No. 720,251. PATENTED FEB. 10, 1903.

C. HIRSCH.

OIL PUMP.

APPLICATION FILED MAR. 17, 1902.

NO MODEL.

Fig. 1.

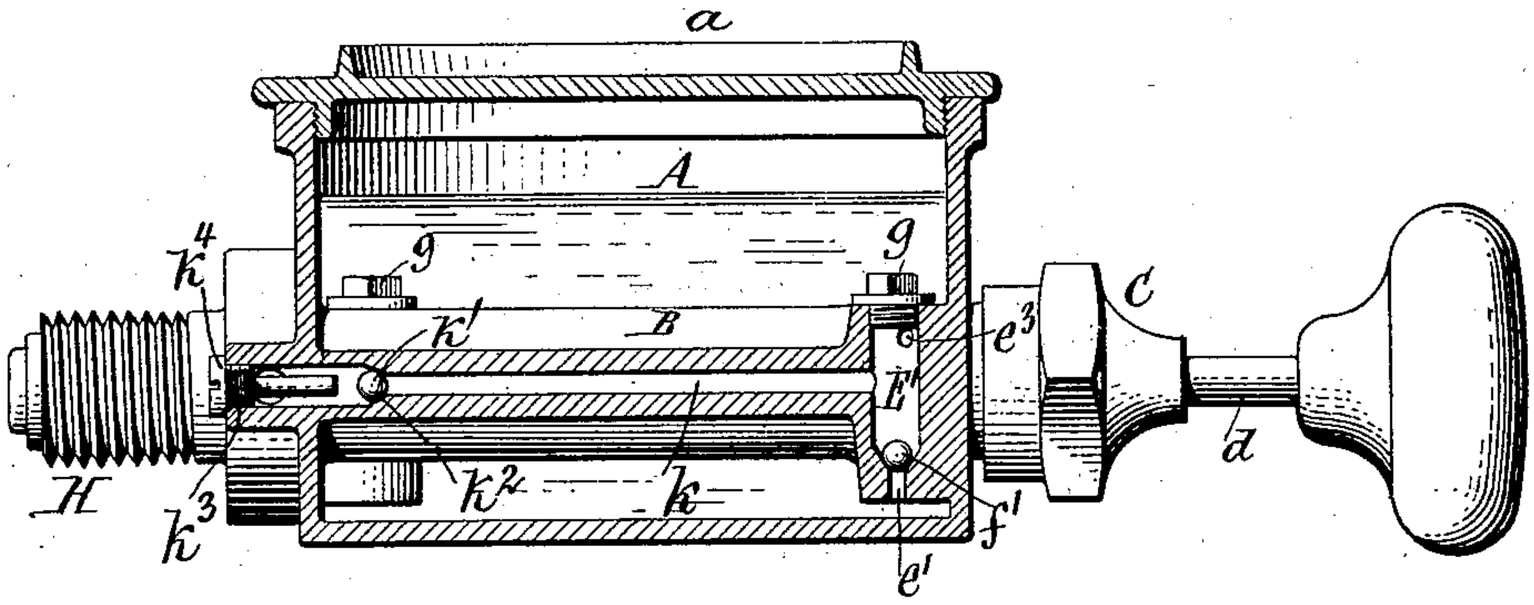


Fig. 2.

