grounding the casing, a condenser positioned in the casing and having one end grounded by contacting the casing, a disc engaging the other end of the condenser and having a contact point thereon, a wire connected to the disc and adapted to be connected to the primary of an induction coil, an arm mounted within and projecting from the casing, and a contact on the arm engageable with the contact point on the disc, said arm being movable to bring the points into and out of engagement, the outer end of said arm being adapted to engage an interrupter cam.

4. In an interrupting device for internal combustion engines, a metal casing, a condenser in the casing and having one end engaging the casing, means for grounding the casing and condenser, a contact point within the casing engaging the other end of the condenser, a spring arm projecting from the casing and having an end adapted to contact an interrupter cam, a contact point on the arm engageable with the first contact point, and electrical connections for connecting the points to a primary of a spark coil.

5. In an attachment for interrupters, a casing, a grounded bracket supporting the casing and grounding the casing, a condenser positioned in the casing and having one end grounded by engaging the casing, a disc engaging the other end of the condenser and having a contact point thereon, a wire for connecting the disc and the primary of a spark coil, a second disc grounded by engaging the casing, and a spring arm projecting from the second disc and having a contact point engageable with the contact point on the first disc, one end of the arm being adapted to engage a cam.

6. A combined condenser and switch unit for use in an ignition circuit for internal combustion

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engines, comprising a condenser having a casing, means for connecting one terminal of the condenser to ground, a switch contact member positioned within the casing and connected to the other terminal of the condenser, and a switch arm having one end positioned within the casing and movable into and out of circuit-closing engagement with the contact member, the arm being yieldably held in circuit-closing position and projecting a distance which renders it engageable by a timer cam to effect periodic opening movements of the arm during the rotation of the cam.

7. A combined condenser and switch unit for use in an ignition circuit for internal combustion engines, comprising a condenser having a casing, means for connecting one terminal of the condenser to ground, a switch contact member carried by the casing and connected to the other terminal of the condenser, and a switch arm having one end carried by the casing and movable into and out of circuit-closing engagement with the contact member, the arm being yieldably held in circuit-closing position and projecting a distance which renders it engageable by a timer cam to effect periodic opening movements of the arm during the rotation of the cam.

8. A combined condenser and switch unit for use in an ignition circuit for internal combustion engines, comprising a condenser having a casing,

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means for connecting one terminal of the condenser to ground, a switch contact member within the casing and electrically connected to one terminal of the condenser, and a switch arm pivotally mounted within the casing and electrically connected to the other terminal of the condenser said arm carrying a contact member movable into and out of circuit-closing engagement with the first contact member upon movement of the arm, the arm being yieldably held in circuit-closing position and projecting a distance which renders it engageable by a timer cam to effect periodic opening movements of the arm during the rotation of the cam.

DEWEY SAMPSON GUILLERMIN.

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