

(No Model.)

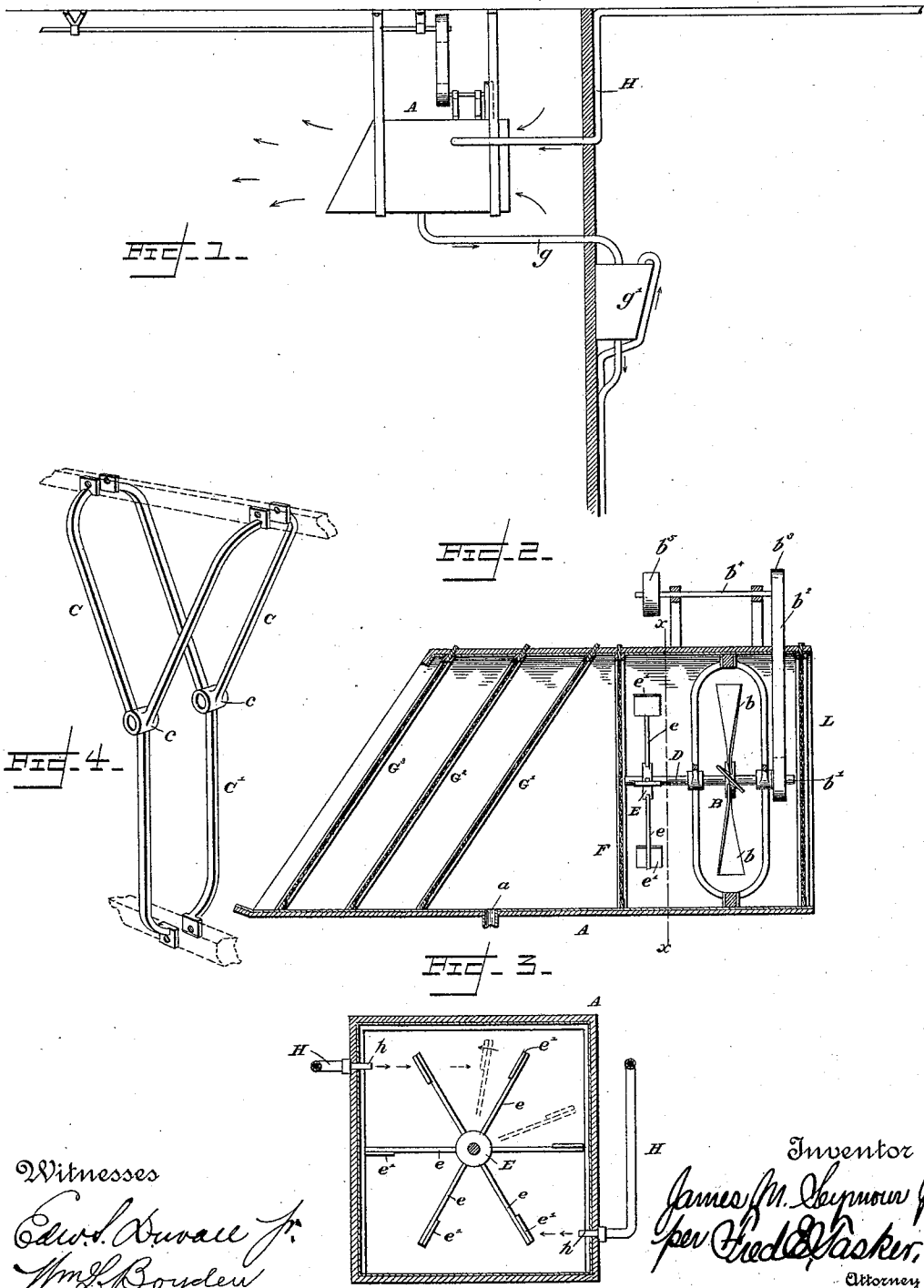
J. M. SEYMOUR, Jr.

2 Sheets—Sheet 1.

VENTILATING MECHANISM.

No. 494,264.

Patented Mar. 28, 1893.



