

Sept. 26, 1944.

A. MARX

2,358,868

VENTILATION APPARATUS

Filed Jan. 18, 1943

2 Sheets-Sheet 1

FIG. 1.

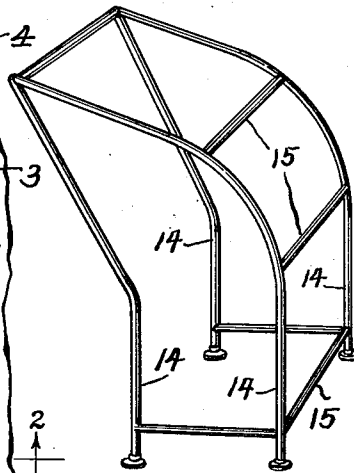
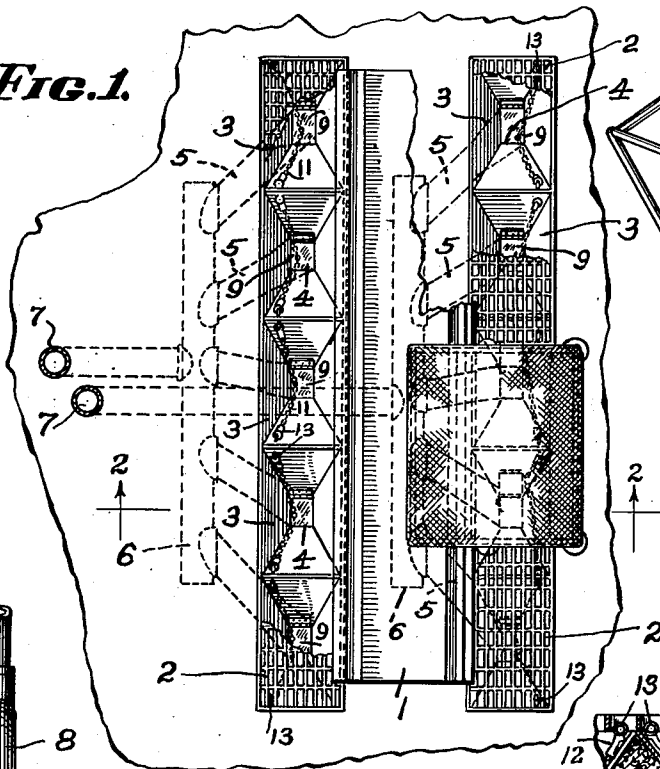


FIG. 5.

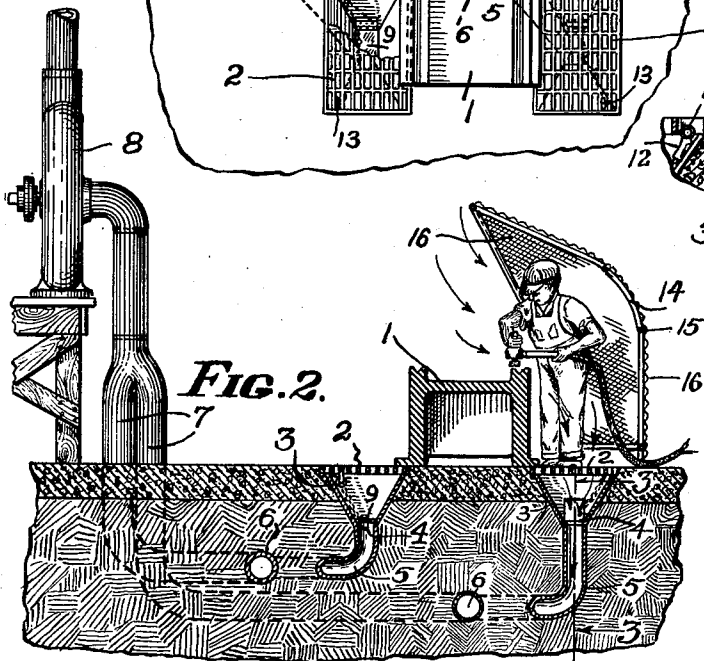


FIG. 2.

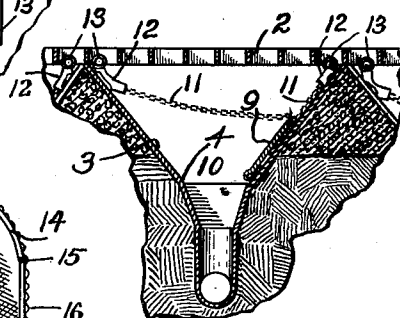


FIG. 3.

