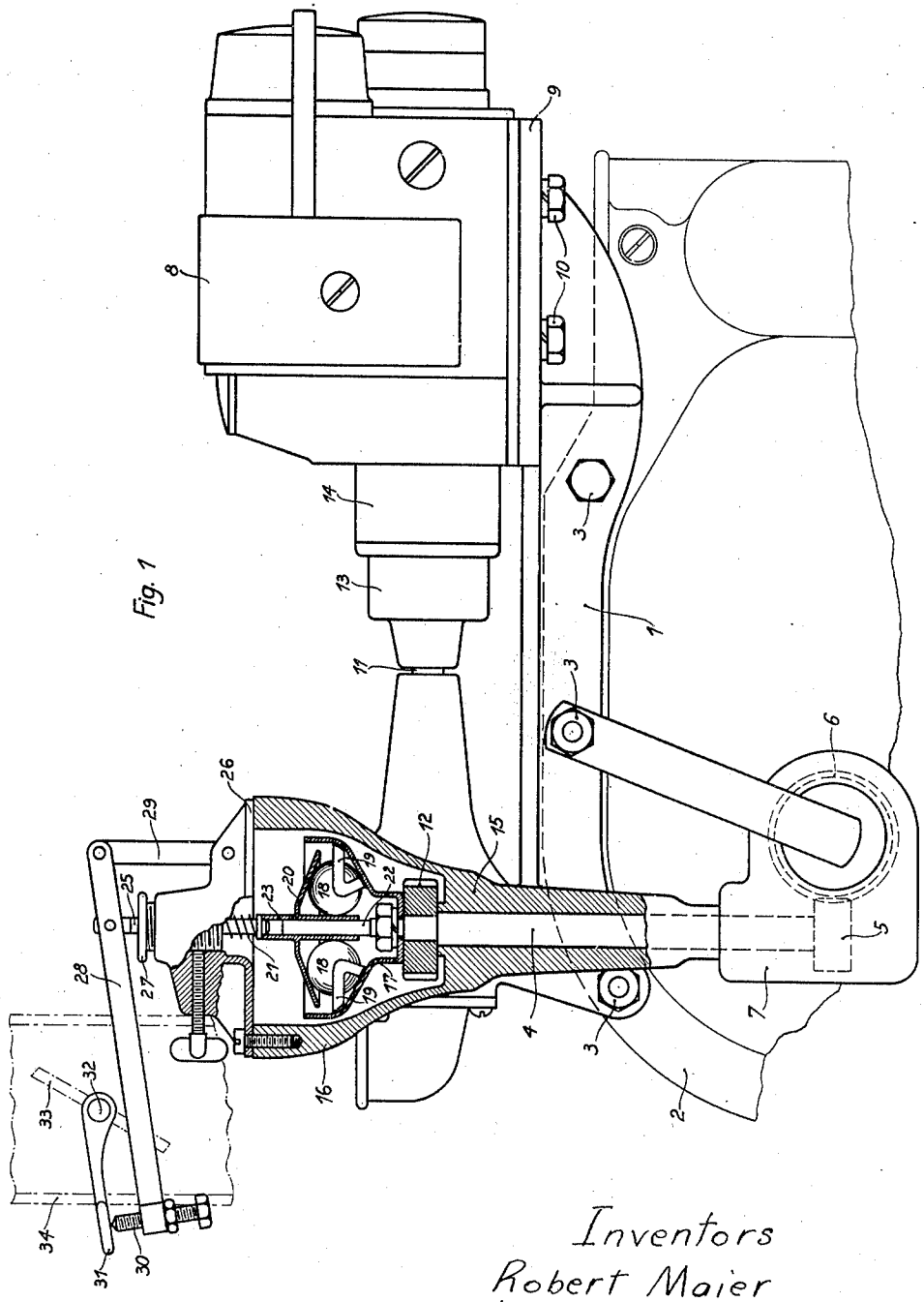
July 9, 1929. R. MAIER ET AL 1,720,561

INTERNAL COMBUSTION ENGINE

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Fig. 1



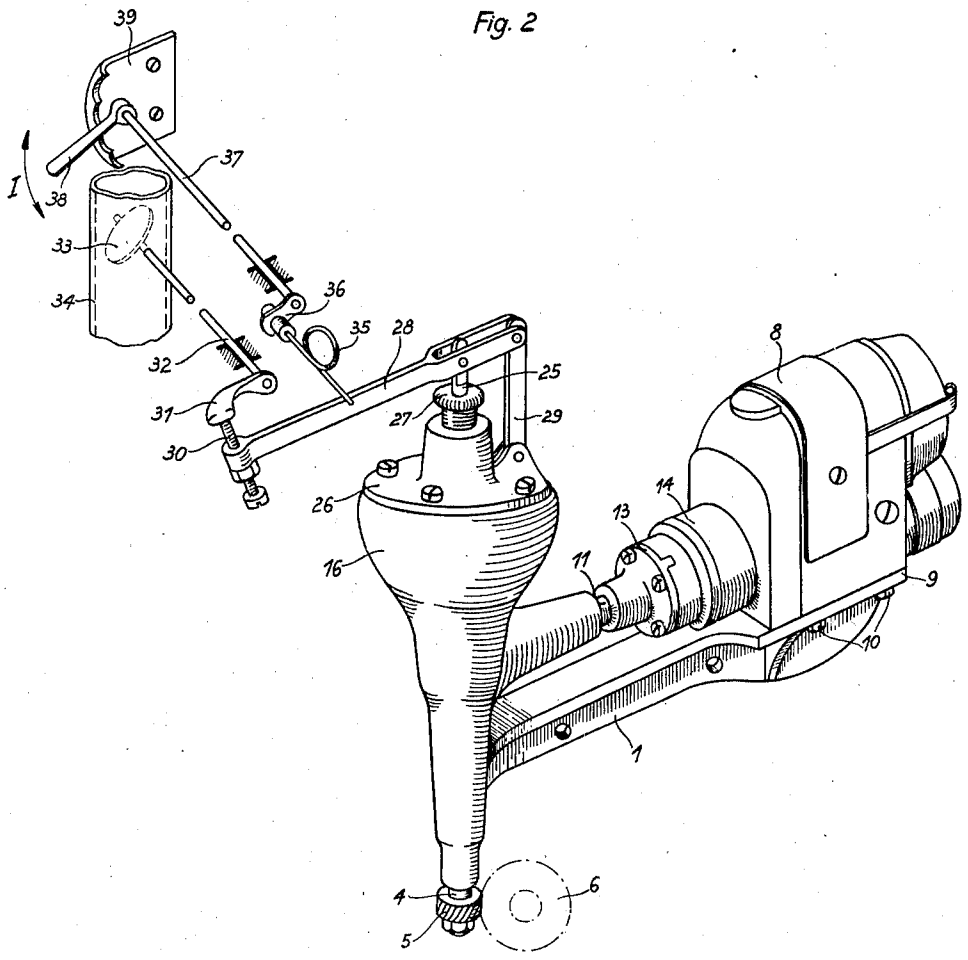
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Fig. 2



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UNITED STATES PATENT OFFICE.

ROBERT MAIER AND MAX RALL, OF STUTTGART, GERMANY, ASSIGNORS TO ROBERT BOSCH AKTIENGESELLSCHAFT, OF STUTTGART, GERMANY.

INTERNAL-COMBUSTION ENGINE.

Application filed August 30, 1927, Serial No. 216,413, and in Germany September 30, 1926.

The present invention relates to an improved magneto or combined magneto and governor attachment adapted to be mounted on an internal combustion engine and particularly applicable to "Fordson" tractors.

The original ignition of a "Ford" or "Fordson" motor vehicle is often replaced by magneto ignition. In known fittings of this kind the magneto is driven through spiral bevel gearing from a shaft parallel to the crankshaft and driven therefrom by chain gearing.

A feature of the present invention is that the shaft from which the magneto shaft is driven is substantially vertical and is driven from the motor by spiral bevel gearing.

Another object of the invention is to provide an improved governor, driven from the engine, to control the fuel admission to the engine, which will require the minimum modification of existing parts of the engine.

A further object of the invention is to provide a hand operated control, for the governor. This can be done by using certain existing parts of a Fordson tractor, whereby the spring loading on the governor may be adjusted as desired.

