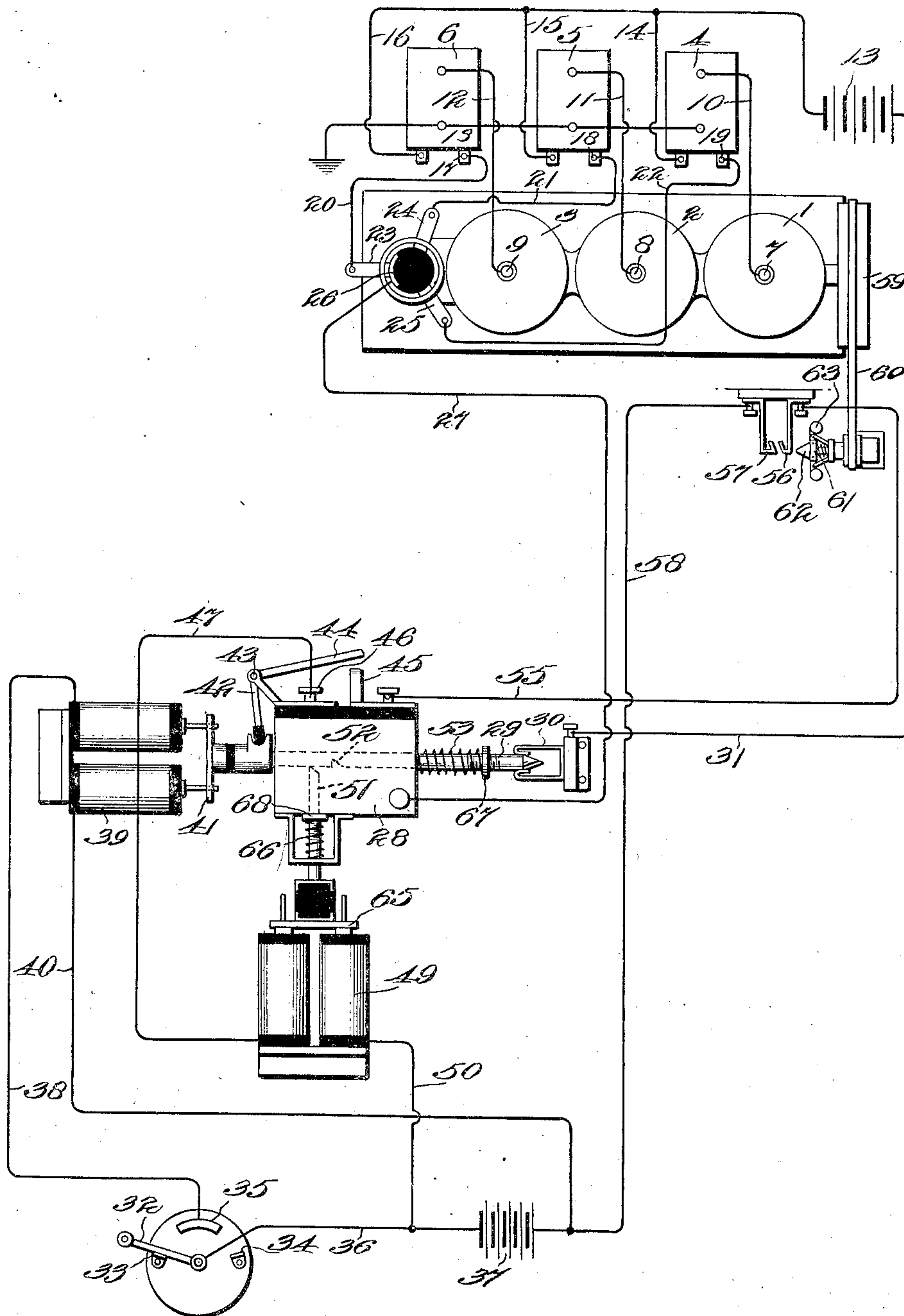


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 AUTOMATIC REVERSING SWITCH FOR GAS ENGINES.  
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Patented June 20, 1911.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JAMES M. RHETT, OF BEAUFORT, SOUTH CAROLINA.

