(No Model.) 2 Sheets—Sheet 1.

J. H. HOLLAND.

DUST COLLECTOR.

No. 534,068. Patented Feb. 12, 1895.

Fig. 1.

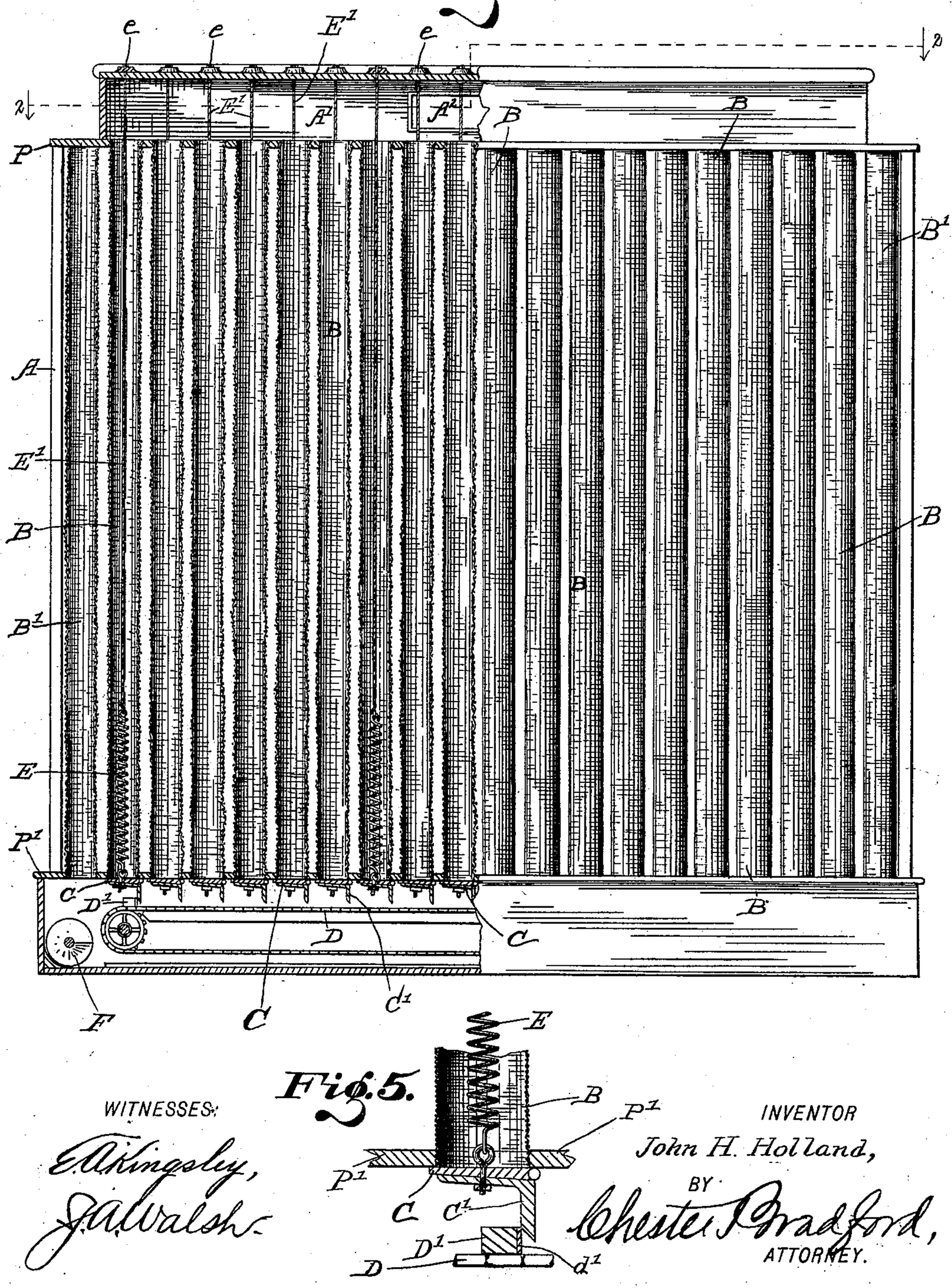

