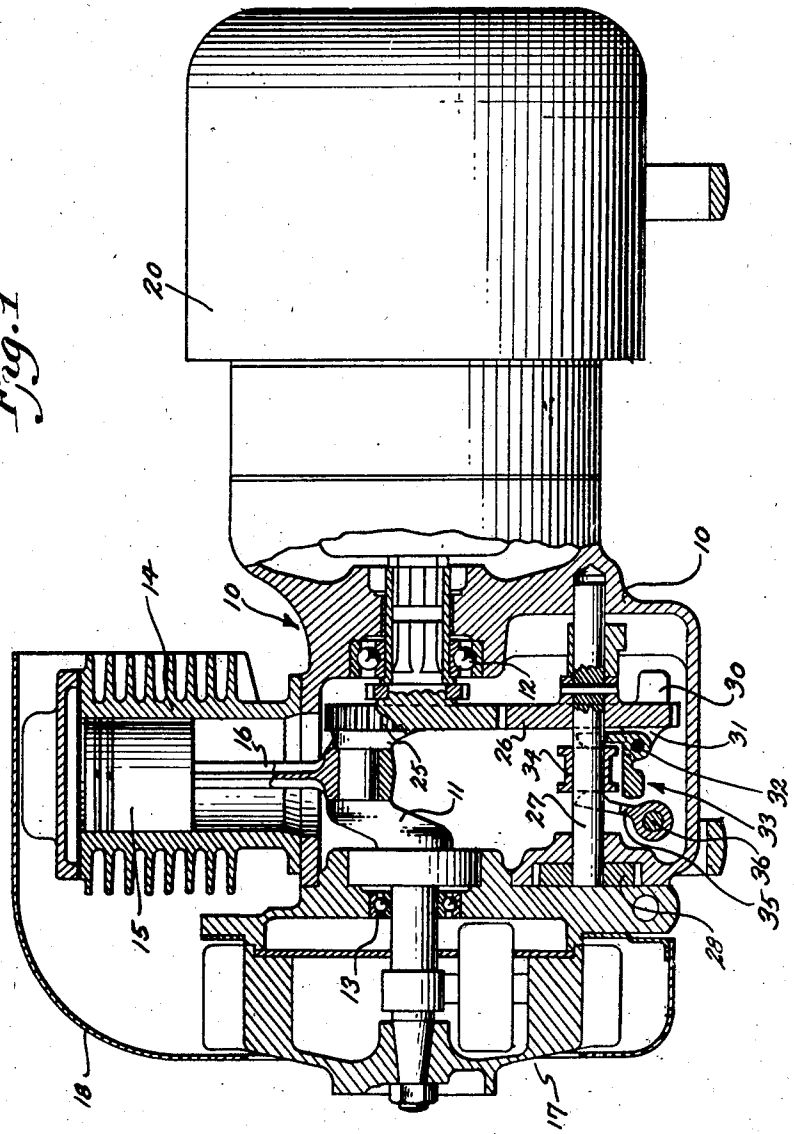
Nov. 26, 1946. E. GINN 2,411,653

INTERNAL-COMBUSTION ENGINE

Filed June 28, 1945 2 Sheets-Sheet 1

Fig. 1



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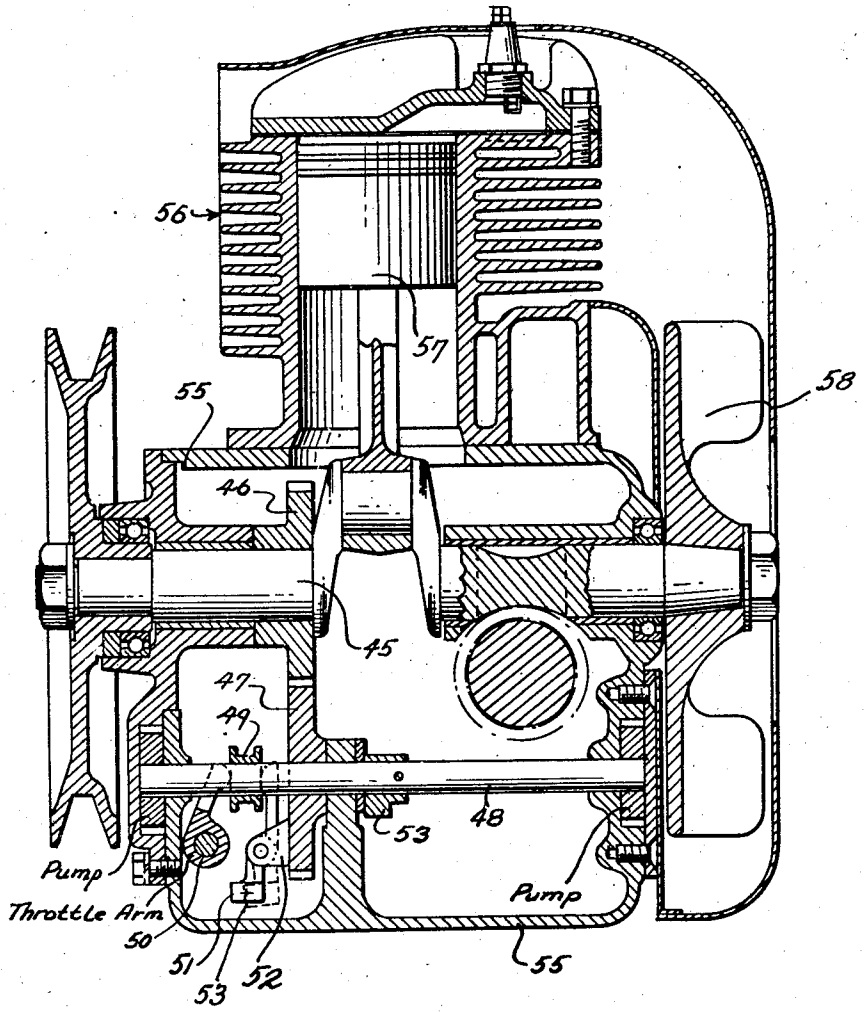


Fig. 2

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UNITED STATES PATENT OFFICE

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INTERNAL-COMBUSTION ENGINE

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Application June 28, 1945, Serial No. 601,983

6 Claims. (Cl. 123—108)

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This invention relates to an internal combustion engine and has particularly to do with a combined counterbalance and speed governor construction.

It is an object of the present invention to provide a simple construction in an internal combustion engine for driving oil or scavenger pumps and at the same time providing a speed governor control and a counterbalance arrangement for the crankshaft.

Another object is the design of a speed governor control within the confines of the present crankshaft and oil pump housing.

For a more detailed understanding of the invention, reference may be had to the accompanying drawings illustrating a preferred embodiment of the invention in which like parts throughout the several views are designated by like numerals, and in which:

