

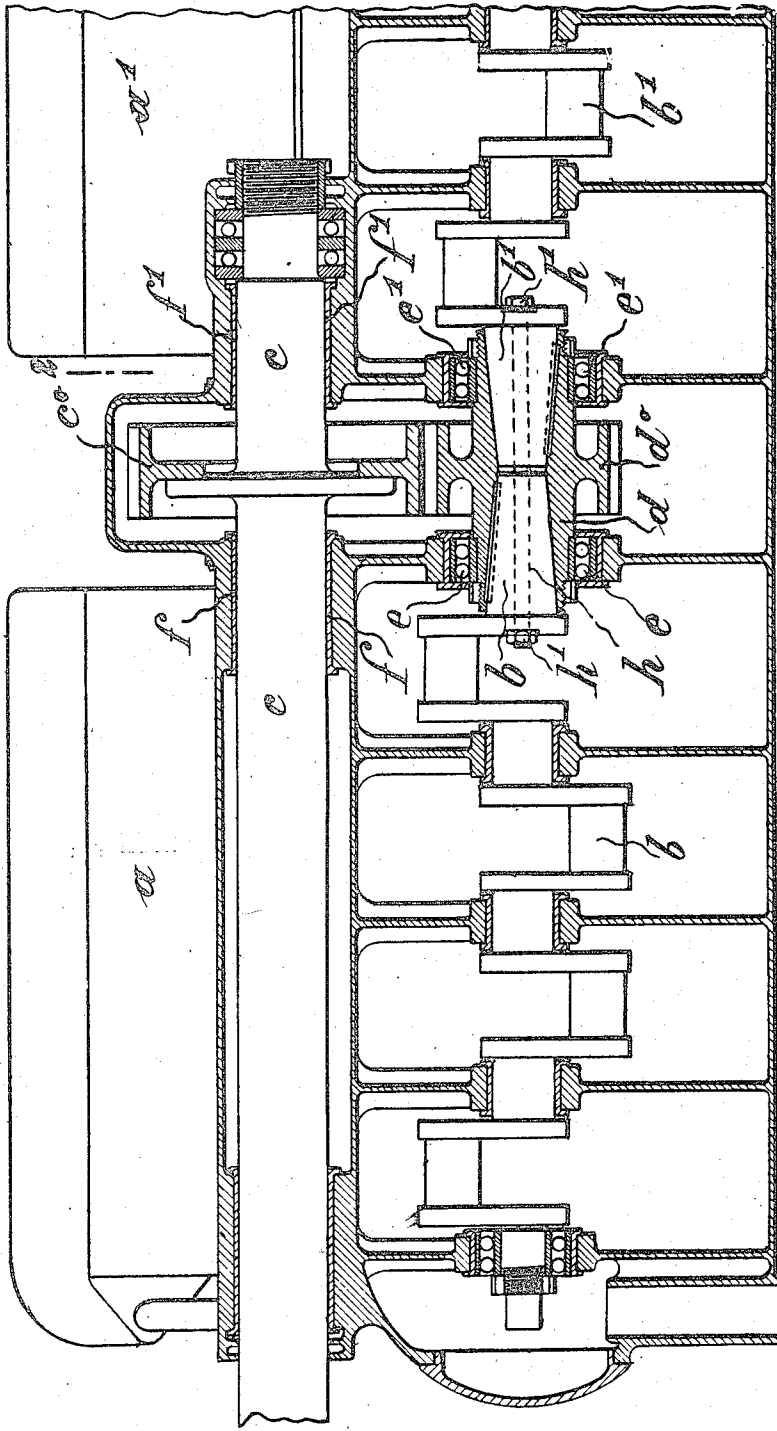
H. V. J. JOUFFRET.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED DEC. 18, 1917.

1,318,209.