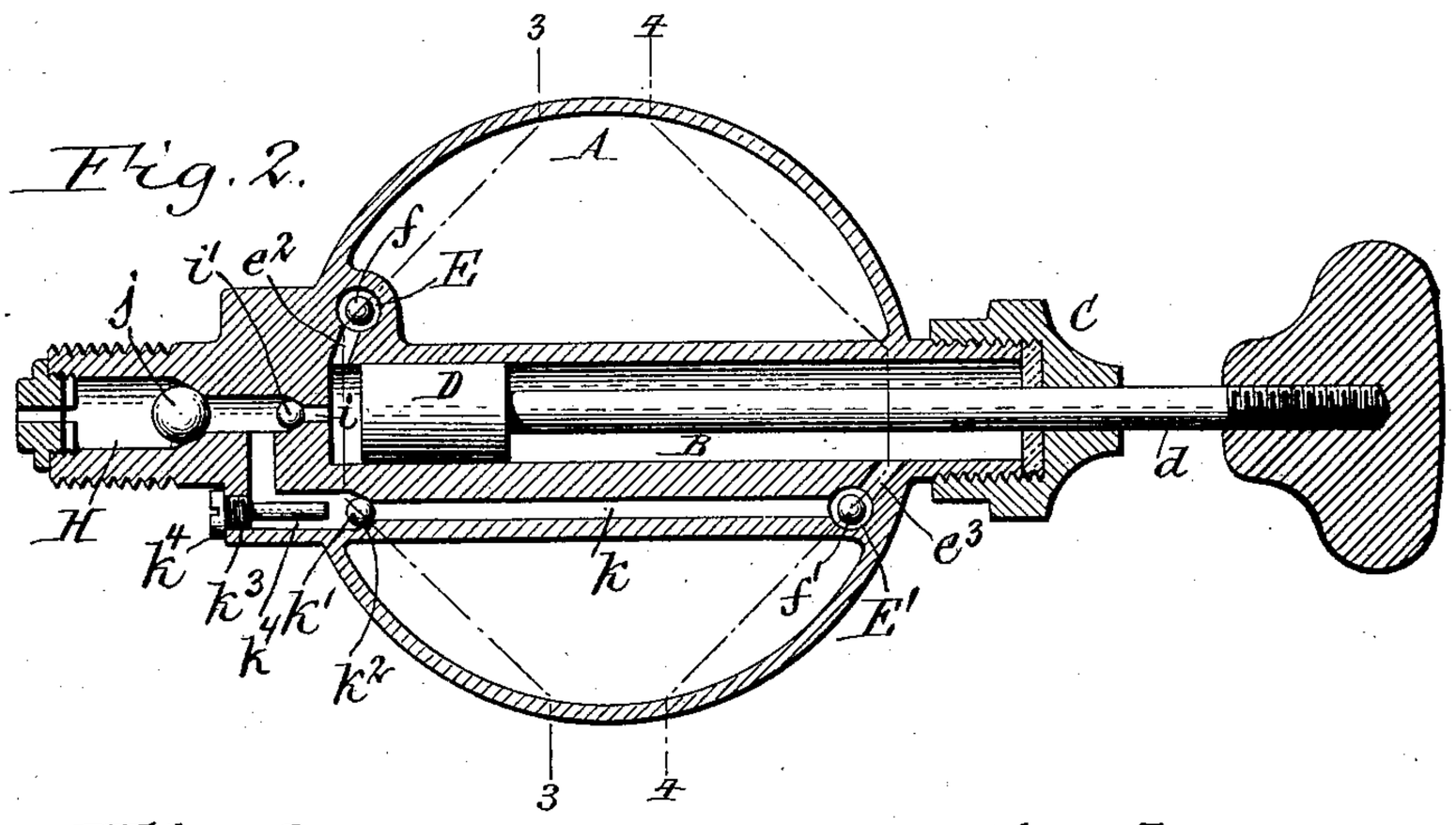


Fig. 3.

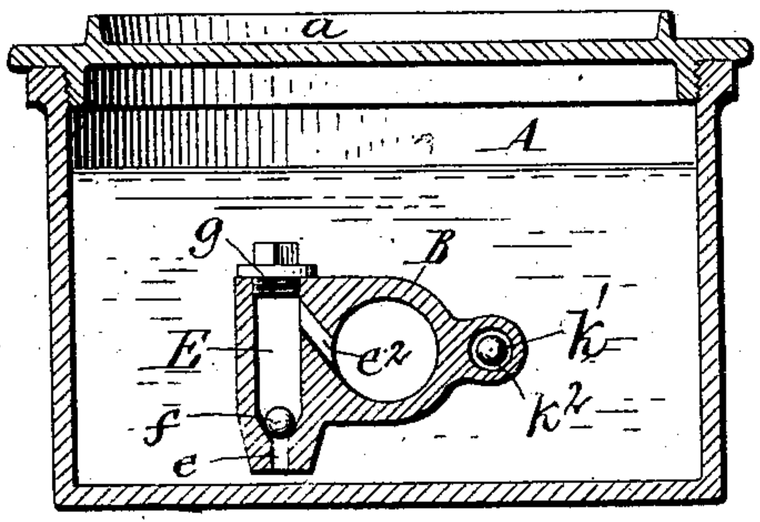
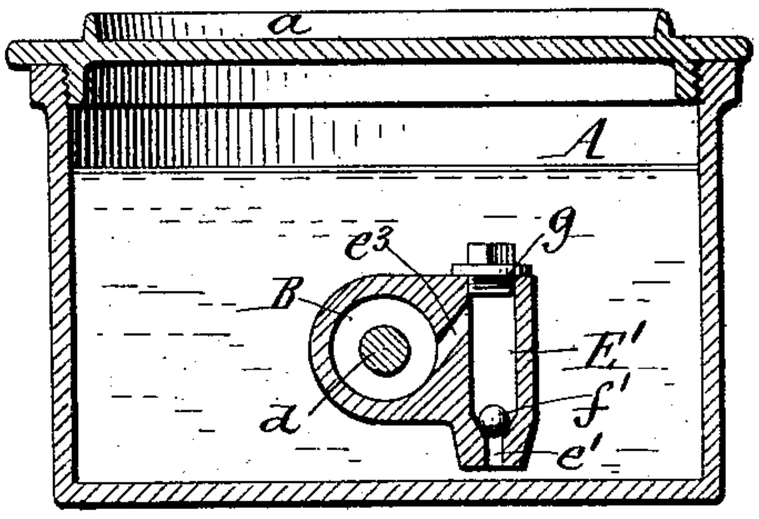


