

(No Model.)

3 Sheets—Sheet 1.

A. F. McNAUGHTON & G. E. SEYMOUR.

DUST SEPARATOR.

No. 532,389.

Patented Jan. 8, 1895.

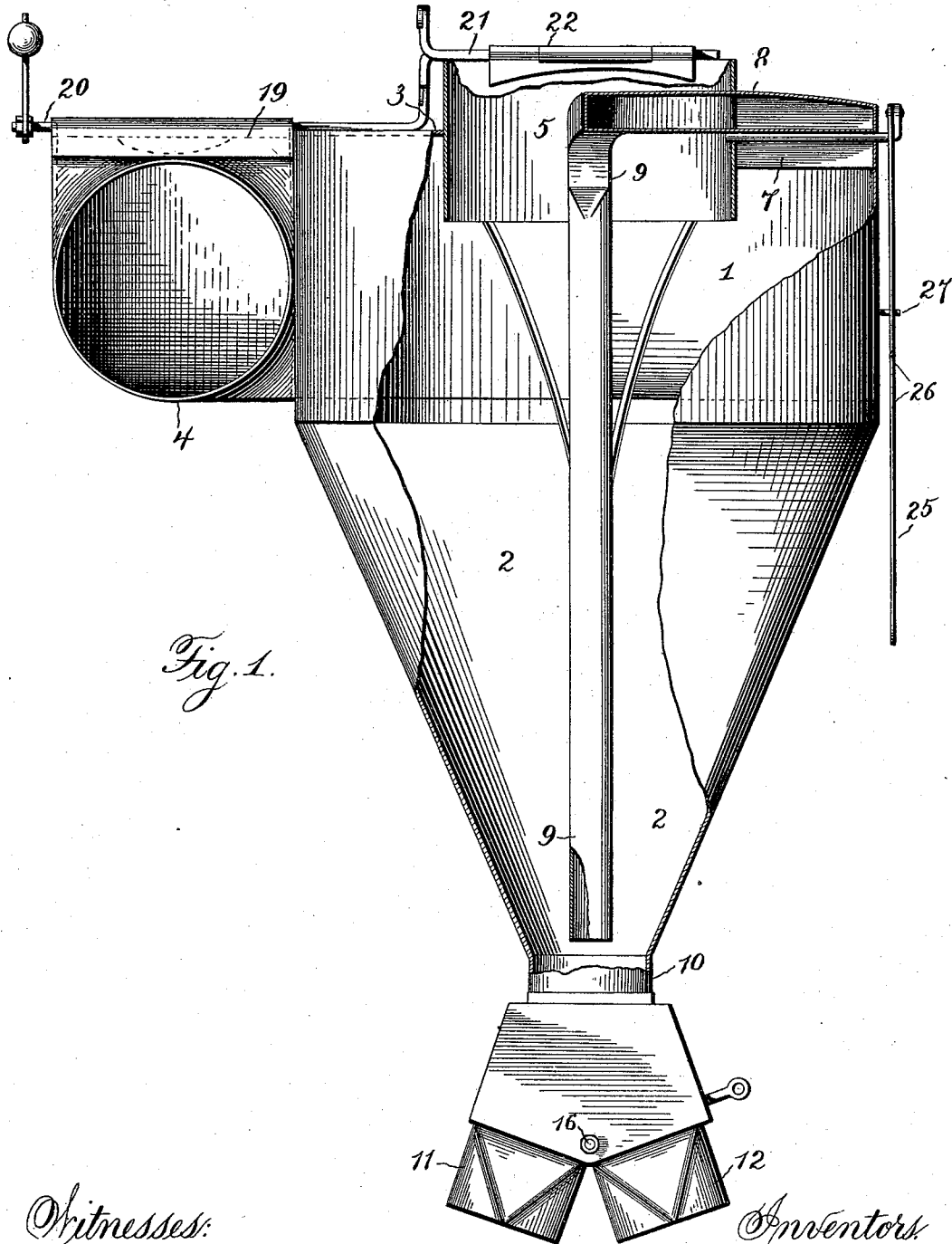


Fig. 1.

