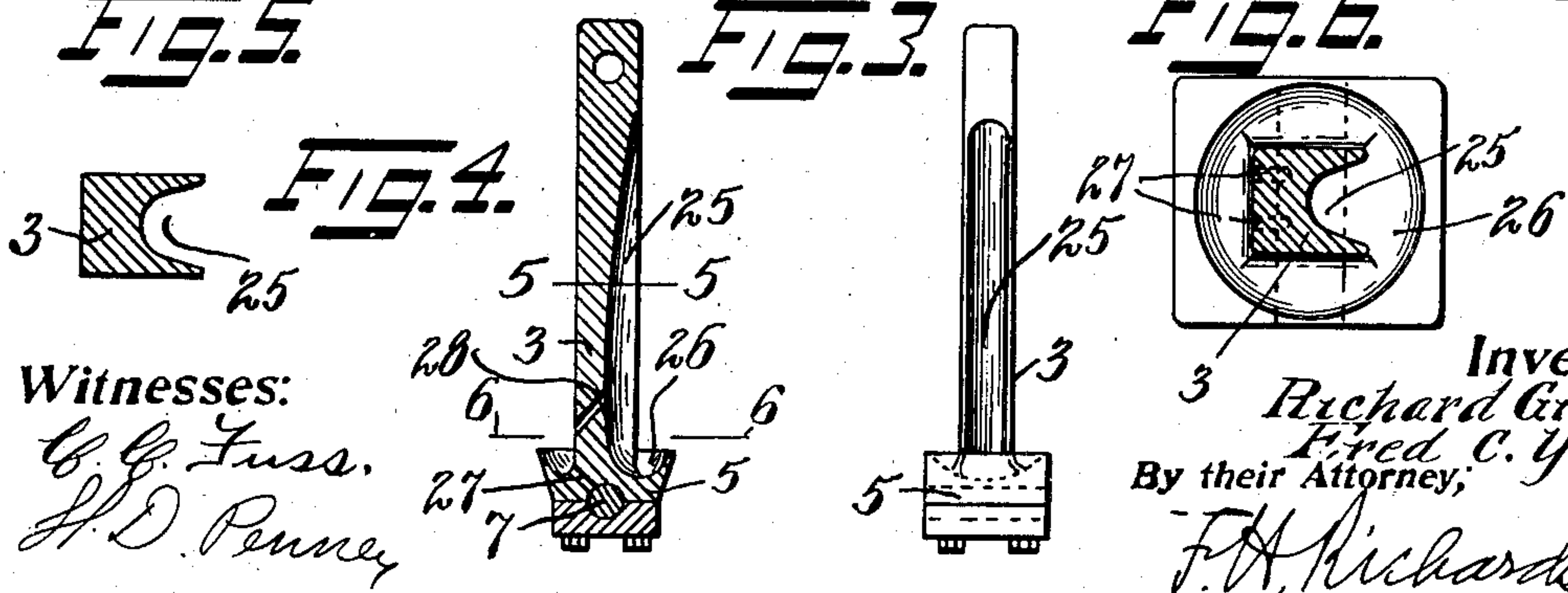
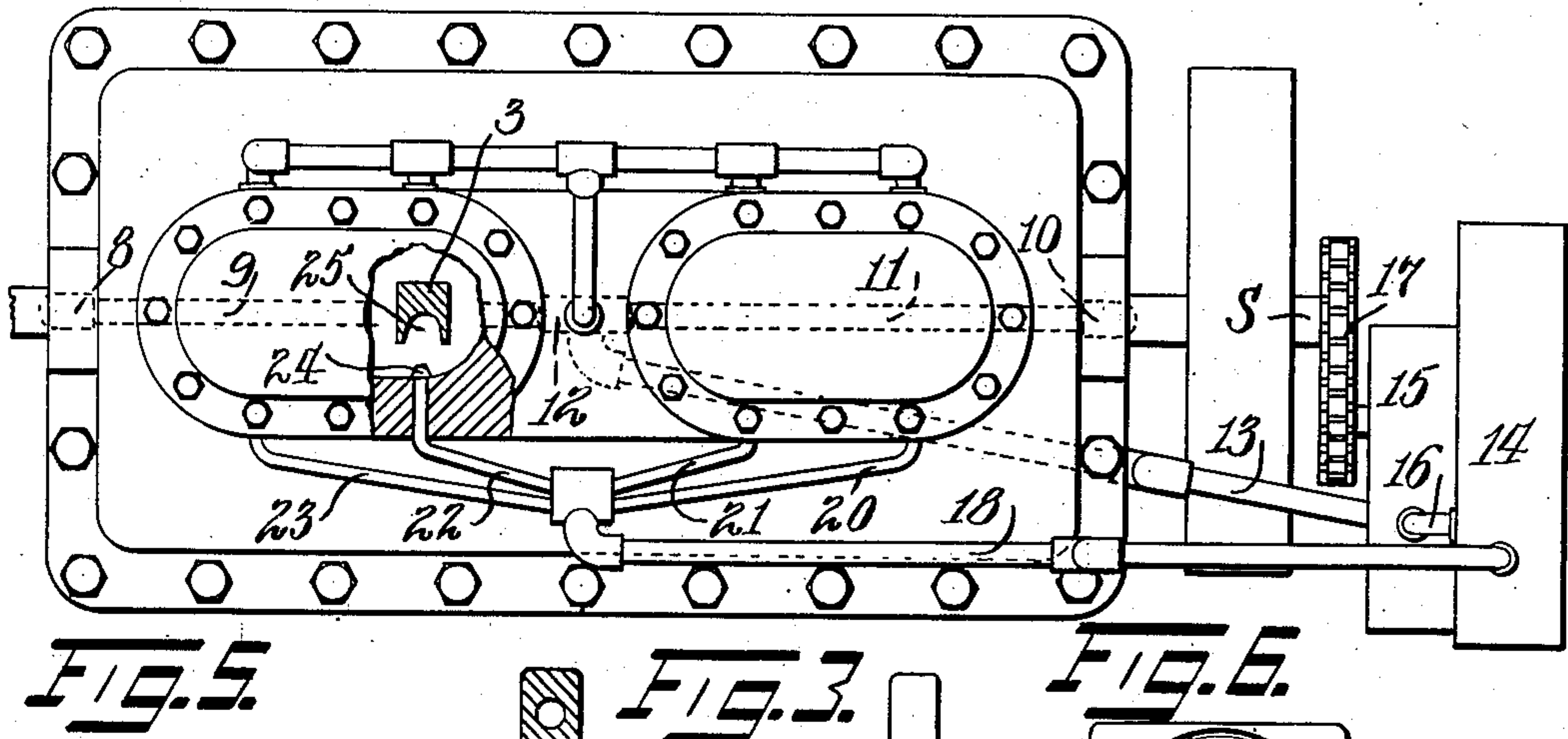
