

H. KOPPERS.

APPARATUS FOR PRODUCING INTERACTION BETWEEN GASES AND LIQUIDS.

APPLICATION FILED OCT. 3, 1907.

903,483.

Patented Nov. 10, 1908.

2 SHEETS—SHEET 1.

Fig. 1

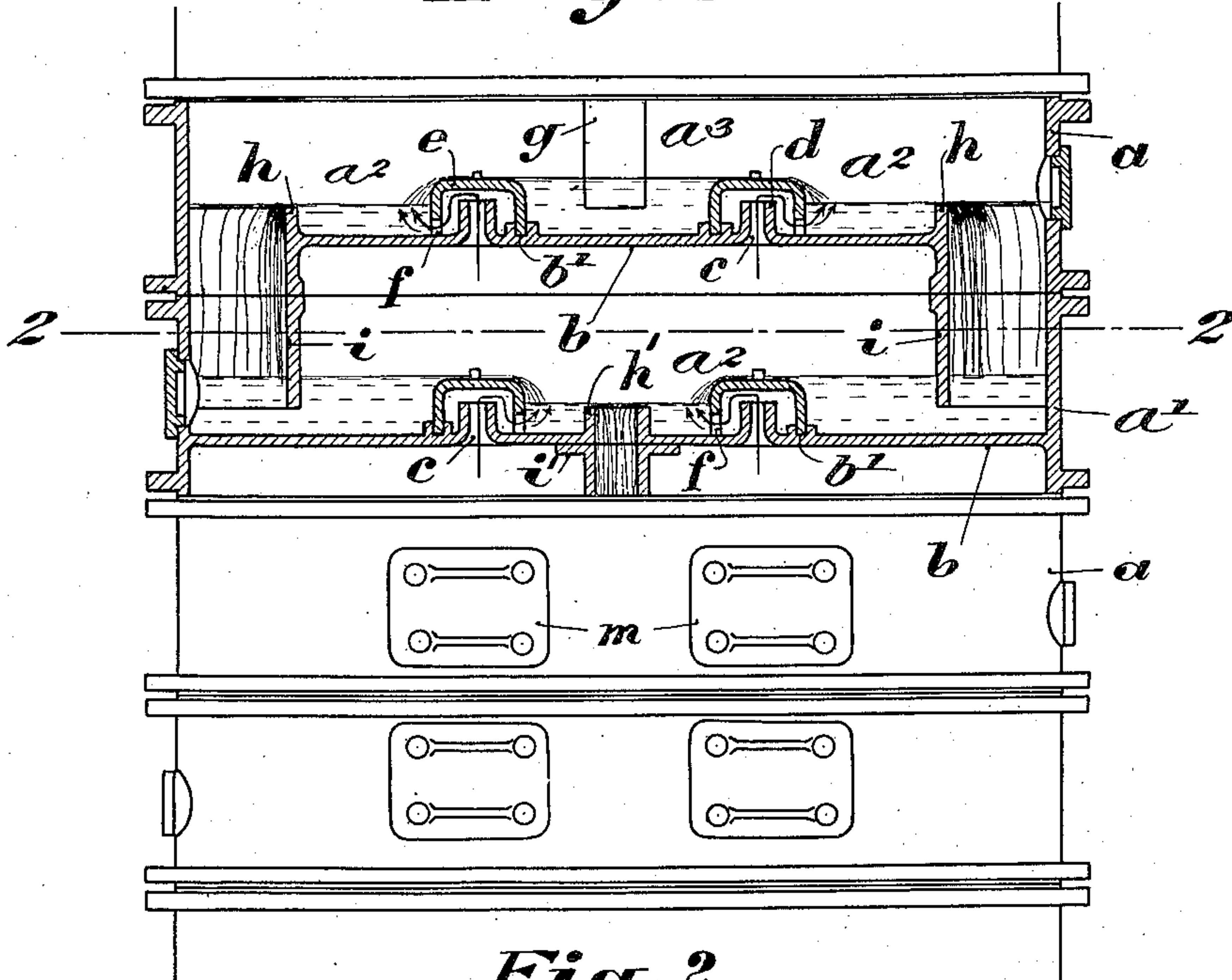
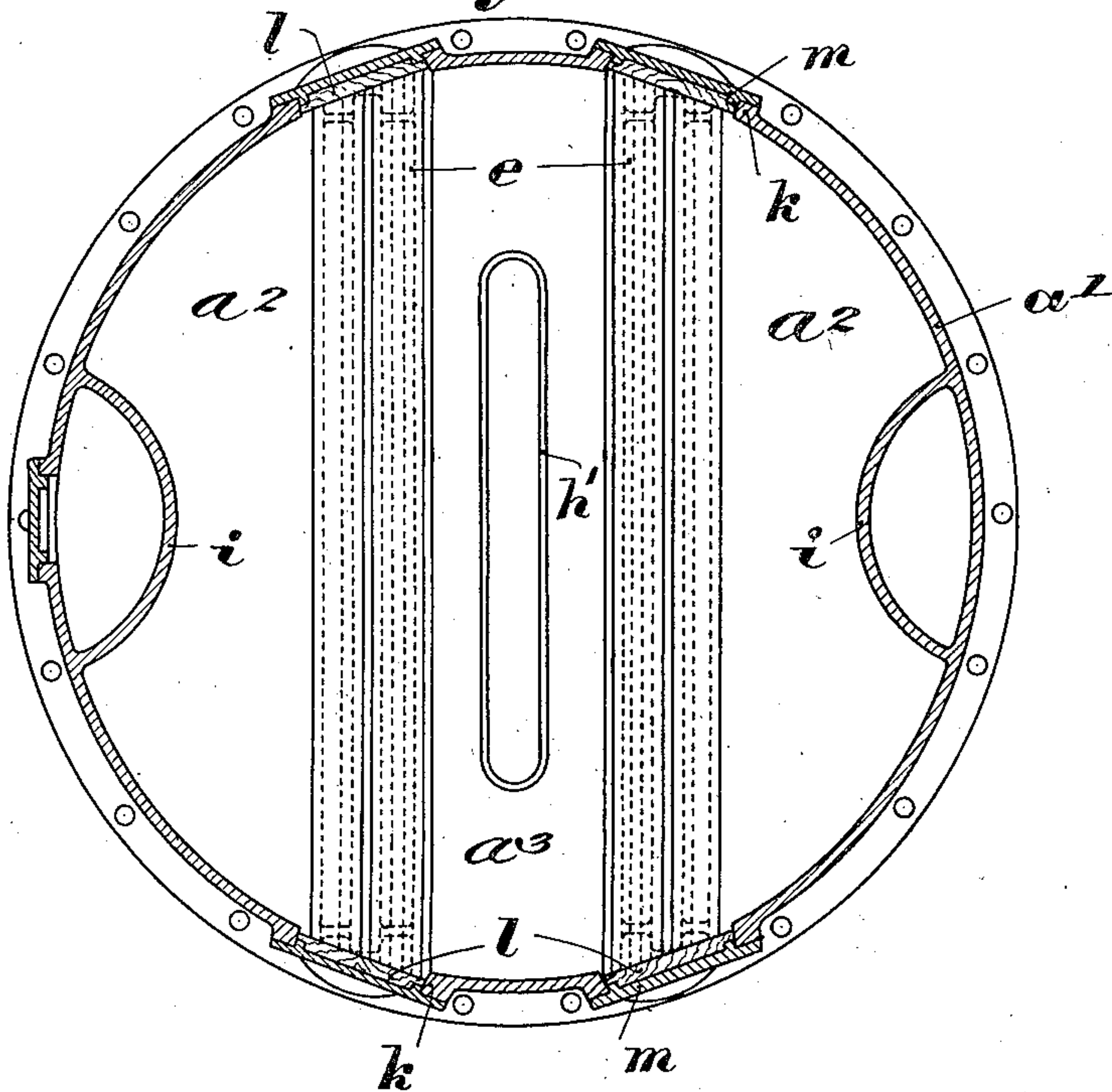


