(No Model.)

5 Sheets—Sheet 1.

J. L. BOGERT.

TWIN CYLINDER ENGINE.

No. 310,979. Patented Jan. 20, 1885.

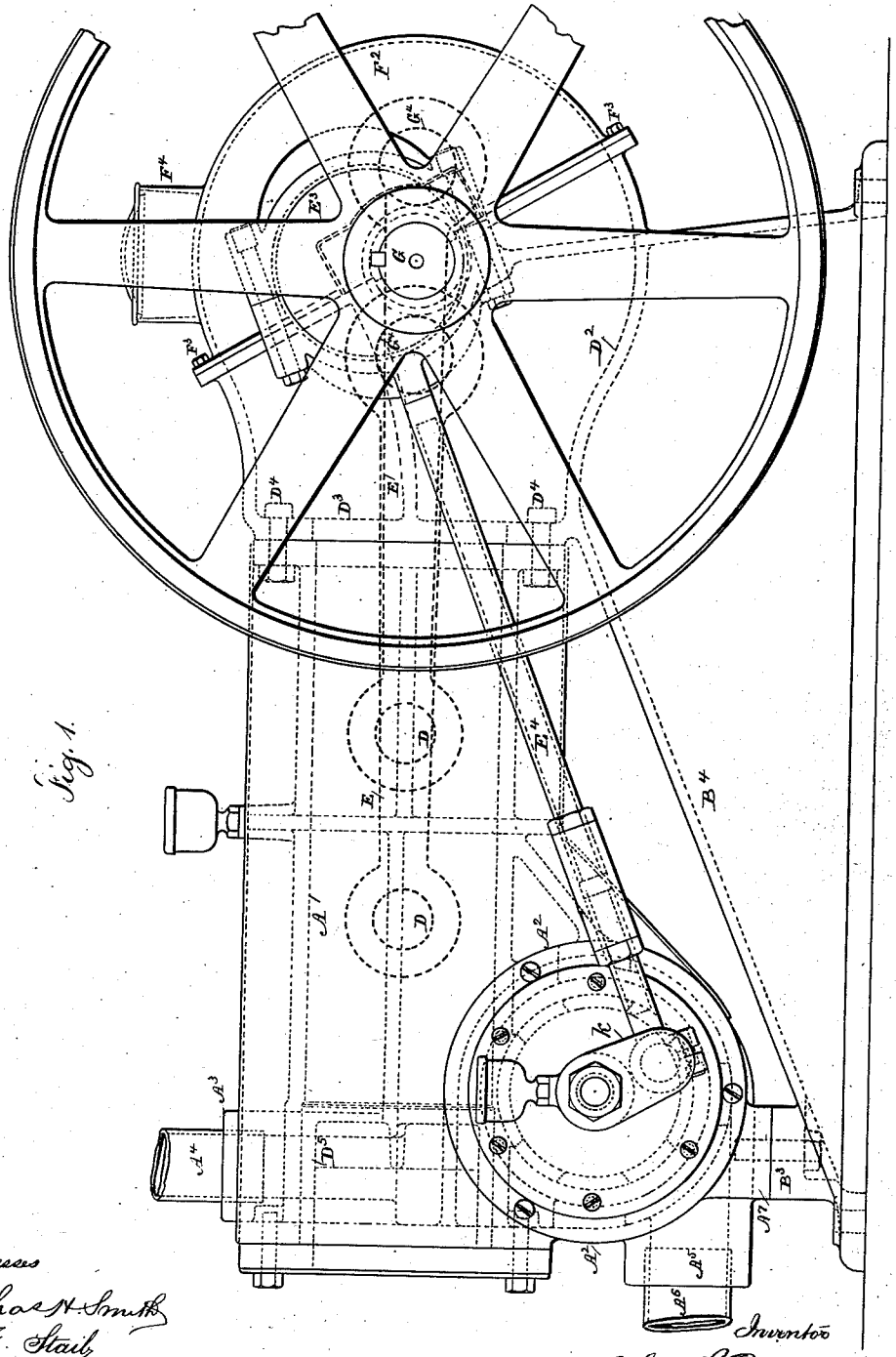


Fig. 1.

Witnesses
Chas. N. Smith
J. Staly

Inventor
John L. Bogert
per Samuel W. Ferrell atty

(No Model.)