Fig. 4.



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UNITED STATES PATENT OFFICE.

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OIL-PUMP.

SPECIFICATION forming part of Letters Patent No. 720,251, dated February 10, 1903.

Application filed March 17, 1902. Serial No. 98,544. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HIRSCH, a citizen of the United States, residing at Buffalo, in the county of Erie, in the State of New York, have invented new and useful Improvements in Oil-Pumps, of which the following is a specification.

This invention relates to the class of pumps which are employed for forcing lubricating-oil into the cylinder of a steam or other engine against the pressure of the fluid therein.

The principal object of my invention is to utilize the full pumping capacity of the barrel or cylinder and yet avoid extending the same beyond the usual oil-reservoir to an objectionable extent.

A further object of the invention is to simplify the construction and reduce the cost of the pump.

In the accompanying drawings, Figure 1 is a sectional elevation of a double-acting oil-pump embodying my invention. Fig. 2 is a horizontal section thereof. Figs. 3 and 4 are vertical sections at right angles to Fig. 1 in lines 3 3 and 4 4, Fig. 2.

Like letters of reference refer to like parts in the several figures.

Referring to the construction shown in Figs. 1 to 4, A indicates the usual oil-reservoir, having the removable cap or cover *a*, and B the pump-barrel, arranged horizontally in the lower portion of the reservoir. The projecting rear end of the barrel is closed by the customary stuffing-box C, through which the rod *d* of the pump-plunger D passes. Within the oil-reservoir and at diagonally opposite ends of the barrel are arranged a pair of upright suction-chambers E E′, which are connected with the interior of the oil-reservoir A by vertical suction-ports *e e′* and with the adjacent ends of the pump-barrel by ports or passages e^2 e^3, respectively, arranged above said suction-ports. At the upper ends of these suction-ports are valve-seats, to which are applied upwardly-opening check-valves *f f′*, preferably of spherical form. These valves are introduced through the upper ends of the suction-chambers E E′, which are normally closed by screw plugs or caps *g*. The delivery-ports e^2 e^3 of the suction-chambers are preferably drilled by inserting the drill obliquely in the upper end of the chambers before applying the screw-plugs *g*. As shown in Fig. 2, the front end of the pump-barrel connects directly with the usual discharge-nozzle H of the oil-reservoir by a longitudinal passage *i*, through which the oil is prevented from returning by a check-valve *i′*, which closes rearwardly against a seat at the front end of said passage. The discharge-nozzle also has the customary main or steam check-valve *j*, located beyond the check-valve *i′*. The rear end of the pump-barrel is indirectly connected with the discharge-nozzle H by the rear suction-chamber E′ and a longitudinal delivery-passage *k*, extending forwardly from the upper portion of said suction-chamber and entering the discharge-nozzle between the two check-valves *i′* and *j*, as seen in Fig. 2. The return of the oil through this longitudinal passage is checked by a valve *k′*, which closes rearwardly against a seat k^2, located in the same near its front end. The front portion of this passage turns inwardly at an angle to its main portion, and at the junction of these longitudinal and transverse portions and in line with said seat an opening k^3 is formed for the insertion of the valve *k′* and the introduction of a suitable tool for grinding the seat, this opening being normally closed by a screw plug or cap k^4, having a pin or projection serving to hold the ball in proximity to its seat, while a free passage for the oil is provided in the annular space around said pin.

