

(No Model.)

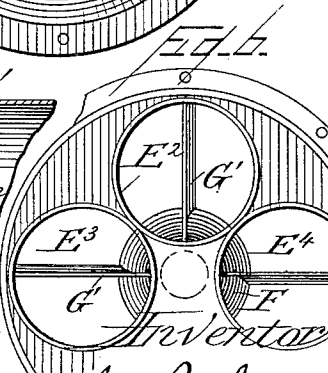
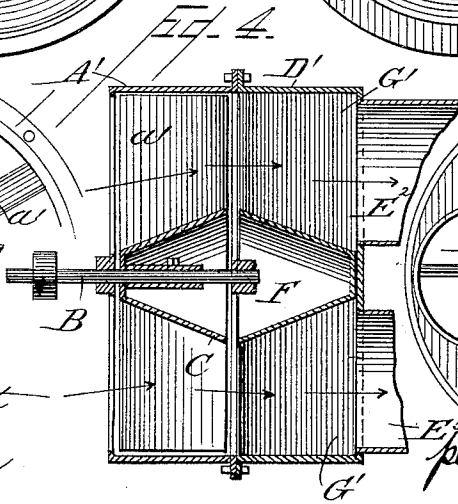
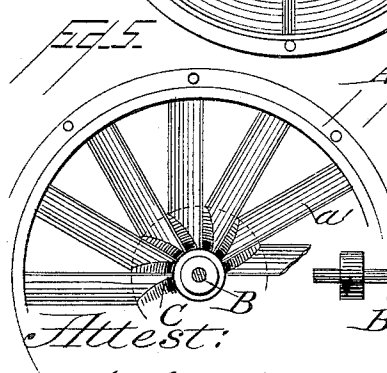
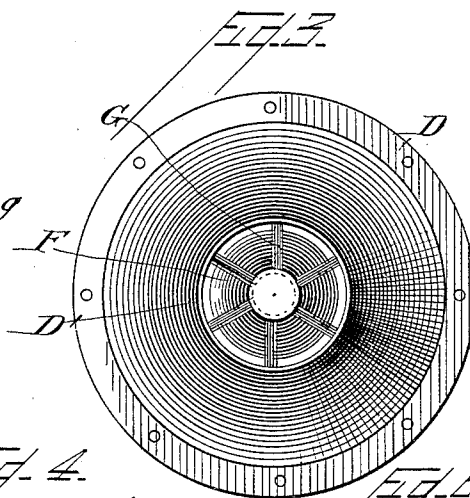
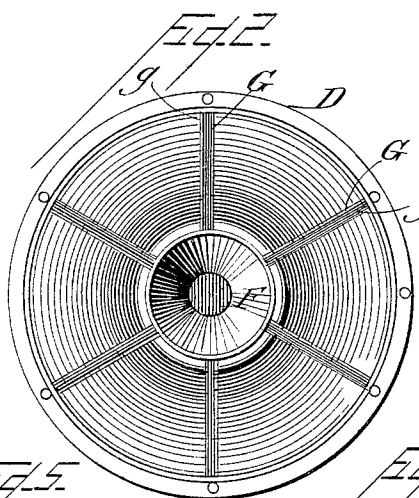
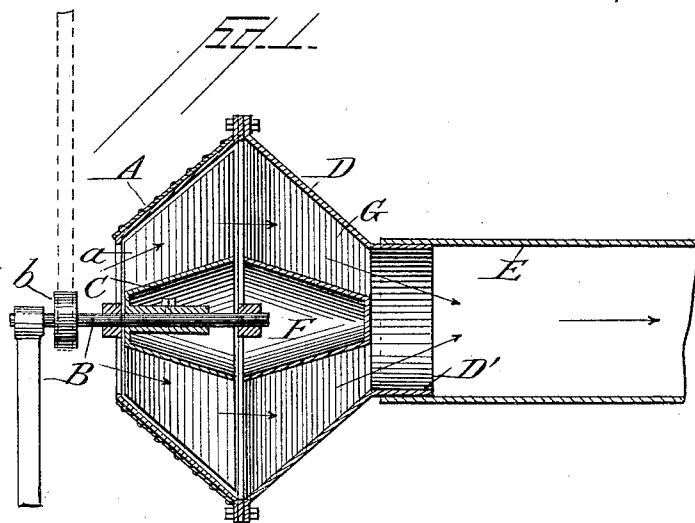
2 Sheets—Sheet 1.

J. M. SEYMOUR, Jr.

ATTACHMENT FOR EXHAUST OR OTHER FANS.

No. 461,051.

Patented Oct. 13, 1891.



Attest:
J. H. Schott
Wm. L. Boyden

Inventor
James M. Seymour, Jr.
per Charles W. Foster,
Att'y

(No Model.)

