

(No Model.)

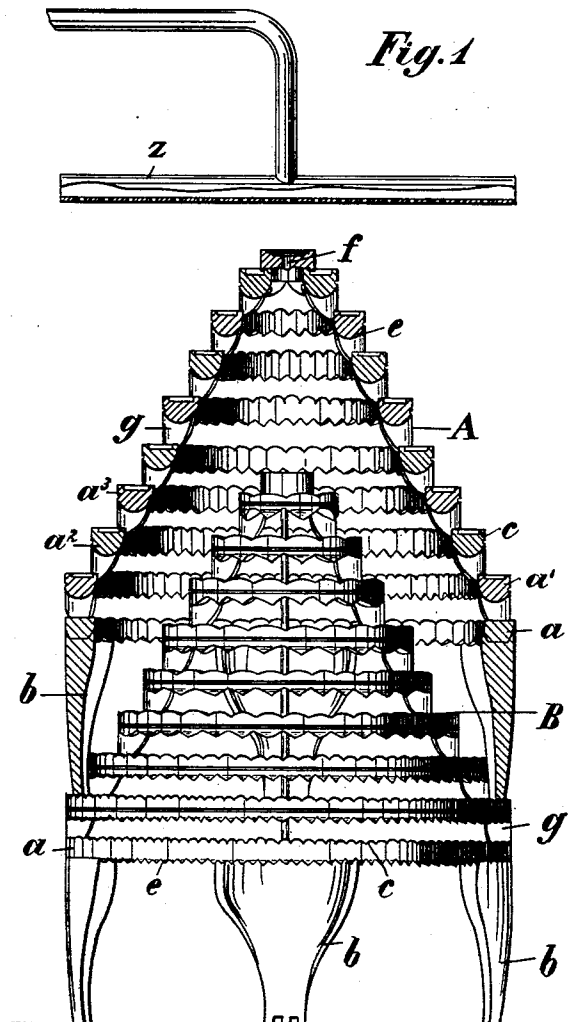
3 Sheets—Sheet 1.

O. FRANZ.

APPARATUS FOR MIXING LIQUIDS WITH GASES.

No. 587,952.

Patented Aug. 10, 1897.