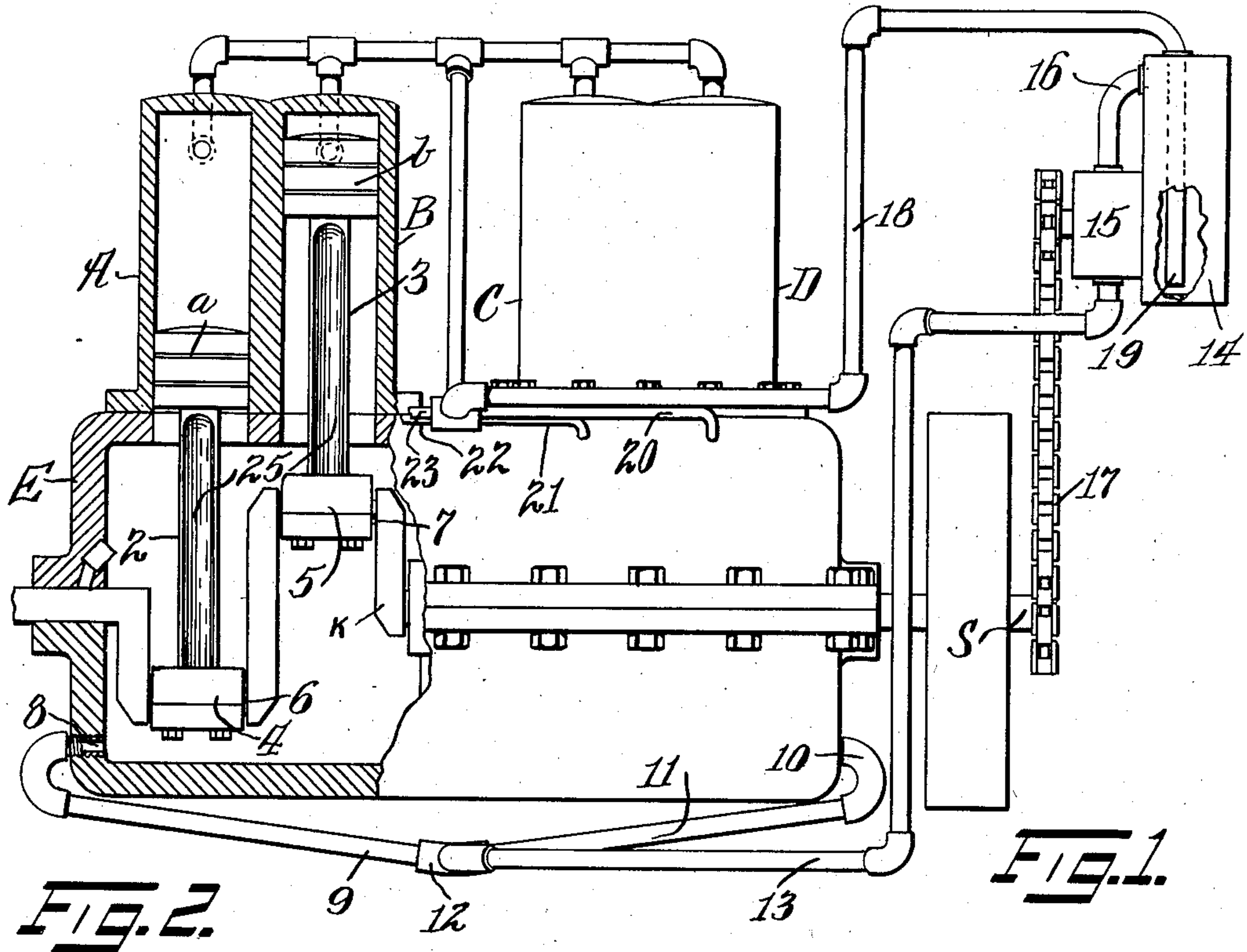


