No. 680,820. Patented Aug. 20, 1901.

G. A. THODE.

LUBRICATING DEVICE FOR GAS ENGINES.

(Application filed Feb. 3, 1898.)

(No Model.)

Fig: 1.

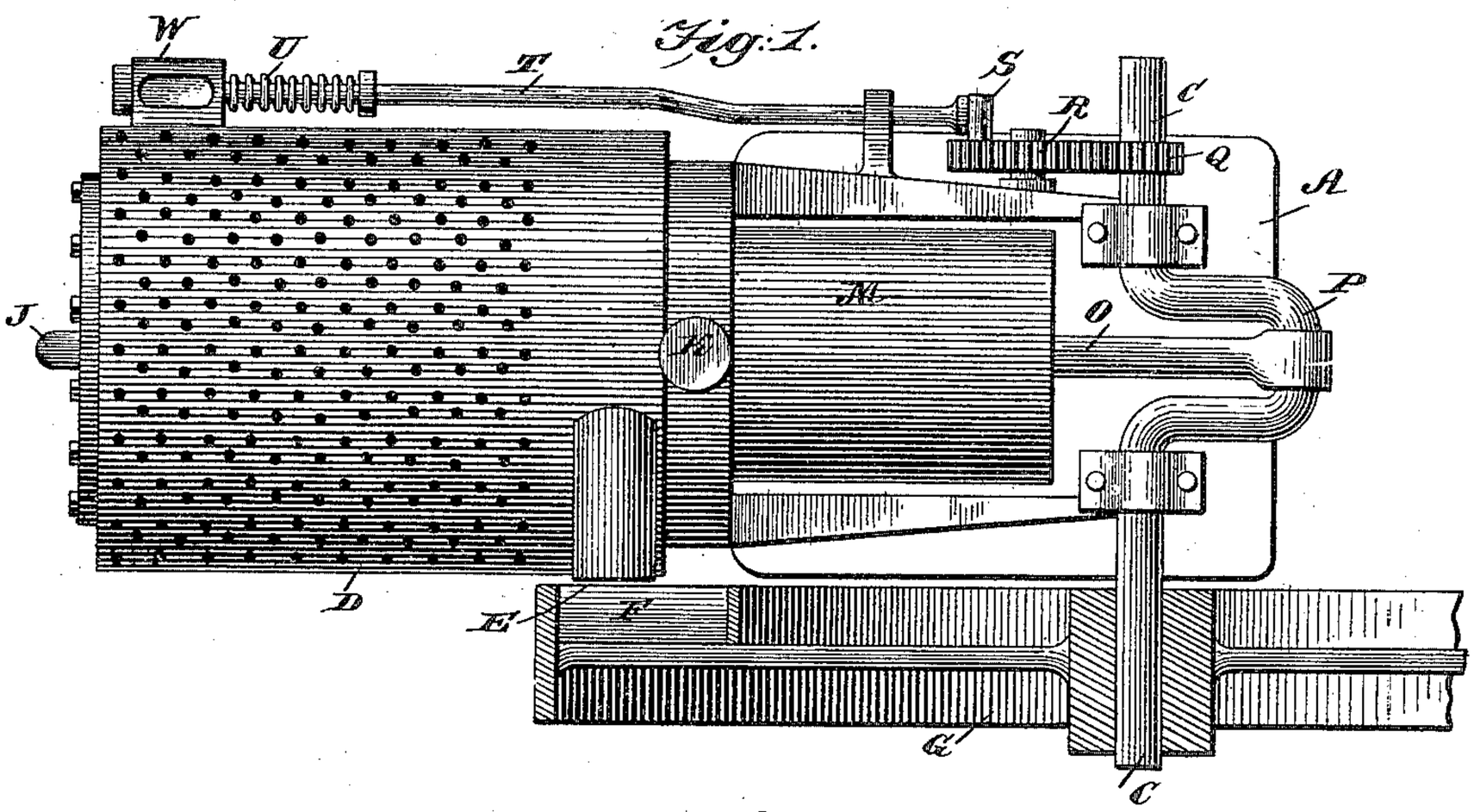


Fig: 2.

