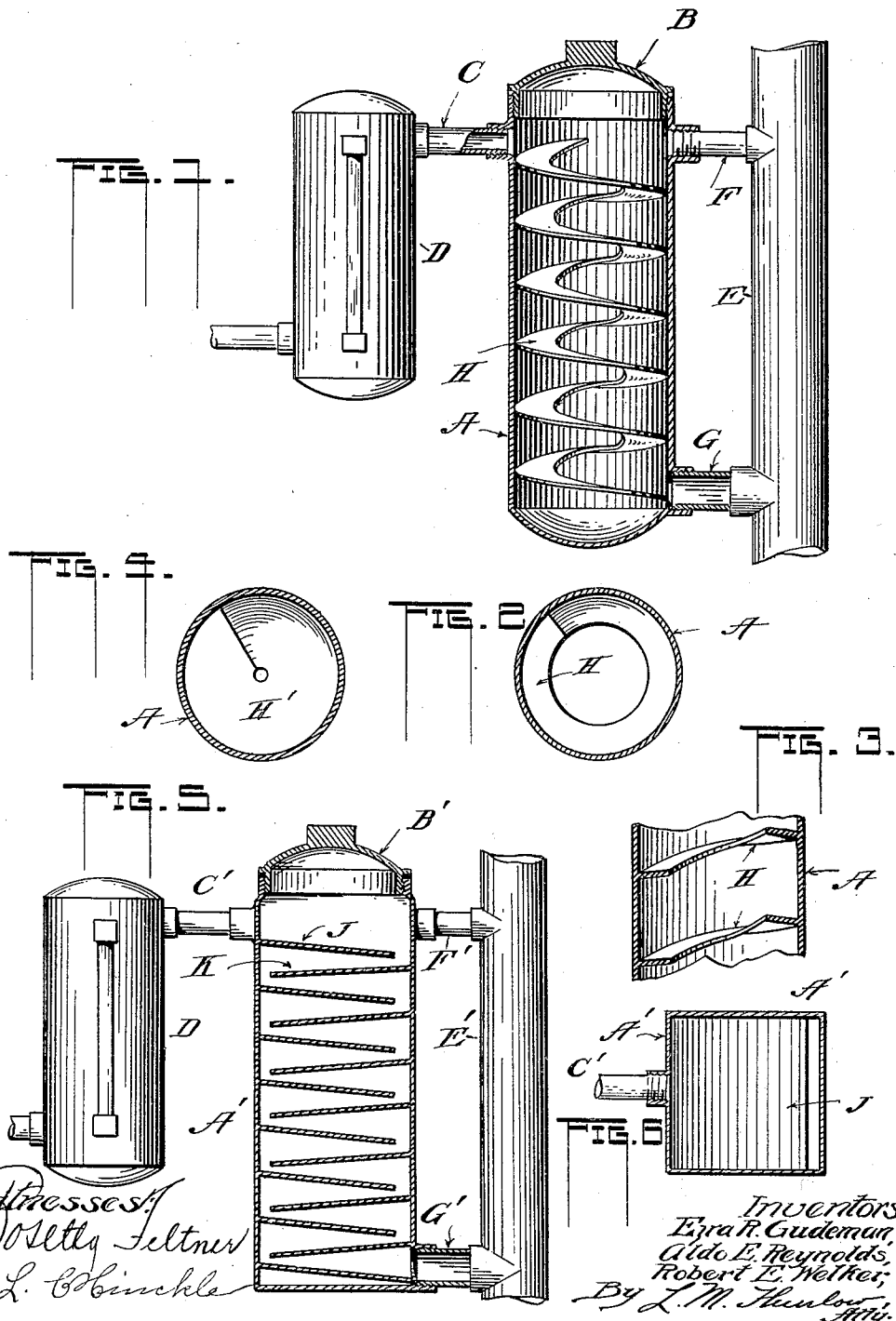


E. R. GUDEMAN, A. E. REYNOLDS & R. E. WELKER.
 VAPORIZING DEVICE FOR LUBRICATORS.
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UNITED STATES PATENT OFFICE.

EZRA R. GUDEMAN, OF PEKIN, AND ALDO E. REYNOLDS AND ROBERT E. WELKER, OF PEORIA, ILLINOIS.

VAPORIZING DEVICE FOR LUBRICATORS.

1,065,239.

Specification of Letters Patent.

Patented June 17, 1913.

