(No Model.)

O. L. SMITH.

AIR COMPRESSOR AND BLOWER.

No. 572,383. Patented Dec. 1, 1896.

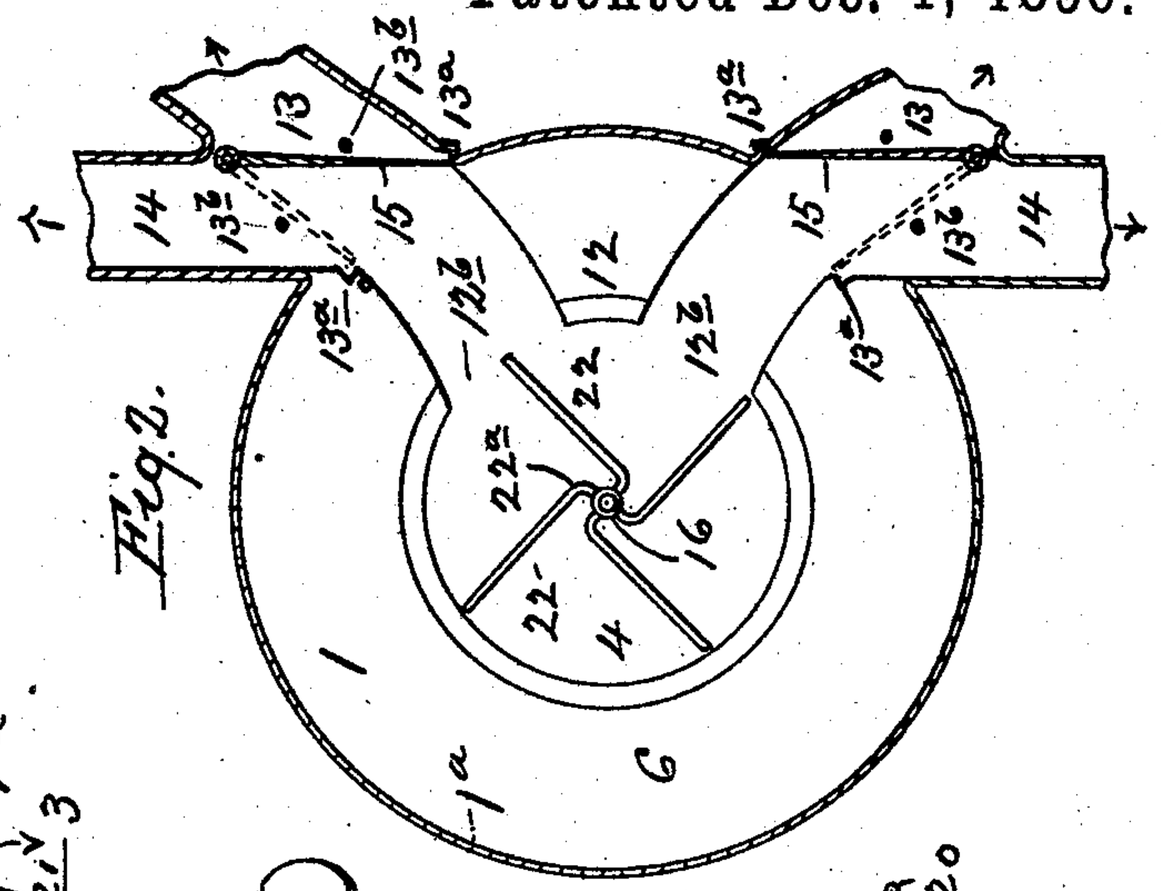

Fig. 2.

