

I. STEINER.
DUST COLLECTOR.
APPLICATION FILED JAN. 3, 1910.

967,849.

Patented Aug. 16, 1910.

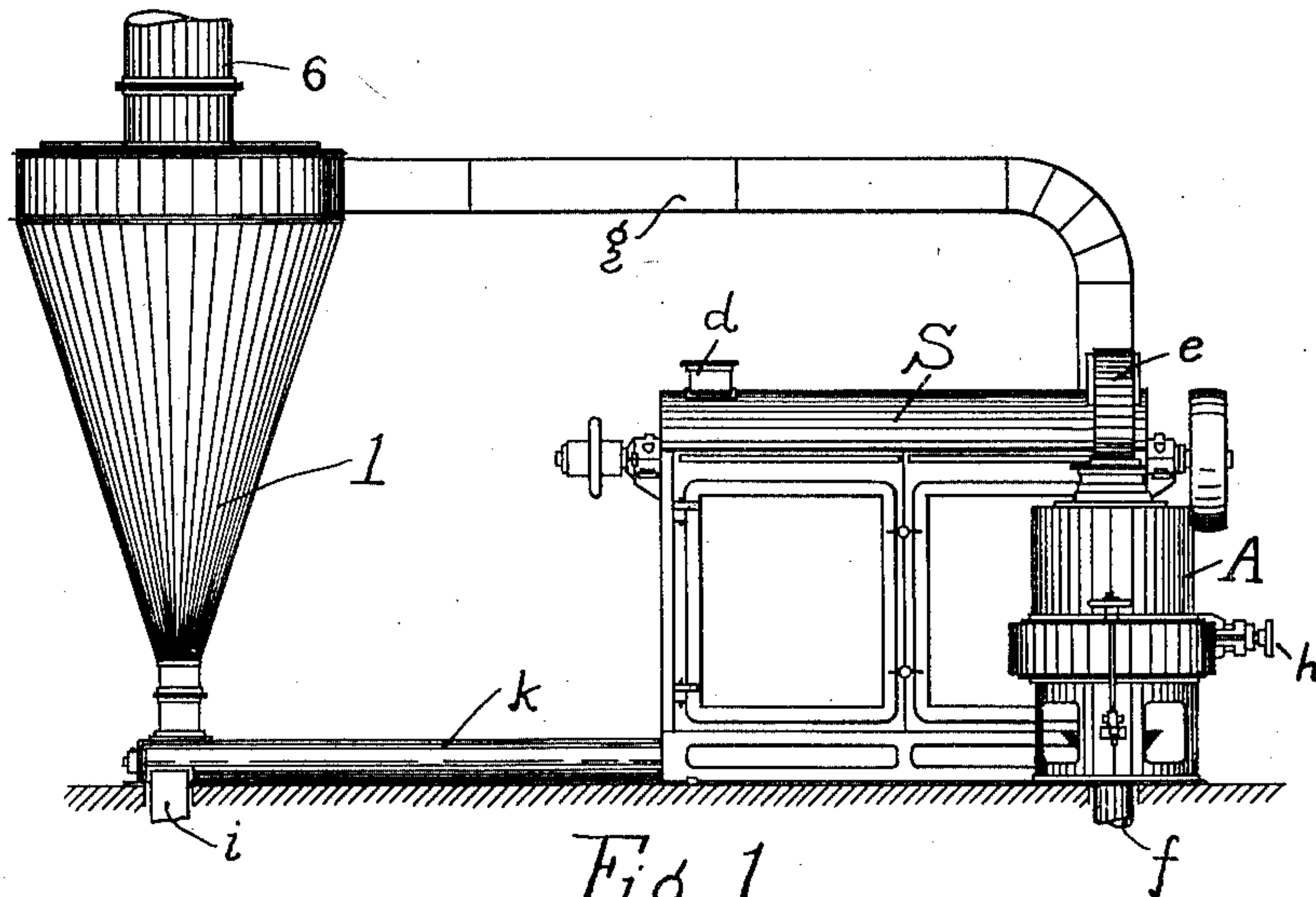


Fig. 1.

