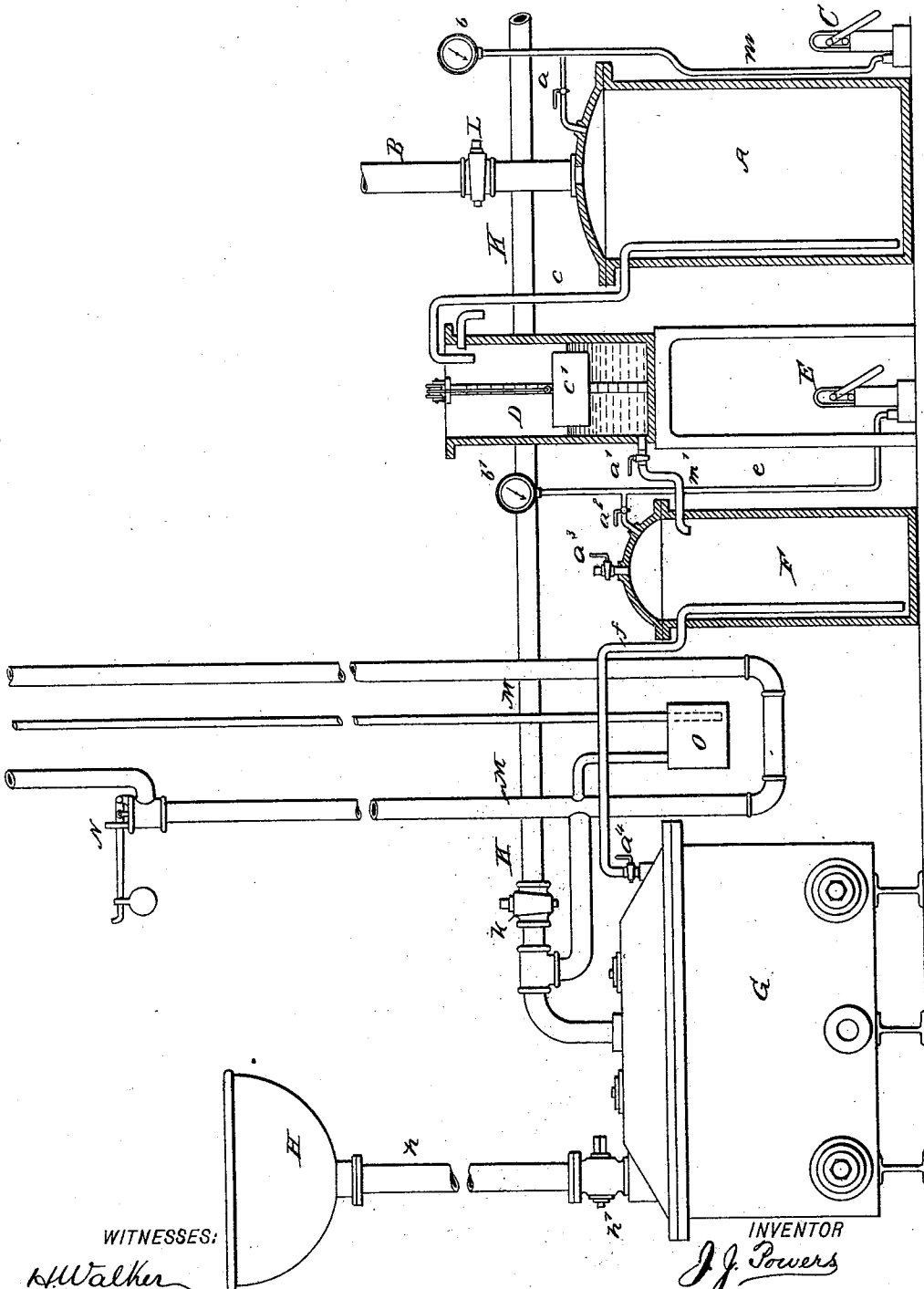


(No Model.)

J. J. POWERS.
APPARATUS FOR MAKING CHLORIN.

No. 544,119.

Patented Aug. 6, 1895.



WITNESSES:

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APPARATUS FOR MAKING CHLORIN.

SPECIFICATION forming part of Letters Patent No. 544,119, dated August 6, 1895.

Application filed April 11, 1895. Serial No. 545,379. (No model.)

To all whom it may concern:

Beit known that I, JAMES JEROME POWERS, of the town of Cortlandt, in the county of Westchester and State of New York, have invented a new and Improved Apparatus for the Manufacture of Chlorin Gas and Similar Substances, of which the following is a full, clear, and exact description.