Fig. 5.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

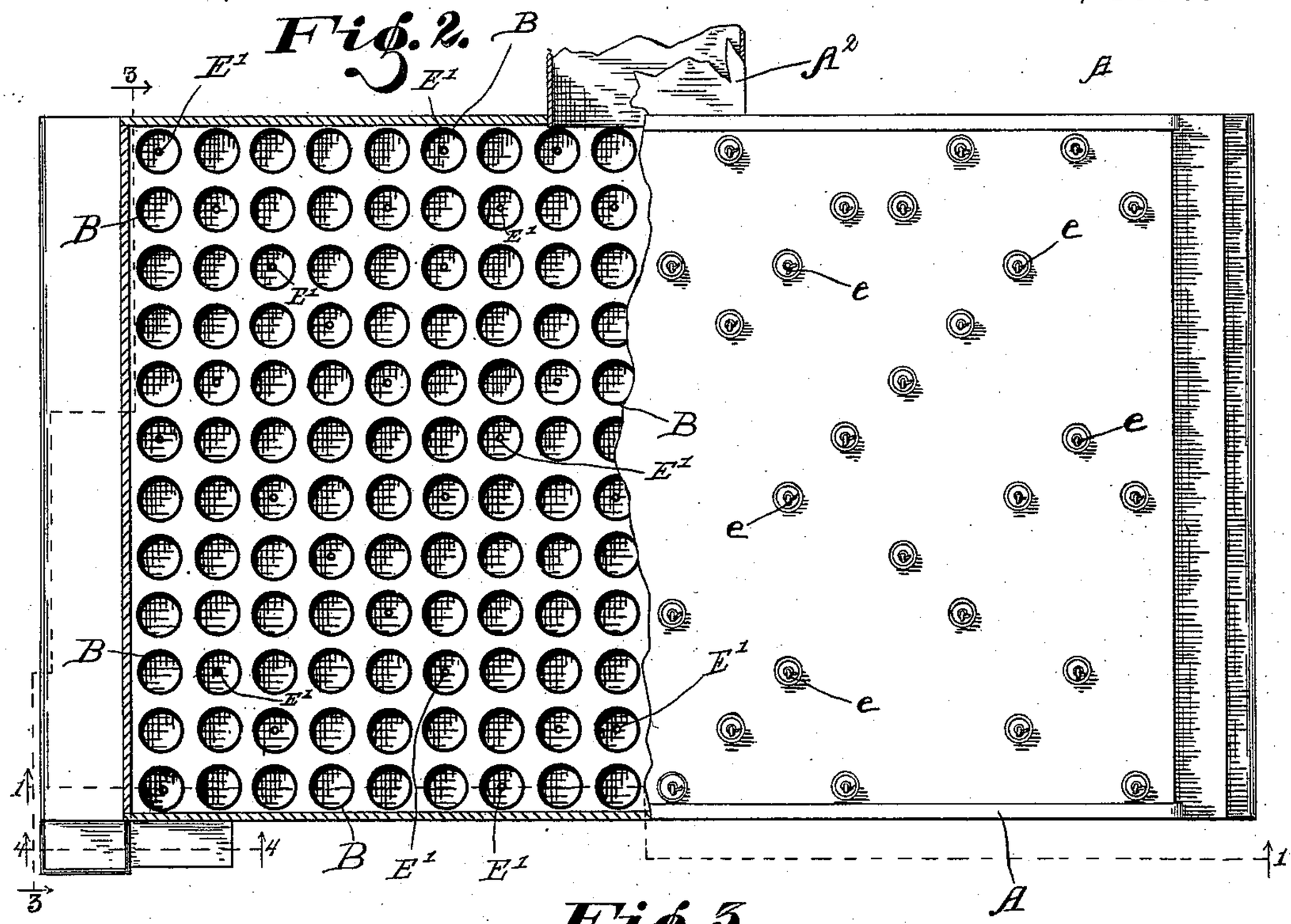


Fig. 3.

