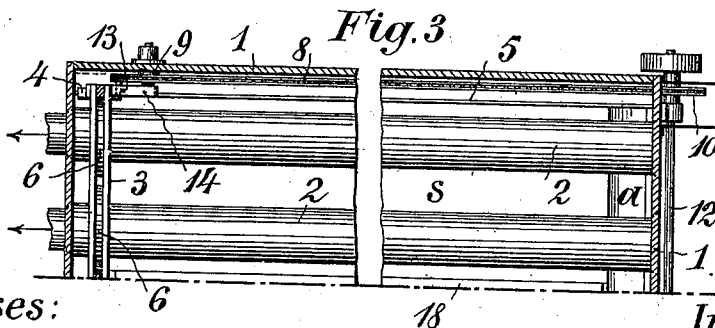
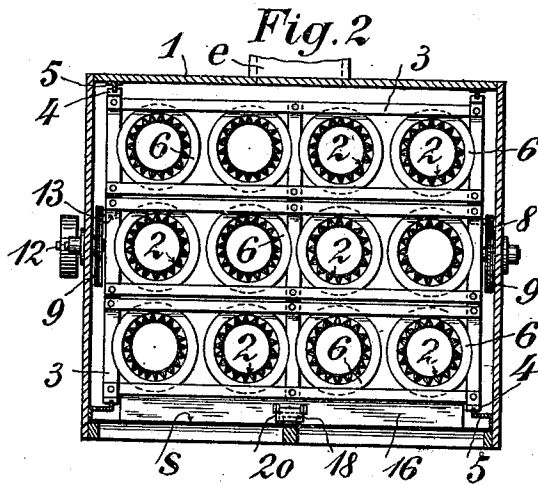
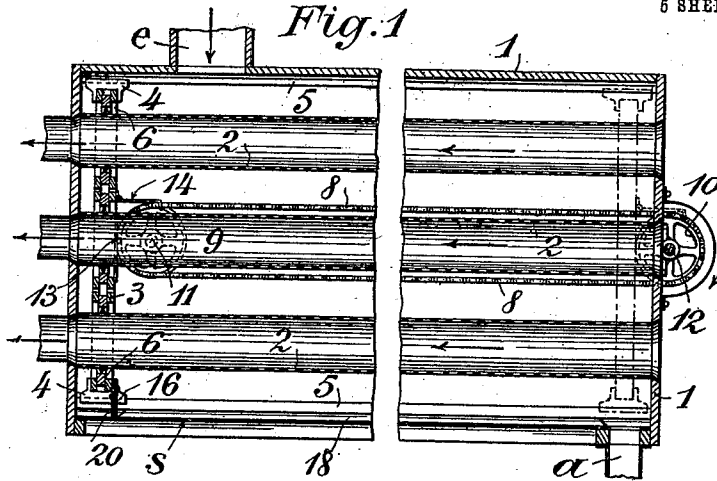


996,519.

6 SHEETS—SHEET 1.



Witnesses:

J. M. Sommers
Mr. J. Ellis.

Inventor:

Jacob Peter
by Henry Orth
Atty

J. PETER.
MULTITUBULAR DUST COLLECTOR.
APPLICATION FILED SEPT. 2, 1909.

996,519.

Patented June 27, 1911.

