C. C. WAKEFIELD.

PUMP.

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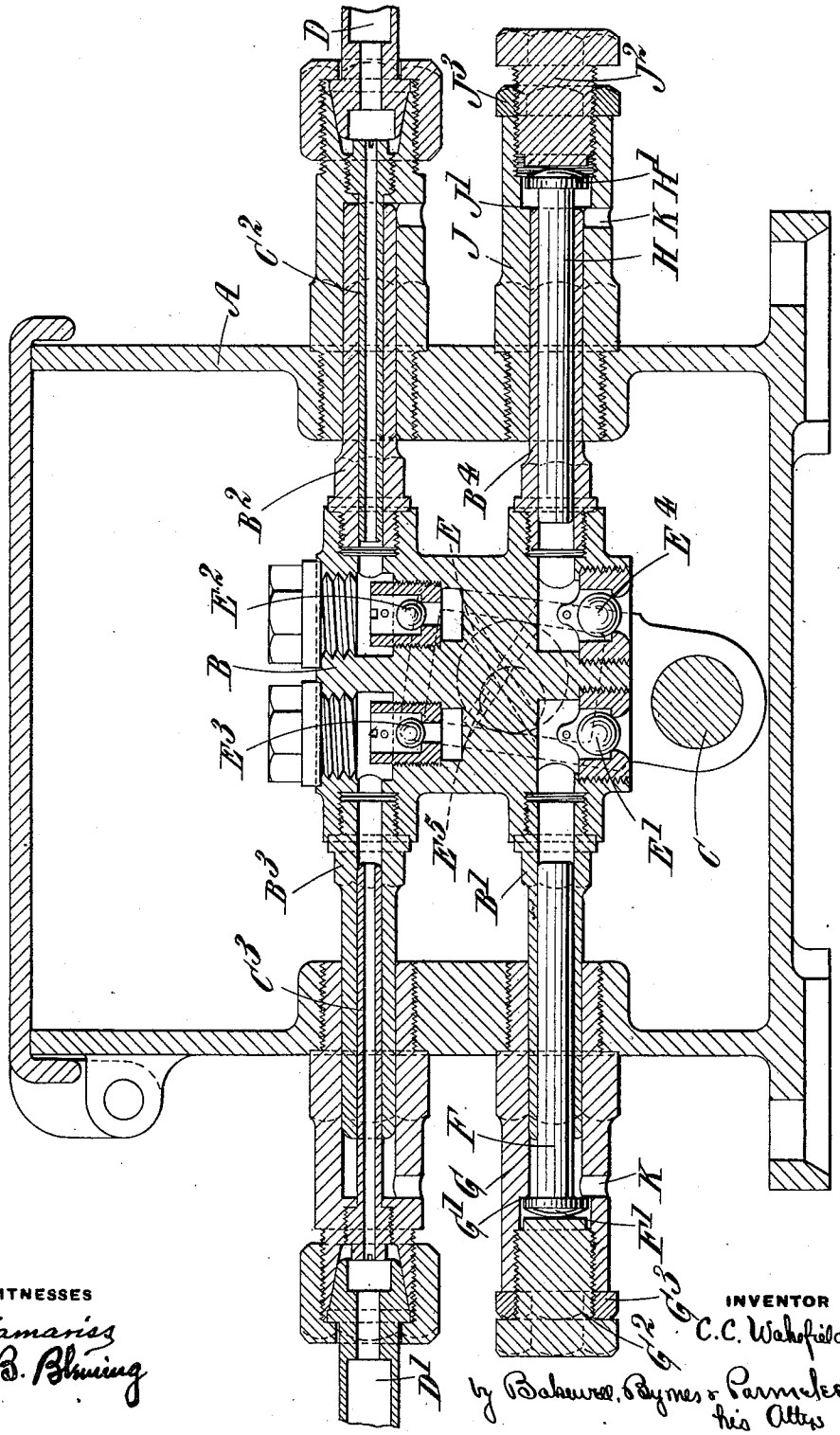
993,920. Patented May 30, 1911.



WITNESSES

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PUMP.

993,920. Specification of Letters Patent. Patented May 30, 1911.

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To all whom it may concern:

Be it known that I, CHARLES CHEERS WAKEFIELD, a subject of the King of England, residing at London, England, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention is for improvements in or relating to pumps of the type in which the valve chest is reciprocated within a reservoir containing the fluid to be pumped. Pumps of this kind are particularly adapted for lubricating purposes and the invention will be described as applied to a lubricator, although it is not restricted to lubricators and is further applicable to a pump, whether for a lubricator or otherwise, wherein only one barrel is employed.

In a force-feed lubricator containing a series of pumps operated from a single driving shaft and each pump supplying lubricant to some part of a machine, it is often required to alter the rate of flow of lubricant to some one part without changing the supply to another. This has been heretofore effected by various means, but that hereinafter described is particularly simple as well as effective and lends itself very readily to force-feed lubricators.

