(No Model.)

2 Sheets—Sheet 1.

P. LOCHMANN.

AIR ENGINE.

No. 333,644. Patented Jan. 5, 1886.

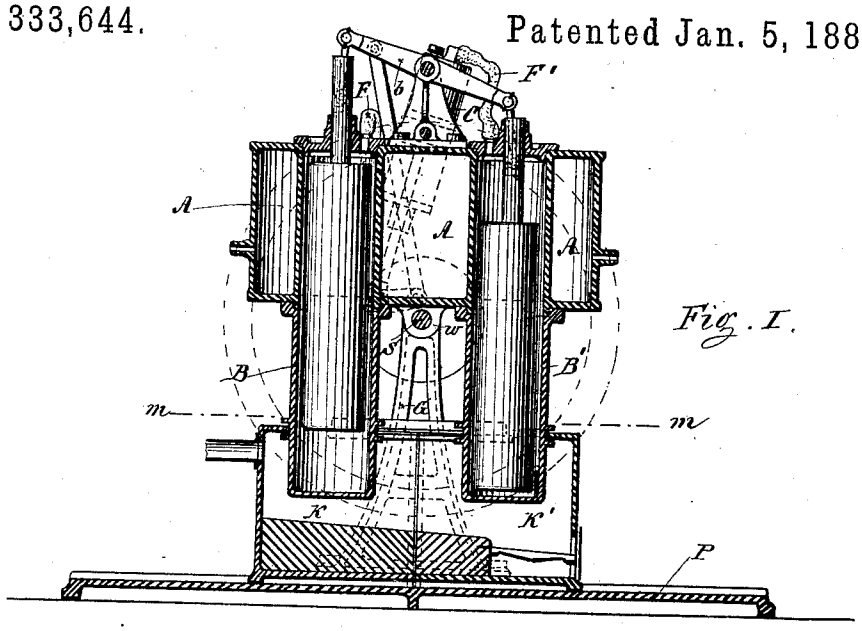


Fig. I.

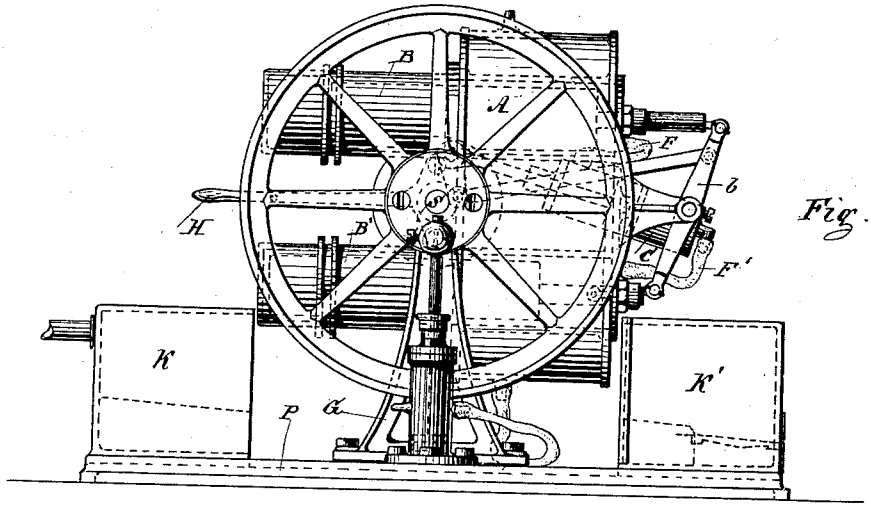


Fig. II

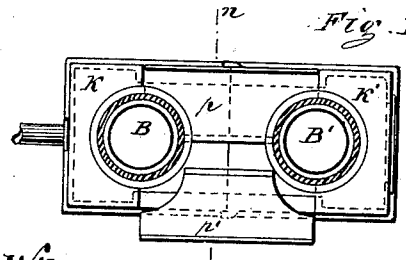


Fig. III.

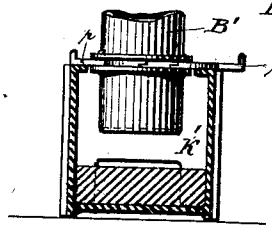


Fig. IV.

Witnesses.

Robt Roy.

M. E. McHugh

Inventor.

Paul Lochmann

per Roeder & Briesen

Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

P. LOCHMANN.

AIR ENGINE.

No. 333,644. Patented Jan. 5, 1886.

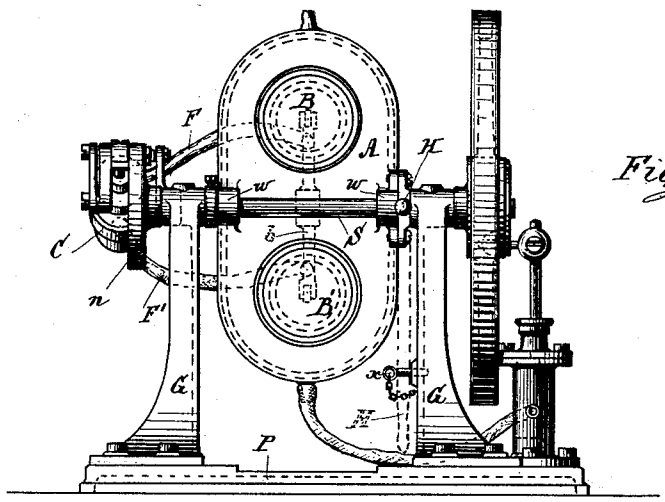


Fig. V.