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Inventors
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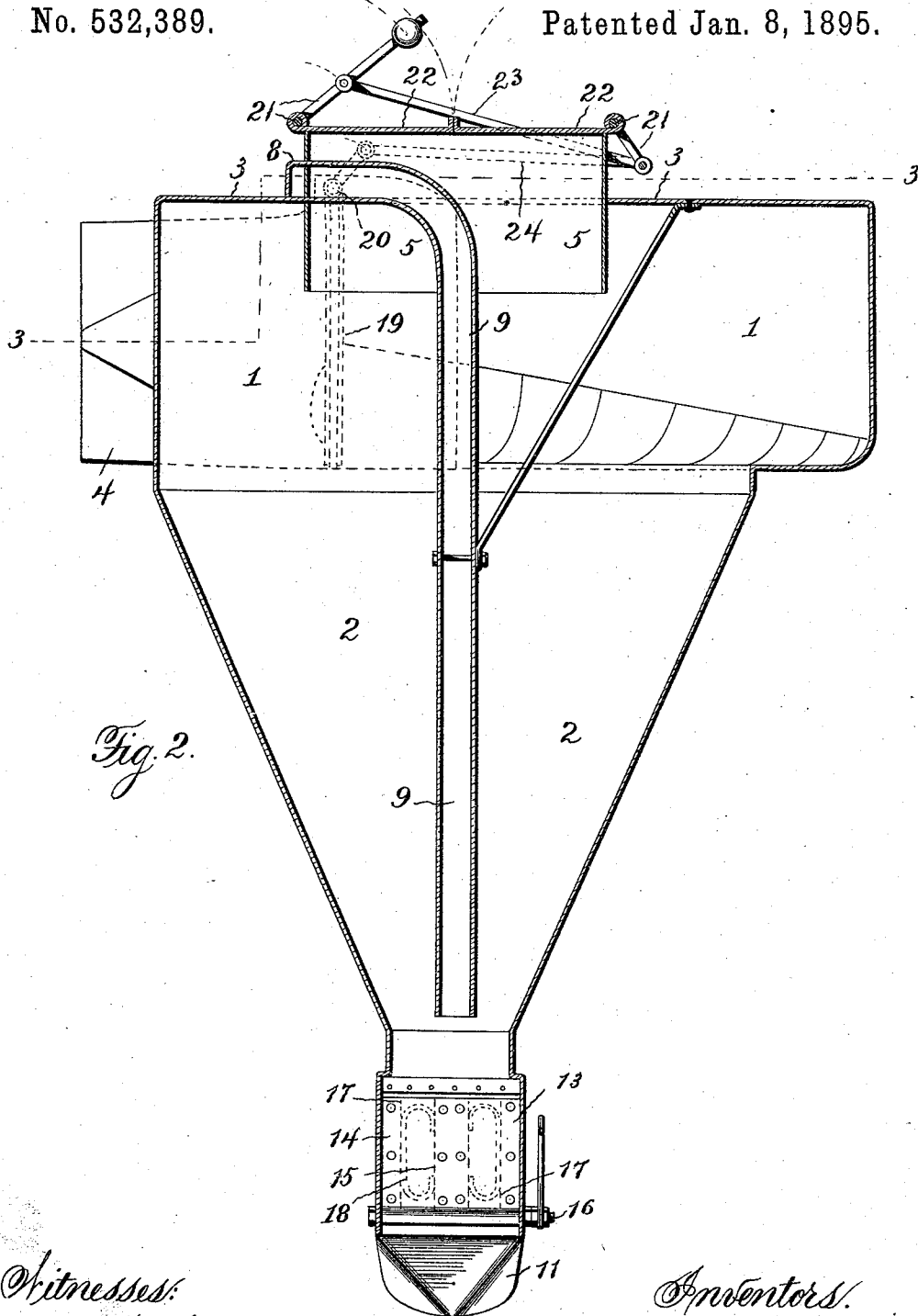
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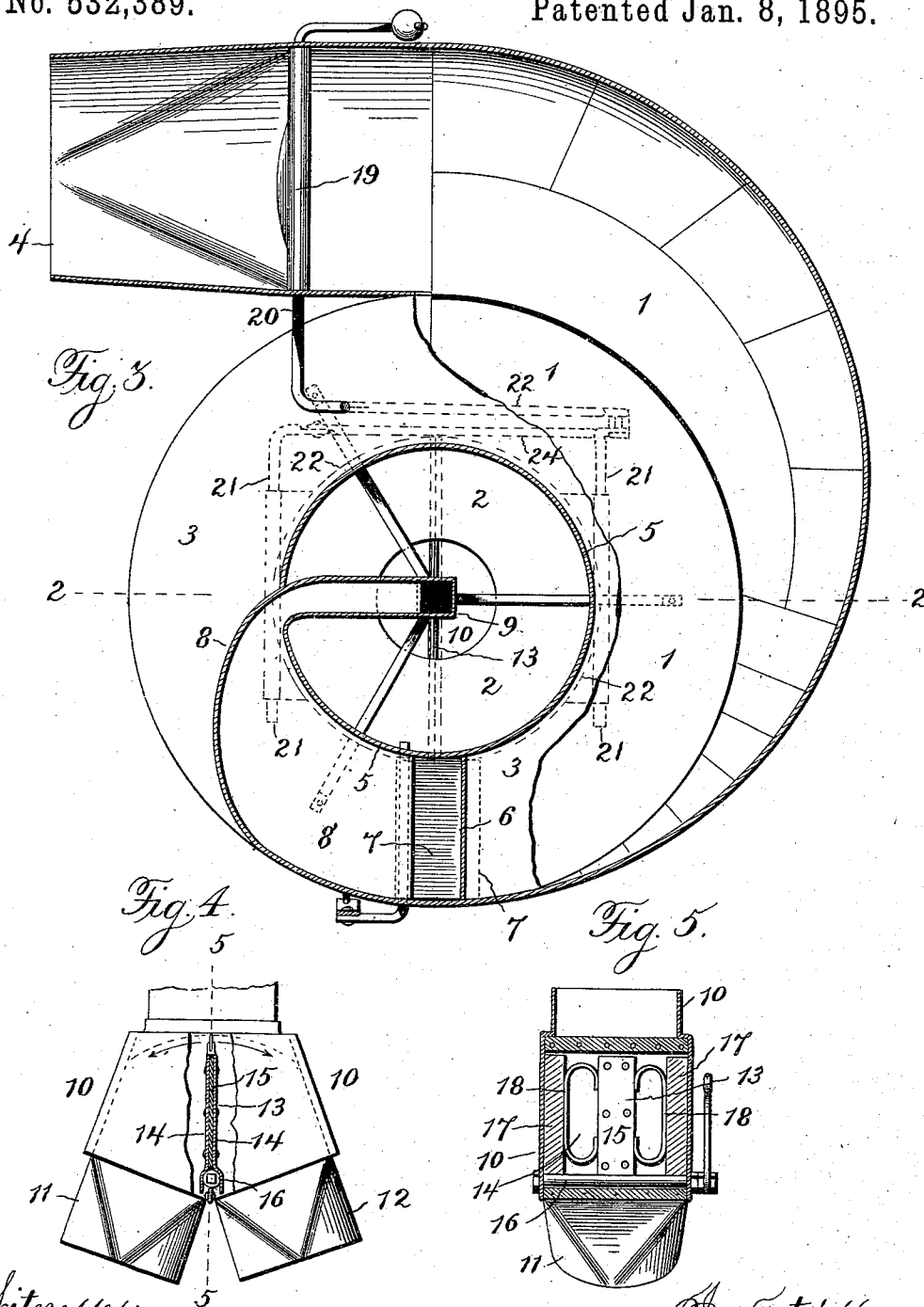
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UNITED STATES PATENT OFFICE.

