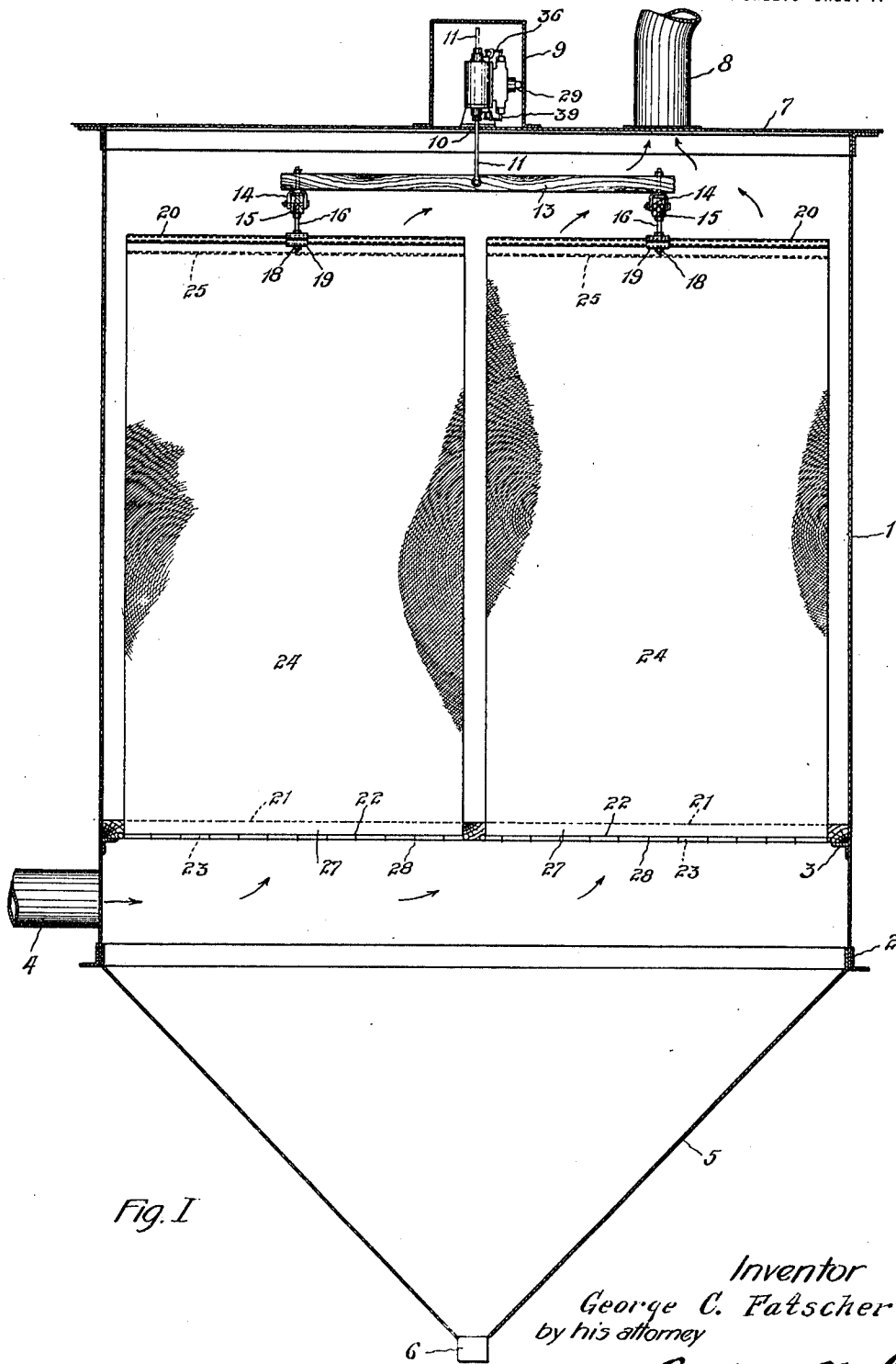


1,316,883.

G. C. FATSCHER.
AIR PURIFIER.
APPLICATION FILED APR. 12, 1917.

Patented Sept. 23, 1919.
4 SHEETS—SHEET 1.



