

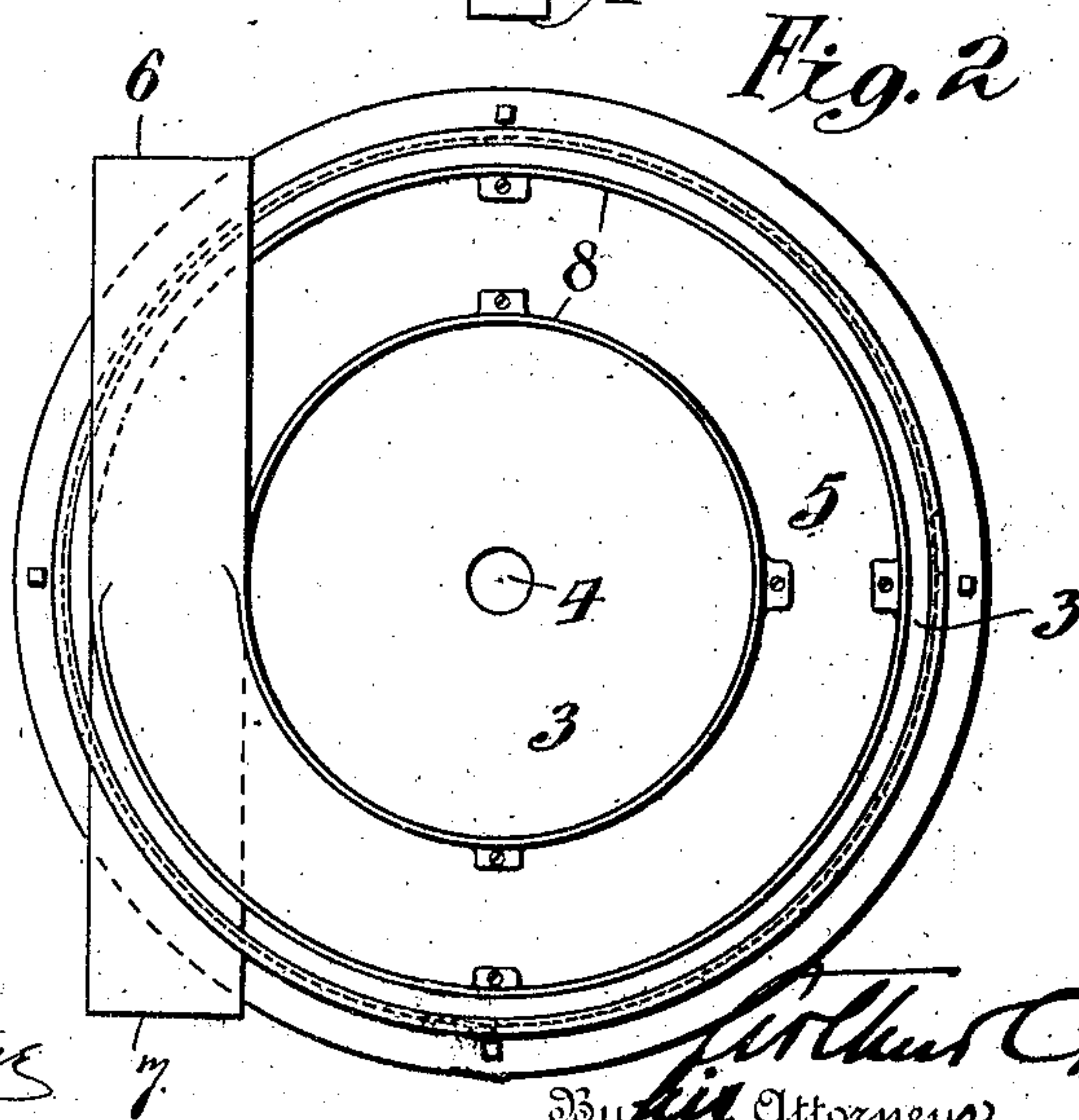
