

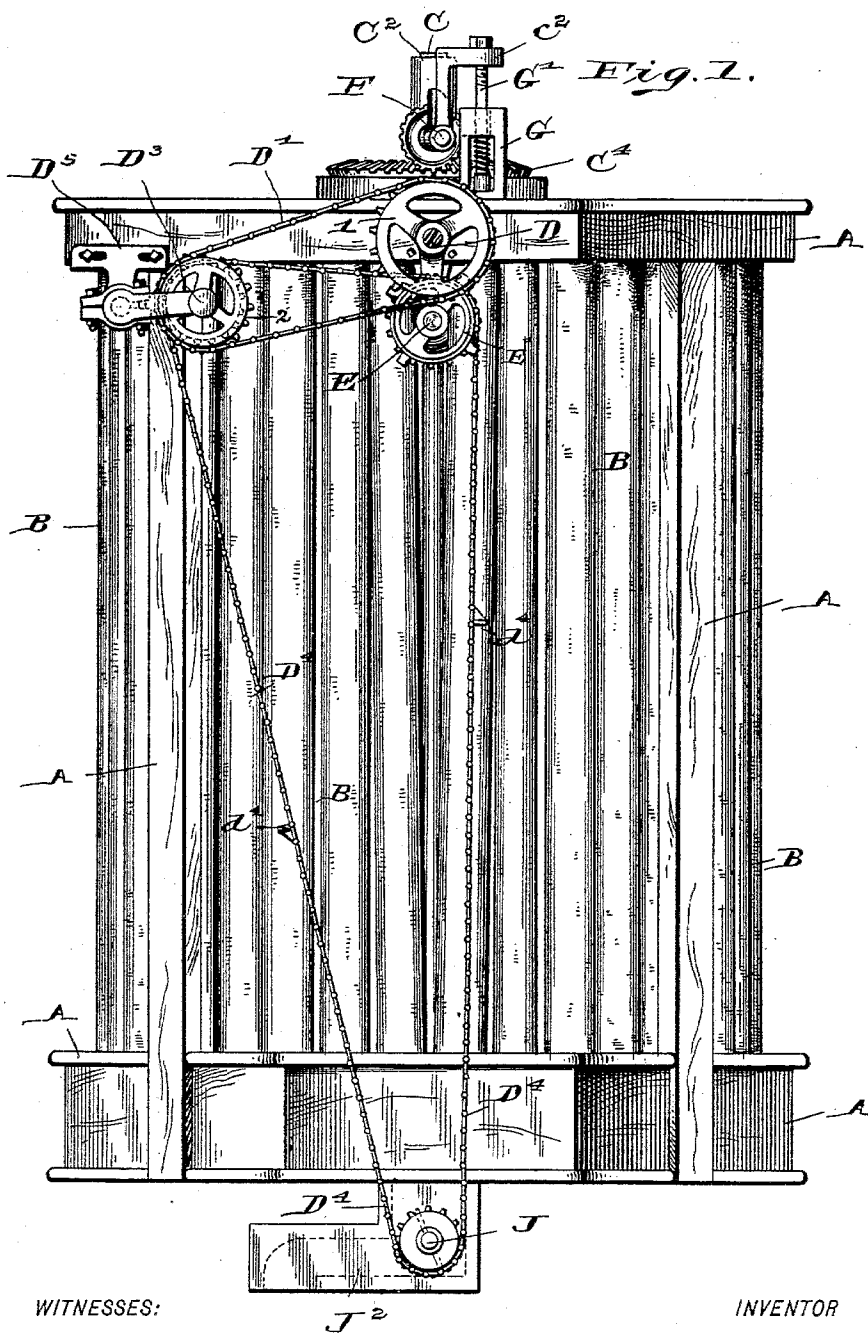
(No Model.)

4 Sheets—Sheet 1.

A. C. BRANTINGHAM.
DUST COLLECTOR.

No. 566,737.