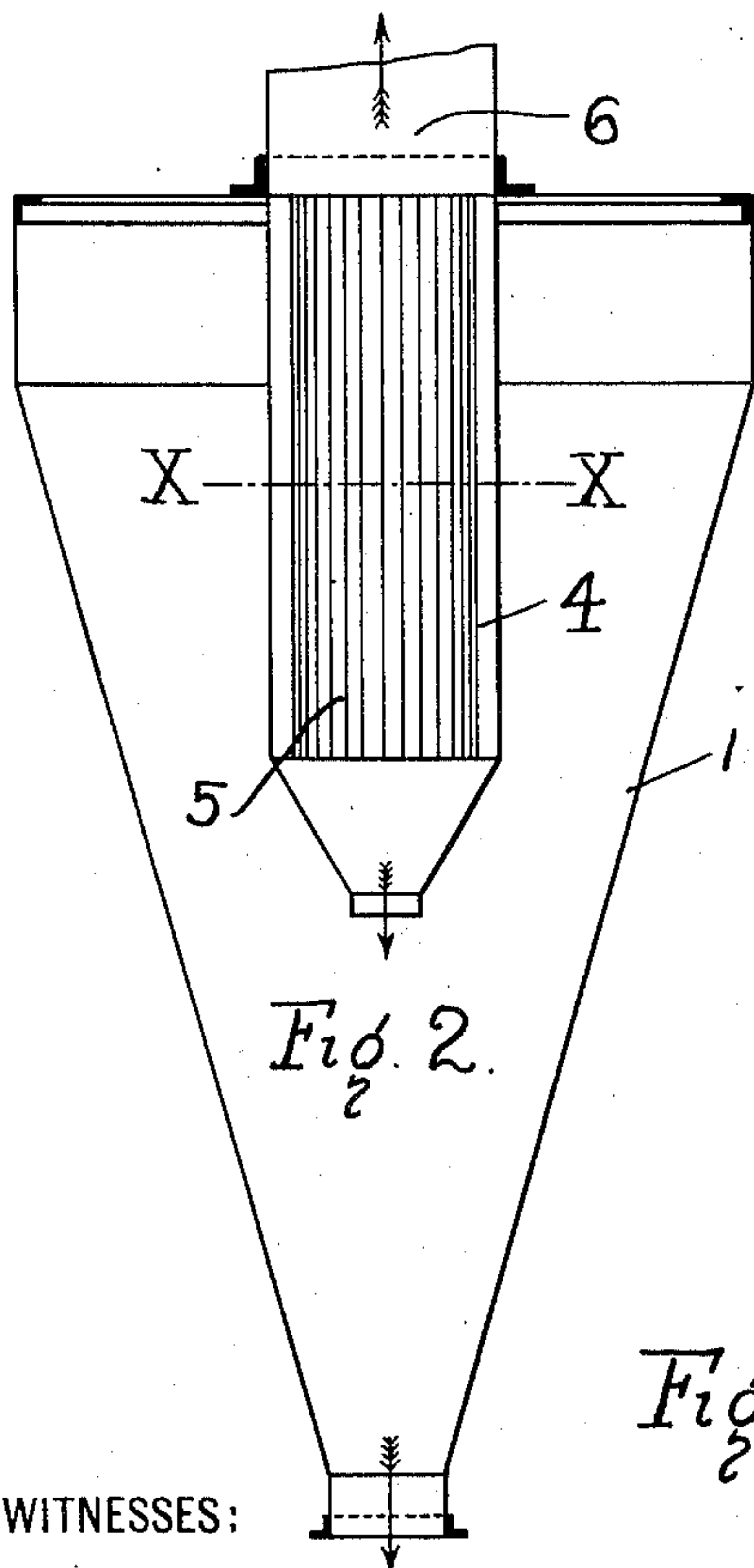


Fig. 2.