Inventor
George C. Fatscher
by his attorney

Carl H. Muller

G. C. FATSCHER.

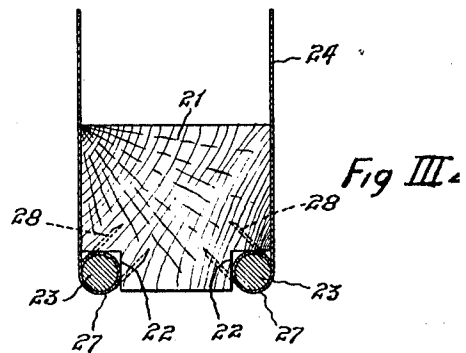
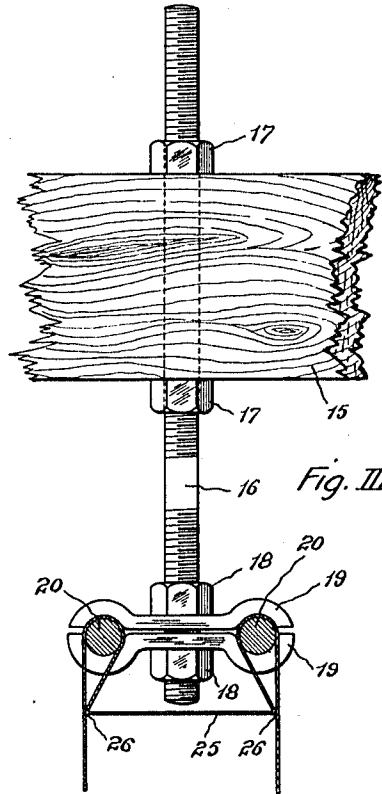
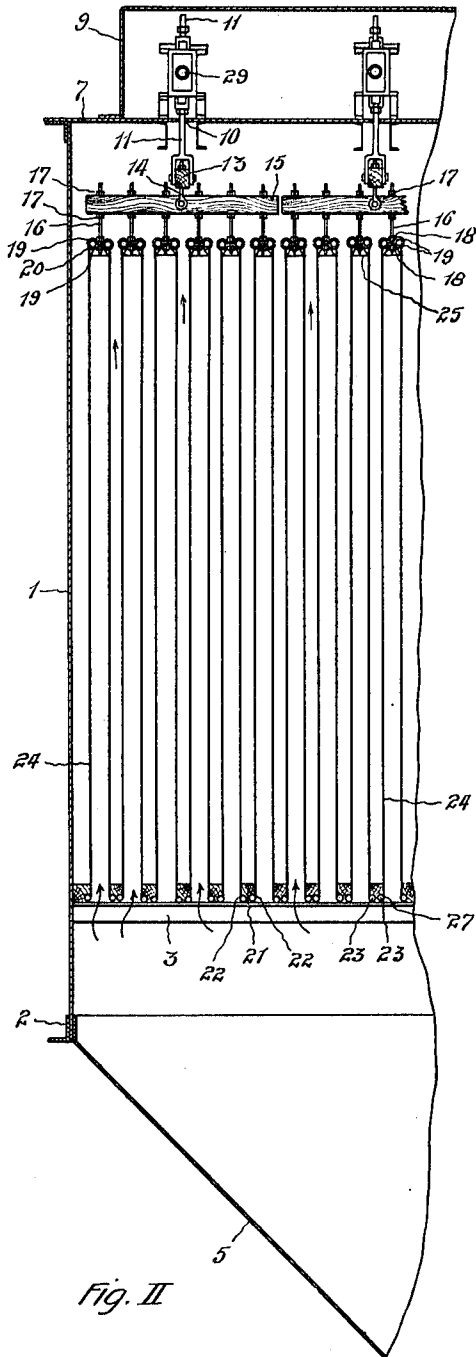
AIR PURIFIER.

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4 SHEETS—SHEET 2.

1,316,883.