Witnesses

Edw. L. Burrell Jr.
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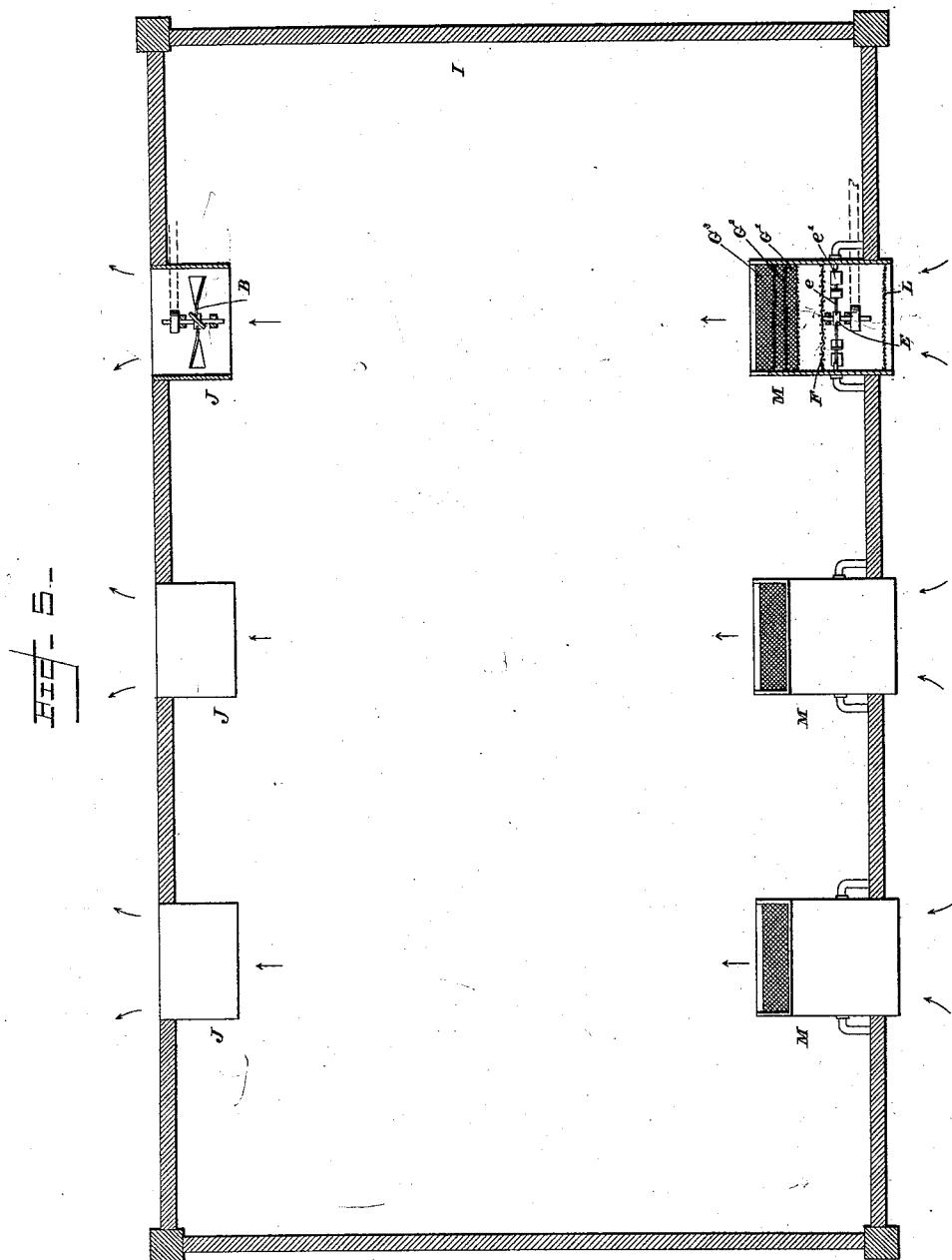
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UNITED STATES PATENT OFFICE.

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

VENTILATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 494,264, dated March 28, 1893.

Application filed May 25, 1892. Serial No. 434,323. (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 Ventilating Mechanism; 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.

This invention relates to an improvement in ventilating mechanism for buildings of various kinds, especially mills and similar places where the atmosphere is filled with dust or is made very dry and unwholesome in consequence of the operation of machinery and processes within the rooms or apartments of said buildings, the object of the invention being to provide some simple, cheap, easily constructed and conveniently arranged mechanism whereby the dust may be eliminated from the atmosphere and the dry condition of the latter moistened and changed so as to be wholesome, and in fact so that a thorough circulation of air may be had through the rooms in order that they may be more habitable and less dangerous to the health of the occupants, and the invention therefore consists essentially in the construction, arrangement and combination of the several parts, substantially as will be hereinafter described and then more particularly pointed out in the appended claims.

