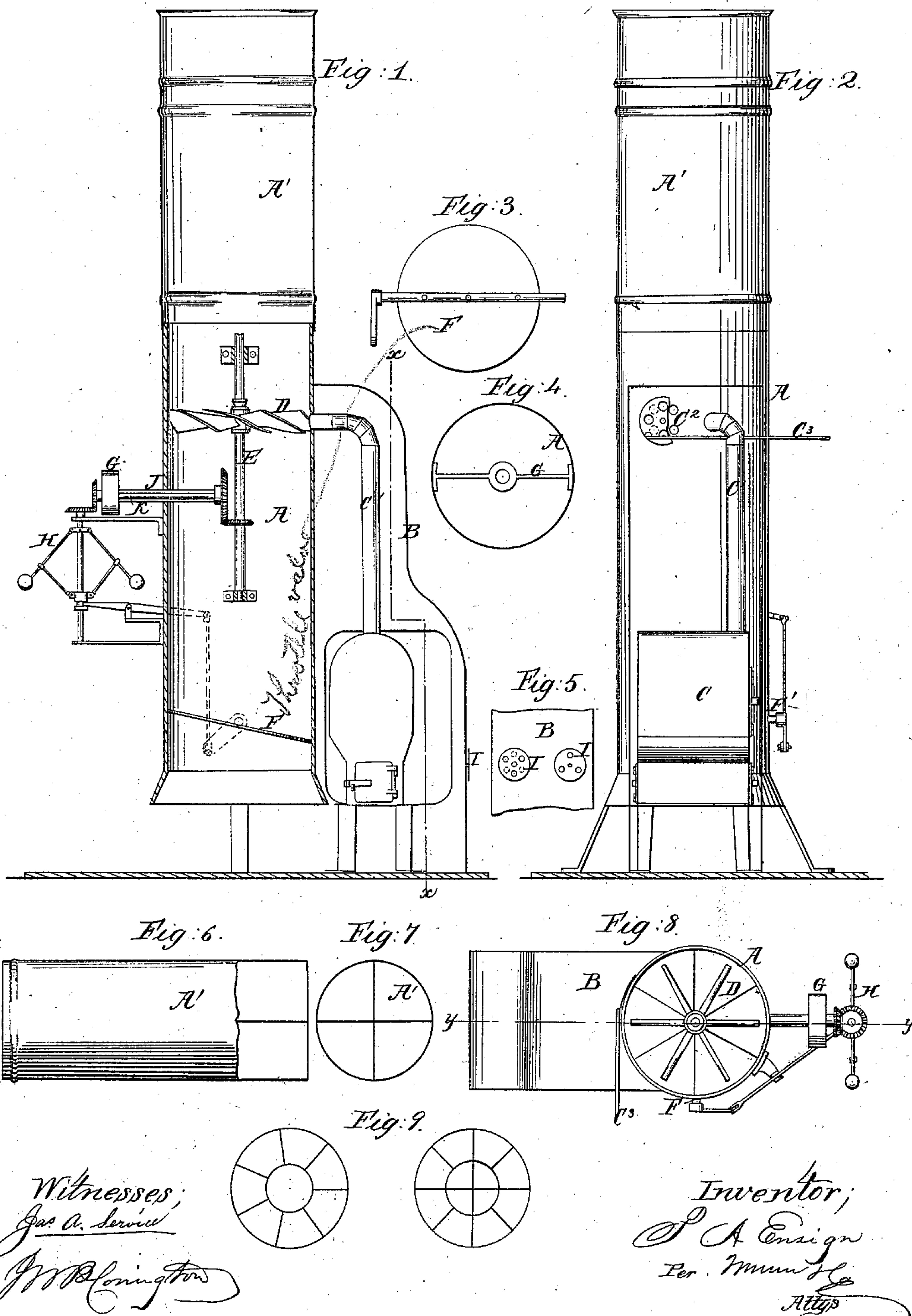


P. A. Ensign,

Wind Wheel,

No. 58,397,

Patented Oct. 2, 1866.



UNITED STATES PATENT OFFICE

PETER A. ENSIGN, OF ADRIAN, MICHIGAN.

IMPROVEMENT IN AIR ENGINES OR MOTORS.

Specification forming part of Letters Patent No. 58,397, dated October 2, 1866.