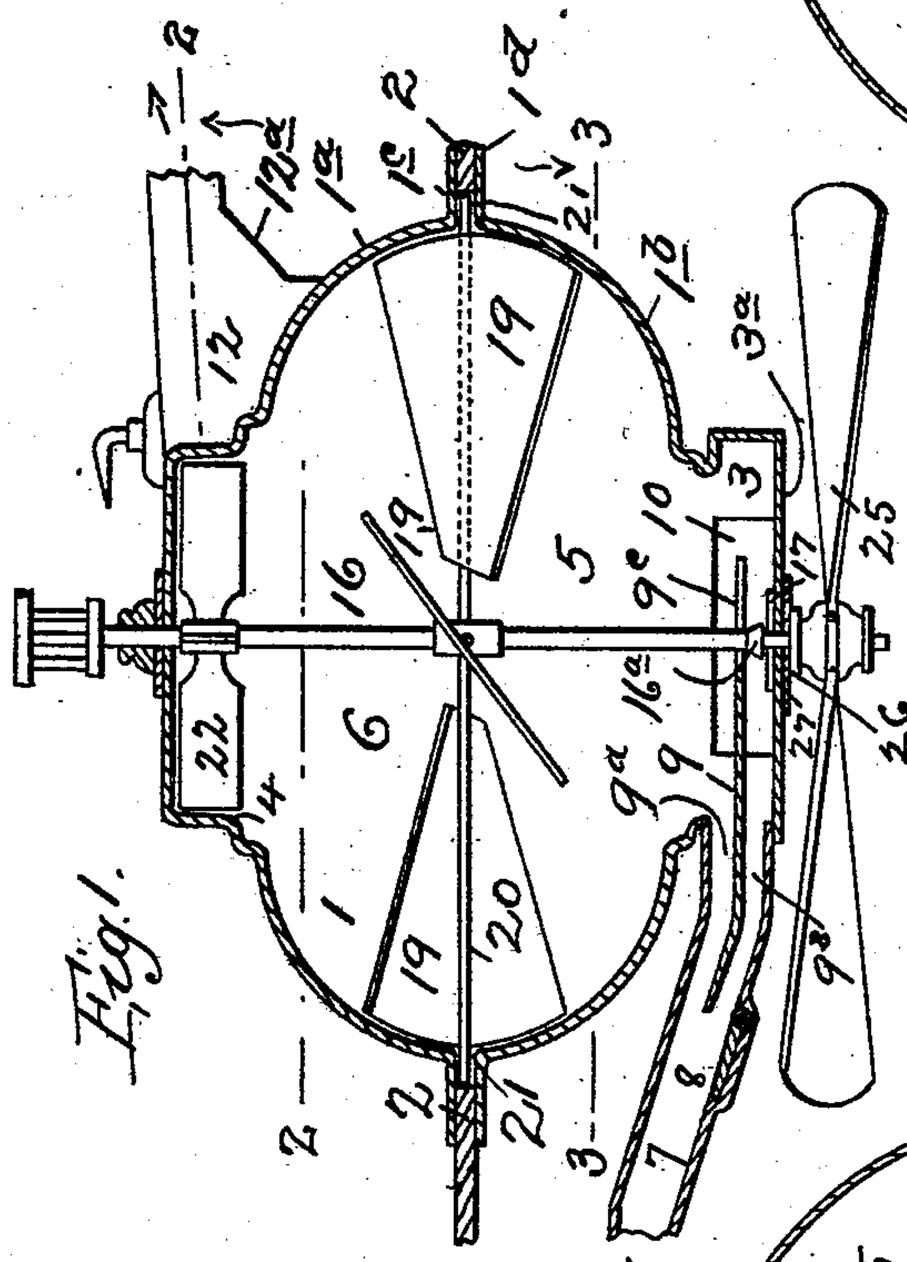

Fig. 1.

