T. E. TAYLOR.

AIR CLEANING ATTACHMENT FOR AIR COMPRESSORS.

APPLICATION FILED MAY 9, 1919.

1,314,443. Patented Aug. 26, 1919.

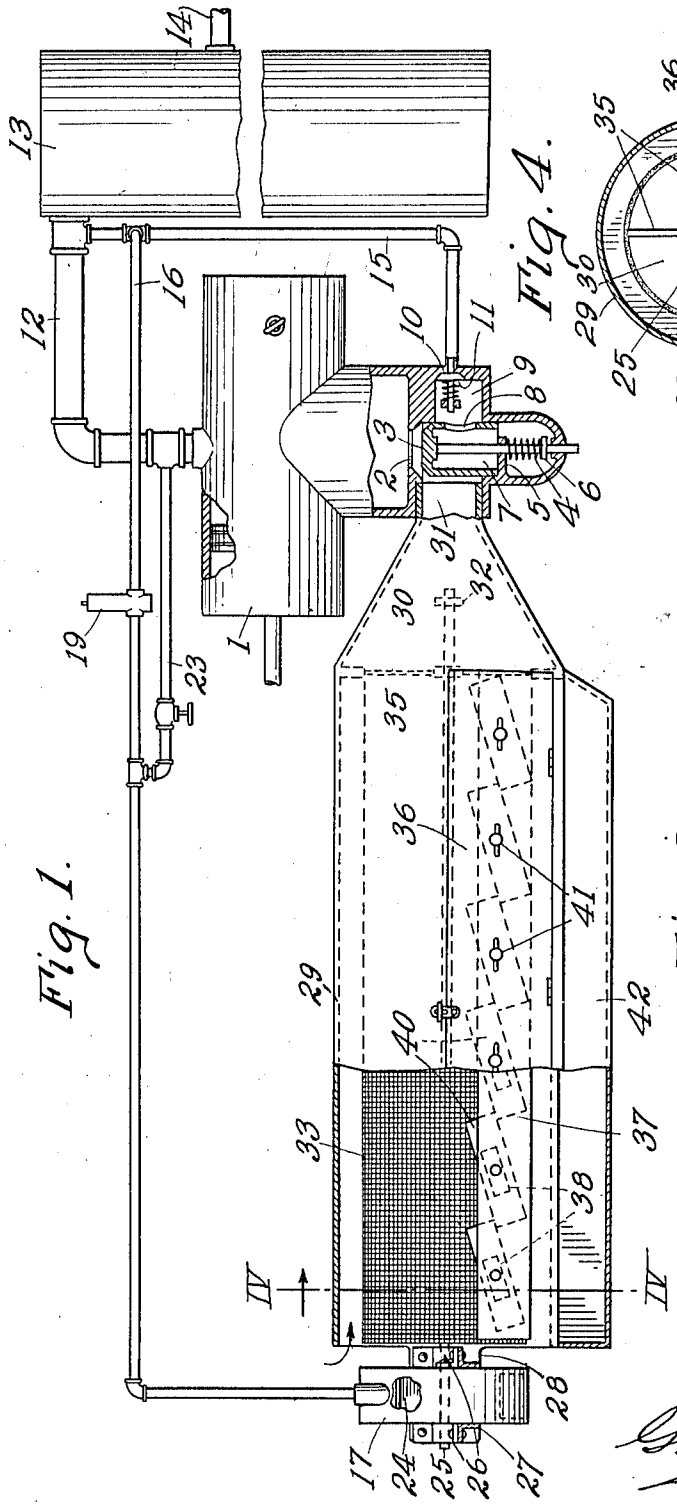


Fig. 1.

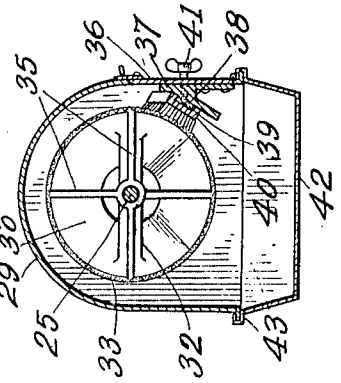


Fig. 4.

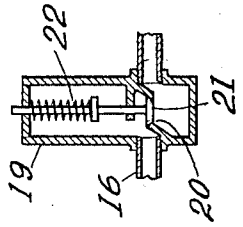


Fig. 3.

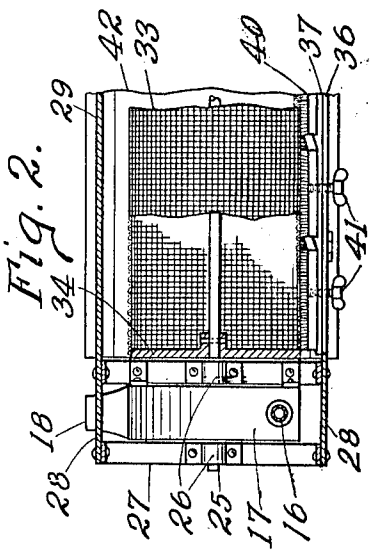


Fig. 2.