6 SHEETS—SHEET 2.

Fig. 4

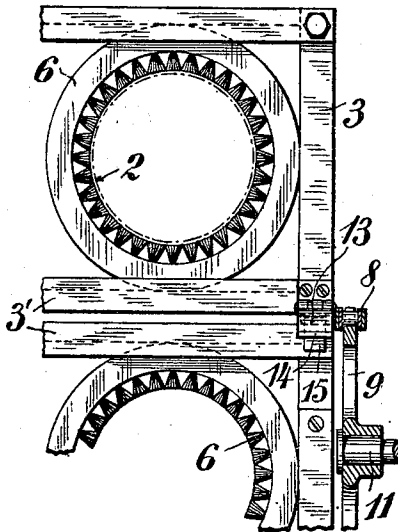
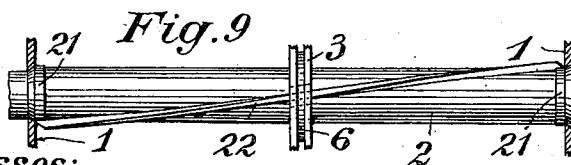
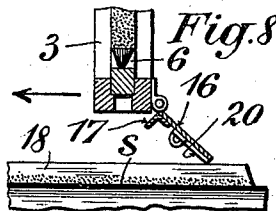
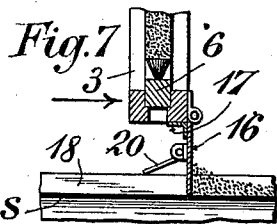
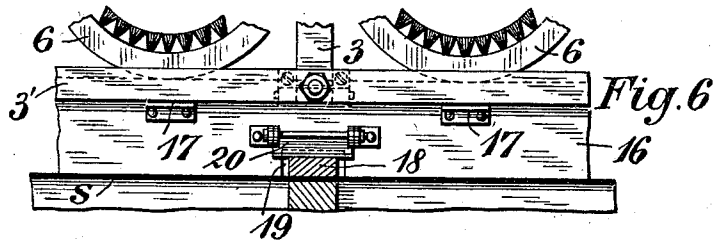
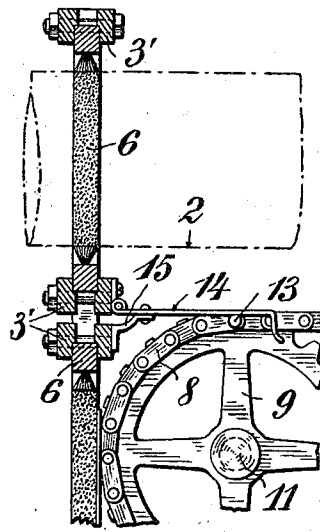


Fig. 5



Witnesses:

J. Rommers
m. F. Ellis.

Inventor:

Jacob Peter
by *Henry Orth*
Att'y.

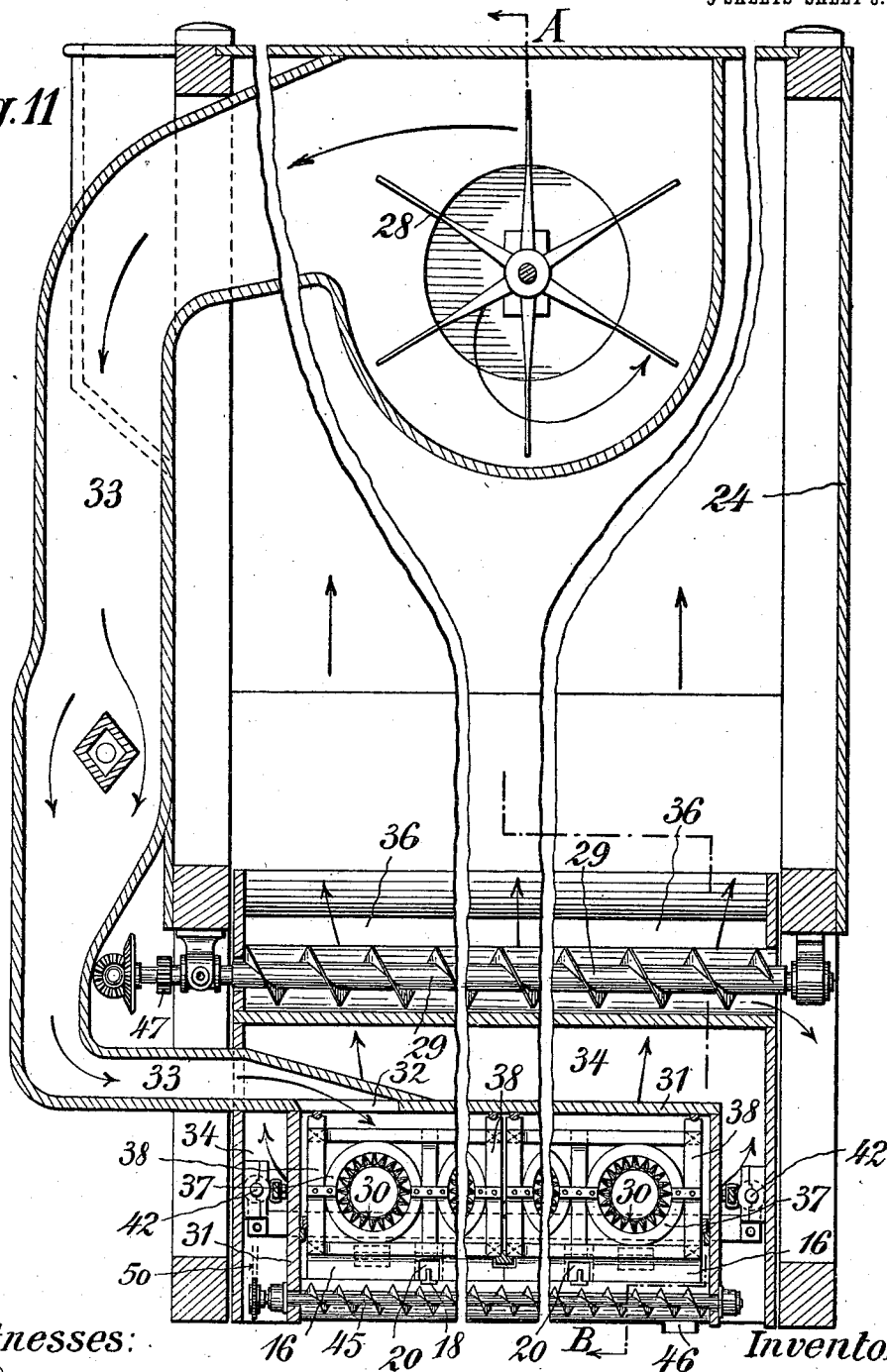
J. PETER.
MULTITUBULAR DUST COLLECTOR.
APPLICATION FILED SEPT. 2, 1909.