5 Sheets—Sheet 2.

J. L. BOGERT.

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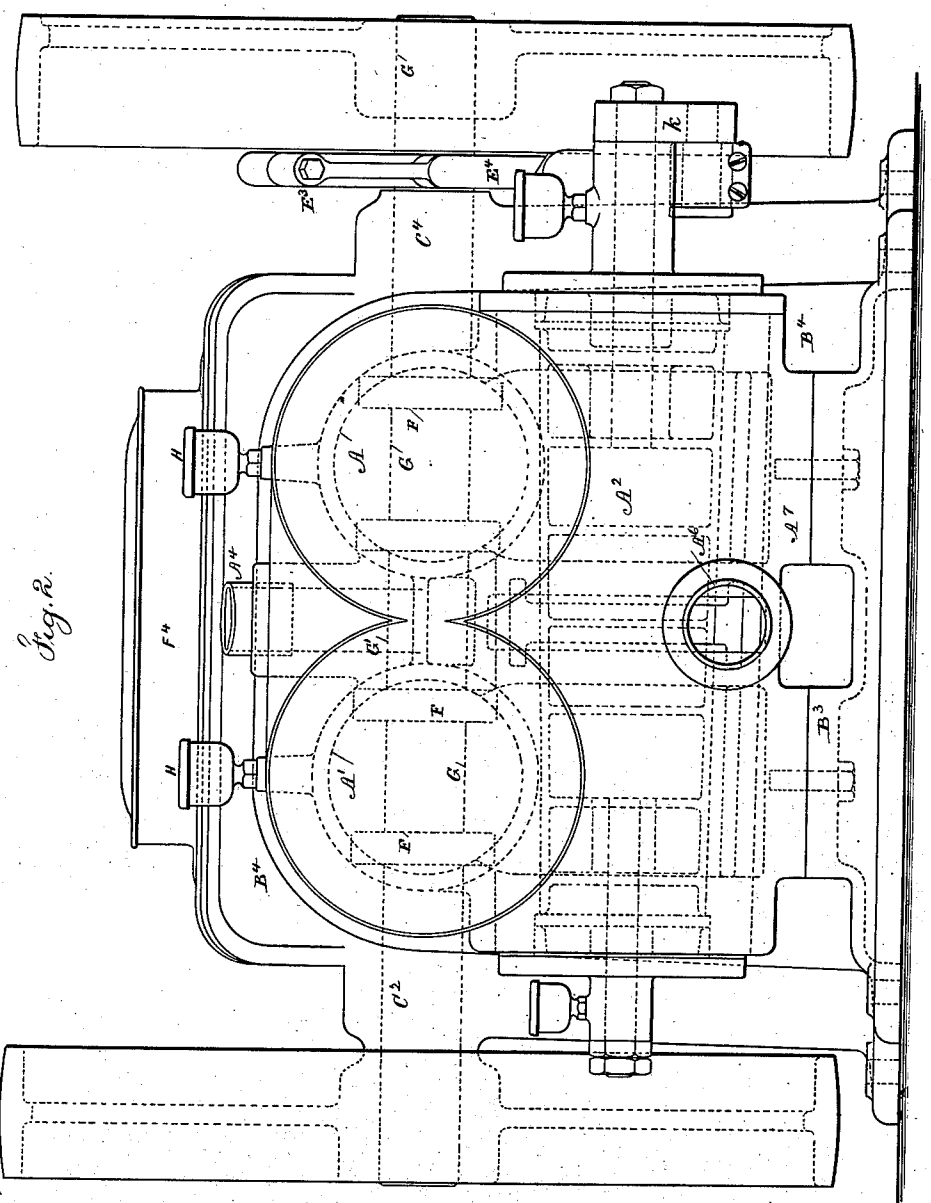


Fig. 2.

Witnesses

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Atty

(No Model.)

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J. L. BOGERT.

