

No. 733,206.

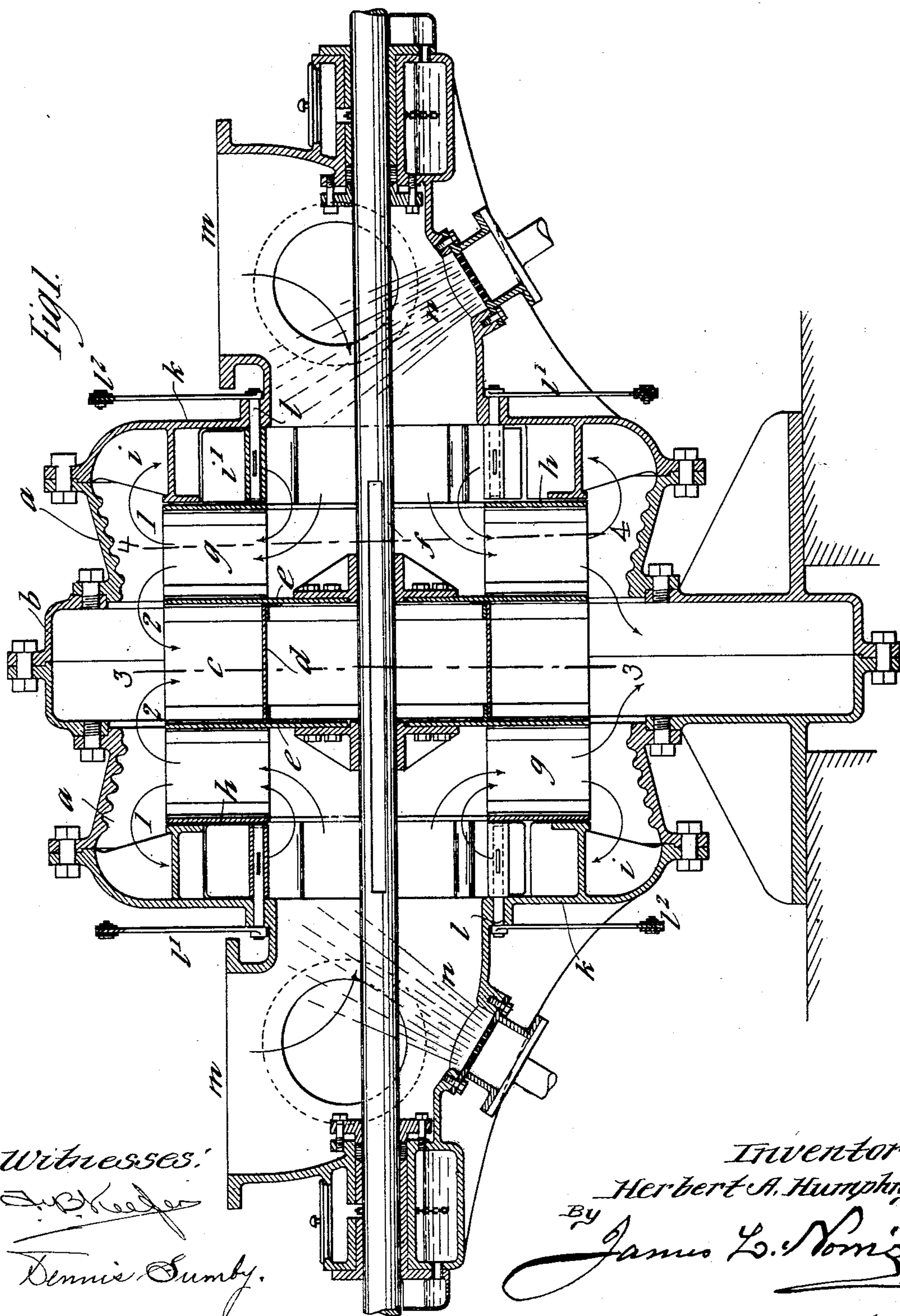
PATENTED JULY 7, 1903.