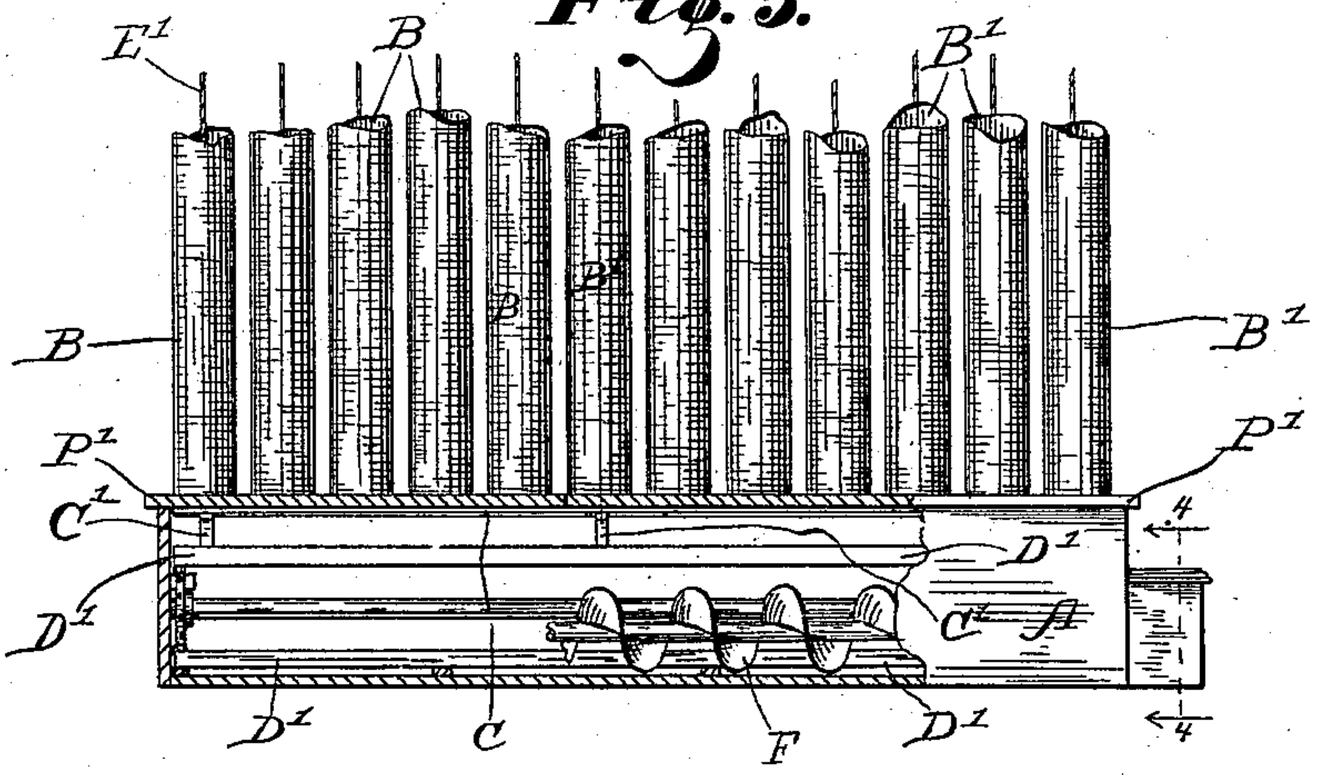
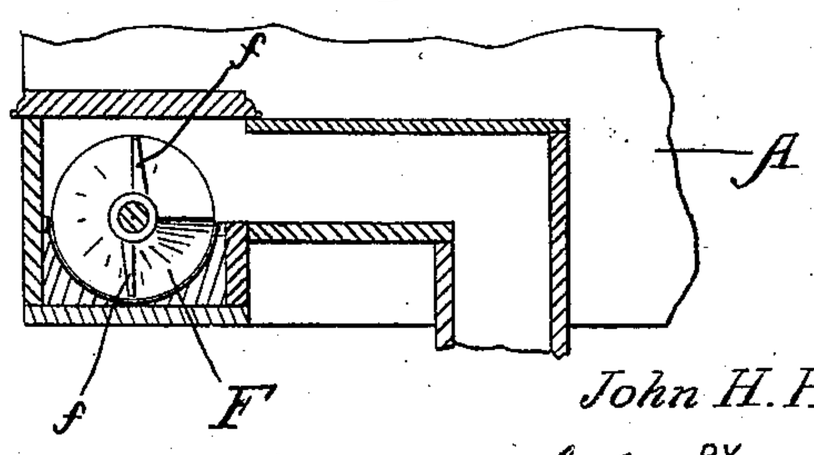


