No. 675,948. Patented June 11, 1901.

P. J. HARLEMAN.

AUTOMATIC LUBRICATOR.

(Application filed Dec. 31, 1900.)

(No Model.)

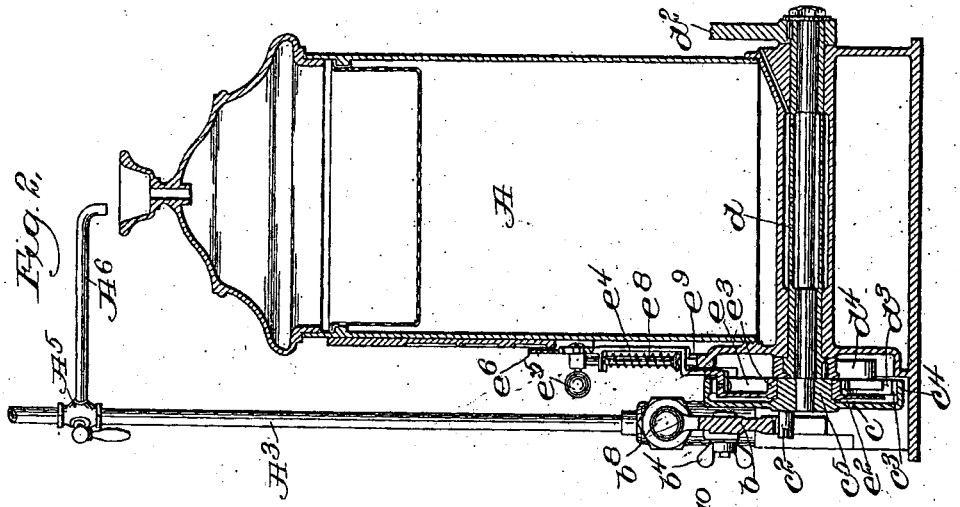

Fig. 2.

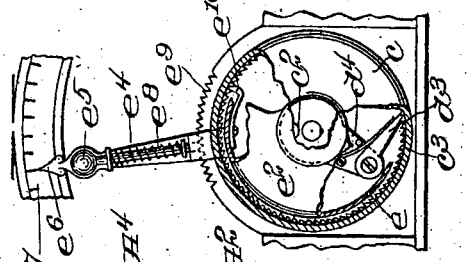

Fig. 3.

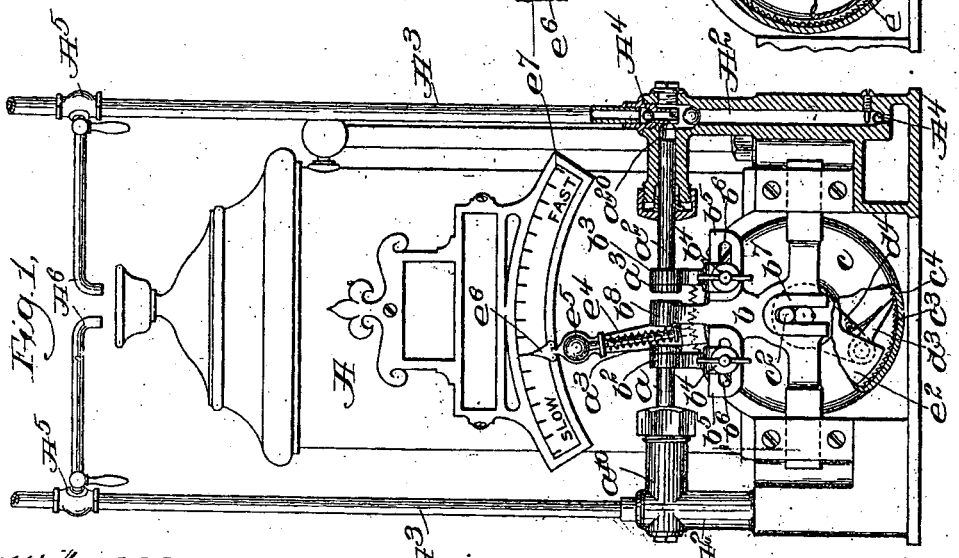

Fig. 1.

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UNITED STATES PATENT OFFICE.

PETER J. HARLEMAN, OF BOSTON, MASSACHUSETTS.

AUTOMATIC LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 675,948, dated June 11, 1901.

Application filed December 31, 1900. Serial No. 41,606. (No model.)

To all whom it may concern:

Be it known that I, PETER J. HARLEMAN, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Automatic Lubricators, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to an automatic lubricator, and is mainly embodied in a novel construction and arrangement of the oil-pumps, whereby the apparatus is made more compact and simple, and in a regulating device of novel construction, whereby the action of the pump may be varied so as to regulate the amount of oil supplied during a given time.