996,519.

Patented June 27, 1911.

5 SHEETS—SHEET 3.

Fig. 11



Witnesses:

M. Kommers
Mr. J. Ellis

Inventor:

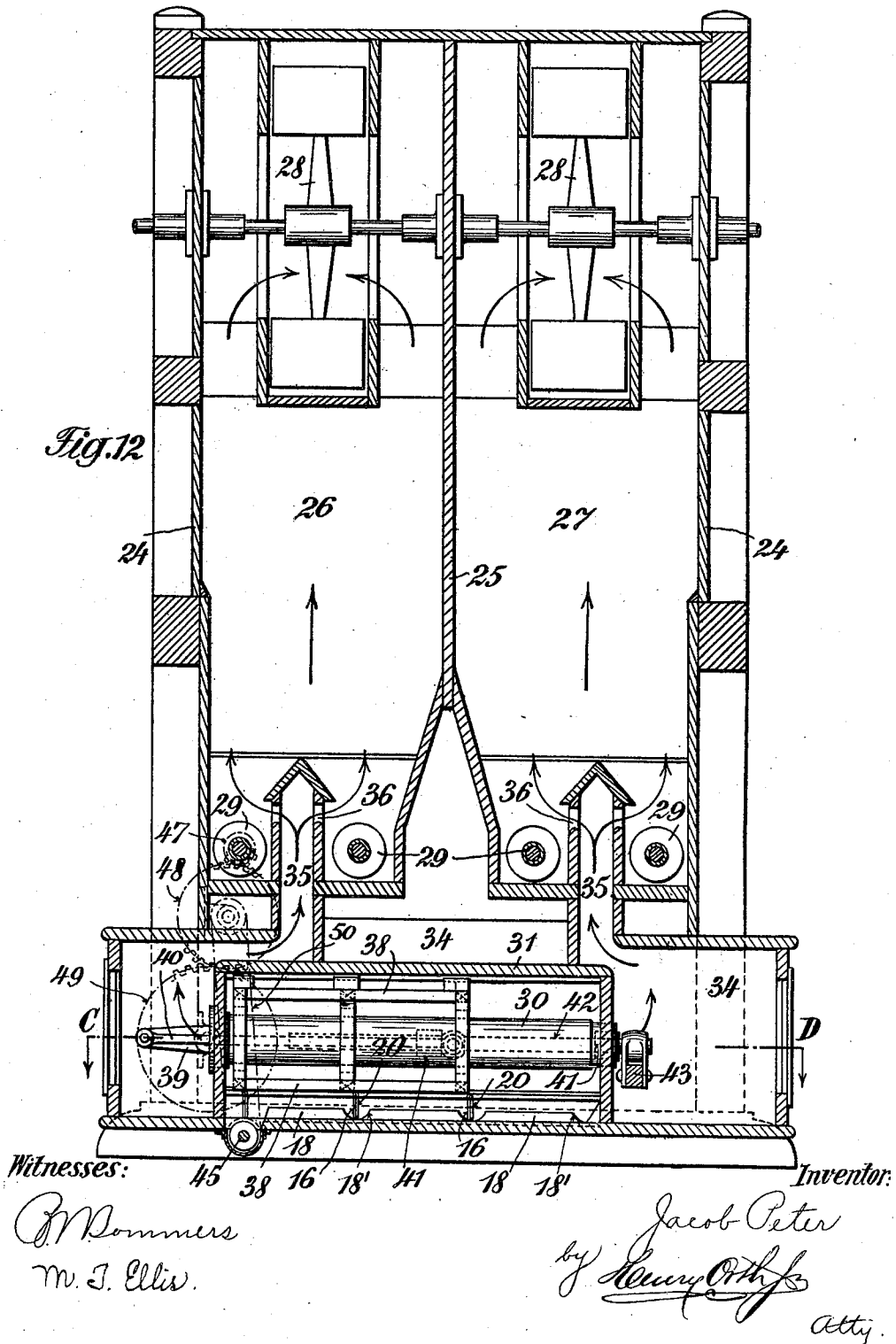
Jacob Peter
by Henry Orth
att_y

J. PETER.
MULTITUBULAR DUST COLLECTOR.
