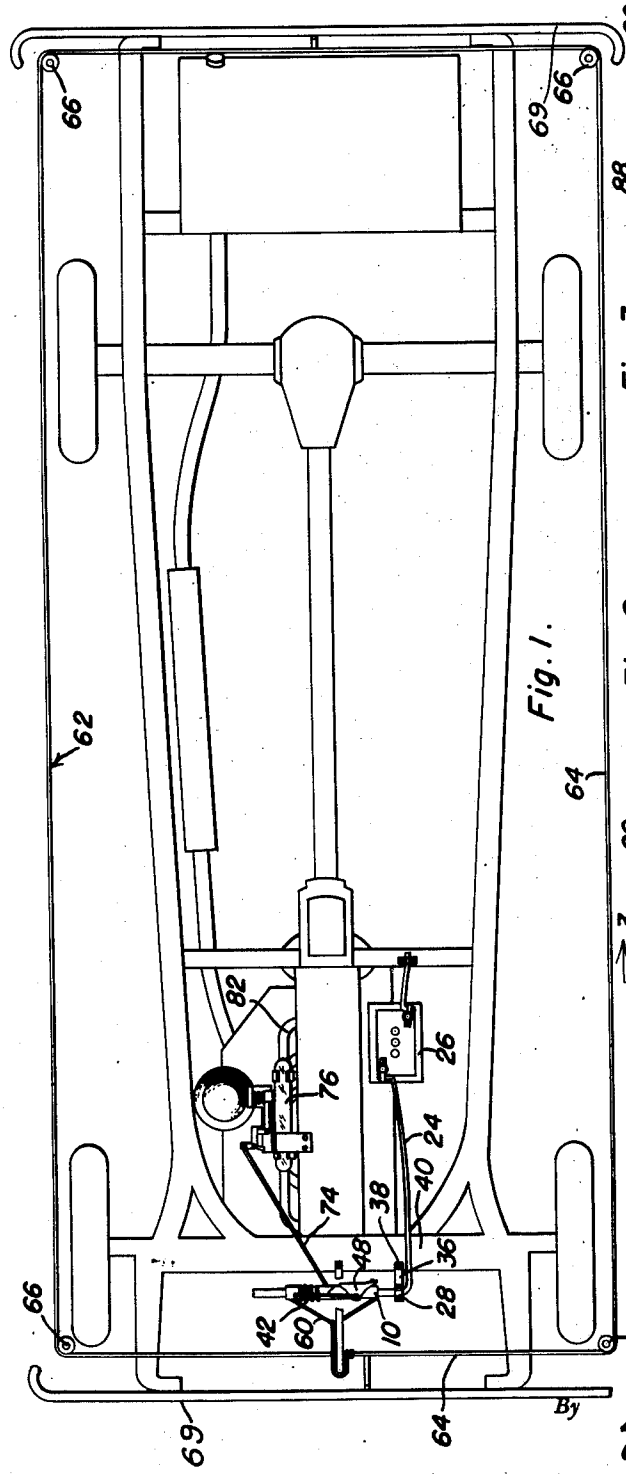
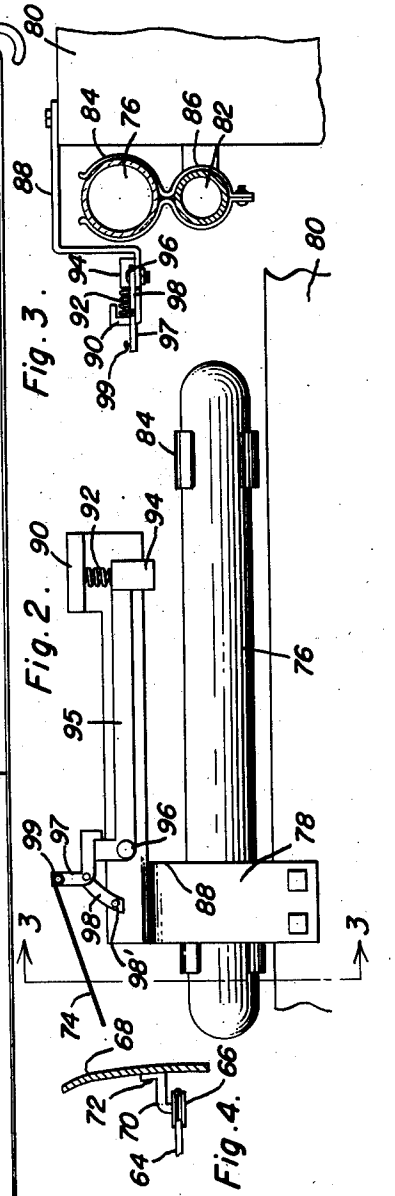
June 20, 1950 D. T. WILLIAMS 2,511,959

