April 12, 1932. C. E. KING 1,853,433

SLEEVE VALVE ENGINE

Filed Dec. 5, 1927

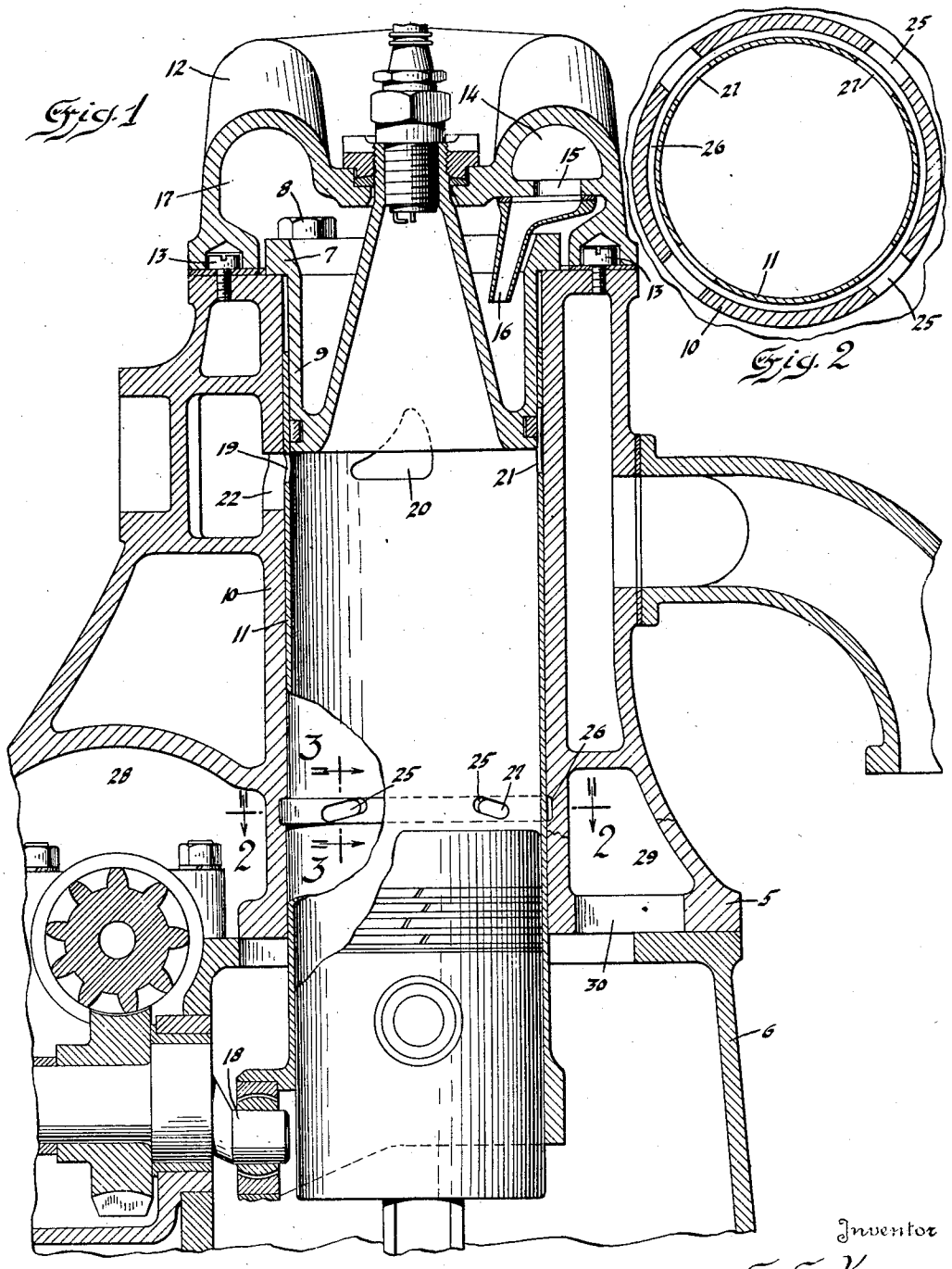

Fig. 1

Fig. 2

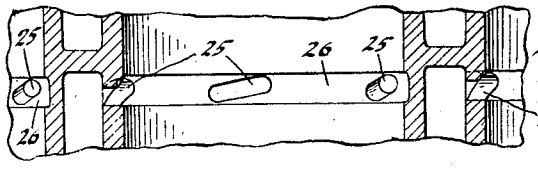

Fig. 3

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UNITED STATES PATENT OFFICE

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SLEEVE VALVE ENGINE

Application filed December 5, 1927. Serial No. 237,955.

This invention relates to internal combustion engines and particularly internal combustion engines of the sleeve valve type and it is an object of the invention to provide a more economical and better operating engine.

It is another object of the invention to provide means for preventing oil pumping in an engine.

It is another object of the invention to provide means for preventing oil pumping combined with means for producing a stratified combustion mixture in an internal combustion engine.

Other objects of the invention will appear in the course of the following specification in which the embodiment of my invention which is shown in the accompanying drawings is described.

In the drawings:

Figure 1 is a view mainly in cross section through a cylinder of an internal combustion engine of the Vauxhall Burt sleeve valve type.

Figure 2 is a fragmentary section on the line 2—2 of Figure 1.

Figure 3 is a fragmentary section on the line 3—3 of Figure 1.

In the drawings, 5 is the cylinder block which is mounted on and secured to the crankcase 6. The reference character 7 indicates the cylinder head which is secured to the block by bolts, such as 8, and has a depending portion 9 between which and the cylinder wall 10 and sleeve valve 11 slides. The cylinder head is provided with a water jacket 12 which is secured to the block by bolts, such as 13. Water enters the jacket through the D-shaped channel 14, flows through the opening 15 into the funnel 16, through the funnel into the depending portion 9 of the cylinder head and then into channel 17, whence it is returned to the radiator.

