No. 699,194. Patented May 6, 1902.

J. H. LANE & E. B. WHITMORE.

DUST COLLECTOR.

(Application filed June 5, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

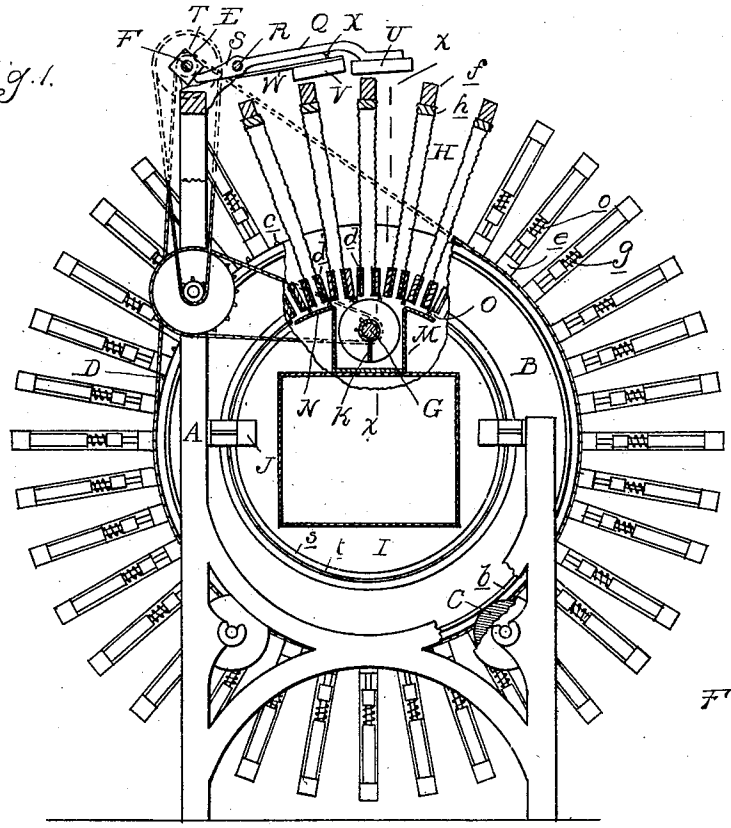


Fig. 3.

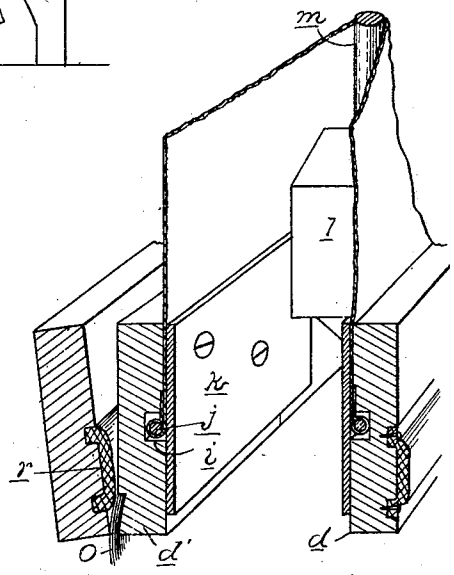
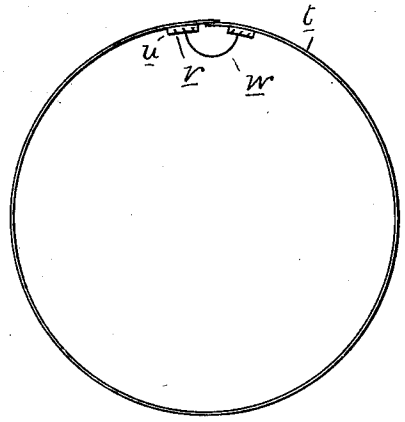


Fig. 5.



Witnesses
H. C. Smith.
M. D. Dogherty.

Inventors
John H. Lane
Edwin B. Whitmore
By Wm. E. Wagner & Son
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 699,194. Patented May 6, 1902.

J. H. LANE & E. B. WHITMORE.

DUST COLLECTOR.

