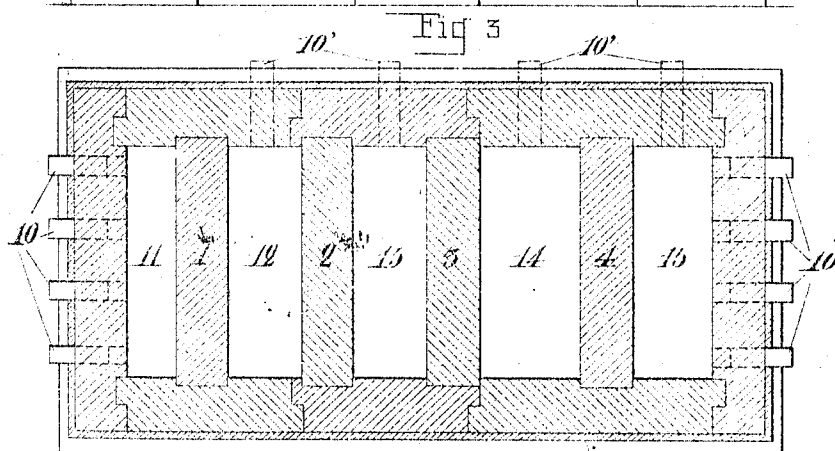
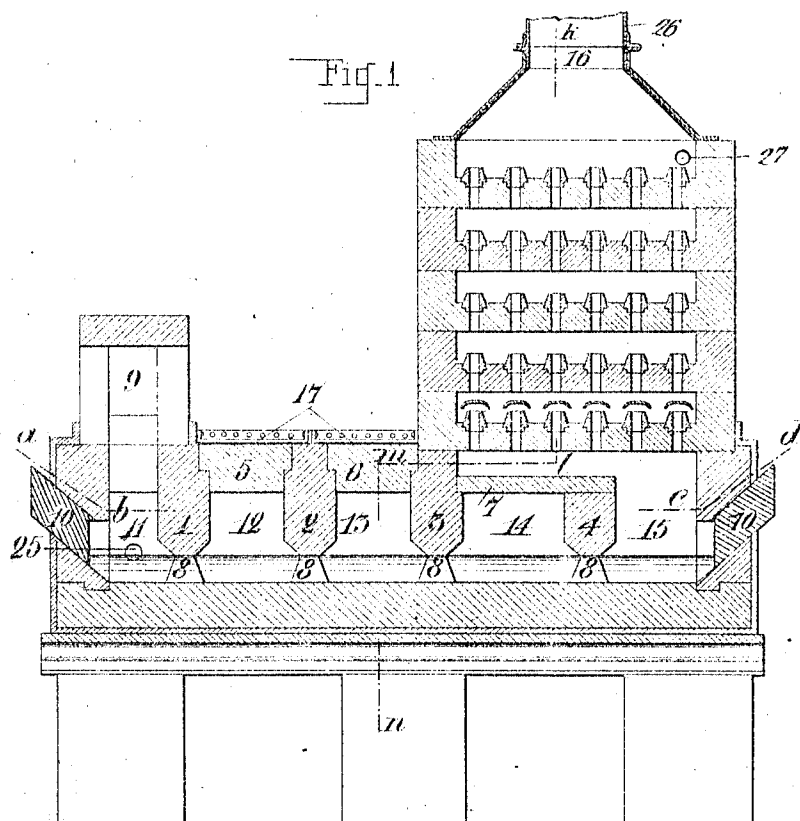


J. TEISSET & J. PRAT.
 KESSLER APPARATUS FOR CONCENTRATING SULFURIC ACID.
 APPLICATION FILED JULY 14, 1909.

993,125.

Patented May 23, 1911.