According to this invention, in a pump of the type referred to there is combined with a pump barrel, a plunger and an adjustable device for controlling the amount of movement of the plunger so as to vary the effective stroke of the pump.

In the accompanying drawing a force-feed lubricator of known type is shown in central vertical section through two of the pumps and provided with adjusting mechanism according to the present invention.

The oil reservoir A has in it a cross-head B which also constitutes a valve casing, that is reciprocated by a crank-pin C, through the medium of a slotted plate actuating a pin secured to the valve casing, operated by mechanism not shown in the drawing. The cross-head carries four pump barrels B′, B^2, B^3, B^4 respectively, and beside these may be another four and so on according to the length of reservoir and number of pumps required, but for the purpose of the present invention, the four shown in section need only be considered. The barrels or cylinders B^2 and B^3 coöperate with stationary pump plungers or pistons C^2, C^3. These plungers are hollow and communicate with the discharge conduits D D′.

The cross-head B carries at its base an inlet valve E′ that controls communication with the pump barrel B′ and in the upper portion of the cross-head is a discharge valve E^2 that controls a conduit E which effects communication between the barrel B′ and the barrel B^2. At the base of the cross-head is a second inlet valve E^4 that controls communication with the pump barrel B^4 and at the upper end of the cross-head is a second discharge valve E^3 that controls a conduit E^5, whereby communication is effected between the pump barrel B^4 and the pump barrel B^3. All these parts are well known and in themselves form no part of the present invention.

The pump barrels or cylinders B′ B^4 instead of coöperating with fixed plungers or pistons or operating as hollow plungers or pistons in stationary barrels or cylinders, are made to coöperate with plungers or pistons that can be given a certain amount of idle movement relative to the cylinders if required. The barrel B′ contains a plunger F that has an enlarged head F′. The barrel B′ slides in a cylindrical casing or guide G that is screwed into the wall of the reservoir and the casing has an interior shoulder G′. The head F′ of the plunger F is of greater diameter than the pump-barrel B′ and is adapted to engage the shoulder G′ of the casing G. Screwed into the outer end of the casing G is an adjustable plug G^2 provided with a lock-nut G^3. This plug is of such length that it can enter the casing G a sufficient distance to hold the plunger F against endwise movement by bringing the head F′ against the shoulder G′ within the casing G. The pump-barrel B^4 contains a similar plunger H having a head H′ and the barrel works in a casing J with an interior shoulder J′. In the end of the casing is an adjustable plug J^2 having a lock-nut J^3. Apertures K are provided in the casings G and J to permit free ingress and egress of the air as the pump plungers reciprocate.

The operation of this mechanism is as follows:—The cross-head is reciprocated by the crank pin C, which in turn is driven by mechanism not shown in the drawings. The delivery of any one pump, however, can be varied by means of the adjustable plug G^2 or J^2 and as shown in the drawing the plug G^2

is screwed home so that the pump-barrel B′ is given a full discharge whereas the plug J^2 is partially withdrawn for the purpose of decreasing the discharge from the barrel B^4. It will be seen that as the cross-head travels to the right a full charge of lubricant will be drawn into the pump-barrel B′ and on the return movement of the cross-head this lubricant will be discharged from the conduit E and past the valve E^2 to the barrel B^2, part of it discharging through the hollow plunger C^2 while the other part fills the barrel B^2 preparatory to discharge on the next reciprocation of the cross-head. As however, the cross-head moves to the left no lubricant will be drawn into the barrel B^4 for the first portion of its movement as the plunger H at the beginning of the stroke will be resting with its head against the adjusting plug J^2, but as the cross-head continues its movement to the left the plunger H will be carried along with the barrel B^4 until its head strikes the shoulder J′ in the casing J. The barrel B^4 will then commence to draw in oil through the valve E^4, but as part of its stroke was ineffective owing to there being no relative movement between the barrel and plunger through the lost-motion device H′ J^2 and J J′, only a partial charge will be drawn into the barrel. During the return movement of the cross-head the plunger H first travels back idly with the barrel B^4 so that no discharge takes place and then when the head H′ strikes the adjustable plug J^2 discharge commences through the conduit E^5 and past the valve E^3 to the barrel B^3. Part of this discharge will pass through the hollow plunger C^3 and part will fill the barrel B^3 preparatory for discharge on the next reciprocation of the cross-head.

It will be seen that by the mere adjustment of the plug G^2 or J^2 of any one pump, the discharge of that particular pump can be decreased from full charge to *nil* and the plug having been adjusted can be secured by the lock-nut G^3 or J^3.