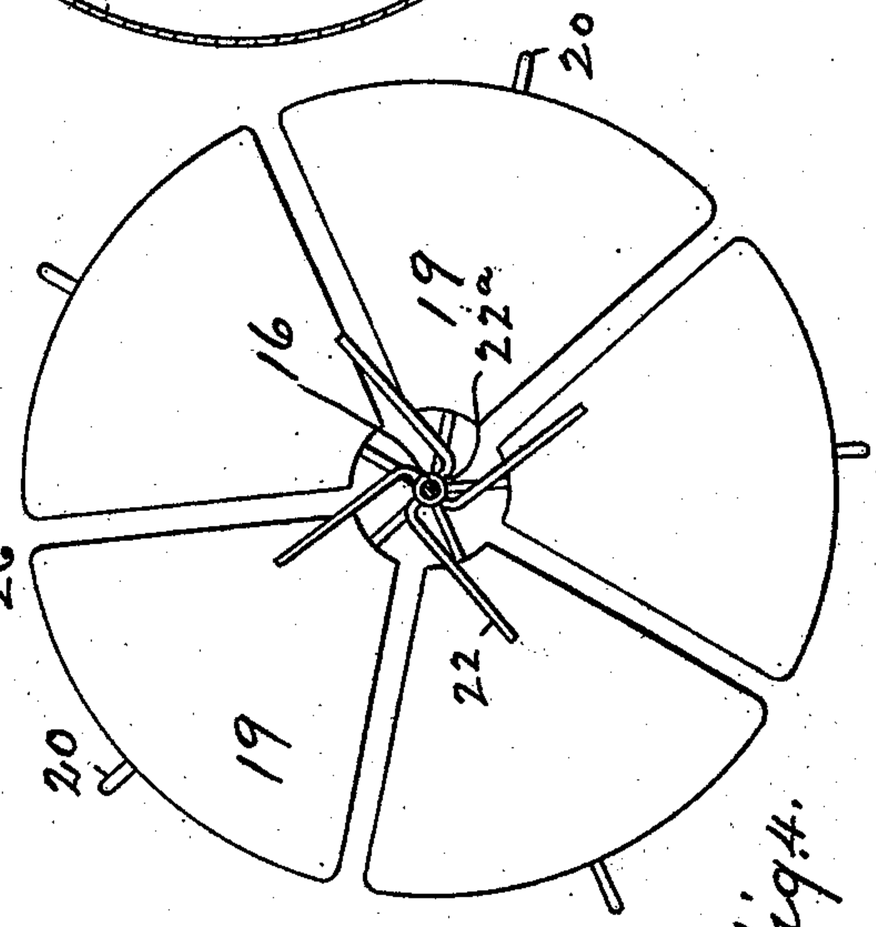

Fig. 4.