FIRE PREVENTING DEVICE

Filed Jan. 13, 1948 2 Sheets-Sheet 1





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FIRE PREVENTING DEVICE

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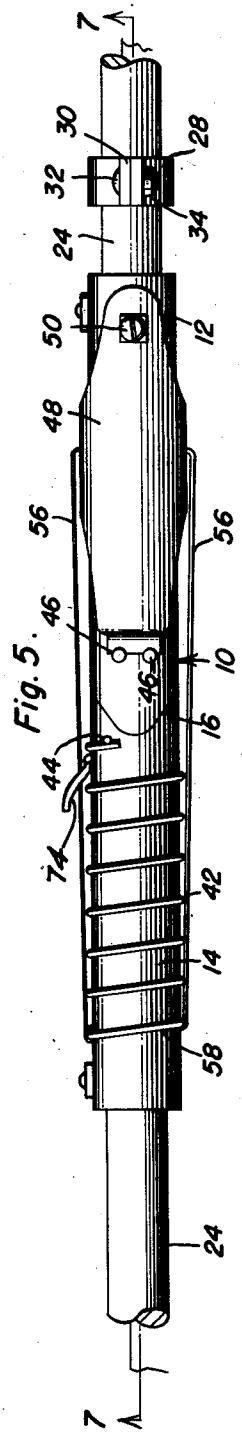


Fig. 5.

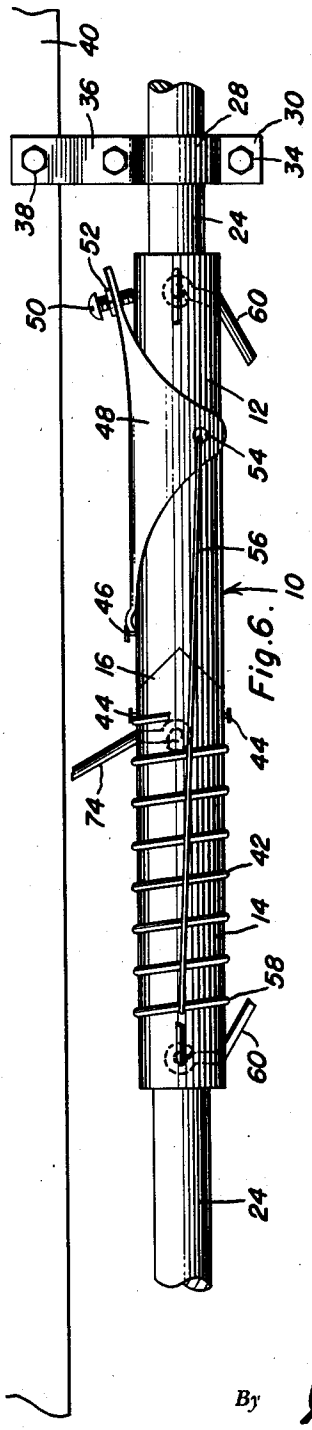


Fig. 6.

