No. 784,556. PATENTED MAR. 14, 1905.

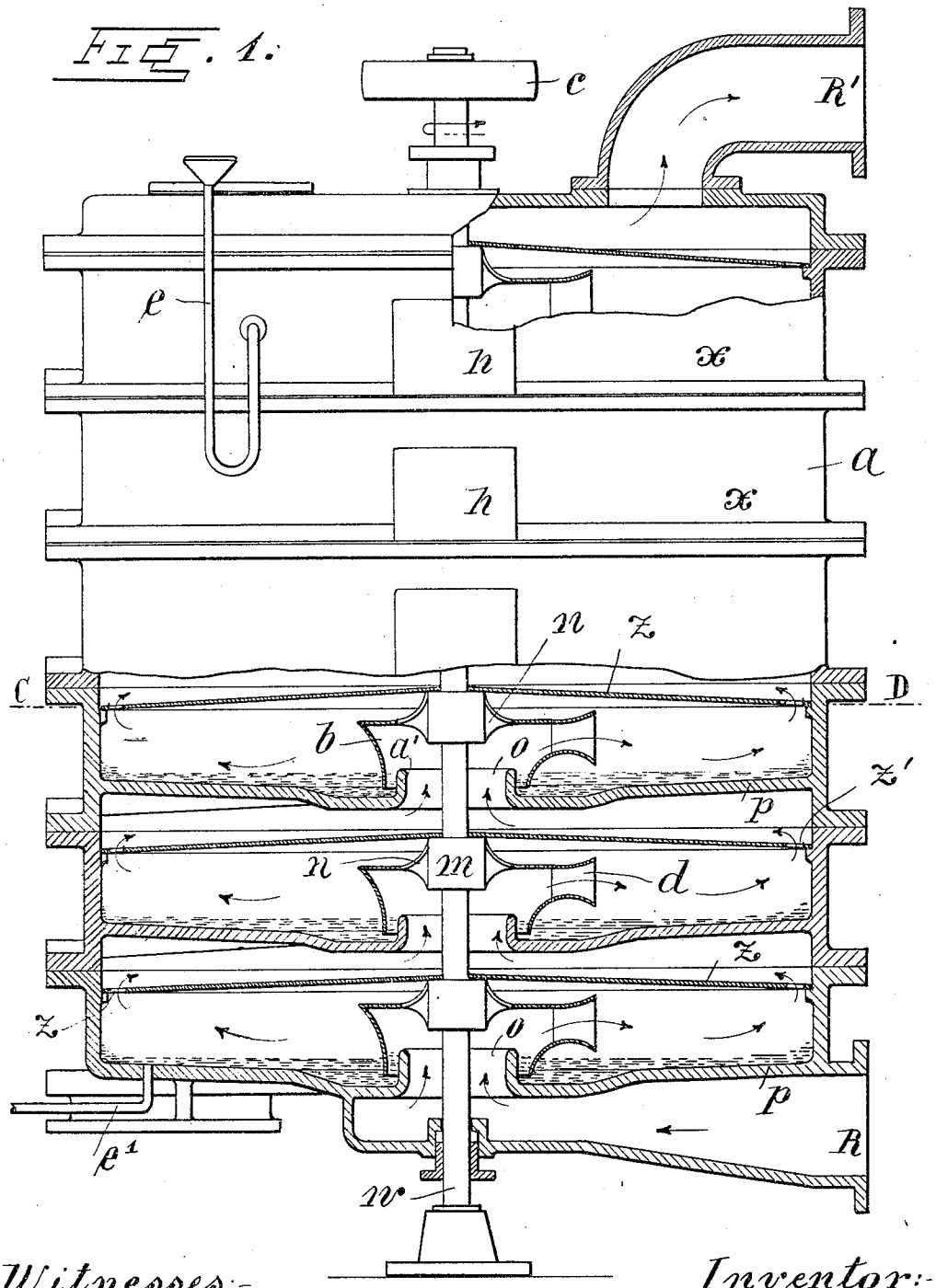
H. GERDES.

GAS WASHER.

APPLICATION FILED MAY 18, 1903.

3 SHEETS—SHEET 1.

FIG. 1.



Witnesses:-

H. Munson

Inventor:-

Heinrich Gerdes

by Eustace W. Hopkins

atty.

