June 23, 1925. 1,543,521

W. M. RISTAU, JR

DUAL IGNITION SYSTEM

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Fig. 1.

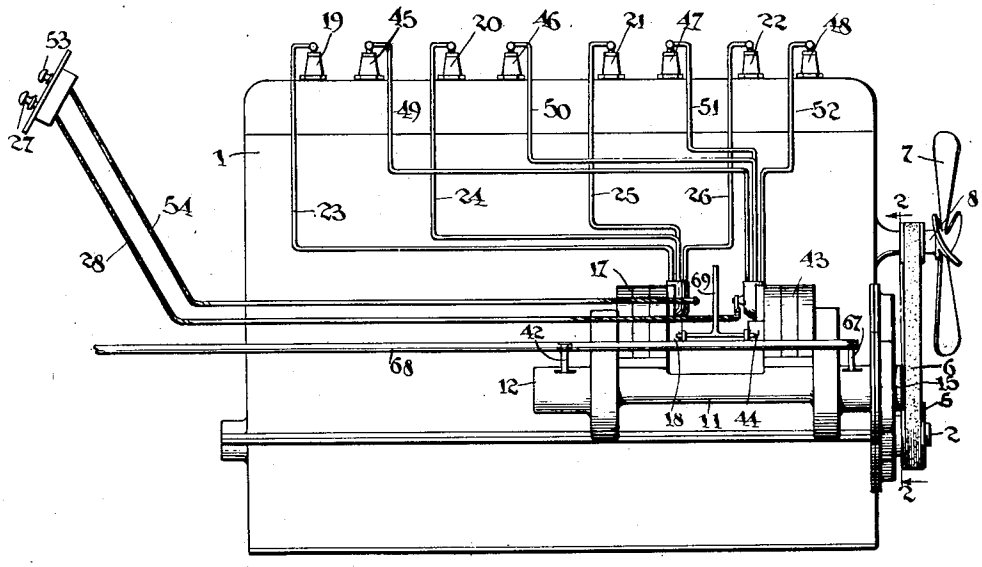


Fig. 2.

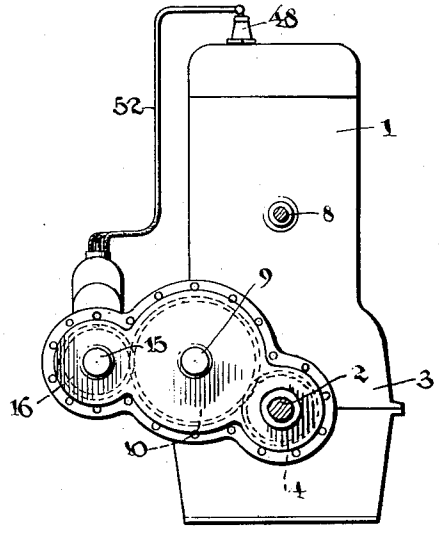
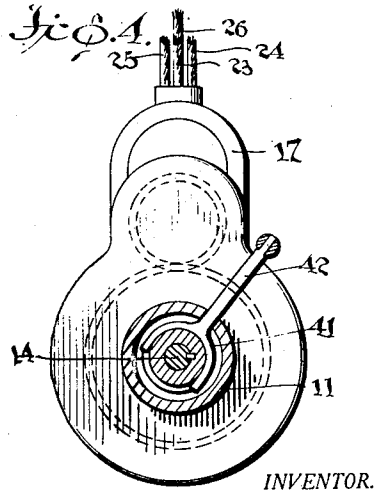


Fig. 4.



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Fig. 3.

