

No. 704,412.

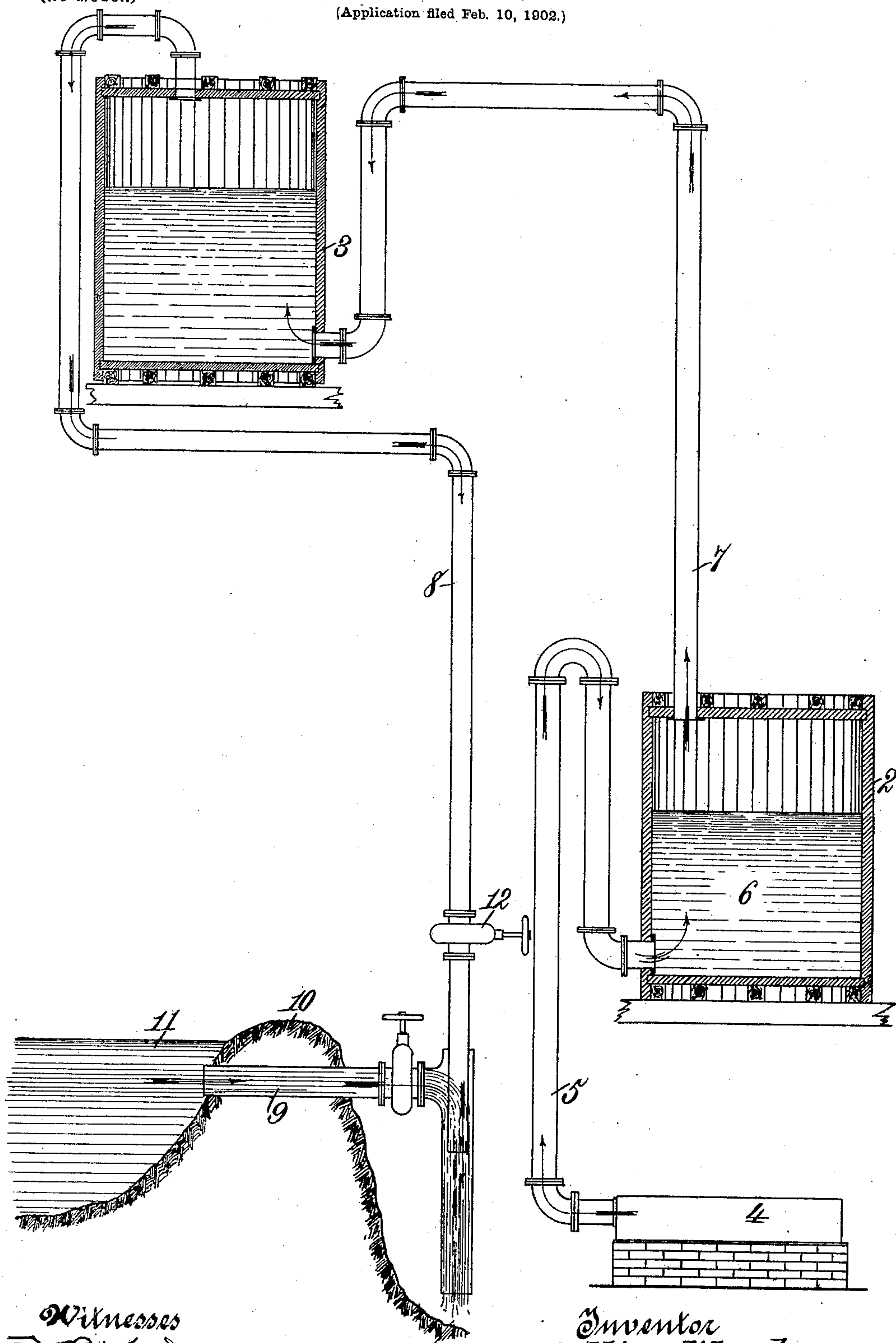
Patented July 8, 1902.

W. WENZEL.

APPARATUS FOR MAKING SULFUROUS ACID.

(No Model.)

(Application filed Feb. 10, 1902.)



Witnesses
J. B. Keeler
Robert Everett

Inventor
William Wenzel,
By James L. Norris, Atty

UNITED STATES PATENT OFFICE.

WILLIAM WENZEL, OF APPLETON, WISCONSIN.

APPARATUS FOR MAKING SULFUROUS ACID.

SPECIFICATION forming part of Letters Patent No. 704,412, dated July 8, 1902.

Application filed February 10, 1902. Serial No. 93,413. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WENZEL, a citizen of the United States, residing at Appleton, in the county of Outagamie and State of Wisconsin, have invented new and useful Improvements in Apparatus for Making Sulfurous Acid, of which the following is a specification.

This invention relates to an apparatus for making sulfurous acid.

The invention is clearly shown in sectional elevation in the accompanying drawing, forming a part of this specification.

The apparatus shown in said drawing includes in its construction a plurality of vacuum-tanks connected by a suitable piping, a sulfur-burner or equivalent device connected by piping with the primary tank, an ejector, and piping connected with the secondary tank and ejector, respectively. I pass through the ejector a body of water, which exhausts the air from the respective tanks, and hence draws the sulfur fumes through the liquid contained in the tanks to thereby facilitate the making of the acid. The stream of water which is passed through the ejector can be secured in any suitable manner—for example, by damming up a river or stream or in any other suitable way.