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AIR CLEANING ATTACHMENT FOR AIR-COMPRESSORS.

1,314,443. Specification of Letters Patent. Patented Aug. 26, 1919.

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To all whom it may concern:

Be it known that I, THOMAS E. TAYLOR, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Air Cleaning Attachments for Air-Compressors, of which the following is a specification.

This invention relates to air compressors, and has for its object to provide automatic air cleaning attachments therefor.

With this general object in view the invention consists in certain novel and useful features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawing, in which:

Figure 1, is a side elevation of an air compressor and cleaning apparatus embodying the invention.

Fig. 2, is a fragmentary view partly in plan and partly in horizontal section, of the air cleaning attachment.

Fig. 3, is an enlarged vertical section of an automatic valve forming a part of the equipment.

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

In the said drawing, 1 indicates an air compressor of any suitable type, having an air intake port 2, and a valve 3 for closing said port at times.

The valve is normally held open by a spring 4 bearing against a fixed arm 5 and a collar 6 movable with the valve. The valve is provided with a depending hollow cylindrical portion 7 having a side opening 8 communicating with the chamber 9 and a port 10 normally closed by a spring-actuated valve 11. A discharge pipe 12 leads from the air compressor to an air tank 13, and the latter is provided with a distributing pipe 14 through which the air from the tank passes for performing work. A by-pass pipe 15 communicates with the pipe 12 and tank 13 at one end and at the other with port 10, so that excess pressure produced by the air compressor in the tank and said pipe 12, shall unseat valve 11 and thus admit air under pressure to chamber 9, whence it passes through opening 8 into the cylindrical portion 7 of valve 3 for the purpose of exerting upward pressure on said valve and causing the same to close the air intake port 2. A pipe 16 leads from the by-pass 15 to a casing 17 provided with a nozzle 18 for discharging into the atmosphere, and mounted on pipe 16 is a valve-casing 19 having a perforated partition 20, the perforation of the partition being normally closed by a valve 21, under the pressure of a spring 22. Said spring is adapted to yield to permit the valve to open when the pressure in the tank 13 is high enough to open valve 11, and when said valve 21 opens, air pressure is discharged into the casing 17, for a purpose which is presently explained. If it is desired to supply air under pressure to casing 19 before the pressure in the tank gets high enough to effect the opening of valve 21, a valve-controlled pipe 23 may be employed, the said connecting pipe connecting 12 to pipe 16 back of the valve-controlled casing 19.

Arranged within the casing 17 is an impeller wheel or fan 24, the shaft 25 thereof being journaled in bearings 26 mounted on cross bars 27 connecting extensions 28 of a housing 29. The housing is open at its rear end and at its front end tapers as at 30, and terminating in a reduced neck 31 fitting in the air compressor and adapted for supplying air to the intake port 2 thereof when the valve 3 is unseated. The shaft of the impeller or fan extends through the body portion of the housing and is journaled at its front end in a cross bar 32 extending across the tapered end of the housing.

Arranged within the housing is an air cleaning or filtering cylinder 33, the same being mounted rigidly upon the shaft 25, and closed at its outer end as at 34, the opposite or inner end consisting of a series of spokes 35 whereby it is supported upon the shaft without impeding the passage of air into the tapered end of the housing.

At one side the housing has an opening controlled by a hinged door 36, and secured to the inner side of said door is a longitudinal bar 37 provided with a series of inclined dove-tail shaped ribs 38 for engagement with dove-tail channels 39 formed in the outer faces of a series of brushes 40 engaging and adapted to brush dust from the screen cylinder 33, and to secure the brushes in place, set screws 41 are mounted in the door and extend through the bar 37 and against the backs of the brushes within the dove-tail grooves thereof, as shown most clearly in Fig. 4. By the arrangement de-

scribed it will be noticed that the brushes extend in parallel inclined planes so that by loosening any particular set screw, the corresponding brush can be slid out of position without interfering with the adjacent brushes, and that a brush likewise can be replaced with the same facility, it being understood, of course, that to place a brush in or remove it from position, the door 36 must first be opened.

The bottom of the housing is open and communicates with an underlying dust pan 42, the dust pan having a tongue and groove relation as at 43 with the lower edges of the sides of the housing so that the former can be readily slid in or removed from position, being removed so that the attendant may dispose of any accumulation of dust or dirt therein.