H. A. HUMPHREY.
CENTRIFUGAL GAS PURIFIER.

APPLICATION FILED MAY 5, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:

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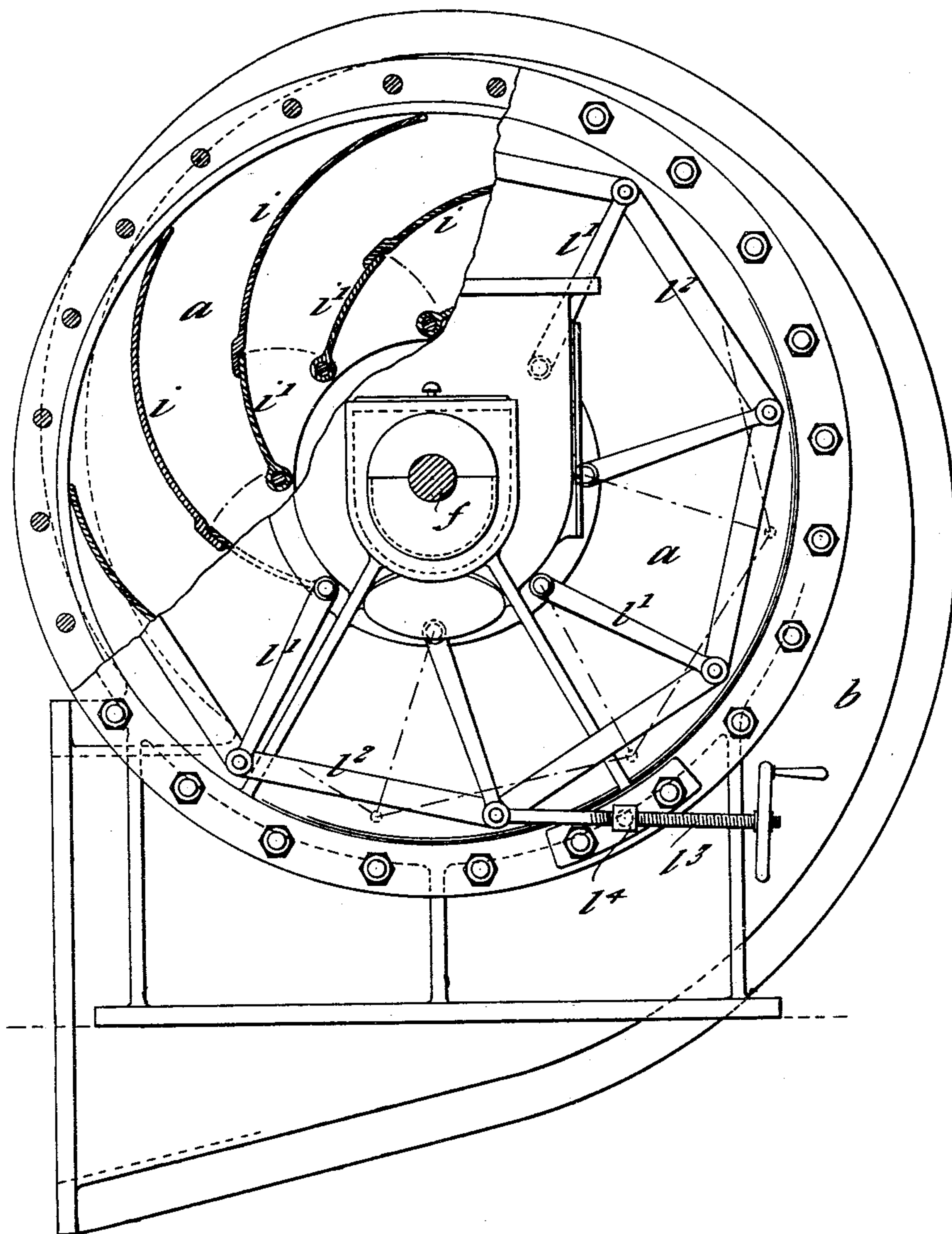
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

