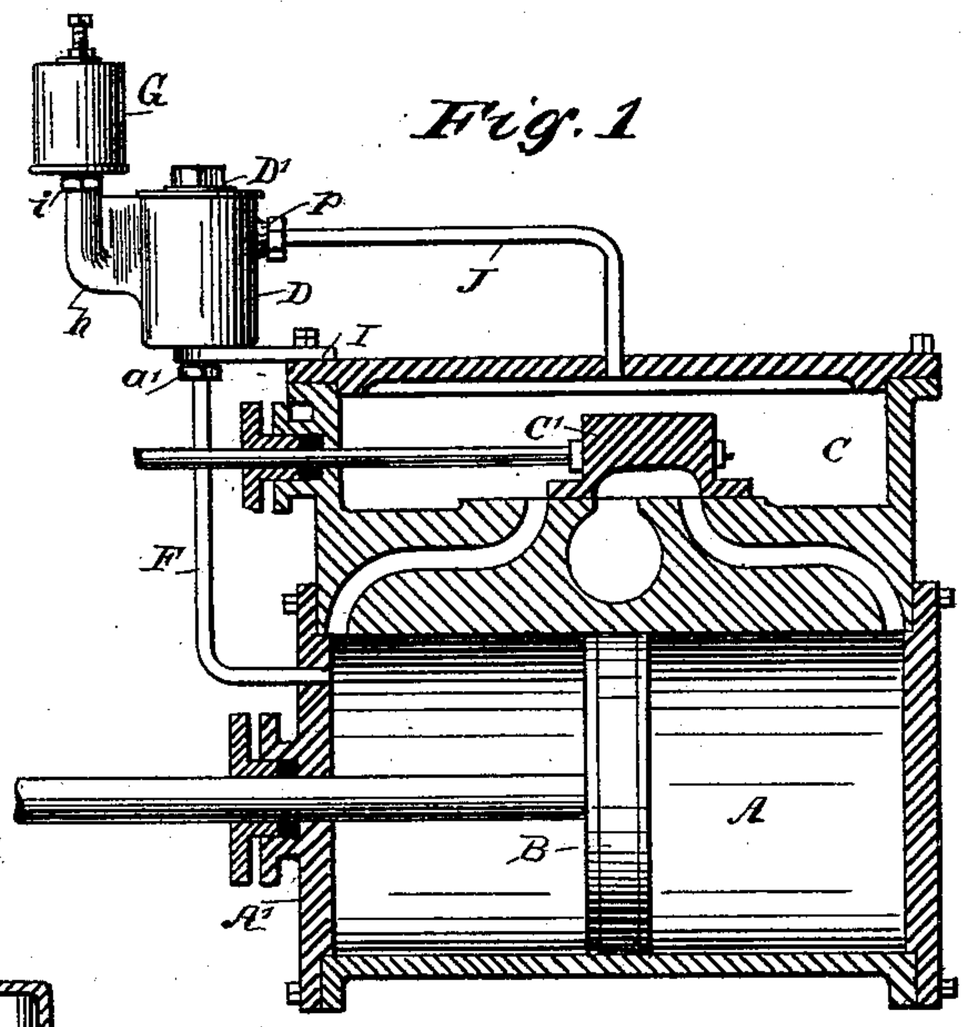
(No Model.)

M. W. WHITE.

LUBRICATOR.

No. 500,451. Patented June 27, 1893.