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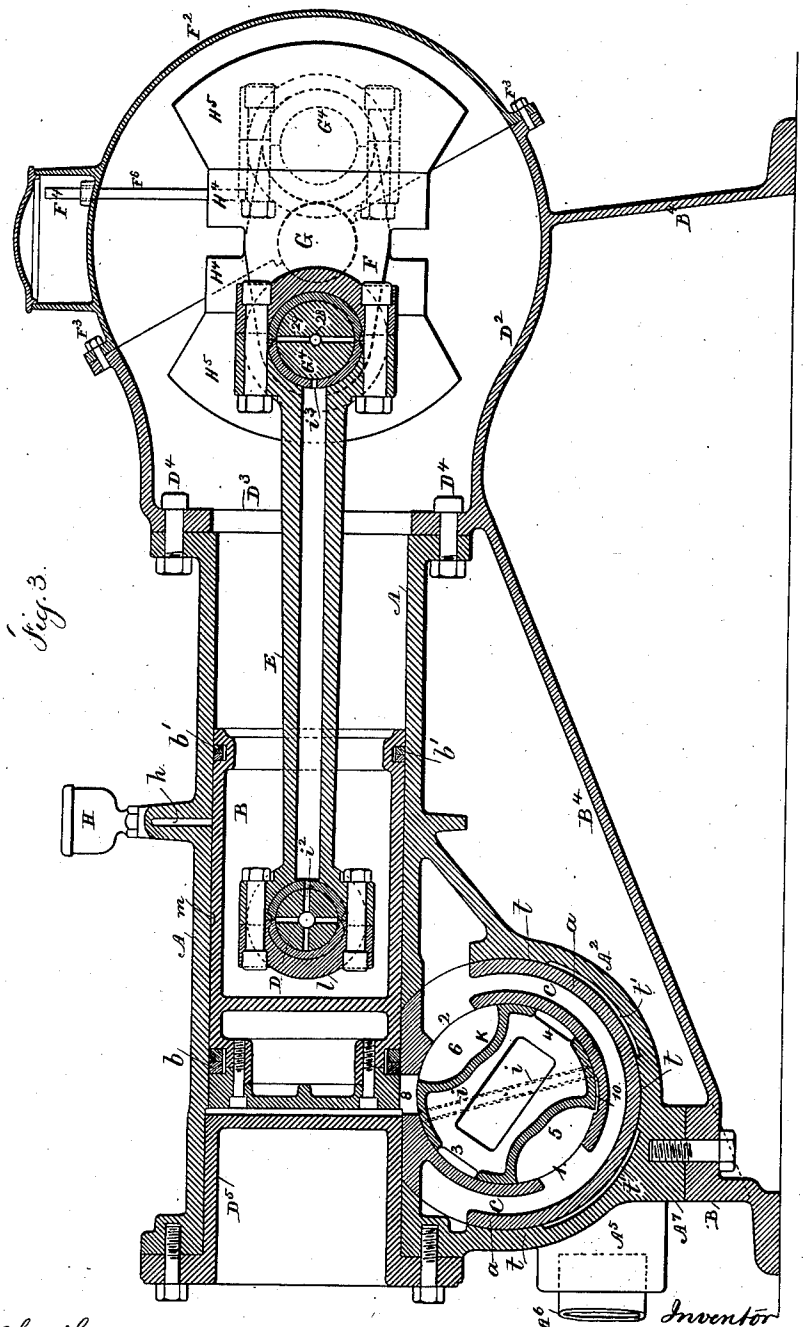


Fig. 3.

Witnesses
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(No Model.)

5 Sheets—Sheet 4.

J. L. BOGERT.

TWIN CYLINDER ENGINE.

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Fig. 5.