Assuming that the air compressor has compressed air into tank 13 in excess of a predetermined pressure, it will be apparent that such pressure will react through the by-pass pipe 15 and pipe 16 and effect the unseating of valve 21, the air entering the chamber 9 passing into the cylinder 7 of valve 3 and effect the closure of the latter. The air entering the casing 19 effects the opening of valve 21, and permits air under pressure to pass into casing 17 and rotate the impeller or fan, and thereby rotate cylinder 33 and effect the brushing of the same by the brushes 40, the dust and dirt dislodged by the brushes passing down into the pan because at this time there is no circulation of air through the screen and housing because the intake port 2 of the compressor is closed. After the screen has been rotated a few times,—the number of revolutions depending on the amount of excess pressure supplied to the tank 13,—the pressure in the tank 13 will fall sufficiently to permit the valve 3 to reopen the valve 21 to close. Immediately this action takes place the continued operation of the compressor draws air into the housing and thence into the cleaning cylinder, and from the open end of the latter through the tapered portion and neck of the housing through port 2. It will thus be seen that the cleaning cylinder is occasionally brushed off automatically, the frequency of the brushing action depending on the frequency with which excess pressure is stored in tank 13. In the event that the consumption of air from tank 13 is so regulated that the store of excess pressure in said tank is too infrequent to brush the cylinder as often as desirable, the engineer in charge may, by opening the valve of pipe 23, effect the operation of the cylinder to dislodge the dust therefrom, without interfering with the circulation of the air through said cylinder by the compressor.

From the above description it will be apparent that I have produced apparatus of the character set forth embodying the features of advantage enumerated as desirable in the statement of the object of the invention, and which can be applied to an air compressor easily and at low cost.

I claim:

1. The combination of an air compressor having an air-intake port and a discharge pipe, a compressed-air tank connected to said pipe, means for closing said port, a pipe through which air when it attains a predetermined pressure in the tank, shall cause said means to close said port, an air strainer for cleaning the air supplied to said intake port, and means whereby said screen is automatically brushed when said closing means is caused to close said intake port.

2. The combination of an air compressor having an air-intake port and a discharge pipe, a compressed-air tank connected to said pipe, means for closing said port, a pipe through which air when it attains a predetermined pressure in the tank, shall cause said means to close said port, an air strainer for cleaning the air supplied to said intake port, means actuated by air when it attains such predetermined pressure in the tank, for imparting movement to said screen, and means to brush said screen when the same is moving.

3. The combination of an air compressor having an air-intake port and a discharge pipe, a compressed-air tank connected to said pipe, means for closing said port, a pipe through which air when it attains a predetermined pressure in the tank, shall cause said means to close said port, an air strainer for cleaning the air supplied to said intake port, means actuated by air when it attains such predetermined pressure in the tank, for imparting movement to said screen, a housing for said screen, and means carried by the housing for brushing the screen when the same is being moved.

4. The combination of an air compressor having an air-intake port and a discharge pipe, a compressed-air tank connected to said pipe, means for closing said port, a pipe through which air when it attains a predetermined pressure in the tank, shall cause said means to close said port, a hollow cylindrical screen connected to the air-intake port when the latter is open, a housing for the screen to admit air to the exterior side thereof, means for automatically rotating the screen when the said intake port is closed, and means for brushing said screen when the same is being turned.

5. The combination of an air compressor having an air-intake port and a discharge pipe, a compressed-air tank connected to said pipe, means for closing said port, a pipe through which air when it attains a predetermined pressure in the tank, shall cause said means to close said port, a hollow

cylindrical screen connected to the air-intake port when the latter is open, a housing for the screen to admit air to the exterior side thereof, a door for the housing, screen brushing means secured to the inner side of the door, and means for automatically rotating the screen against said brushing means when the said port is closed.

6. The combination of an air compressor having an air-intake port and a discharge pipe, a compressed-air tank connected to said pipe, means for closing said port, a pipe through which air when it attains a predetermined pressure in the tank, shall cause said means to close said port, an air strainer for cleaning the air supplied to said intake-port, a rotary impeller for turning the screen, a pipe connecting the impeller with the compressed-air tank, a yieldingly-closed valve in said pipe for opening when the air in the tank attains such predetermined pressure, to operate the impeller, and means for brushing the screen when the same is rotated.

7. The combination of an air compressor having an air-intake port and a discharge pipe, a compressed-air tank connected to said pipe, means for closing said port, a pipe through which air when it attains a predetermined pressure in the tank, shall cause said means to close said port, an air strainer for cleaning the air supplied to said intake-port, a rotary impeller for turning the screen, a pipe connecting the impeller with the compressed-air tank, a yieldingly-closed valve in said pipe for opening when the air in the tank attains such predetermined pressure, to operate the impeller, a by-pass pipe for air, around said yieldingly-closed valve, a manually operable valve in said by-pass pipe, and means for brushing said screen when the same is rotated.

In testimony whereof I affix my signature.

THOMAS E. TAYLOR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."