No. 843,084.

PATENTED FEB. 5, 1907.

R. GRIESER & F. C. YATES.
OILING DEVICE.

APPLICATION FILED AUG. 21, 1906.



Witnesses:
C. G. Fuss.
H. D. Penney

Inventors:
Richard Grieser,
Fred. C. Yates;
By their Attorney,
F. H. Richards.

UNITED STATES PATENT OFFICE.

RICHARD GRIESER AND FREDERICK C. YATES, OF NEW YORK, N. Y.

OILING DEVICE.

No. 843,084.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed August 21, 1906. Serial No. 331,430.

To all whom it may concern:

Be it known that we, RICHARD GRIESER, a citizen of the United States, residing at New York, in the county of New York and State of New York, and FREDERICK C. YATES, a citizen of the Dominion of Canada, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Oiling Devices, of which the following is a specification.

This invention relates to lubricating devices for machinery that is moved from place to place and which will assume different positions relative to the level or horizontal line.

The object of the invention is to provide means in a casing containing a series of bearing members—such, for instance, as the crank-case of an engine—whereby upon the crank-case being inclined from the level position the surplus lubricating-oil will be withdrawn from the lower end of the crank-case and returned to the upper end or else forced directly upon the bearing members. Our invention is particularly applicable to motor-vehicles in which the crank-case is inclined when the vehicle is on a grade. This will cause a surplus of oil at the lowermost end of the crank-case, which will result in too much oil being engaged by the bearings at that end, tending to flood the cylinders and foul the spark-plugs, inducing premature explosions and other troubles. Furthermore, the other end of the crank-case will be without the lubricating-oil and the bearings will become heated and cut. By the present invention the oil is automatically withdrawn from whichever end of the crank-case is lowermost and is distributed uniformly throughout the crank-case and the oil is automatically cooled, dispensing with the need of water-cooling.

A further object of the invention is to provide improved means that will withdraw the lubricating-oil from opposite ends of the crank-casing when the casing is in the normal level position and force the oil onto the bearing members. Thereby upon the crank-casing being inclined in either direction the oil will be withdrawn from the lowermost end and forced upon the bearings, while the upper end of the casing being dry no oil will be forced upon the bearings.