Fig. 2



Witnesses:
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August Miner.

Inventor:
Heinrich Koppers
by his attorney
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Fig. 3

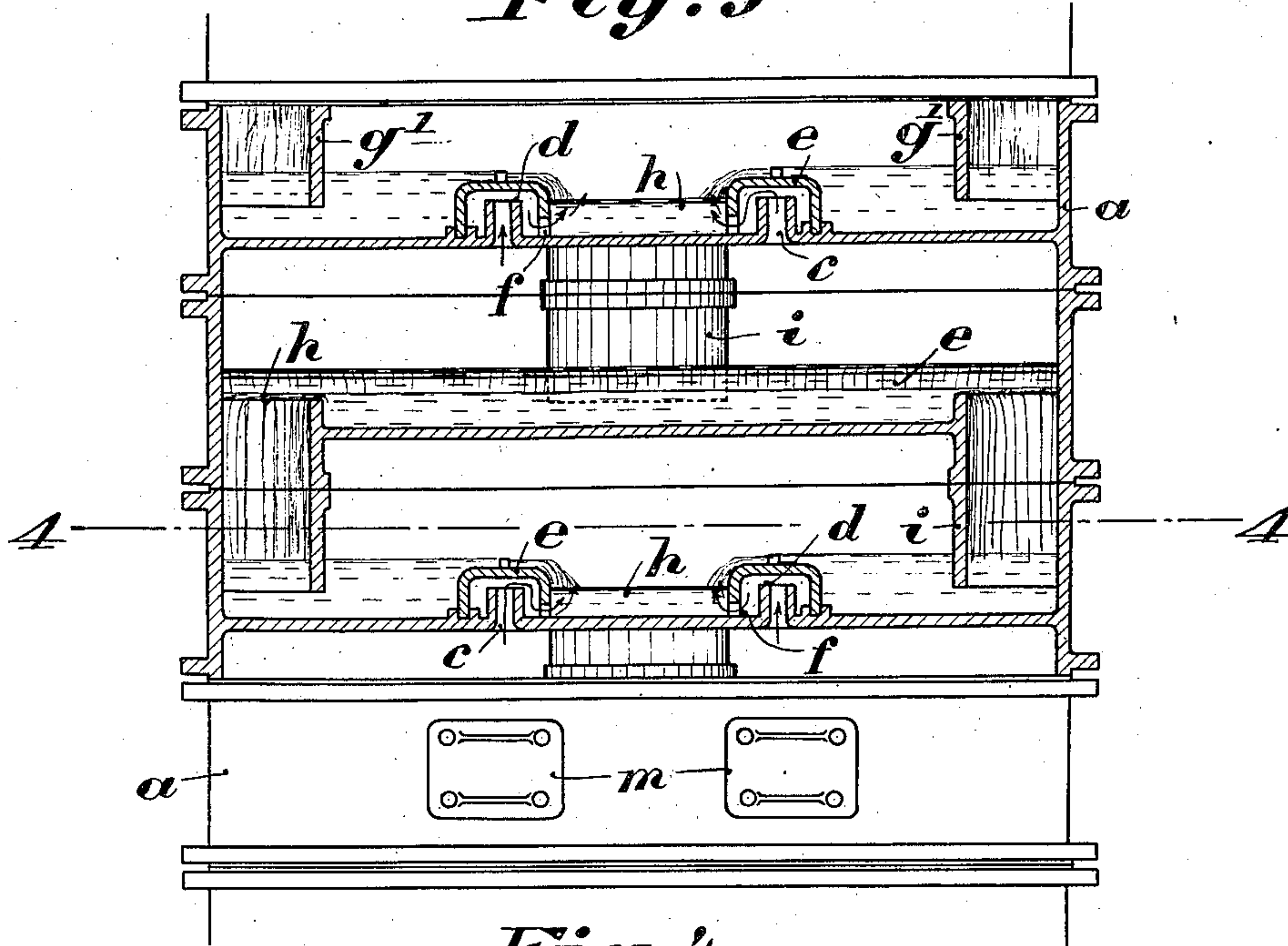
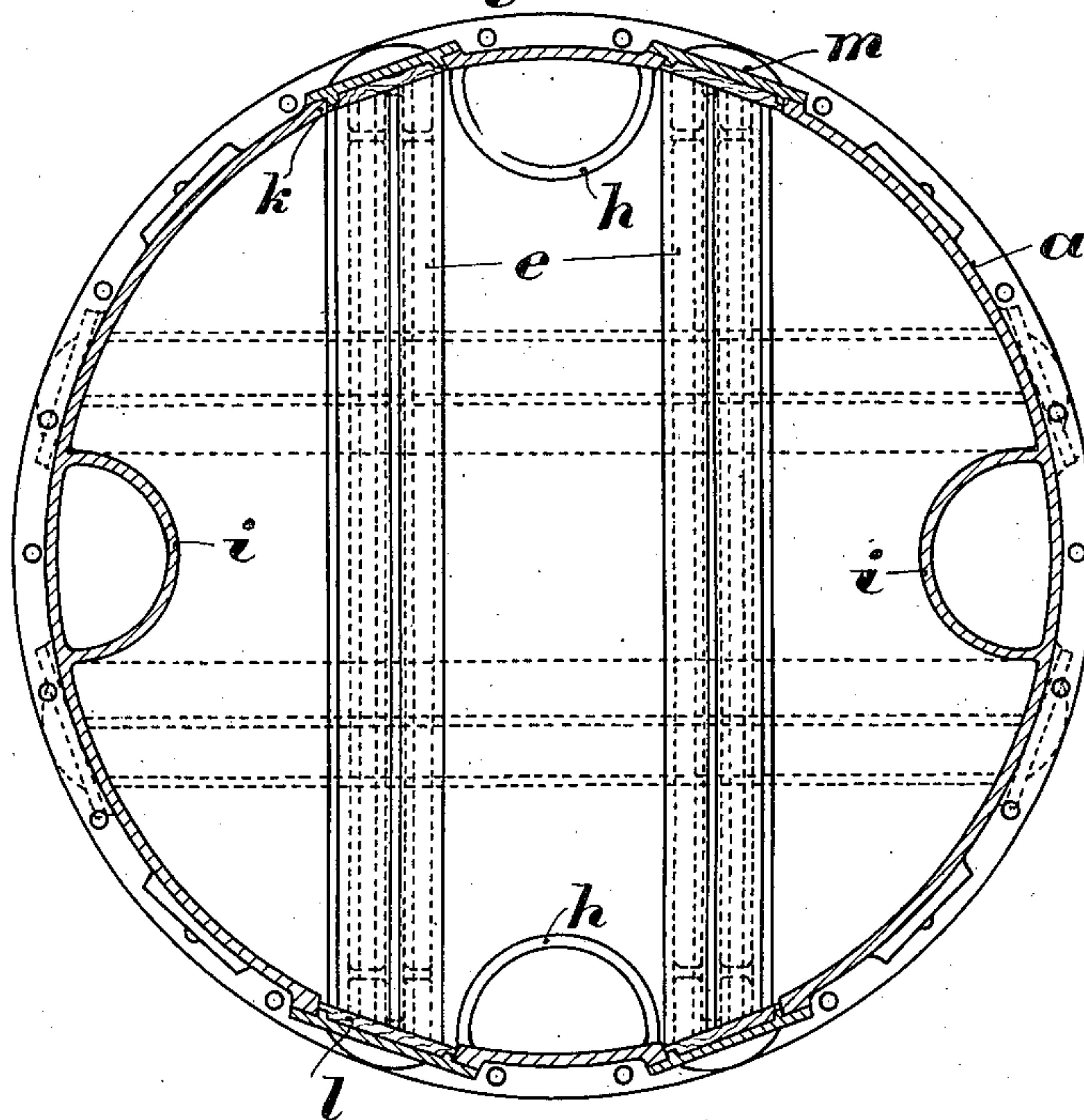