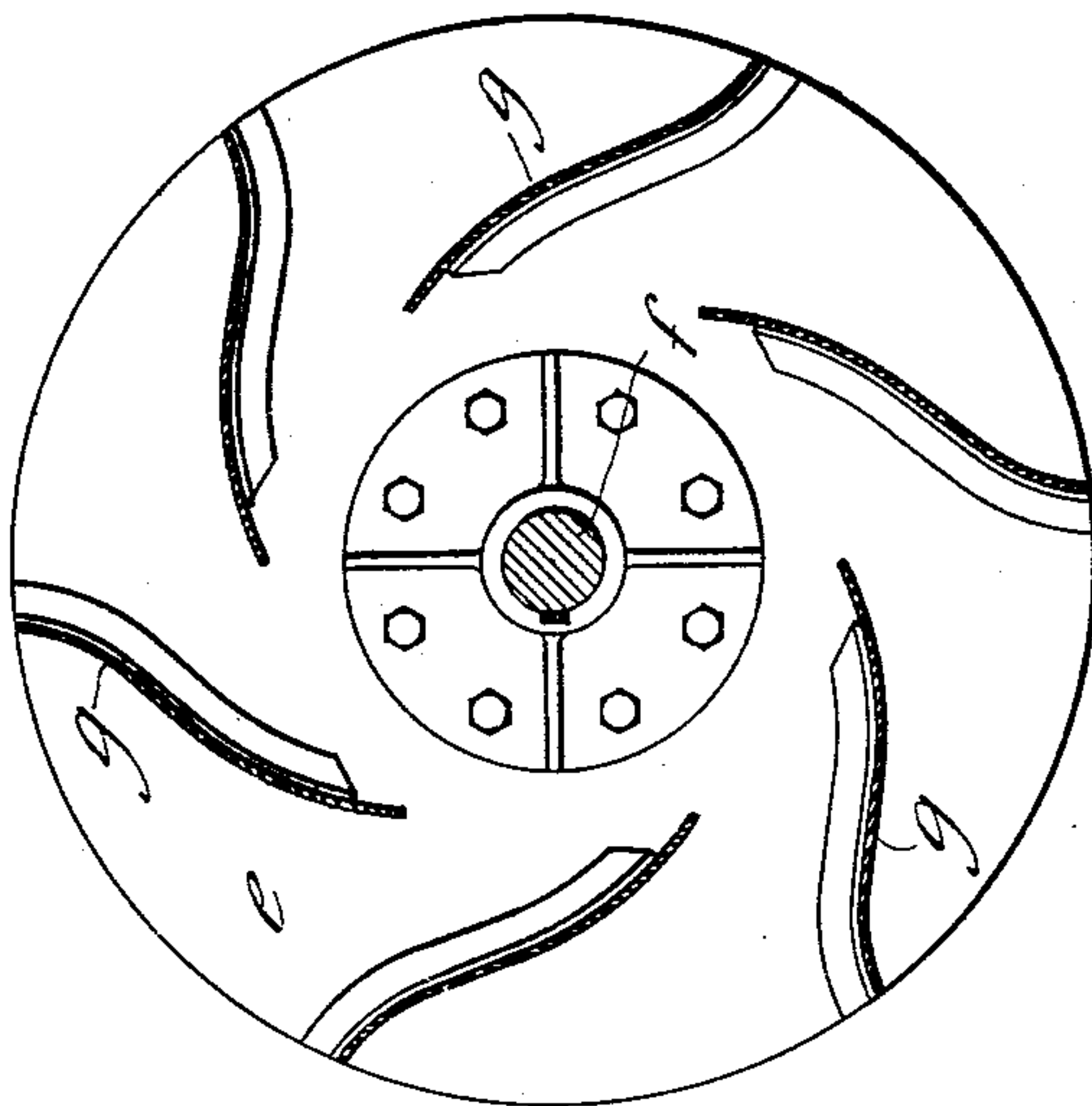