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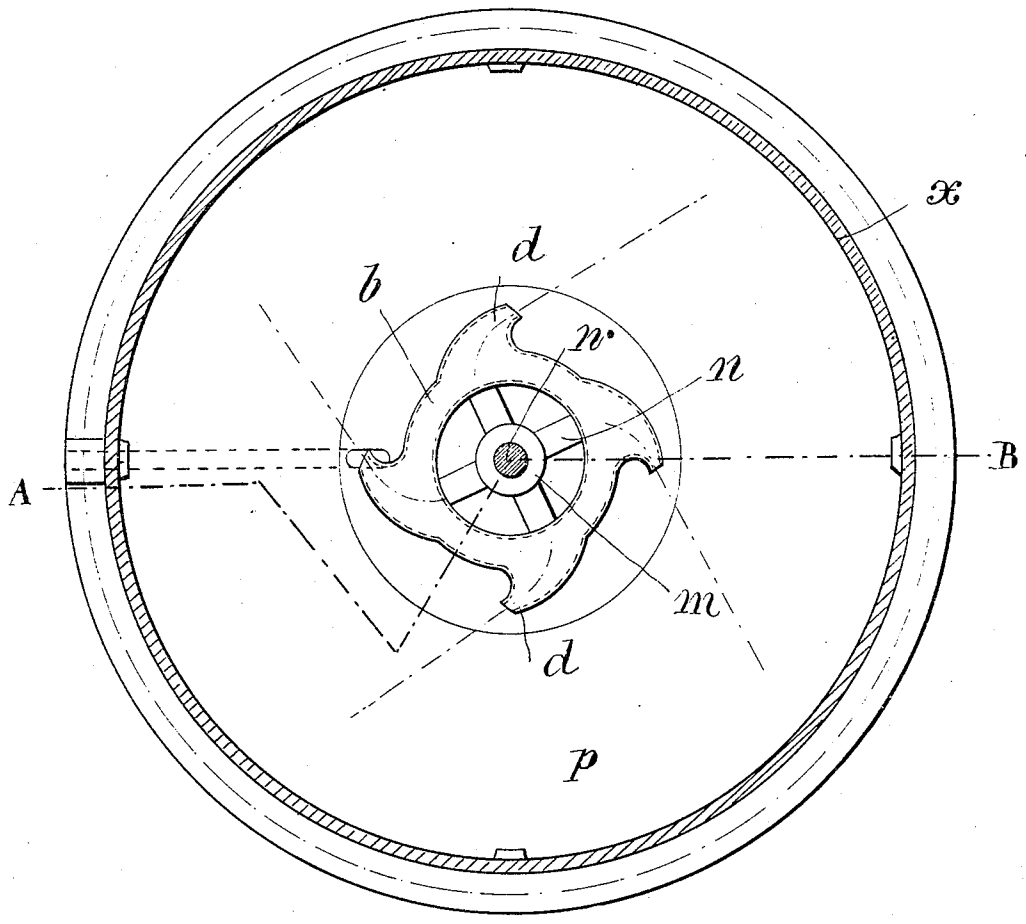
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3 SHEETS—SHEET 2.

Fig. 2.



Witnesses:-

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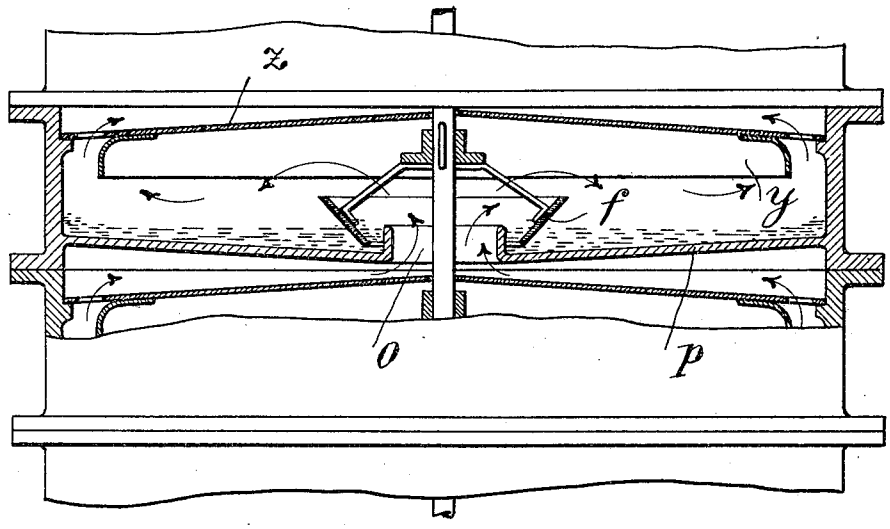
H. GERDES.

GAS WASHER.

APPLICATION FILED MAY 18, 1903.

3 SHEETS—SHEET 3.

FIG. 3.



Witnesses:-

Inventor:-
Heinrich Gerdes
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Atty.

No. 784,556. Patented March 14, 1905.

UNITED STATES PATENT OFFICE.

HEINRICH GERDES, OF BERLIN, GERMANY, ASSIGNOR TO THE FIRM OF JULIUS PINTSCH, OF BERLIN, GERMANY.

GAS-WASHER.

SPECIFICATION forming part of Letters Patent No. 784,556, dated March 14, 1905.

Application filed May 18, 1903. Serial No. 157,638.

To all whom it may concern:

Be it known that I, HEINRICH GERDES, a subject of the German Emperor, residing at Berlin, Germany, have invented a certain new and useful Improved Gas-Washer, of which the following is a description.