Fig. 1



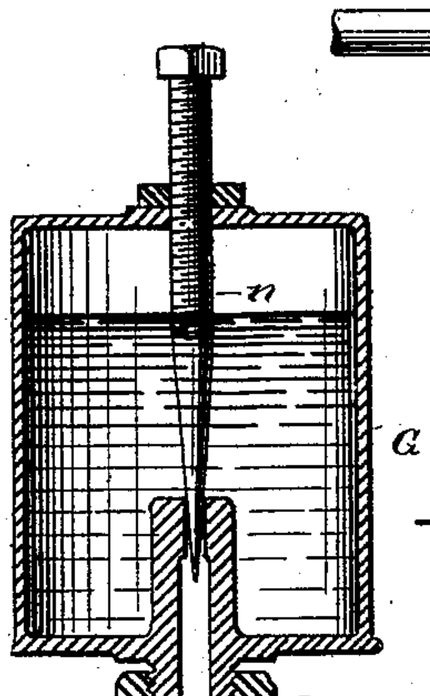
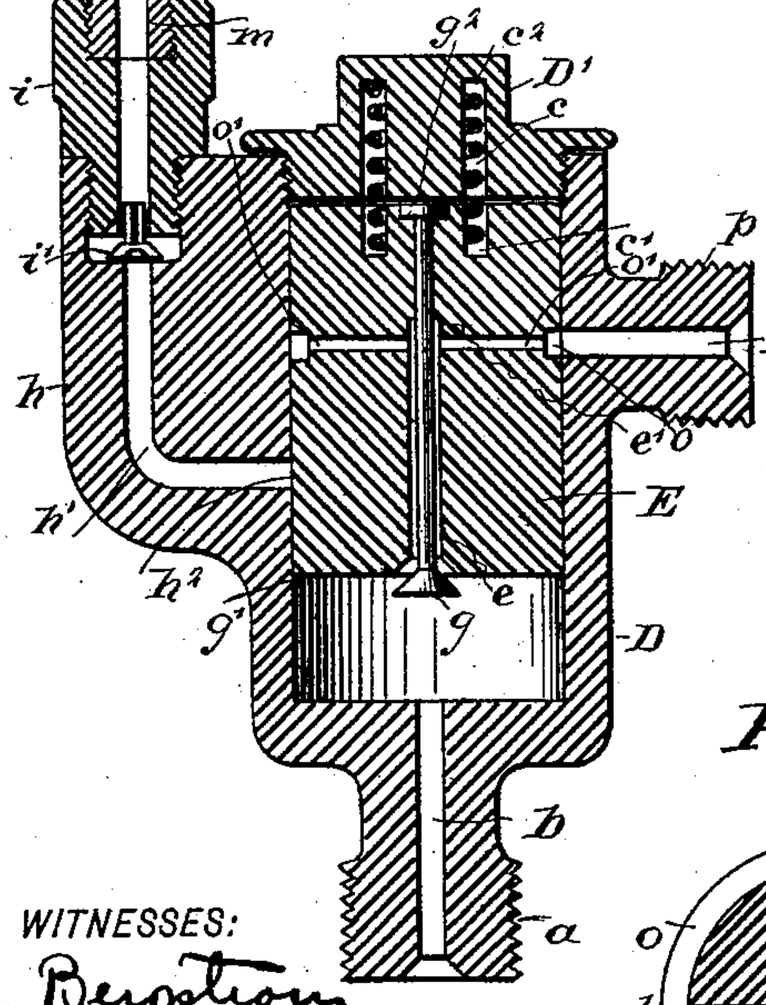