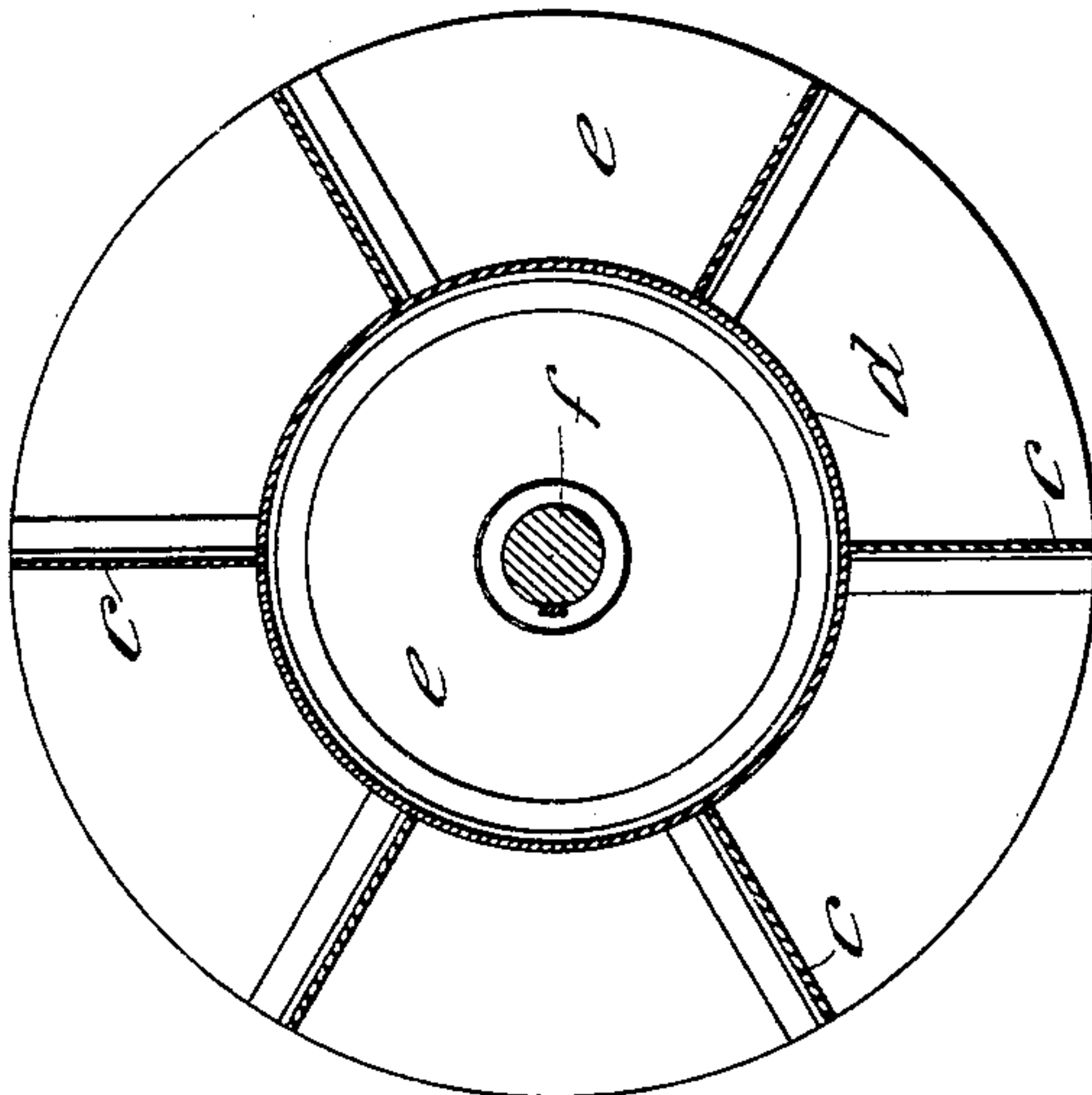


