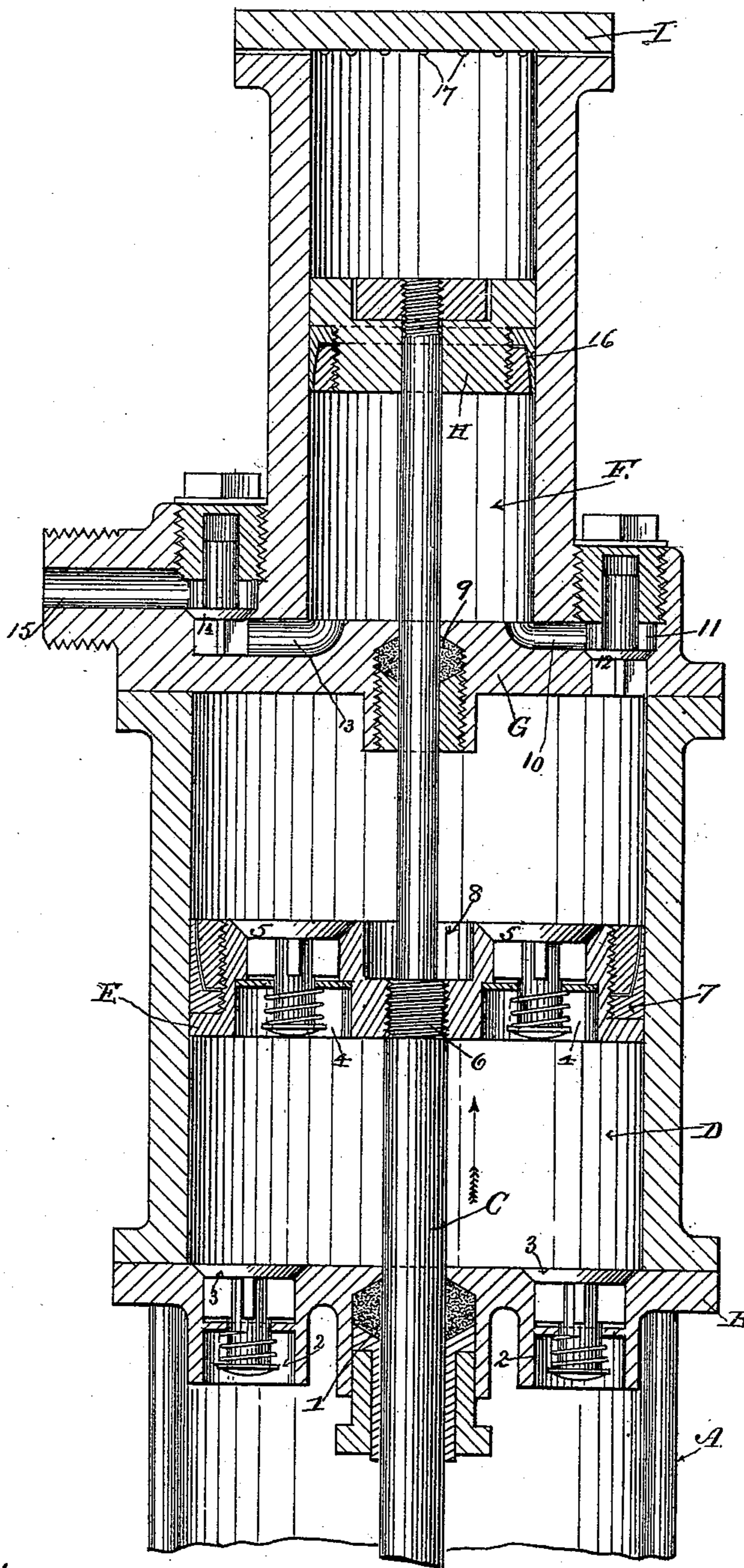


(No Model.)

E. C. FASOLDT.  
AIR COMPRESSING PUMP.

No. 464,223

Patented Dec. 1, 1891.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## AIR-COMPRESSING PUMP.

SPECIFICATION forming part of Letters Patent No. 464,223, dated December 1, 1891.

Application filed September 24, 1891. Serial No. 365,947. (No model.)

*To all whom it may concern:*

Be it known that I, ERNEST C. FASOLDT, of the city and county of Albany, in the State of New York, have invented new and useful  
5 Improvements in Air-Compressing Pumps, of which the following is a specification, reference being had to the accompanying drawing, which forms part of this specification, and which illustrates a vertical central sec-  
10 tion of my air-compressing pump.

My invention relates to improvements in pumps for effecting a compound compression of air by each stroke of the piston of the pump; and the object of my invention is to  
15 simplify the construction of the pump and render its operation more effective.