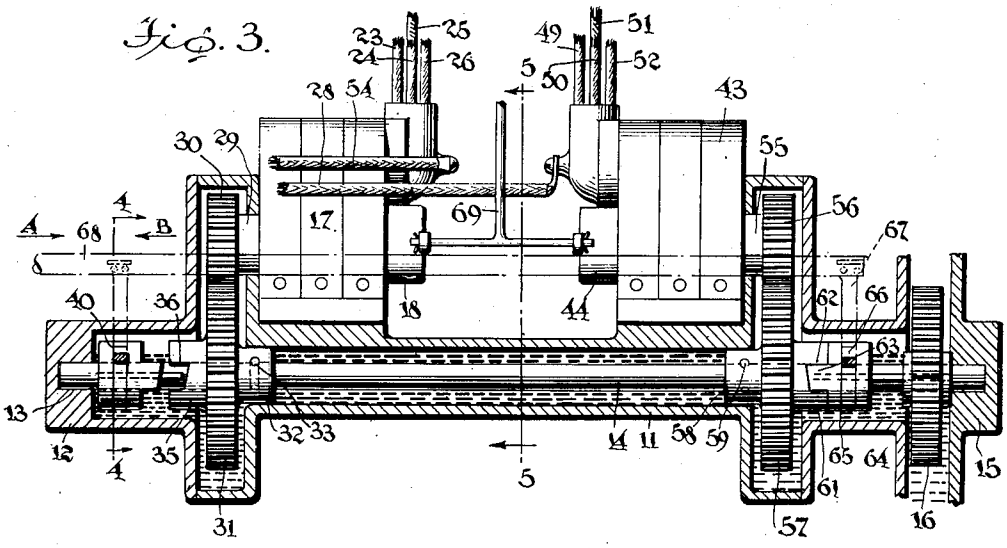


Fig. 5.

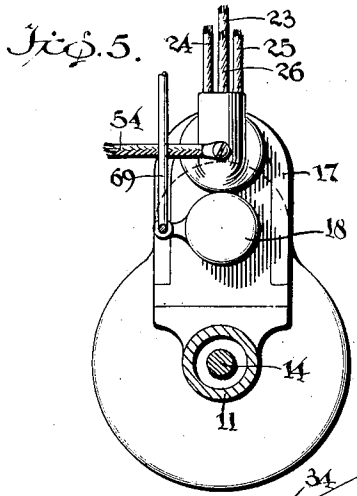


Fig. 6.

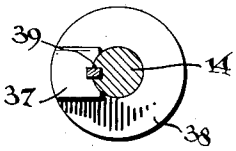


Fig. 7.

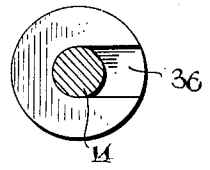


Fig. 8.

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UNITED STATES PATENT OFFICE.

WILHELM M. RISTAU, JR., OF FREDERICKSBURG, TEXAS.

DUAL IGNITION SYSTEM.

Application filed August 5, 1924. Serial No. 730,238.

To all whom it may concern:

Be it known that I, WILHELM M. RISTAU, Jr., a citizen of the United States, residing at Fredericksburg, in the county of Gillespie and State of Texas, have invented certain new and useful Improvements in Dual Ignition Systems, of which the following is a specification.

This invention relates to a dual ignition system, designed primarily for use in connection with internal combustion motors of motor vehicles and aeroplanes, but it is to be understood that an ignition system in accordance with this invention can be employed for any purposes for which it is found applicable, and the invention has for its object to provide, in a manner as hereinafter set forth, a system of the class referred to, with a pair of normally open magneto circuits each including a magneto operated from a common driving means, and with each magneto independently controlled to provide for the operation of one while the other is dormant, under such conditions if one of the magneto circuits becomes impaired the other circuit can immediately be closed to provide for the operation of the motor, thereby overcoming the necessity of stoppage for repairs.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a dual ignition system for the purpose referred to and which is simple in its construction and arrangement, compact, durable, thoroughly efficient in its use, readily installed with respect to the motor, and comparatively inexpensive to set up.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is an elevation of an internal combustion motor showing the adaptation therewith of a dual ignition system, in accordance with this invention.

Figure 2 is a section on line 2—2, Figure 1.

Figure 3 is a fragmentary view in longitudinal section of the system.

Figure 4 is a section on line 4—4, Figure 3.

Figure 5 is a section on line 5—5, Figure 3.

Figure 6 is a fragmentary view, in section, illustrating, that clutch member provided with the clutching protuberance.