Witnesses

J. H. Kunk
J. Volber

Inventor

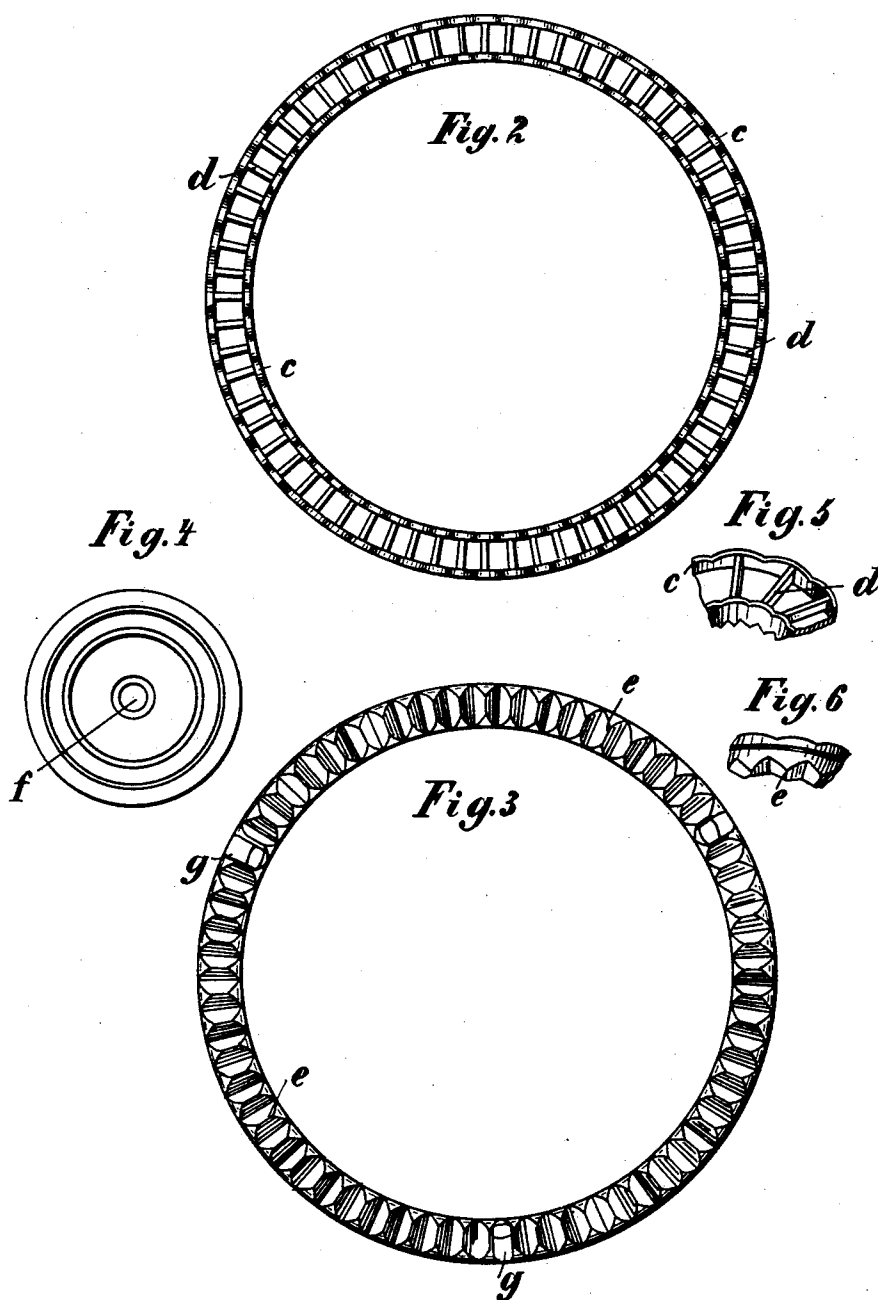
Oscar Franz
by his attorney
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(No Model.)

3 Sheets—Sheet 3.

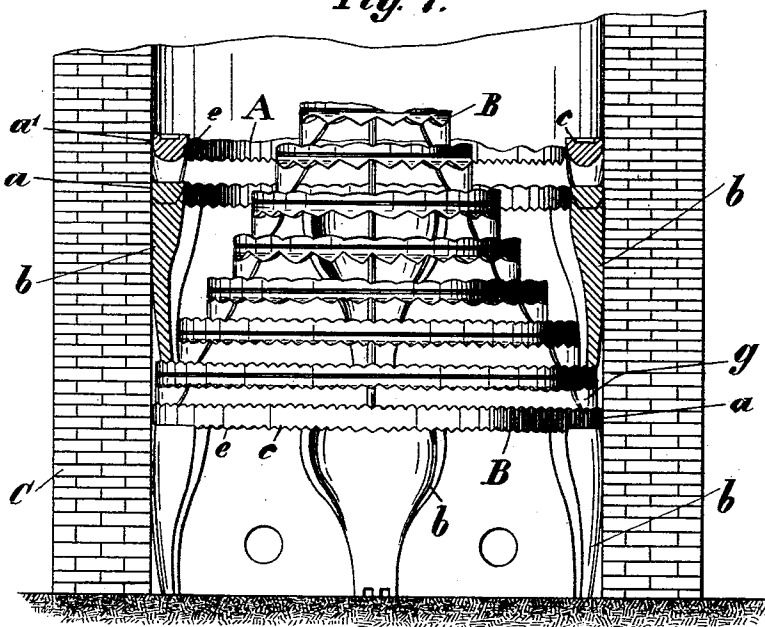
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Fig. 7.



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UNITED STATES PATENT OFFICE.

OSCAR FRANZ, OF MUSKAU, GERMANY.

APPARATUS FOR MIXING LIQUIDS WITH GASES.

SPECIFICATION forming part of Letters Patent No. 587,952, dated August 10, 1897.

Application filed February 24, 1896. Serial No. 580,552. (No model.)

To all whom it may concern:

Be it known that I, OSCAR FRANZ, of Muskau, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in Apparatus for Evaporating Liquids or Mixing Them with Gases, of which the following is a specification.

