(No Model.)

H. H. WESTINGHOUSE.

AUTOMATIC LUBRICATOR FOR STEAM ENGINES.

No. 246,258. Patented Aug. 23, 1881.

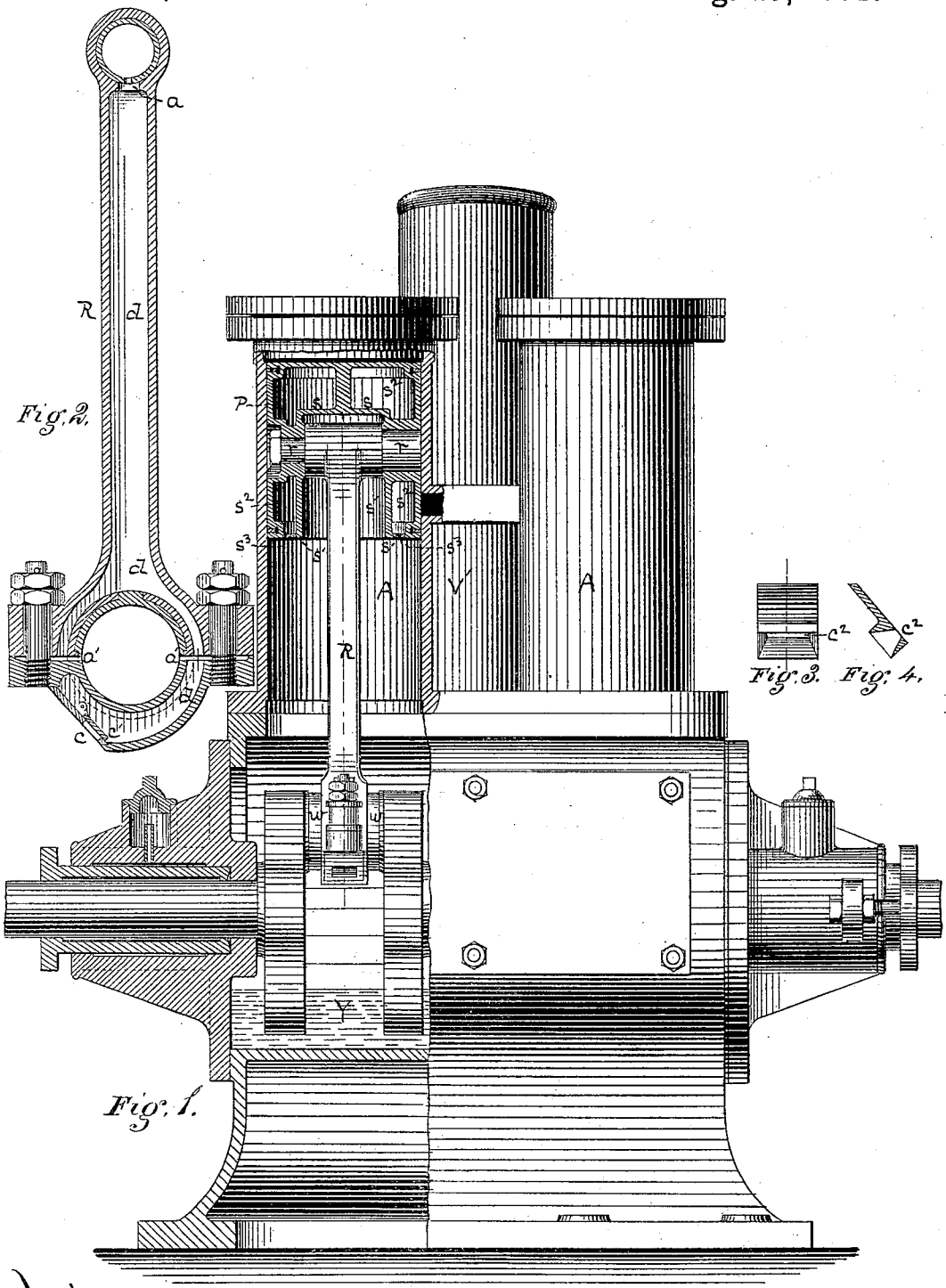


Fig. 2.

Fig. 1.

Fig. 3. Fig. 4.

Witnessed.
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UNITED STATES PATENT OFFICE.

H. HERMAN WESTINGHOUSE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE MACHINE COMPANY, OF SAME PLACE.

AUTOMATIC LUBRICATOR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 246,258, dated August 23, 1881.

Application filed June 18, 1881. (No model.)

To all whom it may concern:

Be it known that I, H. HERMAN WESTINGHOUSE, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Automatic Lubricator for Steam-Engines; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a side elevation, partly in section, illustrative of my present invention. Fig. 2 is a longitudinal sectional view to an enlarged scale of the crank-arm, pitman, or connecting-rod employed between the crank-shaft and the piston, and by the action of which the lubricant in the tank is pumped or forced up to lubricate the upper or piston bearing. Fig. 3 is a face view, and Fig. 4 is a sectional view, of a modified form of oil-inlet valve to be used on the lower end of the connecting-rod.

