Oct. 2, 1934. B. T. HOLMAN 1,975,748

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Filed May 9, 1932

Fig. 1

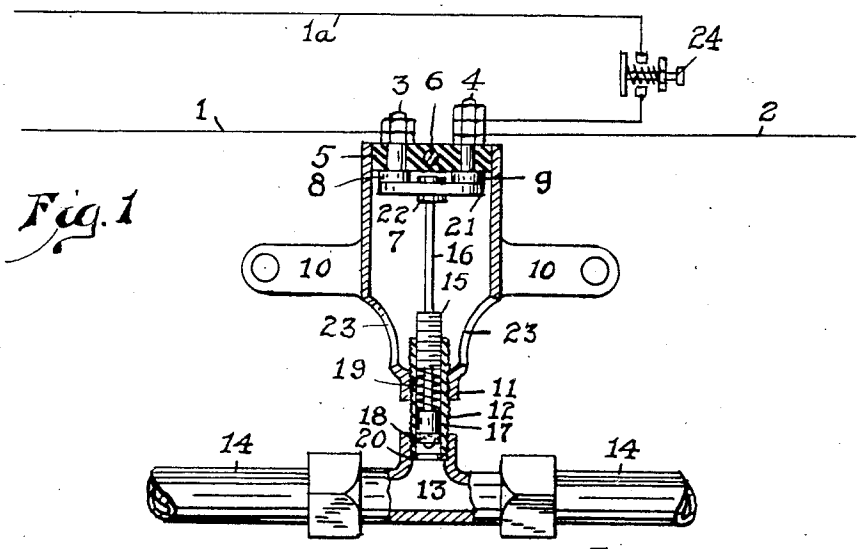


Fig. 2

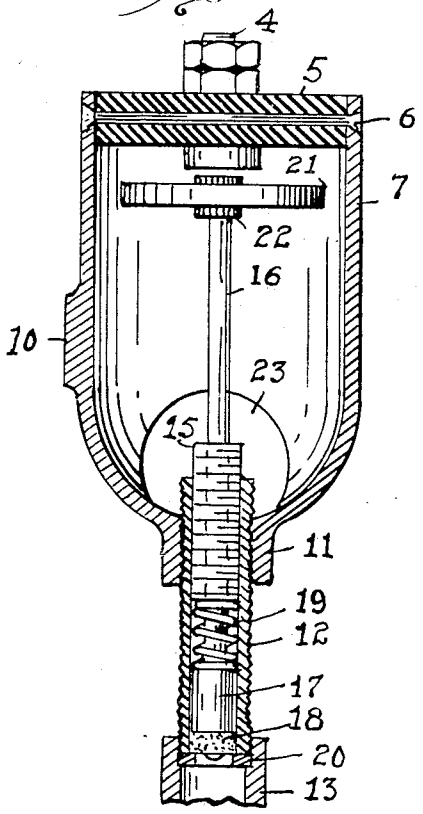
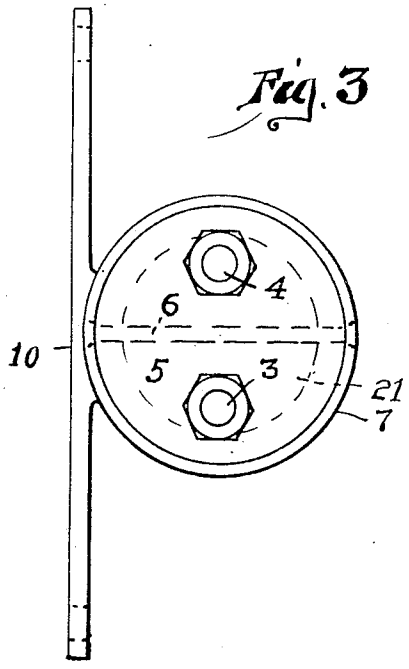


Fig. 3



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Patented Oct. 2, 1934

1,975,748

UNITED STATES PATENT OFFICE

1,975,748

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

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Application May 9, 1932, Serial No. 610,137

1 Claim. (Cl. 200—82)

Although my invention is particularly applicable to motor vehicle engines it may be advantageously applied to all types of internal combustion engines provided with a forced oil feed.

In modern internal combustion engine practice the oil is supplied to the bearings by forced feed and thus when from any cause the oil pressure falls below the safety limit, a sufficient supply of oil to the bearings is not maintained and the continued operation of the engine will result in burned out bearings.

Such failure in pressure may be caused either by a diminution in the oil supply or by failure of the pump or other source of oil pressure.

The object which I have in view is the provision of means, which are independent of the watchfulness of the operator for automatically stopping the operation of the engine when the oil pressure fails or falls below the safety limit.

For the accomplishment of this purpose, my invention comprises an improvement in the ignition systems for internal combustion engines wherein an automatic oil-controlled safety switch is interposed in the ignition system, which switch is maintained in its closed position as long as the proper oil pressure is maintained but is automatically opened and the ignition system interrupted when the oil falls below a predetermined pressure.

Means are provided to regulate the pressure at and above which the switch is held closed, thus enabling my invention to be applied to various characters of internal combustion engines designated to operate with various oil pressures.

Means are also provided whereby the operator may temporarily complete the ignition system to start the engine, which means are automatically rendered inoperative when the engine has been started or oil pressure established.

Other novel features of construction, and also of arrangement of parts, will appear from the following description.

In the accompanying drawing wherein I have illustrated a practical embodiment of the principles of my invention, Fig. 1 is a view partially in vertical section and partially in elevation showing my invention applied to the ignition system and the oil pressure line of an internal combustion engine.