Patented Sept. 1, 1896.



WITNESSES:

INVENTOR

H. S. Neely.
J. A. Walsh.

Allen C. Brantingham,
BY
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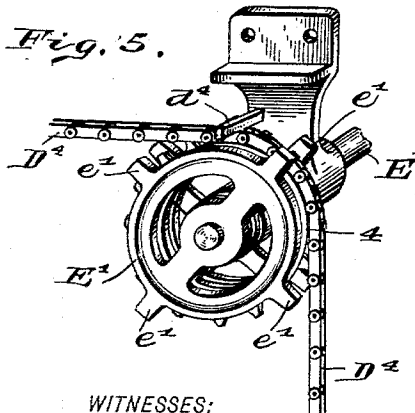
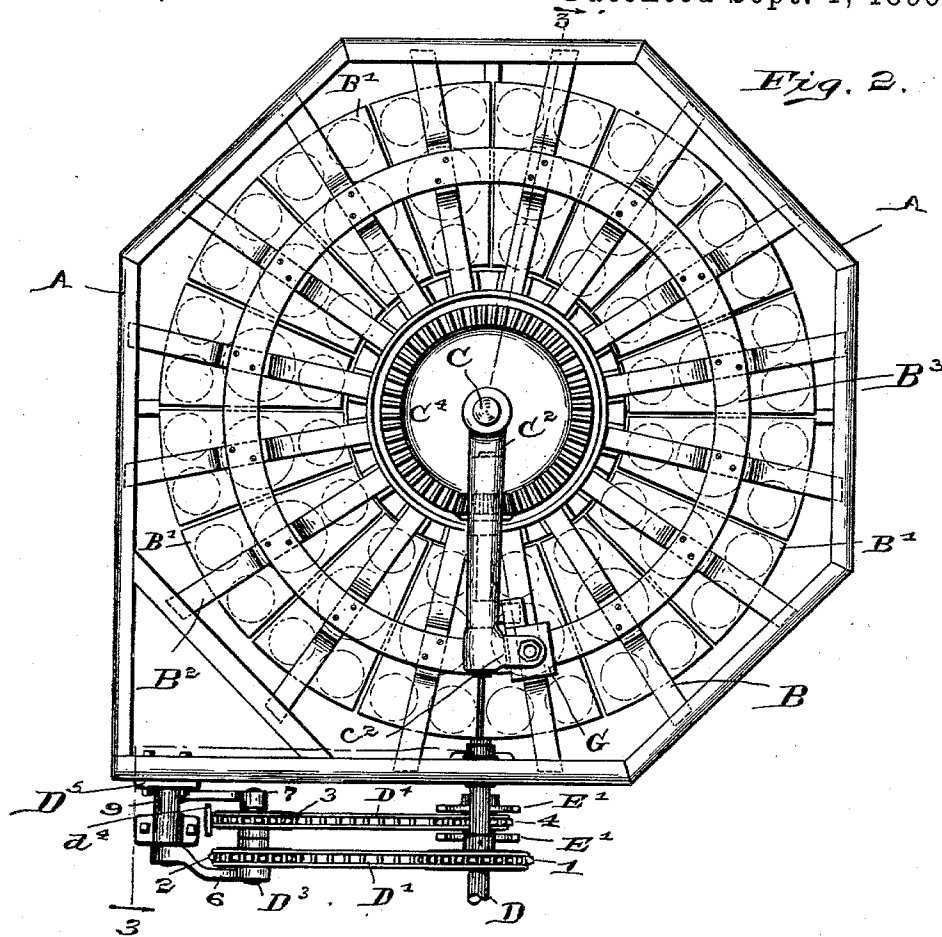
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4 Sheets—Sheet 2.