APPLICATION FILED SEPT. 2, 1909.

996,519.

Patented June 27, 1911.

6 SHEETS-SHEET 4.



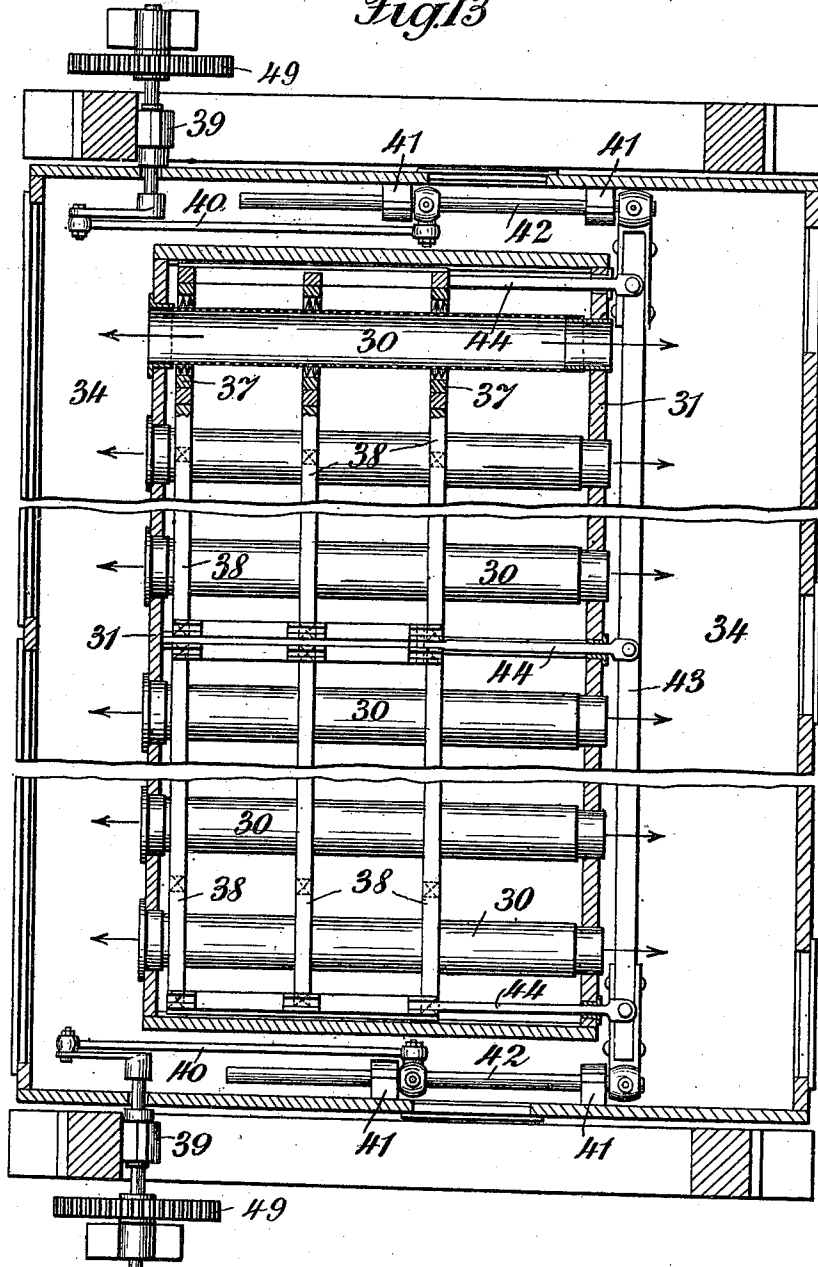
J. PETER.
MULTITUBULAR DUST COLLECTOR.
APPLICATION FILED SEPT. 2, 1909.