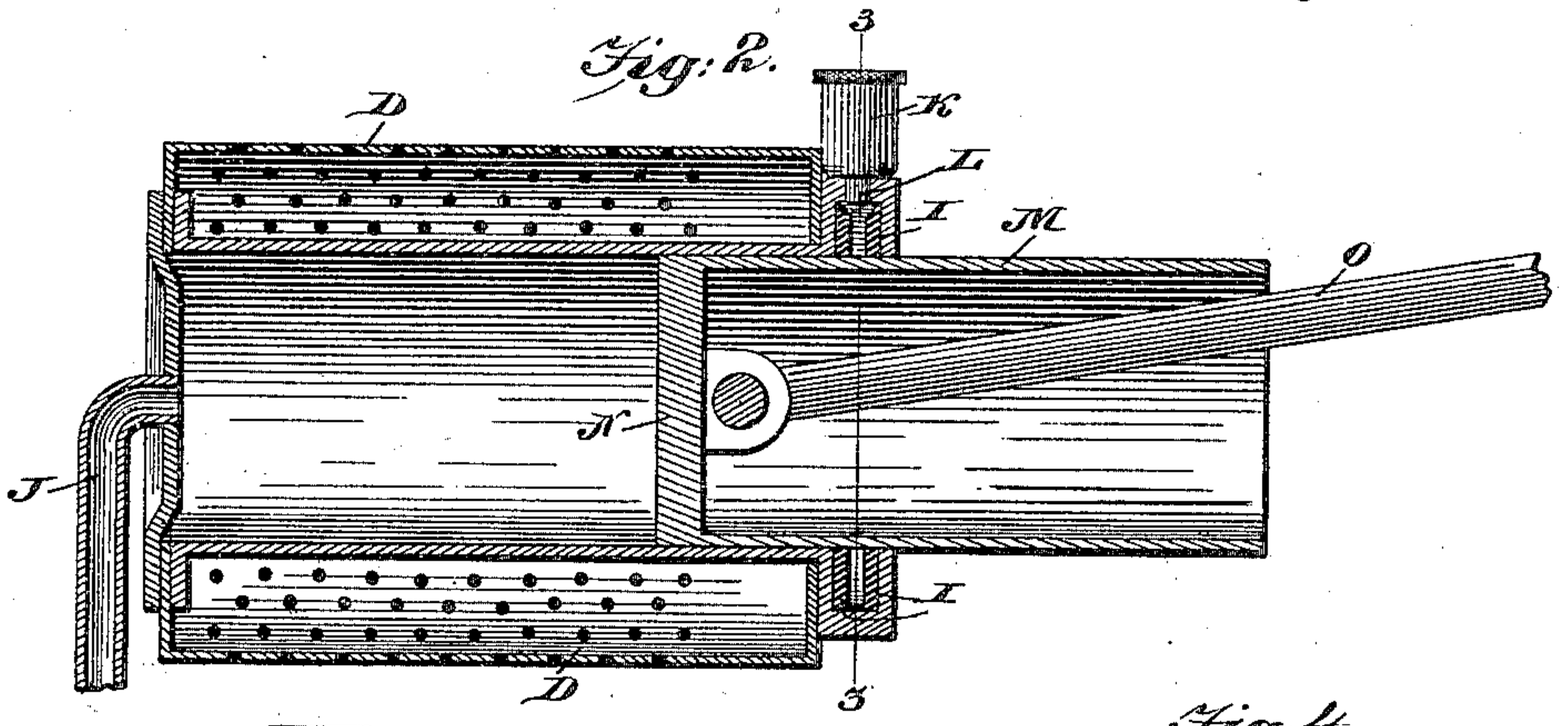


Fig: 3.

