

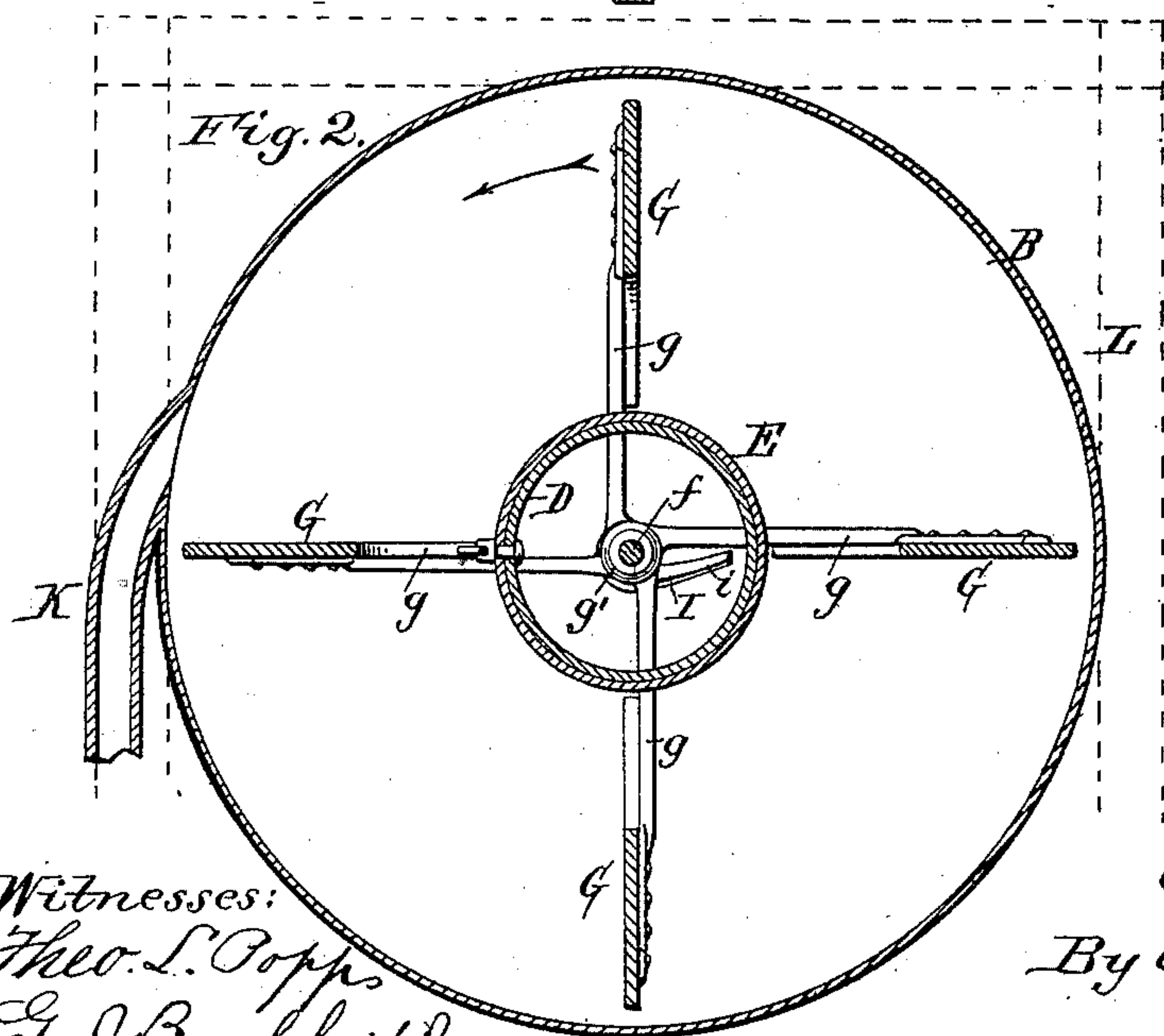