Fig. 1 illustrates a vertical section of an internal combustion engine showing the relationship of the parts,

Fig. 2 is a vertical section of an engine showing a modified pump and governor construction.

In Fig. 1 a crankcase housing 10 supports a crankshaft 11 in bearings 12 and 13. A cylinder 14, in which reciprocates piston 15 with connecting rod 16, is mounted on the crankcase. A cooling fan and flywheel 17 rotates on the free end of the crankshaft passing air through housing 18 past the finned cylinder 14.

At the working end of the crankshaft 11 is a generator 20 having its rotor coupled suitably to the shaft.

A toothed gear 25 is formed as a part of the throw of the crankshaft to engage a gear 26 mounted on a shaft 27 journaled at the bottom of housing 10. At the left end of shaft 27 is an oil pump 28 of standard construction. Formed on gear 26 are off-center axial projections 30 and 31 which serve as balance weights for the throw of the crankshaft, which it will be noticed is a single cylinder shaft.

On projection 31 is pivoted at 32 an L-shaped or bell crank governor arm 33, one portion of which bears against a spool 34 slidably mounted on shaft 27. The other leg of the governor arm serves as a centrifugal weight which is thrown radially upon rotation of shaft 27.

Bearing against the other end of spool 34 is a throttle control lever 35 pivoted on the housing 10 and arranged to rotate a shaft 36 to control the throttle (not shown) of the engine.