A still further object of the invention is to combine the magneto drive and the governor into a single unit, adapted to be fixed to the front part of the crank case of the engine of a "Fordson" tractor. This is done by making the driving shaft for the governor substantially vertical and the driving shaft of the magneto substantially horizontal.

Further objects are to provide simple and efficient governing means as hereinafter described and illustrated.

The invention is more particulary described with reference to the accompanying drawings, in which:—

Figure 1 shows a vertical section through the governor casing and

Figure 2 shows the complete arrangement, together with hand operated control for the governor.

The frame of the fitting 1 is secured to the front wall of the crank case 2 by suitable bolts 3, the bolt holes in the fitting being arranged to correspond to the existing bolt holes in the crank case. A substantially vertical shaft 4 is driven from the cam shaft through spiral bevel gears 5 and 6, of which the gear wheel 5 is mounted at the lower end of the shaft 4 and the gear wheel 6 on an extension of the cam shaft instead of the original distributor. The gears are enclosed in a suitable casing 7 provided, if desired, with an inspection port held in position by a flat leaf spring.

The magneto 8 is mounted on the platform 9 of the fitting by suitable bolts 10, and is driven through the coupling 13 and the automatic ignition timing control 14 by the substantially horizontal cross shaft 11. The shaft 11 is driven from the shaft 4 through spiral bevel gearing 12, the gear ratios being arranged so that the magneto is driven at the correct speed, relative to the engine speed.