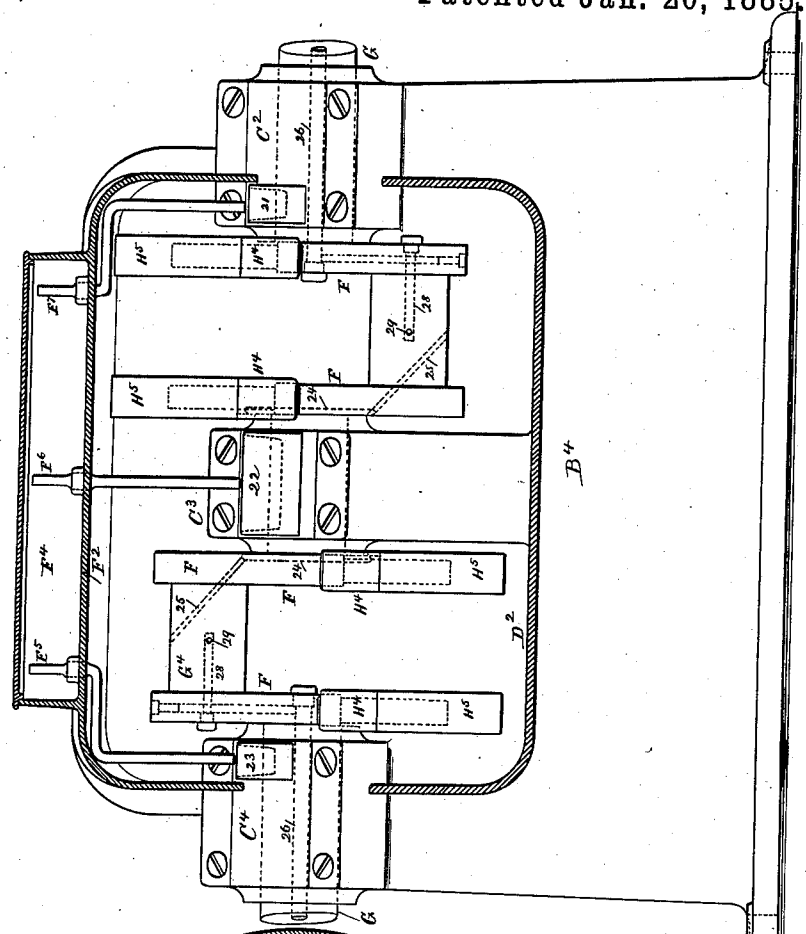
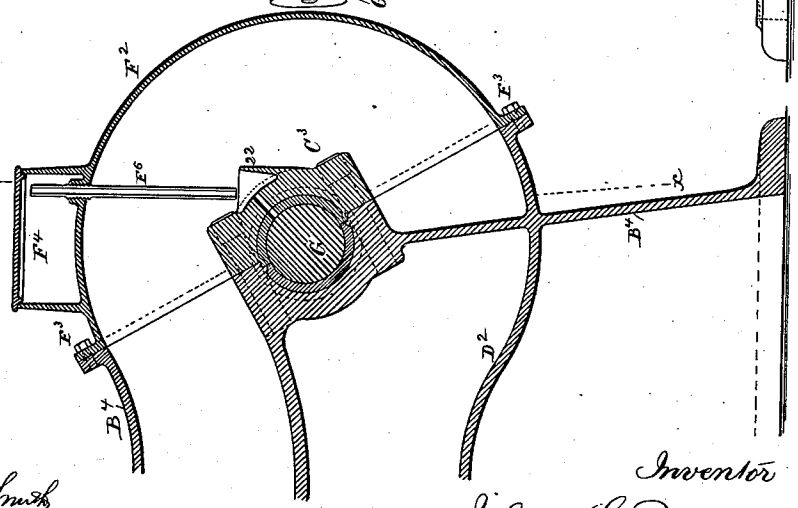


Fig. 4.



Witnesses
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(No Model.)

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J. L. BOGERT.

TWIN CYLINDER ENGINE.

No. 310,979. Patented Jan. 20, 1885.

Fig. 6.

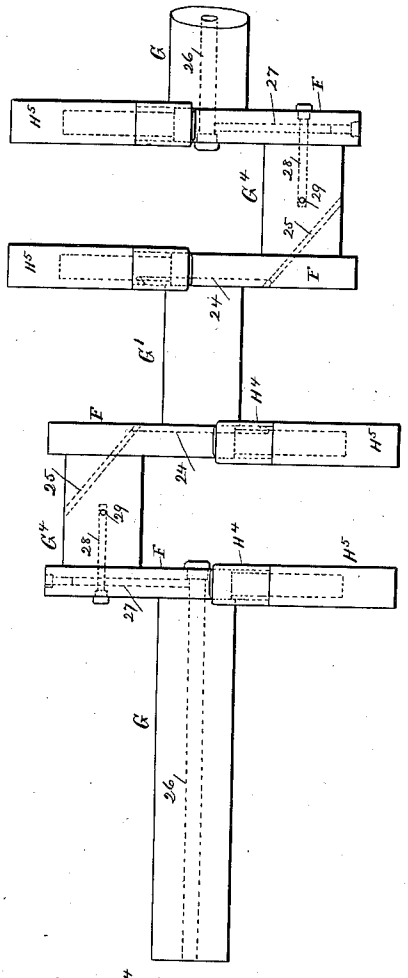
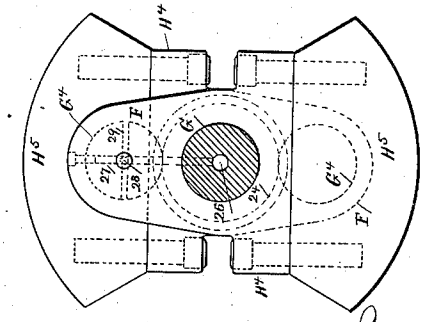


Fig. 7.