(Application filed June 5, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

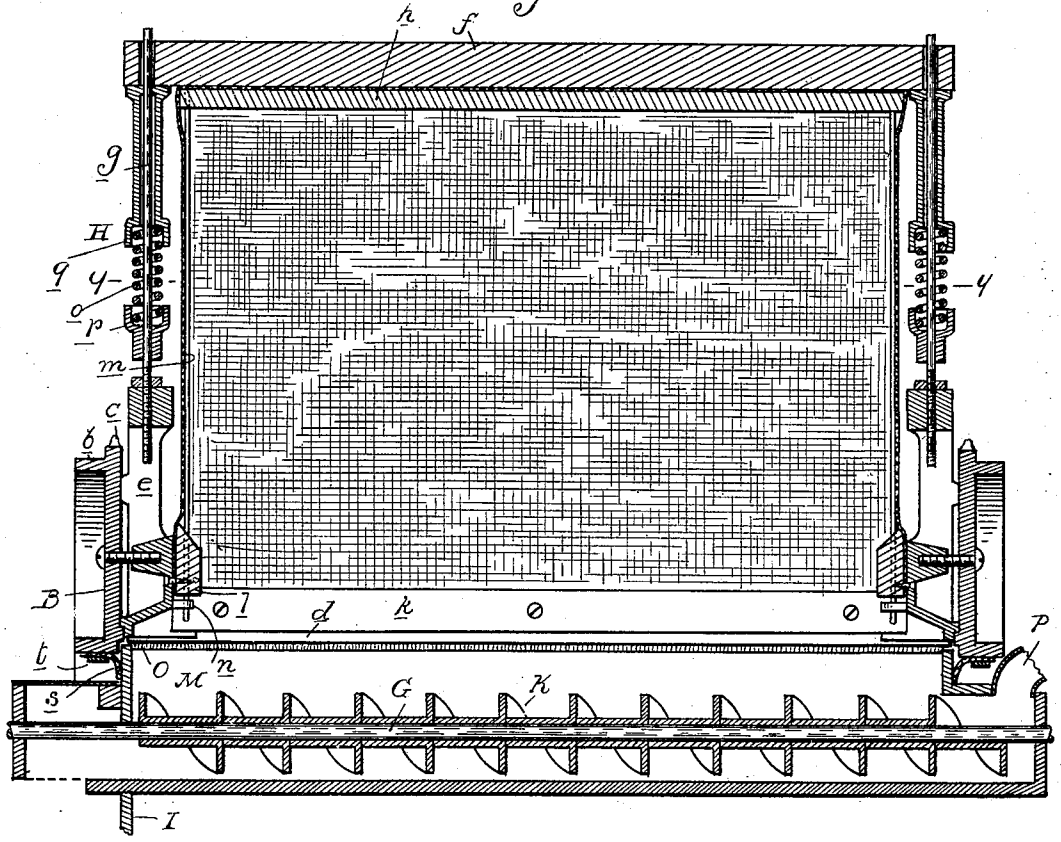
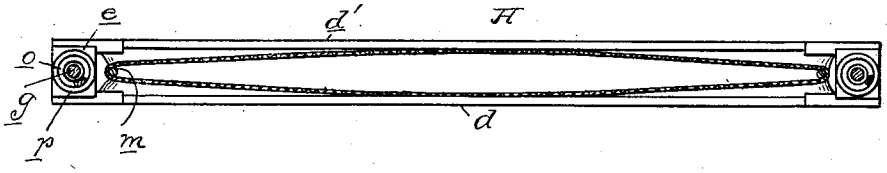


Fig. 4.



Witnesses
F. C. Smith
F. M. Dougherty

Inventors
John H. Lane
Edwin B. Whitmore
By Wm. C. Sprague & Son
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN H. LANE AND EDWIN B. WHITMORE, OF JACKSON, MICHIGAN, ASSIGNORS TO HARMON-WHITMORE COMPANY, OF JACKSON, MICHIGAN, A CORPORATION OF MICHIGAN.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 699,194, dated May 6, 1902.

Application filed June 5, 1901. Serial No. 63,233. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. LANE and EDWIN B. WHITMORE, citizens of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Dust-Collectors, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to dust-collectors of that type comprising a rotary drum provided with a series of radially-extending screening-pockets. In such constructions the dust-laden air is discharged into the drum and filtered through said pockets, while the latter at one point in their rotation are cut off from said air-current and vibrated to knock out the dust.

The invention consists in the peculiar construction of the radially-extending wings or pockets, and, further, in certain details of construction, all as more fully hereinafter described and claimed.

In the drawings, Figure 1 is a sectional side elevation of the machine. Fig. 2 is an enlarged section on line x x, Fig. 1. Fig. 3 is a sectional perspective view of the lower portion of Fig. 2. Fig. 4 is a horizontal section on line y y, Fig. 2, drawn to a smaller scale. Fig. 5 is an elevation of the clamping-ring.