Figure 7 is an end view of a hub of an operating gear for a magneto.

Figure 8 is a perspective view of the operating shaft of the system.

Each of the normally open magneto circuits includes a switch, a spark plug for each cylinder of the motor, a magneto, a spark controlling device, an operating means for the magneto, circuit wires leading from the magneto to the plugs, and circuit connections leading from the magneto to the switch. A common driving means is employed for the operating means for the magnetos, and a common controlling element for the spark controlling devices. The common driving means is active at one time upon but one of the magneto operating means. The magnetos are independently operated, or in other words, when one is operated, the other is dormant.

Referring to the drawings in detail, 1 denotes a motor, as illustrated by way of example, of the four cylinder type. The reference character 2 indicates the crank shaft which is extended from the crank case 3 and has fixed to its extended end a gear 4. The extended end of the shaft 2 carries a pulley 5 for driving an endless transmission belt 6 for the purpose of operating a fan 7, carried by a fan shaft 8. The reference character 9 denotes the cam shaft of the motor and which is provided with a gear 10, meshing with and driven from the gear 4.

Supported from the body portion of the motor 1, is a housing 11, closed at one end as indicated at 12, and said closed end provides a bearing 13 for a shaft 14, which is common to the operating means for the magnetos. The shaft 14 extends from the other end of the housing 11 and is mounted in a bearing 15, between the bearing 15 and the housing 11, the shaft 14 is provided with a gear 16 which meshes with and is driven from the gear 10.

One of the normally open magneto circuits consists of a magneto 17 supported by

the housing 11, a spark control device 18, spark plugs 19, 20, 21 and 22, depending upon the number of cylinders of the motor, circuit wire connections 23, 24, 25 and 26 leading respectively from the plugs 19, 20, 21 and 22 to the magneto 17, a switch 53, and circuit wire connections 54 leading from the switch 53 to the magneto 17. The shaft of the magneto 17 is indicated at 29 and extends into the housing 11. The shaft 29 carries a pinion 30 driven from a gear 31, which is loosely mounted on the shaft 14 and is adapted to be coupled therewith for the purpose of operating the magneto 17. The gear 31 has one side of its hub extended, as at 32, and which is formed with a pin 33 travelling in a peripheral groove 34 formed in the shaft 14, and by such arrangement, although the gear 31 is loosely mounted on the shaft 14, it is prevented from shifting longitudinally with respect to the shaft. The hub of the gear 31, at the other side thereof, is extended, as at 35, and the said extended portion 35 is formed with a socket 36, for the reception of a clutching protuberance 37, carried by a clutch member 38, which is keyed, as at 39, to the shaft 14, whereby the member 38 can shift lengthwise of the shaft 14, but will be carried therewith during the operation of the shaft 14. The member 38 is peripherally grooved, as at 40, and mounted therein is the yoke-shaped inner end 41 of a shifting arm 42, and by this arrangement when the arm 42 is moved in a direction towards the gear 31 the clutching protuberance 37 engaging in the socket 36 will clutch the gear 31 to the shaft 14, thereby providing for the driving of the gear 31 and the operation of the magneto 17, and if the switch 53 is closed it will close the magneto circuit.

The other normally open magneto circuit consists of a magneto 43, supported by the housing 11, a spark control device 44, spark plugs 45, 46, 47 and 48, depending upon the number of cylinders of the motor, circuit wire connections 49, 50, 51 and 52, leading respectively from the plugs 45, 46, 47 and 48 to the magneto 43, a switch 27, and circuit wire connections 28 leading from the switch 27 to the magneto 43. The shaft of the magneto 43 is indicated at 55 and extends into the housing 11. The shaft 55 carries a pinion 56, driven from a gear 57, which is loosely mounted on the shaft 14 and is adapted to be clutched therewith for the purpose of operating the magneto 43. The gear 57 has one side of its hub extended, as at 58, and which is formed with a pin 59 travelling in a peripheral groove 60, formed in the shaft 14 and by such arrangement, although the gear 57 is loosely mounted on the shaft 14, it is prevented from shifting longitudinally with respect to the shaft. The hub of the gear 57, at the other side thereof, is extended as at 61, and the said extended portion 61 is formed with a socket 62, for the reception of a clutching protuberance 63 carried by a clutching member 64, which is keyed to the shaft 14, whereby the member 64 can shift lengthwise of the shaft 14, but will be carried therewith during the operation of the shaft 14. The member 64 is peripherally grooved, as at 65, and mounted therein is the yoke-shaped inner end 66 of a shifting arm 67, and by this arrangement when the arm 67 is moved in a direction towards the gear 57, the clutching protuberance 63 engaging in the socket 62 will clutch the gear 57 to the shaft 14, thereby providing for the driving of the gear 57 and the operation of the magneto 43, and if the switch 27 is closed it will close the magneto circuit.