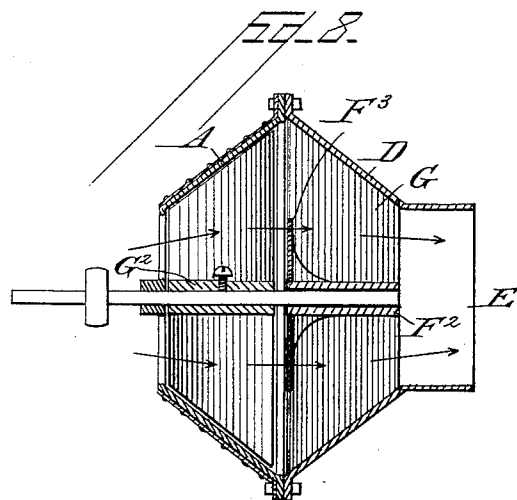
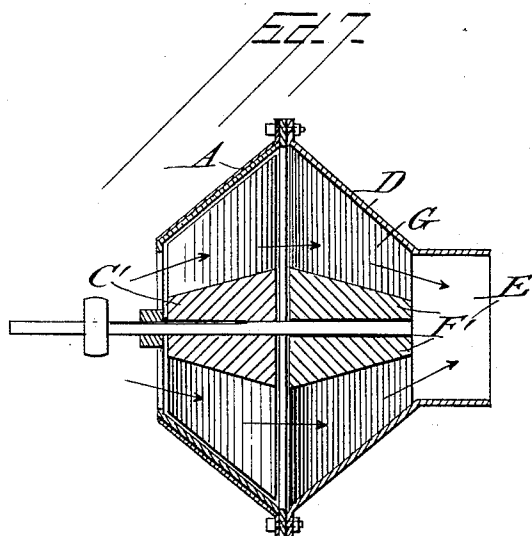
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per Fred B. Barker, atty

UNITED STATES PATENT OFFICE.

JAMES M. SEYMOUR, JR., OF NEWARK, NEW JERSEY.

ATTACHMENT FOR EXHAUST OR OTHER FANS.

SPECIFICATION forming part of Letters Patent No. 461,051, dated October 13, 1891.

Application filed October 4, 1890. Serial No. 367,097. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. SEYMOUR, JR., a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Attachments for Exhaust or other Fans; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to a device for attachment to or use in connection with an exhaust-fan or fan-blower whose object it is to generate a current of air or force or drive the same through a conveying conduit or conduits.

The object of the invention is to destroy the rotary motion of the air-current which leaves the fan and cause the said current to be propelled forward in a steady, compact, and constant rectilinear motion without revolving in the conveying air-conduit, so that the air which is thus furnished for use at any point may have a stronger and more effective current, thus making the fan-blower of greater utility.

It is well known that when a current of air is generated by a fan and delivered therefrom into a tube, pipe, or other conduit to be conveyed to the point where it is to be employed, the air within the conveying-tube partakes of the rotary motion of the fan which generates the current. This may be demonstrated easily by placing small bits of paper in a conveying-conduit, and they will be seen to fly about in a rotary fashion instead of moving forward in one continuous series. This rotary motion in a current weakens the force of the blast and renders the fan less efficient. My invention aims to overcome this defect in the use of fans for the purpose indicated.

The invention accomplishes its end by providing a partitioned receptacle, the construction of which may vary within very wide limits, which receptacle is located adjacent to the fan and at the end of the conveying pipe or pipes. Said partitioned receptacle or chamber may be said in one sense to constitute the end of the pipe. Its construction is

capable of such manifold variation that the broadest expression of the device may be that it is a partitioned receptacle to receive the air-current from the fan before it enters the pipe or conduit which is to convey the current to the point where it is used. This partitioned receptacle serves to break up the rotary motion of the air and cause it to enter the pipe in a steady continuous flow.

The invention therefore consists in the partitioned attachment for the fan, substantially as described, and in certain details in the construction, arrangement, and combination of the several parts, substantially as will be hereinafter more fully described, and pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical section of a fan-blower and my improved attachment thereto, the latter being shown applied in operative position between the blower and the air-pipe. Fig. 2 is an end elevation of my improved fan attachment, looking from the point of the fan. Fig. 3 is an view of end elevation of my improved fan attachment, looking from the air-pipe side of the same. Fig. 4 is a vertical section of a different form of fan and a modified form of my improved attachment, the latter being applied to a fan in operative position. Fig. 5 is a partial left-hand elevation of Fig. 4. Fig. 6 is a partial right-hand elevation of the same. Fig. 7 is a vertical section of a modified form of fan and also of my attachment. Fig. 8 is a vertical section of a still further modified form of fan and a still further modification in the construction of my improved attachment thereto.

Like letters of reference designate corresponding parts throughout all the different figures of the drawings.

