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FAN.

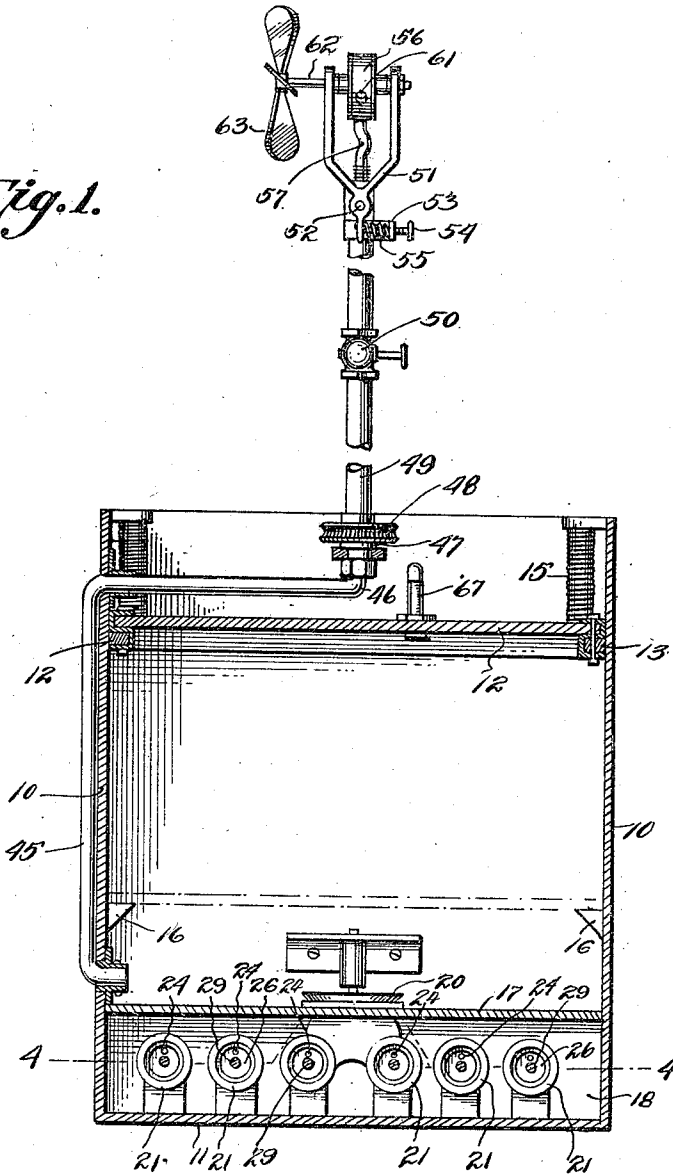
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1,293,518.

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4 SHEETS—SHEET 1.

Fig. 1.



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 4 SHEETS—SHEET 2.

Fig. 2.

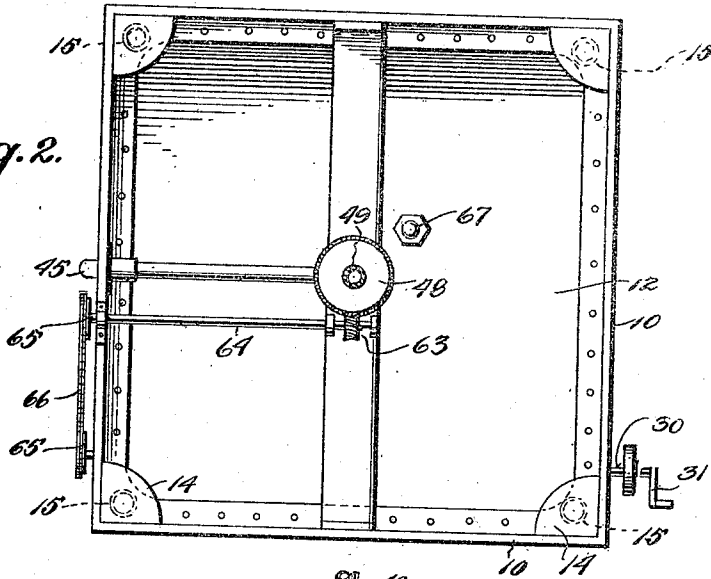
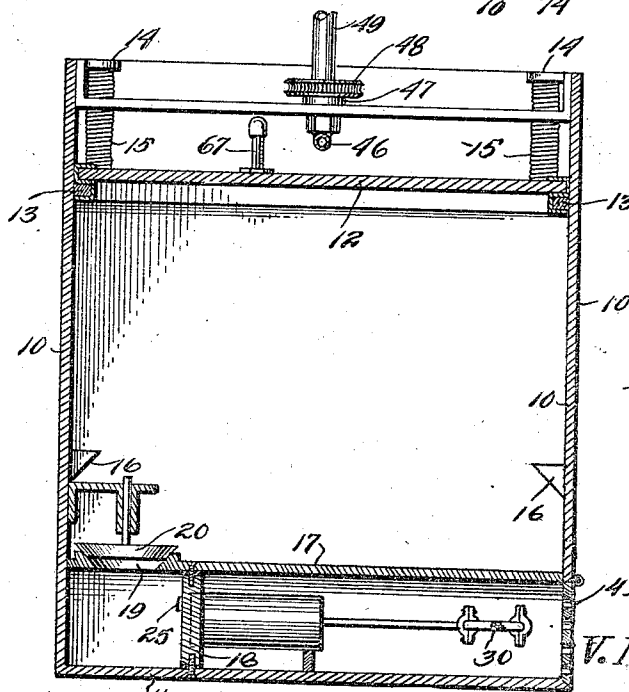


Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 4.

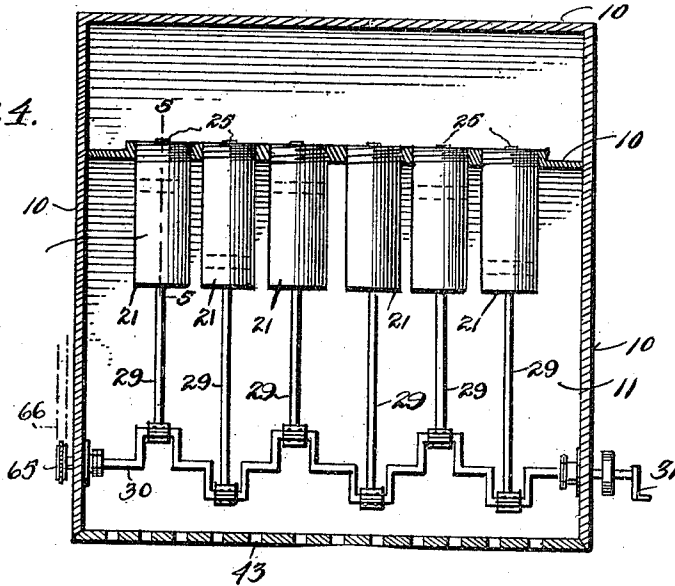
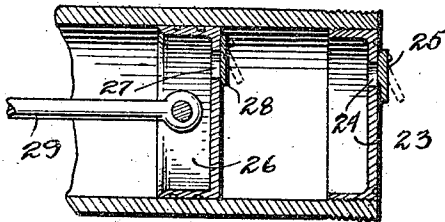


Fig. 5.