Inventor
George C. Fatscher
by his attorney
Amos B. Mueller

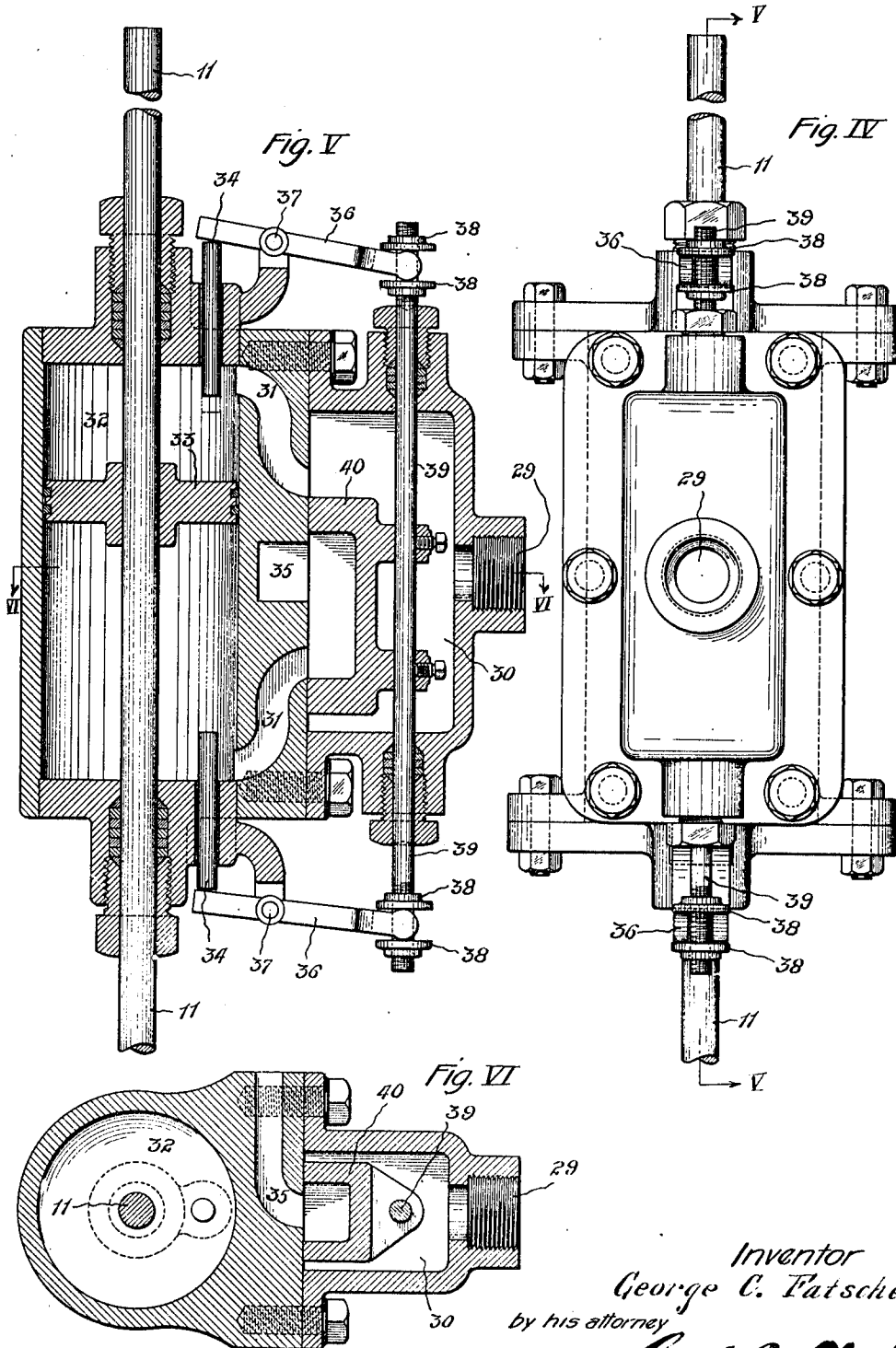