996,519.

Patented June 27, 1911.

5 SHEETS—SHEET 5.

Fig 13



Witnesses

C. M. Kommers
M. J. Ellis.

Inventor:

Jacob Peter
by Mary C. Peter
Atty.

UNITED STATES PATENT OFFICE.

JACOB PETER, OF LONDON, ENGLAND.

MULTITUBULAR DUST-COLLECTOR.

996,519.

Specification of Letters Patent. Patented June 27, 1911.

Application filed September 2, 1909. Serial No. 515,810.

To all whom it may concern:

Be it known that I, JACOB PETER, a citizen of the Republic of Switzerland, residing at Savoy Court, Strand, London, W. C., England, have invented certain new and useful Improvements in Multitubular Dust-Collectors; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The present invention has for its object a multitubular dust collector, consisting of horizontal dust filtering cylinders with deposition of dust on outside of said cylinders. For this purpose, according to this invention, in the dust collecting chamber of a dust collector comprising a number of rigidly mounted filtering cylinders, there is arranged to move to and fro in the direction of the length of the cylinders at least one frame within which are mounted annular brushes which surround the cylinders so that during the movement of the frame the outside of the cylinders are brushed down; at the same time the dust brushed off is collected and carried to one end of the collecting chamber.

The illustrative drawings accompanying my specification show constructional forms of dust collector embodying this invention.

Figure 1 is a vertical longitudinal section showing the dust collecting plant in its employment as a multitubular dust filter. Fig. 2 is a transverse section thereof. Fig. 3 is a partial horizontal section through the upper part of Fig. 1. Figs. 4 to 8 show portions of the dust collecting plant on a larger scale and Figs. 9 and 10 illustrate a modification. Fig. 11 show an arrangement of a dust collecting plant constructed in the form of a multitubular dust filter, incorporated in a grits-cleaning machine, in a longitudinal section. Fig. 12 is a section corresponding to the line A—B of Fig. 11 and Fig. 13 is a section corresponding to the line C—D of Fig. 12.

The dust collecting plant shown in Figs. 1 to 3, and serving as a multitubular dust collector comprises a rectangular box 1 the sides and top of which are tightly closed and which box serves as the dust collecting

chamber. Located within the box 1 are three superposed rows of horizontally arranged dust filters, each row containing four hollow cylinders 2 which constitute the filters proper. Each cylinder 2 is rigidly mounted in opposite ends of the box and is closed at one end, the interior of the several cylinders being in communication at their open ends with a common suction pipe, not shown in the drawing. The cylinders 2 are covered with tightly stretched filtering cloth and are adapted to be mechanically brushed down externally. For this purpose there is arranged in the box 1 a frame 3 the position of which is vertical with respect to the filter cylinders and which is movable to and fro in the direction of the length of the cylinders in which movement it is guided by means of shoes 4 provided on its upper and under sides engaging rails 5 that also extend in the same direction as the cylinders. In the frame 3 are mounted twelve annular brushes 6, that is to say a brush for each filter cylinder, these brushes entirely surround the corresponding cylinders and the bristles thereof bear against the outer surfaces of the cylinders. The annular brushes 6 are simply pushed over the filtering cylinders 2 and are so placed within the driving frames that they fit between the horizontal members 3' of such frames. For moving the frame 3 to and fro along the filtering cylinders two endless chains 8 are passed at the level of the intermediate row of cylinders 2 over guide wheels 9 and over driving wheels 10. The wheels 9 revolve idly on pins 11 fixed to the inside of the side walls of the box 1, see Figs. 4 and 5, while the wheels 10 are fixed upon a driving shaft 12 mounted outside one end of the box and adapted to rotate in the direction of the arrow in Fig. 1, see Figs. 1 to 3. To each chain is attached a tappet pin 13, Figs. 4 and 5, the two pins being set opposite each other and serving to carry along the frame 3 with the annular brushes 6, for which purpose, there is attached to the frame 3 at the level of the upper length of the chain a pivoted hook 14 for each chain, supports 15 holding these hooks in a horizontal position, see Figs. 1, 4 and 5. Pivottally mounted on the bottom member of the frame 3 is an oscillating scraper bar 16 which, in its vertical position, reaches to the bottom of the box 1. 17 are stops or supports on the bar 16 which, by