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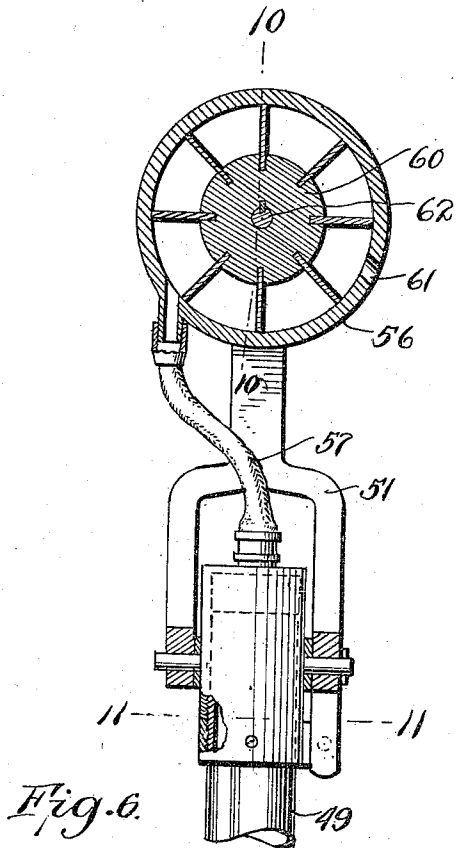
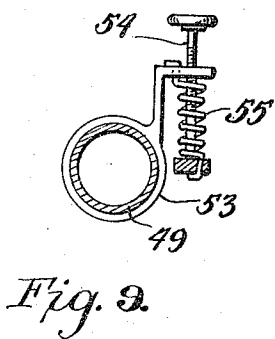
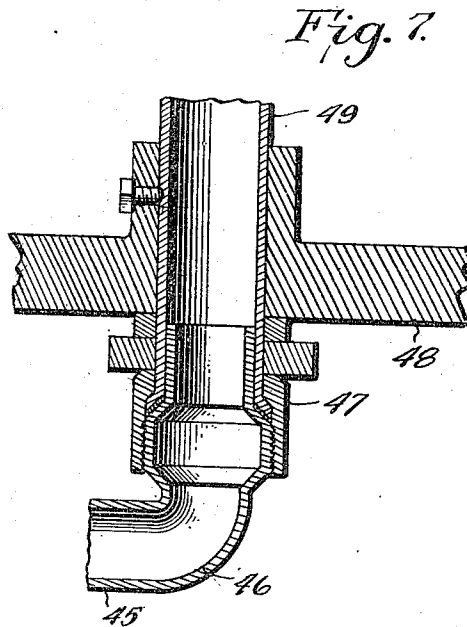
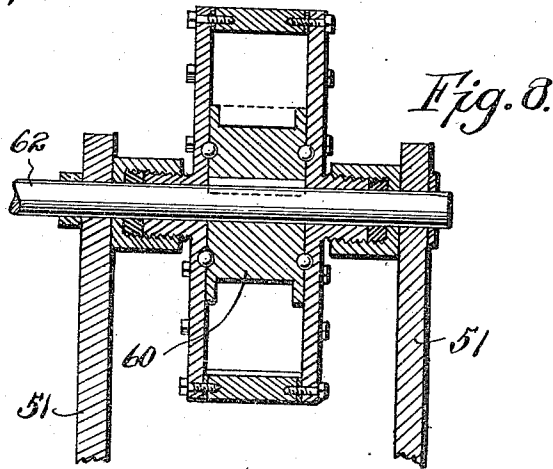
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, VICTOR NIEWINSKI, a citizen of Russia, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Fans, of which the following is a specification.

This invention relates to motors and has special reference to a compressed air engine adapted particularly to run a ventilating or table fan.

One important object of the invention is to improve the general construction of devices of this character.

A second important object of the invention is to provide an improved self controlled device of this character embodying an air reservoir having a variable effective volume so that the air contained in the reservoir may be utilized as fully as desired for the operation of a fan or other air engine.

A third important object of the invention is to provide an improved arrangement of this character wherein the fan engine is mounted for varying position on the reservoir casing so that the blast of air from the fan may be controlled in direction.

With the above and other objects in view, as will be hereinafter apparent the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawing, and specifically claimed.

In the accompanying drawing, like characters of reference indicate like parts in the several views, and:—

Figure 1 is a vertical section through the casing of a device of this character showing the reservoir, the fan and its engine being shown in elevation.

Fig. 2 is a top plan view of the reservoir, the fan supporting pipe being shown in section.

Fig. 3 is a vertical section through the reservoir at right angles to Fig. 1.

Fig. 4 is a section on the line 4—4 of Fig. 1.

Fig. 5 is a section on the line 5—5 of Fig. 4.

Fig. 6 is a vertical section partly in elevation through the fan.

Fig. 7 is a vertical section through a union employed herewith.

Fig. 8 is a section on the line 10—10 of Fig. 6.

Fig. 9 is a section on the line 11—11 of Fig. 6.