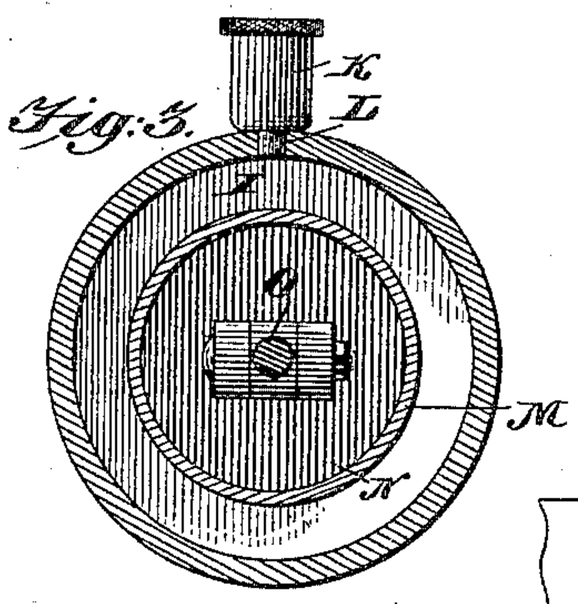


Fig: 4.

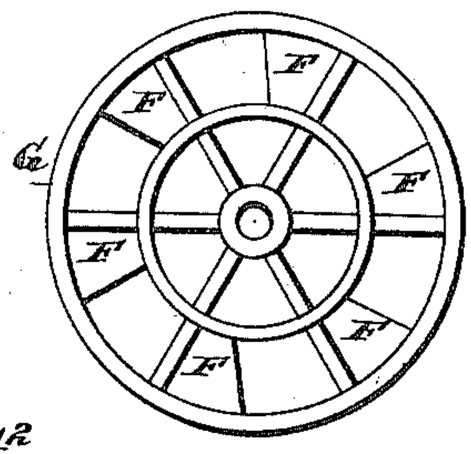
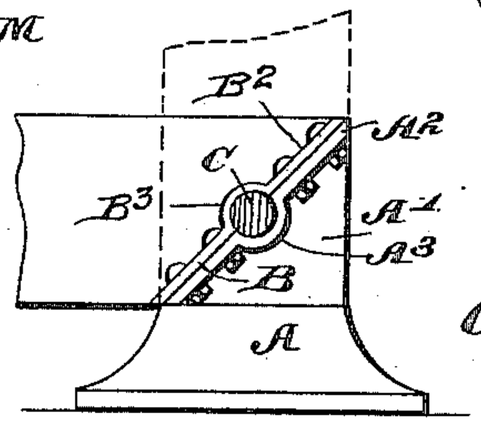


Fig: 5.



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UNITED STATES PATENT OFFICE.

GUSTAV A. THODE, OF OSMOND, NEBRASKA.

LUBRICATING DEVICE FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 680,820, dated August 20, 1901.

Application filed February 3, 1898. Serial No. 669,030. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV A. THODE, residing at Osmond, in the county of Pierce and State of Nebraska, have invented a new and useful Gas-Engine, of which the following is a specification.

My invention relates to gas-engines, and has for its object to generally improve the construction and facilitate the operation of such engines.

With this object in view my invention consists in the novel features of construction hereinafter fully described, and particularly pointed out in the appended claim.

In order to enable others skilled in the art to which my invention most nearly appertains to make and use the same, I will now proceed to describe its construction, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view constructed in accordance with my invention; Fig. 2, a vertical central section through the piston, cylinder, jacket, and lubricator; Fig. 3, a transverse vertical section on the plane indicated by the line 3 3 of Fig. 2; Fig. 4, a view in elevation of the inner side of the fly-wheel, and Fig. 5 a detail view illustrating the convertible base.

Like letters of reference mark the same parts wherever they occur in the various figures of the drawings.

Referring to the drawings by letters, and particularly to Fig. 5, A indicates the base, upon which the framework carrying the cylinder and most of the working parts of the engine are supported. This base A is provided with vertical walls or uprights A′, at the upper edges of which are provided flanges or surfaces A^2, lying in a plane inclined at an angle of forty-five degrees from the horizon. At the central parts of these flanges or surfaces A^2, as at A^3, are formed the lower halves of the bearings for the journals of the main shaft C. The framework B of the engine has one end formed with corresponding surfaces or flanges B^2, lying in a plane inclined at an angle of forty-five degrees from the horizon, and provided with the other halves of the bearings for the journals of said shaft C. Inasmuch as the main central line of the framework B when mounted, as shown in dotted lines in Fig. 5, in position to support the cylinder and working parts of a horizontal engine is parallel with the horizon, its flanges or surfaces B^2 are also at an angle of forty-five degrees to its length and its length at a right angle to the upright line of the base A. When, however, the base A and framework B are to be used with an upright engine, said framework is secured to the base in the position indicated in dotted lines in Fig. 5, in which position the two halves A^3 and B^3 of the bearings for the journals of the main shaft C will register, as will the bolt-holes, and the whole structure may be just as effectively mounted and secured as in the position shown in full lines, thereby adapting the base and the framework for use in either an upright or a horizontal engine. By reason of this provision the same base and framework may be set up in either form to adapt it to circumstances, and the change from one position to the other will have no effect whatever upon the various working parts of the engine.