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN H. HOLLAND, OF INDIANAPOLIS, INDIANA.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 534,068, dated February 12, 1895.

Application filed October 30, 1894. Serial No. 527,419. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. HOLLAND, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Dust-Collectors, of which the following is a specification.

The object of my said invention is to produce a simple and easily operated device for collecting dust, of that variety in which cloth top tubes are employed as the separating medium, in which most of the mechanism usually employed shall be dispensed with, thus greatly simplifying and cheapening the apparatus.

A dust collector embodying my said invention will be first fully described, and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a view partly in side elevation and partly in section of a dust collector embodying my said invention; Fig. 2, a view partly in plan and partly in horizontal section, as seen from the dotted line 2 2 in Fig. 1; Fig. 3, a view partly in section and partly in end elevation as seen from the dotted line 3 3 in Fig. 2; Fig. 4, a fragmentary view of the dust-discharging device, as seen from the dotted line 4 4 in Figs. 2 and 3; and Fig. 5 a detail view, on an enlarged scale, illustrating the valve and its operation, more plainly.

In said drawings the portions marked A represent the frame-work of the machine; B, the dust-collecting tubes; C, valves covering the ends of said tubes; D, a chain belt device for operating said valves in one direction, and also for dragging the collected dust to the discharging devices or point of discharge; E, springs by which the valves are operated in the reverse direction, and F the discharging conveyer.

The frame-work A is or may be of any appropriate size and construction for the purpose. At its upper end is a chamber A′ into which the dust-laden air is discharged through a trunk or chute A^2, and with this chamber the upper ends of all the tubes B, except a row at each end of the machine, communicate.

The tubes B are cloth tubes of the usual type in this form of machine, except that they are connected rigidly at each end to openings in the top and bottom plates P P′ of the frame, and do not ordinarily have any appreciable movement in operation;—the operation of cleaning them depending, as hereinafter described, upon the air-blast, rather than upon any jarring or moving of these tubes.

The valves C are plain flat plates hinged at one corner and extending across under at the lower ends of the tubes, and each covering a row of said tubes. They are ordinarily held closed by the springs E, as will be presently described. They are provided with angles C′ by which they are periodically temporarily opened by the operating contact of bars driven by the chains D.

The chains D are of an ordinary character and arrangement in this class of devices, and are expected to be driven from any suitable source of power and be in continuous motion. They are provided with bars D′, each serving the double purpose of operating the valves C, and of dragging the accumulated dust along the floor of the dust chamber, forming the bottom part of this apparatus, to one end thereof to discharging devices. These bars D′ are preferably armed with metal plates *d′* on the wearing side, thus imparting greater durability thereto, as will be readily understood.

The springs E are connected to the valves C, and, after continuing a suitable length for the purpose, continue on thence to the top in the form of wires or strings E′, and through the top of the machine, where they are suitably secured or knotted, as at *e*. In tying these wires or strings, of course care is taken to secure sufficient tension. These strings or wires E′, as shown in Fig. 1, I prefer to distribute irregularly over the machine, so that at the point where they pass through the dust-laden air-receiving chamber A′, they will form a means of breaking up the air current, preventing anything like a vortical or whirling motion therein, and insuring substantially even distribution of said dust-laden air throughout the receiving-chamber.