In lubricators of this type it is quite common to employ eight or even more pumps, each lubricating its own particular part and to be able to readily adjust the discharge to any one part is of great advantage.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A pumping system comprising a reservoir for the fluid to be pumped, a pump having cylinder and piston members, one of said members being movable and the other member being stationary during a portion of the movement of the movable member, actuating mechanism for reciprocating the movable member the same distance during each stroke, valves for controlling the inlet and outlet for said pump, abutments for the stationary member, and means to adjust one of said abutments to vary the relative movement of the two members whereby the capacity of the pump may be changed with a constant stroke of the movable pump member; substantially as described.

2. A pump system comprising a reservoir for the fluid to be pumped, a pump having a cylinder and a piston, actuating mechanism for reciprocating the cylinder the same distance during each stroke, valves for controlling the inlet and outlet for said pump, abutments for the piston, and means to adjust one of said abutments to vary the relative movement of the cylinder and piston whereby the capacity of the pump may be changed with a constant stroke of the cylinder; substantially as described.

3. In a pump, the combination of a reservoir for containing the fluid to be pumped, a pump barrel, a chamber wherein the pump barrel can slide, mechanism operatively connected with the pump barrel for reciprocating it, a plunger mounted in the barrel and movable endwise therein, an adjustable device coöperating with the plunger to limit the degree of its movement in the barrel and a valve chest situated in the reservoir in such position as to be immersed in the fluid to be pumped, and communicating with the pump barrel; substantially as described.

4. In a pump, the combination of a reservoir for containing the fluid to be pumped, a group of pump barrels, a group of chambers wherein the pump barrels can slide, mechanism operatively connected to the pump barrels for reciprocating them, a group of plungers mounted in the barrels and movable endwise therein, a group of adjustable devices coöperating with the plungers to limit the degree of their movement in the barrels and a valve chest situated in the reservoir in such position as to be immersed in the fluid to be pumped, and communicating with the pump barrels; substantially as described.

5. In a pump, the combination of a reservoir for containing the fluid to be pumped, a pump barrel, a chamber wherein the pump barrel can slide, mechanism operatively connected with the pump barrel for reciprocating it, a plunger mounted in the barrel and movable endwise therein, an adjustable device situated outside the reservoir and cooperating with the plunger to limit the degree of its movement in the barrel and a valve chest situated in the reservoir in such position as to be immersed in the fluid to be pumped, and communicating with the pump barrel; substantially as described.

6. In a pump the combination of, a reservoir for containing the fluid to be pumped, two pump barrels opposed endwise one to the other, a valve chest interposed between and communicating with the pump barrels and situated in the reservoir in such position

as to be immersed in the fluid to be pumped, mechanism for reciprocating the pump barrels for pumping, a loose plunger in one of the barrels, and an adjustable stop for the loose plunger to render the latter operative at different portions of the stroke of the pump, substantially as set forth.

7. In a pump the combination of, a reservoir for containing the fluid to be pumped, a group of pump barrels divided into two lots whereof those of one lot are opposed end on to those of the other lot, a valve chest carried between and communicating with the two lots of pump barrels and situated within the reservoir in such position as to be immersed in the fluid to be pumped, a group of loose plungers one in each barrel, mechanism for reciprocating for pumping one of the aforementioned groups of members, and adjustable stops one for each plunger to render same operative at different portions of the stroke of the pump substantially as set forth.

8. In a pump the combination of, a reservoir for containing the liquid to be pumped, two pump barrels opposed end on one to the other, mechanism for reciprocating for pumping one class of these members, namely, the barrels and plungers, a valve chest interposed between and communicating with the pump barrels and situated in the reservoir in such position as to be immersed in the fluid to be pumped, plungers one in each barrel, and an adjustable device situated outside the reservoir and coöperating with one of the plungers to vary the effective stroke of the pump, substantially as set forth.

9. In a pump the combination of, a reservoir for containing the fluid to be pumped, a group of pump barrels divided into two lots those of one lot being opposed end on to those of the other lot, a valve chest interposed between and communicating with the two lots of barrels and situated in the reservoir in such position as to be immersed in the fluid to be pumped, a group of loose plungers one in each barrel, mechanism for reciprocating for pumping one of the aforementioned groups of members, and adjustable stops situated outside the reservoir, one for each plunger to render same operative at different portions of the stroke of the pump, substantially as set forth.

10. In a pump, the combination of, a reservoir containing the fluid to be pumped, a plurality of tubular casings projecting outwardly from the reservoir, a group of pump barrels mounted free one in each of these casings and extending into the reservoir, a valve chest carried by the pump barrels and situated in the reservoir in such position as to be immersed in the fluid to be pumped, mechanism operative within the reservoir to reciprocate the barrels for pumping, plungers mounted free one in each barrel and provided with means to limit their movement in the barrels in the direction of the valve chest, and plugs secured in one end of each casing, and adjustable therein in the axial line of the casing to limit the movement of the plungers in a direction away from the valve chest, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES CHEERS WAKEFIELD.

Witnesses:
W. J. Norwood,
T. J. Osman.