May 30, 1939. E. V. STONE 2,160,318

OVER SPEED ENGINE CONTROL

Filed Sept. 8, 1936 2 Sheets-Sheet 1

Fig. 1.

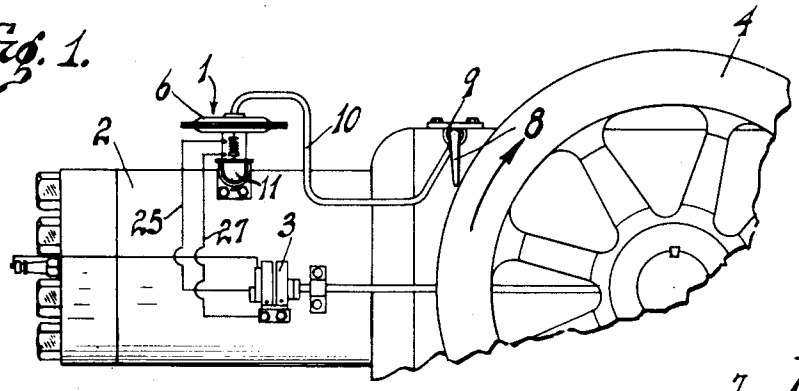



Fig. 2.

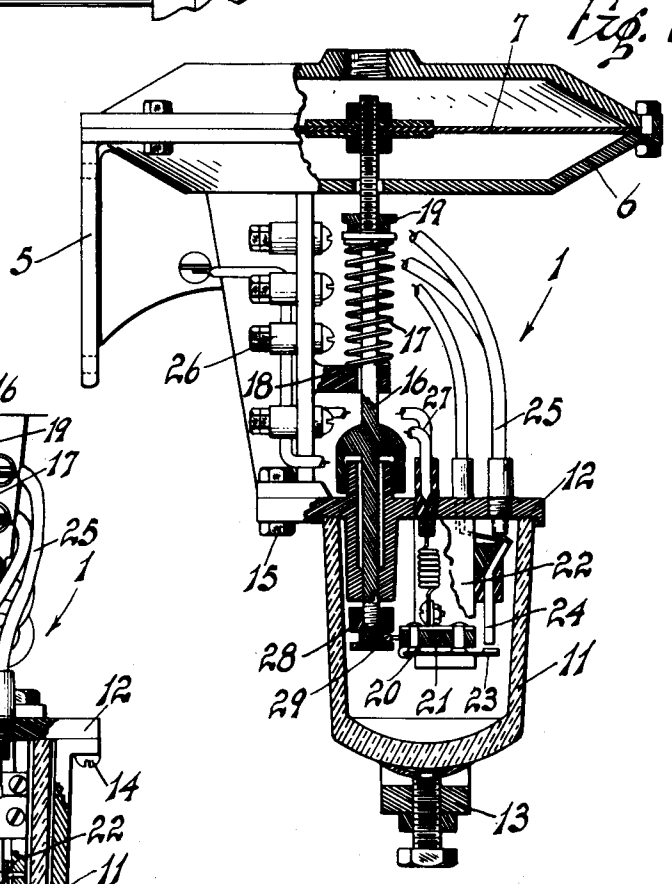
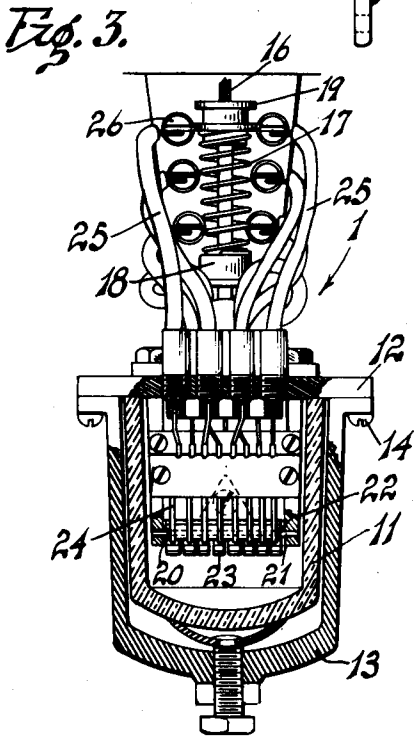



Fig. 3.




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Filed Sept. 8, 1936 2 Sheets-Sheet 2

Fig. 4.

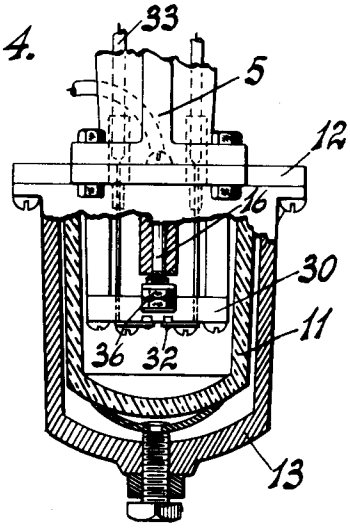



Fig. 5.