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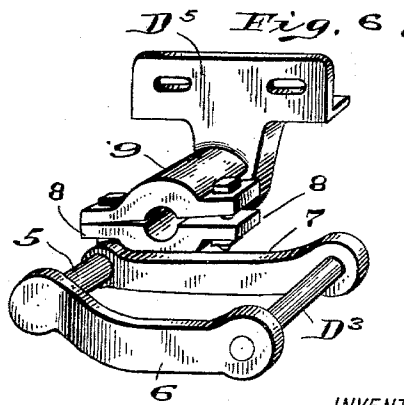
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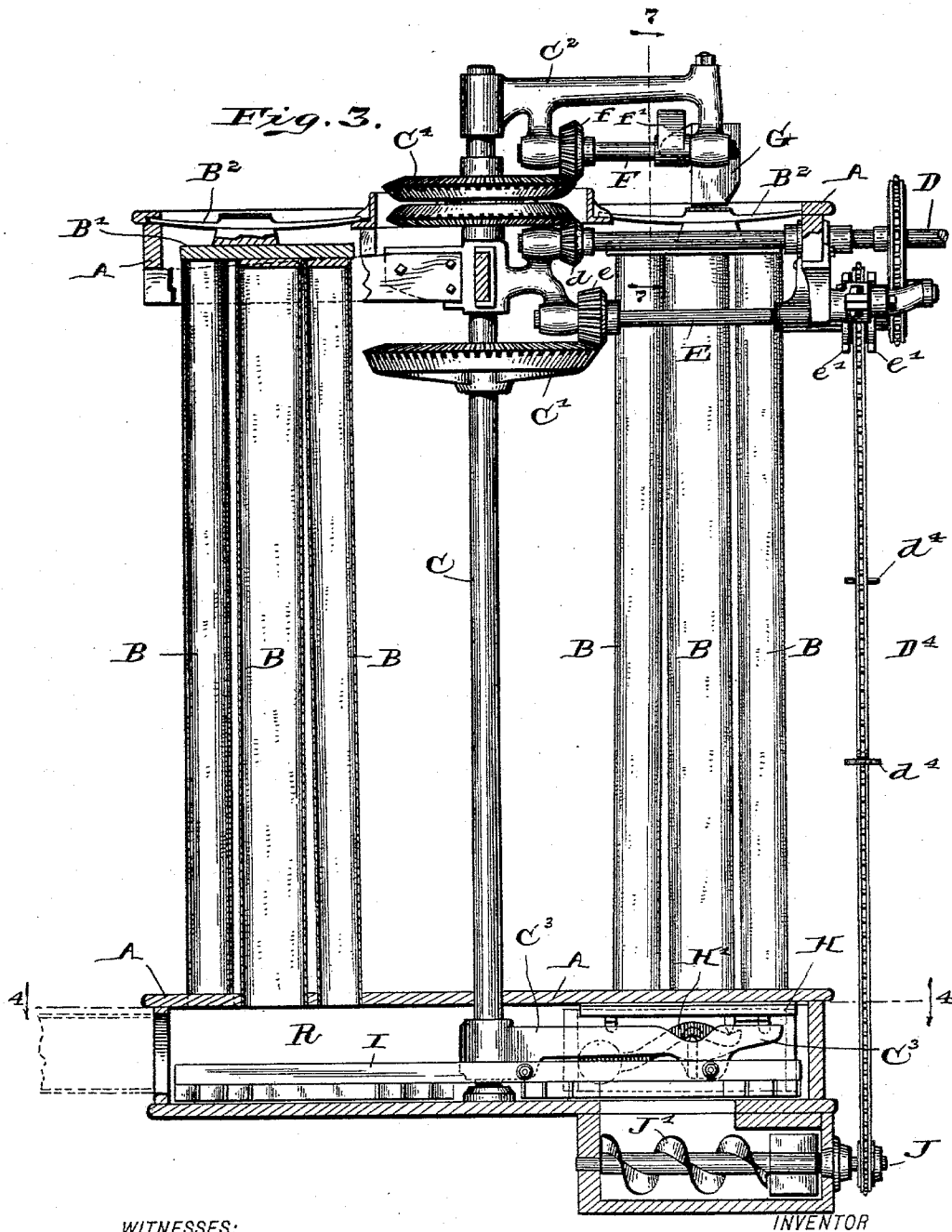