In Letters Patent No. 240,482, granted to me April 19, 1881, I described a single-acting double-cylinder upright engine particularly designed for running at high speed, and in connection therewith I showed an improved oiling device by which automatically to keep the bearings properly lubricated at both ends of the connecting-rod or pitman; but such feature of invention was reserved for the present application. Here, as there, A A represent two upright steam-cylinders, arranged side by side and at such distance apart as to make room for partially-interposed valve-chamber V′. The inside fittings, valves, pistons, and ports employed may be such as are described in said patent or otherwise, as may be preferred; and for illustrating the present invention I have deemed it necessary to show only one cylinder in section, with its piston and a portion of the oil tank or receptacle Y immediately below. This tank is to contain at all times sufficient liquid lubricating material, so that at each downstroke of the crank *w* it will be immersed to such depth as may be necessary to effect thereby the proper lubrication thereof, and also pump up into the hollow connecting-rod R a sufficient quantity to lubricate the pin *r* or other bearing by which it is connected with the piston P; but in order that this latter function may be performed I make the connecting-rod with a tubular passage, *d*, extending up through or along it, and with a port or open communication, *a*, at its upper end to the upper or piston bearing. The pump-tube *d* thus made passes around beneath the crank-pin in the direction in which the lower end of the connecting-rod moves on the downstroke while the engine is in motion, and at its lower forward end I make an inlet-port, *c*, and arrange thereon or therein an inwardly-opening valve, *c′*, of any suitable construction. Then, as the lower end of each connecting-rod on its downstroke enters the oil in the tank and moves forward therein, the inertia of the oil in which it moves will open the valve *c′*, and a small quantity of oil will enter the tubular passage *d* through the port *c*, and by the closing of the valve as the rod rises out of the oil in the tank the oil so forced into *d* will be retained. By successive strokes the passage *d* will gradually be filled and kept full, so that the oil, being forced through the port or opening *a*, will keep the upper bearing properly oiled, and the lower bearing may be kept lubricated in the same way by a supply from the same oil-column through ports *a′*; but I do not consider it necessary that a valve be used on the port *c*. As illustrated in Figs. 3 and 4, such port may have surrounding walls which flare outwardly, so that by or as a result of their outward convergence more oil will be forced in through the port c^2 so formed while passing through the oil than will flow out during the residue of its stroke or motion. Nor do I limit myself to any particular form or construction of port or valve or tubular passage, provided only that a hollow or tubular passage ported at both ends, at its lower end dipping into the oil at each downstroke and at its upper end opening to the upper bearing, be arranged in, on, or in connection with the connecting-rod and piston, so as to move therewith. For example, a separate pump-tube, opening by a suitable port at its upper end to the upper bearing, and provided with an ordinary pump-valve, its lower end open, playing in a supply-barrel arranged in the tank, and the tube being so connected with the piston as to be operated up and down thereby, may be substituted for the device described,

with a substantially like operation. Each down-stroke will then tend to force the oil into the tube and up to the upper bearing, and on the making of an upstroke the supply-barrel will be refilled or replenished; and such means for automatically securing or effecting lubrication may be applied to engines generally, and to the valve-eccentrics and valves as well as to the pistons and cranks, and all such uses and modifications, as also mechanical equivalents and substitutes, are included herein; but separate applications will be made for special features of construction.

In the use of engines of this class I have discovered that the oil is dashed into a spray and up against and (if the piston be open below, as it sometimes must be) into the piston, so as to keep it at a low temperature, and thereby increase the loss by condensation of steam. To guard against this result I make the piston with an inside lining, such somewhat as would be formed by a lady's small sewing-thimble inserted inside a large one. The cap or closed end of such thimble-lining is represented at *s* and the side walls at *s'*, and a chamber, s^2, is thus formed between the thimble-lining and the main piston-shell. The annular space at the lower end of the chamber s^2 is to be closed up, as at s^3, so as to prevent the oil from being spattered up against the inside of the piston proper. The lower end of the thimble-lining *s'* is to be made large enough for the connecting-rod R to have its proper motions therein, and the connecting-pin *r* may pass through the upper end of the thimble-lining as well as through the piston proper. Believing a piston of this construction to be new, and understanding it to belong to a different class of invention, (under Patent Office classification,) I do not claim it herein except in combination with means of lubrication, as set forth. A claim for the piston independent of lubricating devices is reserved for an application yet to be filed.

I am aware that a hollow connecting-rod having an oil-supply chamber in the body of the rod, intermediate between its ends, and with a wick in the hollow of the rod leading from the oil-supply chamber to the end bearings, is not new; but my invention differs radically from this, among other respects, in the fact that my tube or connecting-rod, operating in combination with a separate or independent oil-supply, involves to a greater or less extent the principle of a force-pump, whereby the oil is forced up and along the tube or connecting-rod from the tank to the upper bearing instead of being raised by capillary attraction from an oil-supply, which is made as a part of and moves with it.

I claim herein as my invention—

1. A tubular connecting-rod having an oil-inlet port and an oil-exit port or ports leading to the upper or lower bearings, or both, in combination with a stationary oil-tank, Y, substantially as set forth.

2. In combination with a separate or independent oil-tank, Y, a connecting-rod having a tubular passage in, on, or in connection with it, so as to have a simultaneous motion, such passage extending from an oil-inlet port at its lower end to a port or opening at its upper end, through which to lubricate the upper bearing, substantially as set forth.

3. The method of lubricating a moving bearing which is above the level of the oil-supply by causing the port of a passage which extends from such elevated bearing to a fixed or independent oil-supply to pass through or into such oil-supply, in manner substantially as described, whereby to force a portion of the oil through such port, substantially as set forth.

4. The connecting-rod R, having in combination the passage *d*, ports *a c*, and a suitable inwardly-opening valve on the lower port, substantially as set forth.

5. The piston P, having a thimble-lining, *s s'*, in combination, by a hollow ported connecting-rod, with oil-tank Y, substantially as set forth.

In testimony whereof I have hereunto set my hand.

H. HERMAN WESTINGHOUSE.

Witnesses:

R. H. WHITTLESEY,

G. H. CHRISTY.