Fig. 4



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UNITED STATES PATENT OFFICE.

HEINRICH KOPPERS, OF ESSEN-ON-THE-RUHR, GERMANY.

APPARATUS FOR PRODUCING INTERACTION BETWEEN GASES AND LIQUIDS.

No. 903,483.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed October 3, 1907. Serial No. 395,635.

To all whom it may concern:

Be it known that I, HEINRICH KOPPERS, a citizen of Germany, residing at Essen-on-the-Ruhr, Germany, have invented new and useful Improvements in Apparatus for Producing Interaction Between Gases and Liquids, of which the following is a specification.

This invention relates to an apparatus for producing inter-action between gases and liquids, such as a gas scrubber, gas cooler, ammonia extractor, etc.

By my invention there is obtained a uniform passage of the gas through the liquid, the available space is effectively utilized, and a ready access to the operative parts of the device is provided.

In the accompanying drawings: Figure 1 is an elevation, partly in section, of my improved apparatus; Fig. 2 a horizontal section on line 2—2, Fig. 1; Fig. 3 an elevation, partly in section, of a modification of the apparatus, and Fig. 4 a horizontal section on line 4—4, Fig. 3.

The apparatus is composed of a suitable number of superposed chambers or sections a, a' , of which alternate sections are of like construction. The bottom b , of each section a, a' , is provided with a pair of parallel properly spaced slots c , extending entirely across such bottom. Slots c , are provided at each side with an upwardly projecting flange d . Above each slot is placed an inverted U-shaped hood or cover e , also extending entirely across chamber a, a' . One flange of each hood is slotted or recessed near its lower edge as at f , while the other flange is imperforate and is seated within a groove b' , of bottom b . The grooves b' , of chambers a , are arranged between slots c , while the grooves of the intervening chambers a' , are arranged outside of said slots. Owing to this construction, recesses f , will also alternate in their relative position to slots c , so that in the second, fourth, etc., section a' , such recesses are situated intermediate the slots, while in the first, third, etc., section a , they are arranged outside of the slots. Within each segmental outer compartment a^2 , of chamber a , is arranged an overflow pipe h , which is of a height slightly less than that of flanges d . Each overflow h , communicates with a corresponding outlet i , depending into chamber a' , such outlet terminating somewhat below the top of hoods e , located in such chamber. Within each chamber a' , an upwardly extending overflow h' , is provided in the com-

partment a^3 , intermediate slots c , such overflow being also of a height slightly less than that of flanges d . Each overflow h' , registers with a downwardly extending outlet i' , bolted to the bottom b , of chamber a' , and projecting into the chamber a , next below.

In use, a suitable liquid introduced into the topmost chamber a , through inlet g , will fill the inner space a^3 , of such chamber and will then overflow hoods e , and enter the outer segmental compartments a^2 , from which it will, through pipes h, i , enter outer compartments a^2 , of chamber a' . In this chamber the liquid will overflow hoods e , to enter central compartment a^3 , from which it will be discharged through overflow h', i' , into the inner compartment a^3 , of the next chamber a , this operation being repeated for the entire series of chambers. The gas entering the lowermost chamber, say a , through slots c , and openings f , will rise through the liquid contents of such chamber, and will thus be subjected to the action thereof. From the bottom chamber the gas will pass through slots c , and openings f , of the chamber a' , next above, through the liquid charge of the latter, and thence in like manner through the entire series of chambers, to be finally discharged from the top chamber. In this way a thorough contact of the descending body of liquid with the ascending body of gas is obtained, so that one is acted upon, in the desired manner, by the other.

Hoods e , are readily accessible by means of hand holes k , having covers m , and arranged opposite to ends of hoods e , against which they are held by a packing l , of covers k . It will be seen that in my apparatus the entering liquid is forced to rise to the height of hoods e . It will then flow over said hoods to descend cascade-like therefrom. Through the cascade thus formed the gases discharged through openings f , pass upwardly. In this way an intimate contact between these gases and the atomized liquid is effected, so that a superior interaction is obtained.

In the modification shown in Figs. 3 and 4, all the superposed sections are of like construction. These sections are so assembled that the slots of one chamber extend at right angles to those of the adjoining chambers. The liquid enters the outer compartments of the uppermost chamber through a pair of inlets g' , flows over hoods e , into the inner compartment thereof, and is thence discharged through pipes h, i , into the outer

compartments of the section next below, where the operation is repeated.

I claim:

1. In a device of the character described, a
5 chamber having a flanged slot, combined
with a hood projecting over said slot and
having one open side and one imperforate
side, said hood extending across the entire
width of the chamber, a liquid inlet at the
10 imperforate side of the hood which descends
below a horizontal plane passing through the
top of the hood, and a liquid outlet at the
open side of the hood, the mouth of said out-
let being arranged below the horizontal plane
15 passing through the top of the hood, sub-
stantially as specified.

2. In a device of the character described, a
chamber having a flanged slot and a groove
on one side thereof, combined with a hood
20 projecting over the slot and extending across
the entire width of the chamber, said hood
having one open side and one imperforate
side which is seated in the groove, a liquid
inlet at the imperforate side of the hood, and
25 a liquid outlet at the open side of the hood
which descends below a horizontal plane

passing through the top of the hood, the
mouth of said outlet being arranged below
the horizontal plane passing through the top
of the hood, substantially as specified. 30

3. In a device of the character described, a
chamber having a flanged slot, combined
with a hood projecting over said slot and
having one open side and one imperforate
side, and with hand holes in the chamber op- 35
posite the hood, covers seated therein, a
packing between said covers and hood, a
liquid inlet at the imperforate side of the
hood which descends below a horizontal
plane passing through the top of the hood, 40
and a liquid outlet at the open side of the
hood, the mouth of said outlet being ar-
ranged below the horizontal plane passing
through the top of the hood, substantially as
specified. 45

Signed by me at Dusseldorf, Germany this
twenty-third day of September 1907.

HEINRICH KOPPERS.

Witnesses:

ALFRED POHLMAYER,
M. ENGELS.