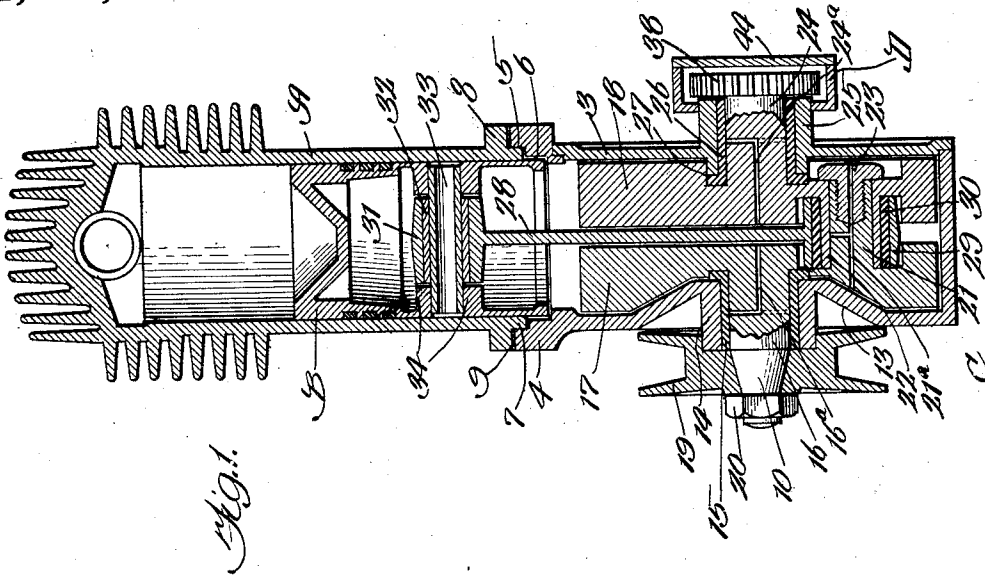
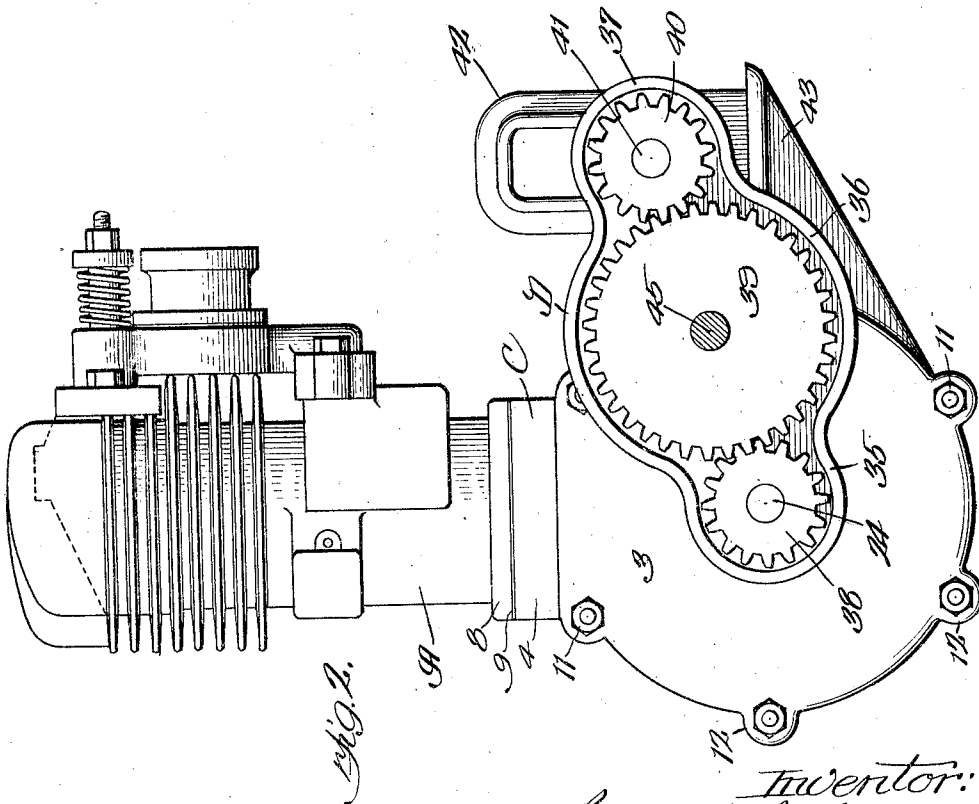


R. F. ROEHL.
CRANK CASE AND FLY WHEEL STRUCTURE.
APPLICATION FILED APR. 7, 1917.

1,322,266.

Patented Nov. 18, 1919.



Inventor:
Richard F. Roehl
By *James H. Kelley* Attorney
James H. Kelley, Esq.
Att'y.

UNITED STATES PATENT OFFICE.

RICHARD F. ROEHL, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
ILLINOIS MOTOR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CRANK-CASE AND FLY-WHEEL STRUCTURE.

1,322,266.

Specification of Letters Patent.

Patented Nov. 18, 1919.

Application filed April 7, 1917. Serial No. 160,366.

To all whom it may concern:

Be it known that I, RICHARD F. ROEHL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Crank-Case and Fly-Wheel Structures, of which the following is a full, clear, and exact description, taken in connection with the drawings annexed hereunto, such as will enable others skilled in the art to make and use the same.