In accordance with the invention the oil-supply pipe is fed from the reservoir by means of pump-plungers which are in alinement with each other and project into plunger-chambers at opposite sides of the reservoir, there being a supply-duct leading from the reservoir to each of said plunger-chambers and a supply-pipe leading from each plunger-chamber to the part which is to be lubricated. In lubricating the cylinders of an engine, for example, there may be a separate pipe for each cylinder, and the apparatus embodying the invention is provided with means whereby different quantities of oil may be supplied through the different pipes. For this purpose each of the plungers is adjustably connected to a reciprocating cross-head, so that the length of stroke of each plunger can be independently varied, if desired. The said cross-head or equivalent actuator is shown as operated upon by a rotating member having a wrist-pin or equivalent transmitting device, the said rotating member having a step-by-step movement, produced through the action of an oscillating shaft which is suitably actuated, being connected, for example, with some part of the engine or machine which is to be lubricated. The said reciprocating member has a constant movement, and it is obvious that if the rotating member is moved a certain predetermined distance at each reciprocating movement the speed of the pump-plungers will also be constant. It is desirable, however, that the speed of the pump-plungers should be variable in order to control or regulate the amount of oil supplied in a given time, and in accordance with the present invention the regulation is obtained by a device which disconnects the oscillating member from the rotating member during a variable portion of the movement of the former, this device being under the control of the operator and preferably provided with a scale to indicate its extent of movement. As herein shown, the oscillating member is provided with a pawl adapted to act on a ratchet connected with rotating member, the pawl traveling back a predetermined distance during its idle stroke and forward the same distance during its operating stroke. The controlling or regulating device consists of a shield or cover adapted to overlie a portion of the teeth in the path of the pawl, the said device being movable, so as to cover as many teeth as desired, the pawl riding from the teeth upon the said shield in its idle stroke and coming in contact in its operating stroke with only so many of the teeth as are beyond the shield in the path of movement of the pawl.

Figure 1 is a front elevation, partly in section, of a lubricator embodying the invention; Fig. 2, a transverse section of the same; and Fig. 3 a detail, partly in section and partly in elevation, showing the regulating device alone.

The oil is contained in the reservoir A, which may be of any suitable construction or shape, and is adapted to be pumped from said reservoir through oppositely-disposed ducts A^2 into the supply-pipes A^3. The said ducts are provided with check-valves A^4 in the usual way, so that the action of the pump-plungers a a^2, which extend, respectively, into the plunger-chambers a^{10} a^{20}, will cause the oil to be supplied to the machine. In accordance with the invention the plunger-chambers a^{10} a^{20} are arranged opposite each other, and the plungers a and a^2, which are in alinement with each other, are provided with flanges or shoulders a^3, to be acted upon by collars b^2 and b^3, adjustably secured, as by thumb-screws b^4, with a cross-head b, provided with oppositely-disposed supports b^5, having grooves b^6, in which the collar-supports are adjustably mounted, the said cross-head be-

ing reciprocated by means of a rotating member *c*. The said cross-head *b* has a constant movement, being acted upon, for example, by means of a wrist-pin c^2, connected with the member *c* and acting on a yoke b^7, so that it makes a complete reciprocation at each complete rotation of the member *c*. The active or inward stroke of the plungers *a* and a^2 is caused by a projection b^8 from the cross-head *b*, the said projection alternately engaging the ends of the plungers between which it moves, and the outstroke of the plungers is caused by the collars b^2 and b^3, which engage the shoulders or flanges a^3. The extent of the outstroke, therefore, can be varied by adjusting the collars b^2 and b^3 with relation to the cross-head *b* by means of the thumb-screws b^4, which have been described above.

As indicated in Fig. 1, the two plungers can be differently adjusted, if desired—for example, in case high and low pressure cylinders are to be supplied with lubricant, there being less lubricant required in one cylinder than in the other. As indicated in the drawings, the adjustment is such that the plunger a^2 will have substantially its maximum stroke, the collar b^2, which acts upon the plunger *a*, however, being so adjusted that the said plunger *a* will have less than its maximum stroke.