In the annexed drawings illustrating my invention: Figure 1 is an outline view showing one form of the ventilating mechanism constructed in accordance with the plan of my present invention, the same being arranged in a room and having operating parts located in connection therewith. Fig. 2 is a longitudinal sectional view of my improved ventilating apparatus. Fig. 3 is a cross section on the line xx of Fig. 2. Fig. 4 is a perspective view of the frame which supports the fan shaft. Fig. 5 is a horizontal sectional plan view of a room or apartment showing a modified form of my improved ventilating mechanism applied in connection therewith for the purpose of ventilating the interior of the same.

Similar letters of reference designate corre-

sponding parts throughout all the different figures of the drawings.

In carrying my improved means for ventilating mills and other buildings, into practical operation, I first provide a suitable box or casing of convenient size and shape and located at a proper point in the room or apartment which is to be ventilated. Of course there may be any number of these boxes and I am not restricted to any particular number. Further it may be situated at any point in the room. That point will be selected which will be found capable of producing the best results.

A designates an example of the casing or box. See Figs. 1 and 2.

Within the box A, near one end is a fan for forcing a current of air through the box, which air is drawn in through one end, forced through the box in a strong positive current and discharged at the other end as shown by the several arrows in Fig. 1. The fan B may be of any suitable and usual construction. It may consist in its simplest form of a hub, provided with radial vanes b fixed at an angle, the hub being supported upon the horizontal shaft D which is held in the bearings cc formed in a supporting framework, one example of which is shown in Fig. 4, where it is seen to consist of the upper inclined arms C C and the lower vertical arms C', the upper arms being supported at the upper part of the box and the lower arms at the lower part of the same. Thus the shaft D is supported in a horizontal position and permitted to revolve freely in its bearings. It will be particularly noted that the fan B may be of any desired construction and I am restricted to no precise form thereof, that shown in the drawings being given by way of example merely.

I have represented in the drawings mechanism for driving the fan, consisting of a pulley b' on the end of shaft D, around which pulley passes a belt b^2 , which likewise passes around another pulley b^3 on the horizontal shaft b^4 supported in bearings above the box A and having thereon a drive pulley b^5 . This operating mechanism may however be varied. I have simply given it to show one way in which the fan may be driven.

At the right hand end of the box is a screen L made of some suitable finely meshed fabric,

through which air is drawn from the interior of the room into the box A by means of the fan B.

On the same shaft D which carries the fan B, is a wheel, consisting of a hub E secured to the shaft D and radial arms *ee* carrying at their outer ends flat plates or paddles *e'*.

Entering the opposite sides of the box A, as shown in Fig. 3, are two water supply pipes H H having outlet nozzles *h h* on their ends inside the box A, from which nozzles emerge small fine jets of water or other suitable liquid, which come in contact with the paddles *e'* of the aforesaid wheel. The wheel revolves in a direction opposite to the direction in which these water jets are forced and consequently the action of the wheel upon the streams of water, will be to thoroughly break up and scatter the latter into very fine particles or mist, which will fill the interior of the box A all about the wheel and in the space adjacent to the fan B. Obviously the construction and form of this wheel may vary within wide limits. Few or many paddles may be provided thereon. It may move at a slow or high rate of speed. The idea of the wheel is simply to afford an obstacle or obstruction in the path of the water jets in order that the latter may be dissipated. The wheel can accomplish its function oftentimes when at a stand still, and it will therefore be evident that in lieu of the wheel, stationary plates may be provided. The wheel however is the preferable form and I give in the drawings a simple way in which it may be made and yet a form which will be efficient in actual use. Furthermore it will be noted that I am not confined to the use of two nozzles. There may be any number of supply pipes, either two or more and the nozzles can be arranged around the periphery of the wheel in such a manner that the effect of the wheel upon the water jets will be the same as in the case of two nozzles.

Adjacent to the water wheel at the left hand side thereof, the box A is provided with a transverse vertical partition F, consisting of a screen made of finely meshed fabric, similar to the screen L. Furthermore the box A is provided at points between the partition F and the left-hand end thereof, as shown in Fig. 2, with several screens, as *G' G² G³*. These screens are preferably fixed in an inclined position so that whatever water may be collected upon them, will easily slip down into the bottom of the box. There may be any number of said screens, either three or four or more. The air which is drawn in through the screen L will be forced in a strong current by means of the fan B through the mass of mist or cloud which results from the contact of the water wheel upon the water jets and this will cause the air to be thoroughly dampened or moistened so that as it passes through the screen F, it will be partially purified. Most of the mist or small particles of water will stay between the screens

F and L, and but little of it will pass through the screen F. Of course it is not desired that any water should pass from the box A into the room. All that is wished for is to purify and cool the air within the box A so that when it re-enters the room at the left hand of said box, it will be free from dust and in a moist and purified condition. It is for this reason that the additional screens *G' G² G³* are provided, so that any water which may pass the screen F, will find an obstruction in these screens, and hence drops of water will not be apt to pass out of the box because they will probably be caught by one or the other of the screens. Further, all of the dust and impurities will probably be collected by the several screens and prevented from passing out of the box into the room again.