In the operation, weights 30, 31 and 33 will act as counterbalance for the single throw of

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crankshaft 11 while shaft 27 drives oil pump 28. At the same time excessive speed of the engine beyond a predetermined amount will tend to shift governor arm 33 and spool 34 to move lever 35 to a decelerating position.

In Fig. 2 a somewhat similar disclosure is shown having a single throw crankshaft 45, with gear 46 driving gear 47 and pump shaft 48 which has, in this case a pump at each end. Sliding spool 49 and throttle arm 50 are controlled by governor arm 51 pivoted on off-center extension 52 of gear 47. An additional small counterweight 53 may be added if necessary to supplement extension 52 and arm 51. Housing 55 supports the usual cylinder 56 with piston 57 cooled by fan-flywheel 58.

Although I have illustrated but one form of my invention and have described in detail but a single application thereof, it will be apparent to those skilled in the art to which my invention pertains, that various modifications and changes may be made therein without departing from the spirit of my invention or from the scope of the appended claims.

What I claim is:

1. In an internal combustion engine of the type having a crankshaft and a pump shaft driven from the crankshaft, a throttle control member, a combined governor and counterbalancing unit structure which comprises a governor member eccentrically mounted on said pump shaft and which is shiftable in response to rotation of said shafts, and means operably connecting said members to provide speed control for said engine.

2. In an internal combustion engine, a crankshaft, a pump operating shaft mounted adjacent said crankshaft and driven thereby, a throttle control member, a combined unitary governor and counterbalancing means which comprises a governor member eccentrically mounted on said pump shaft and operable in response to rotation of said shafts, and means comprising a sleeve slidable on said pump shaft operably connecting said members to cause one to move in response to the other to thus effect governing action.

3. In an internal combustion engine, a pump operating shaft mounted adjacent said crankshaft in the same housing, said crankshaft having a single throw, a driving connection between said shafts, a throttle control member mounted in said housing, and means to serve as a throttle governor and counterbalance comprising a governor member mounted on said pump shaft positioned with opposed eccentricity to said crankshaft throw, and movable in proportion to the

rate of rotation of said shafts, and means operably connecting said members to cause one to move in response to the other to thus effect governing action.

4. In an internal combustion engine, a pump operating shaft mounted adjacent said crankshaft in the same housing, said crankshaft having a single throw, a driving connection between said shafts, a throttle control member mounted in said housing, and means to serve as a throttle governor and counterbalance comprising a governor member mounted on said pump shaft positioned with opposed eccentricity to said crankshaft throw, and movable in proportion to the rate of rotation of said shafts, and means comprising a sleeve slidable on said pump shaft operably connecting said members to cause one to move in response to the other to thus effect governing action.

5. In an internal combustion engine, a pump operating shaft mounted parallel to said crankshaft in the same housing, one or more pumps at the ends of said pump shaft, a gear for driving said pump shafts mounted between the ends thereof and meshing with a gear formed on the throw of said crankshaft and arranged coaxial with respect to the crankshaft axis, a throttle control member mounted in said housing, an off-center axial projection on said pump shaft gear

having an eccentric position opposed to the throw of said crankshaft, a bell crank lever pivoted on said projection one end of which is axially offset from the pivot position to serve as a centrifugal weight, the other end being operatively connected to said throttle control member whereby the member and the lever are mutually shiftable to furnish speed governing control.

6. In an internal combustion engine, a pump operating shaft mounted parallel to said crankshaft in the same housing, one or more pumps at the ends of said pump shaft, a gear for driving said pump shafts mounted between the ends thereof and meshing with a gear formed on the throw of said crankshaft and arranged coaxial with respect to the crankshaft axis, a throttle control member mounted in said housing, an off-center axial projection on said pump shaft gear (located between said gear and a pump) having an eccentric position opposed to the throw of said crankshaft, a bell crank lever pivoted on said projection one end of which is axially offset from the pivot position to serve as a centrifugal weight, the other end being operatively connected to said throttle control member whereby the member and the lever are mutually shiftable to furnish speed governing control.

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