bearing against the frame 3, prevent the bar from rotating beyond its vertical position on one side. The bottom *s* has fixed thereto a centrally arranged rib 18 extending longitudinally from near one end to near the other end to receive this rib there is formed in the scraper bar 16 an opening 19 which is furnished with a swinging flap 20 that rests on the rib 18. *a* is a dust discharge aperture at one end of the box 1 or of the bottom *s*, and *e* is an aperture for the entrance of the dust laden air into the box. The cylinders 2 effect the filtering, the blast of air charged with dust being drawn through the aperture *e*, the cylinders 2, and the aforesaid suction pipe. The impurities contained in this blast of air are thereby deposited on the outer surfaces of the cylinders whence they are brushed off, upon the to and fro movement of the frame 3, by the annular brushes 6 moving along the cylinders. The movement of the brush frame 3 is effected as follows: Starting from the end position in which it is shown in full lines in Fig. 1 the frame is drawn forward in one direction by the pins 13 on the two chains 8 engaging the hooks 14 on the frame, and after the frame has reached its other end position, see the dot and dash lines in Fig. 1, the pins 13 release the hooks as they travel with the chain around the wheels 10 and at the commencement of their return stroke they bear against the frame itself and carry it back again in the opposite direction into the end position shown in full lines, after which the operation is repeated. The impurities brushed off the cylinders during this operation fall upon the bottom *s*, and, as the frame moves from left to right, are collected together and swept toward the discharge passage *a* by the scraper bar 16 which during this forward stroke is in its vertical position, the front edge of the flap 20 trailing idly over the rib 18, see Fig. 7. When the frame moves in the opposite direction, during which time the action of the scraper bar 16 is to be suspended, the rear edge of the flap 20 slides upon the rib 18 and so holds the bar 16 at an inoperative height above the bottom *s*, see Fig. 8.

Figs. 9 and 10 illustrate an arrangement wherein in order that the annular brushes 6 may be caused to partially rotate about their own axes while they slide along the filter cylinders there is secured to bands 21 which surround each cylinder 2 at its ends, a longitudinally inclined rib 22, or it might be a wire, along which a slot in the corresponding brush ring moves and is thereby rotated. By means of this arrangement for moving the brushes in a rotary sense the brushing down or cleaning of the filter coverings stretched over the cylinders is more thorough than in the first described construction in which they are only moved to and fro.