2 SHEETS—SHEET 1.



WITNESSES:
W. H. Kerrigan
John W. Howard

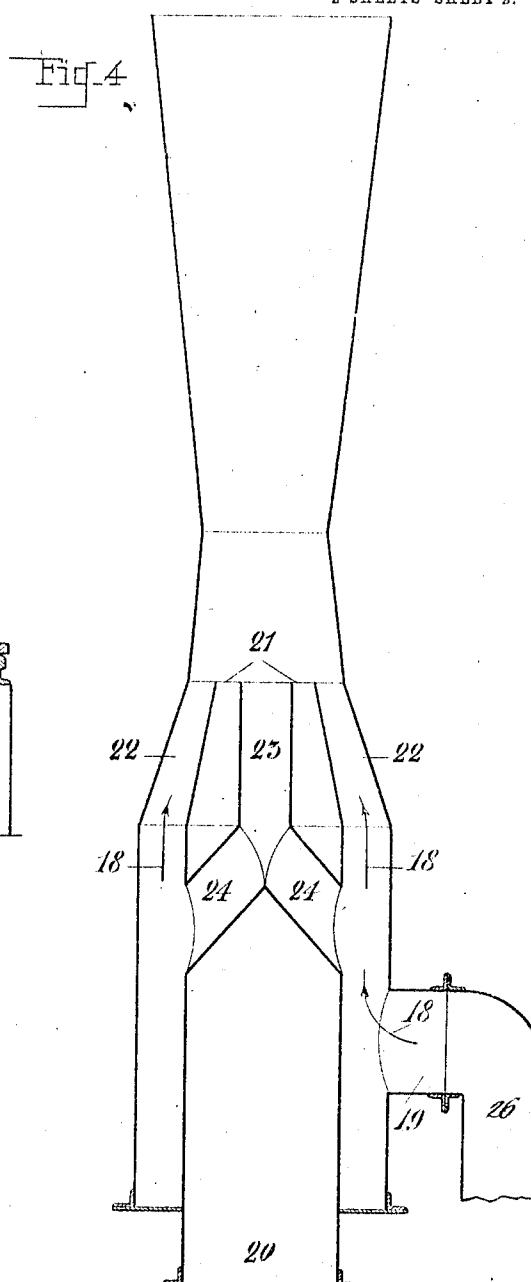
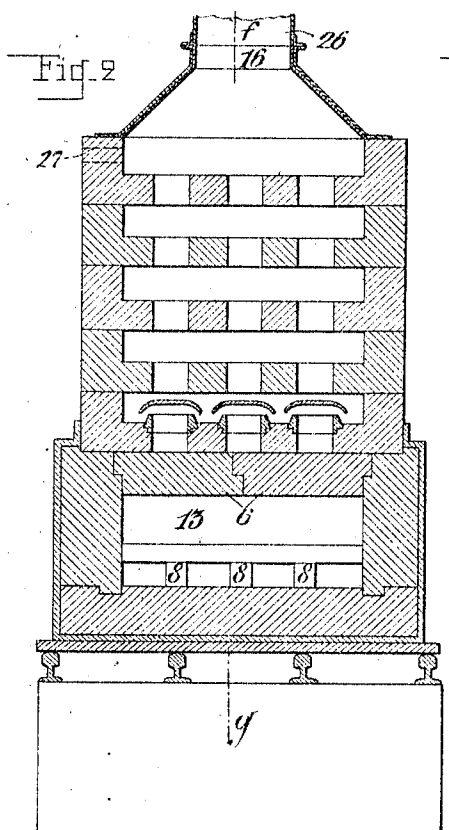
INVENTORS,
 JULES TEISSET and
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 by *Frank Olden*
 Attorney.

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2 SHEETS-SHEET 2.



WITNESSES:

W. H. Berrigan
John H. Hoving

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UNITED STATES PATENT OFFICE.

JULES TEISSET AND JULES PRAT, OF PARIS, FRANCE.

KESSLER APPARATUS FOR CONCENTRATING SULFURIC ACID.

993,125.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed July 14, 1909. Serial No. 507,564.

To all whom it may concern:

Be it known that we, JULES TEISSET and JULES PRAT, citizens of France, residing at Paris, France, have invented new and useful

5 Improvements in Kessler's Apparatus for the Concentration of Sulfuric Acid, (for which we have obtained a patent in France, No. 398,218, bearing date December 31, 1908,) of which the following is a specification.
10 tion.

Our invention relates to improvements in the construction of Kessler's apparatus for concentrating sulfuric acid.

15 It relates, further, to its combination with an external ventilator, for obtaining a better draft, and thereby increasing the yield in sulfuric acid.

20 It relates also to a special construction of the saturator, or final concentrator, and its relation to the concentrating column, or preliminary concentrator, whereby gradual heating is applied to the saturator, which plays the principal part in the concentration of sulfuric acid.

25 In Kessler's apparatus for concentrating sulfuric acid by the insufflation of hot gases, the saturator consists of 2 or 3 conduits, of 11 to 15 cm. in width, running lengthwise of the saturator. These conduits are made
30 of pumice, and are called gas conduits. The hot gases coming from the gas generator circulate in these conduits and raise the pumice partitions to a very high temperature. The hot gases, drawn by the blower, pass down
35 under the pumice partitions and enter 4 conduits 7 mm. in width (parallel with the first conduits) and pass out under the plates.

40 The present invention remedies various defects in the Kessler apparatus, and modifies the saturator by placing a plurality of baffles made of acid resisting or refractory material transversely to the current of the gas, instead of in the direction of the current. The covers of the baffles are made in
45 several pieces, and when the first baffle is worn out, it can be replaced by a new one without disturbing the others. Moreover this arrangement of the baffles has the further advantage that it forms between two
50 baffles a closed chamber, in which the acid becomes raised to a high temperature by the current of gas and is atomized, thereby increasing the rate of concentration and the transfer of the steam from the acid to the
55 gas.

Another advantage of the new construc-

tion is that the number of cleaning plugs is reduced from seven to four and this is important, as the closing of these plugs is a somewhat delicate operation. Moreover, if
60 the joint be very strong, the plugs can only be removed with great difficulty. Sometimes they must be broken and often the head or tail stone of the saturator is injured.
65

The drawings annexed to this description represent the modified apparatus according to the present invention.