A further object of the invention is to provide an improved means for lubricating the bearings of a connecting-rod and crank and also of oiling the cylinder or other reciprocating member with which the connecting-

rod is pivotally jointed.

In the accompanying drawings, representing one embodiment of our invention, Figure 1 is a front elevation partly shown in section. Fig. 2 is a plan view partly in section. Fig. 3 is an elevation of one of the connecting-rods. Fig. 4 is a longitudinal section through the connecting-rod. Fig. 5 is a transverse section of the connecting-rod on line 5 5, indicated in Fig. 4; and Fig. 6 is a transverse section on the line 6 6, indicated in Fig. 4.

In Fig. 1 is represented a four-cylinder gas-engine of the upright or vertical type, having four cylinders A, B, C, and D, in which operate trunk-pistons. The pistons *a* and *b* are shown in section and the adjacent part of the casing E. The pistons *a* and *b* operate in the cylinders A and B and are connected with the crank K by connecting-rods 2 and 3, respectively, the connecting-rods being pivotally jointed to the trunk-pistons at their upper ends and are provided with journal-boxes 4 and 5 at their lower ends, in which operate the crank-pins 6 and 7. The same construction is followed with the cylinders C and D, but which are not shown. At one end of the crank-case E is an outlet 8, from which leads a pipe 9. At the opposite end of the casing is an outlet 10, from which leads a pipe 11, both pipes extending toward the middle part of the casing and inclined downward, and leading to a T 12. From this T suitable piping 13 leads upward and is connected with a reservoir 14; but a suitable fluid-actuator 15 is placed along this pipe for drawing the oil from the cylinder and forcing it into the reservoir. In the form shown a gear force-pump (represented by 15) is used and actuated from the main shaft S of the engine by chain 17. The pipe 13 leads into the reservoir 14 at 16 adjacent its top. The oil in the tank 14 passes out through a pipe 18, whose open end 19 leads nearly to the bottom of the tank, thus forming a siphon. The pipe 18 conducts the oil back into the crank-casing and is provided with means for distributing the oil, so that it is uniformly supplied throughout the casing and each end will receive the proper amount for the bearings therein.

When the engine is placed fore and aft on a motor-vehicle and the latter is on a grade, either ascending or descending, obviously one end of the casing will be elevated consid-

erably above the other. The lower end will have the oil in the casing crowded to that end, while the other and uppermost end will be high and dry. Where the splash system of lubrication is used, one or two cylinders and crank-bearings at that end will receive no lubrication, because there is no oil to be splashed thereby. Hence the bearings will become dry and heated and will then tend to burn and cut, and any small amount of oil they may receive will become immediately carbonized. The spark-plugs will also become foul very shortly; but with the present invention the oil that is now at the lower end will run through the outlet 8 or 10 and pass into the pipe 13. By means of the fluid-actuator 15 this oil will be drawn up into the tank 14. From thence the oil will be forced out of the tank through the siphon-pipe and through the pipe 18 to be distributed throughout the length of the crank-casing. In the present invention the oil from the pipe 18 is directed upon each of the connecting-rods. This pipe 18 is provided with branches 20, 21, 22, and 23, that lead into the casing at each cylinder, respectively, as indicated in section in Fig. 2. These pipes are provided with nozzles 24, whose position is at the extreme lower portion of the cylinder, whereby the oil will be constantly received upon some part of the connecting-rods. By this means whichever end of the cylinder is depressed the oil flowing to that end will be forced up by the pump into the reservoir and thence be uniformly distributed to feed each of the pistons and bearings operatively connected therewith. When the casing is level, the oil will be drawn from both ends; but should either end be elevated the oil running to the other end will be withdrawn and fed upon all of the connecting-rods.

The oil striking the connecting-rods will meet a surface whose inclination varies. When the connecting-rod is in its extreme upper and lower limits, it will be vertical and the oil will meet a substantially perpendicular surface; but between these positions the connecting-rod is alternately inclined in opposite directions. When the connecting-rod is inclined away from the nozzle and toward the piston, the oil will naturally flow up and tend to lubricate the wrist-pin and cylinder, and when the connecting-rod is inclined in the opposite direction the oil will flow down the connecting-rod to lubricate the crank-bearings, &c.

