

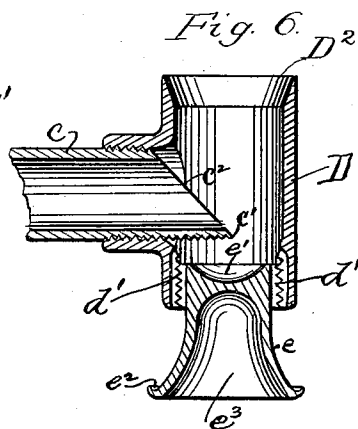
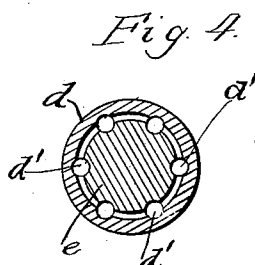
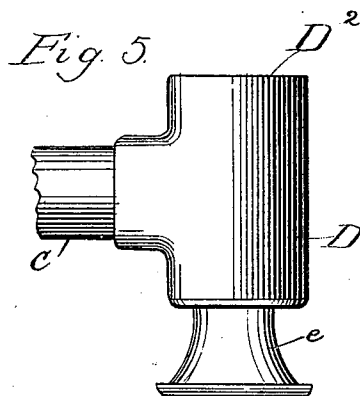
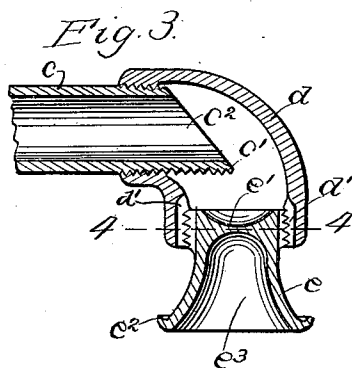
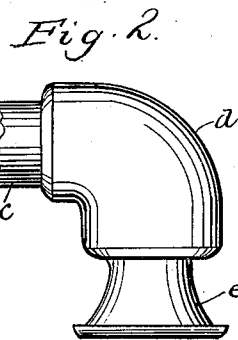
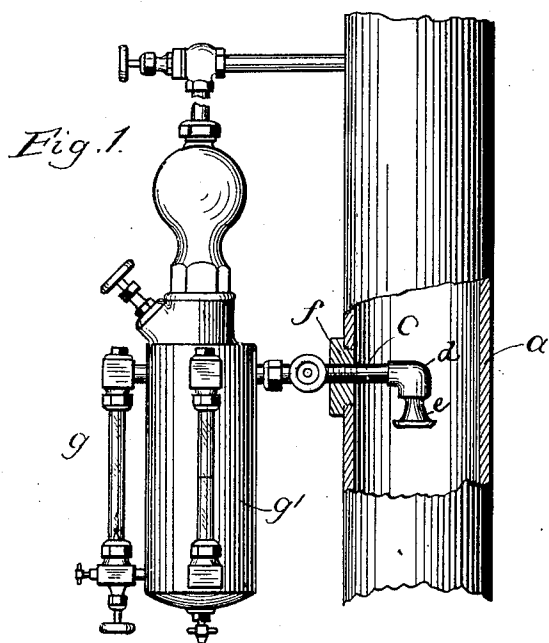
No. 700,797.

Patented May 27, 1902.

H. P. MORRIS.
OIL ATOMIZER.

(Application filed July 17, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

HARRY P. MORRIS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
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OIL-ATOMIZER.

SPECIFICATION forming part of Letters Patent No. 700,797, dated May 27, 1902.

Application filed July 17, 1901. Serial No. 68,597. (No model.)

To all whom it may concern:

Be it known that I, HARRY P. MORRIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Oil-Atomizers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to improvements in devices for supplying lubricating-oil to the cylinders of steam-engines, and has for its objects, generally speaking, the provision of a device by means of which the oil to be fed to the cylinders and slide-valves, if such valves be used, is raised to the temperature of steam and thoroughly atomized and commingled with the steam before it reaches the said parts, whereby a more efficient utilization of the oil than usual is obtained and better results are secured.

More specifically stated the invention comprises a device adapted to be located in the steam-pipe of an engine before the cylinder is reached and preferably about the center thereof. Oil is fed to the same by a connecting-pipe from any suitable or desired reservoir or feeding device. It comprises a conical or bell-shaped part which is raised to the temperature of the steam and upon the surface of which the oil is spread to be thereby atomized and sprayed, so as to be taken up by the passing steam and carried to the parts to be lubricated. A cup or pan is also provided to retard the passage of the oil, so that it may be raised to the temperature of steam and for the purpose of more evenly feeding the oil to the cone or spraying device.