ARTEMAS F. MCNAUGHTON, OF JEFFERSONVILLE, AND GEORGE E. SEYMOUR,
OF SILVER GROVE, INDIANA.

DUST-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 532,389, dated January 8, 1895.

Application filed September 6, 1894. Serial No. 522,295. (No model.)

To all whom it may concern:

Be it known that we, ARTEMAS F. MCNAUGHTON, residing at Jeffersonville, in the county of Clark, and GEORGE E. SEYMOUR, residing at Silver Grove, in the county of Floyd, in the State of Indiana, citizens of the United States, have invented new and useful Improvements in Dust-Separators, of which the following is a specification.

Our invention relates to an improved dust separator and more especially to that class of dust separators employed in mills, manufactories, and the like, for separating the fine dust, saw dust and shavings, from the atmosphere wherein the dust and air are separated by imparting to the dust laden air a centrifugal movement, and it has for its object to provide means for facilitating the separation of the dust and air as the air enters the machine; to provide means for regulating the discharge of the machine without creating any back pressure on the fan; to provide an improved valve for directing the discharged dust either to a furnace or to a dust chamber, and finally to provide an automatic closing device to prevent the entrance of rain, snow, or sparks when the machine is thrown out of operation.

To these ends our invention consists in the novel features of construction and the construction and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings forming a part of this specification, wherein—

Figure 1, is a side elevation, partly in section, of our improved separator. Fig. 2, is a vertical section taken on the line 2—2, of Fig. 3. Fig. 3, is a horizontal section taken on the line 3—3, of Fig. 2. Fig. 4, is an enlarged side elevation of the valve for controlling the outlet. Fig. 5, is a vertical central section on the line 5—5, of Fig. 4.

Referring to the drawings the numeral 1 indicates a cylindrical chamber provided with a funnel shaped base 2 and a cover 3. An inlet pipe 4 communicates with the chamber 1, entering said chamber tangentially and gradually conforming to the configuration of the casing thereof, said pipe, at and from the point where it enters said chamber being rounded or curved in cross-section at its lower

outer edge for the purpose hereinafter described. Said pipe leads from the separator to the point from which the dust laden air is to be conveyed, where it is provided with a fan or blower, not shown, which operates to force the air into the separator. The cover 3 is provided with a downwardly depending air outlet 5 for the escape of the purified air, and is also provided upon the side opposite the inlet 4 with a dust outlet port 6, controlled by a valve 7, a curved conduit 8 upon the upper side of the cover 3 communicating at one end with the port 6 and at its other end with a pipe 9 that extends down through the center of the separator to and slightly within the discharge end of the funnel shaped base 2. A pipe 10 leads from said discharge end of the base 2, and is provided with two branch pipes 11 and 12, one of which, as 11, leads to the furnace, and the other 12, to the dust bin or chamber.

