May 8, 1934. W. P. MUSTONEN 1,957,975

BLOWER PIPE SYSTEM

Filed Sept. 19, 1932 2 Sheets-Sheet 1

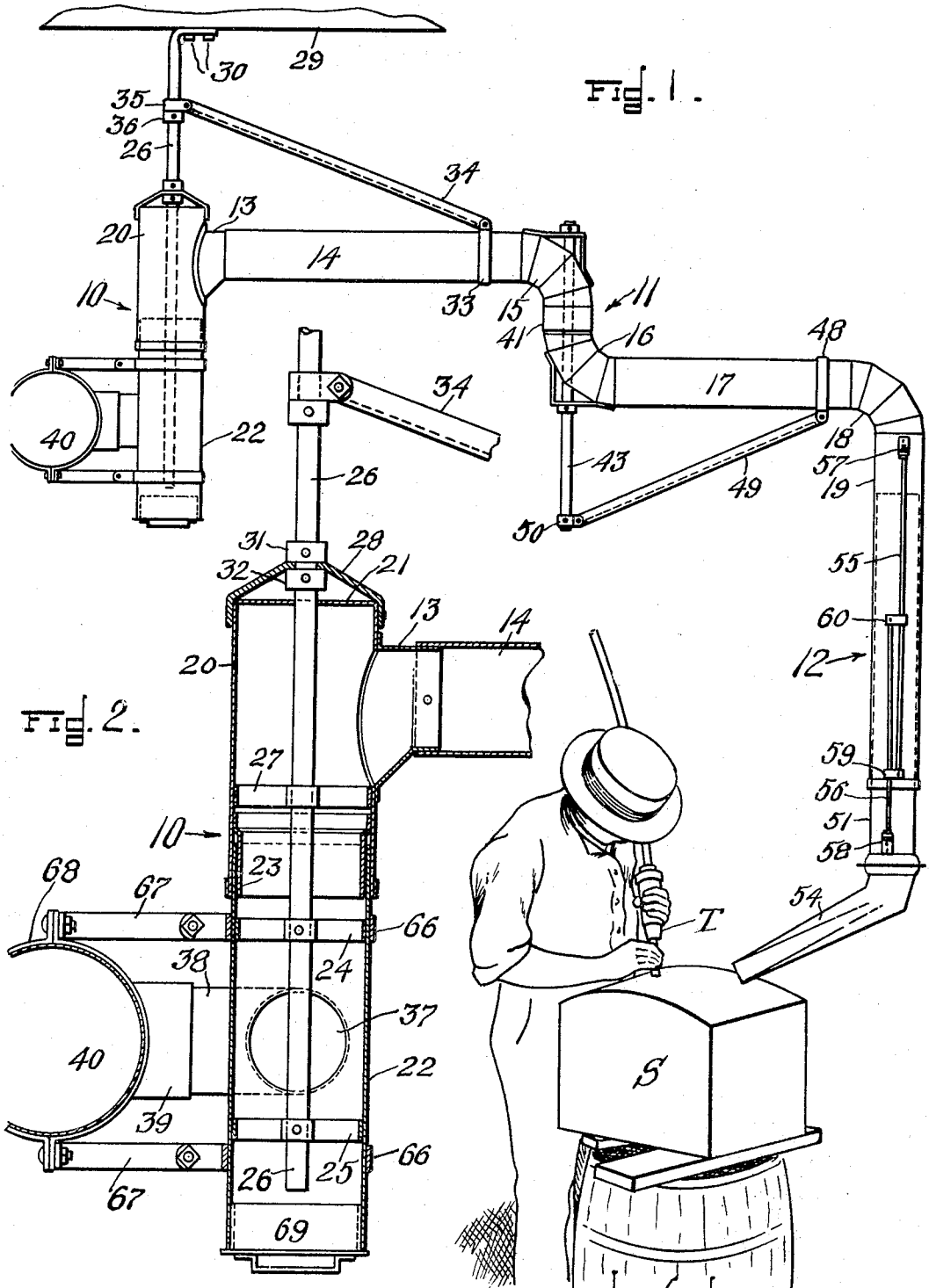


Fig. 1.

Fig. 2.