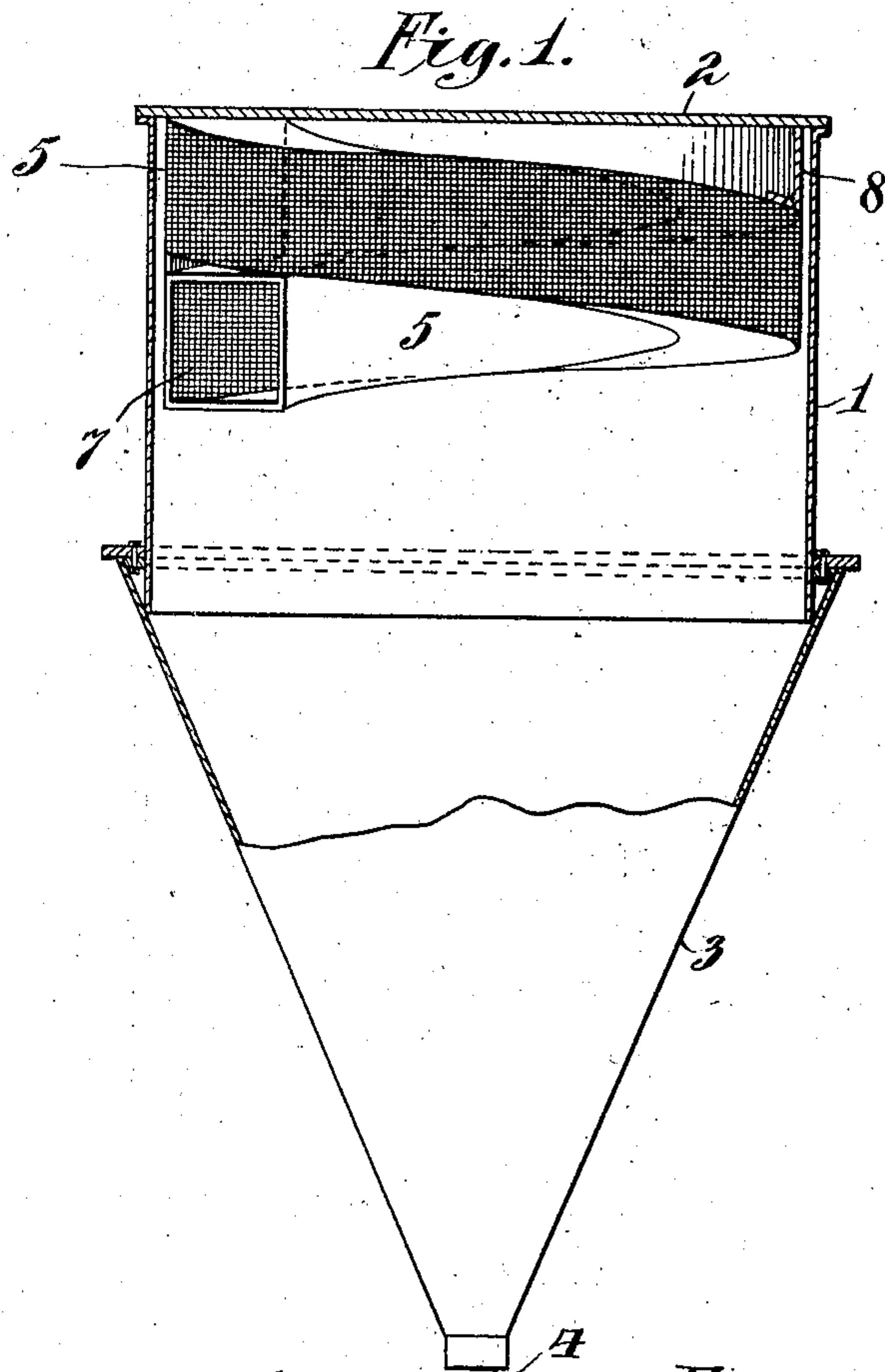
No. 815,967.