It will be obvious that my improved attachment, whose object it is to destroy the rotary tendency of the air-current generated by the rapid revolution of the fan-blower, may be operatively applied to any kind of fan, and I am therefore limited to no particular construction of the latter. I have shown in the drawings several forms of fan with which the invention may be employed.

In Fig. 1 the exhaust-fan consists of a conical casing A, a rotary fan within the same, composed of radial vanes or blades *a*, whose ends are inclined so as to be parallel to the casing A, the driving-shaft B, which is supported in suitable bearings and has thereon a belt-pulley *b*, to which power is applied, as shown by dotted lines in Fig. 1, for the purpose of actuating the shaft, and the conical fan-hub C, secured on the said driving-shaft B, said conical fan-hub being substantially parallel to the conical fan-casing A, and the width of said casing from front to rear being considerably less than its diameter across the face. This is one example of fan in connection with which my improved attachment may be used for the purpose of breaking up the rotary tendency in the current generated by said fan.

In Fig. 4 I have indicated a slightly-different kind of fan, the casing thereof A' being parallel to the driving-shaft B instead of inclined like casing A in Fig. 1, and although the rotary fan is similarly composed of radial vanes or blades *a'*, yet their ends are not inclined, but straight and parallel to the casing A', and also to the driving-shaft B. In this modified form of fan a conical hub C is employed, the same as in Fig. 1.

In Figs. 7 and 8 I have indicated still further modifications in the construction of the fan. In these two figures the casing A of the fan is inclined as it is in Fig. 1 and the fan is composed of a series of radial vanes or blades whose ends are inclined so as to be parallel to the casing. In Fig. 7, however, the fan-hub is a solid fan-hub C', instead of being hollow like fan-hub C in Fig. 1, and in Fig. 8 the fan-hub C² is straight-edged, being cylindrical in form instead of conical. All these variations, however, are given here simply as examples of fans with which the invention may be used, and I am not restricted to these examples, but can use the invention with any kind of a fan which is used for the purpose of generating a current of air.

I will now proceed to describe the construction of one form of partitioned chamber which constitutes my improved fan attachment.

D designates the inclined wall of the device, which is really a conical casing having the general form of a hollow conical frustum and constructed in any suitable and desirable manner, being made either sectional or in a single piece, as may be preferred. The end of the conical casing which is of longer diameter is located closely contiguous to the air-egress end of the fan, said diameter at this end of the device being equal to the diameter of the fan and the device being firmly fastened to the fan by means of bolts, or else stationed in a fixed position closely adjacent to the fan in any suitable and desirable way, so that the blast of air generated by the revolution of the fan may immediately enter the open end of the conical casing D. The end of

the said casing D having a less diameter is preferably provided with a short pipe D', which enters the air pipe or conduit E, or said pipe and the conical casing may be made integral, the said conical casing D in this latter instance being simply an enlargement of the end of the air-conveying pipe or conduit. Said pipe or conduit may obviously be of any suitable and desirable size, and, furthermore, the width of the conical casing D may be proportioned as the constructor of the device may think best.

At the center of the receptacle-casing D is a hub F, whose sides are substantially parallel to the wall of the conical casing. In the example of the device illustrated in Figs. 1, 2, and 3 this hub is made hollow. The annular space between the hub F and the casing D is provided with a series of radial partitions, which are firmly secured to the casing D and to the hub F. There may be any number of these partitions. In Fig. 2 six of them are seen described by the reference-letter G. These partitions G are simply plain flat plates. Their edges on the air-inlet side of the fan attachment may, if desired, be made slightly curved or bent, as shown at *g* in Fig. 2, so as to assist in directing the revolving air-current into the chambers or divisions of the attachment. It will thus be seen that a partitioned receptacle is made, the partitions dividing up the receptacle into a series of chambers, said chambers having separate mouths, but delivering at their rear into a common pipe. The air as it passes from the fan into the partitioned receptacle enters the several chambers, which effectually break up and divide the rotating current of air into numerous small currents, each of which small currents, however, will be devoid of the rotary characteristic and will be propelled steadily through the chambers which they severally enter, these small currents finally becoming amalgamated at the rear or air-outlet end of the attachment, so that the resulting current which enters the air-conduit, being composed of these several smaller currents, will be freed from the objectionable rotating quality commonly belonging to such a current, and the blast will thus move steadily and continuously forward through the air-conduit with a compact, steady, and uniform motion.

It will be noted that the conical hub F has its wider end toward the air-fan. Of course this hub may vary greatly in its construction, certain examples of this variation being indicated in the other figures; but its main function is to present a central obstruction to the air which enters the fan attachment, so that the entire air-current entering the partitioned receptacle may be entirely broken up, confused, and scattered into the separate chambers, as I have already stated, and all whirling and gyration consequently destroyed.