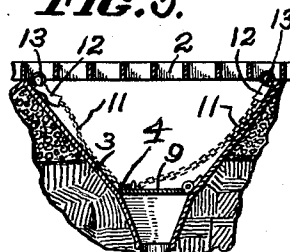


FIG. 4.

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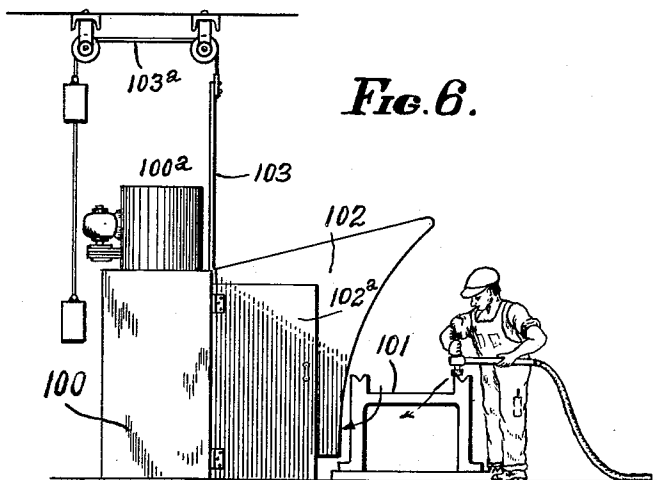
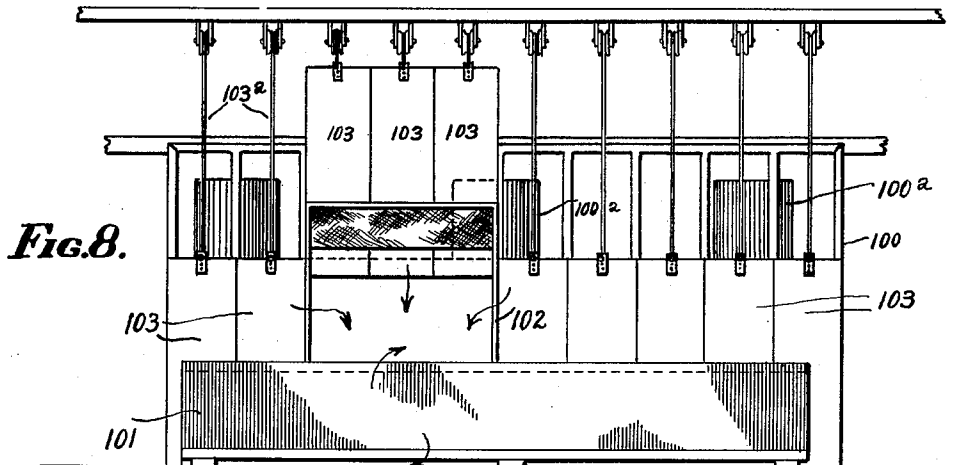
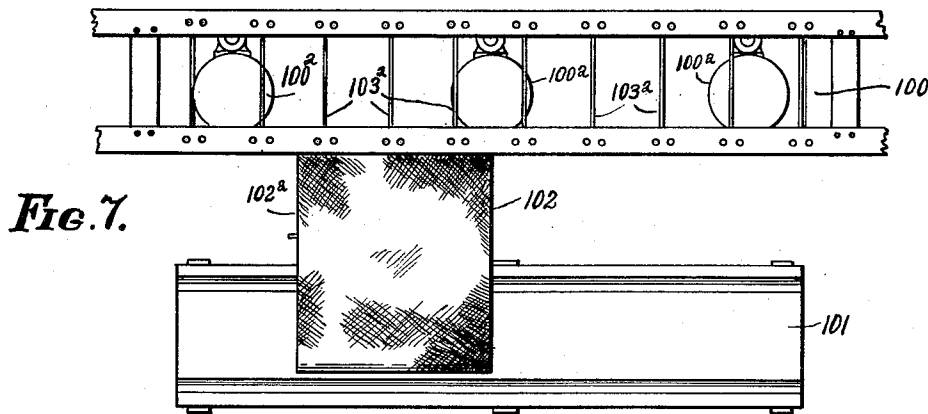
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2 Sheets-Sheet 2



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VENTILATION APPARATUS

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Application January 18, 1943, Serial No. 472,699

6 Claims. (Cl. 98—115)

My invention relates to the provision of ventilation apparatus to withdraw the metallic dust and particles from operations in connection with large scale cutting, drilling, polishing, and particularly grinding work, from the air surrounding workmen when so engaged.