Figs. 11, 12 and 13 show an arrangement of a dust-collecting plant constructed in the form of a multitubular filter and incorporated in a grits-cleaning machine. In this example the grits-cleaning machine is provided with a box 24 of rectangular cross section divided by a vertical partition 25 into two grits-cleaning chambers 26 and 27, each of which has in its upper portion a fan 28 and in its lower portion two conveyer screws or worms 29 arranged longitudinally of the box 24. The grits-cleaning sieves, which however are omitted from the drawing for the sake of simplicity, are arranged in a known manner in the chambers 26 and 27. The conveyer screws or worms 29 serve for conveying the cleaned grits falling onto the bottom of the chambers to the discharge aperture of the machine (Figs. 11 and 12). The dust-collector (here) constructed as a multitubular filter is arranged under the chambers 26 and 27 and comprises the filtering cylinders 30, arranged horizontally transversely to the longitudinal direction of the grits-cleaning machine, that is to say, of the sieves of the latter, such cylinders being arranged alongside each other in a box 31 and rigidly secured in the longitudinal walls of same. These cylinders are open at both ends and, as in the constructional example shown in Figs. 1 to 3, have stretched tightly on them a filtering cloth pervious to air (Fig. 12). The chamber in the box 31 communicates through an aperture 32 with a passage 33 through which the dust-containing air in the chambers 26 and 27 and which has been drawn in by the suction action of the fan 28 is forced by the latter into the box 31. The dust-laden air, after depositing the dust on the external surfaces of the filtering cylinders 30 escapes through the open ends of the cylinders into a space 34 surrounding the box 31 as indicated by the arrows, Figs. 11 and 13. From the space 34 the pure air free from dust passes through longitudinal slots 35 provided in the bottom of the chambers 26 and 27 between the conveyer worms 29 and extending throughout the whole length of the grits-cleaning machine, and back again, through further longitudinal slots 36 formed in chimneys extending over the slots 35, into the chambers 26 and 27 in which the said pure air ascends, passing through the sieves of the grits-cleaning machine and in doing so carrying away the dust with it. For brushing off the dust deposited on the filtering-cylinders 30 annular brushes 37, which surround the cylinders and are adapted to be moved to and fro, are also employed in this case. In contrast however to the constructional example shown in Figs. 1 to 3, there are provided two groups of filtering cylinders 30 and for each filtering cylinder three annular brushes arranged at equal

intervals one after another and forming collectively three rows of brushes. The annular brushes of each row are each carried by a frame 38 adapted to be moved to and fro along guide-bars at the top and bottom, the frames 38 being in turn combined to form a single frame. In addition there is hinged to the underside of each frame an oscillating scraper bar 16 of the kind more fully shown in Figs. 6 to 8 and described with reference thereto and which scraper bars form collectively, like the annular brushes 37, three rows. These bars are provided with openings 19 and with swinging flaps 20 covering same, which openings lie over ribs 18 arranged in succession at the bottom of the box and secured thereto transversely of its length and the number of which is equal to that of the bars 16. These bars are separated from each other by notches 18' which are at the same distance from each other as the scraper bars 16. The movement of the frames 38 is derived from two crank shafts 39 which may be driven by means of toothed wheels 47, 48 and 49 from one of the conveyer worms 29. These crank-shafts are connected by connecting rods 40 to two bars 42 guided horizontally in bearings 41 and which are in turn connected to a driving bar 43 to which the rods 44 connected to the two frames 38 and guided in the longitudinal walls of the box 31 are attached (Fig. 13). The stroke imparted to the frames 38 by the crank-shafts 39 is greater than the distance between two successive scraper bars 16, so that upon the frames 38 being moved forward in the direction from right to left (Fig. 12), at which time the scraper bars 16 assume a vertical position and the swinging flaps 20 slide on the ribs 18, the dust brushed off from the cylinders 30 by the annular brushes and lying on the bottom of the box is conveyed by the scraper bars 16 to a channel arranged along one of the longitudinal sides of the box 31 and in which channel is arranged a conveyer worm 45, which may be driven by means of a chain-gearing 50 from the axis of the toothed wheel 48, and then conveys such dust to the discharge aperture 46 (Figs. 11 and 12). The scraper bars 16 are arranged to co-act in such a way that the last scraper bar always moves forward the dust lying on the ground before it to a sufficient distance for such dust to be engaged by the second scraper bar on the next forward movement and carried by the latter within the reach of the third scraper bar which finally delivers it to the conveyer worm 45. On the return movement of the frames 38 the scraper bars 16, as in the constructional example shown in Figs. 1 to 3, are turned upward by means of the flaps 20 bearing on the ribs 18 and are thus brought out of reach

of the dust lying on the bottom of the box 31, until through dropping into the notches 18' they fall back again into the necessary vertical position for conveying the dust.

With the arrangement of the dust collector under a grits-cleaning machine described and shown a vertical position of the passages for guiding the acting air and an equal delivering of the pure air along the entire length of the cleaning sieves is attained in such a manner, that the dust charged air on its way from the fans 28 circulates through the passage 33, box 31, filtering cylinders 30 and further after its cleaning through the space 34 and the slots 35 and 36 extending the said entire length of the cleaning sieves in the chambers 26 and 27.

