

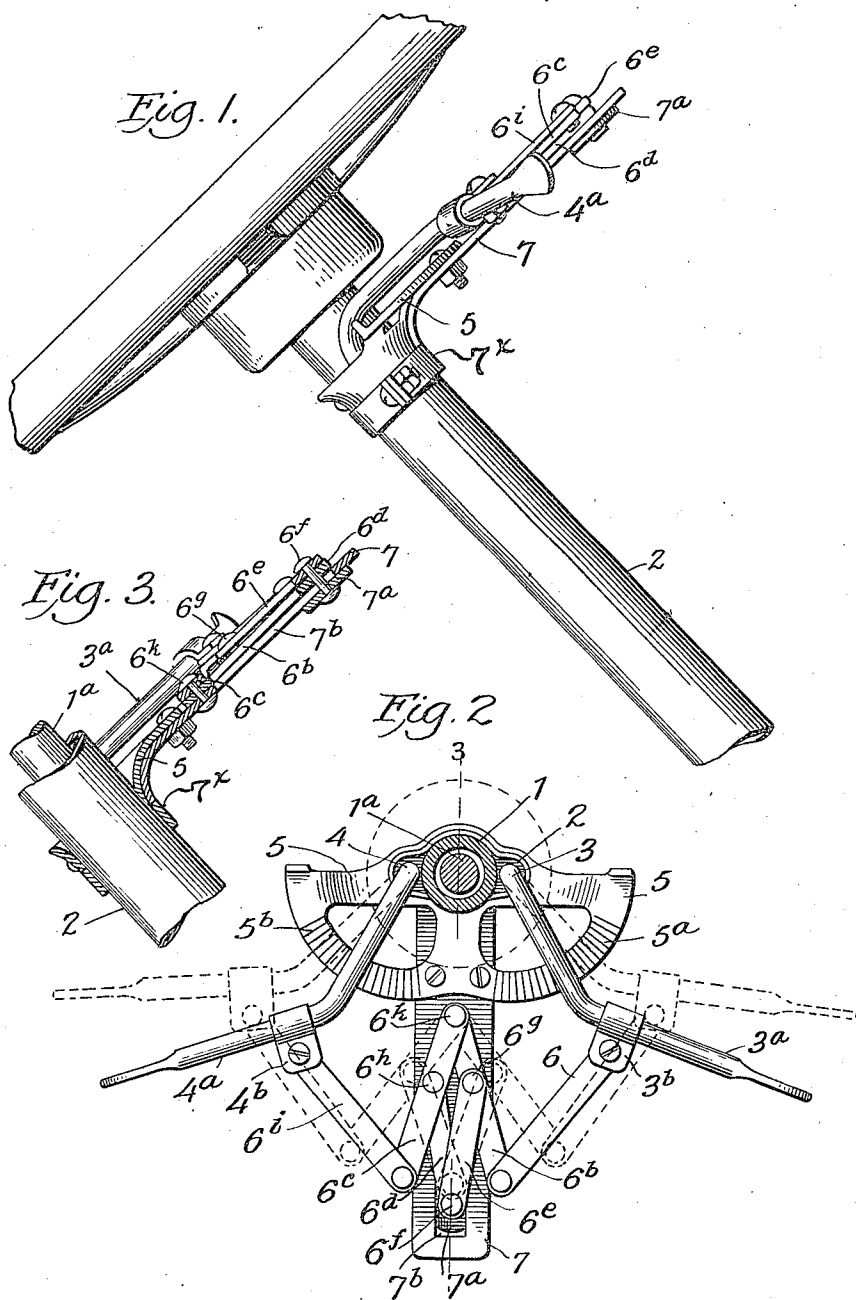
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SPARK AND GAS CONTROL FOR INTERNAL COMBUSTION ENGINES.

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UNITED STATES PATENT OFFICE.

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SPARK AND GAS CONTROL FOR INTERNAL-COMBUSTION ENGINES.

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To all whom it may concern:

Be it known that I, BENJAMIN F. HESS, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Spark and Gas Controls for Internal-Combustion Engines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is a novel combined spark and gas control for automobiles. Its object is to positively control the spark by and in accordance with the control of the gas and thereby insure that the spark will set right for all speeds of the motor, thus insuring a smooth running motor under all service conditions, and which invention will render it impossible for the engine to kick back after setting the gas to start the car, when it is to be cranked manually; will enable very slow driving in traffic with a quick getaway, without having to stop the car or go into low gear; and will enable the machine to climb hills without the motor knocking. Other objects and advantages of the invention will be hereinafter set forth.

In the accompanying drawings I have illustrated one embodiment of the invention as particularly adapted for and applied to the spark and gas controls of a "Ford" automobile engine, and will explain the same in reference thereto; as an understanding thereof will enable others to readily adapt and use the invention in connection with other makes of automobiles and motors.

In said drawings;

Fig. 1 is a side view of part of a steering gear of a Ford motor car showing the automatic combination spark and gas control applied thereto.

Fig. 2 is a plan view of the control.

Fig. 3 is a detail sectional view on the line 3—3 Fig. 2.

In the drawings 1 represents the sleeve of the steering shaft 1^a of a "Ford" automobile, which sleeve is surrounded by a casing 2 through which extend the gas-control rod 3 and spark control rod 4, on opposite sides of the sleeve 1.

Attached to the casing 2 is a bracket 5 which has at one side a segment 5^a adapted to be engaged by the detent of the gas con-

trol lever 3^a, on the upper end of the rod 3; and at the opposite side of said bracket 5 is a segment 5^b adapted to be engaged by the detent of a lever 4^a on the spark control rod 4. The aforesaid parts may be arranged as usual in "Ford" cars.

