

No. 690,062.

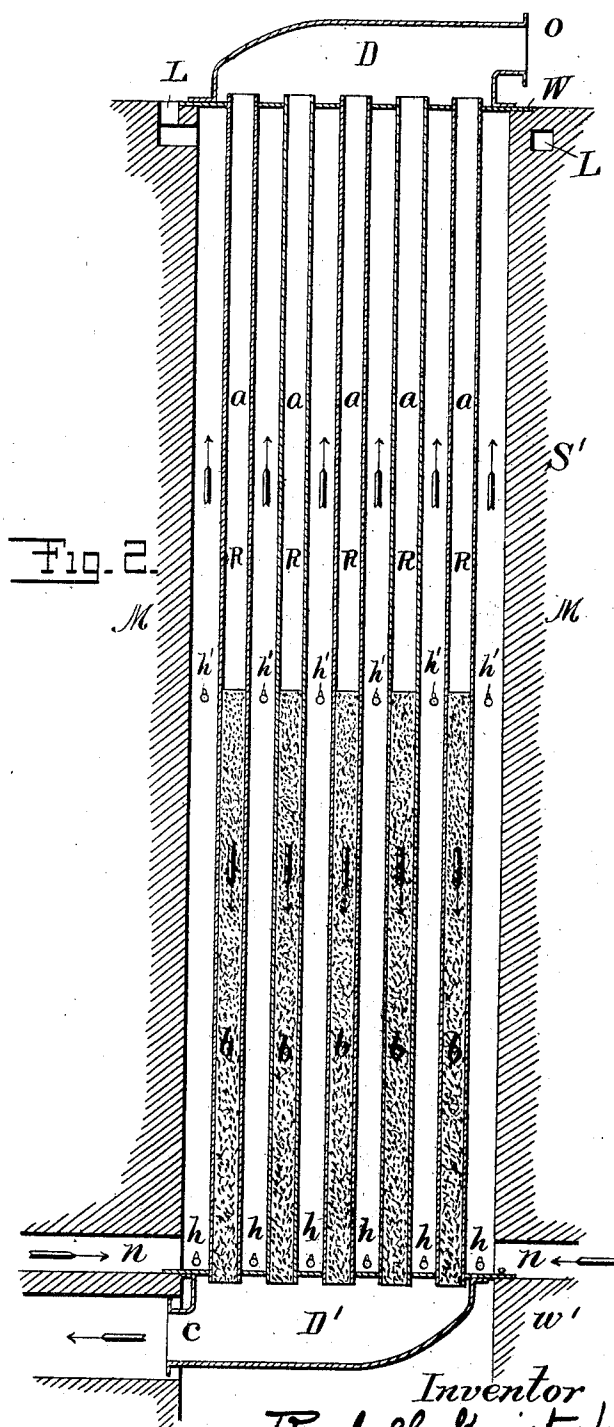
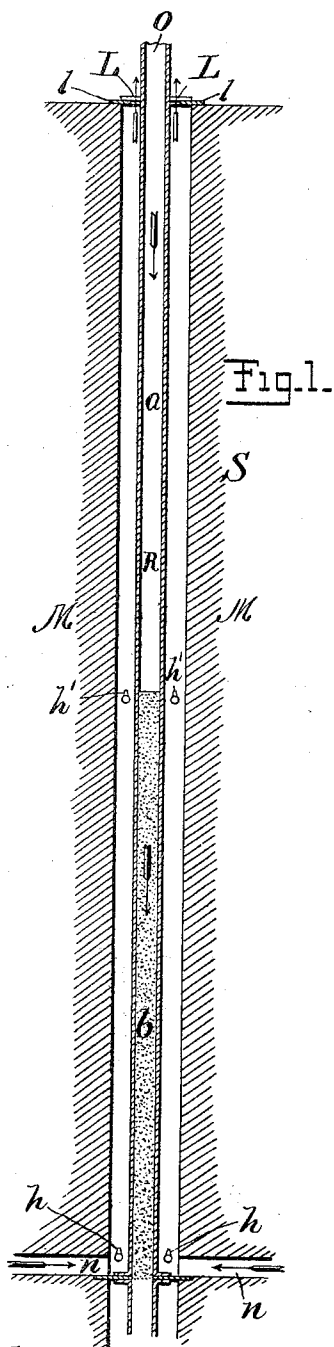
Patented Dec. 31, 1901.

R. KNIETSCH.

METHOD OF MAKING SULFURIC ANHYDRID.

(Application filed Apr. 7, 1900.)

(No Model.)



Inventor
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by Gifford & Bull
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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING SULFURIC ANHYDRID.

SPECIFICATION forming part of Letters Patent No. 690,062, dated December 31, 1901.