PATENTED MAR. 27, 1906.

A. C. LYNCH.
DUST COLLECTOR AND LIKE APPARATUS.

APPLICATION FILED SEPT. 17, 1904.

2 SHEETS—SHEET 1.



Witnesses
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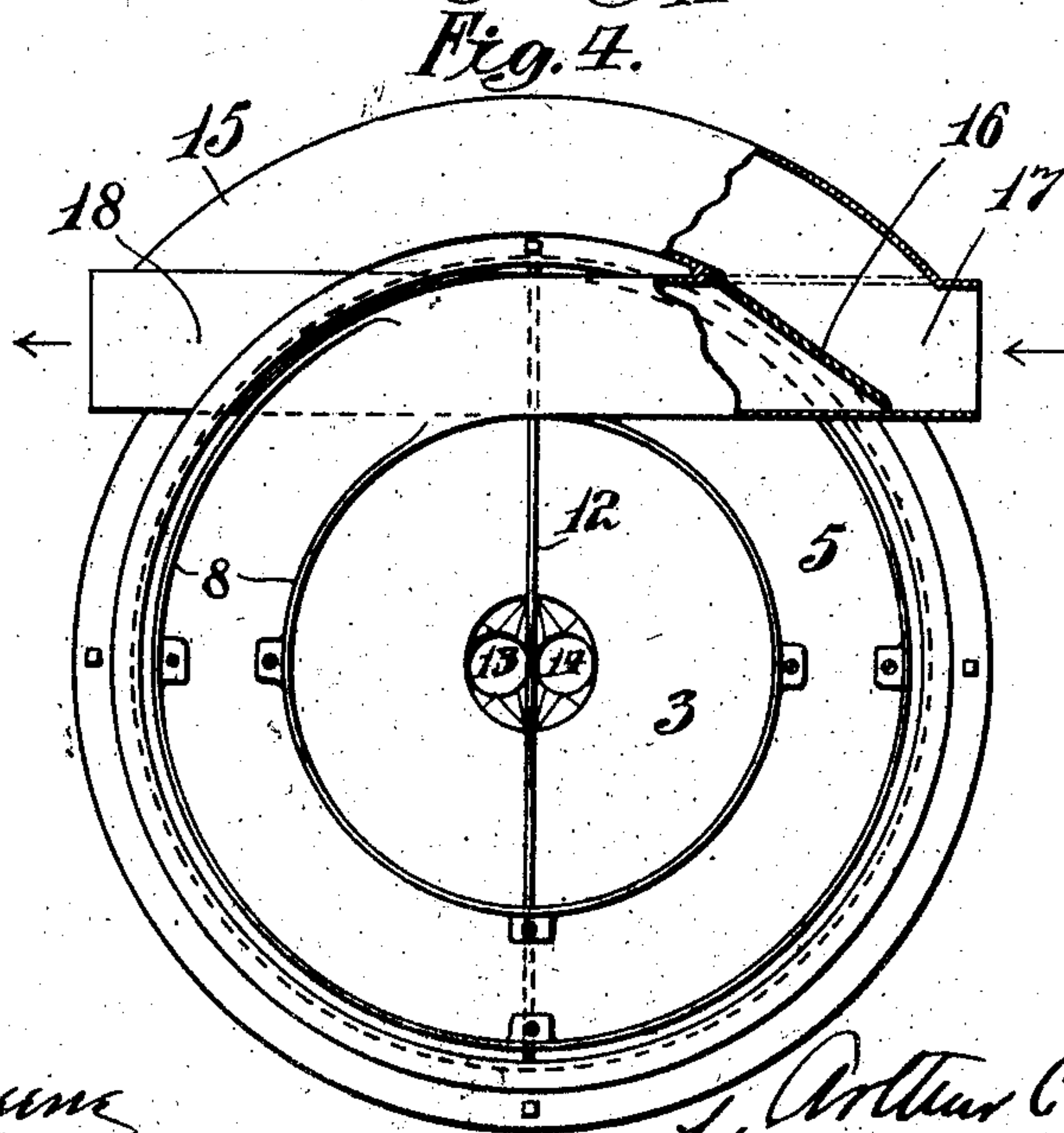