Witnesses

Chas. H. Smith

J. Stail

Inventor

John L. Bogert

per Lemuel W. Serrell

atty

UNITED STATES PATENT OFFICE.

JOHN L. BOGERT, OF FLUSHING, NEW YORK.

TWIN-CYLINDER ENGINE.

SPECIFICATION forming part of Letters Patent No. 310,979, dated January 20, 1885.

Application filed June 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. BOGERT, of Flushing, in the county of Queens and State of New York, have invented an Improvement in Twin-Cylinder Steam-Engines, of which the following is a specification.

These improvements relate to an engine adapted to run at a very high speed and with great uniformity of motion. I employ two cylinders, side by side, with plungers and connecting-rods extending to the cranks, which are at one hundred and eighty degrees apart, and I inclose the cranks, and provide means for oiling the cranks and the wrist pin in the plungers without stopping the engine. I cast the twin cylinders and the steam-chest together, and the cylinders are bolted at their forward ends directly to the frame, and said frame extends beneath the cylinders, so as to form a firm bed, and the frame is bolted to the steam-chest. I provide a movable hood to cover the cranks.

In the drawings, Figure 1 is a side elevation of the engine. Fig. 2 is an elevation endwise of the cylinders. Fig. 3 is a longitudinal section through one of the cylinders. Fig. 4 is a section of the hood and crank-shaft, and elevation of part of the frame. Fig. 5 is a section at the line $x\,x$, Fig. 4, showing the hood, journal-boxes, and crank-shaft. Fig. 6 shows the crank-shaft separately, and Fig. 7 is a section of the shaft and elevation of the cranks.

The cylinders A A′ are cast together, and they also have cast with them the steam-chest A^2, with the connection for the steam-pipe A^4 and for the exhaust-pipe A^6, and below the steam-chest there is a foot-piece, A^7, that rests upon and is bolted to the bearer B of the frame B^4. This frame is made to extend back beneath the cylinders and forward to the three bearing or journal boxes c^2 c^3 c^4. There is a curved partition extending across below the journal-boxes at D^2, forming the bottom of a chamber in which the cranks revolve, and there is a vertical plate at D^3, with openings through which pass the connecting-rods E, and to this plate the ends of the cylinders A A′ are bolted, as at D^4. To the rear end of the cylinder the deeply-recessed heads D^5 are bolted, and these extend in to where the ports 8 for the steam enter the cylinders. The valve K is a rotative or oscillating cylinder, that is slightly tapered, and it is placed in a valve-case, and receives an oscillating motion from the eccentric E^3, rod E^4, and crank k. The valve and its case form the subject of a separate application for patent, Serial No. 136,005, filed June 25, 1884, and these parts are not herein described. I however remark that the valve, as it turns and admits steam to one cylinder, opens the exhaust to the other cylinder, so that the cranks may be at one hundred and eighty degrees apart, and steam will be acting upon the piston of one engine while the other piston or plunger is on the return-stroke, the twin cylinders being single-acting. The plungers B in the respective cylinders are hollow, and provided with wrist-pins D for the inner ends of the connecting-rods E. These plungers and wrist-pins are preferably made like those describe in a previous application of mine, but any other form of plunger or wrist-pin may be made use of.

The journal boxes or bearings c^2 c^3 c^4 are of ordinary character, except that the caps of the boxes are at an inclination, so as to conform to the inclination of the front end of the frame, and the hood F^2, which is applied to this front end of the frame B^4, is a segment of a cylinder and bolted at F^3 to the flange at the front end of the frame. This hood incloses the cranks, but it can be removed to give access to the same without disturbing the journal-boxes, as said hood is notched at the journal-box caps.