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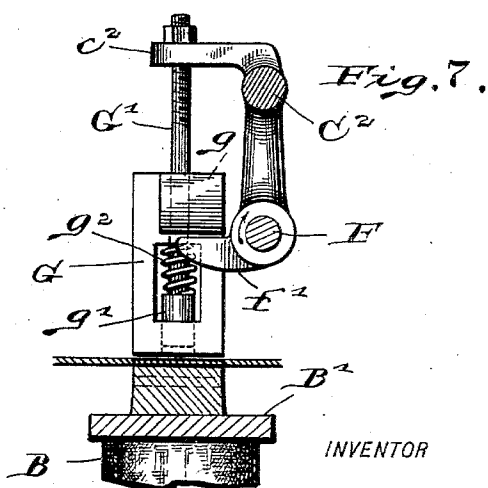
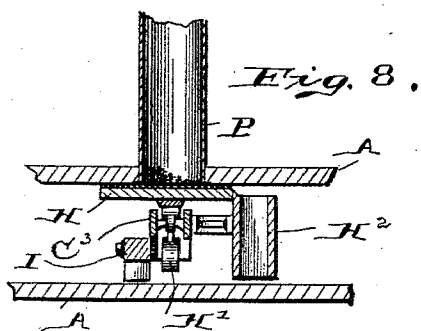
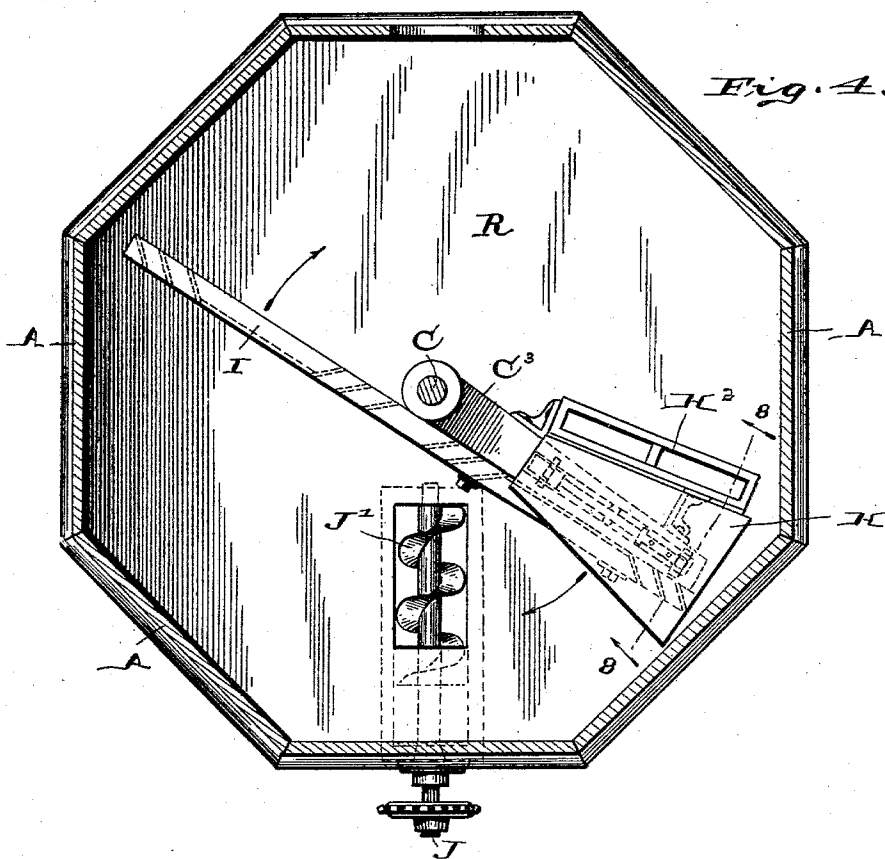
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4 Sheets—Sheet 4.