Patented Oct. 7, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
C. A. Nelson
Norris L. Sumby

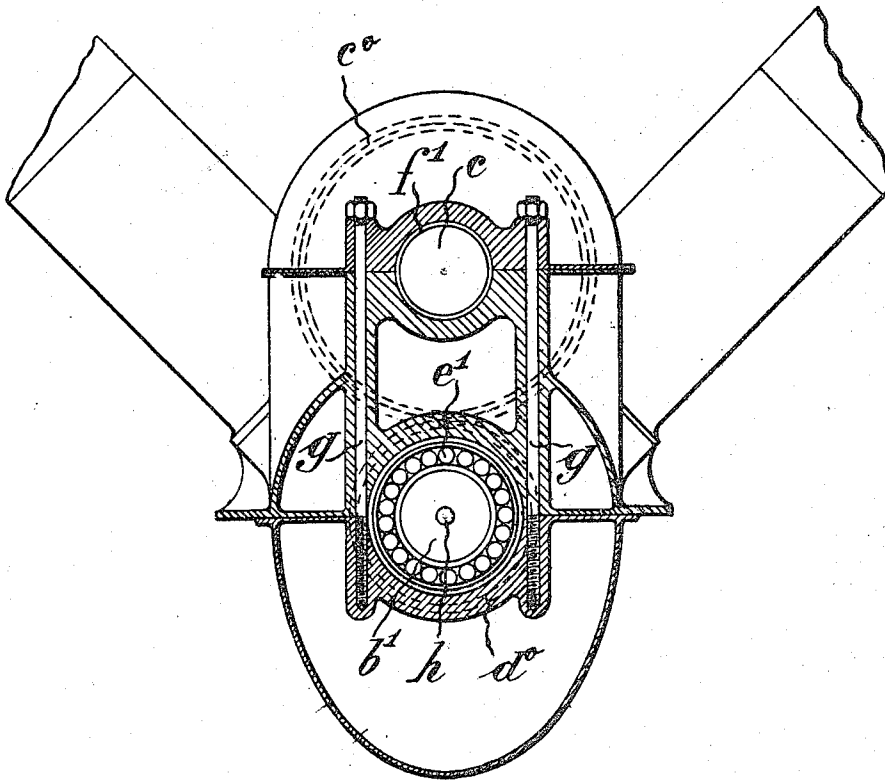
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

HENRI VICTOR JULES JOUFFRET, OF PARIS, FRANCE.

INTERNAL-COMBUSTION ENGINE.

1,318,209.

Specification of Letters Patent.

Patented Oct. 7, 1919.

Application filed December 18, 1917. Serial No. 207,745.

To all whom it may concern:

Be it known that I, HENRI VICTOR JULES JOUFFRET, engineer, citizen of the French Republic, residing at Paris, France, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to motors of the type in which the crank shaft is connected by a system of gearing to the driven shaft and refers more particularly, among motors of the class in question, to those having cylinders arranged in the form of a V, in the case of which the driven shaft is located parallel to the crank shaft and between the two arms of the V constituted by the cylinders.

It has for its principal object to enable motors of the class in question to be so constructed that the transmission of power from the crank shaft to the driven shaft is effected more satisfactorily than is at present the case.

It consists essentially in providing motors of the class in question with a crank shaft made in two parts placed end to end and in interconnecting them by means of a sleeve so constructed and arranged that the said sleeve constitutes one of the elements of the transmission gear between the crank shaft and the driven shaft.

The invention comprises in addition to this principal feature certain other features which will be more fully described hereafter.

It includes, in particular, certain constructions embodying the said features, and it includes, as new industrial products, motors of the class in question comprising the application of the said improvements, as well as special parts adapted for their construction.

It will be clearly understood with the assistance of the following description and from the accompanying drawings which, however, are given merely by way of example.

Figure 1 of the said drawings shows, in longitudinal section, a motor constructed according to the said invention.

Fig. 2 shows the same motor in transverse section on the line 2—2, Fig. 1.

The motor more particularly illustrated in the drawing comprises 16 cylinders, having the cylinders arranged in V formation the driven shaft being driven from the crank

shaft through the intervention of a speed reducing gear.

The general construction and arrangement of the cylinders of the motor and the valve mechanism is of the ordinary description, but the cylinders are divided into two groups a and a^1 , separated by a sufficient space for the speed reducing gear previously mentioned, to be located between them.

The crank shaft of the said motor is formed in two parts b and b^1 , the first corresponding to the 8 cylinders of the group a and the second to the 8 cylinders of the group a^1 .

Mounted in suitable bearings located in the casing of the motor, between the two arms of the V formed by the cylinders, is the driven shaft c .

The adjacent extremities of the two parts b and b^1 constituting the crank shaft, are interconnected by a sleeve d which is keyed to each of the said extremities.

The said sleeve d is provided at the middle with a pinion d^o .

On the axle c to be driven is provided a toothed wheel e^o engaging with the toothed pinion d^o .