In carrying out the objects of this invention there is provided a casing having side walls 10 and a bottom 11. Within this casing is slidably mounted a plunger 12 which constitutes the top wall of the reservoir and which is provided around its periphery with suitable packing 13 to form an air tight joint. Projecting from the upper corners of the plunger 12 are coil compression springs 15 which constantly urge the plunger 12 downward. In order to prevent too great movement of this plunger stops 16 are provided within the casing adjacent the lower end thereof. Extending across the lower part of the casing is a diaphragm 17 which separates the casing into upper and lower chambers and extending transversely across the casing beneath this diaphragm is a partition 18. On one side of this partition the diaphragm 17 is provided with an opening 19 controlled by a check valve 20 so that air may pass upward through this opening 19 but can not pass downward. Within the lower chamber of the casing on the side of the diaphragm 18 opposite the opening 19 are cylinders 21. The cylinders 21 are of the ordinary pump cylinder type and are screwed into the partition 18 so that their ends are flush with the face of the partition which is adjacent the opening 19. These ends are preferably screwed into the respective cylinders as shown at 23 and each end is provided with an opening 24 controlled by a check valve 25 opening outwardly from the cylinder. In each of these cylinders there is a piston 26 having an opening 27 therein controlled by a check valve 28 just as in an ordinary flat valve pump. These pistons 26 are connected by piston rods 29 to a crank shaft 30 journaled in the sides of the casing and provided at one end with a handled crank 31. Now by means of this arrangement air from the intake chamber which is admitted from the atmosphere by ports 43, will be pumped upon rotation of the crank 31, into the re-

ceiving chamber beneath the valve 20 and thus force air into the body of the reservoir causing the plunger 12 to rise. As the plunger 12 rises the springs 15 are compressed so that there is stored in the reservoir by this means a body of compressed air of comparatively great quantity. Extending from the lower part of the reservoir upward is a pipe 45 the upper end of which is turned upward vertically as at 46 and on this upper end is mounted a swiveling union 47 carrying a worm wheel 48. Projecting upward from the union is a pipe 49 having a valve 50 therein, the pipe 49 forming practically an extension of the union and having mounted on its upper end a yoke 51 which is pivoted on horizontal axes 52. Extending from the pipe 49 is a bracket 53 where-through passes an adjusting screw 54 having its end swiveled in the lower arm of the yoke and between this roller arm and the bracket 53 is a coil spring 55. By means of movement of this adjusting screw 54 the angular relation of the yoke to the union may be changed. Mounted between the upper arms of the yoke 51 is a blower casing 56 which communicates by means of a flexible pipe 57 with the pipe 49. Within the blower casing is a rotor 60 here illustrated as typical of an impact rotor as can be seen by reference to Fig. 6, the casing being provided with the usual exhaust port 61. This rotor is fixed on a shaft 62 carrying at one end a fan 63. Now by means of this construction the compressed air from the reservoir will serve to drive the fan as the air is used up in the reservoir the pressure is maintained by the springs forcing the plunger downward. In order to adjust the swivel on its axis there is provided a worm wheel 63 which is mounted on a shaft 64. This shaft 64 may be connected by sprockets 65 and a chain 66 with the crank shaft 30 if desired so that by continuously operating the handle crank 31 the fan may be caused to continuously rotate about the axis of the pipe 49.

A suitable safety valve 67 is provided on the plunger 12 to prevent too great charging of the reservoir.

In operation after the reservoir has been charged in the manner as described above the valve 50 is opened and it will be observed

that by proper adjustment of the yoke and swivel the current of air from the fan may be caused to flow in any desired direction. This operation will continue until all of the air has been exhausted from the reservoir when the latter may be recharged by hand as previously described.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that many minor changes may be made in the form and construction of the invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described but it is wished to include all such as properly come within the scope claimed.

Having thus described the invention, what is claimed as new, is:—

1. In a device of the kind described, a casing constituting a reservoir and having a plunger movable therein toward and from one end of said reservoir, means constantly urging said plunger toward said end, an air compressor in the reservoir arranged to force air into the casing and thereby urge the plunger away from said end, a pipe leading upward from the reservoir and having its upper end vertical, a swiveling union on the upper end of the pipe, and an air engine mounted on and communicating with the union.

2. In a device of the kind described, a casing constituting a reservoir and having a plunger movable therein toward and from one end of said reservoir, means constantly urging said plunger toward said end, an air compressor in the reservoir arranged to force air into the casing and thereby urge the plunger away from said end, a pipe leading upward from the reservoir and having its upper end vertical, a swiveling union on the upper end of the pipe, a yoke pivoted to said union to swing on a horizontal axis, means to adjust the angular relation of the yoke and union, an air engine carried by said yoke, and a flexible pipe connecting the union and engine.

In testimony whereof I affix my signature.

V. NIEWINSKI.