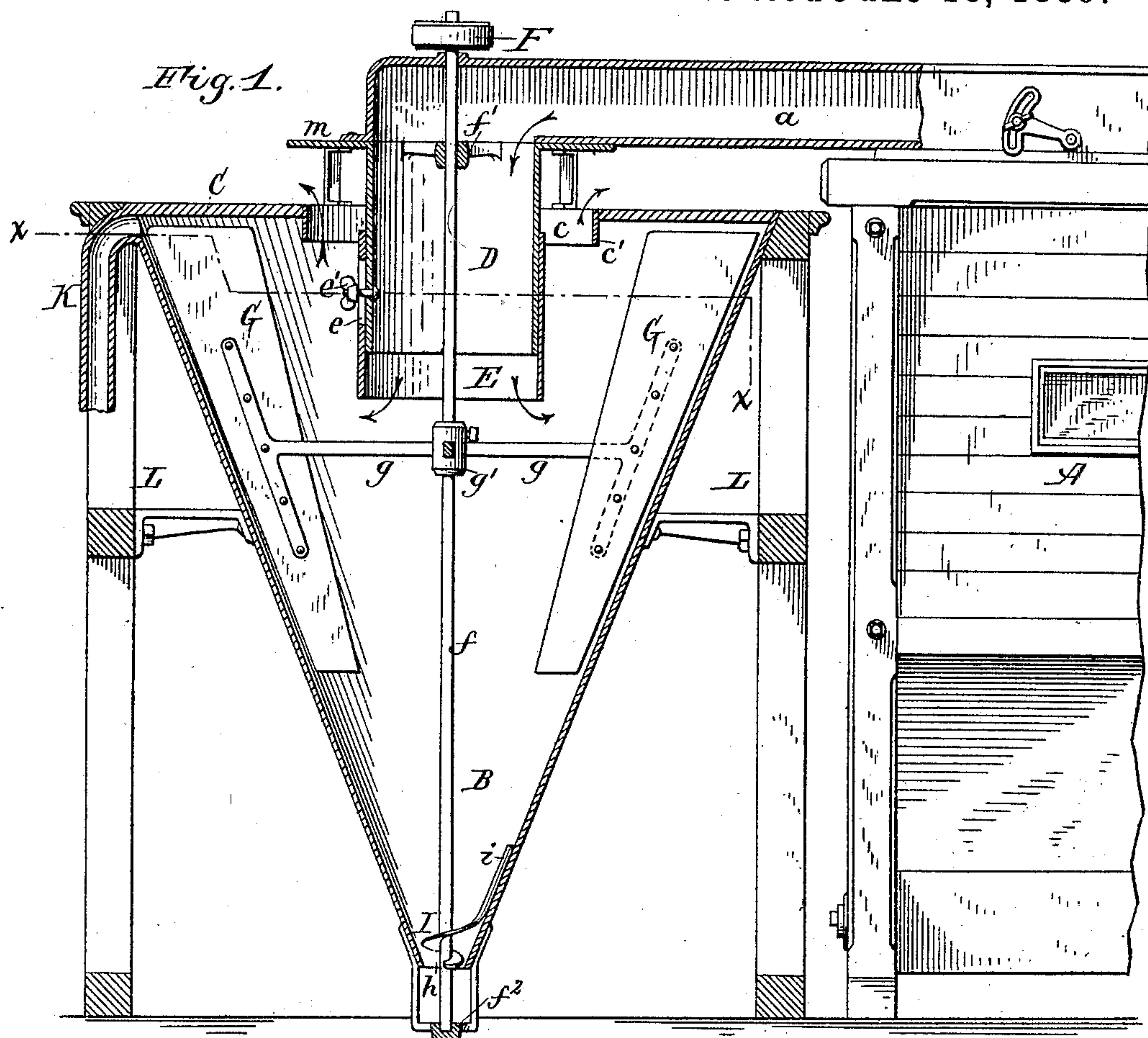
(No Model.)