A. C. BRANTINGHAM.
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UNITED STATES PATENT OFFICE.

ALLEN C. BRANTINGHAM, OF TOLEDO, OHIO, ASSIGNOR TO THE NORDYKE & MARMON COMPANY, OF INDIANAPOLIS, INDIANA.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 566,737, dated September 1, 1896.

Application filed May 4, 1895. Serial No. 548,181. (No model.)

To all whom it may concern:

Be it known that I, ALLEN C. BRANTINGHAM, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Dust-Collectors, of which the following is a specification.

My present invention consists in certain improvements in tubular dust-collectors by which the great economy of space resultant from the employment of a structure circular in form is secured and the disadvantages of revolving the structure as a whole avoided.

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 and figures of reference indicate similar parts, Figure 1 is a side elevation of a dust-collector embodying my present invention; Fig. 2, a top or plan view of the same; Fig. 3, a sectional view as seen when looking in the direction indicated by the arrows from the dotted line 3 3 in Fig. 2; Fig. 4, a horizontal sectional view looking downwardly from the dotted line 4 4 in Fig. 3; Fig. 5, a perspective view illustrating a portion of the intermittent driving mechanism, on an enlarged scale; Fig. 6, a similar view illustrating another portion of said intermittent driving mechanism and showing the means particularly whereby the tension of the driving-chain is adjusted, with the parts separated; Fig. 7, a detail view of the jarring mechanism as seen from the dotted line 7 7 in Fig. 3, but with the parts in a somewhat different position; and Fig. 8, a detail sectional view as seen when looking in the direction indicated by the arrows from the dotted line 8 8 in Fig. 4.

In said drawings the portions marked A represent the casing and framework of my improved dust-collector; B, the dust-collecting tubes therein; C, the central shaft of the operating mechanism; D, the driving-shaft; E, an intermediate shaft; F, the hammer-operating shaft; G, the hammer or hammer-block; H, a plate for closing the lower ends of the dust-collecting tubes while the dust is being dislodged therefrom; I, a sweep for gathering the dust and forcing it to the dis-

charge-orifice, and J the shaft of the conveyer which operates in the dust-receptacle. As in many similar structures, the structure A, composed of the framework and casing of the machine, includes an inclosed chamber R at the lower end for receiving the dust-laden air and a supporting-frame for the dust-tubes B, and to said framework are secured the bearings for the various portions of the mechanism, all as shown and as will be readily understood. This structure is stationary in its character.

The dust-collecting tubes B are open at the lower end and communicate with the chamber R through holes formed in the top for that purpose, as shown, and are closed at the upper end, where they are connected to heads B', which are suspended to springs B², and which latter rest on suitable bearings on the frame structure A. They are entirely stationary, except as operated or jarred by the hammer devices, as will be hereinafter more fully described. The spring-bars B² are preferably connected by an annular plate B³, as shown in Fig. 2, although this may be dispensed with if desired.

The central shaft C is adapted to be revolved preferably intermittingly, although a slow continuous movement might be used with approximately corresponding results. It has rigidly secured thereto a bevel gear-wheel C', by which, through the intermediate shaft E, it is driven, an arm C², carrying the hammer-operating shaft and other parts, and an arm C³, carrying certain dust-gathering devices, at the lower end in the chamber R. It also carries, loosely mounted thereon, the double-faced bevel gear-wheel C⁴, which is shown as composed of two parts secured together, although, obviously, it might be formed solid if desired.