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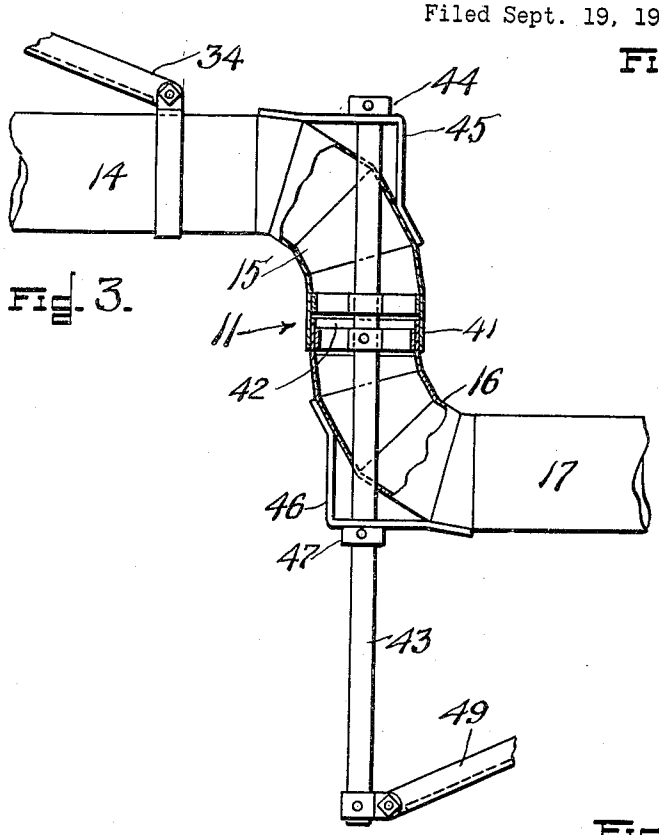


Fig. 3.

Fig. 4.

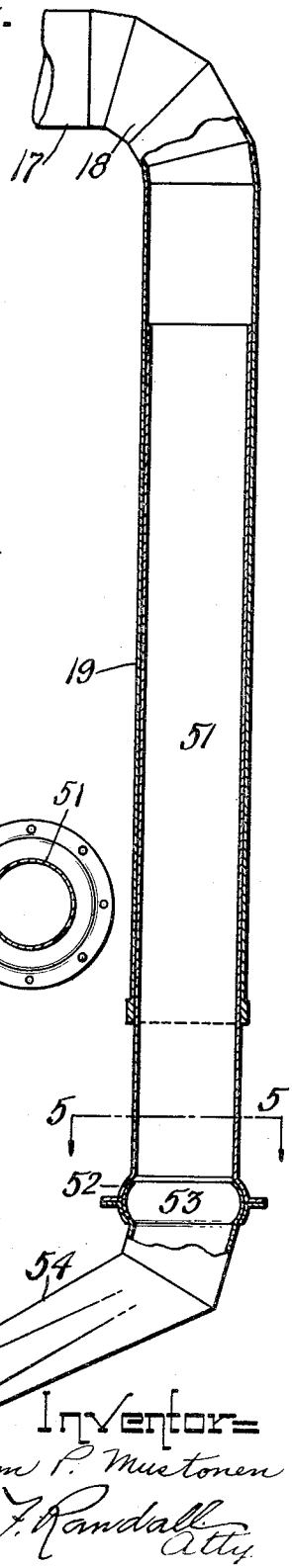
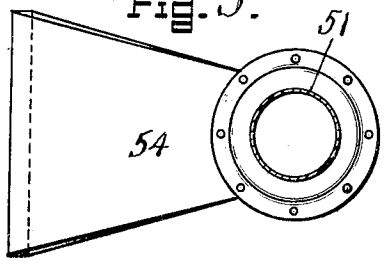


Fig. 5.



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UNITED STATES PATENT OFFICE

1,957,975

BLOWER PIPE SYSTEM

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8 Claims. (Cl. 302—34)

My invention relates to blower pipe systems such as are employed in connection with pneumatic stone cutting or surfacing tools whose operation produces dust and chippings. Blower pipe systems of the class referred to are used to pneumatically collect and carry away the dust and chippings produced in working stone, and my invention has for its object to provide an improved blower intake pipe system of this class.

To this end I have provided an improved blower intake pipe system having the peculiar features of construction and mode of operation set forth in the following description, the several novel features of the invention being particularly pointed out and defined in the claims at the close thereof.

In the accompanying drawings:

Figure 1 is an elevation of a blower intake pipe system constructed in accordance with my invention.

Figure 2 is an enlarged sectional view of one end portion of the pipe system shown in Figure 1.