Large suction fans employing hoods which will be sufficient to cover a piece of work twenty or thirty feet long or longer, and along which workmen will be engaged in operations giving rise to development of metallic dust, are quite impractical because of the very large size and great amount of power required to do an effective job. My invention is directed to an arrangement whereby a suction fan within practical limits as to size and power can be employed to protect workmen in their operations along an extended piece of work, such as for example a long planer bed, which is being worked upon by various metal cutting and polishing tools. Incidentally the draft in my improvement is a down draft, drawing the injurious dust and particles away from the face of the workmen, as distinguished from the use of an overhead hood which draws some of the said dust and particles past the face of the workman.

It is my object to provide floor ducts which extend all along the piece of work which is being employed, and yet provide for valves to limit the suction draft to selected portions thereof. It is also my object to provide a readily shiftable hood which can be moved along the floor which will tend to confine the effects of the down draft to the location where work is being done.

I accomplish my objects by that certain construction and arrangement of parts of which an example will be described in the following specification and the novelty whereof will be set forth in the appended claims, to which reference is hereby made.

In the drawings:

Figure 1 is a plan view of an arrangement where a planer bed is being worked upon.

Fig. 2 is a section partly in elevation showing the same parts as on the line 2—2 of Fig. 1.

Fig. 3 is a section of one of the ducts, showing a simple valve arrangement with the valve open.

Fig. 4 is a like view showing the same parts as in Fig. 3 with the valve closed.

Fig. 5 is a perspective of the frame of the movable hood.

Fig. 6 is a side elevation showing another mode of applying my invention.

Fig. 7 is a plan view of the same, and

Fig. 8 is a front elevation.

As already stated, the invention is illustrated in use as with a long piece of work such as a planer bed, this piece of work being indicated at 1. In the floor along both sides and substantially from end to end of the place where the

bed is to be worked upon, are gratings 2. Beneath the grating are a series of hopperlike vent openings 3 in the floor, each tapering to a valve or shutter seat 4. Beneath the valve seats each of the vent openings connect by passages 5 with a duct or manifold pipe 6, one for each row of vent openings, which pipes 6 have connectors which run through the floor to the intakes 7, 7 of an exhaust dust collector generally indicated at 8.

The valves which have been shown for shutting off all vent openings but the one or ones being worked over, are plates 9, hinged at 10 to one of the sloping walls of the vents, and having two chains 11, 11 connected to their free or unhinged edges. The chains pass through tubular fittings 12 secured near two opposite sides of the vents just beneath the grating. The chains terminate in rings 13, which can be reached through the gratings, and which keep the chains from running through the fittings. By pulling on the chain at one side of the vent opening the shutter or valve will be swung over and will drop down to close the vent by engaging the seat at the bottom thereof. By pulling the other chain the shutter or valve will be swung up and will rest against the sloping side wall of the vent, leaving the vent open to the manifold and the suction line therefrom. Ordinarily, all valves will be closed, as noted above except the ones for vents beneath that part of the grating that is supporting a workman engaged in a task on the work piece.

The hood, as indicated in the example shown, has a frame of side pieces 14, four in number connected by four cross pieces 15 at the back with two cross pieces at the sides, leaving the front open in the form of an overhanging hood coming down to the floor, and this hood is covered with canvas 16 or any other light material which will not freely permit passage of air currents. The side pipes are bent over so that the hood when covered, as indicated in Figs. 1 and 2, will have an overhang at the top. Thus the workman may shift the hood to where he is engaged at the time, open the valve in the vent which is beneath him, and operate without danger of dust and metallic particles in the surrounding air. The arrows in Figure 2 illustrate how the air currents will flow directly over the work and will leave the operator's face free of contact with any particles carried in these currents. The hood assists in this protection but is not an absolute essential. It confines the area through which air must pass to get to the vent and directs it downwardly and inwardly of the workman engaged. The hood may be made of light weight metal pipe, and have suitable feet so that it can be pushed along the floor without difficulty, or lifted and moved from place to place.

A modification is shown in Figs. 6, 7 and 8. Side draft or wall type dust collecting systems are used in many shops. The apparatus is entirely above the floor and therefore, does not require excavating for the underground ducts. For this reason the first cost is much less than for the down draft type, and if the apparatus must be moved to another location in the shop, this can be done without great expense.

