May 12, 1936. A. KÉGRESSE 2,040,206

ARRANGEMENT FOR OPERATING ENGINE VALVE GEAR SLEEVES

Filed Oct. 12, 1933

Fig. 1.

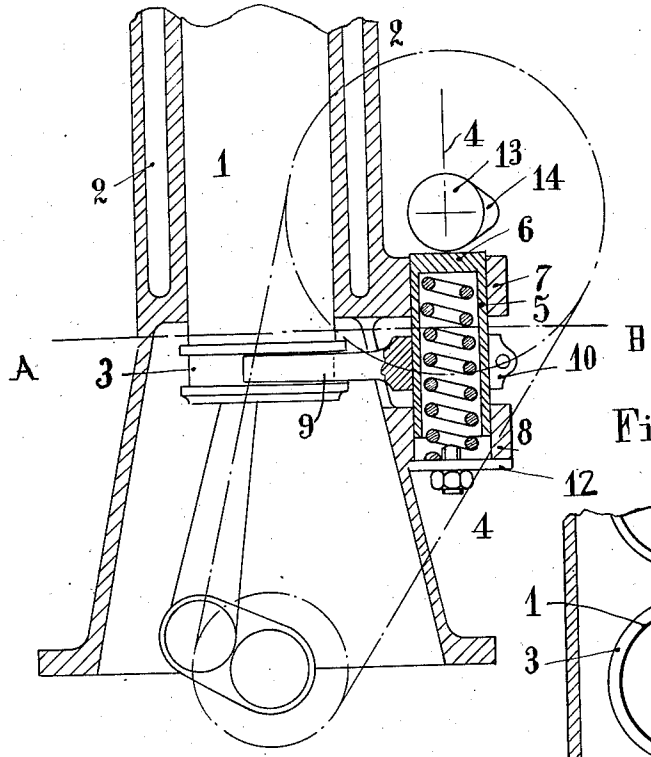


Fig. 2.

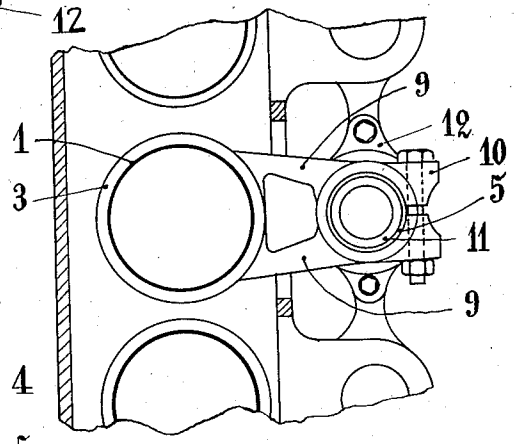
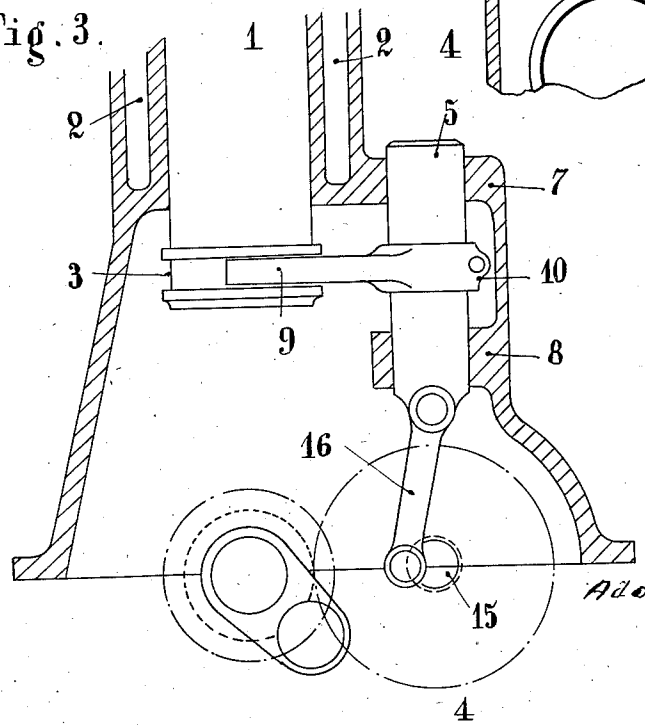


Fig. 3.



INVENTOR:
Adolphe Kégresse
BY
ATTORNEY

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ARRANGEMENT FOR OPERATING ENGINE VALVE GEAR SLEEVES

Adolphe Kégresse, Courbevoie, France

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3 Claims. (Cl. 123—75)

In known engines, the reciprocating valve gear sleeves are generally operated by rocking levers or connecting rods, and in all cases, the said levers or rods are connected to the sleeve by means of a pin mounted on two lugs integral with the sleeve itself.

These arrangements possess the following serious disadvantages:

1. By acting on the sleeve over a small portion of its circumference, they have a tendency to cause it to jam in the cylinder, and to deform it when it has thin walls.

2. The sleeves are expensive to construct on account of the lugs which necessitate complicated milling and drilling operations. Sleeves having a very thin wall, indispensable for obtaining high speeds and efficiencies, are almost impossible to construct and in any case are very expensive.

On the other hand, in sleeve-valve engines, it is important that the said sleeve valve shall be able to rotate in order to facilitate its grinding and to preserve its fluid-tightness. In sleeves with lugs this is impossible.