Original application filed July 14, 1898, Serial No. 685,969. Divided and this application filed April 7, 1900. Serial
No. 12,039. (No specimens.)

To all whom it may concern:

Be it known that I, RUDOLF KNIETSCH, doctor of philosophy, a subject of the King of Prussia, Emperor of Germany, residing at Ludwigshafen-on-the-Rhine, Kingdom of Bavaria, Germany, have invented certain new and useful Improvements in the Process for the Manufacture of Sulfuric Anhydrides, (which invention is divided out of my application for Letters
10 Patent filed July 14, 1898, Serial No. 685,969, which application had previously been divided, giving rise to the application filed August 18, 1899, Serial No. 727,636,) of which the following is a specification.

15 In my application, Serial No. 685,969, filed July 14, 1898, I described the apparatus and process described in this application. In the application, Serial No. 727,636, filed August 1899, I described a specific form of apparatus
20 and claimed the specific apparatus and the process as carried out therewith. I file the present application as a division of the said application for the purpose of securing the specific claim on the said process.

25 In the accompanying drawings, Figure 1 is a vertical section of an apparatus containing a single contact-chamber, represented by a tube or pipe R. Fig. 2 is a vertical section of an apparatus containing a plurality of contact-
30 chambers, represented by tubes or pipes R.

Referring first to Fig. 1, M represents a brickwork structure or an iron pipe. Within this a pipe R is fixed, leaving the passage S' between. This pipe R consists of two parts
35 a and b, which have different functions and may differ from one another in length and diameter. Also either part can be replaced by a plurality of narrower pipes. The portion b of the pipe R is occupied by the contact substance, (indicated in the drawings by broken
40 section lines,) and this is cooled by the cold air entering the passage S' at n. In the other part a of the pipe R the gases containing the sulfur dioxide which enter at O are heated to the temperature necessary for the reaction.
45 When commencing the operation, the whole apparatus is first raised to the temperature necessary for the reaction by heating by means of h h—say gas-flames. Then, when

gases rich in sulfur dioxide are used, after the 50
reaction has once commenced further heating is unnecessary, because the air as it passes through the pipe M in contact with that part
b of the pipe R in which the reaction is in progress in extracting the excess of heat due 55
to the reaction absorbs the heat and transfers sufficient heat to the other portion a to prevent a change of position of the reaction zone or the entire cessation of the reaction. The
60 current of air can be regulated by means of the updraft-openings L L, which are adjustable by the slides l l. It is regulated in such a way that the contact substance in b is constantly maintained at the most favorable
65 temperature for the reaction. When the gases contain but little sulfur dioxide, the air, which is somewhat heated by its cooling action on the contact substance, is further heated by
70 suitable means h' h', (such as gas-flames,) so that the gases in flowing through part a receive a greater increment of heat. When the
75 gases are still poorer in sulfur dioxide, it may be necessary to continually heat to some extent the current of air flowing in through n, either by means of the gas-flames at h h' or in
some other way. The gases containing the sulfuric anhydride issuing from the contact-chamber b leave the apparatus by the pipe C and
are worked up in any suitable way.

The apparatus represented in Fig. 2 is made 80
up of a plurality of contact-tubes R R, which are in connection with one another by means of the two tube-plates W W and the covers D D' above and below. In other respects it
85 resembles Fig. 1.

It will now be manifest that in the operation above described there are two independent currents of gas. One of them—the mixture containing sulfur dioxide and oxygen—
90 passes through the pipe R and is converted. The other current, differently constituted, passes through the passage adjoining the pipe R, but does not enter the contact material, and performs the function of transferring the
95 excess of heat due to the reaction from the part b of the tube R to the part a thereof.

I claim—

1. The herein-described process of making

sulfuric anhydrid which consists in passing a gas containing sulfur dioxid and oxygen through a contact substance while removing excess of heat due to the reaction from the contents of the contact-chamber by means of a current of fluid which does not enter the contact material, substantially as described.

2. The herein-described process of making sulfuric anhydrid which consists in passing a gas containing sulfur dioxid and oxygen through a contact substance while removing excess of heat due to the reaction from the contents of the contact-chamber by means of a current of air, substantially as described.

3. The herein-described process of making sulfuric anhydrid which consists in passing a gas containing sulfur dioxid and oxygen through a contact substance while removing excess of heat due to the reaction from the contents of the contact-chamber by means of

a current of fluid differently constituted from the said gas, substantially as described.

4. The herein-described process of making sulfuric anhydrid which consists in passing a current of gas containing sulfur dioxid and oxygen through a contact substance while transferring excess of heat due to the reaction from the contact substance to said chamber by means of a second current of fluid differently constituted from and flowing in a direction inversely to that of the first-named current, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

RUDOLF KNIETSCH.

Witnesses:

ERNEST F. EHRHARDT,
JACOB ADRIAN.