A is a suitable framework, upon which the drum B is mounted. As shown, the mounting for the drum comprises rollers C, journaled in bearings in the frame at opposite ends thereof. These rollers are adapted to engage with annular flanges b, secured to the opposite ends of the drum, so as to support the latter at four points. The flanges b have formed thereon adjacent to the bearing for the roller C peripheral sprocket-teeth c, which are adapted to engage with the drive-chains D. These chains pass upward and engage with sprockets E, secured to the counter-shaft F. The latter is driven by a sprocket-and-chain connection with the shaft G, extending across the frame in the central plane of the drum.

The drum B comprises the flanges b, before referred to, which are arranged at opposite ends of the drum and have extending therebetween the frames of the filtering-pockets or radially-extending sections H, each of which is of the following construction:

d and d' are two parallel bars, preferably formed of wood and separated from each other by the space desired for the width of the pocket. At their opposite ends these bars are secured to metallic brackets e, which extend outwardly, and are secured to the flanges b by screws or in any other suitable way.

f is a bar extending parallel to the bars d d' at the outer end of the pocket. At its opposite ends this bar is slidingly secured to rods g, which form outward extensions of the brackets e, and together with the latter the bars d and d' and the bar f constitute a rectangular frame.

The filtering fabric is in the form of a flattened tube, which extends between the sides and ends of the frame H. At its outer end this fabric is secured to the bar f by an inner clamping-strip h, bolted or secured to the bar f. The connection between the inner end of the fabric and the bars d and d' is preferably formed by providing said bars on their inner faces with longitudinal grooves i, while the edges of the fabric are sewed to rods j, adapted to fit within said grooves. To hold said rods in position, a metallic plate k is screwed or otherwise secured to the inner face of each bar d and d', and this plate also forms a protecting-lining for the purpose hereinafter described. The fabric at the ends of the pocket is secured to the inner face of the brackets e, preferably by blocks l, which are secured to said brackets and clamp the fabric thereto. m represents rods slidingly secured at their inner ends to hooks n, formed on the brackets e and extending outwardly within the fabric tube. At their outer ends these rods are secured to the bar f, and thus form parallel side bars, which hold the fabric from drawing inward at the center. In order to hold the fabric taut, springs o are sleeved upon the rods g, which springs abut at one end against collars p on said rods and at the opposite ends against a collar q, sleeved upon said rods and bearing against the bar f. In order to vary the tension on the spring o, the rod g is provided

with a screw-threaded shank, which engages with a correspondingly-threaded aperture in the bracket *e*, so that by turning the rod the position of the collar *p* may be adjusted inward or outward. The pockets H are arranged around the drum with their bars *d d'* in adjacence, and in order to form an air-tight joint suitable packing material *r* is secured to the side of the bar *d'* which is preferably against the face of the adjacent bar *d*.

The ends of the drum are formed, as above stated, by an annular ring *b*, and within this ring the space is closed by stationary heads I, which are secured by brackets J to the frame A. The shaft G is journaled in bearings in these stationary heads, and mounted upon this shaft is a screw conveyer K, which is surrounded by the pockets or casing M, extending across between the heads I. The upper end of this casing M is open, and segmental flanges N are provided at the upper edges of the casing. These flanges extend in proximity to the inner edges of the bars *d* and *d'* of the drum, and in order to make an air-tight joint with said bars the latter are provided with packing material, such as O, which when the bars pass over the flanges N packs the joint therebetween. The casing M at one end extends outward through the head I and is provided with a suitable discharge-opening, while at the top of the casing at the opposite end is connected a conduit P, connecting with the air-suction.

Q is a knocker, preferably formed by a rock-arm secured to the rock-shaft R, to which is attached an arm S, extending in proximity to the cam T on the shaft F, the arrangement being such that the rotation of the shaft will cause a rapid reciprocation of said rock-arm. At the outer end of this rock-arm is secured a block U, adapted to strike against the bars *f* of the pockets when arranged directly above the conveyer K. Adjacent to this block U is preferably arranged a second block V, which is attached to the spring-arm W and is adapted to be struck by the lug X on the arm Q, thereby constituting an auxiliary knocker, which strikes against the bars *f*.