The present invention consists of a gas-washer for cleansing the gas of ammonia, naphthalene, cyanogen, sulfureted hydrogen, and other impurities, the object being to obtain the substances washed out in as concentrated a state as possible. In connection with this class of washer it is essential that the gas which has been almost purified be brought into contact with washing fluid which is practically fresh—*i. e.*, which is not already saturated with impurities—so that the last trace of any impurity will be effectively removed. This result is attained advantageously in the present case by applying the principle of opposing currents, as illustrated in the accompanying drawings, in which similar letters of reference denote similar parts throughout the several views.

Figure 1 is a part vertical section taken along the line A B of Fig. 2, which is a section on line C D of Fig. 1. Fig. 3 is a part-sectional elevation showing a modified form of the device.

The washer *a* is built up of the sections *x*, advantageously bolted together by means of their upper and lower flanges. Each section is provided with a bottom plate *p*, sloping downwardly toward the center and provided with a central orifice *o*, having an upwardly-turned flange *a'*. The orifices of all the sections are substantially on the same vertical plane, and a shaft *w*, having a driving-pulley *c* at the upper end, extends throughout the center of the apparatus, the said shaft being rotated by any suitable means. On this are mounted, one above each orifice *o*, a series of fan or stirrer wheels, each of which consists of an upwardly-flared conical ring *b*, suitably attached to its boss *m* by means of arms *n*, the lower edge of the said ring being adapted to encircle the flange of the orifice *o*, leaving an intermediate space between the parts, as will be clearly seen from Fig. 1. Each wheel is provided with any suitable number of tangentially-arranged jets *d*, (in the drawings four are shown,) opening into the interior of the sections *x*. Each section is provided with a partition-plate *z*, which slopes downwardly from the center toward the edges and forms a cover for the sections, having orifices *z'* around the edges, and each section also has a hand-hole *h* for cleaning purposes. The inlet for the purifying liquid is at the upper part of the receptacle, as indicated at *e*, while the gas-inlet is formed on the lowermost section at R.

The device operates in the following manner: The purifying liquid is introduced at *e* and flows onto the bottom plate of the topmost section until it overflows the flange *a'* and passes down onto the cover-plate *z* of the next section below it, running along to the edge of the same and passing through the openings *z'* into the next section, and so on until all the sections have been filled to the height of the flange *a'*. The shaft *w* is rotated in the direction of the arrows in Fig. 1 and causes the fan-wheels to hold the liquid in each section in continuous agitation, throwing it outwardly in the form of fine particles or atomized. The gas enters at R and passes up through the lowermost orifice *o* and out through the jets *d*, which being in rotation will throw it outwardly and cause it to be thoroughly and intimately mixed with the atomized purifying liquid in the section. The gas then passes upwardly through the openings *z'* to the next section above, and so on until it reaches the outlet-pipe R' in a thoroughly-purified condition. From the above description it will be clear that the gas ascending will be more and more purified until close to the top it is almost pure and will meet at this point practically pure cleansing liquid, so that the last traces of impurities will be removed from it. The purifying liquid flows out of the bottom section at *e'*.

In the modification shown in Fig. 3 the jets *d* are omitted, an open conical ring *f* having its largest diameter at the top being employed and the gas passing through the same

in the direction of the arrows. The operation of this modification is otherwise the same as that illustrated in Figs. 1 and 2, with the exception that in the present case the gas is retained or retarded in each section by means of a flanged ring *y*, which may be mounted at the lower side of each cover-plate *z* near the periphery of the same.

I claim as my invention—

1. In a gas-washer, the combination of a series of superposed chambers, having each a central opening in the bottom with upwardly-extending flange around it, said opening serving for the upward passage of the gas and the downward passage of the liquid, a cover to each compartment, downwardly inclined from the center to the edges and having a series of peripheral openings for the downward passage of the liquid and the upward passage of the gas, a shaft extending through all the central openings and having thereon a fan-wheel in each compartment, the lower edge of which extends into the liquid on the bottom of the said compartment, said fan-wheels having a series of peripheral openings for the throughlet of the gas, gas inlet at the bottom and outlet at the top and liquid inlet at the top and outlet at the bottom of the washer and means for rotating the said shaft substantially as described.

2. In a gas-washer, the combination of a series of superposed chambers, having each a central opening in the bottom, the said bottom being upwardly inclined from the center toward the edge, a vertical flange around said central opening, a cover to each compartment being downwardly inclined from the center to the edges and having peripheral openings at the edges, a shaft extending through the central openings and having fan-wheels thereon, downwardly-extending annular flanges to said fan-wheels to extend into the liquid on the bottom of the chamber, peripheral openings in said fan-wheels for the throughlet of the gas, gas inlet at the bottom and outlet at the top and liquid inlet at the top and outlet at the bottom of the apparatus and means for rotating the said shaft and fan-wheels substantially as described.

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

HEINRICH GERDES.

Witnesses:

HENRY HASPER,

WOLDEMAR HAUPT.