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PATENTED MAR. 12, 1907.

E. RICHTER.

APPARATUS FOR ASPIRATING, TREATING, AND FORCING LIQUIDS.

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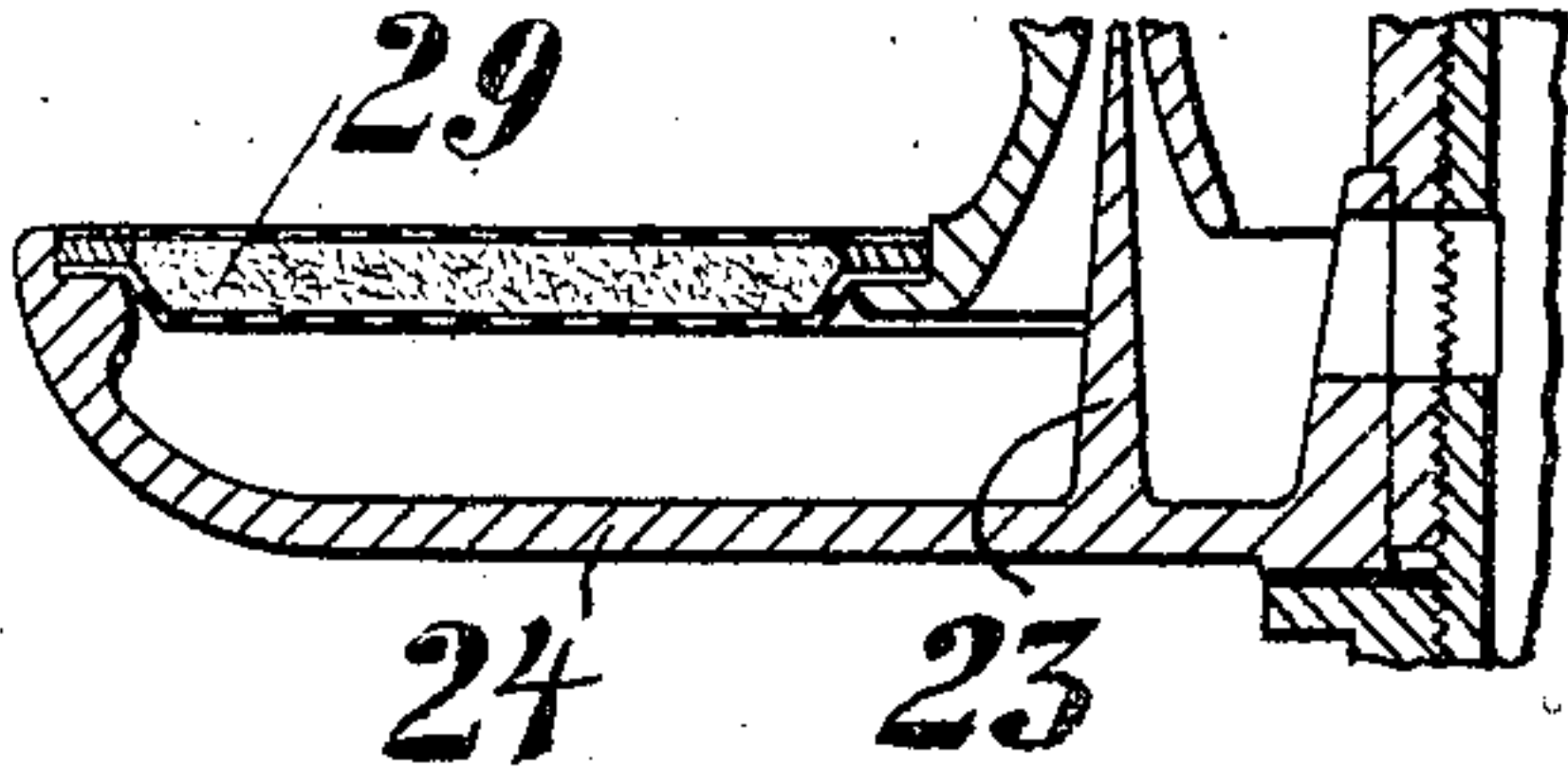


Fig. 2.