The arms 42 and 67 are connected to a common shifting lever 68 therefor. When the lever 68 is shifted in the direction of the arrow A, Figure 3, it will provide for the clutching of the gear 31 to the shaft 14, and the unclutching of the gear 57 from said shaft. If the lever 68 is shifted in the direction of the arrow B, Figure 3, it will provide for the clutching of the gear 57 to the shaft 14. The shifting of the lever 68 in the direction of the arrow A must be to such extent as to provide for the engaging of the protuberance 37 in the socket 36 and the removal of a protuberance 63 from the socket 62, or when shifted in the direction of arrow B, Figure 3, the extent of shift must be such as to provide for the engaging of the protuberance 63 in the socket 62, and the removing of the protuberance 37 from the socket 36. But one of the magnetos is operated at one time, or in other words, when magneto 17 is in operation the magneto 43 is dormant or vice versa, and by this arrangement if one of the magneto circuits becomes impaired the other circuit can be immediately closed, thereby providing for the operation of the motor and to overcome stoppage for repairs.

The housing 11 is provided with a body of lubricant so that the elements thereof will run in oil.

A controlling element, indicated at 69, is common to the spark controlling devices.

It is thought that the many advantages of a dual ignition system in accordance with this invention can be readily understood, and although the preferred embodiment of the system is as illustrated and described, yet changes in the details of construction can be had which will fall within the scope of the invention as claimed.

What I claim is:—

1. In a dual ignition system means to provide a pair of magneto circuits each including a controlling switch, a set of spark plugs and a magneto, a driving element, means

mounted on said element for driving the magnetos of said circuits, and means whereby one of the magnetos is driven independently of the other.

2. In a dual ignition system means to provide a pair of magneto circuits each including a controlling switch, a set of spark plugs and a magneto, a driving element, means mounted on said element for driving the magnetos of said circuits, means whereby one of the magnetos is driven independently of the other, each of said circuits further including a spark control device, and a controlling element common to said devices.

3. In a dual ignition system means to provide a pair of normally open magneto circuits each including a set of spark plugs, a controlling switch and a magneto, each of said magnetos having its shaft provided with a pinion, a common driving shaft, a pair of gears loosely mounted on said driving shaft and each meshing with one of said pinions, and means for clutching one of said gears to said driving shaft independently of the other of said gears to provide for the operation of one of said magnetos independently of the other.

4. In a dual ignition system means to provide a pair of normally open magneto circuits each including a set of spark plugs, a controlling switch and a magneto, each of said magnetos having its shaft provided with a pinion, a common driving shaft, a pair of gears loosely mounted on said driving shaft and each meshing with one of said pinions, and means for alternately clutching said gears to said driving shaft to provide for the operation of one of said magnetos independently of the other.

5. In a dual ignition system means to provide a pair of normally open magneto circuits each including a set of spark plugs, a controlling switch and a magneto, each of said magnetos having its shaft provided with a pinion, a common driving shaft, a pair of gears loosely mounted on said driving shaft and each meshing with one of said pinions, means for alternately clutching said gears to said driving shaft to provide for the operation of one of said magnetos independently of the other, each of said circuits further including a spark control device, and a controlling element common to said devices.

In testimony whereof, I affix my signature hereto.

WILHELM M. RISTAU, JR.