L. BOLLÉE.

VERTICAL ENGINE.

APPLICATION FILED NOV. 14, 1907.

1,027,807.

Patented May 28, 1912.

2 SHEETS—SHEET 1.

FIG. 1

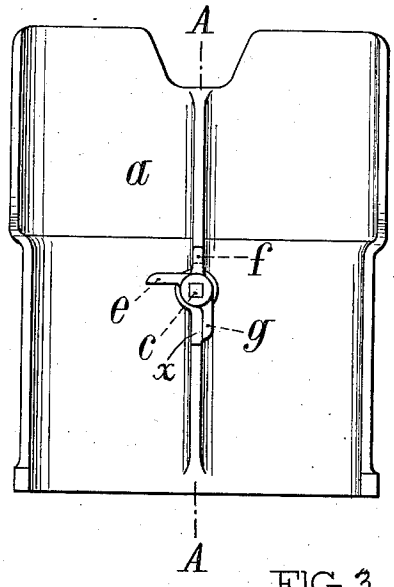


FIG. 2.

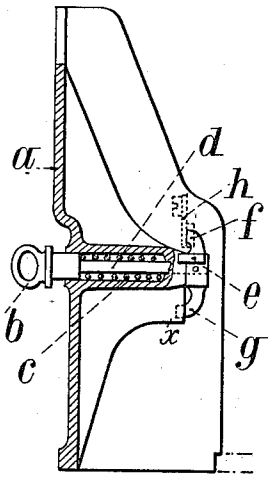
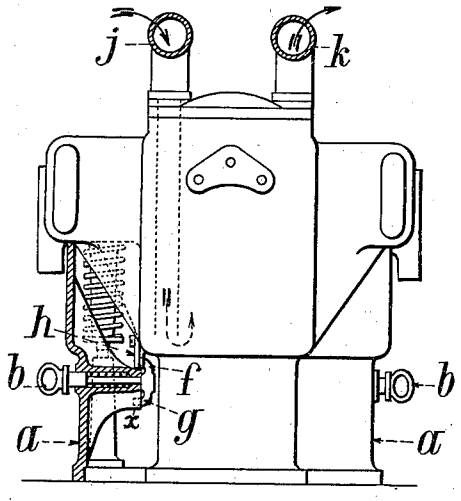


FIG. 3.



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2 SHEETS—SHEET 2.

FIG. 4.

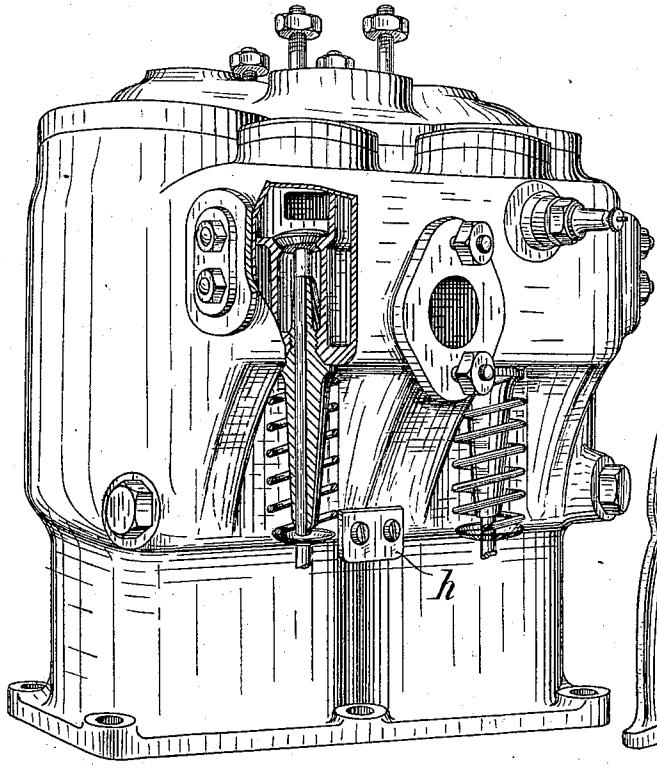
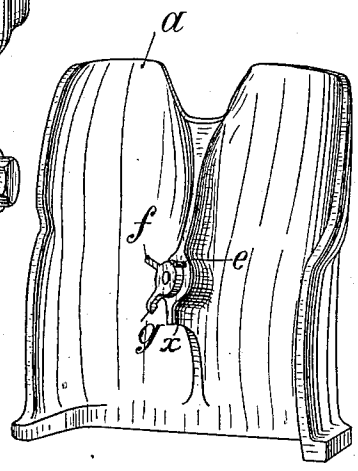


FIG. 5.



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UNITED STATES PATENT OFFICE.