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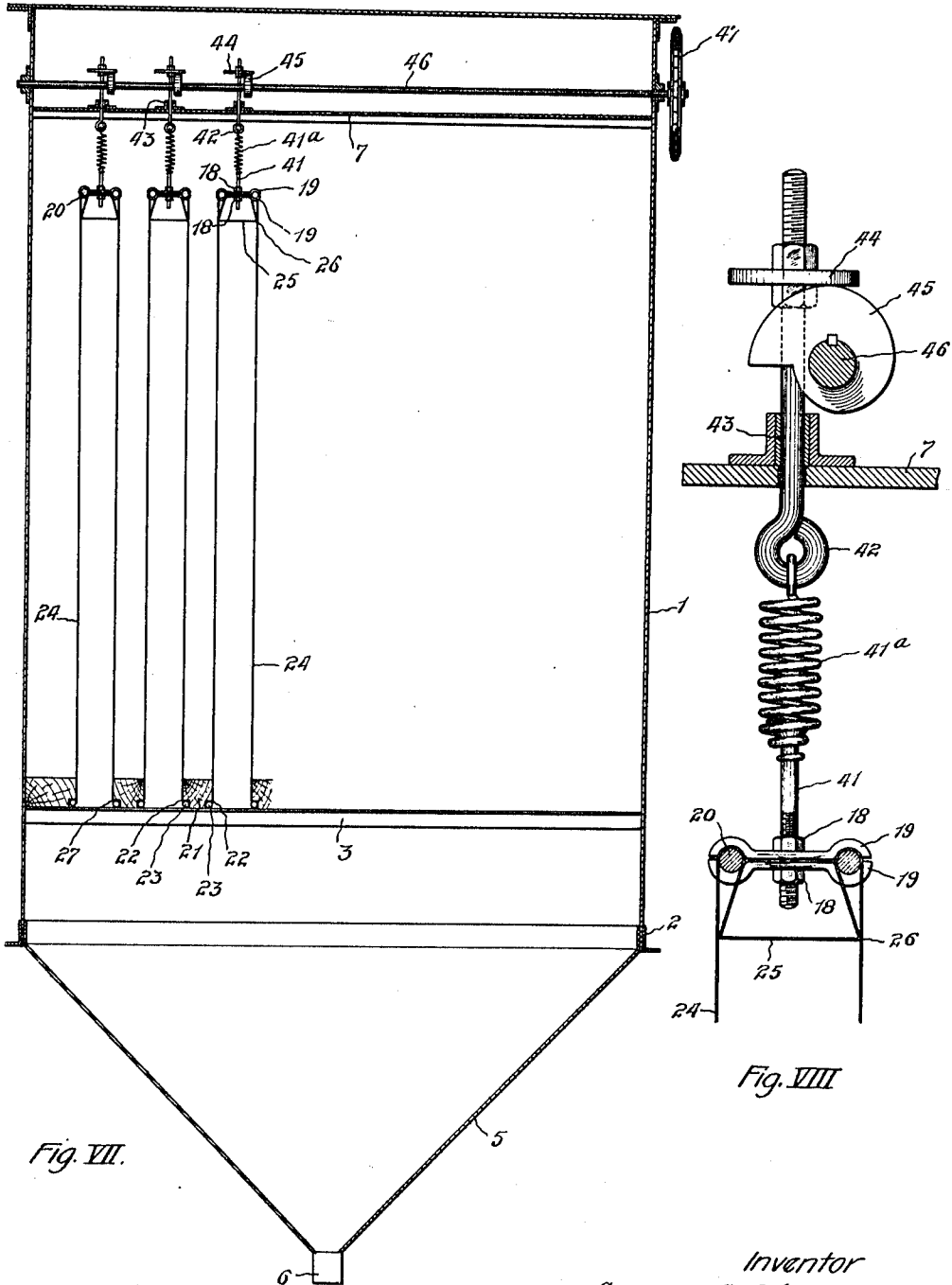
4 SHEETS—SHEET 3.