After the primary adjustment above described has been effected it is obvious that the amount of oil supplied during a given time will depend upon the number of strokes of the plungers during such time, and in order that the amount can be regulated without interfering with permanent adjustments the apparatus is provided, in accordance with the invention, with a regulating device, which controls the action of the rotating member *c*, upon which directly depends the action of the pump-plungers. The said rotating member *c* is shown as driven through the agency of an oscillating sleeve or member *d*, provided with a crank-arm d^2, which may be suitably connected to any part of the machine which is being lubricated, the connection not being herein shown, since it forms no part of the present invention, and the said oscillating sleeve *d* imparts the step-by-step rotary movement to the member *c* through the agency of a pawl d^3, connected with a radial arm d^4, connected with the sleeve *d* and arranged to act upon ratchet-teeth c^3, shown as formed in a flange c^4, which forms part of the member *c*. The length of time required to effect a complete rotation of the member *c*, therefore, with relation to the speed of the oscillating shaft depends upon the number of teeth acted upon by the pawl d^3 during each oscillation, so that by controlling or varying the number of teeth acted upon the action of the pump can be correspondingly varied. For this purpose the apparatus embodying the invention is provided with a controlling device *e*, shown as a shield overlying a portion of the ratchet-teeth c^3 and movable with relation to the said ratchet-teeth toward and from the position occupied by the end of the pawl at the end of its operating stroke, the said shield lying close to the teeth and being inclined at its forward end, so that in the rearward movement of the pawl the latter will ride up upon the surface of the said shield out of contact with the teeth. As herein shown, the said member or shield *e* is in the form of a flange connected with a disk e^2, having a hub e^3, which bears upon the hub c^5 of the member *c*, and the said disk is provided with an arm e^4, having a knob or handle e^5 and a pointer e^6, which is arranged to travel along a suitable scale e^7. The said arm may also be provided with a retaining device e^8, shown as a spring-actuated arm adapted to engage a series of notches e^9, formed in a stationary part of the frame to lock the said arm in any position to which it may be moved. Assuming, for example, that the arm is moved to the end of the scale marked "Fast," it will carry the flange *e* to such a position that the end thereof will be beyond the end of the pawl d^3 when the said pawl is substantially at the end of its idle stroke, so that it will at that period in its operation engage one of the teeth of the member *c* and will impart a rotary movement to said member during the entire operative movement of the pawl. By moving the arm e^4 toward the end of the scale marked "Slow," however, the flange *e* will be moved into the path of the pawl, so that during a portion of the inoperative movement of said pawl the end thereof will ride up into contact with the flange *e*, and in the forward or operative movement of the pawl the said end will not engage the teeth until it reaches the end of the said flange. If, for example, half of the teeth in the path of the pawl d^3 are covered by the flange *e*, it is obvious that the member *c* will make only half as many revolutions for a certain number of oscillations of the shaft *d* as it would if the teeth throughout the entire path of the pawl were uncovered by the said flange, and by placing the said flange in any desired intermediate position the amount of oil fed during a given time can be closely regulated.

For convenience in construction the hub c^5 of the member *c* is shown as mounted on a shaft having a bearing in the oscillating sleeve *d*, and in order to prevent the movement of the member *c* except when actually operated upon by the pawl d^3 a retaining-pawl e^{10} is employed, the said retaining-pawl being shown as connected with the member *e* for convenience, it being obvious that this will not interfere in any way with the operation of the device, although when the pointer is moved toward the end of the scale marked "Slow" it will carry the member *c* with it.

In order to determine the amount of oil which is being fed at any given time, the supply-pipes A^3 are shown as provided with three-way cocks A^5, whereby the oil therein

may be caused to flow through drip-pipes A^6, which extend over the top of the reservoir, the oil being returned to the reservoir.

I claim—

1. In an automatic lubricator, the combination with oppositely-disposed plunger-chambers; of plungers in alinement with each other and projecting toward each other from said chambers; a reciprocating cross-head located between said plungers; engaging members adjustably connected to said cross-head to act directly on the plungers; a rotating member to operate said reciprocating cross-head, said rotating member being provided with ratchet-teeth; an oscillating member provided with a pawl adapted to coöperate with said ratchet-teeth; and a controlling member or shield adapted to be introduced between said pawl and said ratchet-teeth, substantially as described.

2. In an automatic lubricator, the combination with oppositely-disposed plunger-chambers; of plungers in alinement with each other and projecting toward each other from said chambers; a reciprocating cross-head located between said plungers; engaging members adjustably connected to said cross-head to act directly on the plungers; a rotating member to operate said reciprocating cross-head, said rotating member being provided with ratchet-teeth; an oscillating member provided with a pawl adapted to coöperate with said ratchet-teeth; a controlling member or shield adapted to be introduced between said pawl and said ratchet-teeth; and a manually-operating device for said controlling member having a retaining device; and a scale to indicate its position, substantially as described.

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

PETER J HARLEMAN

Witnesses:
HENRY J. LIVERMORE,
JAS. J. MALONEY.