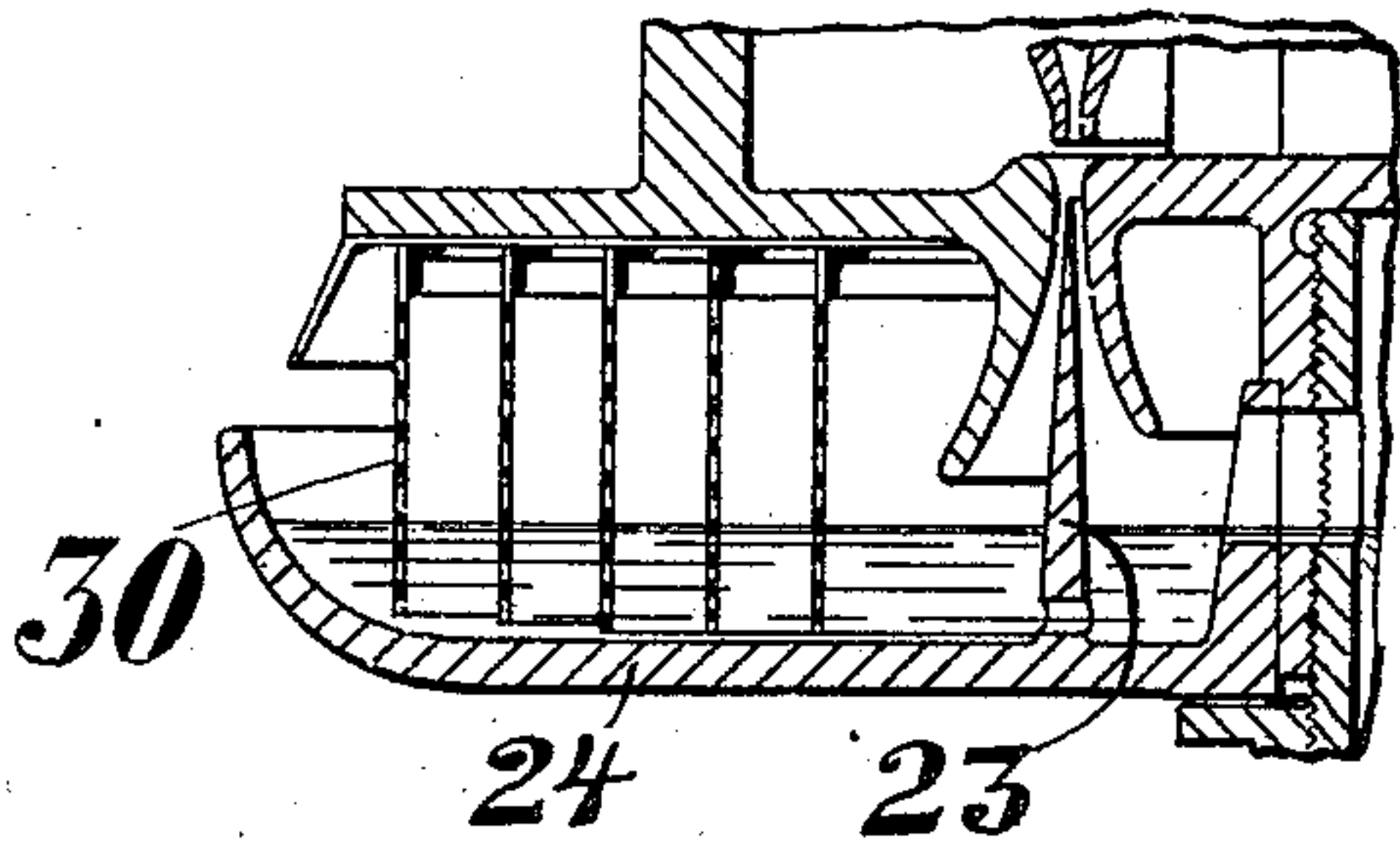
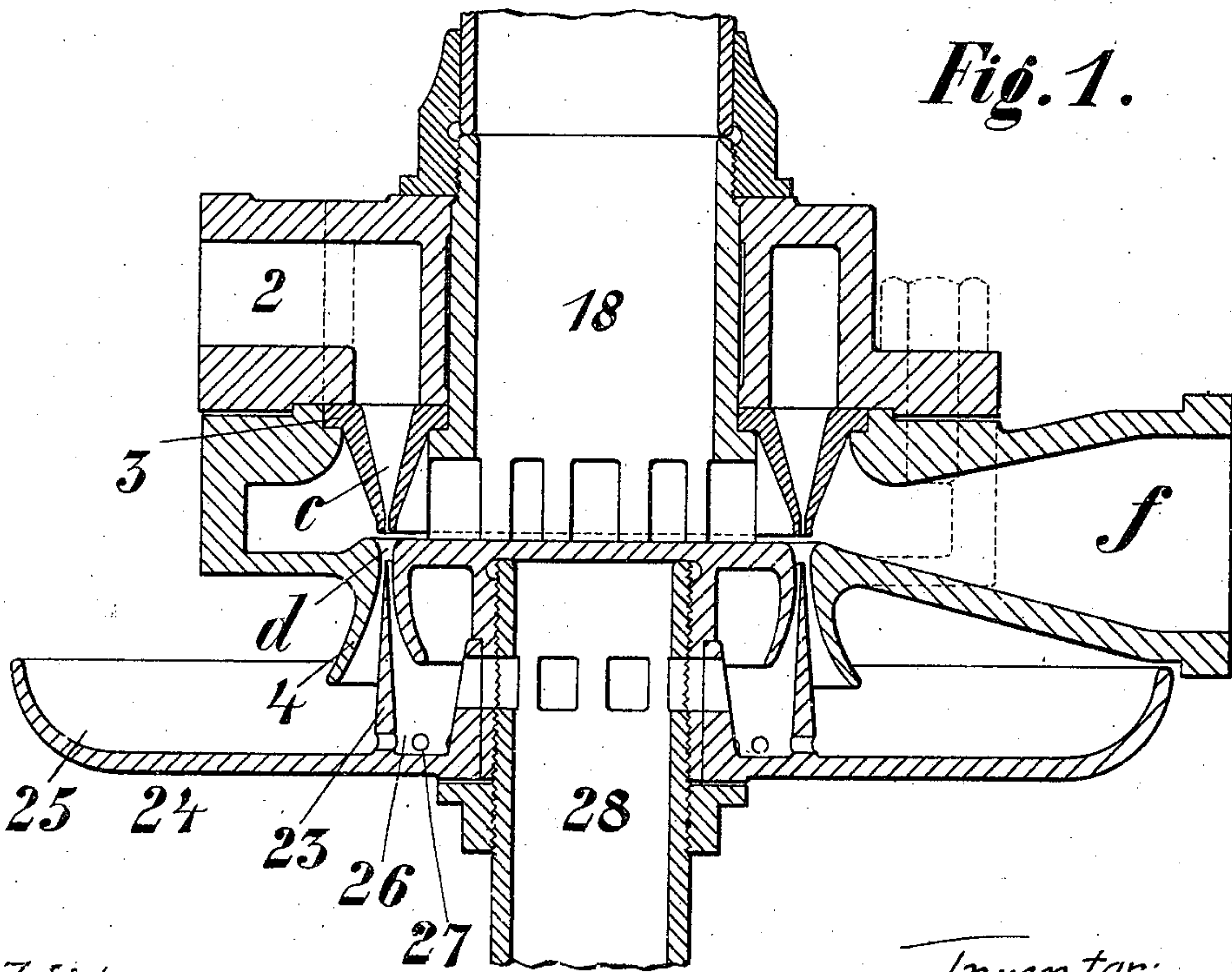