In the use of the pump upon drawing the plunger backwardly the front suction-valve *f* is lifted from its seat, and oil is drawn from the reservoir into the portion of the barrel in front of the plunger through the front suction-chamber E and passage e^2, and the rear or auxiliary check-valve *i′* of the discharge-nozzle H is at the same time drawn against its seat, closing the discharge-passage *i*. During the same stroke of the plunger the oil previously drawn into the barrel behind the plunger is discharged through the port e^3, rear suction-chamber E′, longitudinal passage *k*, and discharge-nozzle H, the pressure of the oil opening the check-valve *k′* of the longitudinal passage and the main check-valve *j* of the discharge-nozzle and closing the rear suction-valve *f′* and the auxiliary discharge-

valve i' for checking the return of the oil into the reservoir and the front end of the pump-barrel. Upon pushing the plunger forwardly the oil in front of the same is discharged directly through the passage i and the nozzle H, the return of the oil into the reservoir being checked by the front suction-valve f, which is closed by the pressure of the oil. At the same time that the plunger is expelling the oil in front of the same a fresh charge of oil is drawn into the barrel behind the plunger through the rear suction-chamber E', the check-valve k' of the longitudinal passage k being closed during this interval and checking the return of the oil through said passage.

By arranging the suction-chambers at the sides of the barrel instead of in line therewith, as heretofore, they do not occupy a part of the barrel-space, and the barrel can therefore be extended clear across the reservoir. This construction affords a comparatively large barrel capacity in which the advantage of a full pumping stroke is obtained in both directions without unduly extending the rear end of the barrel beyond the reservoir. When the valves and their chambers are located in line with the barrel, the latter in order to have the desired capacity must be extended beyond the oil-reservoir to such an extent as to render the pump incapable of use where the available space is very limited, as is often the case in small or crowded engine-rooms. The arrangement of the suction-chambers at diagonally opposite sides of the barrel and the location of one of these chambers in the longitudinal passage k, as shown, simplifies the construction of the pump. By arranging the suction-chambers vertically at the sides of the horizontal pump-barrel with their plugged ends upward or opposite the cover of the reservoir they are easily accessible upon removing the cover and the plugs for grinding the seats of the suction-valves and inserting the latter. This arrangement also permits the reservoir, the pump-barrel, and the valve-chambers to be cast complete in a single piece without interfering with the convenient grinding of the valve-seats and the introduction of the valves, thus requiring comparatively little fitting of the parts and materially reducing the cost of the pump.

I claim as my invention—

1. The combination of an oil-reservoir having an open upper side and provided with a discharge-nozzle at its front side having a check-valve, of a cover for said open upper side, a horizontal pump-barrel arranged in the reservoir and extending continuously from the rear thereof to said nozzle, a vertically-disposed suction-chamber arranged at one side of said barrel at its front end and communicating with the reservoir, a similar chamber located on the opposite side of said barrel at its rear end and communicating with the reservoir, caps closing openings in the upper ends of said chambers, suction-valves in said chambers, a delivery-passage leading from the rear suction-chamber and joining said discharge-nozzle beyond its check-valve, and a piston in said chamber having a working stroke the full length of the barrel, substantially as described.

2. The combination of a reservoir provided with a discharge-nozzle containing a check-valve, a pump-barrel arranged in said reservoir and communicating at its front end with said nozzle, suction-chambers located at opposite ends of the barrel and communicating with the reservoir and the adjacent ends of the barrel, check-valves arranged in said suction-chambers, a longitudinal delivery-passage extending forwardly from said rear suction-chamber and provided with a transverse front portion which joins said discharge-nozzle beyond the check-valve thereof, said longitudinal passage being provided on the rear side of its transverse portion with a valve-seat, and on the front side thereof with a plugged opening arranged in line with said seat, and a check-valve applied to said seat, substantially as set forth.

3. The combination of an oil-reservoir having a discharge-nozzle in the side thereof, a pump-barrel extending transversely of said reservoir and communicating at its front end with said nozzle, suction-chambers located at opposite sides of said barrel and at opposite ends thereof and communicating with the reservoir, check-valves arranged in said suction-chambers, a longitudinal delivery-passage extending forward from the rear suction-chamber and provided with a transverse portion communicating with the nozzle intermediate the ends thereof, a check-valve located in said discharge-passage in rear of the transverse passage, a plug threaded into an opening in line with the bore of said discharge-passage and having a stem extending into proximity to said valve, a check-valve in rear of said transverse portion controlling the communication between the forward end of the barrel and the nozzle and a second check-valve in advance of said transverse passage, substantially as described.

Witness my hand this 1st day of March, 1902.

CHARLES HIRSCH.

Witnesses:
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