

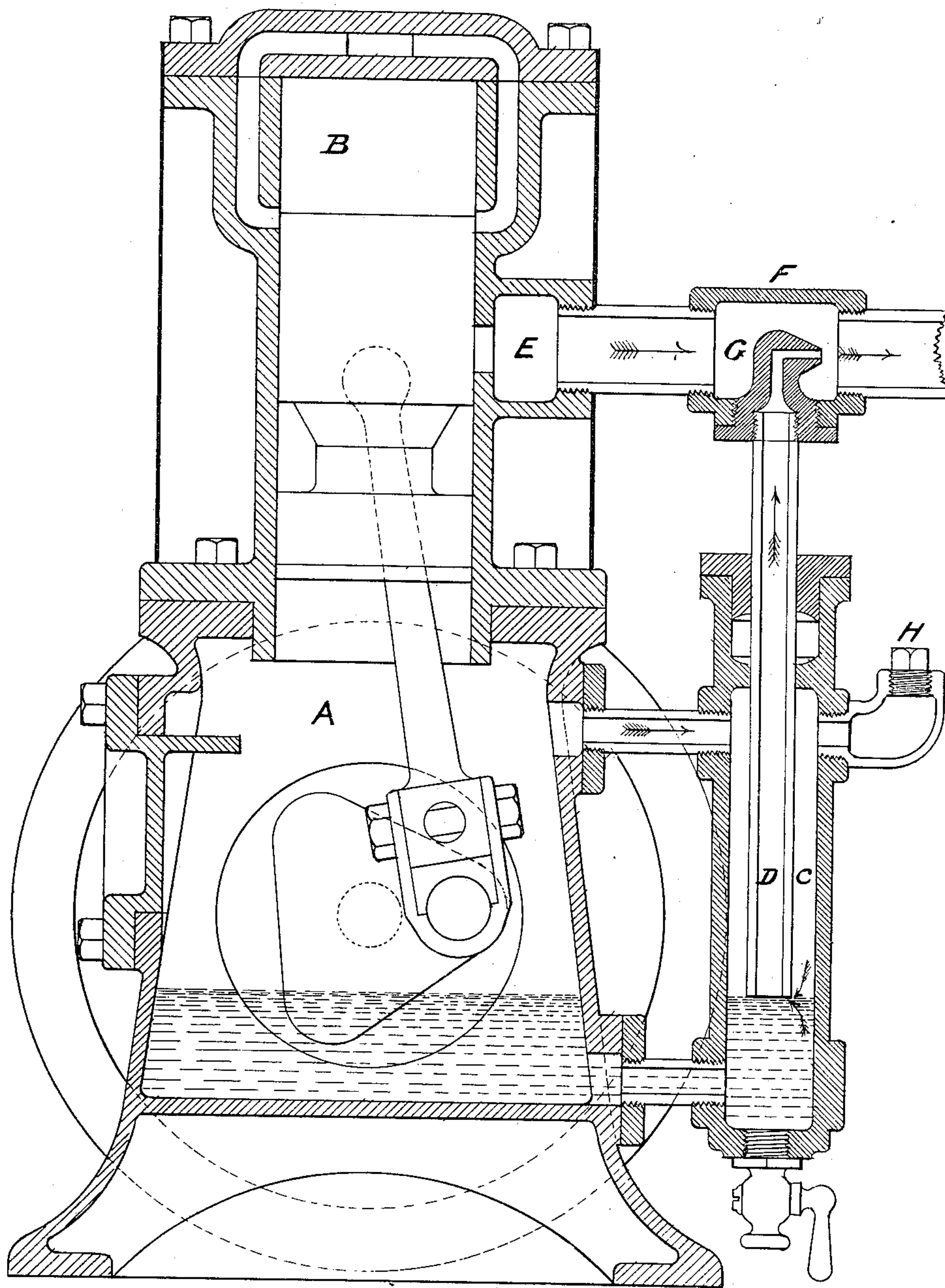
(No Model.)

W. M. HENDERSON.

STEAM ENGINE.

No. 362,078.

Patented May 3, 1887.



WITNESSES.

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STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 362,078, dated May 3, 1887.

Application filed March 9, 1887. Serial No. 230,304. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. HENDERSON, a citizen of the United States, residing at Morton, in the county of Delaware and State of Pennsylvania, have invented a new and useful Improvement in Steam-Engines; and I do hereby declare the following to be 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, reference being had to the accompanying drawing.

This invention relates to an improvement upon steam-engines of the inclosed crank-case variety, and the object is, first, to maintain a practically constant level of the lubricant within the crank-case, and, second, to free the crank-case from heated vapors and attendant evils thereof—two important points to be considered in the successful running of engines of this class.

To select an example of a crank-case engine to which to apply my invention, I will produce a transverse section of the engine patented to me August 24, 1886, No. 347,874.

A is the crank-case, B the central cylinder, and E the exhaust-branch. In a general way the application would serve for any crank-case engine and any cylinder mounted thereon. On that side of the crank-case where the exhaust-branch is situated I arrange a gage-tube, C, having the usual top and bottom connections secured to the crank-case, as shown. This gage-tube may be a glass gage, or may simply be a metallic tube. At the top is a stuffing-box, through which descends the dip-pipe D to a distance within the tube C, terminating on the line where it is desired to establish the fluid-level within the crank-case.

G is an ejector-nozzle affixed to the upper end of the dip-pipe, and making a steam-tight joint where it enters the T-fitting F, located in position to receive it on the line of exhaust-pipe proceeding from the engine. The aperture in this ejector-nozzle is shown bent to a right angle coinciding with the line of exhaust-pipe, so as to be in the path of the direct current of exhaust-steam and subject to its strong induction influence.

The operation of this device is as follows, the lubricating-fluid having been introduced into the crank-case to the proper level through any suitable aperture, as at H, which aperture is subsequently closed and the engine started.

Now, in regard to the first feature of this invention, should the contents of the crank-case become augmented by any leakage of steam or condensed water from the cylinders entering it, the column will rise in the gage-tube C, and when it seals the mouth of the dip-pipe D the induction caused by the flow of the exhaust-steam from the engine, sweeping past the pointed nozzle of the ejector G, will lift such excess fluid and throw it out with the exhaust, practically keeping the level of the fluid within the crank-case on the set line of the dip-pipe; secondly, any heated vapors arising in the crank-case will pass freely into the upper end of the gage-tube C and be carried off by the same means. A snifting action between air and water will be maintained on the line of the lip of the dip-pipe, and if the shaft-journals are provided with stuffing-boxes a partial vacuum may be maintained in the crank-case, which will assist the steam-pistons of the engine on their downstroke, and answer the purpose of cushioning them on their upstroke.

The chances for heated vapors to accumulate in the crank-case of any of my engines are, however, reduced to a minimum, by reason of the slotted cover-plates attached to the lower ends of the pistons, as shown on the patent before referred to, and fully described in a former patent granted to me April 6, 1886, No. 339,292; but the continuous rapid revolving of the cranks in the fluid-box alone would, in a protracted run, generate copious heated vapors, on the principle of the mechanism devised by Joule to determine the mechanical equivalent of heat, which it will be advantageous to remove from the crank-case, and which duty the device herein described will effectually perform, as well as maintaining a constant fluid-level within the crank-case.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the inclosed crank-case A with gage-tube C, having top and bottom connections joining the two, and dip-pipe D, with ejector-nozzle at top opening into the main exhaust, arranged substantially in the manner and for the purposes set forth.

WILLIAM M. HENDERSON.

Witnesses:

FRANK TOOMEY,

ROBT. SHOEMAKER, Jr.