Fig. 3.



Witnesses:-

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By

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UNITED STATES PATENT OFFICE.

EMIL RICHTER, OF ZABRZE, GERMANY.

APPARATUS FOR ASPIRATING, TREATING, AND FORCING LIQUIDS.

No. 846,759.

Specification of Letters Patent.

Patented March 12, 1907.

Original application filed June 15, 1906, Serial No. 321,853. Divided and this application filed January 17, 1907.
Serial No. 352,734.

To all whom it may concern:

Be it known that I, EMIL RICHTER, a subject of the German Emperor, residing at Zabrze, Germany, have invented certain new and useful Improvements in Apparatus for Aspirating, Treating, and Forcing Liquids, of which the following is a specification.

This application is a division of the application filed June 15, 1906, Serial No. 321,853.

The present invention relates to improvements in apparatus for aspirating, treating, and forcing fluids, in which the fluids to be acted on are brought in contact with a jet of the working fluid in the well-known manner.

An annular inlet-nozzle for the jet of working fluid is arranged in combination with annular mixing-nozzles for the fluids to be treated. The working jet is given an annular or cylindrical form, and not only the outer surface, but also the inner surface of the same, is utilized to produce an operative effect.

In order to make the invention more readily understood, I have illustrated it in the accompanying drawing, in which—

Figure 1 is a vertical sectional elevation of the apparatus. Figs. 2 and 3 represent detail sectional elevations of modifications.

If in suction apparatus steam is brought into contact with a cooler fluid, the former condenses, causing the formation of a vacuum, which is filled again by the fluid flowing thereto. The more complete and rapid the condensation the more energetic is the flow or suction. For producing perfect condensation a sufficient quantity of the cooler fluid must be present and the contact between the latter and the steam must be intimate and widespread. In the case of an ordinary steam-jet the core of the same is not perfectly reached by the cooler fluid, so that condensation of the core of the jet is slight. Also if steam is brought into contact with a solid jet of water the core of the water-jet is not operative in the condensation process.