Upon the upper part of the hood F^2 is the oil-vessel F^4, from which the tubes F^5 F^6 F^7 pass down to the oil-boxes 21 22 23 upon the respective journal-boxes c^2 c^3 c^4, and there may be wicks in the tubes F^5 F^6 F^7, or any other convenient device for supplying oil gradually to the boxes. Each oil-box has a hole through which oil passes to the journal of the crank-shaft. The crank-shaft G is made with the cranks F F, there being an intermediate journal which revolves in the bearing or box c^3. There are grooves at 24 around the journal G′ in the opposite faces of the cranks F F, into which grooves the oil from the journal G′ passes by the centrifugal action, and

the holes 25, bored diagonally through the cranks and crank-pins G^4, convey the oil to the respective crank-pins and to the eyes of the connecting-rods E, so as to lubricate the same, and this will be effective so long as no foreign matter passes into the holes to obstruct the same. It, however, is of great importance that all parts of the engine can be lubricated without stopping the engine. I therefore introduce into the main shaft central or axial holes at 26, with holes at 27 bored in from the outer ends of the cranks to meet the axial holes, and there are axial holes 28 that pass into the crank-pins G^4, these holes being plugged at their outer ends, and there is a cross-hole through the crank-pin at 29, so that oil injected in at the end of the shaft will be carried by the centrifugal force to the eye of the connecting-rod to lubricate the same; hence the crank-pins can be lubricated from either or both sources.

In my aforesaid application I have shown how the wrist-pin and the inner end of the connecting-rod can be lubricated from the exterior of the cylinder. I however do not depend upon this mode of lubrication alone; but I make the connecting-rod E tubular, as seen in Fig. 3, and terminate this tube with holes at i^2 and i^3, that pass through the boxes or Babbitt metal, so that when the hole 29 or 25 coincides with the hole i^3 the oil will be thrown by centrifugal force into the tubular connecting-rod, and this connecting-rod will become an oil-holder to aid in lubricating the wrist-pin, and also the crank-pin, if the other supplies fail or are insufficient.

Upon the cranks F there are projections at H^4, against which the weights H^5 are secured by screws passing through such projections. These weights are of such a size as to balance the cranks and connecting-rods, and insure uniformity of movement without concussion or vibration.

I do not herein lay claim to the plunger or the valve or the parts therewith connected, as these form the subject of separate applications of like date herewith.

I am aware that in vertical engines there have been openings and covers at the sides of the frame, below the cylinders. In my improvements, the cylinders being horizontal, I am able to employ a hood that is nearly a half-cylinder, and can be taken off to give access to the cranks and connecting-rods, so that either of the parts can be removed without separating the cylinders and frame.

I claim as my invention—

1. The twin steam-cylinders and the transverse valve-cylinder, the plungers within the steam-cylinders, the connecting-rods, the wrist-pins in the plungers, the crank and crank-shaft, the bearings for the crank-shaft, the frame extending from the bearings to the cylinders and along below the same, and the step at the under part of the transverse valve-cylinder, and the attaching-bolts, substantially as specified.

2. The combination, with the horizontal steam-cylinders, placed side by side, their plungers and connecting-rods, of the shaft and cranks, the counterpoise connected to the cranks, the bearings for the shaft, the frame and bolts to connect the same to the ends of the cylinders, the removable hood to inclose the cranks and shaft, and the attaching-bolts, substantially as set forth.

3. The combination, with the horizontal cylinders, placed side by side, their plungers and connecting-rods, of two cranks, the crank-shaft, the bearings, a removable hood, an oil-reservoir upon the hood, above the crank-shaft, the tubular connections from the reservoir to the bearings and from the bearings through the cranks to the crank-pins, substantially as specified.

4. The combination, with the horizontal engine-cylinder, plunger, and wrist-pin, of the removable hood, the oil-reservoir and pipes upon the hood, the crank-shaft and crank, with the oil-supply tubes to the crank-pin, a tubular connecting-rod with an opening at the crank-pin and an opening at the wrist-pin, for lubricating the respective parts, substantially as set forth.

5. The combination, with the horizontal cylinder, plunger, and connecting-rod, of a crank-shaft, bearings for the same, a frame extending from the bearings to the end of the cylinder, and also extending below the cylinder, and provided with a step and bolts to connect the cylinder and its valve-chest to the respective parts of the frame, substantially as specified.

Signed by me this 16th day of June, A. D. 1884.

JOHN L. BOGERT.

Witnesses:
WILLIAM G. MOTT,
HAROLD SERRELL.