The driving-shaft D is driven from some suitable source of power, (not shown,) and through the chain belt D' and sprocket-wheels 1 and 2 drives the idle-shaft D², which carries the sprocket-wheel 3, and through it drives the chain belt D⁴. At its inner end said shaft D is provided with a bevel-pinion *d*, which meshes with the lower side of the double-faced gear-wheel C⁴ and imparts motion thereto, and through the same and the bevel-pinion *f* drives the hammer-operating shaft

F. By this means, when the driving-shaft D is driven, the hammer-operating shaft F is also continuously driven, while, by means presently to be described, the other mechanism is intermittently driven. The idle-shaft D³ is carried by a frame composed of a rod 5 and arms 6 and 7. Said rod is mounted in a clamping-bearing D⁵, having a fixed half 8 and an adjustable half or cap 9. By loosening the cap-bolts, manifestly the frame can be swung to any position desired, and the tension of the chain D⁴ thus regulated, as will be readily understood. The bearing or bracket D⁵ is secured to the frame by bolts passing through slotted holes, and may thus be shifted as a whole, and the tension of the chain belt D⁴ thus adjusted.

The intermediate shaft E, as shown most plainly in Fig. 5, has a loosely-mounted sprocket-wheel 4, over which the chain belt D⁴ runs, and is also provided with fixedly-attached spiders E', having arms e', with which cross-bars d⁴ on the chain D⁴ will engage. These cross-bars are provided at such intervals as it is desired that the shaft E shall move, and consequently while the chain D⁴ itself is continuously in motion the shaft E is only intermittently driven, and through its pinion e correspondingly intermittently drives the shaft C, with its arms C² and C³ and the mechanism thereon, and thus said arms and said mechanism are shifted from point to point as the arms e⁴ come in contact with the arms e', and at other times are permitted to remain at rest. The gearing is so proportioned as that each movement shifts the hammer mechanism exactly from one set of tubes to the next set of tubes. It is also preferably so proportioned as that the timing of the strokes of the hammer is the same as to each set of tubes, or, in other words, so that the strokes shall always be directly above the tubes while the hammer mechanism as a whole is at rest, it being thus secured that the hammer shall strike on the tubes and not between them, although this could be varied from without departing from my invention.

The shaft F is mounted in bearings formed on the arm C², and, as heretofore stated, is driven from the gear-wheel C⁴ through the bevel-pinion f. As shown most plainly in Fig. 7, this shaft is provided with an arm f', which is adapted to engage with a projection g on the hammer-block G, and thus said hammer-block is continuously alternatively raised by said arm f², and as it escapes therefrom falls by its own gravity. Said hammer-block G is mounted on the rod G', attached to a small arm c² on the main arm C², and has a head or collar g', between which and a suitable opposing surface on the hammer-block G is a spring g². This spring is so adjusted and arranged as that the hammer-block is just held out of contact with the surface beneath it when at rest, thus avoiding friction between the parts as the structure revolves, while at the same time, the spring being only

sufficient for this purpose, when the hammer-block drops it compresses the spring and strikes its jarring blow onto the tube-carrying structure beneath, and thus jars the tubes B and dislodges the dust therein. The rod G' is screw-threaded, as shown in Fig. 7, so that this adjustment may be easily secured and maintained.

The arm C³ on the shaft C carries the devices which gather the dust and sweep it into the conveyer. Said devices consist of the plate H and attached devices and the sweep I.

The plate H bears upon the under side of the upper side of the chamber R, and serves both to cut off the air from the dust-collecting tubes while the hammering or jarring is in process and then to guide the deposited dust onto the floor of said chamber, whence it may fall into the receptacle below containing the conveyer, by which it is carried away. This is illustrated in Figs. 3, 4, and 8, in which the plate H is shown as carried by a weighted lever H', which holds it yieldingly in place, said lever being supported by a knife-edge fulcrum carried by the arm C³. To one side of said plate H is a guide-chute H², down which the dust from the tube will be discharged as the plate passes from under said tube. This guide-chute is for the purpose of depositing the dust onto the floor of the chamber R, protected from the air-currents, which might otherwise again force it up into the dust-tubes B. As said guide-chute H² extends substantially the whole distance between the top and the bottom of said chamber, it is an efficient means for this purpose, as will be readily understood.