In order to facilitate the movement of the oil along the connecting-rods, each rod is preferably channeled, as shown, tending to cause the oil to flow along the rod rather than to move towards the sides. At the lower part of the connecting-rod the channel 25 terminates in an annular pocket 26, and one or more openings 27 are provided, leading from this pocket to the crank-bearing 7. By

this means the oil flowing down the channel will be caught in the pocket, and hence be caused to flow directly upon the crank-bearing. Some of the oil will pass around the pocket to the opposite side of the connecting-rod and will be thrown off against the rear side of the cylinder. A passage 28 through the connecting-rod from the channel 25 to the opposite side permits some of the oil received on the rod to pass through and run down into the pocket on that side.

By this means it is unnecessary to have sufficient depth of oil in the crank-case to insure splash lubrication, as the oil falling from the bearings will be constantly drawn out by the force-pump through air-cooled pipes into the air-cooled reservoir and from it fed directly upon the connecting-rods and the cooled oil caused to lubricate the cylinders, crank-bearings, and the wrist-pins. By means of the siphon-tub 19 a certain amount of oil will always be retained in the reservoir, and as soon as the engine is started and the force-pump operates this oil will be directly fed upon the bearings.

We claim as our invention—

1. In an engine, the combination of a crank-case having operably mounted therein a driving-shaft and a series of cylinders and cranks and connecting-rods, the bottom of the crank-case being substantially parallel with the shaft, and means for withdrawing lubricating-oil from the lower end of the crank-case upon the same and the shaft being inclined in either direction from its level position, and for forcing the oil into the other end of the crank-case.

2. In an engine, the combination of a crank-case having operably mounted therein a driving-shaft and a series of cylinders and cranks and connecting-rods, the bottom of the crank-case being substantially parallel with the shaft, and means for withdrawing lubricating-oil from the lower end of the crank-case upon the same and the shaft being inclined in either direction from its level position, and for forcing the oil upon the bearing members.

3. In an engine, the combination of a crank-case having operably mounted therein a driving-shaft and a series of cylinders and cranks and connecting-rods, the bottom of the crank-case being substantially parallel with the shaft, and means for withdrawing lubricating-oil from the lower end of the crank-case upon the same and the shaft being inclined in either direction from its level position, and for forcing the oil upon the connecting-rods.

4. In an engine, the combination of a crank-case having operably mounted therein a driving-shaft and a series of cylinders and cranks and connecting-rods, the bottom of the crank-case being substantially parallel with the shaft, and means for withdrawing

lubricating-oil from the lower end of the crank-case upon the same and the shaft being inclined in either direction from its level position, and for forcing the oil upon the connecting-rods, the oil being directed in the plane of movement of the connecting-rods.

5. In an engine, the combination of a crank-case having operably mounted therein a driving-shaft and a series of cylinders and cranks and connecting-rods, the bottom of the crank-case being substantially parallel with the shaft, and means for withdrawing lubricating-oil from the lower end of the crank-case upon the same and the shaft being inclined in either direction from its level position, and for forcing the oil upon the connecting-rods, the oil being directed in the plane of movement of the connecting-rods, and being directed to engage the connecting-rods alternately on opposite sides of the perpendicular thereto at the point of contact, whereby the oil will be splashed alternately toward the piston and toward the wrist-pin cooperating with the connecting-rod.

6. In an engine, the combination of a crank-case, having mounted therein a normally horizontal driving-shaft and a series of cranks and connecting-rods, the bottom of the casing being substantially parallel with the driving-shaft, a conduit leading from each end of the reservoir, a fluid-actuator connected with said conduits, pipes leading from the fluid-actuator and arranged to direct oil upon the bearing members of the cylinders respectively, whereby the oil is withdrawn from the lower end of the crank-case upon the latter being inclined in either direction from its level position, and such oil is forced upon the bearing members.

7. In an engine, the combination of a crank-case, having mounted therein a normally horizontal driving-shaft and a series of cranks and connecting-rods, the bottom of the casing being substantially parallel with the driving-shaft, a conduit leading from each end of the reservoir, a fluid-actuator connected with said conduits, pipes leading from the fluid-actuator and arranged to direct oil upon the bearing members of the cylinders respectively, whereby the oil is withdrawn from the lower end of the crank-case upon the latter being inclined in either direction from its level position, and such oil is forced upon the bearing members, said pipes being disposed to direct the oil upon the connecting-rods in the plane of their movement.