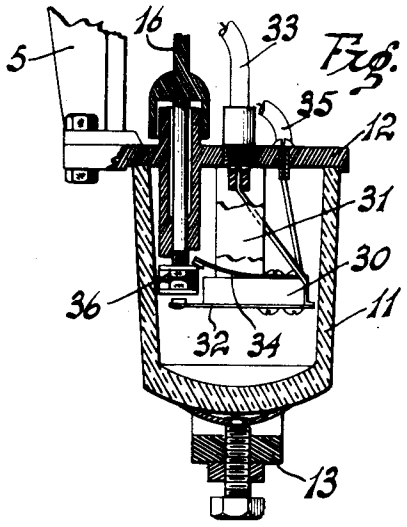



Fig. 6.

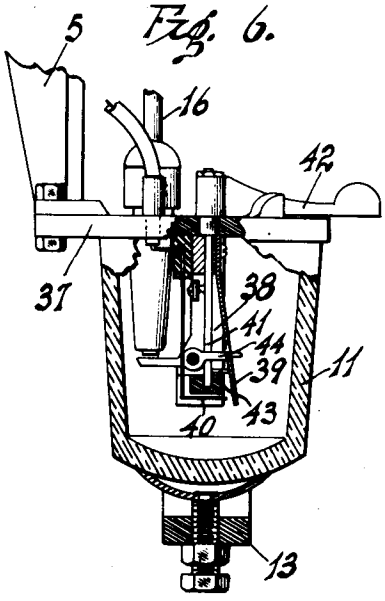



Fig. 7.

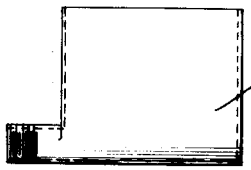
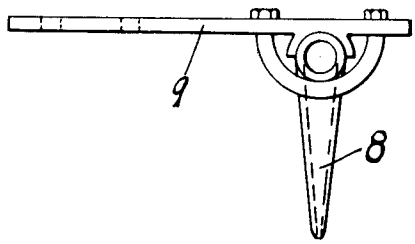



Fig. 8.




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# UNITED STATES PATENT OFFICE

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## OVER SPEED ENGINE CONTROL

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Application September 8, 1936, Serial No. 99,797

2 Claims. (Cl. 200—83)

This invention relates to an over speed engine control particularly applicable to internal combustion engines, and further, to those types of internal combustion engines having an ignition system.

An object of my invention is to provide a novel over speed engine control, the contact member of which is actuated from a diaphragm, the diaphragm in turn being flexed by the air pressure created by the rotation of the engine fly wheel.

Another object is to provide an engine control of the character stated in which the electrical circuit is opened and closed in an oil container by means of a mechanism which is simple in construction, inexpensive to manufacture and effective in operation.

A further feature of my invention when used in connection with engines having a magneto, is the novel means of grounding the magneto circuit, thereby shutting down the engine when its speed increases above a determined amount.

Another feature of my invention is that the control can be made to govern a plurality of engines simultaneously for the purpose of shutting down an entire group of engines if one engine should increase its speed to a dangerous degree.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined, detailed description, and the appended claims.

In the drawings:

Figure 1 is a fragmentary side elevation of an engine with my control mounted thereon.

Figure 2 is a fragmentary vertical sectional view of one form of my control.

Figure 3 is a fragmentary vertical sectional view taken at right angles to Fig. 2.

Figure 4 is a fragmentary vertical sectional view of another form of control.

Figure 5 is a fragmentary vertical view taken at right angles to Fig. 4.

Figure 6 is a fragmentary vertical sectional view of still another type of control mechanism.

Figure 7 is a side elevation of the nozzle.

Figure 8 is an end view of the same, together with its supporting bracket.

Referring more particularly to the drawings, my control 1 is mounted on or adjacent to an engine 2. A magneto 3, of usual and well known construction, supplies the necessary electrical current to ignite the charge in the engine. The engine also includes the usual fly wheel 4. My control includes a bracket 5 which is integrally formed with a diaphragm housing 6. A diaphragm 7 is stretched transversely across the housing 6, and is preferably held in the periphery of the housing.

A nozzle 8 is mounted on a bracket 9 and the nozzle is arranged adjacent to the periphery of the fly wheel 4 substantially as shown in Fig. 1. The air stream carried with the fly wheel creates a pressure in the nozzle 8 and this pressure is conducted thru pipe 10 to the diaphragm housing 6. This air pressure causes the diaphragm 7 to flex downwardly, as viewed in Fig. 2.