Instead of having a conical casing, in which case the receptacle has the general form of a

hollow conical frustum, I may have a cylindrical casing—that is, a casing equal in diameter throughout, being, therefore, in the general form of a section of a cylinder or of a cylinder of narrow width. This form of casing is shown in Fig. 4, and is indicated by the reference-letter D'. In Fig. 4 the same hollow central hub F as is shown in Fig. 1 is used in conjunction with the said casing D', and the device is provided with a series of radial partitions G', securely fastened to the straight cylindrical casing D' and the hub F and dividing the casing into a series of chambers, which break up the whirling motion of the air in the same way as is accomplished by the device when constructed in the form represented in Fig. 1.

It will be obvious that there may be one air-conveying pipe running from the fan attachment to the point where the air is to be delivered for a certain purpose, said single pipe being shown in Fig. 1 as E, or there may be several pipes or conduits running from the fan attachment to different points where the air is delivered for similar or varied purposes. In Fig. 6, as also in Fig. 4, I have indicated a series of four pipes E², E³, E⁴, and E⁵, which pass out from the receptacle. The air which enters these several pipes thus arranged in a series, as shown, is just as effectually freed from its rotary motion as if said air entered a single pipe passing out of the center of the receptacle, because the partitioned receptacle is so arranged with relation to the mouths of the several air-conduits that the air is broken up and enters the several chambers of the receptacle in straight continuous forward currents. Obviously there might be any number of these pipes. One might run out of each of the chambers of the receptacle, and if there were six chambers therein six pipes might run therefrom, and each one would carry a straight-moving compact column of air, because it will be seen that one rotating column enters the end of the receptacle and thus strikes several chambers, and is thus split into numerous smaller columns; but each of these smaller columns will move in straight lines without gyration. Instead of having the mouths of these several pipes connected to a receptacle or partitioned attachment the mouths themselves may be so combined together and arranged in a collocated form that they themselves will constitute the receptacle, their walls forming the partitions of the receptacle, and as the mouths of these pipes present themselves to the air-blast just in exactly the same way as the series of chambers present themselves to the incoming air-blast therefore the effect will be the same, and the result will be to split the blast into smaller currents and allow a continuous straight-moving air-column to pass into and through each of the pipes of the series. This is practically what is shown in Figs. 4 and 6; but of course variations from this structure may be made in order to suit

the arrangement of the mouths of the pipes. The invention is broad enough to permit any desired rearrangement and change in the relative location of the parts to suit these different ideas as to the application of the invention to practice.

In Figs. 7 and 8 we find the attachment provided in each case with the conical casing and the partitions G. In these two figures, however, the pipe E is shown as integral with the casing D, instead of being connected to the short pipe on said casing, as is the case in Fig. 1. In Figs. 7 and 8, therefore, the conical casing D may be considered as simply an enlargement of the air-pipe. In Fig. 7 the hub is conical and is not hollow, as shown in Figs. 1 and 4, but is solid, as F'. In Fig. 8 the hub is cylindrical and is provided with a disk F³, which serves as effectually as the end of the hollow or solid hub for the purposes for which the hub is intended.

It will thus be seen that many variations may be made in the structure of the fan attachment which I have been describing, in order to adapt it for use in different locations, with different kinds of fans, and different arrangement of air-conveying pipes or conduits. The essential idea is to provide a partitioned chamber placed in the path of the air-blast, which blast naturally has a tendency to whirl or gyrate and the said partitioned chamber serving to split up the blast into smaller air-currents, and thus destroy the rotary motion of the original blast. Obviously the smaller currents which enter the several chambers may be collected together at the rear of the device and carried through a common pipe, or they may pass through several pipes, as I have already stated, and therefore many changes not herein mentioned specifically may be made in the structure and relative location of the parts in order to better adapt the invention to practical use and to meet the exigencies of diverse cases and put into practical use the ideas which experience from time to time may dictate with reference to the structure of the device.

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

1. The combination, with a fan or blower, of an attachment for destroying the rotary movement in the blast generated by said fan, consisting of the conical casing, the conical central hub, and the series of partitions, substantially as described.

2. The combination, with a fan or blower, of an attachment thereto, consisting of a casing, the conical central hub, a series of partitions in said casing, and an air-conveying pipe integral with or connected centrally to the rear side of the casing, so that each of the chambers may communicate therewith, substantially as described.

3. The combination, with a fan or blower, of the stationary casing D, the conical hub

F, and the radial series of partitions G, having the bent edges *g*.

4. The combination, with a fan or blower, of the conical casing D, the conical central hub F, the partitions G, which divide the casing into a series of chambers arranged around the hub, and the pipe E, connected centrally to the rear side of the casing, so as to be in
- 5

communication with each of the several chambers, substantially as described. 10

In testimony whereof I affix my signature in presence of two witnesses.

JAMES M. SEYMOUR, JR.

Witnesses:

JAMES M. SEYMOUR,

DAVID C. SEYMOUR.