The parts being constructed as shown and described, in operation motion is communicated to the shaft G, which turns the screw of the conveyer in the direction to carry the material within the casing M to the discharge end thereof. From the shaft G motion is communicated, through a suitable sprocket-and-chain connection, to the shaft F and from the latter through the chain D to the drum. At the same time the dust-laden air is conveyed to the drum through the conduit connecting with one of the stationary heads I, and the air thus introduced is forced outward into the pockets H, escaping through the fabric. In its passage through the fabric the dust is filtered from the air and is collected in the inner face of the pocket. Whenever in the rotation of the drum the pockets are carried above the casing M, they will be cut off from communication with the rest of the space within the drum by means of the packing on the bars *d* pressing against the flanges N. When arranged above the casing M, the reciprocating knocker Q will successively strike the upper face of the bars *f*. This will cause a compression of the springs *o* and permit the bars *f* to move inward, thereby loosening the fabric. As soon, however, as the knocker recedes the spring *o* will instantly return the bar *f*, giving a quick jerk to the fabric, which will dislodge the dust particles adhering thereto. At the same time the exhaust connection with the casing M will cause the air from without the drum to be drawn inward through the fabric to loosen any particles of dust embedded therein. Dust dropping from off the fabric will fall within the casing M, where the conveyer will carry it outward to the discharge-spout. As soon as the rotation of the drum carries the pocket beyond the flange N of the casing M communication will again be established between said pocket and the dust-chamber, and the operation of filtering will be carried on until the pocket is again brought above the casing M.

In dust-collectors of this type difficulty has been experienced in forming a suitable connection between the fabric and the stationary part of the drum which will not pull out or cause the fabric to wear. In the present construction this connection is formed by the rod *j*, to which the end of the fabric is sewed, engaging in the channel *i*, and the plate *k*, which holds said rod in engagement and also covers that portion of the fabric passing over the bars *d d'*. This construction not only forms a firm connection for the fabric which will not loosen or tear, but also forms, by reason of the plate *k*, a durable lining. It has been found in practice that the dust always contains more or less sharp material, which is very wearing upon the fabric, especially where the latter is adjacent to an unyielding surface. This plate *k* serves to protect this portion of the fabric and also prevents the direct impact of the sharp particles against the fabric beyond the bars *d*. The fabric is at all times held in its oval form by the bars *m*, which also hold the edges of the pocket from sagging inward and cause the springs *o* to place a uniform tension on all portions of the fabric.

In order to form a packing between the annular flange *b* and the stationary heads I, a flexible flange *s* of packing material is secured to the former and overlaps the joint with the latter. This flexible flange is secured to the inner face of the flange *b* by an expansible split ring *t*, which latter is provided at its ends with blocks *u*, having slits *v* therein.

w is a spring-bow having its ends engaging the slits *v* in the blocks *u*.

The clamping effect of the ring *t* on the flange *b* may be varied by adjusting the po-

sition of engagement of the bow *w* with the slits *v* to increase or diminish the tension of the spring.

What we claim as our invention is—

1. In a dust-collector, a rotary filter comprising a circular series of radially-extending filter-sections, each section consisting of a flattened fabric tube open at its inner end, a pair of spaced bars to which the edges of the mouth of said tube are attached, opposite end brackets to which said bars are secured, a yielding frame for supporting the outer end of the tube secured to said brackets and annular flanges securing said brackets in fixed relation to each other with the spaced bars of adjacent sections pressed together to form a substantially air-tight joint.

2. In a dust-collector, a filter-section comprising a flattened tube of fabric closed at one end and open at the other, an external spring-frame for supporting said tube, and placing a tension thereon lengthwise of said tube, and rods within said tube at opposite edges thereof adapted to hold the same from drawing inward and permitting of the inward yielding of said spring-frame at the center.

3. In a dust-collector, a filter-section comprising a flattened tube of fabric closed at one end and open at the other, an external spring supporting-frame for said tube having separated bars to which the edges of the opposite ends of said tube are secured, and lining-plates secured to said bars and covering the fabric adjacent thereto for the purpose described.

4. In a dust-collector, a filter-section comprising a flattened tube of fabric closed at one end and open at the other, an external spring supporting-frame for said fabric having separated longitudinally-grooved bars adjacent to the open end of said tube, rods secured in loops in said fabric engaging in the grooves in said bars and plates secured to said bars covering the fabric on the inner faces of said bars and holding said rods in engagement with said grooves.

5. In a dust-collector, the combination with a rotary drum having annular end flanges and stationary heads, of a packing between said annular flanges and heads comprising a flexible flange of packing material, a split ring having slitted blocks at the end thereof, and a bow-spring for adjustably engaging with the slits in said ring whereby the latter will clamp said flexible flange to said annular flange.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN H. LANE.
EDWIN B. WHITMORE.

Witnesses:
F. G. CARLOW,
EDW. KNIGHT.