(No Model.)

O. H. JEWELL.

OIL OR WATER INJECTOR.

No. 271,077. Patented Jan. 23, 1883.

Fig. 1.

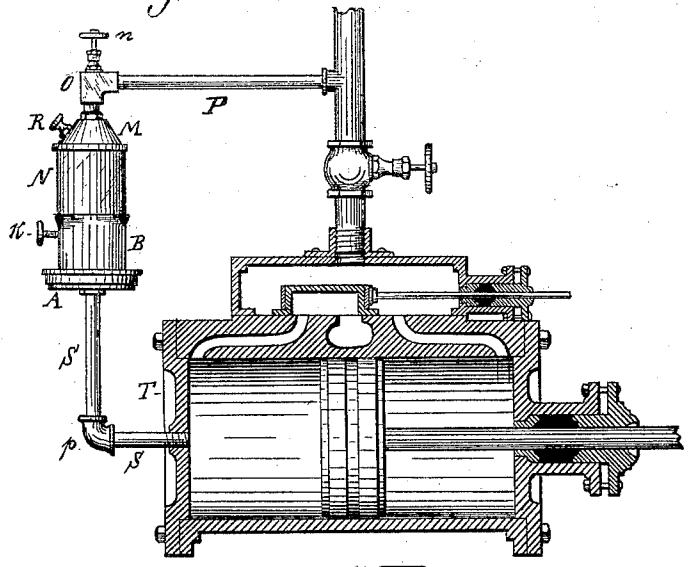
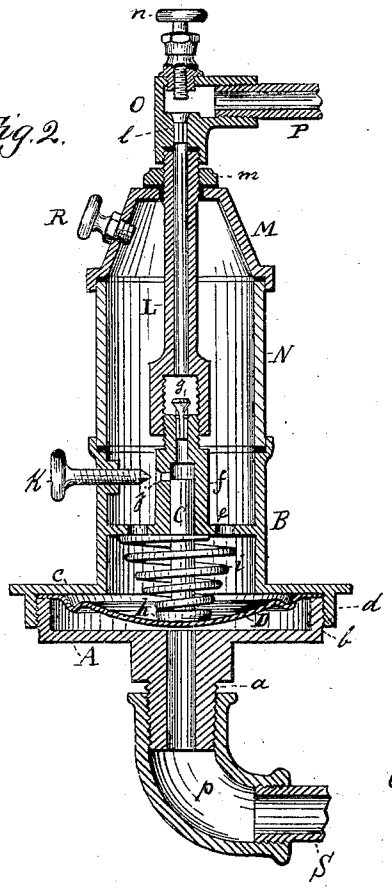


Fig. 2.



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UNITED STATES PATENT OFFICE.

OMAR H. JEWELL, OF CHICAGO, ILLINOIS.

OIL OR WATER INJECTOR.

SPECIFICATION forming part of Letters Patent No. 271,077, dated January 23, 1883.

Application filed December 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, OMAR H. JEWELL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Oil or Water Injectors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to devices for automatically feeding oil into steam-cylinders or water into steam-boilers in regular quantities with each stroke of the engine, and it is an improvement on the apparatus described in Letters Patent of the United States No. 267,692, which were granted to me on November 21, 1882.

My invention consists of an apparatus in which the pulsations of the steam will vibrate a diaphragm, and in which each vibration of such diaphragm will reciprocate a plunger or piston that will force the oil or water; also, in combination therewith, of a small suction-vent, the size of opening of which being adjustable, and that is opened and closed by the end of the plunger or piston moving by it, and of suitable check-valves that will regulate and control the flow of the oil or water, all as more fully hereinafter described and specifically claimed.

In the accompanying drawings, Figure 1 represents a sectional view of steam-cylinder having my apparatus attached, and Fig. 2 a vertical section through the center of the apparatus as arranged for lubricating purposes.

Corresponding letters in the several figures of the drawings designate like parts.

A denotes the base of the apparatus, having a hollow stem, *a*, centrally to its bottom, and an annular flange, *b*, to its top, that is exteriorly screw-threaded.

B is a cylindrical cup, having a circular bottom plate, *c*, with an internally-screw-threaded annular flange, *d*, also a perforated diaphragm, *e*, with a central upwardly-extending tube, *f*, that is screw-threaded on its top end, and is bored out in its lower portion for the plunger or piston C to fit snugly therein, and in its upper end it is bored out and countersunk to form the seat for a conical check-valve, *g*.