The casing of the motor is constructed so that the parts of the crank shaft, the sleeve d and the toothed wheel e^o can be easily placed in position. It may for instance, be made in three portions, a lower portion, a middle portion and an upper portion.

The foregoing details of construction are sufficient for a practical engine but it is preferable to combine with them the whole or part of the following constructions.

The sleeve d may be mounted with its extremities working in bearings e , e^1 , in the frame which supports the ends of the crank shaft: an arrangement enabling the distance between the supports to be reduced to a minimum.

The bearing members, f , f^1 for the driving shaft c , are preferably mounted in line with the bearings e , and e^1 and for simultaneously effecting the clamping of the bearings e and f and of the bearings e^1 and f^1 bolts g are used common to both.

The adjacent parts of the two pieces b and b^1 of the driving shaft are formed as truncated cones, decreasing in section toward the extremities, and in order to insure the clamping of the sleeve d on these truncated parts, a screw threaded pin h is pro-

vided, with threads at its two extremities. This is inserted in an axial hole provided in the adjacent parts of the pieces b , b^1 , and nuts b^2 are screwed on the threaded extremities of the said pin.

In this way a motor is obtained in the case of which the pinion d not being mounted out of line, as is usual, there is no danger of displacement or straining out of truth of the pinion or its support. Moreover the power is transmitted in a perfectly satisfactory manner, since each part of the crank shaft transmits its effort directly to the gear through the intervention of a key which only bears half the total effort.

It is to be understood that the invention is not limited to the particular methods of carrying the same into effect which have been particularly described, as modifications may be made without departing from the principle of the said invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:

1. In a motor of the character described, in combination, a divided driving shaft comprising two alined parts, bearings for each of said parts, a driven shaft, and gearing connecting said driving and driven shafts and including a sleeve connecting the contiguous ends of the parts of said driving shaft, the extremities of said sleeve being journaled in the adjacent driving shaft bearings.

2. In a motor of the character described, in combination, a divided driving shaft comprising two alined parts, a driven shaft, bearings therefor, gearing connecting said driving and driven shafts and including a sleeve connecting the contiguous ends of the parts of said driving shaft, supports for the extremities of said sleeve, and bolts connecting said driven shaft bearings and sleeve supports.

3. In a motor of the character described, in combination, a divided driving shaft comprising two alined parts, bearings for each of said parts, a driven shaft, bearings for said driven shaft, gearing connecting said driving and driven shafts and including a sleeve connecting the contiguous ends of the parts of said driving shaft, the extremities of said sleeve being journaled in the adjacent driving shaft bearings, and bolts connecting said driven shaft bearings with said last-named driving shaft bearings.

4. In a motor of the character described,

in combination, a divided driving shaft comprising two alined parts having tapered contiguous ends, a driven shaft, gearing connecting said driving and driven shafts and including a sleeve mounted on and connecting the contiguous ends of said driving shaft parts, and a bolt passing longitudinally through said ends for clamping the same in said sleeve.

5. In a motor of the character described, in combination, a divided driving shaft comprising two alined parts having tapered contiguous ends, bearings for each of said parts, a driven shaft, gearing connecting said driving and driven shafts and including a sleeve mounted on and connecting the contiguous ends of said driving shaft parts, the extremities of said sleeve being journaled in the adjacent driving shaft bearings, and a bolt passing longitudinally through said ends for clamping the same in said sleeve.

6. In a motor of the character described, in combination, a divided driving shaft comprising two alined parts having tapered contiguous ends, a driven shaft, bearings therefor, gearing connecting said driving and driven shafts and including a sleeve mounted on and connecting the contiguous ends of said driving shaft parts, a bolt passing longitudinally through said ends for clamping the same in said sleeve, supports for the extremities of said sleeve, and bolts connecting said driven shaft bearings and sleeve supports.

7. In a motor of the character described, in combination, a divided driving shaft comprising two alined parts having tapered contiguous ends, bearings for each of said parts, a driven shaft, bearings for said driven shaft, gearing connecting said driving and driven shafts and including a sleeve mounted on and connecting the contiguous ends of said driving shaft parts, the extremities of said sleeve being journaled in the adjacent driving shaft bearings, a bolt passing longitudinally through said shaft ends for clamping the same in said sleeve, and bolts connecting said driven shaft bearings with said last-named driving shaft bearings.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRI VICTOR JULES JOUFFRET.

Witnesses:

EUGÈNE JULLIN,
CHAS. P. PRESLY.