A cup 11 is secured to a head 12 by a yoke 13, the yoke being secured to the head by means of screws 14. The head 12 is attached to the lower end of the bracket 5 by means of bolts 15.

A rod 16 is secured to the diaphragm 7 and extends downwardly into the cup 11 thru the head 12. A spring 17 surrounds the rod 16 and extends between a lug 18 projecting from the bracket 5, and a nut 19 which is threaded on the rod 16. By adjusting the nut 19, the tension of the spring 17 can be altered. The spring 17 opposes the pressure of the incoming air in the diaphragm housing 6, and by adjusting the tension of the spring, the amount of pressure necessary to actuate the control can be varied.

A switch block 20 is pivotally mounted in the cup 11 on a pin 21 which pin is secured in a frame 22, the frame depending from the head 12. The block 20 carries a plurality of contacts 23 which are adapted to be brought into engagement with the stationary pins 24. The pins 24 are fixedly mounted within the cup 11 and each pin is connected thru a lead 25 to one of the terminals 26 mounted on the bracket 5. Each of the contacts 23 is grounded thru the ground leads 27 which extend upwardly thru the head 12. As shown in Fig. 1, the lead 25 extends from the magneto 3 and the lead 27 is grounded. Thus, when the contacts 23 and 24 are engaged, the magneto will be grounded and the engine will cease to operate.

A fitting 28 on the lower end of the rod 16 is engaged by a pin 29 projecting from the rear edge of the block 20. Thus, when the rod 16 is moved downwardly by the diaphragm 7, the block 20 will be swung to engage the contacts 23 and 24, thereby stopping the engine or engines. As soon as the speed of the fly wheel 4 is reduced, the pressure in the nozzle 8 will be correspondingly reduced, the spring 17 will then urge the rod 16 upwardly, thus breaking the contacts 23 and 24 and permitting the engine to re-start. By adjusting the tension of the spring 17, the amount of over speed of the engine can be accurately controlled.

In Figs. 4 and 5, I have illustrated a switch which may control a single motor instead of the multiple switch arrangement disclosed in Figs. 2 and 3. The diaphragm, the air pressure means, the rod, the cup and its mounting, are all identical to the structure previously described.

A stationary block 30 is mounted on the frame 31 which depends from the head 12. A contact 32 is mounted on the bottom of the block 30 and is connected thru the lead 33 to the magneto (or other electrical system). A spring contact 34 is mounted on top of the block 30 and is connected thru the lead 35 to the electrical system, these two contacts—when connected—serving to ground the electrical system. A block 36 attached to the lower end of the rod 16 serves to make contact with the terminal 32, the terminal 34 constantly pressing on top of the block. When the rod 16 is lowered, due to increased pressure in the diaphragm chamber 6, the contact is made between 32 and 34, and the electrical system is thus grounded to temporarily stop the motor.

In Fig. 6, I have illustrated a snap type of switch. The rod 16 extends thru a head 37 affixed to the bottom of the bracket 5. The frame 38 depends from the head 37. A spring contact 39 is attached to the frame 38 and serves to close a contact with the terminal 40. A shaft 41 rotatable by the handle 42, is provided with a pin 43 which serves to engage and raise the spring plate 39. On raising the plate, a trigger 44 is engaged. This trigger is pivotally mounted on the frame 38, and the rod 16—on engaging the trigger—swings the same, thereby releasing the plate 39 to form its contact. When the plate 39 has been set, the arm 42 is swung to disengage the pin 43.

Having described my invention, I claim:

1. An over speed engine control comprising a bracket, a diaphragm chamber integrally formed with the bracket, a diaphragm in said chamber, an air pressure nozzle connected to the chamber whereby air under pressure is conducted to said chamber, said nozzle being mounted adjacent the fly wheel of the engine and receiving air under pressure from said fly wheel, a rod attached to the diaphragm and extending out of said chamber, a coil spring surrounding the rod, an adjustable nut on the rod, said spring bearing against the nut, a cup mounted on said bracket, said rod extending into the cup, a switch in the cup, said switch including a block, a ground contact on the block, a stationary terminal, and means operable on movement of the rod whereby said contact and terminal are engaged and disengaged.

2. An over speed engine control comprising a bracket, a diaphragm chamber integrally formed with the bracket, a diaphragm in said chamber, an air pressure nozzle connected to the chamber whereby air under pressure is conducted to said chamber, said nozzle being mounted adjacent the fly wheel of the engine and receiving air under pressure from said fly wheel, a rod attached to the diaphragm and extending out of said chamber, a coil spring surrounding the rod, an adjustable nut on the rod, said spring bearing against the nut, a cup mounted on said bracket, said rod extending into the cup, a switch in the cup, said switch including a block, a ground contact on the block, a stationary terminal, said block being pivotally mounted, and means coupling the block and the rod whereby movement of the rod will engage and disengage said contact and terminal.

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