Such a side draft dust collector of the type in common use but employing the movable hood and individually controlled valves is shown in Figures 6, 7 and 8. A filtering cabinet 100 is enclosed on all sides except the side toward the work piece 101. This side may be made up of glass fibers which form a filter. Air is sucked into the filter cabinet through the filters and is expelled through the opening 100a in the top of the cabinet. One or more motor driven fans on the top of the cabinet provide the suction. The air in the cabinet could also be exhausted through a centrifugal type dust collector in which case the glass filters would not be used. The hood 102 is open on the sides toward the work and toward the filter cabinet also. The operator can push the hood along on the floor as he works on the piece he is grinding. A hinged door 102a is provided in each of the closed sides of the hood so the workman can get into and out of the hood without pushing it to the end of the work piece or work bench if a long bench were used.

Dust falling on the floor would be carried across the floor by the air current, into the filter. The work piece, or work bench would set up off of the floor to allow the air to pass underneath.

Various methods could be used to close off that part of the intake side of the filter cabinet which is not drawing air in through the hood 102. On our drawings, we have shown doors 103 which are arranged to slide vertically. The doors would be guided in slide ways and counterweighted by cables and weights 103a, so they would operate with little effort.

Instead of only one filtering cabinet as shown in Figures 6, 7 and 8, two could be used, one on each side of the work piece. Such an arrangement would permit more workmen to work on a piece simultaneously. In certain uses the movable hood can be employed to localize suction over a long vent even though the draft through the vent is not itself localized by means of valves or shutters as shown.

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

1. A structure for dust elimination which consists in a series of vents located in the floor of a building, in a pattern to encompass a piece of work to be operated upon, valves for individually controlling the opening and closing of said vents, grating over the vents whereon a workman may stand, and a suction device to supply a draft down through the vents, each of said vents being connected to said suction device, said vents having walls sloping to a seat, the said valves comprising plates hinged at the seats, and having connected thereto pulling members which are available for operation through the grating to manipulate said plates to closed position against the seats or open position away from the seats.

2. A structure for dust elimination which con-

sists in a series of vents located in the floor of a building, in a pattern to encompass a piece of work to be operated upon, valves for individually controlling the opening and closing of said vents, grating over the vents whereon a workman may stand, and a suction device to supply a draft down through the vents, each of said vents being connected to said suction device, said vents having walls sloping to a seat, the said valves comprising plates hinged at the seats, and having connected thereto pulling members which are available for operation through the grating to manipulate said plates to closed position against the seats or open position away from the seats, said pulling members formed as chains, having tubular fittings through which they pass from the free edge of the plates to the opposite sides of the vents beneath the gratings.

3. A structure for venting of metallic dust and particles in large scale machining operations comprising a central exhaust system, a series of vents each connected to said system and located along a site for operations on a large scale piece of work, and a portable hood having an open face toward the work within which hood a workman may stand on the floor of the site, said hood otherwise substantially closed down to the floor but having an opening for communication with a selected vent, and means for closing all but the selected vent, for the purpose described.

4. A structure for dust elimination which consists in a series of vents located in the floor of a building, in a pattern to encompass a piece of work to be operated upon, valves for individually controlling the opening and closing of said vents, grating over the vents whereon a workman may stand, and a master suction device connected to the several vents to supply a draft down through the vents, each of said vents being connected to said suction device, and a movable hood mounted on the floor and having its sides except one open side enclosed against passage of air, and of a size within which a workman may stand, said hood adapted to be located adjacent a working point, and having an overhang to come above the head of the workman and a bottom opening to communicate with selected vents, whereby a draft downwardly and inwardly of the workman's location will be created, the velocity of which is increased by the hood.

5. A structure for dust elimination which consists in a row of adjacent vents located in the floor of a building arranged to extend along the area where a piece of work is located, valves for individually controlling the opening and closing of said vents, grating over the vents whereon a workman may stand, and a master suction device connected to the several vents to supply a draft down through the vents, and a movable hood for localizing the draft, mounted on the floor and having its sides except one open side enclosed against passage of air, and of a size within which a workman may stand, said hood adapted to be located adjacent a working point and said hood open at the bottom to communicate with the selected vents.

6. The structure set forth in claim 3, wherein the series of vents are located in the floor of the site.

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