Inventor
George C. Fatscher
by his attorney
Ernst H. Mueller

1,316,883.

Patented Sept. 23, 1919.
4 SHEETS—SHEET 4.



Inventor
George C. Fatscher
by his attorney
Charles A. Fatscher

UNITED STATES PATENT OFFICE.

GEORGE C. FATSCHER, OF LAKEWOOD, OHIO.

AIR-PURIFIER.

1,316,883.

Specification of Letters Patent.

Patented Sept. 23, 1919.

Application filed April 12, 1917. Serial No. 161,489.

To all whom it may concern:

Be it known that I, GEORGE C. FATSCHER, a subject of the Emperor of Germany, residing at No. 1568 Warren road, city of Lakewood, Ohio, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Air-Purifiers, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated apply that principle, so as to distinguish it from other inventions.

My invention pertains to an air purifier and has as its object to collect all dust created by machinery or noxious matter otherwise accumulated in the atmosphere of buildings, such as chemicals in fine dust form or solid particles carried in smoke. Such matter is to be extracted through the agency of a suction appliance in combination with a filter so arranged that the exhaust air current is cleansed before reaching the suction appliance. A further feature of my invention is that in winter it conserves the heat in the air which has been purified by returning it at substantially the same temperature. The dimensions of the apparatus are limited yet can be arranged as a unit varying in size as may be required. The particular object which I have had in mind to fulfil is to provide an improved mode of dislodging the collected sediment which has, during operation, adhered to the fine fabric screen which I prefer to employ. I am familiar with earlier devices of this character known to the art and believe my invention to distinguish therefrom by effecting the shaking of fine fabric bags with an alternate stretching and loosening of the same. Such a shaking action may be accomplished in various ways, two of which I have elected to exemplify. Other improving details of structure and arrangement will hereinafter be more specifically explained.

I would have it expressly understood that I in no wise limit myself to this specific application or embodiment of my invention, which I have selected as a basis for illustrating and describing my invention merely for the purpose of rendering a clear and

comprehensive understanding of the scope and novel features thereof.

Adverting to the drawings:

Figure I is a vertical section of an air purifying apparatus embodying my invention.

Fig. II is a broken vertical section on a plane transverse to that of Fig. I.

Fig. III is an enlarged broken elevation of certain details.

Fig. III^a is an enlarged section showing how adjacent portions of certain duplicated parts are secured.

Fig. IV is an enlarged elevation of reciprocable shaking mechanism.

Fig. V is a vertical section on line V—V of Fig. IV.

Fig. VI is a section on line VI—VI of Fig. V looking in the direction indicated by the arrows.

Fig. VII is a view corresponding to Fig. II disclosing a modified form of shaking mechanism.

Fig. VIII is an enlarged detail of certain portions of such modified structure.

The structure includes a closed compartment 1 having near its bottom an exterior stiffening angle 2 and an interior angle 3. A single lateral air intake 4 is provided and at the bottom a hopper 5 provided with a central trap 6. The top 7 of the compartment is closed with exception of an air outlet 8 which is to be presumed operatively connected with a suction appliance, not shown.

My idea comprehends the support of a plurality of filter bags within the compartment 1, given numbers of which are to be shaken on occasion by suitable mechanism carried above. The drawings exemplify an arrangement whereby one shaker mechanism is to operate twelve closely adjacent bags of considerable height but narrow width, which bags are arranged in two rows of six each or in six rows of two each according to the direction the same are viewed. For the purpose of simplicity in description the explanation of the structure will be confined to only one of the arrangements which as proposed may be duplicated.

The top 7 carries a housing 9 and under-

neath the same is provided with an opening 10 which may be considered as a slide bearing to permit the reciprocal movement therein of a rod 11, which movement is to be effected in a manner to be later described. Pivoted at the bottom of the rod 11 is a bar 13 and carried by opposite ends of such bar are a pair of clevises 14 to which two transversely extending bars 15 are in turn attached. Equi-spaced along each of the bars 15 are six suspension bolts 16 which extend through the bar 15 and are adjustable as regards height by means of upper and lower nuts 17. Such adjustment will establish the normal or stationary distance between certain parts to be controlled by the movement of the rod 11 as and for a purpose to be later explained. The lower end of the bolts 16 each carries another pair of nuts 18 between each of which a clamp composed of complementary parts 19 is carried. Extending between opposite ends of the clamps 19 are a pair of rods 20 which are necessarily substantially parallel to the bar 13.

Just above the hopper 5 and intake 4 and resting upon the angles 3 so as to extend parallel with the rods 20 are six beams 21. These have their lower corners fashioned with right angular cut-out portions at 22 for the reception of rods 23 as is clearly shown in Fig. III.

The structure thus far described is adapted to support twelve inverted bags preferably of fine meshed fabric, such as canvas or linen, in an inverted position, that it, with their open ends below. I have devised what I believe to be an advantageous manner of so supporting the bags 24 so that the walls thereof are held apart and the maximum interior surface exposed. An inspection of Fig. III discloses that the closed ends of the bags 24 encircle each a pair of the rods 20 so that a portion 25 of such ends, corresponding in width to the distance between the outer sides of rods 20, may be sewn at 26 to the depending sides of the bags. In this way a strong neat manner of effecting the support of the bags is accomplished. The lower open ends 27 of the bags are caused to be wound about the rods 23 and become wedged in the cut-out corners 22 after which they may be securely clamped in place by means of staples 28.