LÉON BOLLÉE, OF LE MANS, FRANCE.

VERTICAL ENGINE.

1,027,807. Specification of Letters Patent. Patented May 28, 1912.

Application filed November 14, 1907. Serial No. 402,190.

To all whom it may concern:

Be it known that I, LÉON BOLLÉE, a citizen of the French Republic, and residing at Le Mans, France, have invented a new and useful Improved Vertical Engine, of which the following is a specification.

In vertical motors, chiefly those exposed to the action of weather and those which are driven by amateur engineers, as for example on launches, motor cars, etc., a construction of motor having a very simple appearance is preferred the construction also being such that the delicate parts of the valves are protected while all accessibility thereto is left and a perfect cooling or heating of the said valves insured, according as the motor is actuated by steam, explosion or liquid carbonic acid gas.

The construction according to this invention completely fulfils these requirements, a feature of the same consisting in the protection of each valve mechanism by a hooked-on casing, the instantaneous removal of which enables the valve mechanism to be examined as readily as if these casings did not exist.

Another feature of the same construction for the purpose of facilitating access to and the manipulation of each casing of the valve mechanism consists in arranging the circulation of water so as to leave the sides of the motor perfectly free and thus the pipes of the said circulation do not cause an obstruction, while a perfect cooling or heating according to the nature of the motor is insured.

In the accompanying drawings given by way of example:—Figure 1 is an elevation of one casing. Fig. 2 is a vertical section on the line A—A of Fig. 3, and Fig. 3 is an end view of the cylinders of the motor. Fig. 4 is a perspective view, partly in section, of the valve mechanism and the adjacent parts. Fig. 5 is a perspective view of the casing removed from the engine.

According to this invention the outside parts of the inlet and exhaust valves of a motor, that is the spring, valve spindle, driving means, etc., are protected by a detachable casing *a* inclosing the said parts, so as to entirely cover them. This casing is so shaped relatively to the form of the cylinders that it adapts itself to the cross-section of the same along the edges of its lateral walls. The same casing *a* is provided with hooking or bolting means secured to it in such manner that after removing the said casing, there is left on the motor only the staple which does not constitute an obstacle. The bolting means, the arrangement of which can vary, consist in the example illustrated of a handle or button *b* outside the casing, having an extended spindle *c* which is controlled by a spring *d*, to which spindle is secured a latch *f* the rotation of which is limited to one-quarter of a revolution by two stops *e* and *g* which are adapted to engage a portion *x* of the web of the casing. When the casing is in position, the latch can be caused to engage behind the staple *h* of the cylinder by pushing the spindle of the latch inward and turning the same. The staple *h* may also be provided with a cam surface in order to further facilitate the longitudinal movement of the spindle, so that it is only necessary to turn it in the direction of locking. The latch *f* having been once placed behind the staple engages with a small recess in the same to prevent its turning automatically. The spring *d* obviates any vibration of the casings.

For removing the casings *a* the handle *b* is pushed inward, the latch *f* comes out of the depression or recess of the staple *h*, the button *b* is turned and with it the latch *f* which no longer remains behind the staple *h*, and the casings *a* is free.

The latch *f* can be of different construction. It can rotate about a spindle arranged in a different direction or even slide. It can be a multiple one.

The important feature in the method of hooking, which is a feature of the invention, is first that it is not necessary to release the handle or button in order subsequently to seize the casings which it is desired to remove, and secondly that the whole fastening device should form a part of the casings, so that the valve mechanism is left free and there are left on the cylinder, crank chamber, or columns, only small staples or slight notched projections, which receive the bolts or latches. Thus it will be seen that the side of the crank chamber rises almost vertically to the casing *a* with a rounded off portion at the top outside the said casing, the latter resting on the crank chamber and not projecting or receding therefrom to any appreciable extent, and the handle for the fastening means for this casing projecting from the cylinder. The casing *a* thus seems to form at the same time a portion of the crank chamber and a portion of the cylinder, and there is a harmony of lines which is not only

pleasing to the eye but also facilitates cleaning.

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

In an explosion engine, cylinders and valve rod parts projecting therefrom, a staple *h*, on said cylinders, a casing or plate adapted to the shape of said cylinders for covering said parts, and means for securing said casing to said cylinders, said means comprising a spindle *c*, a handle *b*, at its outer end, a spring *d*, surrounding said spindle, a latch *f* at its inner end for engaging the staple *h* on the cylinders, a stop *x* affixed to the casing, and stops *e g* attached to said latch to limit the rotation of the latter to a quarter of a revolution by engaging the stop on the casing.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LÉON BOLLÉE.

Witnesses:
DEAN B. MASON,
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