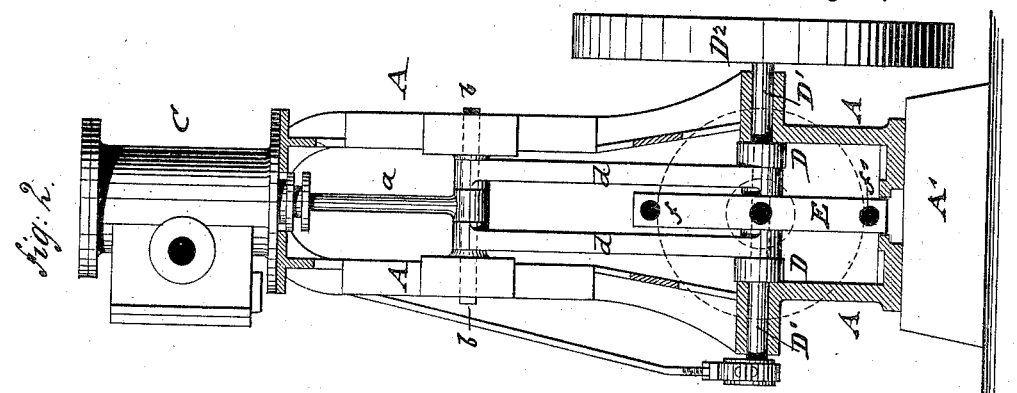
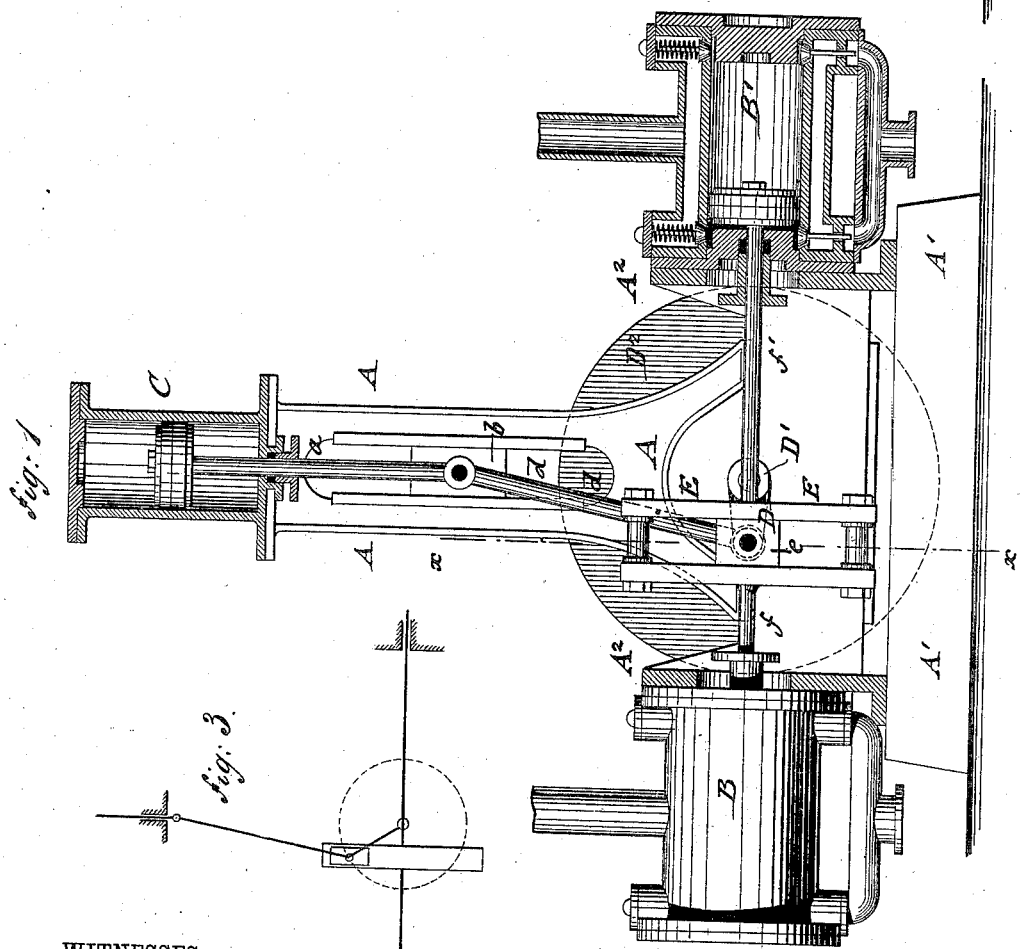
(No Model.)