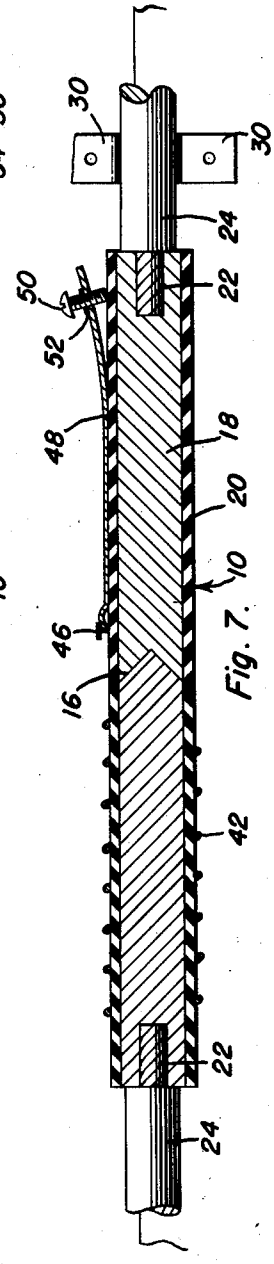


Fig. 7.

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FIRE PREVENTING DEVICE

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6 Claims. (Cl. 180—83)

1

This invention relates to a device utilizable in automobiles, airplanes, and other vehicles possessing electrical ignition systems to prevent fires from arising in these vehicles when a collision occurs.

The primary object of this invention is the provision of a simple and efficient device which may be readily inserted into an appropriate part of the ignition system of a vehicle to prevent a fire from arising at its usual source when such vehicle is struck. It is commonly known in the automotive safety art that the primary cause of fires in struck vehicles is the snapping of electric wires and/or the dislodging of electric cables from their battery posts, with the result that the free end of the wires and/or cables will cause a short circuit by accidental contact with other metallic elements of the vehicle. The present invention prevents or makes improbable this short circuit phenomenon by operating as a circuit breaker.

Another important object of this invention is the provision of an adjustable two-part circuit breaker which is properly insulated and actuated by the force of a collision. The adjustment of the circuit breaker is simply and easily accomplished by means of a set screw which varies the tension on the wire means urging the two-parts of the circuit breaker together. Thus, by this simple adjustment, the circuit breaker can be readily made to withstand the thrusts and bumps encountered in the usual operation of the automobile or airplane; but is incapable of remaining intact under the force of a substantial blow from another vehicle or object.

A further object is the provision of a complete fire prevention device comprising an adjustable circuit breaker which may be readily inserted between two ends of an electric cable in the ignition system of a vehicle and a breakable vial or container secured to the exhaust manifold and means connecting the circuit breaker with the vial. The vial may contain a fire extinguishing fluid such as carbon tetrachloride or carbon dioxide. When a thrust is applied to the circuit breaker whereby the breaker is opened, the means connecting it with the vial will actuate a mallet that will break the vial and cause the expulsion of the fire extinguishing fluid. Thus, the instant invention serves the dual purpose of preventing short circuits and cooling the exhaust manifold within the vehicle in one and the same operation.

These, together with various ancillary objects and features of the invention which will later become apparent as the following description proceeds, are attained by the device, a preferred embodiment of which has been illustrated by way of example only in the accompanying drawings, wherein:

2

Figure 1 is a bottom plan view showing the circuit breaker, cooling means and actuating means in their operating positions on the automobile;

Figure 2 is a fragmentary plan view of the coolant-containing vial assembly;

Figure 3 is a fragmentary sectional view taken substantially on plane 3—3 of Figure 2;

Figure 4 is a sectional view showing the attachment of a pulley to a fender;

Figure 5 is a fragmentary front elevational view of the circuit breaker;

Figure 6 is a fragmentary side elevational view of the circuit breaker; and

Figure 7 is a fragmentary sectional view taken substantially on plane of the section line 7—7 of Figure 5.

Specific reference is now made to the drawings. In the several views in the accompanying drawings and in the following specification similar reference characters indicate corresponding elements throughout.

