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SAFETY DEVICE FOR INTERNAL COMBUSTION ENGINES

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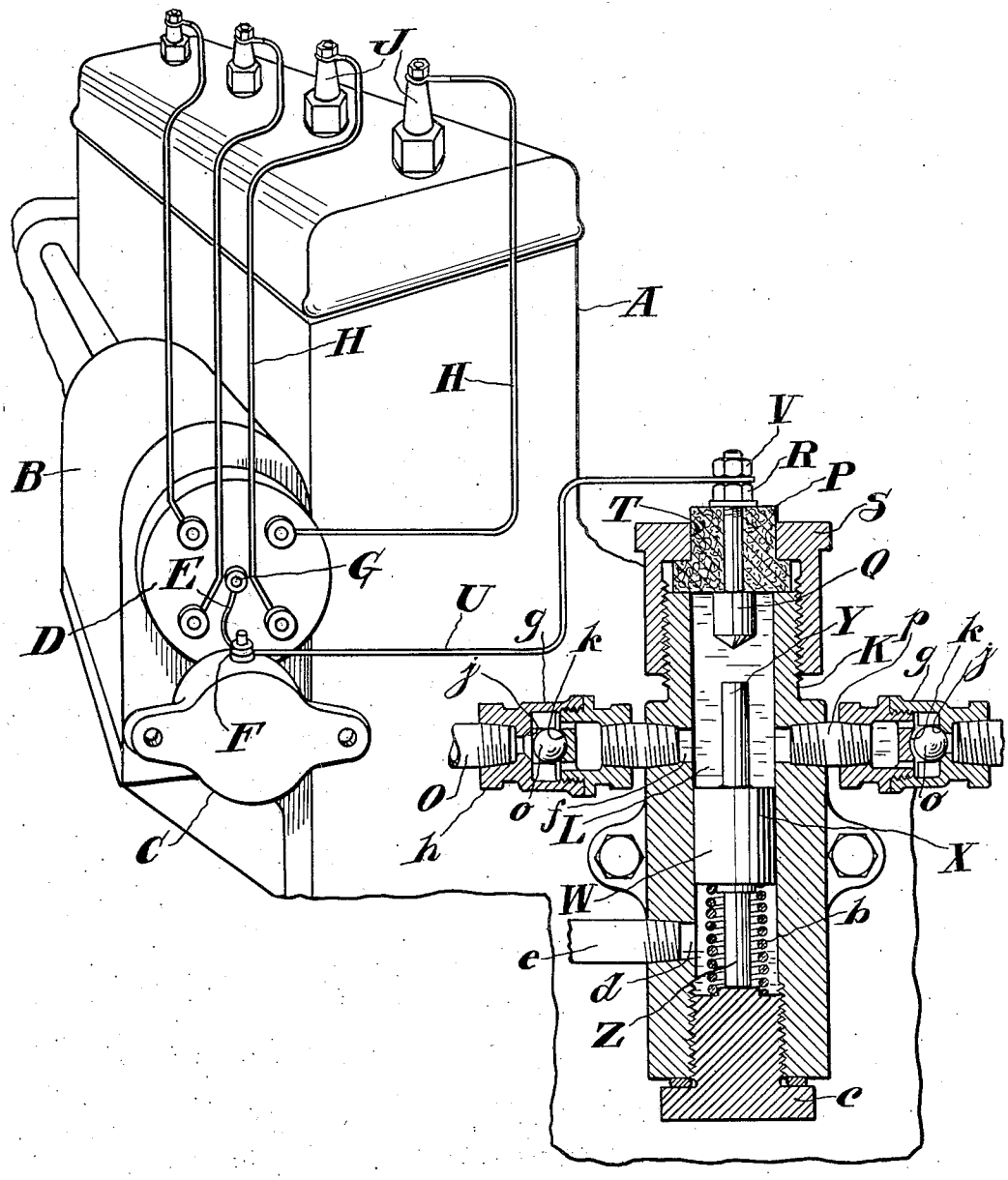

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SAFETY DEVICE FOR INTERNAL COMBUSTION ENGINES

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This invention relates to internal combustion engines, but more particularly to a safety device associated with the pressure lubricating system of engines of this type.

One object of the invention is to render the engine inoperative whenever the pressure in the lubricating system drops to a value deemed insufficient to properly lubricate the engine.

Other objects will be in part obvious and in part pointed out hereinafter.

The figure in the drawing is a perspective view of an internal combustion engine having the safety device attached thereto, said device being shown in sectional elevation.

Referring more particularly to the drawing, A designates an internal combustion engine and B a starting device which may be of the pressure actuated type used in connection with portable compressors and similar machines.