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To all whom it may concern:

Be it known that we, EZRA R. GUDEMAN, citizen of the United States, resident of Pekin, county of Tazewell, and State of Illinois, and ALDO E. REYNOLDS and ROBERT E. WELKER, citizens of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Vaporizing Devices for Lubricators; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved vaporizing device for lubricants, and has for its object to provide a simple and efficient arrangement by which a lubricant is partially or entirely vaporized by the direct contact of steam therewith and then introduced with the steam to machinery parts requiring lubrication, such as engine cylinders and the like.

Another object is to provide a device of the class described wherein the lubricant, whether oil or grease, will be brought into direct contact with the steam and thereby heated to very high temperature to cause vaporization of the same.

To the end that the invention may be fully understood the accompanying drawing is provided in which:

Figure 1 is a sectional elevation of the device shown in communication with a steam pipe and with which is connected any ordinary form of lubricator. Fig. 2 is a horizontal section of the device showing a spiral member illustrated in Fig. 1. Fig. 3 is a sectional elevation of the device shown in Fig. 1 on a slighter larger scale, the spiral member being shown in section. Fig. 4 is a view similar to Fig. 2 showing a slightly modified form of spiral member. Fig. 5 is a view similar to Fig. 1 showing a slightly modified form of the device. Fig. 6 is a horizontal section of the same.

A indicates a vessel provided at its top, for example, with a plug or cap B serving as a closure. Into the upper end of the vessel is connected a pipe C for delivering the oil or lubricant from any source of oil or grease container, for instance, as shown at D. Said vessel A is also connected with a steam pipe E, leading to an engine through pipes F and G, for example, which permit free passage

of steam through said vessel. Although we have shown and described two connections for the pipe E, only one may be used, it merely being a requirement that the steam shall have free access to said vessel so as to be brought directly into contact with the oil deposited therein for vaporization. It is our preference to provide an outlet for the vaporized lubricant which, in the present instance, may be through the short connecting pipe G referred to. As a preference the vessel A is cylindrical in form as shown in Figs. 2 and 4 and contains a spirally arranged member H in the form of a substantially flat run-way which may be inserted in said vessel or cast therewith. Its upper end lies near an opening in the wall of the vessel with which the pipe C communicates. Said member lies close to said wall of the vessel and in the form of a spiral, consisting of a series of convolutions arranged to form a continuous flat slanting shelf or run-way from top to bottom down which the lubricant can flow to the outlet at the bottom of said pipe G, through which it can enter the steam pipe E described the central portion of the vessel being open throughout its height within the spiral. While the spiral member H is shown terminating at its ends in the vicinity of the inlet for oil and the outlet for the same, and the steam, these ends may terminate at any point desired so long as the oil can properly reach said member and that its discharge properly reaches the said outlet.

In Fig. 3, we have shown a horizontal section of the vessel A and its spiral in which the latter is shown with its inner free edge at a slightly higher elevation than that portion thereof lying adjacent to the wall so that the lubricant will have no inclination to pass over the said free edge of the spiral but will remain upon the latter and merely run down the same.

Fig. 4 shows substantially the same structure as Fig. 2, except that the spiral member indicated by H' is made much wider than that shown in Figs. 1 and 2, thereby providing a larger area for the lubricant to be spread upon.

Fig. 5 shows a modified form of the vessel denoted by the character A' and as illustrated is of a square form. It is connected with the steam pipe E' and has a lubricator or other oil feeding device D' connected

thereto as described as to Fig. 1. Instead of providing the spiral H of the other figures, a series of shelves J inclined in one direction and alternated with a series of shelves K inclined in an opposite direction are provided so that the lubricant will pass from one inclined shelf to another finally finding its way to the bottom of the vessel as before to pass out the pipe G' into a steam pipe E'.

The grease, oil or other lubricant is led into the vessel, the steam being also introduced thereto, the latter raising the temperature of the said lubricant to a very high degree, in consequence of which said lubricant is fully or partially vaporized the extent of such vaporization depending upon the kind of oil or lubricant employed and the pressure of the steam. The vapors of the oil or the partially vaporized particles of the same are discharged into the steam pipe and there commingle with the steam passing to the parts to be lubricated and by thus being vaporized and forming an admixture with the steam is deposited upon the walls of the engine cylinder thereby thoroughly lubricating all the surfaces whereas when the lubricant is deposited in the ordinary way in a heavy globule it falls into the bottom of the cylinder without lubricating all of the surfaces. The large surface of the spiral H or those surfaces furnished by the shelves J insures the lubricant spreading upon a very large area in a very thin layer. The steam in being brought into direct contact with this thin layer will quickly and thoroughly vaporize it. The action is very quick and thorough, also, by reason of the fact that the steam in occupying the space in the vessel in which the lubricant is exposed will aid in holding and carrying the vaporous-oil in suspension for its ready introduction into the path of live steam passing to the engine or other place for use.