8. The combination of a casing having a series of bearings therein, a closed reservoir, a pipe leading from said reservoir into the casing and provided with branches for directing oil upon the bearing members, a conduit leading from one end of the casing into said reservoir, a conduit leading from the opposite end of the casing into the said reservoir, and a fluid-actuator connected with

said conduits and organized to force oil flowing from the ends of the casing into the said reservoir and thence through said pipes onto the bearing members.

9. The combination of a casing having a series of bearings therein, a closed reservoir, a siphon-pipe leading from said reservoir near the bottom into the casing and provided with branches for directing oil upon the bearing members, a conduit leading from one end of the casing into the reservoir, a conduit leading from the other end of the casing into the said reservoir, and a fluid-actuator connected with said conduits and organized to force oil flowing from the ends of the casing into the reservoir and thence through said pipes onto said bearing members.

10. In an engine, the combination of a series of cylinders and a series of cranks and connecting-rods operating in a crank-case, a closed reservoir, a siphon-pipe leading from said reservoir into the crank-case and provided with branches for directing oil upon each connecting-rod, a conduit leading from one end of the crank-case into said reservoir, a conduit leading from the other end of the crank-case into said reservoir, and a fluid-actuator connected with said conduits and organized to force oil flowing from the ends of the crank-case into the reservoir and thence through said pipes onto all the connecting-rods.

11. In an engine, the combination of a casing having a series of bearings, a closed reservoir, a siphon-pipe leading from said reservoir near the bottom into the casing, a conduit leading from one end of the casing into said reservoir, a conduit leading from the other end of the casing into the said reservoir, and a suction force-pump connected with said conduits and organized to force oil flowing from either end of the casing into the reservoir and thence through said pipes into the crank-case.

12. In an engine, the combination of a series of cylinders and a series of cranks and connecting-rods operating in a crank-case, a closed reservoir, a siphon-pipe leading from said reservoir into the crank-case and provided with branches for directing oil upon the connecting-rods, a conduit leading from one end of the crank-case into said reservoir, a conduit leading from the other end of the crank-case into said reservoir, and a force-pump connected with the conduits and organized to force oil flowing from the ends of the crank-case into the reservoir and thence through said pipes onto all the connecting-rods.

13. In a lubricating device, the combination with a crank and a reciprocating member, of a connecting-rod pivotally connected with said members the connecting-rod being provided with a longitudinal channel on one side and with a pocket which runs around to

the back of the connecting-rod at one end of the channel having openings leading to the crank-pin, and means for directing a stream of oil onto the channeled side of the connecting-rod.

14. In an engine, the combination of a casing having a series of cylinders, cranks and connecting-rods operable in a crank-case, the connecting-rods being provided with a longitudinal channel opposite one side of the casing, pipes arranged to direct lubricating-oil onto said side of each connecting-rod, means for withdrawing the oil from the bottom of the casing at each of opposite ends and forcing said oil through said pipes for oiling the connecting-rods, whereby the oil is withdrawn from the lower end only when the casing is inclined in either of two directions and forced upon the connecting-rods.

15. In an engine, the combination of a series of cylinders, cranks and connecting-rods operating in a crank-casing, the connecting-rods having channels on their sides opposite one side of the casing and also each provided with a pocket having openings leading to the crank-pin, pipes arranged to direct lubricating-oil onto each of the connecting-rods at their channeled sides, means for withdrawing the oil from the bottom of the crank-case at

each of opposite ends and forcing the oil through said pipes onto the connecting-rods, whereby the oil is withdrawn from the lower side only of the crank-casing upon being inclined in either of two directions and forced upon the connecting-rods.

16. In an engine, the combination of a series of cylinders, cranks and connecting-rods operating in a crank-casing, the connecting-rods having channels on their sides opposite one side of the casing and also provided with a pocket having openings leading to the crank-pin, pipes arranged to direct lubricating-oil onto each of the connecting-rods at their channeled sides, means for withdrawing the oil from the bottom of the crank-case at each of opposite ends and forcing the oil through said pipes onto the connecting-rods, whereby the oil is withdrawn from the lower side only of the crank-casing upon being inclined in either of two directions and forced upon the connecting-rods, said means being operated by a force-pump actuated from the engine.

RICHARD GRIESER.
FREDERICK C. YATES.

Witnesses:

WILLIAM H. REID,
F. E. BOYCE.