As illustrated in the drawing, A indicates the bed-piece of the pump, of which the head B for the primary cylinder preferably forms  
20 an integral part. Said head is provided with a stuffing-box 1 for forming an air-tight joint around a piston-rod C, which is fitted to reciprocate through the head B. The latter is also provided with inlet air-openings 2, pro-  
25 vided with spring-actuated valves 3 for closing said openings.

D is the primary cylinder of my air-compressing pump, into which the air is first drawn and in which the first compression of  
30 the air is effected.

E is a piston fitted to slide reciprocally in the primary cylinder D, and provided with openings 4 for the passage of the air from one side of the piston to the opposite side,  
35 and said openings are provided with spring-actuated valves 5, which are fitted to form air-tight joints with the end of said openings. The piston E is secured to the piston-rod C, so as to be firmly held thereon, and the mode  
40 of so securing the piston to the piston-rod may be by means of screw-threads 6, as shown in the drawing, or by any other suitable means commonly employed for a like purpose. The perimeter of the piston E is pro-  
45 vided with packing 7, for the purpose of forming an air-tight contact with the bore of the cylinder D, so as to prevent a leakage of air at that point, and a chamber or depression 8 is formed centrally in the upper face of said  
50 piston, for a purpose hereinafter explained.

F is a secondary cylinder erected on the upper end of the primary cylinder D. The two cylinders are separated horizontally by a head or partition G, which is common to both of them, but is preferably made inte-  
55 gral with the secondary cylinder. Said head is provided with a stuffing-box 9, whereby an air-tight joint is formed around that part of the piston-rod C which passes through the head G from the primary cylinder D into the  
60 secondary cylinder F, and said stuffing-box is adapted to enter the chamber 8 when the piston E is approaching the termination of its stroke toward the head G. By this provision the clearance of said piston in said phase of  
65 its stroke is reduced to a minimum, so that a more perfect compression of the air can be obtained in said cylinder than when a large clearance is allowed for said piston in the  
70 cylinder D.

The head G is provided with a passage 10, that forms a communication with an opening 11, provided with a valve 12, said passage and opening forming a communication from  
75 the upper end of the primary cylinder to the lower end of the secondary cylinder, for allowing the compressed air to pass from the former into the secondary cylinder. Said head is also provided with an eduction-pas-  
80 sage 13, provided with a valve 14, which is fitted to automatically close the communication through said passage, and a nozzle 15 affords the means for connecting a pipe to the eduction-passage for the purpose of conduct-  
85 ing the compressed air to any point where it is required.

H is a piston fitted to reciprocate in the bore of the secondary cylinder F, and provided with suitable packing 16 to form an air-tight joint for said piston with the bore of the  
90 secondary cylinder. Said piston is securely fastened to the piston-rod C by any suitable means.

I is a cylinder-head attached to the secondary cylinder F by any of the well-known  
95 means for making such attachments, air-holes 17 or other form of leakages being formed between said cylinder-head and cylinder for the purpose of allowing air to pass freely into and out of the cylinder at that point.  
100

My pump may be driven by means of a steam-cylinder fixed to the bed-piece A, and having its piston attached to a continuation of the piston-rod C, after the manner of an ordinary steam-pump, or by motive power applied to a shaft having a crank connected to the piston-rod C, or in any other suitable manner by which a reciprocating motion can be imparted to the piston-rod C and its attached pistons E and H.

My invention operates in the following manner: When the piston-rod C is moved inwardly in the direction indicated by the arrow in the drawing, air is drawn through the inlet-openings 2 to fill the space between the head B and piston E, as the latter recedes from said head. In making this stroke if any air is contained in the cylinder D between the piston E and head G, said air will be forced into the secondary cylinder F, through the opening 11, in a compressed condition. By the return stroke of the piston E the air in the cylinder D between the head B and piston E will pass through the openings 4 into the space between the piston E and head G. Simultaneously with this shifting movement of the air in the primary cylinder D the piston H will force the air contained in the secondary cylinder F, said air being in a compressed condition, from said cylinder through the eduction-passage 13 to the place required, and the air, being decreased in volume to enable it to pass through the

eduction-passage 13, will have its pressure correspondingly increased.

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

In a compound air-compressor comprising two single-acting air-compressing pumps, the combination, with a large primary compressing-cylinder D, provided with valved induction-openings 2, and a smaller secondary compressing-cylinder F, provided with a head G, which forms a partition that is common to both of said cylinders between the conjoining ends of the latter, said head being provided with a centrally-located stuffing-box 9 and with a passage 10, leading from said primary cylinder into the secondary cylinder, the opening through said passage being governed by a valve 12, said head being also provided with a valved eduction-passage 13, which leads from said secondary cylinder, of a single piston-rod C, which, passing through the stuffing-box 9 of the head G, is common to both of said cylinders, and two pistons E and H, secured to said piston-rod, the piston E being fitted to reciprocate in the cylinder D and having valved openings 4 formed therein, and the piston H being fitted to reciprocate in the cylinder F, as and for the purpose herein specified.

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Witnesses:

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