The sleeve 11 is given a reciprocatory, combined translational and rotational motion by the pin 18 and in the course of its movement brings the sleeve intake ports (two of which, 19 and 20, are shown) and the sleeve exhaust ports (one of which, 21, is shown) into registration with the proper cylinder intake ports (one of which, 22, is shown) and cylinder exhaust ports (not shown) at the proper times to allow intake or exhaust.

The cylinder wall 10, it will be noted, is provided with four lozenge shaped openings 25 in a circumferential groove 26 near its lower end. The excess lubricating oil carried by the sleeve runs into the groove 26, thence through the openings 25 into the spaces 28 and 29 and from these spaces through communicating openings one of which is indicated at 30 to the crankcase and thus oil pumping is prevented.

The sleeve 11 is provided with four lozenge-shaped openings 27 which are adapted to register with the openings 25 in the cylinder wall to admit air to the cylinder at the end of the intake stroke, as shown in Figures 1 and 2. It is to be noted, as shown in Figure 1, that at this time the top of the piston is below the groove 26 and, the openings 25 and 27 being in registration, air will enter the cylinder from the spaces 28 and 29, which are in communication with the atmosphere, due to the difference in pressure in the cylinder and outside. Admission of air to the cylinder at the end of the intake stroke produces what is known as a stratified combustion mixture which tends to make the engine operate more economically.

The openings 27 in the sleeve may be eliminated if desired. If this is done, no air will be admitted to the cylinder through the openings 25 and the remaining structure (the groove 26 and the openings 25 in the cylinder) will function merely to prevent oil pumping.

Furthermore, the openings 25 and the openings 27, or the openings 27 and the groove 26 may be eliminated. In the former case the groove 26 will operate to hold oil for lubricating the sleeve. In the latter case the openings 25 will operate to prevent pumping of oil.

The provision of the means for producing a stratified combustion mixture in the engine cylinders is not my invention and I, therefore, do not claim this feature, per se. My invention resides in the means for preventing oil pumping and the means for permitting the return of the lubricating oil to

the crankcase, per se, and in combination with the means for producing a stratified combustion mixture in the engine cylinders.

I claim:

1. In an internal combustion engine which includes a cylinder and a piston slidable in the cylinder, in combination, means for preventing oil pumping and for producing a stratified combustion mixture including, a groove in the inner wall of the cylinder so located that it will be uncovered by the piston near the end of the suction stroke, and openings in the groove leading to the outside of the cylinder.

2. In an internal combustion engine which includes a cylinder, a sleeve valve slidable in the cylinder, and a piston slidable in the sleeve, means for preventing oil pumping and for producing a stratified combustion mixture including, a circumferential groove in the inner wall of the cylinder so located that it will be uncovered by the piston near the end of the suction stroke, an opening in the groove leading to the outside of the cylinder wall, and an opening in the sleeve adapted to register with the opening in the cylinder wall near the end of the suction stroke.

3. In an internal combustion engine which includes a cylinder, a sleeve slidable in the cylinder, and a piston slidable in the sleeve, a circumferential groove in the inner wall of the cylinder so located that it will be uncovered by the piston near the end of the suction stroke, an opening in the groove penetrating the cylinder wall, and an opening in he sleeve adapted to register with the opening in the cylinder wall near the end of the suction stroke.

4. In an internal combustion engine which includes a cylinder and a piston slidable in the cylinder, means for preventing oil pumping and for producing a stratified combustion mixture including an opening in the cylinder wall through which excess lubricant is adapted to be discharged from the cylinder, which is so arranged as to prevent the return of discharged lubricant into the cylinder and which is adapted to be uncovered by the piston near the end of the suction stroke.

5. In an internal combustion engine which includes a cylinder, a sleeve valve slidable in the cylinder, and a piston slidable in the sleeve, means for preventing oil pumping and for producing a stratified combustion mixture including, an opening in the cylinder wall through which excess lubricant is adapted to be discharged from the cylinder, which is so arranged as to prevent the return of discharged lubricant into the cylinder, and which is adapted to be uncovered by the piston near the end of the suction stroke, and an opening in the sleeve adapted to register with the opening in the cylinder wall near the end of the suction stroke.

6. In an internal combustion engine which includes a cylinder, a sleeve valve slidable in the cylinder, and a piston slidable in the sleeve, an opening in the cylinder wall through which excess lubricant is adapted to be discharged from the cylinder, and which is so arranged as to prevent the return of the discharged lubricant into the cylinder, and an opening in the sleeve through which excess lubricant may be drained from the piston, and which is adapted to register with the opening in the cylinder wall at predetermined intervals.

7. In an internal combustion engine, which includes a cylinder, a valve slidable on a wall of the cylinder, and a piston slidable in the cylinder, means for preventing oil pumping and for producing a stratified combustion mixture including a circumferential groove in the inner wall of the cylinder adapted to be uncovered by the piston near the end of the suction stroke, an opening in the groove leading to the outside of the cylinder, and an opening in the valve adapted to register with the opening in the cylinder wall near the end of the suction stroke.

8. In an internal combustion engine which includes a cylinder, a valve slidable on a wall of the cylinder, and a piston slidable in the cylinder, means for preventing oil pumping and for producing a stratified combustion mixture including an opening in the cylinder wall through which excess lubricant is adapted to be discharged from the cylinder, which is so arranged as to prevent the return of the discharged lubricant into the cylinder, and which is adapted to be uncovered by the piston near the end of the suction stroke, and an opening in the valve adapted to register with the opening in the cylinder wall near the end of the suction stroke.

In testimony whereof I affix my signature.

C. E. KING.