

No. 659,236.

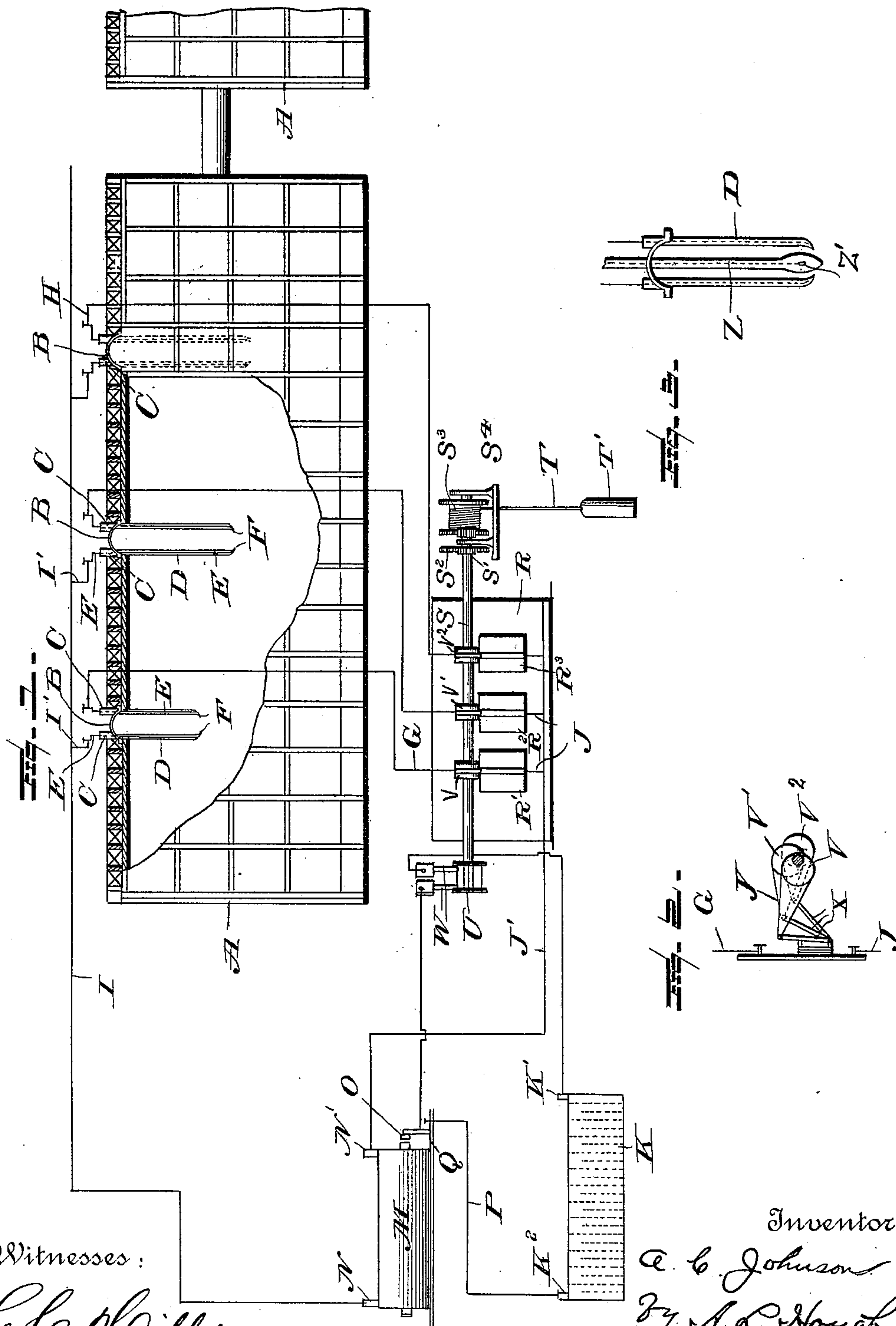
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A. C. JOHNSON.

PROCESS OF MAKING SULFURIC ACID.

(Application filed Dec. 14, 1899.)

(No Model.)



Witnesses :

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PROCESS OF MAKING SULFURIC ACID.

SPECIFICATION forming part of Letters Patent No. 659,236, dated October 9, 1900.

Application filed December 14, 1899. Serial No. 740,297. (No specimens.)

To all whom it may concern:

Be it known that I, ALBERT COLLOM JOHNSON, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Processes of Producing Sulfuric Acid; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in processes for producing sulfuric acid, whereby gaseous vapors confined within leaden chambers or towers may be precipitated or rapidly condensed by the introduction, through the aid of an electric induction-coil, of an electrical current producing an endless series of sparks causing concussions.

In carrying out the present invention it is my purpose to provide a sulfuric-acid chamber or chambers in which a number of electric-spark-producing points are introduced, suitable apparatus being provided to cause a succession of sparks to be produced in each revolution of a shaft and commutator having suitable electrical connection with alternating switches and electric battery and induction-coil.

My invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, and in which drawings—

Figure 1 is a side elevation of a sulfuric-acid chamber of ordinary construction, a portion of the wall being cut away to better illustrate the invention. Fig. 2 is a cross-sectional view through the shaft on which the commutator is mounted and showing the eccentrics mounted on said shaft. Fig. 3 is a detail view of a slight modification of a detail of the invention.

Reference now being had to the details of the drawings by letter, A designates a sulfuric-acid chamber of well-known construction, having the usual leaden lining, and, if necessary, a series of chambers may be con-

nected together with suitable communicating passage-ways. At various locations in the chamber or chambers may be disposed apertures, which are closed by means of cups or lutes B to prevent the escape of gas. Secured to each of said cups are two short lead pipes C, which pipes pass through the cups and secured by burning to their under sides. Through these lead pipes glass tubes D pass, the lower ends of said glass pipes being bent at right angles and toward each other in pairs. Passing through said glass tubes are copper wires E of suitable size and are provided with platinum tips F, which are a sufficient distance apart to give the required electric spark when the apparatus is connected to a source of electrical supply.

K designates a battery or dynamo, which ever may be desired to be used to generate the primary electric current.

K' designates the negative pole of the battery, and K² the positive pole of the battery or dynamo.

M is an induction-coil, made with the most suitable wire to give a long spark and considerable report or detonation. The poles of the coil are designated by letters N and N', respectively. The vibrator O is connected to one end of the primary coil Q, and also connected to said primary coil is a wire P. The other end of the latter is connected to the positive pole of the battery or dynamo.

Mounted at any suitable location is a switchboard R, having three switches R', R², and R³. It will be understood that as many of the switches may be provided as it is found necessary, the number depending on the number of pairs of platinum points it is desired to place within the chambers in which the acid is held in a gaseous form and which is precipitated by the concussion caused by the explosions. In the drawings I have shown only three of the switches, which are sufficient for the proper illustration of the invention. Mounted horizontally is a shaft S, which has connection with a gear-wheel S', which meshes with a gear-wheel S², rotating with said shaft. A drum S³, mounted on a suitable shaft in the supports S⁴, has wound about its circumference a rope T, to which a weight T' is secured. This rope, with its

weighted end, may be wound up in any suitable manner, and the rotation of the shaft S is caused by the unwinding of said rope.

Secured to the opposite end of the shaft S is a commutator U, properly insulated from the shaft, and it is provided with a number of segments of copper, also insulated from one another. W W are two copper brushes, having their free ends bearing upon the circumference of the commutator. Keyed to the shaft S are three eccentrics V, V', and V², and the straps of the eccentrics are connected to wood or hard-rubber rods Y, which in turn are pivoted to the blades X of the switches. In the drawings, Fig. 2, is shown the blade connected to the eccentric V in a closed relation, while the other two blades are open, but are alternately closed and opened as their respective eccentrics revolve with the shaft S. Each switch is connected by a wire J to the wire J', which latter is connected to the pole N' of the induction-coil. Wires G are connected to the opposite ends of the switches and run to suitable binding-posts H, to which the upper ends of the copper wires mounted in the glass tubes D are fastened. Leading from the pole N of the induction-coil is a wire I, and electrical connections I' are made between said wire I and the second copper wire of each pair which are mounted in the glass tubes.

In Fig. 3 I have shown a tube Z, which extends through an aperture Z' in the cover B and has an aperture in its lower end opposite the points F and between which the electrical current passes through the air and in passing causes a spark. Through this pipe Z it is my purpose to introduce oxyhydrogen gas, which will be exploded by the electrical spark, thus expediting the precipitation of the vapors.

In operation when the connections are made, as before described, the shaft S is started and the eccentrics V, V', and V² in succession will open and close the three switches, causing a current to pass through each pair of copper wires with platinum points, and the

current jumping across the space between said points will cause a spark. It will thus be seen that a continuous series of sparks are being produced alternately at each pair of platinum points, thus causing a series of concussions, which has the effect of precipitating the acid held in suspension in a vaporous form and also makes a circulation compelling more of the acid particles to come in contact with the sides, top, and bottom of the chamber. This passage of the spark seems to have some effect of an ozonizing nature on the oxygen, which causes the steam H₂O and the sulfur gas SO₂ to unite with the other necessary atom of oxygen to form sulfuric acid H₂SO₄. As the shaft continues to revolve the switches R', R², and R³, as before stated, open and close, producing a continued series of sparks. The knives of the switches are so arranged that as each closes before the brushes W come into contact with the segments of the commutator and the brushes are off the segments before the switch is open there is no sparking outside the chamber.

Having thus described my invention, what I claim to be new, and desire to secure by Letters Patent, is—

1. The process previously described of producing sulfuric acid, consisting in introducing a series of electric sparks within a tower or gas-chamber containing vaporous sulfuric-acid gas, whereby the acid-laden moisture held in suspension may be precipitated.

2. The process previously described of producing sulfuric acid consisting in causing a series of electric sparks within a chamber containing vaporous sulfuric-acid gas, and introducing oxyhydrogen gas, which is exploded by the electric sparks, whereby the acid-laden particles of moisture may be precipitated.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT COLLOM JOHNSON.

Witnesses:

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