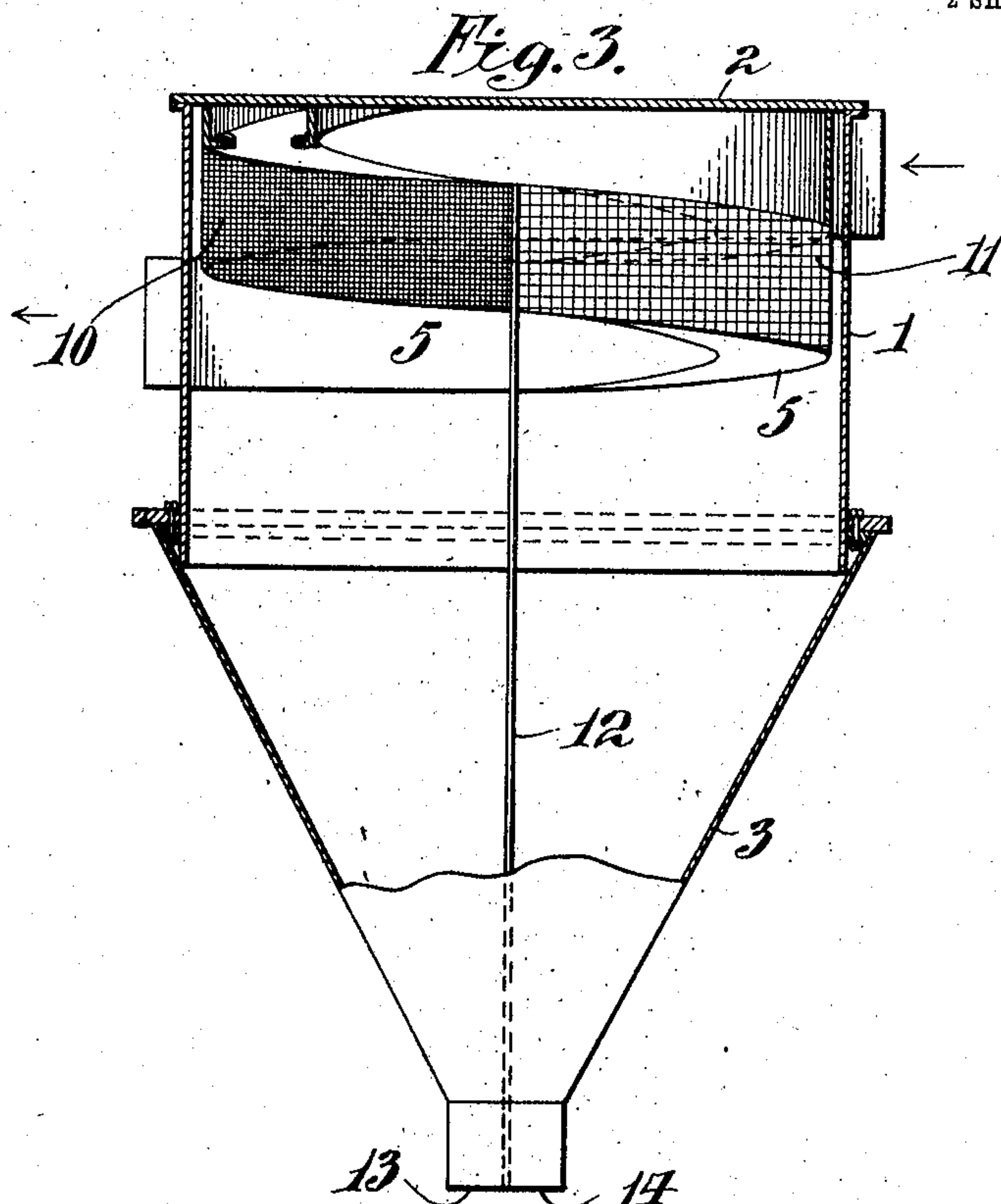
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ARTHUR C. LYNCH, OF RICHMOND HILL, NEW YORK, ASSIGNOR TO STERLING BLOWER & PIPE MANUFACTURING COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