My present invention relates in general to gas engines, and has reference more especially to an improved crank case and fly wheel construction for use in connection with gas engines of the crank case compression type, such as that employed with motor-cycles.

The invention has for its objects, to improve the construction and increase the efficiency and utility of structures of this type; to provide an improved fly-wheel structure consisting of a pair of wheel elements constructed and arranged in the crank casing so as to provide full bearing areas throughout and for adequate lubrication of the same, and to provide a construction of the character stated that is easily manufactured and readily assembled in a minimum of space. The invention further anticipates the provision of novel details of construction, combination and arrangement of parts, all of which will be first fully described and then specifically pointed out in the appended claims.

These, together with such other objects as may hereinafter appear or are incident to my invention, I attain by means of the construction illustrated in preferred form in the accompanying drawings, wherein:—

Figure 1 represents a central vertical longitudinal section of an engine to which my invention is shown applied; and

Fig. 2 is a side elevation of the same, with the gear train housing cap plate removed.

Referring to the drawings, the reference letter A designates the cylinder, B the piston, and C the crank case which is formed open at one side and provided with a cap 3 to close the opening. The crank case C has an annular flange 4 bored at 5 and counter-bored at 6 to receive the projecting end 7 of the cylinder A and be engaged by the flange 8 of the same, a suitable gasket 9 to

effect a gas-tight joint being provided. The crank case C is provided with lugs to receive cap screws 11 that pass through the lugs 12 in the cap plate 3 and fasten the same in place.

It will be noticed by reference to Fig. 1 that, in order to economize space and to increase bearing surface area, the vertical wall of the crank case is dished inwardly at 13, and provided with a bearing 14, suitably bushed at 15, to receive the crank shaft element 16 which is formed with the fly wheel member 17 and has a tapered projecting end 10 designed to receive the driving pulley 19; the latter being held in place by a key and nut 20.

The fly-wheel element 17 has a lug 21 that passes into a bored lug 22 on the other fly wheel member 18 and is secured rigidly thereto by a nut 23 so that the fly-wheel elements 17 and 18 move as a unitary structure. The fly-wheel member 18 has a shaft section 24 which turns in the bearing 25, the latter being formed with the cap plate 3 and is suitably bushed at 26. The fly-wheel element 18 is counterbored at 27 to allow a portion of the bearing 25 to project into the same so as to economize space and provide full bearing areas.

The numeral 28 indicates the piston rod which has a bearing 29, suitably bushed at 30, to receive the lug 22 which acts as the crank pin, the piston rod having a second bearing 31 suitably bushed at 32 to receive the piston pin 33 carried in the bearings 34 of the piston B.

Formed with the cap 3 and bearing 25 is a gear train housing D composed of three gear pockets 35—36—37, in which the elements 38—39—40 of the gear train are located, the gear 38 being keyed to the end of the shaft section 24, while the gear 40 is secured on the shaft 41 of the magneto 42, which may be mounted on the bracket shelf 43.

The pockets of the gear train housing D are in turn closed by a cap plate 44, the gear 39 being journaled on a stub shaft 45 carried by the cap 44. In order to provide an adequate and effective system of lubrication for the bearings in the crank case C, each of the shaft sections 16 and 24 are axially and then laterally bored to provide the lubricant carrying passages 16^a and 24^a, respectively, for the bearings 15 and 26; 110

while the male member or lug 21 is similarly formed with a passage 21^a which passes clear through it and the bolt 23, a lateral branch being provided leading to the crank-pin bearing. It will be understood that in operation, the lubricant is fed to the engine with the fuel, in accordance with present practice, and that centrifugal force is relied upon to carry the lubricant via the passages 16^a—24^a—21^a to the bearings above enumerated.

What I claim is:—

1. In a motorcycle engine, the combination of a crank casing provided with a detachable side cover plate, a two-part fly-wheel mounted within the body of said casing, the halves having shaft portions respectively journaled in said casing and said plate and each provided with a duct leading from its inner vertical face to the bearing, a piston rod extending through said casing to work between the halves of the fly-wheel and said ducts, that half of the fly-wheel journaled in the casing being integrally formed with a stem projecting laterally toward but terminating just short of said plate to provide a space therebetween, and the other half having a sleeve of the same length as that of the stem and constructed to receive and surround said stem, the eye of the piston rod having a bearing on said sleeve, and means for uniting the fly-wheel halves together comprising a headed member having a threaded engagement with said stem and engaging with its head the back portion of said sleeve, the

head of said member disposed in said space so as to be exposed upon detaching said side plate.

2. In a motorcycle engine of the two-cycle crank compression case type, of an open sided crank case and a flat detachable side cover plate closing the open side of the case and each provided with a hub, a centrally disposed piston rod, a two-part fly-wheel having its halves positioned within the casing and spaced slightly apart to permit the rod to work therebetween, bushings for said hubs, the halves having shaft portions journaled respectively in the bushings of said casing, and said plate, that part of the fly-wheel journaled in the casing bushing being integrally formed with a stem projecting toward said plate and the other half provided with a sleeve having the same length as that of the stem and constructed to receive and surround said stem, a bushing on said stem, the eye of the piston rod having a bearing on said stem bushing, a set screw insertible through said open side and engaging said stem and its sleeve, a horizontally and laterally directed lubricating duct in each of shaft portions leading to the bushings of said hubs, and a lubricating duct through said stem provided with a branch communicating laterally with the bushing of the sleeve, substantially as described.

In testimony whereof I have hereunto signed my name to this specification.

RICHARD F. ROEHL.