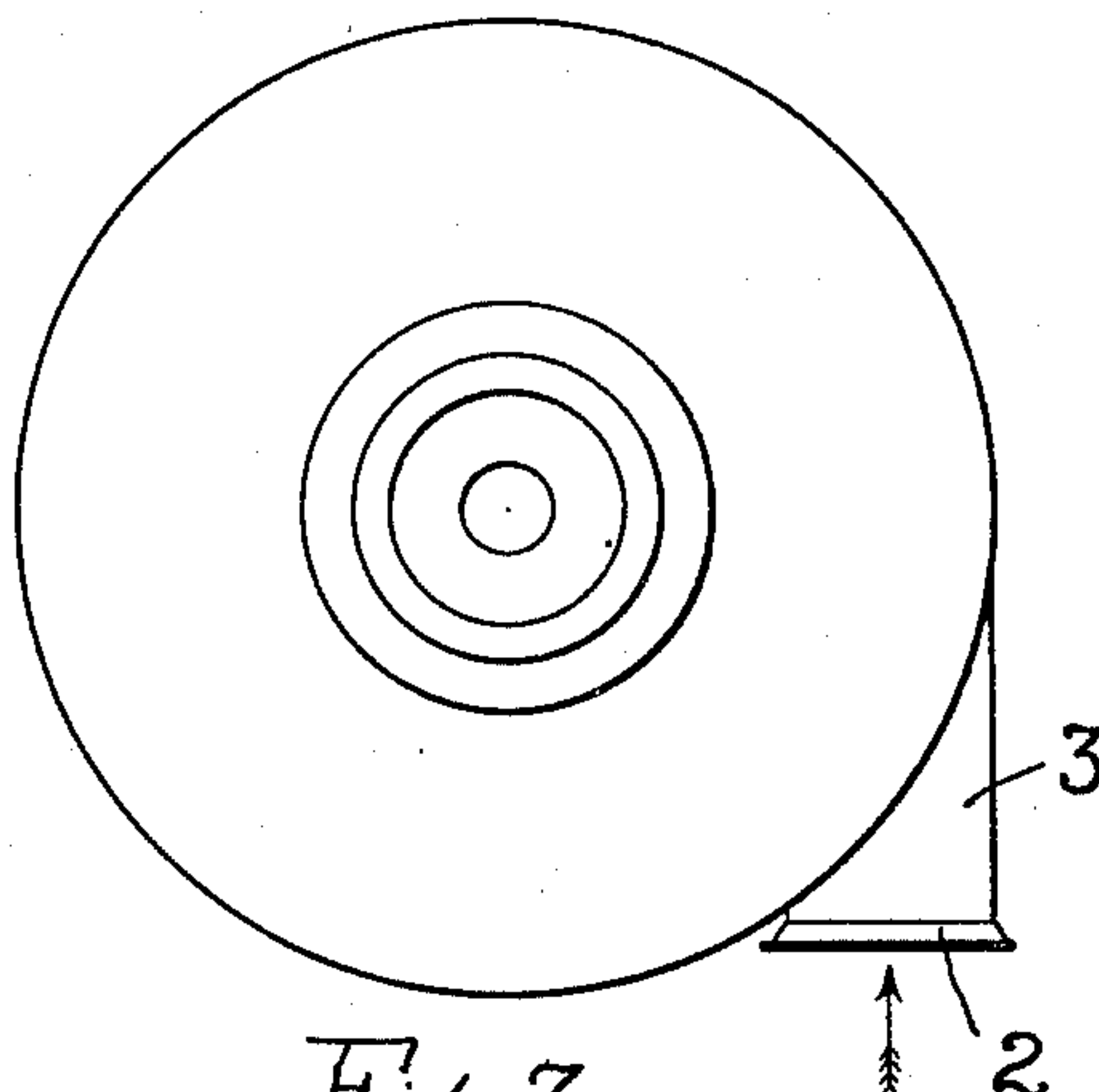


Fig. 3.