The present invention relates to an apparatus for mixing sulfuric acid, nitric acid, hydrochloric acid, &c., with fluids or evaporating them and mixing them with gases.

The apparatus not only works faultlessly, but is so simple in its construction that the smallest detail can be easily taken to pieces. Worn out or useless parts can also be renewed or mended without any trouble.

The essential parts of the apparatus are shown in the accompanying drawings.

Figure 1 shows two groups of drop-rings, partly in cross-section and partly in elevation. Fig. 2 is a view from above, and Fig. 3 a view from below, of a single drop-ring; Fig. 4, a view from above of the uppermost drop-ring, and Figs. 5 and 6 a part of a drop-ring in perspective. Fig. 7 shows, partly in cross-section and partly in elevation, two groups of drop-rings in combination with the tower or casing C.

The apparatus consists, essentially, of conically-arranged groups of drop-rings a a' a^2 a^3 , superimposed step-like one over the other, and a tripod b , separating one group of drop-rings from the other. Each drop-ring has on top a depression with laterally-rising scalloped walls c . The depressions are further divided by the radial cross-pieces d into smaller divisions. These cross-pieces d can be formed as desired—i. e., they can either have an unvarying width or be constructed broader in the middle. Underneath each drop-ring is a drop-nose e . The uppermost and smallest drop-ring has no cross-pieces, but takes the form of a plate, with an edge rounded outward and provided with the center hole f . Each single drop-ring rests with its three feet g upon the inner edge of the larger drop-ring below.

The outermost, lowest, and largest drop-ring a rests with its feet g upon the equal-sized ring a , having the high tripod b . The ring a has below a nose-piece e similar to the drop-ring a' above it. The feet b rest upon

the outermost largest drop-ring a' of the succeeding drop-ring group B, formed the same as those mentioned above.

The drop-rings of similar size lie perpendicularly over one another, the nose-pieces e of the upper drop-ring lying perpendicularly over the cross-piece d belonging to the equal-sized drop-ring of the succeeding drop-ring group.

The following is a description of the working of the arrangement: The liquid to be mixed with gases or evaporated is so conducted into the depressions of the separate rings of the uppermost group by means of a suitable inlet and distributing contrivance that it is equally distributed over the divisions formed by the cross-pieces. Here it remains until driven out by the pressure of the constantly-flowing liquid, when it runs over the scalloped walls c of the lower part of the drop-ring and there hangs on the drop-nose e . It next drops onto the cross-piece d of the corresponding ring belonging to the group lying below, which ring has the same form as that in Fig. 2. The drop falls onto the center of the cross-pieces d and thence divides itself over the surrounding divisions of the depressions, the liquid next passing in the same manner to the next ring of the succeeding drop-ring group and by this means through the whole apparatus.

The number of the drop-rings in a group, as well as the number of the groups, are based upon the dimensions which the apparatus is to have. The drop-ring groups are so inserted in the drop-tower C that the largest ring of each group, which must of course have the same internal diameter as the tower, fits close into the corresponding part of the tower. This is necessary in order that the gases streaming in from below should not rise direct between the inner wall of the tower and the external wall of the largest ring in the tower, but each time touch the lower surface of the largest ring and in this way be forced to circulate to and fro in the tower or to move, thus causing them to be thoroughly mixed with the liquid dropping upon the rings.

A special advantage of this apparatus is that useless parts can easily be removed and replaced by others. It is not necessary to pay close attention to the drop-rings, as they

only need to be laid on in order to have the proper position.

Liquids are mixed with gases by this apparatus in the most thorough manner, as the
5 largest possible liquid surface is offered to the gases upon which to act.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

10 In an apparatus for evaporating liquids or mixing them with gases the combination of a tower or casing, with several drop-ring groups composed of separate drop-rings arranged terrace-like in such a way that the rings of
15 each group having the same dimensions lie

perpendicular over one another, each ring being provided with scalloped walls and divided by radial cross-pieces into small divisions and also provided with a drop-nose attached to the lower side of the ring and below each small division; as and for the purpose set forth. 20

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

OSCAR FRANZ.

Witnesses:

MAX NIVUS,
TH. HAUSKE.