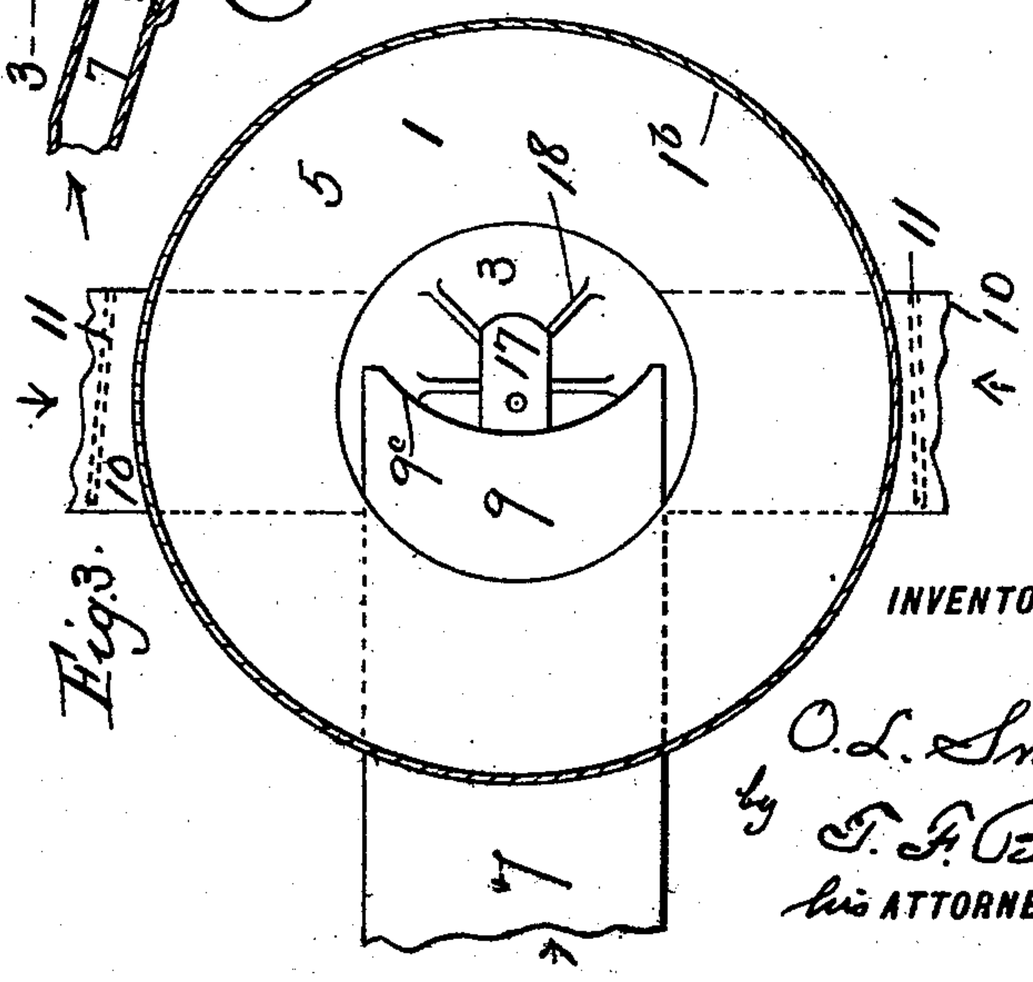

Fig. 3.

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AIR COMPRESSOR AND BLOWER.

SPECIFICATION forming part of Letters Patent No. 572,383, dated December 1, 1896.

Application filed January 27, 1896. Serial No. 577,058. (No model.)

To all whom it may concern:

Be it known that I, OSCAR L. SMITH, residing in the village of Edgewater, (Rosebank P. O.,) Richmond county, New York, have invented certain new and useful Improvements in Air Compressors and Blowers, of which the following is a specification.

The object of my invention is to provide a machine which will draw in air, distribute it evenly within the casing, compress it, and discharge it therefrom under pressure.

The invention consists in the novel details of improvement and the combinations of parts that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a central vertical section through the casing of my improved compressor and blower. Fig. 2 is a horizontal section, inverted, on the line 2 2 in Fig. 1. Fig. 3 is a horizontal section on the line 3 3 in Fig. 1, and Fig. 4 is a plan view of the suction and compressing fans or blades.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views, the number 1 indicates the main casing of the machine, which is divided into compartments.

The casing 1 is composed of an upper section 1^a and a lower section 1^b, flanges 1^c 1^d being located at the meeting edges of said casing and properly secured together. 2 is packing between said flanges to make an air-tight fit. The casing 1, at the bottom of section 1^b, has a compartment 3, which receives the air, and the section 1^a has an upper compartment 4, in which the air is compressed, and between the compartments 3 4 are intermediate compartments 5 6, divided by fans or blades, as hereinafter explained. The compartments 3 4 may be formed by the metal of the sections 1^a 1^b or by separate parts secured thereto.

7 is an inlet-pipe which leads to the compartment 3 of casing 1, and it is provided with a suitable valve 8 to regulate the passage of air.

9 is an air-distributing plate located in the delivery end of pipe 7 and extending into the compartment 3 about in line with the center thereof. The plate 9 lies between the upper and lower walls of pipe 7 and forms upper and lower air-channels 9^a 9^b. By this means the air from pipe 7 is distributed evenly throughout all portions of the casing below the fan 19, so as to supply the fans more uniformly with air than if the air merely entered the casing at one point.

10 are air-inlet pipes leading to opposite sides of the compartment 3 for admitting air thereto, and said pipes 10 are provided with suitable valves 11 for regulating the admission of air to said compartment. When valve 8 is open, valves 11 will be closed, and vice versa, to admit air either through pipe 7 or pipes 10, as required.

From the compartments 4 and 6 extend outwardly two incasements 12, that are a part of the casing, being firmly joined to it, both of which lead from side openings in the casing 1^a. These incasements 12 open outwardly and extend well down the sides of the section 1^a, being inclined downwardly at 12^a, and having flaring mouths or ends 12^b to readily receive air from the compartments to be discharged from the rear and sides. From the incasements 12 extend pipes 13 for conducting away the air, and to the pipes 13 are joined pipes 14. (See Fig. 2.)

15 are valves located at the junction of the pipes 13 14, and they are arranged to close pipes 13 while opening pipes 14, and vice versa, as required, so that the air from the casing can pass through either set of pipes desired. The pipes 13 have recesses 13^a to receive the ends of valves 15 to prevent the passage of air when the valves are closed. Valves 11 and 15 can be connected together, so as to be operated simultaneously. Pins 13^b in each pipe help to sustain the middle of the valve and prevent bending thereof.

16 is a vertical shaft journaled at its upper and lower ends in the main casing 1 and projecting therefrom. This shaft may be rotated by any suitable means. Near its lower end the shaft 16 has a shoulder or bearing 16^a, which rests on a plate or step 17, secured on the bottom of compartment 3 and having an aperture for the passage of said shaft. 18 18 are prongs extending from plate 17 and secured to the bottom 3^a to strengthen the structure.