We are aware that vaporizing devices for lubricants have included a spirally arranged pipe for the lubricant which is heated to a high degree by the steam surrounding said pipe, also, that a spiral groove in the vertical face of a member has been employed, the steam being brought into direct contact with the lubricant in said groove. We are not aware, however, of a device of the nature described wherein the lubricant is spread upon an extended surface in a very thin layer so that the steam is made to impinge upon every particle of the thin layer of oil instead of upon a solid bulk such as would flow through a pipe, or a deep groove. In such an arrangement as we describe the vaporization of an extended bulk of the lubricant spread over the large area is quickly vaporized, being carried in a very finely divided form to the cylinder to be lubricated. As a matter of fact in the older forms of

devices referred to the lubricant must be carried in a more or less solid form into the cylinder due to the structures employed. Those devices contemplate the passage of the vaporized oil into the steam pipe leading to the cylinder to be lubricated. As a matter of fact it is found that oil must be vaporized before it is allowed to enter the steam pipe if it is to be properly and thoroughly vaporized at all. If this is not done the oil falls in heavy globules into the pipe and is carried to the cylinder in that form. The present device has been designed to correct this very result.

It is to be understood that in our device the lubricant is vaporized and carried in that state to the cylinder. The provision of the part of the spiral terminating at the steam outlet through the steam line provides for the escape of such lubricants as do not vaporize as readily and quickly as the better grades of oils. Since we contemplate using an oil or grease that readily vaporizes there would be no need of terminating the parts at the steam pipe in the manner described except for the reason mentioned. An advantage in employing the broad flat spiral, in addition to the above, is that the steam in its passage through the vessel A from pipe F to pipe G is given a partial spiral movement broken up in that movement partially by the vertical passage between the convolutions of said spiral. This insures a thorough admixture of the steam and oil-vapor and still further insuring that in that well mixed state the vaporous oil will be deposited in the cylinder.

We do not confine ourselves to the structures illustrated and described since the invention is susceptible of changes such as will lie within the scope of the claims.

Having thus described our invention, we claim:—

1. In an oil vaporizing device the combination with a steam-pressure pipe, of a closed vessel having at its top and bottom an inlet and an outlet opening respectively connected with said pipe, and provided interiorly with a spirally arranged downwardly extending shelf-like member formed with the wall of said vessel and having a central vertical opening extending down through the same communicating with the upper and lower portions of the vessel, there being an opening in the top of the latter for the introduction of a lubricant, said member terminating at its upper end substantially at said opening, and at its lower end substantially at the outlet opening of the vessel at its bottom.

2. In combination with a steam-pressure pipe, of a vessel having openings communicating at its top and bottom with said pipe, a broad flat spirally arranged shelf-like member disposed in said vessel and lying

against its wall, and having an opening extending vertically therethrough communicating with the upper and lower portions of the vessel, there being an opening in the top
5 of said vessel for the introduction of a lubricant upon the member, said member terminating at one end substantially at the said opening and at its other end substantially at the opening at the bottom.

10 3. The combination with a steam-supply conduit, of a vessel communicating therewith, a spirally arranged member in said vessel adjacent its wall, and having an open passage at its center extending longitudinally through said vessel, said member having
15 a broad substantially flat surface forming a continuous downwardly slanting shelf-like oil receiving part, the said passage substantially centrally thereof communicating
20 with the upper and lower portions of the vessel, there being an opening in the wall of the vessel for the introduction of the oil to be vaporized and disposed above a portion of the said member for the deposit of oil
25 thereon.

4. As a new article of manufacture, in an oil vaporizing device, a single casting comprising a closed vessel for confining steam under pressure provided with an inlet opening and an outlet opening for steam, and an
30 inlet for oil opposite one of said openings, and a continuous spirally arranged portion

at the wall of the vessel and provided with a central opening communicating with the closed interior of said vessel.

5. As a new article of manufacture, in an oil vaporizing device, a single casting comprising a closed vessel for confining steam under pressure provided with an inlet opening and an outlet opening for steam, and an
40 inlet for oil and a continuous spirally arranged portion at the wall of the vessel and provided with a central opening communicating with the closed interior of said vessel.

6. As a new article of manufacture, in an oil vaporizing device, a closed vessel provided with an inlet opening for steam, an inlet for oil and an outlet for vaporized oil and steam, said vessel including a part in its interior integral with its walls having a
50 downwardly slanting upper surface, said vessel including a passage through which its upper and lower parts communicate with one another and the inlets and outlets communicate with one another.

In testimony whereof we affix our signatures, in presence of two witnesses.

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Witnesses:

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