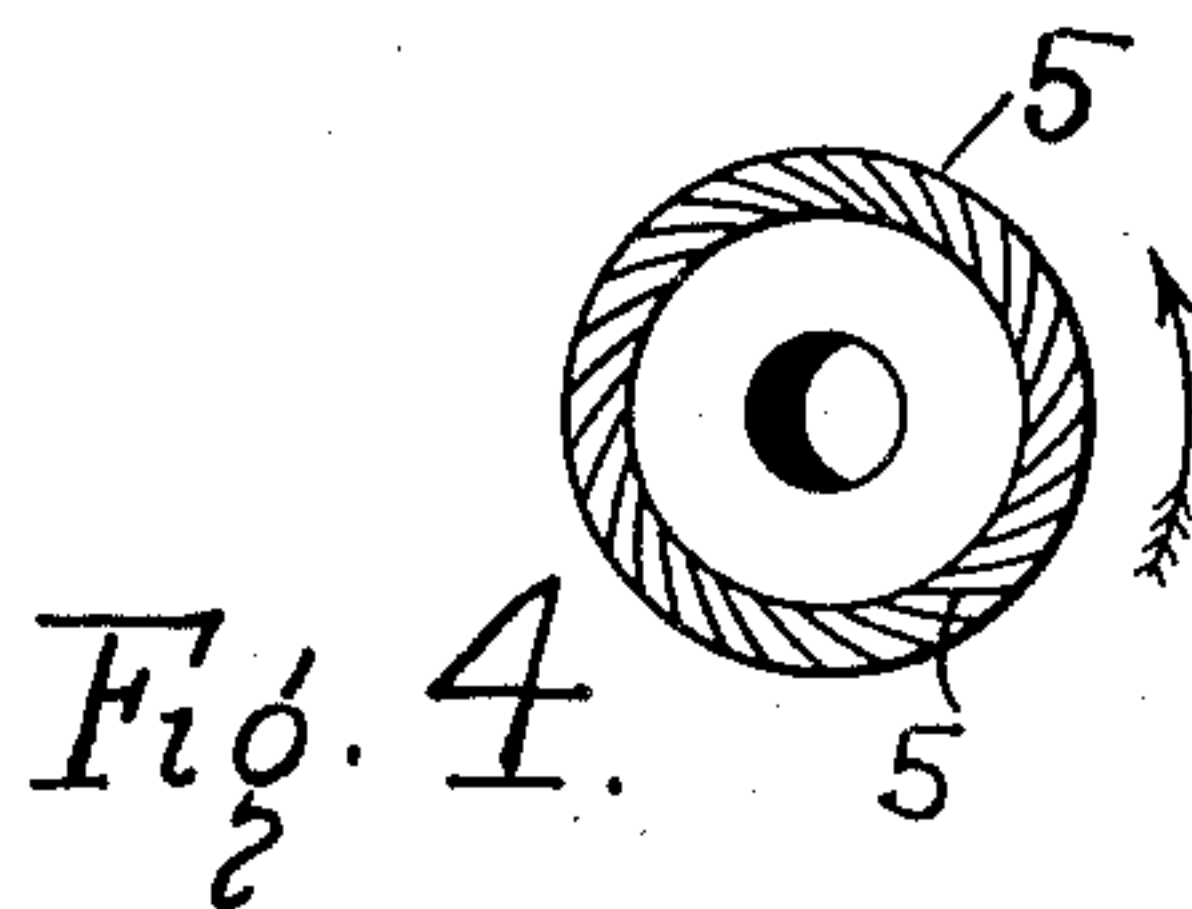


Fig. 4.

WITNESSES:

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ISIDOR STEINER, OF MUNICH, GERMANY.

DUST-COLLECTOR.

967,849.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed January 3, 1910. Serial No. 536,153.

To all whom it may concern:

Be it known that I, ISIDOR STEINER, subject of the German Emperor, residing at Munich, Bavaria, Germany, have invented a new and useful Dust-Collector; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a machine for treating and cleaning grain, principally malt.

It relates further to one part of a compound apparatus, which consists as a whole of three parts, a "separator" in which the grain is freed from the combs, a second device called the "aspirator", and a third device the "dust-collector". The first, or separator has been applied for by me, under date of July 26th, 1909, and Serial No. 508653, and the second, or aspirator, forms the subject matter of an application filed on the 3rd day of Jan. 1910, Serial No. 536,152.

The present invention relates specifically to the apparatus called the "dust-collector", into which the air current, laden with the combs and dust particles, passes, with the result that the latter are completely separated from the air current, so that the air leaves the dust collector in a purified condition.

In the drawings: Figure 1 is a side elevation of the entire apparatus consisting of the three parts, separator, aspirator, and dust collector. Fig. 2 is a vertical section through the dust collector. Fig. 3, a plan view of the same, and Fig. 4, a cross section on the section line X—X, of Fig. 2.