Generally indicated at 10 is solid cylinder or circuit breaker consisting of two complementary members 12 and 14 having a tongue and groove frictional engagement as at 16. Cylindrical member 10 is in effect an electrical conductor since, as shown in Figure 7, its inner member 18 consists of a conducting material such as laminated copper wire and its outer member 20 is an insulating shield, such as rubber or other suitable non-conductors.

At both ends of cylindrical member 10 are recesses 22 for receiving and frictionally engaging the ends of an electric cable 24, one branch of which cable is connected to the post of a battery 26, the other branch of which is connected to the remainder of the ignition system (not shown).

Around that branch of cable 24 which leads directly to the battery and at a position adjacent the complementary member 12, is secured a conventional two membered collar clamp 28 with a pair of lips on each member 30, and apertures through the lips for receiving a bolt 32 and a nut 34 whereby the clamp can be made to rigidly clasp the cable. One of the collar clamp members is provided with a longer lip 36 at the end of which is an aperture for receiving a bolt or screw 38 for securing the collar clamp to a desired position on frame 40 of the vehicle.

Thus it will be seen that cylindrical element 10 is more or less rigidly fixed at one end and rela-

tively freer at the other end (opposite clamp 28) being supported at this latter end merely by the weight of the cable.

Wound around and freely movable on member 14 is a spring 42. A pin or screw stop means 44 is provided in member 14 to prevent movement of the spring 42 beyond a desired position.

At the bottom of member 12 pin or screw means 46 is provided for frictionally engaging the base of an arcuate plate 48 upwardly curved at its end and provided with an aperture for engageably receiving a set screw 50 and a nut 52. The inwardly curved finger-like sides of plate 48 are provided with two apertures 54. Two fairly rigid wires 56 are provided each of which is hooked at one end to engage plate 48 through aperture 54, and at the other end is curled to form an eye engageably receiving the bottommost coil 58 of spring 42.

Thus, wires 56 urge members 12 and 14 together. By turning set screw 50 in a counter-clockwise direction, tension on wire 56 is lessened, coil 42 expanding with the result that the force urging 12 and 14 together is diminished; whereas, by turning set screw 50 in a clockwise direction, tension on wire 56 is increased, coil 42 contracting and moving toward stops 44 with the result that the force urging 12 and 14 together is increased. Thus, by simply setting the screw 50 at a desired point an efficient control is effected whereby a predetermined minimum force will be required to separate members 12 and 14 at the tongue and groove interface 16.

Fixedly attached at both ends of 10 are wires 60 joined together and made integral with a wire and pulley system, generally shown at 62. This wire and pulley system is made to encircle the bottom of the vehicle at its inside and is so constructed and arranged as to transmit an impact to the vehicle from any side thereof eventually to wires 60 which will pull circuit breaker 10 and snap it open at the tongue and groove interface 16. This wire and pulley system consists of the conventional wires 64 and pulleys 66 which pulleys are fixedly secured to the fenders 68 or bumpers 69 by means of a bracket 70 and bolt 72.

While wires 60 are operating to snap circuit breaker 10 open, wire 74 fixedly secured to 10 is simultaneously impelled to actuate a spring urged mallet arm which strikes and breaks a glass container, generally shown at 76, filled with a fire-extinguishing fluid or coolant such as carbon tetrachloride which fluid is expelled onto the exhaust manifold. The construction of fire-extinguisher 76 is shown in greater detail in Figures 2 and 3.

Glass vial 76 is rigidly fixed at one end by means of the conventional collar clamp 78 to the frame of the car 80 nearest the exhaust manifold 82. At the other end, a conventional double collar clamp is employed to secure vial 76 to manifold 82; one member 84 embraces the vial, and the other member 86 embraces the manifold.