The present invention relates to an arrangement for operating engine valve gear sleeves which eliminates the serious disadvantages enumerated in the foregoing.

In the accompanying drawing:

Figure 1 shows in sectional elevation and by way of example, an operating device according to the invention.

Figure 2 is a horizontal sectional view of Figure 1, taken along the line A—B.

Figure 3 shows a modification of Figure 1.

As will be seen from Figure 1, the sleeve 1 projects beyond the cylinder 2 by its base, which comprises a circular groove 3.

Parallel to the axis of the cylinder 2 and on an axis 4 there is provided a small hollow cylinder 5 closed at its upper end 6. The small cylinder 5 can move in a vertical direction in two bosses 7 and 8, which may be cast on the cylinder block.

Between the bosses 7 and 8, the small cylinder 5 carries a fork 9, which is fixed on cylinder 5, for example by means of a clamping device 10. The two branches of the fork 9 engage the circular groove 3 of the sleeve.

A strongly compressed spring 11 is located within the small cylinder 5. One end of the spring bears against the base 12 fixed against the lower part of the boss 8, and the other end bears against the end 6 of the small cylinder 5. The effect of the spring 11 is to push the unit comprising the cylinder 5, fork 9 and sleeve 1, upwardly.

A cam shaft 13 carrying a cam 14 is provided at the upper portion 6 of the small cylinder 5.

The operation of the device is easy to understand. It has been seen that the sleeve 1 is urged upwardly under the action of the spring 11. Under the action of the cam 14 on the shaft 13, the attachment comprising the small cylinder 5, fork 9 and sleeve 1, will be moved downwardly to move upwardly again under the action of the spring 11, as soon as the action of the cam 14 has ceased to be effective.

The clamp 10 fixing the fork 9 on the small cylinder 5, enables the latter to be adjusted relatively to the sleeve.

This arrangement may be applied equally well to sleeve-valves and to port sleeves. For the latter, other modifications may be provided of which Figure 3 provides an example.

As will be seen in Figure 3, the cam shaft 13 of Figure 1 is replaced by a crank-shaft 15 operating the small cylinder 5 by means of a connecting rod 16.

In the two devices described, it will be seen that the sleeve 1 cannot be subjected to any jamming effects, since its movement is controlled along an axis 4 (Figures 1 and 3) strictly parallel to its own.

Furthermore, in its movement the sleeve is stressed on at least half of its periphery. It would even be possible by attaching a half-collar to the fork, to cause the latter to act upon the entire periphery of the groove 3. Practice, however, shows that this addition is unnecessary.

It will also be seen that an advantageous effect of the groove 3 is to reinforce the lower portion of the sleeve and to prevent it from being deformed. This renders it possible to construct the body of the actual sleeve with a wall as thin as is desired.

Another very important advantage, in the case of a sleeve-valve is that, due to the circular groove, the sleeve-valve is able to make a free movement of rotation about its own axis, like an ordinary valve. This will enable the wear produced by the piston on the sleeve to be appreciably reduced by the constant changing of the portions of surface in contact, and will improve the fluid-tightness of the seat of the sleeve-valve by a slight circular rubbing at the moment of making contact.

Normal grinding of the sleeve-valve will be possible. Finally, a point which is also important, the machining of the sleeve will only necessitate operations excluding milling and drilling. Its

cost price will therefore be reduced to a minimum.

I claim:

1. In a reciprocating engine having a crank-shaft, a piston connected thereto, a cylinder in which said piston reciprocates and a sleeve valve surrounding the piston, means for reciprocating said sleeve valve comprising a reciprocating element, means for supporting and guiding said element to confine its reciprocation to a path parallel to the axis of the sleeve valve, means for reciprocating said element in timed relation to said crank-shaft, said sleeve having a guide-way extending about its circumference, and means rigidly carried by said reciprocating element and adjustable thereon in the direction of reciprocation for engaging at least two substantially diametrically opposed points on said guide-way for imparting reciprocating movement of said element to said sleeve.

2. In a reciprocating engine having a crank-shaft, a piston connected thereto, a cylinder in which said piston reciprocates and a sleeve valve surrounding the piston, means for reciprocating said sleeve valve comprising a reciprocating element, means for supporting and guiding said element to confine its reciprocation to a path parallel to the axis of the sleeve valve, means for reciprocating said element in timed relation to said crank-shaft, said sleeve having a circumferential channel provided on its outer surface, and a fork-like member rigidly carried by said reciprocating element and adjustable thereon in the direction of reciprocation with its prongs engaging at least two substantially diametrically opposed points in said channel for imparting reciprocating movement of said element to said sleeve.

3. In a reciprocating engine having a crank-shaft, a piston connected thereto, a cylinder in which said piston reciprocates and a sleeve valve surrounding the piston, means for reciprocating said sleeve valve comprising a reciprocating element, means for supporting and guiding said element to confine its reciprocation to a path parallel to the axis of the sleeve valve, means for reciprocating said element in timed relation to said crank-shaft, said sleeve having a circumferential channel provided on its outer surface, and a fork-like member rigidly carried by said reciprocating element and adjustable thereon in the direction of reciprocation with its prongs engaging at least two substantially diametrically opposed points in said channel for imparting reciprocating movement of said element to said sleeve, the engagement between said fork-like member and the sleeve being such as to afford free rotation of the sleeve about its axis.

ADOLPHE KÉGRESSE.