Fig. 2 is an enlarged vertical section taken on a plane at right angles to that of Fig. 1 showing the switch structure illustrated in Fig. 1.

Fig. 3 is a plan view of the switch structure.

Referring to the drawing, 1 and 2 represent a conductor of the ignition system which is interrupted, the ends of the wires being electrically connected to the posts 3 and 4 respectively, which posts extend downwardly through an insulating support 5 which may be of fibre or any other suitable nonconductor of electricity. The support 5 is supported, as by the rivet 6, in the upper end of a vertically disposed body or cage 7. The lower or inner ends of the posts 3 and 4 are provided with enlarged contact heads 8 and 9 respectively. The cage 7 may be attached to any convenient support, such as a portion of the structure of the vehicle or the engine installation, as by means of the brackets 10 which may be cast integral with the cage 7. The lower end of the cage 7 is provided with an axially disposed threaded neck 11, in which is screwed the upper end of a nipple 12 whose lower end is screwed into the vertical arm of a T-coupler 13 which is interposed in the oil pressure line 14. The nipple 12 is internally threaded to receive an externally threaded guide sleeve 15 in which works the rod 16, whose lower end is provided with a piston 17 and a packing 18 working in the bore of the nipple 12.

19 is a helical spring coiled about the rod 16 below the lower end of the sleeve 15 and the piston 17, thus tending to depress the piston. Means are provided for limiting the depressive movement of the piston and such means may be a washer 20 held between the lower end of the nipple 12 and the T-coupler 13. The upper end of the rod 16 is provided with a bridge-piece 21 which is made of electric conductive material and which is insulated from the rod 16 as by the fibre bushing 22. When the rod 16 is elevated into its position shown in Fig. 1 it completes the electrical connection between the contact members 8 and 9, but when the bridge-piece 21 is depressed into its position illustrated in Fig. 2 the electrical connection between said contact posts is broken and therefore the ignition system of the internal combustion engine is placed out of commission. The compressive strength of the spring 19 may be adjusted by screwing the sleeve 15 up or down in the neck 11, and to enable access to be had to said sleeve the cage 7 is apertured as at 23 so that a tool or the hand may be inserted to accomplish such adjustment.

It is noted that the under side of the piston 17 is exposed to the pressure in the oil supply line 14, and the arrangement is such that while the pressure is maintained at or above a predetermined amount the piston 17 is elevated and held elevated so that the bridge-piece 21 completes the

connection between the contact members 8 and 9, thus permitting the supply of electric current to the spark plugs and thus maintaining the operation of the engine.

However, should the pressure in the line 14 fail or fall below a predetermined amount the spring 19 will cause the piston 17 to descend, depressing the bridge-piece 21 and breaking the electrical circuit. Thus should the oil supply be diminished below the safety amount or an accident happen to the means by which the pressure is maintained in the oil line, the ignition of the internal combustion engine is automatically interrupted and the operation of the engine ceases.

Insomuch as the pressure in the oil line 14 will be below operating pressure when the engine is not operating, means are provided for temporarily connecting up the ignition system when the engine is to be started. Thus I have provided a by-pass conductor 1*a* in the ignition system which is connected to the binding post 4, to which the conductor 2 is also connected, and said conductor 1*a* has inserted therein a spring opened switch 24, which in the case of a motor vehicle may be mounted on the instrument board and which in the case of a stationary combustion engine may be mounted in any convenient place.

When the operator desires to start the engine he closes the switch 24 by hand and holds it closed while he is working the starter and until the engine begins to operate and the pressure is established in line 14. He then releases the switch and the spring opens the same, interrupting the by-pass conductor 1*a*, and the engine thereafter maintains its operation owing to the fact that the pressure now established in line 14 has elevated the bridge-piece 21 and completed the circuit of the electric conductors 1 and 2.

It is obvious from the foregoing that my invention is of great value. Very frequently engine bearings are burned out, owing to the fact that the oil supply has been dangerously diminished or has failed or the operation of the oil pump has either ceased or has been impaired.

For instance in the case of a motor vehicle the operator may be unconscious of these conditions or he may feel that he can complete a trip before the bearings are injured. The result is burned out or badly damaged bearings.

With the use of my invention the operation of the vehicle is immediately halted when said failure occurs and the operator is compelled to have the oil supply replenished or the pump put into efficient operation before he can continue the operation of the vehicle.

I claim:—

The combination with a T fitting adapted to be inserted in the oil line of an automobile engine; of a sleeve threaded externally from end to end and screwed into the stem portion of the T fitting, said sleeve being threaded internally for a considerable portion of its length at the end remote from the T fitting, a second sleeve screwed into the internally threaded end of the first sleeve and having its end projecting from the first sleeve, said second sleeve being screw adjustable in the first sleeve, a relatively large tubular housing having a constricted and internally threaded neck screwed on the first sleeve and screw adjustable therealong, said housing having a pair of oppositely disposed access openings opposite the projecting end of the second sleeve to permit access thereto for adjustment thereof, a stem slidably extending through the second sleeve, a piston on said stem fitting the second sleeve adjacent the T fitting, a compression spring surrounding said stem and bearing at its ends on the second sleeve and piston, an insulating disk closing the housing at the end remote from said sleeves, a pair of spaced contact terminals extending through said disk and having contact heads on the ends within the housing, and a conductive disk fixed on the end of the stem within the housing to bridge said contact heads.

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