DUST-COLLECTOR AND LIKE APPARATUS.

No. 815,967.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed September 17, 1904. Serial No. 224,793.

To all whom it may concern:

Be it known that I, ARTHUR C. LYNCH, a citizen of the United States, residing at Richmond Hill, county of Queens, State of New York, (whose post-office address is the same,) have invented certain new and useful Improvements in Dust-Collectors and Like Apparatus, of which the following is a full, true, and concise specification.

This invention relates to improvements in apparatus for collecting dust and other solid particles from air and separating the finer from the coarser of such material; and to this end the invention embodies apparatus of novel arrangement of parts and mode of operation, as will be presently described, and more particularly pointed out in the accompanying claims.

Referring to the drawings, Figure 1 is a side elevation with parts broken away, and Fig. 2 is a plan view of a simple form of apparatus of this invention with top removed. Fig. 3 is a vertical section with parts in elevation of a development of the invention, and Fig. 4 is a plan view thereof with parts broken away.

The apparatus consists of a chamber formed by a casing 1 with a top 2 and an inclined floor or bottom 3, provided with a discharge-opening 4. The chamber may be of any convenient shape, but is preferably circular in cross-section, and the inclination of the bottom 3 is sufficient to cause solid matter to slide downwardly thereon and out of the discharge. Within the chamber is disposed a curved or spiral pipe or passage-way 5, entering the chamber at the point marked 6 and leaving it at the point marked 7. The pipe may be of any suitable construction and as herein illustrated is rectangular or square in cross-section. The curvature may be formed by any desired number of spiral convolutions, which are preferably and for the sake of compactness concentric with the casing 1. The outer peripheral wall of the passage-way is perforated, being conveniently formed of a woven-wire screen of proper mesh, and this wall is spaced a suitable distance from the side wall of the casing for permitting solid matter or siftings from the screen to pass downwardly onto the inclined bottom 3.

In the operation of the device air laden

with particles of solid matter is forced into the inlet-opening 6 through the curved passage-way and out through outlet 7. Centrifugal force due to the curvature of the passage-way acts upon the solid particles and drives them against the outer side wall, and such particles as are small enough to pass through the perforations in the screen are driven through the same, falling into the outer receiving-chamber. The larger particles which cannot pass through the screen are carried on out of the apparatus to be deposited elsewhere or subsequently reassorted in a similar manner or separated from the air-current. In the case of air which is laden with the refuse of wood-working machinery—such as shavings, chips, sawdust, &c.—and for which this apparatus is more particularly designed and is especially serviceable the mesh of the screen is of such grade of coarseness as to permit only the sawdust to pass therethrough, and this material falling into the receiving-chamber finds exit through the normally open discharge-opening 4 above described. The area of this opening is predetermined with respect to the pressure of the air and also with respect to the condition of the material, so that the flow of air through the screen will be sufficient only to facilitate the passage therethrough of the small particles and will not seriously impair the velocity of the air and shavings at the outlet 7. The opening 4 may, if desired, be made adjustable, so as to be capable of regulation in conformity with different conditions. Also the space between the outer wall of the passage-way and the casing-wall 1 may be predetermined with the same effect. As herein illustrated, the passage-way 5 makes a complete convolution within the chamber; but centrifugal action and separation of particles, as above described, will obviously take place if formed with less or with several convolutions. The pipe may be supported in any convenient manner within the chamber, and a convenient method is by means of the plates or partitions 8, located between the pipe and the top 2 of the casing. These partitions may be fastened both to the top and to the pipe, serving the double function of supporting the latter and also preventing accumulation of dust on top of the same.

