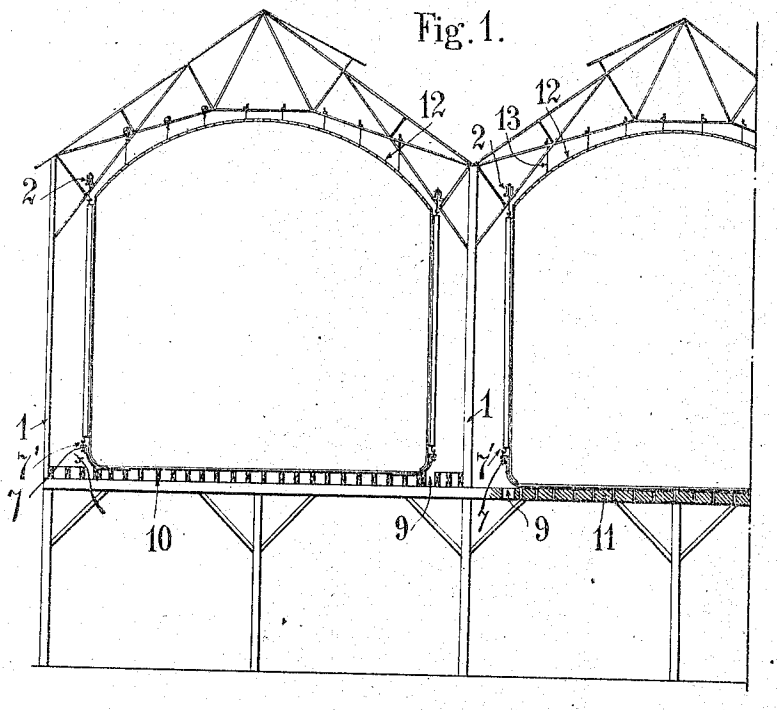
R. MORITZ.

APPARATUS FOR MAKING SULFURIC ACID.

APPLICATION FILED SEPT. 17, 1909.

981,103. Patented Jan. 10, 1911.

Fig. 1.



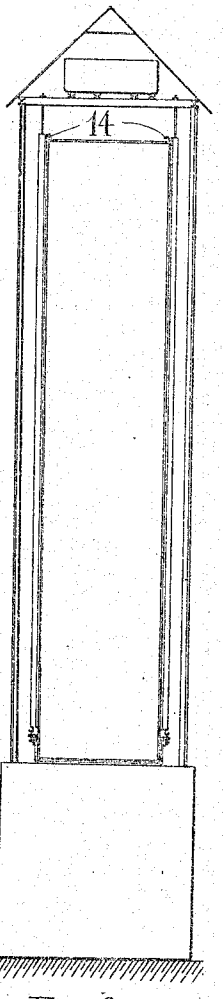


Fig. 8.

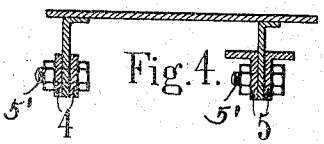


Fig. 4.

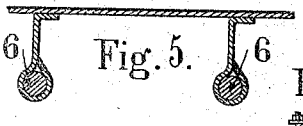


Fig. 5.

Fig. 3.

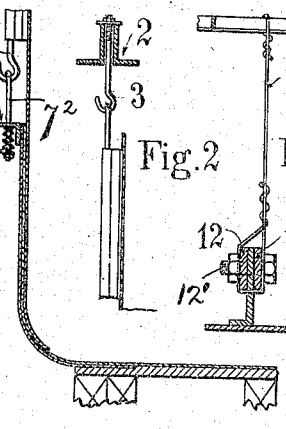


Fig. 6.

Fig. 2

Fig. 7.

Witnesses:

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR MAKING SULFURIC ACID.

981,103. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed September 17, 1909. Serial No. 518,195.

To all whom it may concern:

Be it known that I, RENÉ MORITZ, a citizen of the Republic of France, residing at Wasquehal, Nord, France, have invented certain new and useful Improvements in Apparatus for Making Sulfuric Acid, of which the following is a specification.

My invention relates to apparatus for the manufacture of sulfuric acid and among the objects in view is to provide an apparatus of this character designed to obviate the disadvantages often met with in apparatus of this kind as heretofore constructed.

The invention consists in the novel construction, arrangement and combination of parts as hereinafter fully described, illustrated in the drawings and pointed out in the appended claims.

In the drawings: Figure 1 is a vertical sectional view partly in elevation of an apparatus embodying my invention. Figs. 2 to 7 inclusive, are detail views hereinafter referred to, Figs. 2, 4, 5 and 6 being sections, Fig. 3 an elevation, and Fig. 7 a sectional view partly in elevation. Fig. 8 is an end elevation of Fig. 1.