Fig. 2

Fig. 3



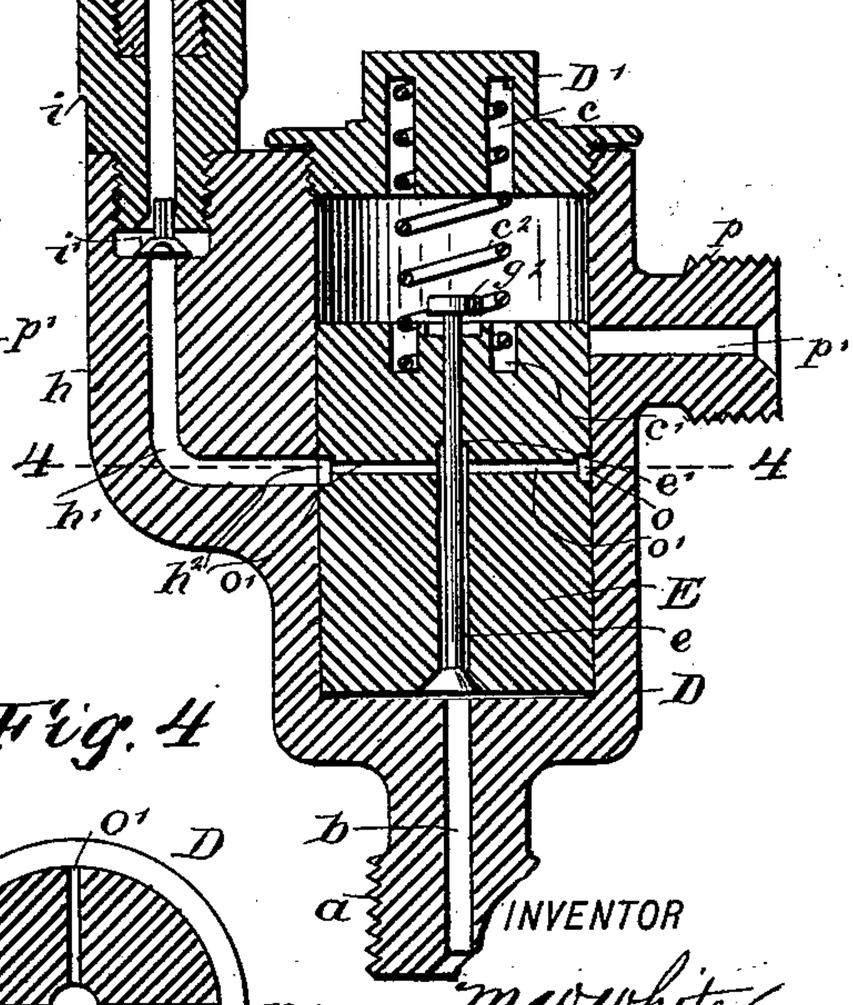
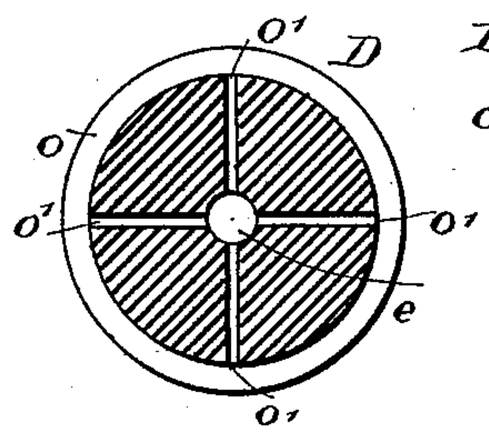


Fig. 4



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LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 500,451, dated June 27, 1893.

Application filed February 3, 1893. Serial No. 460,891. (No model.)

To all whom it may concern:

Be it known that I, MILES W. WHITE, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Oil-Feeding Devices for Engines, of which the following is a full, clear, and exact description.

My invention relates to improvements in oil feeding appliances for steam engines; and has for its object to provide a novel, simple and inexpensive device which is adapted for service in connection with a high or low pressure steam engine, and when in place, affords convenient and reliable means for the graduated periodical introduction of lubricating liquid, into the steam chest of such a motor.

To these ends my invention consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side view of a steam engine cylinder, piston therein, steam chest, and valve, with the improvement applied thereto, showing the relative position of the latter. Fig. 2 is an enlarged detached sectional side view of the improved oil feeding device, and an ordinary needle-feed oil cup thereon, the working parts of the improvement being arranged to feed the increment of oil received from the needle cup, into a steam chest. Fig. 3 is an enlarged detached sectional side view of the improved device, showing its working parts adjusted to receive an increment of lubricating liquid from an oil cup shown in part; and Fig. 4 is a transverse section of the improvement on the line 4—4 in Fig. 3.

In Fig. 1, A is the cylinder, B the piston, and C the steam chest of a steam engine of ordinary construction, which is shown to illustrate the preferred points for attaching the improved oil feeding device to such a motor.