Referring now to the drawing, the numeral 2 indicates the primary tank of an acid-manufacturing apparatus, and 3 the secondary tank, they being shown as situated in superposed planes, although, of course, this is not essential, and in like manner while two of them are shown this is not necessary, for the number may be increased or one of them may be dispensed with without departing from the spirit of the invention.

A sulfur burner or furnace of some suitable type is shown diagrammatically at 4, it being situated under the primary tank 2, and the sulfur-burning pan having a pipe, as 5, connected therewith, said pipe extending upwardly and then downwardly, the upper part thereof being thereby substantially of inverted-U shape and the inner leg of the U being connected with the tank 2 at or near the bottom thereof. As the pipe 5 affords a communication between the burner 4 and primary tank 2, the fumes from the sulfur can pass from said burner and into the said

tank and be passed through the liquid 6 in said tank, and the sulfur-laden air after passing through the liquid 6 is drawn from the secondary tank 3 by a vacuum-pump, hereinafter more particularly described, it passing from the tank 2 into the pipe 7, the lower end of which is fitted into the top of said tank 2, while the upper end of said pipe 7 is connected with the secondary tank 3 at or near the bottom thereof.

The two tanks or vats 2 and 3 may be of any suitable construction and may be supported in any convenient manner.

A suction-pipe 8 is connected with the top of the secondary vat 3 and coöperates with a vacuum-pump, which I will now proceed to describe, and said pump serves by exhausting the air from the upper tank to more rapidly draw the sulfurous air through the respective tanks 2 and 3 to hasten the manufacture of the acid.

The vacuum-pump includes in its organization an ejector, as 9, and said ejector is shown as being of angular or substantially L form, and I pass a body or stream of water through the ejector, and as the suction-pipe 8 is connected with said ejector, as will hereinafter appear, the result will be that on the passage of the stream in the manner hereinafter indicated the air from the respective vats 2 and 3 will be exhausted. As a means for securing a stream of water through the ejector I dam up a stream of water, the dam being denoted by 10, and the horizontal leg or branch of the ejector is passed through the dam or embankment 10 with its open end in position to receive a stream of water from the supply 11, such stream passing through the vertical leg or branch of said ejector. It will be remembered that the suction-pipe 8 is connected with the secondary tank 3 and extends downwardly therefrom, and its lower end is inserted into the vertical branch of the ejector and is projected a suitable distance therein, and it will be seen that the suction-pipe is of less external diameter than the internal diameter of said vertical leg, so that the water can circulate around the lower end of said suction-pipe. It will be understood, therefore, that as the stream of water flows through the ejector it serves to draw off the air from the secondary tank 3, and as said secondary

tank is connected with the primary tank the sulfurous air will be rapidly drawn from the burner 4, through the primary tank and also through the secondary tank by means of the hereinbefore-described pipes, the arrows showing the course of the air and water, respectively. I provide means for regulating the size of the stream of water passing through the ejector and also for regulating the amount of air exhausted from the acid-making apparatus. The suction-pipe 8 at a suitable point above the ejector 9 is provided with a valve 12, which may be operated by hand, so as to regulate the amount of air exhausted, while the horizontal branch of the ejector is equipped with a similar valve 13, which can be manipulated to control the volume of water passing through the ejector. The water after it passes from the ejector may be disposed of in any suitable manner—for example, it may be pumped back into the stream or initial source of supply 11.

While I have shown only one suction-pipe 8, the invention is not limited in this respect, for a series of them may be employed, if necessary.

Ordinarily vacuum-pumps are employed to draw the sulfur-laden gases through the liquid in the tanks; but an objection to these is that they require power to operate them and also wear on the belts and gearing. Gases also attack the cylinders and piston-heads and soon wear them out, and as these parts are all made of bronze considerable expense follows the use of such vacuum-producing apparatus. By the use of a hydraulically-controlled air-exhausting device as contemplated by my improvement, and one simple form of which has been hereinbefore described at length, these objections are

wholly overcome, and any of the fumes which are drawn down to the ejector cannot injure the same, as such fumes are so diluted by the water passing through the ejector as practically to cause no harm to the parts.

Having described the invention, what I claim is—

1. In an apparatus for making sulfurous acid, the combination with a tank, of a sulfur-burner communicating with said tank, an angular ejector one leg of which is horizontally disposed and the other leg of which is vertically disposed, the ends of the legs being open, means for passing a stream of liquid through the open end of the vertical leg, and a suction-pipe connected with said tank and inserted into the vertical leg of the ejector, the lower end of the suction-pipe being situated below the horizontal leg of the ejector and being of less external diameter than the internal diameter of the vertical leg of said ejector and the latter being arranged to deliver the water away from said tank.

2. In an apparatus for making sulfurous acid, the combination of a plurality of tanks, piping connecting said tanks, a sulfur-burner, piping connecting said sulfur-burner with the primary tank, an ejector, means for passing a body of water through said ejector, and a suction-pipe connected respectively with the secondary tank and the ejector, and the latter being arranged to deliver the water away from said secondary tank.

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

WILLIAM WENZEL.

Witnesses:

AUGUST NITSCHKE,
LILLIAN LEIDGEN.