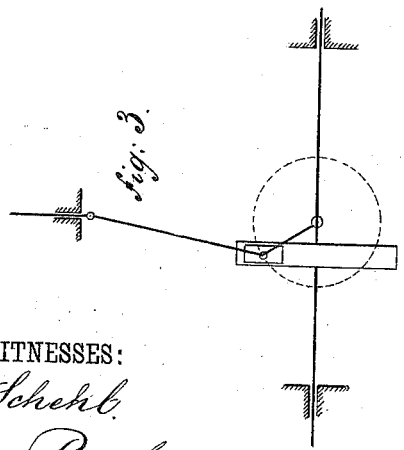
P. EHLERS.

AIR COMPRESSOR AND EXHAUSTER.

No. 301,348. Patented July 1, 1884.







WITNESSES:

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UNITED STATES PATENT OFFICE.

PETER EHLERS, OF ALBANY, NEW YORK, ASSIGNOR TO SULLIVAN & EHLERS, OF SAME PLACE.

AIR COMPRESSOR AND EXHAUSTER.

SPECIFICATION forming part of Letters Patent No. 301,348, dated July 1, 1884.

Application filed August 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, PETER EHLERS, of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Air Compressors and Exhausters, of which the following is a specification.

This invention has reference to an improved air compressor or exhauster, in which the piston of the steam-cylinder is so connected with the pistons of one or more air compressing or exhausting cylinders that the power developed by the steam-cylinder is utilized to better advantage in the air compressing or exhausting cylinders.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved air compressor or exhauster. Fig. 2 is an end elevation, partly in vertical transverse section on line *x x*, Fig. 1; and Fig. 3 is a diagram showing the arrangement of the transmitting mechanism between the steam-cylinder and the air compressing or exhausting cylinders.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A represent two upright supporting-standards of my improved air compressing or exhausting pump. The standards A are supported on a bed-plate, A′, to the ends of which are further applied upright transverse standards A^2, that support the inner heads of the air compressing or exhausting cylinders B B′. The upright standards A A support at their upper ends a vertical steam-cylinder, C. The axis of the steam-cylinder C is in the same vertical plane with the axes of the horizontal air compressing or exhausting cylinders B B′, but at right angles, or nearly so, to the horizontal axis of the cylinders B B′. The piston-rod *a* of the steam-cylinder C is connected with a cross-head, *b*, that is guided in ways of the standards A A, the cross-head *b* being again connected by connecting-rods *d d* to cranks D of a transverse horizontal shaft, D′, that turns in bearings of the lower parts of the standards A A. A fly-wheel, D^2, is applied to one end of the shaft D′, while the eccentric that controls the slide-valve of the steam-cylinder C is applied to the other end of the crank-shaft D′, as shown in Fig. 2. The transverse connecting-pin of the cranks D D is passed through a cross-head, *e*, that is guided in a vertical yoke, E, to which the piston-rods *f f′* of the pistons of the air compressing or exhausting cylinders B B′ are rigidly secured. In place of the yoke E, the cranks D D may be connected to double piston-rods, which are again applied to cross-heads that reciprocate in horizontal ways, and are connected to the piston-rods of the cylinders B B′. In case one compression or exhausting pump only is required, the second cylinder is replaced by a plain guide-sleeve for guiding the second piston-rod. This sleeve may be considered as represented by the sleeve *s*, shown at the right of Fig. 1 supported by a plate, *t*. When the pistons of the air-cylinders arrive at the ends of their strokes, the connecting-cranks D D are acted upon by the full power of the piston of the steam-cylinder, and thereby carried without difficulty over the dead-points of the piston-rods of the air-cylinders, so that the pistons of the latter are better adapted to overcome the resistance of the air at the ends of their strokes. The advantages of this construction are that it provides for double-acting cylinders, the piston-rods of which move in a right line, and are connected by a simple intermediate mechanism with a steam-piston, whereby the power of the steam is utilized to the best advantage.

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

1. The combination of a vertical steam-cylinder, horizontal air compressing or exhausting cylinders, the axes of which are located in the same plane with but at right angles to the axis of the steam-cylinder, a transverse crank-shaft, connecting-rods pivoted to the piston-rod of the steam-cylinder and the cranks of said crank-shaft, a vertically-reciprocating cross-head connected to said crank-shaft, a yoke for guiding said cross-head, and connected to the piston-rods of the air compressing or exhausting cylinders, substantially as and for the purpose set forth.

2. The combination of the vertical support-

ing-standards A, a vertical steam-cylinder, C, supported at the ends of the standards A, piston-rod *a* of the piston of the steam-cylinder C, cross-head *b*, connecting-rods *d d*, transverse crank-shaft D D′, cross-head *e*, reciprocating yoke E, piston-rods *f f′*, and horizontal air compressing or exhausting cylinders B B′, supported by transverse standards A^2, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PETER EHLERS.

Witnesses:
M. F. CAREY,
WM. LACY.