Figure 3 is an enlarged sectional view of an intermediate portion of the system shown in Figure 1.

Figure 4 is an enlarged elevation, mostly in section, of the free end portion of the system shown in Figure 1.

Figure 5 is a section on line 5—5 of Figure 4.

The embodiment of my invention illustrated in Figs. 1 to 5, inclusive, comprises an inner vertically disposed tubular sheet metal conduit that is indicated generally at 10; an intermediate vertically disposed tubular sheet metal conduit that is indicated generally at 11, and an outer vertically disposed tubular sheet metal conduit that is indicated generally at 12. The inner tubular conduit 10 is provided near its upper end with an inlet nipple 13 which is telescopically engaged with, and fastened to, one end of a horizontal sheet metal pipe section 14 whose outer end is made with a sheet metal downwardly directed elbow 15, telescopically engaged with an upwardly directed sheet metal elbow 16 provided at one end of a second horizontal sheet metal pipe section 17 whose opposite outer end is constructed with a downwardly directed sheet metal elbow 18 to which is rigidly secured the upper end of a vertically disposed pipe section 19, the latter forming part of the vertically disposed outer conduit 12.

The inner vertical conduit 10 comprises an upper tubular sheet metal section 20, Fig. 2, that is closed at its upper end by a top wall 21, and a lower sheet metal pipe section 22 whose upper end portion is telescopically fitted within the lower portion of the upper section 20, said upper section being provided interiorly with a skirt 23 fitting telescopically into the upper end portion of the lower section 22.

Upon its interior the lower section 22 of conduit 10 is made with two spiders 24 and 25 having apertured hubs through which extends a vertically disposed pintle bar or post 26, said spiders 24 and 25 being secured to the lower section 22 and also to the pintle post 26.

From the spider 24 the pintle post 26 extends upwardly loosely through the apertured hub of a spider 27 that is part of the upper section 20 of conduit 10, thence upwardly loosely through an aperture provided through a bracket 28 fastened to the upper end of the upper section 20 to an overhead fixture or support 29 to which its upper end is securely fastened as by means of screws or bolts 30. Collars 31 and 32 fixed to pintle post 26 above and below the middle portion of bracket 28, respectively, serve to hold the upper section 20 of vertical conduit 10 against vertical displacement on pintle post 26, but so that said upper section 20 is free to rotate on said post relatively to the lower section 22. The spiders 24 and 25 which are part of the lower section 22 are fixed rigidly to pintle post 26 so that said lower section 22 is immovably supported by said post.

Fixed in position upon the outer end portion of horizontal pipe section 14 is a band or collar 33 to the top of which is fastened one end of an angle iron strut or brace 34 whose opposite end is fastened to a collar 35 rotatably mounted upon the pintle post 26 immediately above a collar 36 that is fixed in position upon said post. Intermediate its upper and lower ends the lower section 22 of vertical conduit 10 is made with an outlet 37 that extends through a nipple 38 provided upon the outside of lower section 22. This nipple 38 is telescopically fitted into a nipple 39 provided upon the outside of a suction pipe 40 which as usual connects with the inlet of a blower by means of which air is exhausted from vertical conduit 10, horizontal pipe section 14, vertical conduit 11, horizontal pipe section 17 and the vertical conduit 12.

The elbow 15 at the outer end of pipe section 14 is made at its lower end with a vertically disposed cylindrical portion 41, Fig. 3, into which is telescopically fitted a vertically disposed cylindrical portion 42 provided at the upper end of the elbow 16 of pipe section 17.

Extending through apertures provided for it in elbows 15 and 16 is a pintle bar 43 whose axis is coincident and parallel with the axis of the short vertical conduit 11. At its upper end the post 43 has fixed upon it a collar 44 that rests upon an angle iron bracket 45 fastened to elbow 15. The lower elbow 16 also has fastened in position upon the outside thereof, an angle bracket 46 immediately below which a collar 47 is fixed in position upon post 43.

Fixed in position upon the outer end portion of the horizontal pipe section 17, Fig. 1, is a collar 48 to which is fastened one end of an angle iron strut or brace 49 whose opposite end is fastened to a bracket 50 which in turn is fixed in position upon the post 43.

As will be clear the post 26 and strut 34 serve to prevent sagging of the outer end portion of the horizontal pipe section 14, while the pintle bar 43 and strut 49 serve to prevent sagging of the outer end portion of the horizontal pipe section 17.