The improvement comprises a cylindrical chamber D, of proper dimensions for efficient service, which is furnished with an integral nipple *a*, on its lower end through which an axial steam passage *b*, is formed; and a steam feed pipe F, that is removably attached to said nipple by a nut *a'*, extends thence to the cylinder head A', in which it is inserted to receive and convey live steam from the cylinder to the chamber D. The chamber D, is sealed at its upper end by a removable cap D', which has a threaded engagement within the same, a sufficient thickness being given to the cap to permit the formation vertically and concentrically in its body, of an annular channel *c*, which extends from the lower or inner surface of the cap piece a proper extent therein.

Within the chamber D, a neatly fitting cylindrical slide block E, is introduced, which is of such a relative length as will allow a correct space to intervene between the lower face of the block and the bottom of the cylindrical cavity of the piece it slides within, when the slide block is made to impinge on the inner face of the cap piece D'. The block E, is longitudinally and centrally perforated, this cylindric passage *e*, being reduced in diameter above a point *e'*, which is nearer the upper end wall of the block than to its lower surface, and within this reduced axial passage the stem *g'* of a valve *g*, is adapted to slide a limited distance. The valve *g*, which is preferably given a conical form, fits upon a mating cone-cupped seat in the lower end wall of the slide block, the upper end of the valve stem *g'*, having a head plate g^2, of circular form affixed to it, which plate is adapted to enter a recess of a corresponding shape and suitable depth, that is formed in the upper end of the slide block; the length of the valve stem allowing the valve *g*, to reciprocate a proper degree.

On the side of the chamber D, a protuberance *h*, is integrally formed, by preference, but may be a separable piece affixed by any suitable means; and in it a right angle bent passage *h'* is produced, which intersects the cavity of the chamber with its lower terminal h^2 at a correct height from the bottom wall of said chamber. The upper terminal of the passage *h'*, is diametrically enlarged where it apertures the top of the protuberance *h*, and is internally threaded in said enlargement, for the threaded connection therewith of a union nipple *i*, wherein an oil cup G, is removably secured by its shank *m*, that has a

threaded connection with the top of the nipple, as shown in Fig. 2. The oil cup G, may be of any approved form, that shown having an adjustable needle *n*, that graduates the escape of oil or other liquid lubricant from the oil cup in the usual way, the cup being adapted to deliver any predetermined number of drops of the lubricating liquid, into the union nipple and thence into the oil feeding passage *h'*. The nipple *i*, is furnished with a check valve *i'*, that is of the winged style, and by its gravity if lowered from the seat formed for it in the lower end of the nipple, there being a cross groove formed in the lower face of the valve disk, which will allow the lubricating liquid to pass from the nipple into the passage *h'*, when the device is attached and maintained upright, for service, by a bracket plate I, or like device, upon the steam engine, the valve *i'*, serving to prevent a back pressure of steam into the cup, as will be further explained. At a point which will locate it opposite the lower terminal h^2, of the oil passage *h'*, when the block E, is seated upon the bottom of the chamber D, a circumferential groove *o*, is formed in said slide block, and from the axial passage *e*, a proper number of perforations *o'*, are extended radially, so as to intersect this groove. There is a laterally projected integral nipple *p*, formed on the side of the chamber D, at a point nearly opposite the protuberance *h*, said nipple being provided to receive the cup nut that is on the end of an oil feed pipe J, which pipe extends from the side of the chamber a sufficient distance, to have its other end inserted in the side or lid of the steam chest C. The axial orifice *p'*, in the nipple *p*, is located at such a distance from the cap piece D', that its inner terminal will be covered by the upper portion of the slide block E, when the latter is seated on the bottom wall of the chamber D, as shown in Fig. 3. There is an annular retaining groove *c'*, formed in the upper part of the slide-block E, of an equal diameter with the channel *c*, and opposite it, so that a spiral spring c^2 may be caused to engage these grooves, and by its expansion cause the block E to rest on the bottom wall of the chamber D, when the latter is free to assume such a position.