In the present invention the spark and gas control devices are so mechanically connected that the spark control is automatically shifted by or with the adjustment of the gas control. The mechanical connections might be varied. In the particular example shown a collar or sleeve 3^b is adjustably attached to the lever 3^a and connected to one end of a link 6 the other end of which is connected to one end of a link 6^b of a lazy tong or toggle lever comprised of a link 6^b, a link 6^c similar to the link 6^b, and two shorter links 6^d and 6^e; links 6^d, 6^e are pivoted together at 6^f, and the other end of link 6^e is pivoted to link 6^b as at 6^g; and the other end of link 6^d is pivoted to link 6^c as at 6^h; the free end of link 6^c is connected to one end of a link 6ⁱ, the other end of which is pivotally connected to a collar or sleeve 4^b on the lever 4^a.

The pivot pin 6^k connecting the links 6^b and 6^c extends through and is connected with an arm 7 on a bracket 7^a attached to the casing 2; and the pivot pin 6^k extends through a block 7^b which is slidably engaged in a slot 7^c in the arm 7; so that the pin 6^k is caused to move to or from the pin 6^k as the lever 3^a is moved to turn the gas control rod 3. As indicated in Fig. 2 when the lever 3^a is turned to feed the gas, the lever 4^a is also turned to advance the spark.

The relative extent of movement of the spark control lever 4^a relative to the movement of the gas control lever 3^a can be regulated to any desired extent by adjusting one (or both) of the sleeves 3^b, 4^b on the levers 3^a, 4^a, as will be obvious from the drawings.

When the connections are properly adjusted, as and when the gas control is shifted the spark control is shifted accordingly, and the spark will be properly advanced or retarded in accordance with the amount of gas supplied to the motor.

With this invention the spark is always in proper accord with the gas supply for any and all speeds of the motor. This invention insures a smooth running motor and relieves it of all internal strains, such

as arise in hill climbing and in hard pulling due to improperly adjusted spark control; it enables the operator to drive as slowly as he pleases in traffic and to make a quick getaway without first stopping and then starting, or without first going into low gear. It enables the motor to climb hills without knocking or pounding. When stopped, or when driving slowly the connections can be adjusted between the gas or spark levers, by setting the clips 3^b or 4^b in or out as desired. When once properly set the relative adjustment of gas and spark controls will be maintained, and the operator does not have to worry as to whether or not his spark is properly adjusted for the amount of gas he feeds to the engine.

The invention also obviates the danger of an operator breaking his arm in cranking the car because of the motor kicking back due to improperly set spark after he has adjusted the gas preparatory to cranking the car, because when he sets the gas he sets the spark accordingly. As stated with this invention the spark will be right for all feeds of gas or speeds of the motor; and it obviates strain on the bearings, the engine and the motor in general.

While I have illustrated a simple form of apparatus as applied to a Ford car, I do not consider the invention restricted to the particular construction shown nor limited to application to Ford cars, or the like, as it may be applied to various makes of engines suitably modified to suit the same while retaining the essentials of the invention.

I claim:

1. In combination a spark control rod, a gas control rod, and hand levers connected to the upper ends of said rods for operating said controls; an expansible and contractible device between and connected with the said control levers, whereby the spark control rod is automatically adjusted by and proportionally with the adjustment of the gas control rod or vice versa, as and for the purpose specified.

2. In mechanism as set forth in claim 1; said device being so constructed and connected that the relative proportional extent of movement of the two control rods can be varied.

3. In combination, a spark control rod, a gas control rod, and hand levers connected to the upper ends of said rods for operating said controls; of a mechanical connection between the said control levers comprising a lazy tongs lever whereby the rods are simultaneously shifted in opposite directions; and

the spark control rod automatically adjusted by and proportionally with the adjustment of the gas control rod, or vice versa, as and for the purpose specified.

4. In an apparatus for the purpose specified having a spark control rod and a gas control rod and levers for operating the respective rods; of a lazy tongs connection between the said levers whereby when the gas control lever is shifted the spark control is correspondingly and oppositely shifted, substantially as described.

5. In apparatus as set forth in claim 4, the connection between the lazy tongs and levers being adjustable, whereby the relative proportional extent of movement of the control rods can be varied.

6. In spark and gas control for automobile engines and the like, a spark control lever, a gas control lever adjacent the spark control lever, a lazy tongs, and links connecting opposite members of the tongs with the said levers, substantially as described.

7. In apparatus as set forth in claim 6, slides connected with said links and adjustably mounted on the said levers, whereby the relative proportional extent of movement of the levers can be varied.

8. In spark and gas control for automobile engines and the like, a spark control lever, an adjacent gas control lever, sleeves slidably connected with said levers, an expansible and contractible device intermediate the levers, and links connecting the opposite members of the device with the sleeves on the said spark and gas control levers, substantially as described.

9. In combination, a spark control lever, a gas control lever, a lazy tongs, links respectively connected at one end with one of said levers and with opposite members of the lazy tongs; and a support to which the lazy tongs is slidably connected, substantially as described.

10. In combination, a spark control lever, a gas control lever, a lazy tongs intermediate the said levers, links connected at one end with the opposite levers, and at their other end with the adjacent member of the lazy tongs; a support, and a slidable connection between the lazy tongs and said support, substantially as described.

11. In a spark and gas control as set forth in claim 10, slides adjustably mounted on the said levers and to which slides the ends of the links are pivoted for the purpose and substantially as described.

In testimony that I claim the foregoing as my own, I affix my signature.

BENJAMIN F. HESS.