To all whom it may concern:

Be it known that I, PETER A. ENSIGN, of Adrian, Lenawee county, State of Michigan, have invented a new and useful Improvement in Air-Motors; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an axial section of an apparatus made according to my invention. Fig. 2 is an elevation, partly in section on the bent line x of Fig. 1. Fig. 3 is a detail view of the damper F. Fig. 4 is a top view of cylinder A. Fig. 5 is an elevation of that part of the heater B which contains the dampers I I. Fig. 6 is a peripheral view, one side being partly broken away, of an upper section, A', of the cylinder of the apparatus. Fig. 7 is a top view of such section. Fig. 8 is a top view of the apparatus. Fig. 9 shows, in red outline, two methods by which the upper parts or sections of the cylinder may be divided into compartments.

Similar letters of reference indicate like parts.

The object of this invention is to obtain motive power from the movements of a column or columns of air in a cylinder, such power being made use of to drive machinery by means of suitable connections made in any convenient way.

The movement of the air may be accelerated by heating it, for which purpose a furnace and heater are attached to the apparatus, the products of combustion and heated air from which may be directed into the apparatus beneath a set of vanes, which are immediately set in motion by the pressure of the hot air, &c., such motion being then communicated to a driving-pulley outside of the apparatus by means of suitable gearing.

The speed is governed by a governor, which operates a throttle-valve inside of the cylinder below the vanes.

The letter A designates a vertical hollow cylinder, open at its ends, and supported at a suitable height above the ground to allow air to enter it freely.

Near the lower end of the cylinder is placed a throttle-valve, F, whose shaft is connected

through a crank to a connecting-rod, F', outside of the cylinder, which rod is moved by means of the rising and falling of the balls of a governor, H, in the usual way.

The shaft of the governor (see Fig. 1) is supported by brackets outside of cylinder A, the upper end of said shaft being connected by bevel-gears with a horizontal shaft, K, which goes through the side of the cylinder toward its center, where it is connected by bevel-gears with a vertical shaft, E, supported in the axial center of cylinder A.

The shaft K is supported and inclosed by a stationary tube, J, which has several holes on its upper side to receive oil for lubricating the shaft.

The shaft E is supported in suitable cross-pieces, which may be provided with cups to hold oil for lubrication. Around said shaft E, near its top, is a wind-wheel, D, whose vanes reach nearly to the interior surface of the cylinder, being set at such a height as to be about opposite the places of discharge of hot air and gases from the heater and furnace connected with the apparatus.

The cylinder A is lengthened by means of sections A', one of which is shown in Figs. 1, 2, 6, and 7, such sections being made plain or with two or more divisions throughout their length, for the purpose of making the currents of air move upward with increased energy.

The letter B designates the wall of a heater, which is placed along one side of the cylinder, extending downward nearly to the ground, and inclosing a stove, C, which may be fitted and arranged to burn coal or wood.

The stove-pipe c is extended upward nearly to the top of the heater, and is then led into the cylinder.

The heater B is closed below, and has register-openings I I for the admission of air, which will become heated from the stove, and is discharged into the cylinder at c^2 , where are several openings in the walls of the cylinder, that are controlled by a damper, whose handle, c^3 , is taken through one side of the heater, in order to be within reach of the operator. The heater has suitable doors, through which the stove can be reached.

I have shown but one wind-wheel in this example of my invention; but there may be two

or more. The damper F is to be so arranged and connected with the governor as to be gradually turned across the space within the cylinder as the motion of the wheel D increases, thereby partially shutting off the supply of air from below.

It will be observed that the wheel D, being placed horizontally across the cylinder, will intercept the column or current of air that ascends within the cylinder, and be rotated by reason of the obliquity of its vanes. The rapidity of the current will depend partly on the height of the cylinder, whose height may be increased by adding sections A', which may be, as above stated, divided into two or more compartments, in order, by dividing the column of air, to increase the rapidity of its ascent. The upward movement of the air may also be accelerated by means of the stove and heater C B, the hot air and gases from which will, when delivered into the cylinder, induce an upward movement of air from below.

The outer end of shaft K has on it a pulley, G, which can receive a band when motion is to be communicated from it to a pulley on any machine that is to be operated.

I claim as new and desire to secure by Letters Patent—

1. The combination and arrangement of the cylinder A, suitably elevated, wind-wheel D, vertical shaft E, shaft K, perforated stationary tube J, governor H, valve F, and heater B, substantially as described, for the purpose specified.

2. The heater B and stove C, arranged along side of and connected to the cylinder, as above described, in combination with the said cylinder and the wind-wheel, substantially as shown.

The above specification of my invention signed by me this 31st day of March, 1866.

PETER A. ENSIGN.

Witnesses:

GEO. H. PARK,
GEO. M. PARK.