In use, when the piston head B of the engine approaches the cylinder head A', there is a certain compression of steam produced generally, to cushion said moving part B, which will cause the slide block E to rise in the chamber D, by reason of the pressure of steam thus produced on the lower terminal of the block, the progressive movement of the piston head away from the head A', decreasing said pressure, so as to permit the spring c^2, to force the block downwardly until it assumes the position represented in Fig. 3. When the block E, is in lowered adjustment, oil from the cup G, will flow by gravity into the circumferential groove *o*, and thus an increment of lubricating liquid will be always deposited during the passage of the piston head from one end of the cylinder to the other end. The close approach of the piston head to the cylinder head A', by the sudden compression of steam, as before mentioned, causes the expulsion of the oil from the groove *o*, through the pipe J, and into the chest C, in sufficient quantity to lubricate the valve C', and also the interior of the cylinder; the upward movement of the slide block which causes the groove *o* to come opposite the passage *p'* in the nipple *p*, at the same time sealing the end h^2 of the oil passage *h'*, and opening the valve *g*, by the impingement of the head g^2, on the lower side of the cap piece D', thereby permitting the steam which enters the axial orifice *b*, to pass up around the stem *g'*, and into the groove *o*, through the radial perforations *o'*. Should the slide block become longitudinally scored from any cause, so as to allow a pressure of steam from below in the chambers D, to enter the oil passage *h'*, the steam will be cut off from the oil cup G, by a consequent elevation of the check valve *i'*.

From the description of parts given, it will be seen that the reciprocating movement of a high pressure or a low pressure steam engine, having the improvement applied as shown, will effect a periodical and reliable lubrication of the slide valve and cylinder of the engine, the quantity of lubricant injected automatically by the improved appliance being predetermined by the graduation of feed or escape of the liquid lubricant from the oil cup G.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with a chamber perforated at its base, to receive steam pressure thereat, and an oil feeding cup tapping the side of the chamber, of a slide block in the chamber, grooved to receive an increment of oil from the cup when in lowered adjustment and discharge said oil under steam pressure through an aligned passage when the slide block is elevated, substantially as described.

2. The combination with a cylindrical chamber, a sealing cap therefor, an oil feeding cup tapping one side of the chamber, a steam inlet at the base of the chamber, and an oil discharge on the side of the chamber, of a slide block fitting within the chamber, a valve centrally located on said block, and engaging its stem with an axial perforation in the block, and a peripheral groove in the block, which registers with the oil inlet when the block is lowered and coincides with the oil discharge when the block is elevated, substantially as described.

3. The combination with a cylindrical chamber perforated for steam introduction at its base, a removable cap on top of the chamber, an oil inducting passage extending laterally and upwardly from the chamber, and a feed-

ing oil cup on the top of said passage, of a downwardly spring-pressed slide block fitting the chamber and laterally and axially perforated, a pendent valve adapted to seat upwardly on this perforation, its stem loosely engaging therein, a peripheral groove in the block, a lateral oil discharge on the chamber, with which said groove registers when the block is elevated, and radial perforations extending from the axial perforation to the peripheral groove, substantially as described.

4. The combination with a cylindrical chamber perforated for steam introduction at its base, a screw cap on top of the chamber, an oil receiving passage extending laterally and upwardly from the chamber, and a feeding oil cup on the top of said passage, of a downwardly spring-pressed cylindrical slide block within the chamber and axially perforated in two diameters, a pendent valve adapted to seat upwardly on this perforation, its stem loosely engaging therein, a peripheral groove in the block, a lateral oil discharge on the chamber, with which the groove registers when the block is elevated, and radial perforations extending from the axial perforation of the block to its peripheral groove, substantially as described.

5. The combination with a steam cylinder, a piston head therein, and a steam chest on the cylinder, of an oil feeding device comprising a sealed chamber, a pipe leading from the base of said chamber to the steam cylinder, a pipe extending from the side of the chamber to the steam chest, an oil feeding cup adapted to discharge a graduated oil feed into the side of the chamber, an oil discharge on the opposite side of the chamber and near its top, a downwardly spring-pressed slide block within the chamber, a valve centrally located on said block and engaging its stem with an axial perforation therein, a peripheral groove in the block, which registers with the oil inlet when the block is lowered and coincides with the oil discharge pipe when the block is elevated, substantially as described.

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Witnesses:
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