The invention further consists in the novel details of construction, parts, and combinations of parts hereinafter described, and fully pointed out in the appended claims.

In the drawings, in which the same reference characters designate like parts throughout the several views, Figure 1 is a section of a supply steam-pipe, preferably a vertical portion, showing the invention applied thereto. Fig. 2 is a side view of the atomizer detached. Fig. 3 is a sectional elevation through the center of the same. Fig. 4 is a sectional

plan view on the line 4-4, Fig. 3; and Figs. 5 and 6 are respectively side and sectional elevations of a modification of the device.

In the figures, *a* indicates a section of a steam-pipe leading to a steam-cylinder, and while it is shown vertical it will be understood that the invention may be readily adapted to pipes running in other directions. The steam in this pipe is considered as traveling in a downward direction. In this form the device consists of a supply-pipe *c*, screwing or otherwise fitting into an elbow-pipe connection *d*, into the lower opening of which elbow the bell-shaped part *e* is secured, as by the usual screw connection. The supply-pipe *c*, as shown in Fig. 1, is extended through a suitable bushing *f* in the pipe *a* and is connected with a reservoir or oil-cup *g* of the desired kind. As shown, however, it contains the usual reservoir *g'*, from which the oil is forced into the pipe *c* by condensation or otherwise. Suitable gages and valves are provided for filling and otherwise operating the same. The end of the pipe *c*, communicating with the elbow *d*, is extended therinto and terminates substantially over the center of the bell-shaped or conical part *e*, so as to prevent the oil from trickling down the side of the elbow *d* and directly out upon the cone *e*, though it is apparent that a similar result would be accomplished by ending the spout *c'* only a slight distance from the inner wall. The end of the pipe *c* may be cut on a slant or bevel *c''* to provide room between it and the adjacent wall of the elbow, though this feature could be dispensed with. The bell-shaped part *e* is designed to spread, scatter, and evenly distribute the oil in the pipe *a* and to expose it to the action of the steam. Its upper end is provided with a depression *e'*, into which the oil drips from the end *c'* of the feed-pipe and where it is held and heated to substantially the temperature of steam. Grooves *d'* are formed (see Figs. 3 and 4) in the threaded portions of the cone and elbow, which afford communication between the interior of the elbow and the exterior of the cone *e*. These openings may be made entirely in the cone *e* or the elbow *d*, but are preferred in both, as shown. The rim *e''* of the bell is upturned and serves to retard the

passage of the oil from the surface of the bell *e* and at the same time tends to spread any remaining unevenly-distributed portions of the oil. The oil from the spout *c'* falls into the depression *e'*, where it is held long enough to become heated. As the latter fills the oil overflows its edges and passes through the apertures *d'*, from whence it spreads about the flaring surface of the bell *e*. As the oil strikes the heated surface of the cone *e* it tends to fly into spray, and at least a large percentage of it is thus atomized and carried away with the steam. Any remaining oil is subjected to the action of the steam flowing in the pipe, and a further portion of it is taken up thereby. The remainder of the oil passes to the rim of the bell and is there caught and again evenly spread about, and as it falls from the rim it is finely divided and is readily taken up by the steam and carried to the cylinders. The several retardations of the oil in its passage through the device, especially in the pan *e'*, as well as its film-like conditions over the surface of the bell, allow it to become heated to the temperature practically of the steam. The result is that the oil is heated, and the oil and steam are thoroughly commingled and are carried to the cylinders in the best possible condition, whereas in the devices of the prior art the oil is liable to trickle down the sides of the pipes, where it mixes with the water and is washed through without accomplishing the desired purpose. Moreover, oil of different fire tests can be used in any steam-pressure, and there is no danger of clogging or getting out of repair. The device can also be utilized as a testing apparatus for poor oils, as oil of a low fire test will burn in the oil-pan and can be readily seen by removing the atomizer. It is cheap to construct and convenient to apply.

Figs. 5 and 6 show a modification in which a T connection D instead of an elbow is employed. Its upper end D² is open, which admits the steam to the interior and assists in the raising of the oil to the proper temperature. In both figures the bell *e* is hollowed at *e'* for convenience and cheapness of manufacture and to enable the steam to more quickly affect the temperature of the same. Copper is found to be a good material for the device.