Any suitable ignition system may be provided for igniting the fuel charge in the cylinders of the engine. The means illustrated for this purpose comprises a magneto C which may be supported by the starting device, and a distributor D to which the current is supplied from the magneto C by a cable E connected at one end to a terminal F of the magneto and with its other end to a terminal G on the distributor.

The magneto C and the distributor D may be of any suitable type, and from the distributor D lead cables H which are connected to spark plugs J, on the engine A.

As is customary in engines of this type, the engine A may be provided with the usual pressure lubricating system (not shown) for delivering lubricant to the various bearing surfaces of the engine.

In accordance with the present invention, means are provided for short-circuiting the ignition system, such as the magneto C whenever the pressure in the lubricating system falls below that required for supplying an inadequate amount of lubricant to the various bearings of the engine. The means provided for this purpose comprises a casing K having a chamber L into which oil from the lubricating system may be introduced through a pipe O leading from the oil pump (not shown) of the engine.

Disposed on one end of the casing K is an insulator P which supports a fixed contact Q extending into the chamber L and secured to the insulator by means of a nut R threaded on a projecting end of the contact Q. The insulator may be fixedly clamped in position by means of a cap S threaded on the end of the casing K and having an aperture T to accommodate the insulator. The contact Q is connected to the magneto C by means of a cable U secured at one end to the terminal F and is clamped at its other end to the contact Q by a nut V.

Disposed within the chamber L is a movable contact W in the form of a plunger having a central head X which is slidably guided by the wall of the chamber L and has stems Y and Z at its opposite ends. The stem Y constitutes a contactor adapted to engage the contact Q, and the stem Z serves to guide a spring *b* which bears with one end against the head X and with its other end against the plug *c* threaded into the casing K.

Preferably the casing K is provided with a port *d* in the end of the chamber containing the spring *b* to provide an escape for any oil which may pass between the head X and the casing. Such oil may be returned to the oil reservoir supplying the lubricating system of the engine by a pipe *e* threaded into the casing K to register with the port *d*.

The pipe O communicates with the chamber L through a port *f* which is preferably located so that it will at no time be covered by the plunger W. In the pipe O is disposed a check valve *g* comprising a casing *h* in which are formed opposed valve seats *j* and *k* to ac-

commodate a ball valve *o* whereby the flow of lubricant through the pipe O is controlled.

In order that the plunger W may be held free from the contact Q during the starting period of the engine A, means are provided for introducing pressure fluid into the chamber L simultaneously with the admission of pressure fluid to the starting device B. This means comprises a pipe *p* which may lead from a source of pressure fluid supply, and a check valve *g* similar in all its essential respects to the check valve *g* used for controlling the admission of lubricant into the chamber L. The check valve *g* interposed in the pipe *p* is therefore also provided with a pair of opposed seats *j* and *k* to accommodate a ball valve *o*.

The casing K may be suitably secured to any metallic portion of the apparatus to which it may be applied or, as illustrated, to the engine A so that it will be thoroughly grounded to assure short-circuiting of the ignition system whenever the movable contact W engages the fixed contact Q.

The operation of the device is as follows: Let it be assumed that pressure fluid is being admitted to the starting device B for setting the engine A in operation. Upon admission of pressure fluid to the starting device B pressure fluid may also flow through the pipe *p* into the chamber L to act against the the head X of the movable contact W for holding it out of engagement from the contact Q. Such pressure fluid admitted into the chamber L will flow into the check valve *g* and press the ball valve *o* against the seat *j*.

After the engine A is started the pressure in the lubricating system will rise to such a value that it will move the ball valve *o* in the pipe O against the seat *k* and lubricant under pressure will then flow into the chamber L and hold the movable contact W in the retracted position. The lubricant will also act against the ball valve *o* associated with the pipe *p* and will hold said ball valve firmly against its seat *j* to prevent the admission of lubricant into the pipe *p*.

Under normal conditions of operation of the engine the parts will remain in the positions described. In the event however, that there should be an insufficient amount of lubricant in the supply reservoir to maintain the pressure in the lubricating system above the pressure exerted by the spring *b*, the said spring *b* will act to move the plunger W against the contact Q. In this way the magneto C will be short-circuited and the engine A will automatically stop operating. Thereafter it will be impossible to again set the engine A in operation until the condition which caused the decrease in the pressure in the lubricating system has been remedied.

I claim:

The combination with an internal combustion engine having a pressure lubricating system and an ignition system, of a casing having a chamber, a fixed contact extending into the chamber, a movable contact in the chamber, a spring for actuating the movable contact against the fixed contact to short circuit the ignition system, means for admitting pressure fluid into the chamber to actuate the movable contact out of engagement from the fixed contact, and means for admitting lubricant under pressure into the chamber to hold the movable contact out of engagement from the the fixed contact.

In testimony whereof I have signed this specification.

MORTIMER S. PARKHILL.