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

HERBERT A. HUMPHREY, OF WESTMINSTER, LONDON, ENGLAND.

CENTRIFUGAL GAS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 733,206, dated July 7, 1903.

Application filed May 5, 1902. Serial No. 106,037. (No model.)

To all whom it may concern:

Be it known that I, HERBERT ALFRED HUMPHREY, a citizen of England, residing at 38 Victoria street, Westminster, in the county of London, England, have invented a certain new and useful Centrifugal Apparatus for Purifying Gases, (for which I have applied for a patent in Great Britain, dated November 2, 1901, No. 22,131,) of which the following is a specification.

My invention relates to improvements in centrifugal apparatus for purifying gases, by which improvements the gas and water are brought into repeated or prolonged contact.

I construct the centrifugal apparatus, such as a centrifugal fan, with a casing divided into two chambers, one of which contains the fan, while the other serves as a by-pass for the gas between the periphery and the intake of the fan-chamber.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of an apparatus consisting of a central centrifugal fan with a centrifugal fan on either side of it, each of these two fans having a by-pass chamber, as aforesaid. Fig. 2 is an end elevation thereof, partly in section. Figs. 3 and 4 are sectional views on lines 3 3 and 4 4, respectively, of Fig. 1.

Referring to Figs. 1 and 2, the two casings *a* are fastened, one on each side, to a third casing *b*, which has the usual snail shape of a centrifugal fan-casing and contains fan-blades *c*, mounted on a drum *d*, which is fastened to disks *e*, themselves mounted on the shaft *f*. The other face of the disk *e* carries fan-blades *g*, to which is attached an annular disk *h*. The latter serves to divide the chamber formed by the casing *a* into two chambers, the outer of which contains a number of curved partitions, each made in two parts, as shown in Fig. 2. The part *i* far from the axis of the casing is cast in one with the end cover *k* of the casing, while the part *i'* near the axis is keyed to an axle *l*, which extends through the end cover of the casing. These partitions form passages for gas from the periphery to the center of the fan, and in order to control the amount of gas which can pass through the passages each of the inner parts of the partitions may be turned down onto the one next to it. For this purpose the

axles *l* have keyed to them lever-arms *l'*, which are pivoted at their other ends to a frame *l²*, Fig. 2. By shifting this frame by means of the screw *l³*, working in the nut *l⁴*, the partitions *i'* are more or less turned. The interior surface of the casing *a* is coned outwardly toward the chamber thus partitioned and is corrugated on its interior surface.

The operation of this apparatus is as follows: The gas to be purified enters at *m* and passes through the water-spray *n* into the fan, where it is thrown, together with the water, at high tangential velocity against the interior of the casing. This being coned, much of both gas and water are caused to travel back in the direction of arrow 1, whereupon they are caught by the partitions *i* and returned to the entrance of the fan. Some of the gas, however, is always passing forward, as indicated by arrow 2, into the central fan-chamber to be delivered in the usual manner. The proportion of the gas which thus circulates through the fan and the partitioned chamber is controlled by adjusting the position of the movable partitions *i'*. The corrugations on the interior coned surface of the casing *a* serve to retain water, so that there is always a layer of water, against which the gas is projected. As a substitute for the corrugations an annulus may be bolted between casings *a* and *b*, so as to project into the passage between them, and thus form a weir over which the water running down the interior surface of *a* must flow.

It is obvious that although the apparatus herein described is expressly designed for bringing gas and liquid into contact for the purpose of purifying the gas it is equally applicable to bringing gases and liquids into contact in order to effect chemical or physical reaction between the gas and the liquid or even merely to cool the gas.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

1. A centrifugal apparatus for purifying gases, comprising a casing divided into two chambers, a centrifugal fan arranged in one of said chambers, and partitions arranged in the other of said chambers and forming channels extending from the periphery to the center thereof.

2. A centrifugal apparatus for purifying gases, comprising a casing divided into two chambers, a centrifugal fan arranged in one of said chambers, partitions arranged in the other of said chambers and forming channels extending from the periphery to the center thereof, and the said casing having its interior surface coned outwardly toward the said channeled chamber.

3. A centrifugal apparatus for purifying gases, comprising a casing divided into two chambers, a centrifugal fan arranged in one of said chambers, partitions arranged in the other of said chambers, and forming channels extending from the periphery to the center thereof, each of said partitions formed in sections, the outer of each of said sections being fixed and the inner of each of said sections being pivoted so that it can be adjusted to lie against the adjacent section, and said casing having its interior surface coned outwardly toward said channeled chamber, substantially as described.

4. A centrifugal apparatus for purifying gases, comprising a central centrifugal fan, a casing arranged at each side of said fan and divided into two chambers, a centrifugal fan arranged in one of said chambers of each casing, partitions arranged in the other of said

chambers of each casing and forming channels extending from the periphery to the center thereof, and said casings having their interior surface coned outwardly toward the said channeled chambers, substantially as described.

5. A centrifugal apparatus for purifying gases, comprising a central centrifugal fan, a casing arranged at each side of said fan and divided into two chambers, a centrifugal fan arranged in one of the chambers of each casing, partitions arranged in the other chamber of each of the casings and forming channels extending from the periphery to the center thereof, each of said partitions formed of two sections, one of which is fixed and the other of which is pivoted so it can be adjusted to lie against the adjacent partition or section, and the said casings having their interior surface coned outwardly toward its respective channeled chamber, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

H. A. HUMPHREY.

Witnesses:

GERALD L. SMITH,
EDWARD GARDNER.