

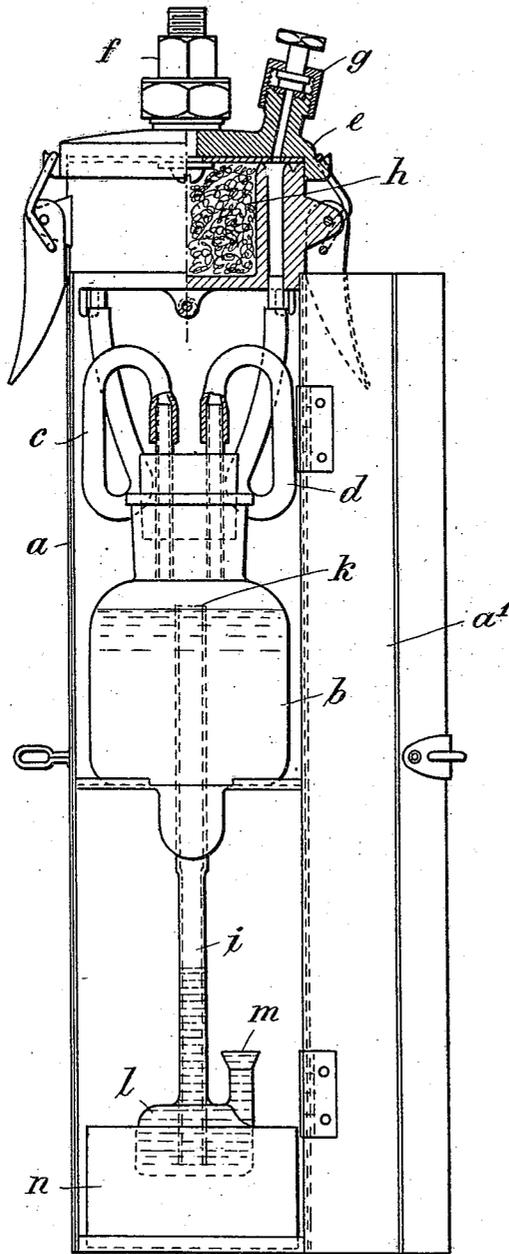
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O. RODHE

APPARATUS FOR ANALYZING GAS MIXTURES

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Inventor
Olof Rodhe
By Knut J. J. J. J.
Attor

UNITED STATES PATENT OFFICE.

OLOF RODHE, OF STOCKHOLM, SWEDEN, ASSIGNOR TO SVENSKA AKTIEBOLAGET
MONO, OF STOCKHOLM, SWEDEN, A CORPORATION.

APPARATUS FOR ANALYZING GAS MIXTURES.

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To all whom it may concern:

Be it known that I, OLOF RODHE, subject of the King of Sweden, residing at Odengatan 54 A, Stockholm, Sweden, have invented certain new and useful Improvements in Apparatus for Analyzing Gas Mixtures, of which the following is a specification.

In analyzing gas-mixtures, particularly in gas-analyzing apparatus, the drawback is met with that the metal-conduits leading to the apparatus may be clogged by dirt caused by the metal being chemically acted on by the condensable constituents.

To prevent this, a material, such as concentrated sulphuric acid is used which absorbs the condensable constituents.

Then, however, another difficulty arises, viz. that there will be an increase in volume of this sulphuric acid according as the condensable constituents are being absorbed. Such an increase in volume must be avoided, since the same clearance space has to be present in the piping system in all analyses, as otherwise the time passing between the taking of the test-gas from the gas-source and the introduction thereof into the gas-analyzing apparatus varies, which in turn has a detrimental effect on the result of the analysis.

According to the present invention such an increase in the volume is avoided by providing an overflow pipe through which the absorbing material for example concentrated sulphuric acid, automatically escapes, the said overflow pipe having one end in open communication with the interior of the receptacle containing the absorbing material and the lower end dipping into a liquid-seal which is provided with an outlet.

A constructional form of an apparatus for carrying out the present invention is shown by way of example in the accompanying drawing which represents a front elevation and partial section of such apparatus.

Primarily, this apparatus is distinguished in that the receptacle holding the material for the absorption of the condensable constituents is provided, in addition to inlet and outlet-pipings for the gas-mixture, with an outlet for automatically leading off that quantity of the liquid which corresponds to the increase in volume. The outlet is provided with a liquid seal.

In the drawing, *a* denotes the casing of the apparatus, the same being provided with a door *a'*, *b* designates the receptacle for the

material which absorbs the condensable constituents, *c* is a gas-supply pipe and *d* an outlet-pipe for the gas flowing from the receptacle.

e designates a cover in which is arranged a socket *f* for a supply-pipe and a socket *g* for an outlet-pipe. *h* denotes a filter through which the gas passes between *f* and *c*.

i is an overflow pipe leading from the receptacle *b*, the upper mouth of this pipe being located at the level of the liquid. This pipe *i* enters the liquid-seal *l* which contains a sealing liquid having a specific gravity higher than that of the absorbing liquid and which is provided with an outlet *m* through which the liquid is allowed to flow into the lower receptacle *n*, this receptacle being emptied when required.

The mode of operation will be evident from the above description. As the condensable constituents come into the receptacle *b*, they are absorbed by the sulphuric acid and as the latter increases in volume, because of such absorption, it overflows into the pipe *i* and accumulates therein until its hydrostatic head is sufficient to force the surplusage thru the liquid in the seal *l*, and escape by the outlet *m* into the receptacle *n*. Changes in the pressure of the gas being analyzed will not affect the level of the absorbent in the receptacle *b*, it only being necessary to meet any such change by a proper depth of liquid in the liquid seal whereby a suitable hydraulic column will be established in pipe *i*. In the receptacle *b* there can obviously be only one constant clearance-space and a constant pressure, since on an increase in volume of the liquid in the receptacle the excess quantity of the liquid will flow out through pipe *i*.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. A gas-analyzing apparatus in which the gas is freed from condensable constituents by means of a suitable absorbing material, a receptacle for containing the absorbent material, a liquid seal provided with an outlet, and an overflow pipe, one end of which is in open communication with the interior of said receptacle and the other end of which dips into the said liquid seal.

2. A gas-analyzing apparatus in which the gas is freed from condensable constituents by means of a suitable absorbent mate-

rial, a receptacle for containing the absorb-
ent material, a liquid seal provided with an
outlet located below the said receptacle, and
an overflow pipe, one end of which is in
5 open communication with the interior of
said receptacle and the other end of which
dips into the said liquid seal.

3. A gas-analyzing apparatus in which
the gas is freed from condensable constitu-
10 ents by means of a suitable absorbing mate-

rial, a receptacle for containing the absorb-
ent material, a liquid seal for the gas pro-
vided with an outlet and containing a liquid
heavier than the absorbing material, and an
overflow pipe, one end of which is in open 15
communication with the interior of said re-
ceptacle and the other end of which dips
into the said liquid seal.

OLOF RODHE.