The upper part of the bearing 15 of the shaft 4 expands into the cup shaped housing 16 of the governor. The governor is mounted at the upper end of the shaft 4 and comprises a cup 17 which may be made of sheet metal, firmly and non-rotatably attached to the shaft 4, containing two or more steel balls 18 between suitable guide members 19, which may take the form of plates or suitably shaped bars. A dished plate 20 rests in contact with the balls under the action of the spring 21. An extension 22 of the shaft 4 fits freely into the tubular extension 23 of the plate 20 and serves as a bearing for the plate. The mode of operation is obvious from the drawing. As the speed of the engine increases the balls tend to move outwards under the centrifugal force, so raising the plate 20 and the rod 25 against the spring 21. The cover 26 of the governor housing carries an adjustable collar 27 by means of which the tension of the spring 21 may be adjusted.

The rod 25 is pivoted to a lever 28 which is itself pivoted to an arm 29 pivotally mounted on the cover 26. The other end of the lever 28 carries an adjusting screw 30 which is adapted to contact with the lever 31 mounted on the rod 32 which actuates the throttle valve 33 in the induction pipe 34 of the engine.

In addition to the spring 21, adjusted by the screwed collar 27, additional hand control over the governor is provided, utilizing for this purpose the existing ignition control lever, which is no longer needed since automatic ignition control 14 is now provided. A looped spring 35 is secured to the lever 36, mounted on the original control rod 37. The handle 38 of the control rod is adapted to engage a number of notches or slots on a plate 39, providing a number of fixed posi-

tions of the spring 35 relative to the lever 28. The free end of the spring 35 can, under certain conditions dependent on the position of the handle 38 and the speed of the motor, contact with the lever 28 so increasing the spring loading on the governor when desired.

We claim:

1. In an internal combustion engine, a magneto whose horizontal shaft is at right angles to the crank shaft of the engine, a substantially vertical driving shaft to engage the magneto shaft, means to drive said vertical shaft from the motor, a casing above the upper part of the bearing of said vertical shaft, and a fuel governor within said casing.

2. In an internal combustion engine, a magneto whose horizontal shaft is at right angles to the crank shaft of the engine, a substantially vertical driving shaft to engage the magneto shaft, means to drive said vertical shaft from the motor, a casing above the upper part of the bearing of said vertical shaft, a fuel governor within said casing, a cover for said casing, a regulating spring and an adjusting screw therefor and thereon, and a fuel supply lever partly mounted on said cover.

3. In a Fordson tractor having the usual ignition control rod, a magneto, a governor and a spring attached to the control rod arranged to apply spring pressure to the governor upon movement of the rod.

4. In a Fordson tractor having the usual ignition control rod, a magneto, a governor, a spring attached to the control rod arranged to apply spring pressure to the governor upon movement of the rod, and means to secure the control rod in a plurality of positions.

5. In a Fordson tractor having the usual ignition control rod, a magneto, a governor, a spring attached to the control rod arranged to apply spring pressure to the governor upon movement of the rod, a handle on said control rod, said handle being adapted to engage a plurality of notches.

6. In a Fordson tractor having the usual ignition control rod, a magneto, a governor and a spring attached to the control rod arranged to apply spring pressure to the governor upon movement of the rod, said spring consisting of a looped wire.

7. A fitting for internal combustion engines having an induction pipe and a throttle valve in said pipe, comprising in combination a magneto, a centrifugal governor, a casing for said governor, a substantially vertical shaft driven from the engine and driving said governor, a substantially horizontal shaft driven from said vertical shaft and driving said magneto, and means to connect said governor to said throttle valve.

8. A fitting for internal combustion engines having an induction pipe and a throttle valve in said pipe, comprising in combination a platform adapted to receive a magneto, a centrifugal governor, a substantially vertical shaft driven from the engine and driving said governor, a substantially horizontal magneto shaft driven from said vertical shaft, and means to connect said governor with said throttle valve.

9. A fitting for internal combustion engines comprising in combination a platform adapted to carry a magneto, a spring loaded governor, a substantially vertical shaft driven from the engine and driving said governor, a substantially horizontal magneto shaft driven from said vertical shaft, and means to vary the amount of spring loading on the governor.

10. A fitting for internal combustion engines having an ignition control rod, comprising in combination a magneto, a spring loaded governor, a throttle lever actuated by said governor, a substantially vertical shaft driven from the engine and driving said governor, a substantially horizontal magneto shaft driven from said vertical shaft, a looped spring having one end connected to the end of said control rod, and the other end engaging with the governor to apply a load to the latter.

11. In an internal combustion engine, a magneto having a substantially horizontal shaft, a substantially vertical driving shaft to engage the magneto shaft, means to drive said vertical shaft from the motor, a casing above the upper part of the bearing of said vertical shaft, and a fuel governor within said casing.

In testimony whereof we have hereunto affixed our signatures.

ROBERT MAIER.
MAX RALL.