By means of the present invention a more perfect condensation is produced, as the annular or cylindrical jet of working fluid is operative both on its inner as on its outer surfaces and is brought into intimate contact with considerably larger quantities of cooler fluid than would be possible with a solid jet.

The improved apparatus can be used for forwarding great quantities of steam, water, air, gas, and the like and also for cleansing, or

for the absorption of gases by fluids, for mixing various gases and fluids, for condensing steam by fluids, and for various other purposes. If the apparatus is used, for instance, for airing and removing the dust from rooms, at the outer and inner circumferential face of the annular working jet air is drawn up and the air and dust particles taken with it into a common collecting-chamber. By means of the improved apparatus foul air or dust-filled air can be removed from residential or other rooms, as is done by ordinary exhausters. With the ordinary exhauster the air drawn off is replaced by fresh air, which enters the room to be ventilated principally through badly-fitting parts of windows and doors. Apart from the fact that drafts are consequently produced the air is not freed from dust. These inconveniences are overcome by the present apparatus by causing the inner cylindrical face and the outer cylindrical face of the working jet to operate on different sources. The jet is subsequently divided into an inner and outer part, which can be conveyed away separately.

The working jet draws out the foul air and simultaneously supplies fresh air to the room without causing draft or dust clouds, and the apparatus can be operated by water-pressure, air-pressure, steam, or the like.

In the drawings three forms of the apparatus for ventilating and air-cleansing are shown. Through the passage 2, Fig. 1, the apparatus is supplied with water, which passes in the form of an annular jet through the annular passage *c* of the nozzle 3 and from thence to the annular passage *d* of the nozzle 4. The inner surface of the annular working jet communicates, by means of a pipe 18, with the room to be ventilated, and the outer surface communicates, through the pipe *f*, with the open air.

By the action of the working jet passing through the nozzles foul and dusty air is drawn up at the inner periphery of the jet and fresh air at the outer.

Immediately on entering the nozzle 4 the annular working jet strikes on the dividing-wall 23, arranged therein, and is split by the latter into an outer part, forming formerly the outer portion of the annular jet, and into an inner part, forming formerly the inner portion of the annular jet. The dividing-wall is connected to a cup 24 for catching the water

flowing out of the nozzle 4. The outer part of the jet, carrying with it fresh air, flows into the outer part 25 of the cup 24, communicating with the room to be ventilated. The inner
 5 part of the jet, carrying with it the foul air, passes into the inner part 26 of the cup. From the outer part of the cup the fresh air flows into the room, and the water passes through openings 27 into the inner part 26 of
 10 the cup, passing from thence, together with the water always in 26 and also the foul air, into the waste-pipe 28. If the working jet consists of compressed air, the cup 24 is, as shown in Fig. 2, provided with a filter 29, by
 15 means of which all dust is completely retained.

If it is desired to introduce pure air free from dust and more or less saturated with moisture into residential rooms, work-rooms,
 20 or the like, the apparatus is operated by steam and is constructed as shown in Fig. 3. Steam and air flow through the vertical sieves 30. The steam condenses gradually in its passage, so that through the last sieve
 25 damp air only flows. The condensed steam flows, as in Fig. 1, to a central waste-pipe.

What I claim as new is—

1. In an apparatus of the character described comprising means for producing an
 30 annular jet of fluid under pressure, the combination therewith of means for dividing said jet into two separate annular jets one within the other, substantially as described.

2. In an apparatus of the character de-
 35 scribed comprising means for producing an annular jet of fluid under pressure, the combination therewith of an annular wall for di-

viding said jet into two separate annular jets one within the other, substantially as de-
 40 scribed.

3. In an apparatus of the character described comprising a casing and a plurality of nozzles having annular openings arranged in series in the casing and separated from
 45 each other, the combination therewith of means in one nozzle for separating an annular jet from a preceding nozzle into two separate annular jets, substantially as described.

4. In an apparatus of the character described comprising a casing and a plurality
 50 of nozzles having annular openings arranged in series in the casing and separated from each other, the combination therewith of an annular dividing-wall in one nozzle for separating an annular jet from a preceding nozzle
 55 into two separate annular jets, substantially as described.

5. In an apparatus of the character described comprising a casing and a plurality of
 60 nozzles having annular openings arranged in series in the casing and separated from each other, the combination therewith of an annular dividing-wall in one nozzle for separating an annular jet from a preceding nozzle
 65 into two separate annular jets, said dividing wall separating two receiving-chambers which communicate through said wall, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EMIL RICHTER.

Witnesses:

SIEGFRIED LUSTIG,
 ERNST KATZ.