The most universal custom in gas-engines now in use is to provide a jacket surrounding the cylinder, through which water is circulated to prevent the heating of the cylinder to a very high degree, which would sometimes cause premature explosions and interrupt the working of the engine. This method of cooling the cylinder has been found to be objectionable in many respects, and in order to provide means for cooling the cylinder not open to such objections I have provided it with a jacket D, which is perforated around its entire circumference and nearly throughout its length, leaving, say, about one-fourth of its length at the end nearest the main shaft without perforations, but provided with a lateral opening E, through which air is to be drawn, the perforations permitting of the admission of the air in all directions and through any portion of the periphery of the jacket. In order to circulate the air within the jacket D, I find it expedient to provide a fan to withdraw the air through the opening E. This fan I have constructed of blades F, located just within the periphery of the fly-wheel G on the main shaft C, such blades being mounted at an angle to the rim of the wheel after the manner of propeller-blades and pitched in a proper direction to cause an outward draft through the opening E through

the inside of the perforated jacket. This suction or draft will cause the air to enter the perforations and contact with the outer surface of the cylinder at all points, thus providing a continual current of air from the cooler outside atmosphere to be directed against every portion of the cylinder and effectually preventing its overheating.

Heretofore difficulty has been experienced in lubricating cylinders due to the overheating of the packing owing to contiguity to the explosive-chamber. This difficulty I have overcome by locating the packing-rings I at the extreme opposite end of the cylinder from that at which the pipe J enters and supplies the explosive mixture and where the explosion takes place. These packing-rings I are also located at the far end of the cooling-jacket, and by reason of their location, as just described, they are rendered far less liable to be overheated than in constructions heretofore used.

K is an oil-cup having a dischage-opening L between the packing-rings I, whereby the piston M and packing-rings I are thoroughly lubricated. The end of the cylinder is provided with an annular shoulder, which forms a stop or support for one end of the jacket D and is grooved upon its inner surface, within which the rings I are located one upon each side with the oil-inlet opening between them. Both ends of the jacket may be flanged inwardly, one of which flanges bears against the shouldered end of the cylinder and the other one is clamped between the cylinder and the cylinder-head. The piston-head N is coupled to a pitman O, which at its opposite end engages the crank P on the main shaft C. On the opposite end of the main shaft C from the fly-wheel G is mounted a pinion Q, which meshes with the teeth of a gear-wheel R of double its size, said gear-wheel being provided on its upper face with an eccentrically-located cam S.

T is a rod properly mounted and normally held in the path of the cam S by means of the spring U. This rod T is connected at its outer end to an exhaust-valve W. Two rotations of the main shaft are required to give one rotation of the gear-wheel R and a single operation of the cam S upon the rod T, whereby an exhaust takes place once in every two complete strokes of the piston. I prefer this arrangement; but the number of exhausts in comparison with the number of strokes of the piston can be regulated to suit the circumstances attending each particular case by changing the pinion Q and gear-wheel R.

The advantages attending the use of my several improvements in gas-engines will be obvious from the foregoing description and need not be further specified here, and while I have illustrated and described what I believe to be the best means for carrying out my invention I do not wish to be understood as limiting myself to the exact construction and arrangement herein shown, but hold that such slight changes and variations as might suggest themselves to the ordinary mechanic would properly fall within the limit and scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a gas-engine, a cylinder having an internally-grooved annular shoulder at its open end, and having an oil-inlet on top communicating with said groove, a cylindrical piston in the cylinder, packing-rings in the groove at a distance apart, one upon each side of the oil-inlet, whereby oil from the inlet may pass from the inlet to all points between the rings, and power-transmitting mechanism connected with the piston, substantially as described.

GUSTAV A. THODE.

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