The outer vertical conduit 12 also comprises an inner vertical pipe section 51, Figs. 1 and 4, that is telescopically fitted within the outer pipe section 19, and at its lower end this inner pipe section is made with a socket 52 within which is rotatably mounted the upper ball-like end portion or nipple 53 of a laterally and downwardly projecting terminal nozzle 54 which may be made from sheet metal. As will be clear the terminal nozzle 54 may be raised and lowered by sliding the pipe section 51 up and down within the pipe section 19 and it may also be rotated to the extent of 360° on the axis of pipe section 51.

It is a feature of advantage to the above described construction that the tubular parts extending outwardly from the inner vertical conduit 10 constitute a rigid cantilever arm which can be swung laterally on the axis of post 26 to the extent of more than 180°; that this contilever arm is in two sections that are pivotally connected together near the middle of the arm so that they can be swung relatively on the vertical axis of the pintle bar 43, and that the laterally directed inlet terminal nozzle 54 can be adjusted angularly, or rotatively on the vertical axis of conduit 12. These structural peculiarities permit of wide range of adjustment of the inlet nozzle 54 so that it may be conveniently and properly positioned with respect to the work and the workman, wherever the work may be placed within a semi-circle described by the cantilever arm when the latter is fully extended.

In order to provide for adjustment of pipe section 51 lengthwise with respect to pipe section 19 and to hold said pipe section 51 in adjusted position, I provide a pair of vertical rods 55 and 56, the former having its upper end fastened to pipe section 19 at 57, and the latter having its lower end fastened at 58 to pipe section 51. At its lower end the rod 55 is provided with a laterally extending arm 59 formed with an aperture through which the rod 56 extends, while said rod 56 is provided at its upper end with a laterally extending arm 60 that is formed with an aperture through which the rod 55 extends. The arm 60 is made somewhat longer than the arm 59 with the result that the two rods are slightly bowed or sprung laterally so that the arms 59 and 60 frictionally engage and clutch said rods. In this way pipe section 51 is yieldingly held in its adjusted position. At the same time the flexibility or resiliency of rods 55 and 56 permits of extensive vertical adjustment of pipe section 51 relatively to pipe section 19.

It is also a feature of advantage to the above described construction that the distance from the axis of post 43 to the outside of the vertical pipe section 19 is less than the distance from the axis of post 43 to the nearest side of vertical conduit 10. As a result of this peculiarity, the horizontal pipe section 17 can be rotated 360° on the axis of post 43.

The lower section 22 of conduit 10 has two bands 66 fixed in position upon its exterior and these bands 66 are made with laterally extending arms 67 fastened at their outer ends to a collar or band 68 fixed in position upon the suction pipe 40. These parts provide a rigid bracket connecting section 22 with suction pipe 40 so that the former is securely and rigidly held in position.

When my new blower pipe system is in use, the inlet opening of the nozzle 54 is positioned close to the stone S, Fig. 1, and near the pneumatic tool T and as dust and small chips are produced by the latter, they are drawn into nozzle 54 and caused, by the current of air passing therethrough, to traverse the pipe sections 19, 17 and 14. From the pipe section 14 the dust and chips are delivered into the upper end of the vertical conduit section 10 and travel downwardly through the latter to the outlet 37 through which they pass into the suction pipe 40 by which they are usually carried to a distant point. As the air, laden with dust and chips makes the sharp turn to pass through outlet 37, the heavier particles are projected downwardly into the lower portion of section 22 which latter therefore serves as a trap in which the heavier particles are caught and held.

The lower end of section 22 is provided with a removable closure member 69 which is preferably made from sheet metal and which is slid telescopically into the lower end of section 22 and held therein by friction assisted by air pressure upon its exterior.

From the above description it will be apparent that the structure, regarded as a whole, constitutes a rotatably supported cantilever conduit arm made up of two cantilever sections, one including the pipe 14 adapted to be rotated around the vertical axis of the fixed pintle rod 26, and the other including the pipe 17 adapted to be rotated around the vertical axis of the pintle rod 43.

The above described blower pipe system is made almost entirely from sheet metal and as a result it is light and durable and at the same time it can be quickly and easily adjusted according to the position, laterally and vertically, of the work.