The hereinbefore described improved construction of dust collector with brushing arrangement is such that it is possible to arrange in a rectangular chamber the base of which corresponds in size or nearly so to that of any desired machine with which such a filter is to be connected, and the height of which is small, a number of filtering cylinders which practically fill the chamber, these filtering cylinders being so constructed and arranged that without any sloping of the under part of the chamber all the dust is mechanically brushed off the surfaces of the filters and is collected together at one end of the chamber; the whole forming a complete and efficient multitubular filter contained in one rectangular chamber.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A dust collector comprising a collecting chamber, a dust filtering unyielding cylinder mounted therein, a frame in the chamber movable longitudinally of the cylinder and an annular brush in contact with the cylinder carried by said frame.

2. A dust collector comprising a collecting chamber, a dust filtering cylinder mounted therein, a frame in the chamber movable longitudinally of the cylinder, an annular brush in contact with the cylinder carried by said frame, and means to revolve the brush around the cylinder.

3. A dust collector comprising a collecting chamber, a plurality of filtering cylinders fixed therein, a frame in the chamber movable longitudinally of the cylinders, annular brushes carried by the frame and surrounding the cylinders and in contact with the outer surfaces of the latter, and means carried by the frame to convey the dust, brushed from the cylinders, to one end of the chamber.

4. A dust collector comprising a collecting chamber, a plurality of filtering cylinders fixed therein, a frame in the chamber movable longitudinally of the cylinders, annular

brushes carried by the frame and surrounding the cylinders and in contact with the outer surfaces of the latter and a scraper bar carried by the frame adapted to convey dust brushed from the cylinders to one end of the chamber.

5. A dust collector comprising a collecting chamber, a plurality of filtering cylinders fixed therein, a frame in the chamber movable longitudinally of the cylinders, annular brushes carried by the frame and surrounding the cylinders and in contact with the outer surfaces of the latter, means carried by the frame to convey the dust, brushed from the cylinders, to one end of the chamber, and means to render the scraper inoperative during the movement of the frame in one direction.

6. A dust collector comprising a collecting chamber, a plurality of filtering cylinders fixed therein, a frame in the chamber, means to reciprocate the frame longitudinally of the cylinders, annular brushes carried by the frame surrounding the cylinders and in contact with the outer surfaces of the latter, a scraper carried by the frame adapted to engage the floor of the chamber, a longitudinal rib on said floor and means on the scraper to engage the rib and raise the scraper.

7. A dust collector comprising a collecting chamber, a plurality of filtering cylinders fixed therein, a frame in the chamber, means to reciprocate the frame longitudinally of the cylinders, annular brushes carried by the frame surrounding the cylinders and in contact with the outer surfaces of the latter, a scraper carried by the frame adapted to engage the floor of the chamber, a longitudinal rib on said floor, means on the scraper to engage the rib and raise the scraper, and a flap on the scraper adapted to be raised by the rib during the movement of the frame in one direction and to raise the

scraper during the movement of the frame in the opposite direction.

8. A dust collector comprising a collecting chamber, a plurality of filtering cylinders fixed therein, a frame in the chamber, means to reciprocate the frame longitudinally of the cylinders, annular brushes carried by the frame surrounding the cylinders and in contact with the outer surfaces of the latter, a longitudinal rib on the floor of the chamber, an oscillatory scraper carried by the frame having an opening for the rib, means on the scraper to hold it in contact with the floor when moving in one direction and means operated by the rib to hold the scraper above the floor when the scraper is moved in the opposite direction.

9. A dust collector comprising a collecting chamber having a discharge aperture at one end, a plurality of filtering cylinders fixed in the chamber, a plurality of frames mounted in the latter, a plurality of annular brushes mounted in the frames surrounding each cylinder and in contact with the outer surfaces thereof, oscillatory scraper bars, corresponding to the number of annular brushes, mounted on the frames at equal distances apart, means to reciprocate the frames longitudinally of the cylinders, the stroke of the reciprocations being greater than the distance between two adjacent scraper bars, means to hold the scraper bars in operative position during their movement toward the discharge aperture and means to hold said bars inoperative during their return movement.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

JACOB PETER.

Witnesses:

HERMANN GROF,
CARL ZUBLER.