The annular flange *b* of base A screws into the annular flange *d* of cup B, and between such flange *b* and bottom of plate *c* is hermetically clamped the peripheral edge of a sheet-metal diaphragm, D, that is spun out to be a little concave, with an annular crease near its periphery, which will allow such diaphragm to yield to an upward pressure, and when released to assume its former shape.

The plunger or piston C has a flat-head, *h*, and between this head *h* and the diaphragm *e* is interposed a conical spiral spring, *i*, that forces the plunger down upon the diaphragm D. A small vent, *j*, is drilled through one side of tube *f*, just on a line with the upper extremity of plunger C while on its lower position, in a manner that such vent will be closed by the plunger while on its upstroke, and thus to cut off and capture the oil that entered the vent and to force it upward past the valve *g*. A pointed thumb-screw, E, is tapped through the wall of the cylindrical cup B in line with vent *j*, for regulating the opening of such vent.

Upon the screw-threaded end of cylinder *f* is secured the tube L, the upper end of which forms the seat for an auxiliary check-valve, *l*, and is exteriorly screw-threaded; and M is the conical cap, and between the cup B and cap M is interposed the glass tube N, that is clamped between them by a nut, *m*, on tube L. An elbow-coupling, O, is screwed upon the upper extremity of tube L, for connecting the pipe P that leads to the steam-pipe Q of the engine. This elbow-coupling may be provided with a set-screw, *n*, for regulating the rising of valve *l*, and thereby the quantity of oil that is to pass such valve. The cap M is provided with an opening that is closed by a screw-plug, R, for filling the cup with oil.

A pipe, S, is tapped into the cylinder-cover T, and by an elbow, *p*, is coupled either direct or indirect with screw-stem *a* of base A of the apparatus.

While the engine is running, live steam from the boiler is admitted from the steam-chest through the slide-valve alternately into one end and then into the other end of the steam-cylinder, and the apparatus being connected by pipe S with one end of the cylinder, the pressure of the steam will act in pulsations upon the diaphragm D in a manner that with each revolution of the engine-shaft such diaphragm will be once depressed and released again, and the pulsation of diaphragm D being transmitted to the plunger C, such plunger

will be reciprocated, and with every upward stroke will force a small quantity of oil through the check-valves *g* and *l*, and with every return-stroke again it will draw oil through vent *j*. The diaphragm D having a much larger area against which the steam acts than the plunger C, that again is acted upon by such diaphragm D, the force exerted by the reciprocation of plunger C is much in excess over the pressure of steam in the boiler or steam-chest into which the water or oil is to be fed, thus insuring a perfect and reliable operation of the pumping mechanism. Live steam thus being admitted into the chamber between diaphragm D and base A, these parts become heated, and will conduct the heat to the contents of the chamber above sufficiently to liquefy tallow, and thus enable the use of tallow for lubricating purposes.

In place of vent *j*, a suction-valve may be applied in like manner, as shown in my former patent above referred to.

As will be noticed, the apparatus is very compact in its construction, and has no parts excepting the valves which could wear, and every part is easily accessible, should repairs be required.

With this apparatus to an engine oil or water can be fed automatically in uniform quantities with every stroke of such engine, and as soon as the engine stops running the feed of oil will stop also.

The apparatus can be connected to feed oil not only into the steam-chest for lubricating the valve and cylinder, but as well to other parts of the engine that need lubricating, or to the air-pump cylinder on locomotives for operating the pneumatic brakes.

What I claim is—

1. An oil or water injector having an elastic diaphragm that communicates with either end of the cylinder of a reciprocating engine or air-pump, in a manner that such diaphragm is alternately depressed by the pressure of the steam or air and released again with the exhaustion of the same, and acting upon a pump-plunger that is reciprocated by the pulsations of such diaphragm, in connection with suitable valves that will draw and direct the course of the oil or water set in motion by the reciprocations of such plunger, the whole being constructed and arranged to operate as set forth, for the purpose specified.

2. An oil or water injector that is to be connected by a pipe, S, with one end of the cylinder of a reciprocating engine or pump, and is provided with elastic diaphragm D, plunger C, suction-vent *j*, and check-valves *g* and *l*, the whole being constructed and arranged to operate substantially as set forth.

3. An oil-injector that is to be connected by a pipe, S, with one end of the cylinder of a reciprocating engine or pump, has an oil-reservoir, B N, and is provided with elastic diaphragm D, plunger C, suction valve or vent *j*, and check-valves *g* and *l*, the whole being constructed and arranged to operate substantially as specified.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

OMAR H. JEWELL.

Witnesses:
LOUIS NOLTING,
R. SCHMID.