What I claim is:

1. A blower pipe system of the character described having, in combination, a fixedly supported suction pipe; an articulated cantilever conduit arm comprising a vertically disposed conduit including an upper section having an inlet and supported so as to be rotatively adjustable on its own axis relatively to said suction pipe thereby to provide for lateral adjustment of said articulated cantilever conduit arm and a lower section having its upper end telescopically and rotatively associated with the lower end of said upper section and provided with an outlet communicating with said suction pipe, said outlet being positioned intermediate the upper and lower ends of said lower section so that the lower portion of the latter serves as a trap; means fix-

edly supporting said lower section, and a removable closure for the lower end of said lower section.

2. A blower pipe system of the character described, constructed in accordance with claim 1 wherein the lower end of the upper section of said vertical conduit is made upon its interior with a depending skirt that is also telescopically associated with the upper end of said lower section so that said upper end occupies a position between said skirt and the lower end portion of said upper section.

3. A blower pipe system of the character described having, in combination, a fixedly supported suction pipe and an articulated cantilever conduit arm comprising a vertically disposed trap conduit including an upper section provided with an inlet and supported so as to be rotatively adjustable on its own axis relatively to said suction pipe thereby to provide for lateral adjustment of said articulated cantilever conduit arm, and also including a lower section fixedly connected with said suction pipe and provided with an outlet communicating with said suction pipe, said outlet being positioned between the upper and lower ends of said lower section so that the lower portion of the latter serves as a trap; a removable closure for the lower end of said lower section; an outer vertically disposed conduit provided at its lower end with an inlet, and two horizontally disposed intermediate pipe sections, one of which is connected at its inner end with the inlet of said upper trap section and the other of which is connected at its outer end with the upper end of said outer vertically disposed conduit, and means pivotally joining the opposite proximate ends of said two horizontal pipe sections so that they are rotatively adjustable relatively on a vertical axis.

4. A blower pipe system of the character described constructed in accordance with claim 3 wherein said outer vertically disposed conduit comprises two telescopically associated pipe sections that are relatively adjustable longitudinally; wherein friction clutch means is provided upon the exteriors of said pipe sections for yieldingly holding said sections in adjusted condition, and wherein a laterally extending inlet nozzle is provided that is connected with the lower end of the lowermost of said pipe sections so that it is rotatively adjustable on the axis thereof.

5. A blower pipe system of the character described having an articulated cantilever conduit arm comprising two intermediate horizontally disposed adjoining pipe sections made with telescopically associated and vertically disposed cylindrical end portions; a vertical pivot pintle which extends axially through said cylindrical end portions and holds the latter against separating, and a strut connecting the lower end portion of said pivot pintle with the outer end portion of the outermost horizontal pipe section to support the latter.

6. A blower pipe system of the character described constructed in accordance with claim 1 wherein said vertically disposed conduit is supported by a pintle post extending axially therethrough, wherein one end of a horizontally disposed pipe section is connected with the inlet of said upper section and wherein a strut is provided for supporting the outer end of said horizontal pipe section, said strut having one end thereof connected with said pintle post and its opposite end connected with said horizontal pipe section.

7. A blower pipe system of the character described having, in combination, a fixedly supported suction pipe; and a cantilever conduit arm comprising an inner vertically disposed sheet metal conduit including a fixedly supported section and a rotatively supported section having one end portion thereof telescopically associated with said fixedly supported section and provided with an inlet; an intermediate vertically disposed sheet metal conduit comprising two telescopically and rotatively associated sections; an outer vertically disposed sheet metal conduit including two telescopically associated sections; a horizontal sheet metal pipe section connecting the upper end of one of the sections of said outer vertical conduit with one of the sections of said intermediate vertical conduit; a horizontal sheet metal pipe section connecting the other section of the intermediate vertical conduit with the inlet of the rotatable section of said inner vertical conduit; a laterally extending sheet metal inlet nozzle rotatively connected with the lower end of the other section of said outer vertical conduit so that it is rotatively adjustable on the axis thereof, and means for holding the two sections of said outer vertical conduit against longitudinal movement relatively but with provision for vertical adjustment of said nozzle and the section with which it is connected.

8. A blower pipe system of the character described having, in combination, a fixedly supported suction pipe and an articulated sheet metal cantilever conduit arm extending laterally from said suction pipe that is pivotally adjustable on a vertical axis and provided at its outer end with a vertically adjustable inlet end portion, said inlet end portion being also universally adjustable laterally and constructed at its lower end with a laterally extending terminal nozzle that is rotatively adjustable independently and horizontally on the axis of said inlet end portion.

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