2 Sheets—Sheet 1.

O. M. MORSE.
DUST COLLECTOR.

No. 405,674.

Patented June 18, 1889.



Witnesses:
Theo. L. Popp
Geo. Buchheit Jr.

O. M. Morse Inventor,
By Wilhelm & Bonner.
Attorneys.

(No Model.)

2 Sheets—Sheet 2.

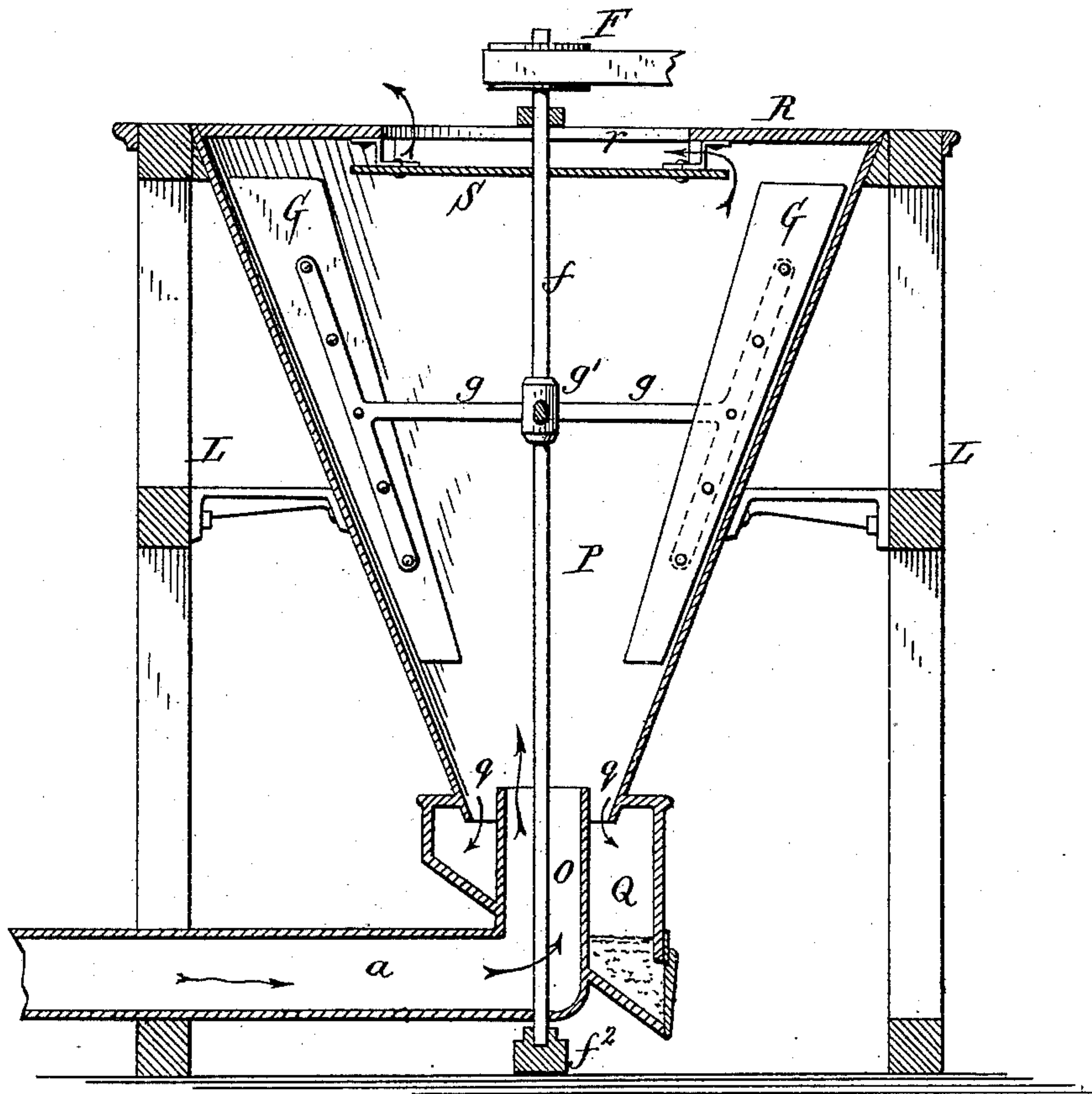
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Fig. 3.