Underneath the vial 76 and bolted or screwed to frame 80 is a substantially S-shaped bracket 88 the free end of which is integral with an L-shaped spring seat 90 to which is secured a spring 92 urging a mallet head 94 in the direction of glass vial 76.

Mallet head 94 is supported on an L-shaped mallet arm 95 which in turn is pivotally secured at its corner 96 to bracket member 88. Adjacent the short arm of mallet arm 95 is a bellcrank 97 pivotally attached at its corner to an arcuate plate 98 which in turn is fixedly secured to bracket member 88 as at 98'. One arm of bellcrank is provided with an aperture for receiving the end of wire 74. Thus it will be seen that the bellcrank 97 serves as both a stop means and a release means.

A brief description of the operation of the device follows. An impact, as in a wreck, received by a vehicle, such as an automobile or airplane, will be transmitted via the wire and pulley system 64 almost instantly to wire 60. This wire 60 will, therefore, exert a pulling force on insulated circuit-breaker 10 snapping it open at the tongue and groove interface 16 thus breaking the circuit. Because of the insulation around 10 hanging elements 12 and 14 will not accidentally cause an undesired short circuit with other metal parts of the vehicle frame. As 10 is snapped open, a pulling force is exerted simultaneously on wire 74 releasing bellcrank stop 97. Spring 92 which is normally in contracted position will then expand against mallet head 94 which in turn will strike and break vial 76 releasing a fire-extinguishing fluid or coolant such as carbon tetrachloride onto the exhaust manifold.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In a motor driven vehicle having an exhaust manifold; a fire preventing device comprising an adjustable circuit breaker, exhaust manifold cooling means, means connecting said cooling means with said adjustable circuit breaker for simultaneously actuating said cooling means and said circuit breaker, and separate means responsive to an impact on the vehicle connected to said circuit breaker for actuating the same, said adjustable circuit breaker comprising, an insulated conductor having two separable complementary portions, and adjustable spring means urging said complementary portions together.

2. The combination of claim 1, wherein said cooling means comprises a breakable container having a cooling fluid therein.

3. The combination of claim 2, wherein said means connecting said breakable container with said adjustable circuit breaker comprises a tensioning wire secured at one end to the insulated portion of said circuit breaker, a mallet arm secured to the other end of said tensioning wire, a mallet head secured to said mallet arm positioned adjacent to said breakable container, and means adjacent said mallet head whereby said mallet head is urged in the direction of said breakable container.

4. In a motor-driven vehicle having an exhaust manifold, a fire-preventing device comprising in combination, an adjustable insulated conductor having two separable complementary portions, a tongue and groove engagement between said separable portions, adjustable spring means secured on said conductor across the tongue and groove engagement urging said separable portions together with a predetermined force, and wire means secured to the insulated portion of both

ends of said conductor responsive to an impact force on said vehicle greater than that predetermined force urging said separable portions together, whereby said conductor is separated at the tongue and groove engagement, a breakable container having a cooling fluid therein, a tensioning wire secured at one end to the insulated portion of said conductor, a mallet arm secured to the other end of said tensioning wire, a mallet head on said mallet arm adjacent said breakable container, and spring means urging said mallet head in the direction of said breakable container.

5. The combination of claim 4, and a wire and pulley system circumscribing said motor driven vehicle contiguous with said wire means secured to both ends of said conductor whereby the impact of collision on any side of said vehicle will be immediately transmitted to said conductor and in turn to said breakable container.

6. In a fire preventing device adaptable for use in a motor driven vehicle including a fire-extinguisher, the improvement comprising a circuit breaker cooperative with said fire extinguisher including, an insulated conductor having two separable complementary portions, a tongue and groove engagement between said separable portions, adjustable spring means secured on said conductor across the tongue and groove engagement urging said separable portions together with a predetermined force, and wire means secured to both ends of the insulated portion of said conductor responsive to an impact force on said vehicle greater than the predetermined force urging said separable portions together, whereby said conductor is separated at the tongue and groove engagement.

DAN T. WILLIAMS.

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