The operation is, after a valve has been opened by contact of a bar D′, when such bar has passed from contact with the angle-arms thereon, that these springs will bring the valve immediately again into closed position,

as will be readily understood. While the form, location and arrangement of springs shown is a desirable one, variation from these particulars is obviously within the scope of my invention, and I do not desire to be understood as confining myself to those shown.

The conveyer F is of an ordinary and well known construction, and receives the dust as it is brought along by the bars or drags D′ and forces it out of the machine. The conveyer-box projects somewhat, at one end, from the general outline of the machine, and from one side of this conveyer-box I have shown a packing discharge-spout extending, and in Fig. 4 have shown appropriate packing-wings *f* for use with this kind of an apparatus; but obviously these are mere matters of detail, which may be selected to suit the builder.

As shown in Fig. 1, and as hereinbefore referred to, a row of tubes at each end of the machine do not connect with the dust-laden air-receiving chamber A′, but are instead closed at the upper ends, and open into the dust-collecting chamber in the lower portion of the machine at the lower ends, and are wholly unprovided with valves or any other mechanism. The purpose of these rows of tubes is to permit the escape of air from the dust-collecting chamber which is discharged thereinto during the operation which will now be described: The dust-laden air enters the chamber A′ at the upper end of the machine, and passes thence down into the tubes B, which tubes, as above stated, open into said chamber. The dust adheres to the inner surfaces of the tubes, while the air strains through to the outside, and is thus purified, leaving the dust within the tubes. This is continuous while the valves C are closed. As one of the valves is opened, by the mechanism provided for the purpose, of course the air can be driven directly through the tubes, from the chamber A′ to the dust-collecting chamber, and in being so driven through, takes with it the accumulation of dust previously collected on the interior of such tubes, and deposits it in said dust-collecting chamber. The tubes B′, before referred to, permit of the escape of the air thus driven into the dust-collecting chamber. As will be readily understood, each set of tubes, except the tubes B′ at the ends, is opened one or more times during each travel of the chain D, according as to how many of the bars D′ are placed on said chain. I find it desirable or advisable, in ordinary sized machines, to use two of such bars, one of which is engaged all the time in opening the valves C successively, and the other of which is at the same time occupied in driving the dust toward the conveyer, but obviously this arrangement may be varied at pleasure, or according to the necessities of the case.

While, as before stated, there are no mechanical means especially provided for jarring the tubes, the closing of the valves C under the force of the springs E necessarily jars the structure somewhat, and this jarring, so far as it goes, aids in the dislodgement of dust from all of the tubes, including as well the tubes B′ as the tubes B, but this is a mere incident in the operation of the springs, which are provided primarily for the purpose of keeping the valves closed.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a dust collector, of the frame-work having chambers in the upper and lower portions thereof, those sides whereof which are nearest each other being perforated, cloth tubes placed in said perforations and leading from one chamber to the other, hinged valves covering the lower ends of said tubes, springs holding said valves normally closed, and mechanism whereby said valves may be periodically opened.

2. The combination, in a dust collector, of a series of dust-collecting tubes, a dust-laden air-receiving chamber at the upper end of said tubes, valves covering the lower ends of said tubes, means for holding said valves normally closed, and means for periodically operating said valves.

3. The combination, in a dust collector, of a series of dust-collecting tubes, a dust-laden air-receiving chamber above said tubes, a dust-collecting chamber below said tubes, the valves at the lower ends of said tubes, means for operating the same, and tubes closed at the upper end and opening into the dust-collecting chamber whereby a means of escape is provided for the air which may be driven into said chamber when the valves are open.

4. The combination, in a dust collector, with the dust-collecting tubes and the valves therefor, of springs E located within said tubes for holding said valves closed, and supporting wires or strings for said springs extending up and connected to the top of the machine.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 18th day of September, A. D. 1894.

JOHN H. HOLLAND. [L. S.]

Witnesses:
CHESTER BRADFORD,
JAMES A. WALSH.