The shaft 16 at about its center carries fans

or blades 19, which are so inclined as to draw air from compartment 3 and force it upwardly. The fans 19 are carried by and suitably secured to rods 20, that are carried by shaft 16 and project radially therefrom. The ends of rods 20 project beyond the ends of fans 19 and extend into an annular groove 21 in the walls of casing 1. (See Fig. 1.) The ends of rods 20 do not normally engage the walls of groove 21, but are arranged to engage the wall when necessary, to assure the stability of the rods and blades against excessive air-pressure up or down and to prevent any side deviation of the shaft 16 at its middle.

22 are fans or blades carried by the shaft 16 near its upper end in the compartment 4. These fans or blades are placed vertically edgewise so as to present a flat surface to the air, and they act to compress the air in the compartment 4 into a strong steady whirlwind that is forced into the incasements and equally discharged from the pipes 13 or 14 and to force it under pressure through the incasements and pipes. As shown in Figs. 2 and 4, the blades 2^b extend outwardly from the shaft 16 and are then bent backwardly at 22^a, whereby they extend tangentially to the shaft, so as to force the air into the incasements and pipes.

The inner end of air-distributing plate 9 is curved inwardly in Fig. 3 at 9^c to deliver the feed-air from pipe 7 or pipes 10 uniformly throughout to compartments 3 and 5. This distributer-plate 9, with the compartments 3 and 5, is made to deliver the feed-air to all portions of fan 19 equally, the three air-inlets allowing air to be drawn into the casing at different points to enable it to be quickly and evenly distributed within the casing.

The construction above described affords a simple yet compact and effective structure for sucking or drawing in the air and for compressing it and forcing it under pressure from the casing and incasements and all by the rotation of a single shaft.

The lower projecting end of shaft 16, below the casing, may be provided with a horizontal fan 25, suitably secured thereto, which will tend to lift the shaft and thus reduce friction and wear on the shoulder 16^a on said shaft. The shaft 16 has a bearing or shoulder 26, against which the fan 25 bears more or less when rotated, the collar or shoulder 26 resting against a lower friction-plate 27, secured on the bottom of the casing.

Having now described my invention, what I claim is—

1. A casing having a central enlarged compartment, and an upper and lower contracted compartment communicating therewith, a feed-pipe leading to the lower compartment, and incasements opening into the upper compartment, combined with a shaft, a set of fans or blades carried by said shaft in said central compartment, and a set of smaller air-compressing fans or blades carried by said shaft in the upper compartment of said casing, substantially as described.

2. A casing having an upper and lower compartment, a feed-pipe leading into said lower compartment and a distributing-plate located in said feed-pipe and extending into said lower compartment, combined with a shaft, a series of blades carried thereby in said casing for drawing in air, another series of blades carried by said shaft in said upper compartment for compressing and forcing out air, and incasements carried by said casing to receive and conduct air, substantially as described.

3. A casing having an upper and lower compartment, a feed-pipe 7 leading to the lower compartment, a distributing-plate 9 extending from the feed-pipe 7 into said lower compartment, feed-pipes 10 also leading into said lower compartment, the inner end of said plate being curved at 9^c to distribute air from the pipes 7 and 10, and incasements connected with the upper compartment, to receive air, combined with a shaft having a series of fans or blades 19, to draw air, and a series of fans 22 to compress and expel air, substantially as described.

4. A casing having an upper and lower compartment, and an annular groove 21, and a feed-pipe leading to the lower compartment, combined with a shaft having a series of fans or blades, and rods extending from said fans or blades and located in said annular groove, as and for the purposes specified.

5. The combination of a casing having an upper and lower compartment, and an air-inlet for said lower compartment, with incasements connected with said upper compartment and inclined downwardly at 12^a to form a flaring mouth opening into the upper portion of said casing, in combination with a shaft having a double series of fans or blades to draw in, compress and expel air, as and for the purposes specified.

6. A casing having air inlets and outlets, combined with a shaft 16, a double series of fans or blades carried thereby in said casing, and a fan carried by said shaft below said casing, substantially as described.

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Witnesses:
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