AUTOMATIC REVERSING-SWITCH FOR GAS-ENGINES.

995,482.

Specification of Letters Patent. Patented June 20, 1911.

Application filed October 15, 1910. Serial No. 587,276.

*To all whom it may concern:*

Be it known that I, JAMES M. RHETT, a citizen of the United States, residing at Beaufort, in the county of Beaufort and State of South Carolina, have invented certain new and useful Improvements in Automatic Reversing-Switches for Gas-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to automatic switches for reversing gas engines, and has for its object to improve the switch shown in my prior Patent Number 950,704, dated March 1, 1910.

To these ends the invention consists in the details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification, the figure is a diagrammatic illustration of one form of my invention.

It is well known to those operating gas or other internal explosion engines that they may be readily reversed without the employment of any clutch by the proper adjustment of the sparking points, and by a skillful throwing of the switch controlling the ignition circuit at the proper time, all as has been set forth in my patent above.

However, as stated in said patent, there are a number of objections to the reversal of engines by this method, and the object of my invention therefore more specifically stated is to provide a magnetic means operating automatically to reverse the engine, and therefore to render such reversal more certain than has been the case heretofore.

In the drawings 1, 2 and 3 represent the cylinders of any suitable engine; 4, 5, and 6 suitable spark coils in this instance shown as induction coils; 7, 8 and 9 spark plugs for the cylinders; and 10, 11 and 12 connections between the secondaries of said coils and said spark plugs respectively.

13 represents any suitable source of current in this instance shown as a battery, and 14, 15 and 16 represent suitable connections between one pole of said battery and one end of the primaries of said spark coils. The other ends 17, 18 and 19 of said primaries are connected by the wires 20, 21 and 22 to

the arms 23, 24 and 25 to the usual commutator or timing device employed in connection with engines of this type. This timing device as is well known is provided with an insulating plug with which said arms 26, which successively contacts with the arms 23, 24 and 25 as the said plug is rotated by the engine. 27 represents a connection between said plate 26 and the block 28, which is in electrical connection with the plunger 29 adapted to contact with the spring terminals 30, with which the wire 31 is connected, and which wire leads to the other pole of the battery 13.

It is evident from what has now been disclosed that as the plate 26 successively contacts with the arms 23, 24 and 25, that the spark plugs 9, 8 and 7 will be successively operated, and the engine will continue to turn its driving shaft in the same direction. When, however, it is desired to reverse the engine according to my invention, I simply throw a switch 32 from the position shown in the drawings in contact with the stop 33 over to the right and into contact with the stop 34. During this movement the said switch 32 will momentarily make contact with the plate 35, and thereupon permit a current to pass through the wire 36 connected to one pole of the battery 37, through the wire 38 connected to the magnets 39, through said magnets, and through the wire 40 leading back to the other pole of the battery as shown. The magnet 39 being thus energized will pull its armature 41 to the left, as seen in the drawings, and thereby pull the rod 29 connected to said armature in the same direction, and consequently break the circuit just described passing through the sparking system. The breaking of the sparking system will, of course, cause the engine to slow down, and the movement of the rod 29 in the direction stated will rock the bell crank lever 42 on its pivot 43 and cause its arm 44 to make contact with the spring finger 45. The arm 44 is electrically connected with the binding post 46 as shown, and with the wire 47 leading to the magnet 49 which in turn is connected by the wire 50 to one pole of the battery 37. When the armature 41 was retracted as above described, a spring controlled plunger 51 entered a notch 52 in said rod 29, and thereupon held the latter retracted against



the tension of its spring 53. The contact 45 is in electrical connection with the wire 55, which in turn is connected to one member 56 of a spring contact, the other member 57 of which is connected by the wire 58 to the other pole of the battery 37.