The uprights 1, 1, 1 of the chamber, carrying the roof and the walls, are not placed against the walls of the chamber, but separated from the same by the width of an inspection passage. They can be of iron, wood, reinforced concrete or any other suitable substance, and carry the roof directly, the latter being calculated so as to be sufficiently strong to hold the weight of the covering and the walls of the chambers. The framework of the roof can also be made of iron, wood or reinforced concrete, but it is preferably constituted by trusses of the Polonceau type strengthened so as to be capable of carrying the two loads mentioned above, and the ceiling of the chamber is more or less arched, in order properly to utilize the space and to compensate better the effects of expansion. At the right hand side of the walls, all around the chambers and supported by the trusses of the roof, runs a line of double angle irons 2, 2 (Figs. 1 and 2) with which engage the hooks 3 (Fig. 2) or U-brackets (Fig. 3) or any other means of suspension, to which are suspended iron ties constituted either by two bar irons 4 (Fig. 4) or angle irons 5 (Fig. 4) provided with holes and compressing the connection hereinafter referred to, by means of a series of bolts 5′ passing through the holes; or by a round iron bar 6 (Fig. 5) around which is soldered the connection which is thus secured to the tie. These ties are almost as long as the vertical height of the chamber, and are taken up at the bottom by another hook 7′ depending on the pan. To each of these ties is secured, as already stated, a connection in a single piece, which is itself soldered from top to bottom against the wall. The wall is thus held throughout the whole of its height by this connection of a part secured to the tie which is secured to the roof by means of a double angle iron, and at the bottom to the pan which is provided to that end with an angle iron at the top. This angle iron 7 (Figs. 1 and 6) is provided with holes at the points corresponding to the ties, and a hook 7^2 passes through each of the said holes. The hook is held in the angle iron by a nut (Fig. 6). In cases in which the chamber has to work under very heavy pressures or depressions, as is the case when fans are used, in order to prevent the traction or pull on the ties from exceeding a certain limit, the lower hook can be provided with a spring 8 (Fig. 6) which allows the tie to expand or contract within sufficient limits in order that the effects due to expansion or the slight movements of the walls should be possible.

The pan is made of sheet iron or steel, perforated or not, so as to enable the lead to cool, and consequently to avoid the premature wearing out mentioned before; the bottom angle of the pan is rounded off, and the bottom return is sufficiently long in order that the 15 centimeters of lead at the bottom which is generally corroded, should be properly cooled and consequently attacked less. The floor of the passage is arranged so that a current of air may be produced at 9 and constantly cools the pan.

The floor below the bottom of the lead chamber may be of wood as usual 10 (Fig. 1) or, if it is desired that the chamber should be absolutely noncombustible, it can be made of reinforced concrete 11 (Fig. 1). In that case the reinforced concrete is provided with holes arranged fairly close together and connected together by small grooves in order that any leak in the bottom should be at once located. The concrete is in that case tarred, or insulated from the lead by any desired means, so as to avoid

the action of cement on the lead. It can also be made of sheet metal provided with a suitable number of holes.

The ceiling, as already stated, is preferably arched in order that the expansion should not open the walls but simply raise the ceiling. The connections are also constructed for the purpose. To that end the connections are of very small height and are continuous from one end of the chamber to the other, and at a right angle to the axis of curvature of the chamber. They are taken up at each side by an iron bar 12, 12, curved beforehand (Figs. 1 and 7) provided with holes through which pass bolts 12' which tighten together the two iron bars against the lead connection; iron wires 13, 13 (Figs. 1 and 7) take up the connections from place to place, and transmit the load to the angle irons or wooden parts supported by the trusses of the framework. If the ceiling is entirely of reinforced cement, these iron wires can be sealed in the reinforced cement directly. Two or more chambers can be arranged side by side, and may be of horizontal, rectangular, circular, oval or any other desired cross section.

Glover and Gay-Lussac towers with circular, square or rectangular cross-section can be built in the same way. A series of continuous vertical connections 14, 14 (Fig. 8) secure the lead to iron ties supported at the top by the roof or the special framework of the towers, the uprights of which are however at a distance from the walls, so as to allow free circulation of air and to facilitate repairs. It is unnecessary in that case to take up the ties at the bottom, as pressure effects are felt very little on the towers.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In an apparatus for the manufacture of sulfuric acid the combination with a framework, of roof trusses supported thereby, a lead chamber comprising a ceiling and sides and a pan forming the bottom of said chamber, double angle-irons extending around the said chamber and supported by the said trusses, tie-bars approximating in length the height of the chamber, an angle-iron carried by the pan at its top, connections between the upper end of the tie-bars and the angle-irons carried by the roof trusses and between the lower end of the tie-bars and the angle-iron carried by the pan, and connections between the ceiling and the roof trusses.

2. In an apparatus for the manufacture of sulfuric acid the combination with a framework, of roof trusses supported thereby, a lead chamber comprising a ceiling and sides and a pan forming the bottom of said chamber, double angle-irons extending around the said chamber and supported by the said trusses, tie-bars approximating in length the height of the chamber, an angle-iron carried by the pan at its top, connections between the upper end of the tie-bars and the angle-irons carried by the roof trusses and yielding connections between the lower end of the tie-bars and the angle-iron on the pan.

3. In an apparatus for the manufacture of sulfuric acid the combination with a framework, of roof trusses supported thereby, a lead chamber comprising a ceiling and sides and a pan forming the bottom of said chamber, double angle-irons extending around the said chamber and supported by the said trusses, tie-bars approximating in length the height of the chamber, an angle-iron carried by the pan at its top, connections between the upper end of the tie-bars and the angle-irons carried by the roof trusses and between the lower end of the tie bars and the angle-iron carried by the pan, and connections between the ceiling and the roof trusses comprising adjacently-arranged bars, a connection bolted between said bars and carried by the ceiling and wires suspending said adjacently-arranged bars from the roof trusses.

4. In an apparatus for the manufacture of sulfuric acid the combination with a framework, of roof trusses supported thereby, a lead chamber comprising a ceiling and sides and a pan forming the bottom of said chamber, tie-bars approximating in length the height of the chamber, connections between the upper end of the tie-bars and the roof trusses, and between the lower end of the tie-bars and the pan, and connections between the ceiling and the roof trusses.

5. In an apparatus as described the combination with a floor and a framework supported thereby, of roof trusses, supported by the framework, a lead chamber comprising a ceiling and sides and a pan forming the bottom of the chamber, tie-bars secured to the sides of the chamber, connections between the upper end of said bars and the roof trusses, and between the lower end of said bars and the pan, and means provided in the floor whereby air currents may cool the pan and leaks therein be detected.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RENÉ MORITZ.

Witnesses:
ROBERT SAUCAY,
CHARLES LÈTELLEVER.