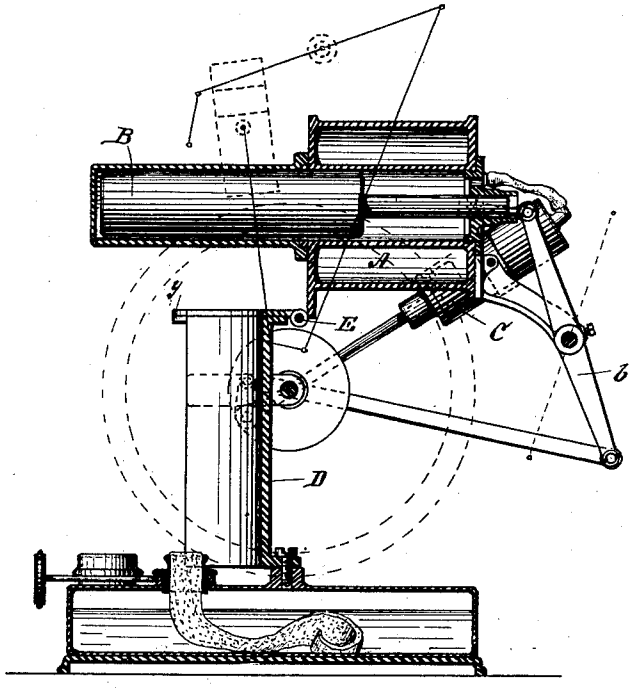


Fig. VI.

Witnesses.
Robt Roy.
M. E. McHugh.

Inventor.
Paul Lochmann
per Roder & Briesen
Attorneys.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

PAUL LOCHMANN, OF LEIPSIC-GOHLIS, SAXONY, GERMANY.

AIR-ENGINE.

SPECIFICATION forming part of Letters Patent No. 333,644, dated January 5, 1886.

Application filed May 11, 1885. Serial No. 165,092. (No model.)

To all whom it may concern:

Be it known that I, PAUL LOCHMANN, residing at Leipsic-Gohlis, Saxony, Germany, have invented a new and Improved Air-Engine, of which the following specification is a full, clear, and exact description.

My invention consists in the arrangement of the several parts of an air-engine, pivoted upon the driving-shaft and capable of turning around the same, and, further, in the arrangements of the furnace, made in two parts capable of sliding apart, whereby the machine is easily removed out of the furnace and turned partly around for the purpose of facilitating the cleaning of the same.

Figure I is a vertical section of an air-engine embodying my invention in position for operation. Fig. II is an outside view of the same, showing the furnace moved apart and the machine turned around. Fig. III is a horizontal section at line *m m*, Fig. I, and top view of the furnaee. Fig. IV is a cross-section of furnace at line *n n*, Fig. III. Fig. V is an end view of the machine in the position shown in Fig. II. Fig. VI is a vertical section of an air-engine with single air-cylinder in position for cleaning.

In Figs. I to V, K K′ is the furnace, made in two parts, divided near the middle and arranged capable of sliding on the foundation-plate P in suitable ways. Upon the plate P the frames G are placed, supporting the driving-shaft S.

B B′ are the air-cylinders, provided with the usual plungers, receiving a reciprocating motion from the beam *b*. The upper parts of the air-cylinders are surrounded by the cooling-vessel A, to which the working-cylinder C is attached, acting through its piston-rod upon the crank-wheel *n* on the end of the shaft S. The air-cylinder B is connected through pipe F with one end of the working-cylinder C, and the air-cylinder B′ is connected through pipe F′ with the opposite end of said cylinder C. By this arrangement of two air-cylinders, B B′, connected with the opposite ends of the working-cylinders a double-acting engine is obtained.

The air-cylinders B B′, cooling-vessel A, and working-cylinder C being, as above described, connected together, are pivoted through suitable lugs, *w*, attached to the under side of the cooling-vessel A upon the driving-shaft S so as to be supported upon the same and capable of turning around it. To one of the lugs *w* a lever, H, is attached, through which the several parts may be moved around the shaft S when required. A pin, *x*, passing through the lever H and one of the frames G, secures this lever H and consequently the above parts in the upright position, as shown in Fig. I. The lower parts of the air-cylinders B B′ project some distance into the furnace K K′. The top of the furnace is only closed solid from its ends to the center line of the air-cylinders, while the remaining parts and the portion between the air-cylinders are closed by sliding plates *p p′*, (see Fig. III,) so as to close the whole top of the furnace when the air-cylinders are in position for operation, as shown in Figs. I and III.

When the air-cylinders require cleaning, the parts constituting the furnace K K′ are moved sidewise on the foundation-plate P, as shown in Fig. II, when the air-cylinders, with cooling-vessel A and working-cylinder C, can be moved around on the shaft S without disturbing any part of the machine or of the working-gear, and in which position the cleaning of the ends of the air-cylinders is greatly facilitated.

In Fig. VI a machine with only one air-cylinder is represented. In this arrangement D represents the furnace, into which the lower end of the air-cylinder B projects. This furnace is made in two halves hinged together at *y*, and has on the upper end a lug, E, to which the cooling-vessel A, supporting the air-cylinder B, working-cylinder C, and the necessary working-gear, is hinged, and around which lug E the same can be turned whenever the air-cylinder requires cleaning.

What I claim is—

1. In a caloric-engine, the combination of the cooling-vessel A, air-cylinders B B′, working-cylinder C, with lugs *w w*, and with the driving-shaft S, in the manner and for the purpose specified.

2. In a caloric-engine, the furnace K K′, divided near the middle, with the air-cylinders B B′, and sliding top plates, *p p′*, as and for the purpose described.

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

PAUL LOCHMANN.

Witnesses:
EDMUND BACH,
HEINRICH ZUSKE.