Witnesses:

Theo. S. Popp
Geo. J. Buchheit Jr.

O.M. Morse Inventor.

By *Wilhelm Bonner*
Attorneys

UNITED STATES PATENT OFFICE.

ORVILLE M. MORSE, OF JACKSON, MICHIGAN, ASSIGNOR TO THE KNICKERBOCKER COMPANY, OF SAME PLACE.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 405,674, dated June 18, 1889.

Application filed November 26, 1887. Serial No. 256,219. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE M. MORSE, of Jackson, in the county of Jackson and State of Michigan, have invented a new and useful Improvement in Dust-Collectors, of which the following is a specification.

This invention relates to that class of dust-collectors which are provided with a separating-chamber having an imperforate peripheral wall, and in which the dust-laden air is caused to assume a whirling or gyrating motion, whereby the dust-particles are driven against the peripheral wall and conducted to a suitable discharge-orifice, while the purified air escapes through an opening at or near the center of the separating-case.

The object of my present invention is to provide the separating-chamber with fan-blades whereby the air is set in motion and caused to whirl in the separating-chamber, thereby permitting the dust-laden air to be admitted into the separating-chamber at or near the center thereof, instead of tangentially, as heretofore.

My invention consists of the improvements which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a sectional elevation of a dust-collector provided with my improvements. Fig. 2 is a horizontal section in line *x x*, Fig. 1. Fig. 3 is a sectional elevation, showing a modified construction of the dust-collector.

Like letters of reference refer to like parts in the several figures.

A represents a middlings-purifier or other machine, from which dust-laden air is discharged through a spout *a*.

In the construction of my improved machine represented in Figs. 1 and 2, B represents the peripheral wall or case of the separating-chamber of the dust-collector, made circular in cross-section and tapering lengthwise of its axis.

C is a head or ring secured to the large end of the separating-case and provided with a central opening *c*, through which the purified air escapes from the separating-chamber.

D represents the central air-inlet pipe for

the dust-laden air, communicating with the air-spout *a* and projecting into the large portion of the separating-chamber through the opening *c* in the head C. The pipe D is so much smaller in diameter than the opening *c* in the head C that the annular opening between the pipe D and the rim *c'* of the opening *c* is sufficiently large to permit the air to escape freely from the separating-chamber.

E represents a tubular extension or nozzle mounted upon the inlet-pipe D within the separating-chamber B, and made adjustable on the pipe D by a slot *e* and set-screw *e'* or otherwise, so that the dust-laden air can be admitted to the separating-chamber at a greater or less distance from the air-outlet opening *c* by adjusting the nozzle of the inlet-pipe.

f represents a shaft arranged axially in the separating-chamber B, and journaled in a bearing *f'*, secured in the pipe D, and resting upon a step *f''*, secured to the small end of the separating-chamber.

F represents a pulley secured to the upper end of the shaft *f*, for rotating the same by power applied thereto.

G G represent fan-blades arranged within the separating-chamber, near the peripheral wall thereof, and connected by arms *g* with a hub *g'*, secured to the shaft *f*.

h represents the discharge-opening for the light dust formed at the apex or small end of the tapering separating-case, and I is a discharge worm or screw secured to the shaft *f* within or immediately above said discharge-opening, whereby the escape of the fine dust through the opening *h* is facilitated. This screw also serves to intercept the air which tends to enter the separating-chamber through the opening *h*. The screw I is preferably provided with a wiper or cleaner *i*, which sweeps the inner side of the separating-case near the opening *h* and prevents the fine dust from accumulating on the same.

K is a discharge-opening for the heavy dust formed in the peripheral wall of the separating-chamber at the large end thereof adjacent to the head C.

L represents the supporting-frame, to which the separating-case is secured.

m represents a horizontal deflecting-ring,

which surrounds the inlet-pipe D above the air-outlet opening c, and which deflects the escaping air outwardly and intercepts the air which tends to pass into the separating-chamber into the center of the vortex.