In Figs. 3 and 4 is shown a development of

the apparatus above described. According to this form of the invention a number of receiving-chambers are provided, each intersected by a portion of the curved passage-way 5, and the outer peripheral wall of the said passage-way is provided with screens of increasing coarseness for the successive receiving-chambers. The chambers may obviously be formed in separate casings, but for convenience and compactness are provided within a single casing 1, similar in shape to the casing of the foregoing figures. A vertical partition 12 divides the interior of this casing into two chambers, and the outer peripheral wall of the passage-way of the first chamber is provided with a screen 10 of comparatively fine mesh, and the outer peripheral wall of the passage-way of the second chamber is provided with a screen 11 of comparatively coarser mesh, while each chamber has discharge-openings, respectively designated 13 and 14. These openings are restricted in the same manner as mentioned above in connection with the opening 4, so that only a proper amount of air is permitted to flow through the screens 10 and 11. In operation air laden with solid particles of various sizes enters the inlet, the finer particles passing through screen 10 and out of the opening 13, the particles of larger size passing through the screen 11 and out of opening 14, while the still larger particles which can pass through neither of the screens are carried on through the outlet to be deposited at any desired place. It will be understood, of course, that any number of partitions and screens of graded coarseness may be provided.

The special utility and also novelty of the present device consists in the fact that the apparatus may be interposed at any convenient point in the path of the current of dust-laden air to separate therefrom the finer particles, such as the sawdust, while the coarser chips and shavings are carried on with practically undiminished velocity outside of the casing to be deposited elsewhere, most desirably in the fire-box of the shavings-furnace of the mill, where they are utilized as fuel for the production of power. This effect is due to the fact that pipe 5 is isolated from the interior of the chamber save through the fine perforations and that the dust-discharge opening is restricted as to area. The fine sawdust is less desirable as a fuel and is more serviceable and valuable for other purposes. By the present invention it is delivered in a constant stream, and the air-pressure within the casing may be sufficient to permit of its being carried a considerable distance for deposit.

In systems employing apparatus as above described it frequently becomes necessary or desirable to stop the operation of a single apparatus without interrupting the flow of air,

for which purpose a by-pass 15 may be provided leading from a point, such as 17, at the inlet to a point, such as 18, in the outlet. At the junction of the by-pass with the inlet a hinged gate-valve 16 may be disposed, adapted to direct the current of air through the by-pass when in its open position or to allow the same to pass through the passage-way 5 when in its closed position. This gate-valve is preferably of such dimension with relation to the diameter of the inlet that when in open position it is inclined to the flow of air, as indicated in the drawings.

In all of the above forms it is to be understood that the structural formation of the casing, passage-way, and other parts are matters which can be changed to any extent according to the option and facilities of the manufacturer, the representations in the drawings being merely simple forms and not intended as working drawings, and it will be observed from the following claims that various modifications in the arrangement of the several parts of the invention may be effected within the spirit and scope of this invention.

Having described my invention, what I claim, and desire to secure by United States Letters Patent, is—

1. A dust-separator comprising a casing to receive the finer particles, a pipe passing through said casing and formed with a spiral convolution therein, the said pipe having its outer curved wall perforated but being otherwise isolated from the interior of said casing, whereby the finer particles are sifted through said perforated wall and the coarser particles are carried on through the pipe out of the separator, in combination with a receptacle for said finer particles provided with a restricted outlet.
2. A dust-separator comprising a casing, a pipe passing through said casing, formed with a convolution therein and having its outer curved wall perforated but being otherwise isolated from the interior of the casing, in combination with partitions supporting said pipe from the top of the casing and preventing accumulation of dust on said pipe.
3. A dust-separator comprising a casing, a pipe passing through said casing, formed with a convolution therein and having its outer curved wall formed by perforated walls of successively larger-sized apertures, but being otherwise isolated from the interior of the casing, in combination with a vertical partition dividing said interior into compartments to receive different grades of siftings from said perforated walls, and restricted outlets for said siftings formed in each chamber.

4. A dust-separator comprising a casing, a pipe passing therethrough and formed with a complete spiral convolution therein whereby the inlet and outlet of said pipe are on the

same side of the casing and a perforated
outer curved wall for said pipe, in combina-
tion with a by-pass directly from the inlet to
the outlet whereby the dust-laden air may be
5 prevented from passing through said convo-
lution of the pipe.

In testimony whereof I have signed my

name to the specification in the presence of
two subscribing witnesses.

ARTHUR C. LYNCH.

Witnesses:

G. A. TAYLOR.

A. G. KIMBALL.