

F. GOCKERELL.
OPERATING MECHANISM FOR EXPLOSION ENGINES.
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1,381,181.

Patented June 14, 1921.

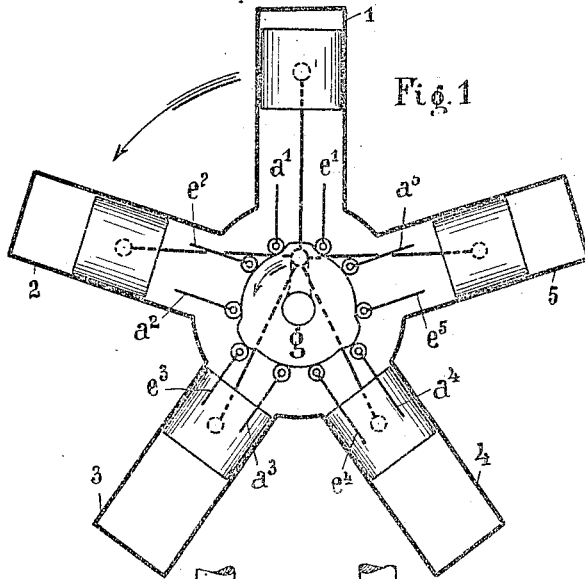


Fig. 1

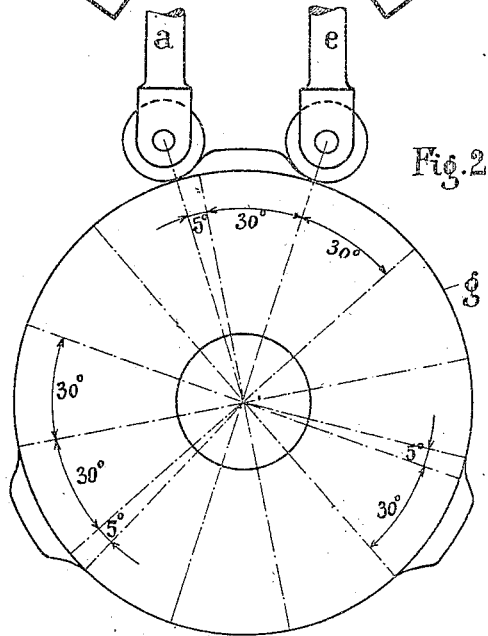


Fig. 2

Inventor.
Fritz Gockerell
by B. Singer, Atty.

UNITED STATES PATENT OFFICE.

FRITZ GOCKERELL, OF MUNICH, BAVARIA, GERMANY.

OPERATING MECHANISM FOR EXPLOSION-ENGINES.

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To all whom it may concern:

Be it known that I, FRITZ GOCKERELL, citizen of the German Empire, residing at Munich, 51 Herzogstrasse, Bavaria, Germany, have invented certain new and useful Improvements in Operating Mechanism for Explosion-Engines, of which the following is a specification, reference being had therein to the accompanying drawing.

The object of the present invention relates to a valve governor for explosion engines with radially arranged cylinders; this governor permits a very slow revolving of the cam disk in view of all governors hitherto known, the wear and tear of said cam being thereby very much diminished and the number thereof is reduced to half of that hitherto employed; finally the juxtaposition of the cams can be applied instead of the alternately arranged cams. An important feature of the present invention is, that the opening and closing of the valves does not coincide with the dead position of the pistons as it was the cases with the former one cylinder motors.

All the cited advantages have as result besides an outmost simplicity a very diminished weight of the engine.

All known governors for explosion engines—in which the cylinders are radially disposed and the inlet and outlet valves are governed by control—are provided with two cam disks in juxtaposition and are driven in the proportion of 1:2, they turn therefore with half the speed of the crank shaft. Likewise governors are known with only one cam disk, in which the cams are located behind each other, but the cams serve in such case for controlling the supply valves only, whereas in the present invention the inlet and outlet valves are governed by control; besides the speed of the cam-disk is much more greater than in the present invention. The more cylinders there are provided, the more slowly the cam disk may revolve; this is an important feature, as it is known that the cams are exposed heavy shocks so that they are very soon torn off.

In the annexed drawings a mode of ex-

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ed by way of example, in which:—

Figure 1 shows the application in a five cylinder motor, whereas

Fig. 2 shows the same in actual size.

The working cylinders 1—5 possess each an inlet and an outlet valve a' and e' ; the ends of the valve stems are provided with rolls and guided around the cam disk g . The position of the piston as shown in the drawing illustrates, that the cylinder 1 has immediately before shut off the outlet valve e' and that now the suction period begins, during which period the piston is in its upper dead position of rest and the cam-disk moves to the left hand side in the direction of the arrow. The cylinder 2 is already in the position of explosion and both valves a^2 and e^2 or respectively their rollers are guided on the primitif circle (base circle) of the cam disk; these valves are therefore closed. The piston of the cylinder 3 approaches the lower dead point and the early opening of the outlet valve a^3 is clearly seen; whereas the end of the suction period in the cylinder 4 is represented by the roller e^4 which now leaves the cam g , the mixed gas above the piston in the cylinder 5 is compressed, during which period the valves a^5 and e^5 are closed. For illustrating the important opening and cutting off of the valve, Fig. 2, shows the graduation of the cam disk. According to this disk g bears three cams around which the rollers of the valve stems are guided. The proportion for the movement is in this case 1:6. The cylinder turn six times, the cams 5 times, if a revolving motor is employed, whereas the crank-shaft revolves 6 times and the cam-disk once, if the governor is employed in a fixed motor. In both cases a revolving of the crank of 180° corresponds to a revolution of 30° of the cam-disk. But as the cam of the crank shaft needs an addition of 5° , the control points of the governor do not coincide with the dead points of the crank shaft; but a difference of 5 times 6 equal to 30° arises. The other dates can easily be calculated from this construction. For in-

stance if the invention is supplied to a 9 cylinder motor, a favorable proportion results amounting 1:10 *i. e.*, the cam disk would turn 10 times slower than the crank-
5 shaft.

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:—
10 Control device for explosive motors with an uneven number of cylinders arranged in star formation, characterized thereby that

the adjacently arranged inlet and outlet valves are provided in the same plane of rotation and are successively controlled by a 15 single cam disk with successively provided singly stepped cams whose drive takes place with a decreasing number of revolutions.

In testimony whereof I affix my signature in presence of two witnesses.

FRITZ GOCKERELL.

Witnesses:

PAUL DREY,
A. DE OLEA.