The box A is provided with an outlet pipe *a* at the bottom thereof through which water may have an outlet into the pipe *g* and thence into collecting tank *g'*, shown in Fig. 1. A box of this character having internal mechanism arranged as stated, will be found invaluable for use in a room where the atmosphere is dry and charged with all kinds of impurities such as dust and other objectionable substances resulting from the operation of heavy machinery within the room, or the carrying on therein of such processes as are commonly carried on in cotton and woolen mills and other similar factory buildings where the air is exceedingly impure and dangerous to the health of the occupant. One of these casings A located at some convenient point of the room, will be situated so that the air can be drawn into it at one end by means of a fan, said air being again forced in a strong current through the broken water and then driven out at the other end in a purified condition. Thus a constant circulation can be kept up in the air of the room and all the air that passes through the apparatus will be freed from its impurities and returned in a wholesome condition.

In Fig. 5, I denotes a room. In this figure I have represented a modification in the arrangement of my improved ventilating mechanism. Instead of having single boxes, located as shown in Fig. 2, at different points of the room, each box containing a blast fan and also a water wheel, together with numerous screens for keeping the particles of water which are set free in the box from emerging therefrom, I employ separate chambers for the fans and separate chambers for the hydraulic purifying mechanism. For instance, I place at suitable points in one wall of the room, as say, at points over the windows, a series of boxes J J J, whose ends are open to the air of the room and likewise to the external atmosphere and in these boxes I arrange fans B, which will exhaust the air from the room and cause it to flow out through the boxes J into the external atmosphere. These fans will be driven by any convenient mechanism. The exhausting of the air from the

interior of the room, will of course create a circulation.

In the opposite wall of the room at points directly opposite to the boxes J J and preferably over other windows which are situated opposite to the windows above which the boxes J J are located, I arrange similar boxes M M M which are open at their inner ends to the interior of the room and at their outer ends to the outer atmosphere and through which air can pass into the room from without. In these boxes M M, I place wheels, similar to the water wheels shown in Fig. 2, having hub E and radial arms e, carrying paddles e'. Also these boxes are provided with screens L at one end and screens G' G² and G³ at the other end, together with an intermediate screen F located near the water wheel. In fact it will be observed that the interior mechanism of the boxes M M is the same as that of the boxes A, with the exception of the fan B, which fan is, as we have already seen located at the other side of the room in another box. Now although the parts of my improved ventilating apparatus are in this modification, somewhat changed and re-arranged, yet their function and operation are the same, because the action of the fans B will be to create currents within the room I and draw in the external atmospheric air through the boxes M, wherein it will be purified by contact with the finely divided water or mist which it will find therein.

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

1. The herein described ventilating mechanism, consisting of a casing, a fan or blower arranged therein for the purpose of creating a current of air through the casing, a revolving wheel also within the casing, a series of one or more nozzles for directing jets of water against the wheel which revolves in a direction reversely to the direction of motion of

the water jets so that the revolving wheel will strike said jets and produce a thin spray or mist through which the air will be forced by the fan, substantially as described.

2. As an improvement in ventilating mechanism, the combination of suction or blast fans suitably arranged for creating a current of air and mechanical devices for providing a thin spray of water or mist through which said air will be forced, said devices consisting of a series of one or more water nozzles and a moving wheel revolving in a direction the reverse of the direction of motion of the water jets so that the jets will be struck by the wheel and dashed into spray, substantially as described.

3. In a ventilating mechanism, the combination of the casing A, fan B therein, the mechanism for actuating it, a water wheel having the paddles e', said wheel being located upon the shaft of fan B, a series of one or more water jets arranged in connection with the water wheel, which wheel revolves in a direction reverse to the direction of motion of the water, a screen L at one end of the casing, a screen F contiguous to the water wheel and screens at the other end of the casing, all arranged substantially as described.

4. In a ventilating mechanism, a series of water jets or nozzles arranged tangentially to the water wheel, in combination with said wheel which rotates in a direction opposite to the direction of motion of said jets of water so that the latter may be struck and converted into a thin spray or mist through which the air may be passed for the purpose of purification, moistening and cooling, substantially as described.

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

JAMES M. SEYMOUR, JR.

Witnesses:

WM. L. BOYDEN,

EDW. S. DUVALL, JR.