While the invention has been described with particular reference to the details of construction, I would have it understood that it is not to be limited thereto, as various changes, alterations, and substitutions may be made therein and still come within the scope and principle of the same; but

What I do claim, and desire to secure by Letters Patent, is—

1. A lubricating device for steam-engines and like machinery, comprising in combination a steam-pipe, an oil-atomizer comprising a feed-pipe, a conical member having the surface exposed to the direct action of the steam, and a receptacle in the upper part of

said member into which the oil is adapted to be fed and from which it flows to the outer exposed surface of the conical part of the member, substantially as described.

2. The combination with a steam-pipe, of an oil-atomizer therein comprising a feed-pipe, and a conical member having an exposed surface and an upturned lower edge or rim to retard and evenly distribute the oil from said surface of the member, substantially as described.

3. The combination with a steam-pipe, of an oil-atomizer therein comprising a feed-pipe, and a conical member having a depression in its upper end into which the oil is fed and an upturned rim at its lower end, substantially as described.

4. The combination with a feed-pipe, of a bell-shaped member, a connecting-joint to secure the said member to the pipe, the member having a depression in its top over which the end of the feed-pipe terminates, and openings from the edge of said depression to the surface of the bell-shaped member, substantially as described.

5. The combination with a feed-pipe, of an angle-joint connected therewith, a conical member having a depression in its top, threaded into the lower end of said joint, registering grooves in the threaded portions of both parts, the said pipe terminating over said depression, whereby oil from the pipe first drops into the receptacle and then overflows and passes through the grooves to the outer surface of the cone, substantially as described.

6. The combination with a feed-pipe, of an angle-joint connection secured thereto, a conical part secured in the lower opening of said connection, said part having a depression or pan in its upper end and an upturned lower edge, and communicating passages from the edge of said depression or pan to the outer surface of said cone, substantially as described.

7. A steam-engine lubricator comprising in combination with a steam-pipe leading to the parts to be lubricated, of a spraying device located in said steam-pipe and having a spraying-surface exposed on all sides to the action of the passing steam and out of contact with the side walls of the pipe, the lower edge of said surface being formed to prevent the collection of the unsprayed oil in drops, a feed-pipe to conduct the lubricating-oil to said spraying device, and means also within the steam-pipe for detaining the oil before feeding it to the spraying-surface whereby the oil is heated, substantially as described.

8. In a steam-engine lubricator, the combination with a steam-pipe leading to the steam-cylinder, of an oil-atomizer located within the pipe comprising an inclined spraying-surface adapted to be wholly exposed to and heated by the passing steam to substantially the temperature of steam and upon which surface the oil is adapted to be fed in

a film-like condition, and means for retarding the passage of the oil through the atomizer whereby it is heated to substantially the temperature of steam before reaching said spraying-surface, the lower edge of said surface being formed to prevent the gathering of the unsprayed oil in drops, substantially as described.

9. A steam-engine lubricator, comprising in combination a steam-pipe leading to the cylinder of the engine, and an oil-atomizer within the pipe comprising a hollow conical member exposed on its inner and outer surfaces to the direct action of the steam, a feed-pipe to supply the oil to the atomizer, and means for detaining the oil for a short period before it reaches the exposed surface of said member, substantially as described.

10. In an oil-atomizer, the combination with a conical spraying member having an exposed outer surface, a cup for the reception of the oil before it reaches said surface, and a raised rim at the lower edge of said surface, substantially as described.

11. The combination with an oil-feed pipe, an angle-joint connection secured thereto, a hollow conical part secured in the lower open-

ing of said connection, said part having a depression in its upper end, and communicating passages from said depression to the upper part of the outer surface of said cone, substantially as described.

12. The combination with a vertical portion of a steam-pipe in which the steam passes downwardly, of a feed-pipe extending at right angles into the steam-pipe, an elbow-joint fitted to the extended end of the feed-pipe and turned downward, the end of said feed-pipe being slanted so as to terminate substantially over the center of the downward opening of said elbow, a conical part screwed into said lower end of the elbow and having a depression in its upper end into which the oil from the feed-pipe is adapted to fall, and passages leading from the depression to the surface of the cone, substantially as described.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

HARRY P. MORRIS.

Witnesses:

M. R. ROCHFORD,
ROBERT LEWIS ARNES.