Mounted as described each of the bags has its open lower end capable of direct unobstructed communication with the intake 4, whereas communication with the outlet 8 above may only be had by passage of the air current through the material of which the bags are composed, thereby purifying the same and causing the objectionable sediment either to directly fall into the hopper 5 or to adhere to the interior surfaces of the bags.

Inasmuch as such interior surfaces would

eventually become so covered with foreign substance as to obstruct the continued flow of air therethrough, some means must be provided for periodically shaking the bags in order to loosen the matter collected thereon and cause it to fall into the hopper from which it may be removed at intervals through the trap 6.

The shaking mechanism is mounted in the compartment 9 and is designed to effect a reciprocal action of the rod 11 and hence of the bar 13 and therefore of the twelve upper bag ends toward and away from the lower open ends thereof which are fixed. According to the preferred mode of reciprocating the rod 11 by the mechanism shown in detail in Figs. IV and VI inclusive compressed air will be utilized. It will be noticed that the air under pressure is caused to enter at 29 into a compartment 30. From opposite ends of one side of such compartment a pair of ducts 31 are seen to lead into another compartment 32, with which they communicate at its opposite ends. The rod 11 is seen to extend through the middle of the compartment 32 with the ordinary slide bearing connection. Movable upon the rod 11, interiorly of the compartment 32, is a piston 33 adapted alternately to engage and actuate plungers 34 which project into the compartment 32 at opposite ends. That portion of the structure which separates the ducts 31 is fashioned with an outlet duct 35 communicating with the compartment 30. The outer ends of the plungers 34 engage levers 36 which are fulcrumed at 37 and articulate between a pair of adjustable nuts 38 with opposite ends of another rod 39 that extends through the compartment 30 and is substantially parallel to the rod 11. Interiorly of the compartment 30 the rod 39 has fixed to it a valve member 40 adapted in its movements alternately to bring first one of the ducts 31 and then the other into communication with the exhaust outlet 35.

The operation of the shaking mechanism may be thus described. As air under pressure enters the chamber 30 it expands into the chamber 32 through one of the two ducts 31 which is exposed to the air and thus shifts the piston to the opposite limit of its throw. As shown in Fig. V the direction which the piston is next to take is in a downward direction and therefore such as to accomplish the loosening and wrinkling or partial collapse of the bags 24. During the movement of the piston 33 in a direction downward, as appears in Fig. V, the air is allowed to escape through that duct 31 which is at the right and thence out through the duct 35. When the piston 33 reaches the end of its throw it impinges against the plunger 34 which by means of the lever 36 causes the rod 39 to be moved in the opposite direction thereby sliding the valve 40

to a position in which the other duct 31 is brought into communication with the chamber 30, whereupon the operation is reversed. It should be understood that the reciprocal throw of the rod 11 is not very extensive but just sufficient to alternately slacken and stretch the texture of the bags with sudden snap actions, thereby effectually loosening and shaking off the accumulated clogging material thereon. The adjustment of the clamps 19 along the bolts 16 determines the degree of tautness to which the bags may be brought by the upward throw of the rod 11.

The modification disclosed in Fig. VIII is confined solely to the mechanism for shaking the bags after the manner of my invention. Short bolts 41 directly support the clamps 19, are in turn reactingly supported by springs 41^a which are suspended from eye bolts 42 that pass through slide bearings 43 in the top 7. The upper end of the bolts 42 carry an adjustable collar 44 adapted to let over single step cams 45 keyed to a shaft 46 which is to be rotated by a sheave 47. In this manner, as will be apparent, the bolts 42 are gradually lifted and permitted suddenly to fall with each revolution of the shaft and thereby the same alternate stretching and relaxa-

tion of the bags becomes effected with an additional more pronounced vibratory action.

I claim:

1. An air purifier comprising a support, a fabric bag having one end open and suspended from said support with such open end below, the upper end encircling said support and sewn at two points to the depending sides thereof, spaced beams provided with cut-outs and means for attaching opposite sides of said bag each in the cut-out of one of said beams.

2. An air purifier comprising a closed chamber having an intake opening and an exhaust opening, rods arranged in pairs between said openings, a fabric bag open at one end and stretched and supported at each end by a pair of said rods, the closed end of said bag being passed between one pair of said rods and attached to a pair of points on said bag, somewhat removed toward the other pair of rods and a device including a reciprocal rod for suddenly moving one pair of said rods.

Signed by me, this 31st day of March, 1917.

GEORGE C. FATSCHER.