The sweep I is fixedly secured to the arm C³, and, as indicated, has numerous inclined sweeping-blades on its lower side, arranged to sweep the floor of the chamber R, and inclined so as to draw the dust to a position midway between the shaft and the extreme outer edge of the chamber, where it will fall into the orifice in the floor of the chamber leading to the receptacle containing the conveyer, as is fully illustrated in Figs. 3 and 4.

The conveyer-shaft J carries a conveyer J', which revolves near the bottom of the dust-receptacle and operates continually to draw the dust along and discharge it out of a suitable discharging orifice or chute provided for the purpose (as J² in Fig. 1) in an ordinary and well-known manner. Said conveyer-shaft is driven by the chain D⁴, as shown, and is intended to run continuously.

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 a stationary frame structure, dust-collector tubes mounted therein and disposed about a common center and having heads detached from the frame structure, springs carrying said heads, a central vertical shaft carrying a hammer mechanism at the upper end and a tube-closing device at the lower end, and

mechanism for revolving said shaft and for operating said hammer mechanism.

2. The combination, in a dust-collector; of a stationary frame structure, including an in-
 5 closed chamber at the lower end for receiving the dust-laden air; and a supporting-frame for the dust-tubes; dust-tubes open at their lower ends and communicating with said dust-
 10 chamber, and provided with closed heads at their upper ends; springs carrying said heads; a central shaft carrying a hammer mechanism at the upper end, and a device at the lower end for shutting off the air from the tubes, and positioned beneath said hammer
 15 mechanism; mechanism for intermittently driving said central shaft and shifting the mechanism carried thereby from set to set of the tubes; mechanism for operating the hammer mechanism to jar the tubes and dislodge
 20 the dust therein; and mechanism for removing the dust from the machine, substantially as set forth.

3. The combination, with a circular dust-collector, composed essentially of a frame-
 25 work, a chamber, and dust-collecting tubes; of a central vertical shaft carrying a device at the lower end for shutting off the air from certain of said tubes, and consisting of an arm on said shaft, a plate bearing against the
 30 surface in which said tubes terminate, and a weighted lever whereby said plate is held yieldingly against said surface, substantially as set forth.

4. The combination, in a dust-collector, of
 35 a framework containing stationary dust-collecting tubes arranged radially about a common center, a central shaft having an arm fixedly connected thereto at the upper end and carrying a hammer mechanism, a bevel
 40 gear-wheel thereon by which it may through

an intermediate shaft be driven intermittently, a loose doubled-faced bevel gear-wheel on said shaft between said fixed gear-wheel and said arm, and a driving-shaft and hammer-operating shaft engaging with said faces
 45 of said loosely-mounted gear-wheel, respectively, whereby the hammer mechanism may be continuously driven, and the shaft intermittently driven, substantially as and for the purposes set forth. 50

5. The combination, in a dust-collector, of the dust-collecting tubes radially disposed about a common center and having heads detached from the frame structure, springs carrying said heads, a central vertical shaft carrying a hammer mechanism adapted to strike
 55 upon and jar said springs, said hammer mechanism consisting of a hammer-block mounted on a vertical slide-rod and having a projection thereon, a rotating shaft having an arm adapted to engage with the projection on the
 60 hammer-block, a spring connected to said rod and supporting said hammer-block, whereby it is held free from contact with the surface where it is to strike when at rest, but which
 65 is sufficiently yielding to permit said hammer-block as it falls to operate upon said springs and thus jar the dust-collector tubes, said hammer mechanism as a whole being
 70 thus adapted to pass freely from set to set of the tubes without frictional contact therewith, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Toledo, Ohio, this 20th day of April, A. D. 1895.

ALLEN C. BRANTINGHAM. [L. S.]

Witnesses:

SAMUEL HARRIS,
 ROBT. C. WHITTLESEY.