The grain is introduced into the apparatus S at the opening *d*, and automatically reaches the aspirator A through the pipe *e* after being polished and freed from the combs. The completely cleaned grain leaves the aspirator at *f*, while the combs and particles of dust are sucked away and carried off to the dust-collector 1, through a pipe *g*, by an air current provided in an exhaustor, or the like, not shown in detail, which is driven, for example, by an electric motor to be coupled up at *h*. The combs and dust particles are separated from the air current in the dust collector 1, and fall through the pipe *i* below, while the purified air leaves at 6 at the top.

Grain cleaning machines and apparatus for the separation from an air current of combs, dust and the like are already known, in which the air current is conducted tangentially into a vessel provided with a central

outlet pipe, in such a way that on circling around the outlet pipe, the heavy particles are thrown outward by centrifugal force and separated by their own weight, while the purified air leaves the central outlet pipe. Further apparatus for separating dust are also known in which the upper part of the vessel is provided, instead of with a tangential pipe, with vanes similar to those of a turbine, and the air current containing dust or the like thus enters the vessel tangentially, so that in this case the above described effect is essentially obtained. The arrangement of a cylinder provided with guiding vanes before the air outlet of the vessel is also known for the purpose of dividing the current up and carrying it to the outlet pipe.

The heavy particles are separated (in a known manner) by the centrifugal force in the outer funnel shaped vessel 1, (Fig. 2) but at the same time the above described device insures that by diminishing the velocity of the air as much as possible on passing from the outer to the inner vessel an opportunity is given to the finer and lighter particles of separating by means of their own weight. It is essential in this case that the turbine-like vanes of the inner cylinder be arranged in such a manner that the air supplied to the outer vessel and circulating around the inner vessel, exercises a sucking motion. As, however, the air must necessarily pass from the outer vessel to the inner vessel between the turbine-like vanes, no other way being open to it, the velocity of the air on passing through is almost entirely destroyed by the sucking action produced between the vanes, so that the smallest particles are separated in the inner vessel.

In the form shown, by way of example, in Figs. 2, 3 and 4, the air containing combs and particles of dust and having a suitable velocity is supplied at 2 through the tangential pipe 3 to the above mentioned vessel 1, so that a current circulating around the inner cylinder 4 is first produced. The inner cylinder, as already mentioned above, is provided along its whole length and on its whole circumference with transverse walls 5 (Fig. 2) curved in the manner of turbine vanes, which are so arranged that by means of the air current circulating in the direction of the arrow shown in Fig. 4, the air contained in the interior of the cylinder

would be sucked outward. As, however, the air is being continually supplied to the vessel 1, it must escape through the vanes to the interior of the cylinder and thence
5 through the pipe 6. As the air passes between the vanes its velocity is diminished to such an extent or destroyed, by the sucking action described above, that the combs and dust particles are completely separated,
10 as has been proved by experiment. These particles first fall through the funnel-shaped bottom of the cylinder 4, and thence through the opening provided at the bottom of the cylinder 1 together with the particles al-
15 ready separated, and fall into a suitable receiver or into a pipe *i* through which they are removed either alone or together with the coarser particles conveyed thither by the worm in the pipe *k*. The funnel shaped bot-
20 tom has only a small central opening for the dust to fall through, and the small size of said opening prevents any appreciable amount of air from escaping through it; almost the entire volume of air entering the
25 vessel 1 being thus compelled to pass through the walls of the cylinder 4. The regularity

of flow through the vanes 5 is insured by the cylindrical form in which they are grouped.

The particular advantage of this arrangement consists, on the one hand, in the fact 3 that the apparatus does not require any power, and, on the other hand, that the degree of separation can be regulated as required by suitably determining the curvature of the vanes and velocity of entrance. 3

Having thus fully illustrated and described my invention, what I claim, is:—

A dust collector, comprising an outer vessel, a cylinder provided with vanes inclosed within said vessel, an air tube communicating tangentially with the vessel, the vanes 4 on the cylinder commencing at the height of the air supply and a bottom for said cylinder having a small central opening, substantially as set forth. 45

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

ISIDOR STEINER.

Witnesses:

JOSEPH HUBER,
LOUIS MUELLER.