Power being applied to the shaft f by means of the pulley F or some other suitable driving mechanism, the fan-blades G are rapidly rotated in the chamber B, whereby a suction is created in the center of the separating-chamber, which causes the dust-laden air to flow into said chamber through the spout a and pipes D E. The fan-blades cause the dust-laden air to assume a rotating motion in the separating-chamber, whereby the solid particles contained in the air are driven against the peripheral wall of the separating-chamber. The heavy and bulky particles seek the large end of the separating-chamber and escape through the opening K, while the light and fine particles pass to the small end of the separating-chamber and escape through the opening h. The air which has been freed from these solid particles escapes through the opening c in the head of the separating-chamber. When the suction produced by the fan-blades in the separating-chamber is sufficiently powerful to create an air-current of the required strength through the purifier, a separate fan for this purpose may be dispensed with. When the dust-laden air contains no heavy or bulky particles which require to be separated from the light and fine dust, the discharge-opening K at the large end of the separating-chamber may be omitted.

In the modified construction represented in Fig. 3 the air-inlet pipe O enters the small end of the separating-chamber P, and is surrounded by a receiving-chamber Q, which receives the fine dust from the separating-chamber through the annular passage q between the inlet-pipe O and the small end of the separating-case. The purified air escapes through a central opening r in the head R, which is secured to the large end of the separating-case. This opening is protected by a deflecting-disk S, which is secured within the separating-chamber P near said opening and made somewhat larger than said opening, so that the air is compelled to pass toward the peripheral wall of the separating-chamber before it can escape from the latter.

I claim as my invention—

1. The combination, with the separating-chamber having an imperforate peripheral wall, an outlet for the purified air located inwardly from the peripheral wall, and a dust-outlet, of an inlet-pipe for the dust-laden air entering the separating-chamber at or near its axis, a rotating fan arranged within said chamber, whereby the dust-laden air is caused to whirl therein and the dust is massed

against the imperforate peripheral wall, while the purified air moves toward the axis of the separating-chamber, and power mechanism whereby the fan is rotated, substantially as set forth.

2. The combination, with a tapering separating-chamber having an imperforate peripheral wall, a dust-discharge opening at its small end, and an outlet for the purified air, of an air-inlet pipe entering said chamber centrally, a rotating fan arranged within said chamber, and power mechanism whereby the fan is rotated, substantially as set forth.

3. The combination, with the separating-chamber having an imperforate peripheral wall, a dust-discharge opening at its end, and a central air-escape opening, of an air-inlet pipe entering the separating-chamber through said air-escape opening and made of smaller size than said opening, substantially as set forth.

4. The combination, with the tapering separating-chamber provided with a dust-discharge opening at its small end and an air-escape opening at its large end, of an air-inlet pipe entering the separating-chamber through said air-escape opening and made of smaller size than said opening, substantially as set forth.

5. The combination, with the separating-chamber having an imperforate peripheral wall and a dust-discharge opening and an air-outlet at its end, of a lengthwise-adjustable air-inlet pipe entering said case centrally, a fan arranged within said case, and power mechanism whereby the fan is rotated, substantially as set forth.

6. The combination, with the tapering separating-chamber having an imperforate peripheral wall, a discharge-opening for the light particles at its small end, a discharge-opening for the heavy particles at its large end, and an air-outlet at its end, of an air-inlet pipe entering said case centrally, a fan arranged within said case, and power mechanism whereby the fan is rotated, substantially as set forth.

7. The combination, with the separating-case having an imperforate peripheral wall, a dust-discharge opening at its end, a central air-outlet, and a power-fan arranged within the separating-case, of a central air-inlet pipe entering the separating-case through the air-outlet opening, and a deflector arranged around the air-inlet pipe opposite the air-outlet opening, substantially as set forth.

Witness my hand this 17th day of November, 1887.

ORVILLE M. MORSE.

Witnesses:

C. H. HIGDON,
C. H. BENNETT.