59 represents the fly wheel of the engine connected by a belt 60 to a centrifugal governor 61, which may be of any suitable construction, but is preferably of the type shown in my patent above. This governor 61 is provided with a projection 62 which is located in close proximity to one of the members 56 of a spring contact, and the relation of the parts is such that when the fly wheel slows down, the centrifugal balls 63 of the governor will permit said projection 62 to contact with the spring 56, and thereby close the circuit between the said springs 56 and 57. When this happens the circuit will then be closed through the magnet 49, and the armature 65 of said magnet will be retracted, against the tension of the spring 66 on the rod 51, whereupon the rod 29 will be released and the original sparking circuit will be reestablished.

The spring 53 or the spring 66, or both, are suitably adjusted by means of the nuts 67 and 68 and the screw threads on their respective rods, or by other suitable means in order to secure an efficient operation of the parts. When the desired point in the revolution of the fly wheel has been reached, the parts are so arranged that the sparking will reoccur before the piston has completed its stroke, and therefore the new sparking will cause the engine to be reversed. After the engine is reversed, of course, the throwing of the lever 32 back into its original position shown in the drawings will again reverse the engine or start it in its original direction.

It is evident that those skilled in the art may vary the details of construction and arrangement of parts without departing from the spirit of my invention, and therefore I do not wish to be limited to such features except as may be required by the claims.

What I claim is:—

50 1. In a reversing switch for gas engines the combination of a sparking circuit; magnetic means for breaking said circuit; means for controlling the action of said magnetic means; and means for locking said magnetic means and automatically releasing the same after a predetermined interval, substantially as described.

2. In a reversing switch for gas engines the combination of a sparking circuit; magnetic means for breaking said circuit, comprising a plunger; a spring for controlling the movements of said plunger; means for locking said plunger against the tension of said spring in its extreme position; and automatic means for releasing said plunger

after said engine has decreased its speed, substantially as described.

3. In a reversing switch for gas engines the combination of a sparking circuit; magnetic means for breaking said circuit, comprising an armature; a spring for controlling the movements of said armature; means comprising a magnetically controlled latch for locking said armature against the tension of said spring in its extreme position; a circuit associated with said magnetically controlled latch; and automatic means comprising a centrifugal device for closing said circuit and releasing said armature after a predetermined change in the speed of said engine, substantially as described.

4. In a reversing switch for gas engines the combination of a sparking circuit; a plunger adapted to make and break said circuit; a spring controlling said plunger; a magnet for retracting said plunger; a latch for holding said plunger retracted; a second magnet for retracting said latch; and a centrifugal device for closing the circuit through said second magnet, substantially as described.

5. In a reversing switch for gas engines the combination of a sparking circuit; a plunger adapted to make and break said circuit; a spring controlling said plunger; a magnet for retracting said plunger; a second circuit; a lever controlled by said magnet and spring for making and breaking said second circuit; a latch for holding said plunger retracted; a second magnet for retracting said latch, connected in said second circuit; and a centrifugal device for closing the circuit through said second magnet; substantially as described.

6. In a reversing switch for a gas engine the combination of a sparking circuit; a spring controlled plunger for making and breaking said circuit; a magnet for retracting said plunger; a spring controlled latch for holding said plunger retracted; a second circuit; a lever actuated by said plunger for making and breaking said second circuit; a second magnet joined in said second circuit and controlling said latch; a spring contact controlling said second circuit; and a centrifugal device adapted to close said spring contact when the engine has reached a predetermined speed; substantially as described.

7. In a reversing switch for a gas engine provided with a fly wheel, the combination of a sparking circuit; a spring controlled plunger for making and breaking said circuit; a magnet for retracting said plunger; a spring controlled latch for holding said plunger retracted; a second circuit; a lever actuated by said plunger for making and breaking said second circuit; a second magnet joined in said second circuit and controlling said latch; a spring contact con-



trolling said second circuit; a centrifugal device connected to said fly wheel adapted to close said spring contact when the engine has reached a predetermined speed; and a  
5 hand operated switch adapted to control said retracting magnet; substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

JAMES M. RHETT.

Witnesses:

T. L. P. BETTISON,  
DANIEL MANN.