In the pipe 10 is disposed a valve 13 consisting of two parallel plates 14 riveted or otherwise suitably secured to the opposite sides of an arm 15 carried by a shaft 16 journaled in the sides of said pipe, gaskets 17, of leather or other suitable flexible material being arranged between the edges of said plates, and forced outward against the casing by means of springs 18.

The inlet pipe 4, preferably at a point slightly in advance of its junction with the separating chamber, is provided with a weighted valve 19 rigidly suspended from a crank shaft 20, which is also preferably weighted, by means of which the communication between the inlet pipe and the separating chamber may be cut off, the weights serving to maintain said valve closed against any current of air that may seek to pass up through the pipe 5.

In suitable bearings on the opposite sides of the upper end of the air outlet pipe 5 are journaled crank shafts 21, carrying valves or lids 22, the cranked portions of said shafts being extended in opposite directions and connected by a link 23 and to one of said cranks 21 is pivotally connected one end of a lever 24, the other end of which is likewise connected to a cranked portion of the shaft 20,

that carries the valve 19 before described. When the valve 19 is closed to shut off the separator, the valves or lids 22 will also be closed, through the medium of the crank-shafts 21 and their connections above described, in an obvious manner.

The operation of our invention will be readily understood. The dust laden air being forced through the inlet pipe 4 impinges against the curved outer edge of the discharge end of said pipe by which the heavier particles are caused to glide easily into the separator and causes the dust to rise to the top. Owing to the curvature of the discharge end of the inlet pipe 4, which gradually conforms to the formation of the separator casing, the incoming current of air is given a centrifugal movement, throwing outward and upward the dust which escapes through the port 6, conduit 8 and pipe 9, to the discharge pipe 10, while the air freed of the dust passes out through the outlet 5. The particles too heavy to escape in the manner described drop by gravity down the funnel shaped base 3 into the discharge pipe 10. From the discharge pipe 10 the dust, shavings, &c., pass into one or the other of the pipes 12, and are finally discharged into the furnace or dust bin as may be desired, the valve 13 being turned to the proper position to direct the material into either of the pipes 11 or 12, for the purpose.

The downward pressure of air in the pipe 9 passing down through the center of the funnel shaped base 2 operates to force the shavings and heavier materials that drop into the funnel-shaped base through the discharge pipes, and this pressure is regulated to correspond with the nature of the material passing through the separator by opening or closing the valve 7 to a greater or less extent, suitable means being provided for maintaining the valve in its adjusted position, consisting in the present instance of an arm 25 pivotally connected at one end to a crank shaft rigidly connected to said valve and at its other end provided with a series of perforations 26 adapted to engage a pin 27 fixed to the separator casing.

When it is desired to throw the separator out of action the valve 19 is closed which automatically closes the valves 22 in the manner before described, preventing the entrance of rain, snow, or sparks.

Having described our invention, what we claim is—

1. In a dust-separator, the combination of a cylindrical separating chamber having a funnel-shaped base, an air inlet in the top of said chamber, an air outlet in the bottom of the funnel-shaped base, a pipe communicating at its upper end with the upper portion of the separating chamber and extending centrally downward into the discharge end of the funnel-shaped base, and a valve for controlling the passage of air through said pipe, substantially as described.

2. In a dust separator, the combination of a cylindrical separating chamber having a funnel shaped base, an air inlet arranged tangentially thereto, an air outlet centrally disposed in the top thereof, a valved port formed in said top at one side of said outlet, and a pipe communicating at one end with said port and extending downwardly through the center of said separating chamber into the discharge end of the base thereof, substantially as described.

3. In a dust-separator, the combination of a separating chamber, an air-inlet, air and dust outlets, a hinged valve 19 mounted on a crank-shaft 20 and arranged in the air-inlet, valves 22 arranged over the air outlet, said valves being mounted on crank-shafts 21, the cranks of which extend in opposite directions and are connected together by a link, and a lever 24 pivotally connected at one end to one of said cranks 21 and at its opposite end to the crank-shaft 20, whereby the valves are operated simultaneously, substantially as described.

4. In a dust separator, the combination of a separating chamber, an air inlet, an air outlet, a dust discharge pipe provided with two branch pipes, and a cut off valve arranged in said dust discharge pipe and comprising two plates having gaskets disposed between their edges and springs operating to project said gaskets outward, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

ARTEMAS F. McNAUGHTON.
GEORGE E. SEYMOUR.

Witnesses:

A. J. HOWARD,
O. C. HOWARD.