In these drawings:—Figure 1 is a longitudinal sectional elevation of the apparatus
70 taken on the line *f, g*, of Fig. 2. Fig. 2, is a section of the same taken on the line *h, l, m, n* of Fig. 1. Fig. 3, a horizontal section thereof taken on the line *a b c d* of Fig. 1, and Fig. 4 is a sectional elevation of the
75 ventilator or aspirator for exhausting the hot gases at the top of the apparatus.

The concentrating pan is the same as that of the Kessler apparatus, but the pumice is replaced by transverse baffles 1, 2, 3, 4, made
80 of acid resisting material, and resting, at each end in the walls of the pan, and supported also at intervals by three blocks 8, of resistant material. On these baffles rests the inlet gas flue 9, as well as the covers 5,
85 6 made of resistant material, but in two pieces, to facilitate cleaning. A plate 7, of acid resisting material, extends from the baffle 3 to the baffle 4.

10 are the cleaning plugs, which may be
90 located in one or the other face of the concentrator, and 25 is the outlet for the acid.

The lead surrounding the saturator is not soldered above the covers 5, 6, but is retained
95 by several angle iron frames, 17, and bolts, so as to form a tight joint.

Instead of the former steam blower, the mechanical draft apparatus, of the type devised by Mr. Prat, carries the gases coming
100 from the concentrator away from the head 16, by the jointed passage 19, in the direction of the arrow 18, through a suitable pipe 26.

In this apparatus, the air tube 20, forming a continuation of the ventilator, terminates,
105 at its upper end, in an annular orifice 21. The air flows through this, while the gases on which the air is to act, are led, at the same time, through the conical annular twyer 22, and through the central portion 23,
110 which is in communication with the outside of the ventilator by means of a number of

inclined passages 24 traversing the air conduit, or by a vertical passage traversing this same passage, according to the position of the ventilator.

5 To assure proper heating in the saturator, the concentrating column is situated at the end of this latter. The hot gases cannot now pass into the concentrating column, without having traversed the series of chambers 11, 12, 13, 14 formed by the successive
10 baffles 1, 2, 3, 4, which compel the gases to bubble through the acid, which tends to flow more and more concentrated through the outlet 25 situated at the opposite end of the saturator from the concentrating column.
15 In this region, the acid having reached the highest point of concentration, is subjected to the direct action of the current of hot gases coming through the pipe 9, and these
20 gases are at this point at their highest temperature. It will be easily seen that this is the best arrangement and is the most advantageous for increasing the concentration and transferring the steam from the acid to
25 the gases.

The operation is as follows:—The acid to be treated enters the concentrating column through an opening 27 and passes over the plates to the saturator. The gas coming
30 from the gas generator through the flue pass into the first chamber 11, whence they pass under the baffle 1 into the chamber 12. The hot gases raise the temperature of the baffles with which they come in contact, and
35 they carry away with from the acid water in the form of steam. The gases pass in succession, under the baffles 2, 3 and 4, into the chambers 13, 14, 15, and in each of them concentration is effected, though with less
40 energy than in chamber 12, since the gases have become cooler and more highly charged with water vapor. Passing under baffle 4 the gases arrive in chamber 15, directly communicating with the plates of the concentrating column. The acid which is fed
45 in over these plates receives the heat of the gases rising to the plates, and from here it passes to the outlet 25, in the meantime

traversing the chambers in succession and becoming gradually concentrated. The gases
50 are sucked by the blower, seen in Fig. 4 up through the plates of the concentrating column, out of the opening 26, whence they pass to the gas generator, to be again admitted through the flue 9.
55

The improvements herein set forth offer the following advantages: Under the action of the exhaust ventilator, the gases easily enter the saturator, the construction of this latter obviating any danger of obstruction,
60 the cleaning of the outlet pipe being easy, without having to fear the destruction of the pumice partitions facing it; the bubbling and the atomization of the acid are effected in comparatively very wide chambers; the
65 concentration is gradual, whence result economy in fuel and ease of obtaining the highest concentration; repairs are very easy, as the baffles are not connected with each other, as were the old partitions; and, finally,
70 the saturator is easier to clean, and the lining wears less rapidly.

What we claim, is:—

An improvement in the Kessler's apparatus for concentrating sulfuric acid, comprising a saturator provided with baffles
75 having their bottoms on the level with acid in the concentrator, and running transversely across the saturator, to cause the gases to bubble under said baffles and in contact with the acid; a concentrating column located at the end of the saturator opposite to the gas inlet flue; and an aspirator
80 attached to the top of the concentrating column, and arranged to draw the hot gases from the gas generator, through the saturator and concentrating column.
85

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JULES TEISSET.
JULES PRAT.

Witnesses:

JULES FAYOLLET,
EUGÈNE PICHAN.