The invention relates to improved apparatus for the manufacture of chlorin gas and similar substances, in which a substance has to be treated by an acid, and in which it is desirable to measure the acid used in order to secure a proper proportion of weights or volumes. It also provides a safety appliance to prevent any explosion, and a measuring device, the whole working in combination to carry out the chlorin-making process.

Reference is to be had to the accompanying drawing, forming a part of this specification, which is a view of the entire apparatus, partly in section and partly in projection.

A represents a closed vessel having an imperforate lower portion made of homogeneous acid-resisting material for receiving the acid and communicating by a pipe B with the source of acid. Such pipe may conveniently run outside of the building, so as to receive the acid without its being carried within the building, or it may run to any proper place. The pipe B is provided with a valve L. Connected with the vessel A is a pump C, connecting with the vessel by a pipe *m*, as shown. Upon said pipe is a valve *a*, while a pressure-gage *b* is connected thereto also, in order to indicate the pressure of air.

Acid is run into the tank or vessel A and the valve L is closed. If the pump be operated, air will be forced into the vessel and the acid will escape under the pressure by means of the pipe *c*. This pipe *c* leads into a measuring-tank D, provided with a float *c'*, connected with a cord and index and scale, so that the amount of acid in the tank can be determined by inspection. This is the measuring device.

From the measuring-tank D a pipe *m'*, with a valve *a'*, runs to a second pressure-tank F, having an imperforate lower portion made of homogeneous acid-resisting material. This tank is provided with a pump connection consisting of a pump E, pipe *e*, pressure-gage *b'*,

and faucet *a''*. At its summit it is also provided with a cock *a'''*, which may be used for letting off the pressure, if desired. From this tank F a pipe *f* runs, provided with a valve *a''''*, to the generating tank or still G. A pipe *h* is connected with the still G, said pipe having a cup H at its upper end, and is provided near its connection with the still with a valve *h'*.

In the manufacturing process a mixture of manganese oxid and salt or other chemicals is introduced by means of the cup H and pipe *h* through the valve *h'*, into the still G. By operating the pump E acid from the tank F is forced into the generating tank or still G.

The outlet-pipe K of the generating-tank G is provided with a valve *k*, which can be closed, if desired. Back of the valve *k* a connection is made to the safety-column M. This is a U-shaped pipe connection containing water or other liquid in its bottom, so as to act as a hydraulic valve, while as an additional protection a safety-valve N of the usual construction is placed upon one of its heads. Should the valve *k* be accidentally closed or should any other stoppage occur in the delivery-pipe there would be no danger of an accident, because the gas would get out through the water-seal at the bottom of the safety-column, and if the water-seal should be frozen or otherwise stopped the safety-valve N would operate and permit the escape of the gas. In order, however, to indicate the pressure there is connected to the safety-column a pressure-gage O of the usual construction, consisting of a sealing-tank containing water, whence a glass tube rises, on which the height of the column can be read off. Such tube is advantageously carried up to the roof of the building into the open air, its prolongation being, of course, of metal to insure cheapness of construction, only enough being made of glass to give the possible range of pressures.

The operation is as follows: The tank A is first charged with acid and the valve in the pipe B is closed. By working the pump C, the valve *a* being open, air is forced into the tank and a corresponding quantity of acid flows into the measuring-chamber D. When the measuring-chamber is full the operation of the pump C is stopped. Now the desired quantity of acid is run into the tank F, the measuring-tank being employed to determine

how much is introduced. When the proper quantity is introduced, the valve a^3 is opened to permit air to escape. When the proper quantity has been introduced into the tank F, the valves a^3 and a' are closed, the valve a^2 is opened, and the pump E being worked air is forced into the tank. Such air is compressed and its pressure may be read off on the gage b' , and, if desired, a high pressure can be given to it, provided the valve a^4 is closed, or the valve a^4 may be left open, so that the acid will leave the tank F as air is pumped in. It will be seen that this provides two modes of operation. The tank F may be charged with compressed air above the acid, so that the valve a^4 , being opened from time to time, will admit the acid as desired to the generating tank or still G, or the valve a_1 may be left open all of the time, in which case as fast as air is pumped into the tank F acid will escape therefrom into the still G.

The other steps of the process are those used in the regular generation of chlorin.

The advantage in thus dealing with the acid is that it is measured and transferred to the generator without being seen or touched by the operator, and all liability to injury of person or property is thus prevented.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In apparatus for the manufacture of chlorine gas, the combination of a storage tank for acid constructed to resist pressure, an open top measuring tank connected by a pipe with the storage tank, means for forcing air into the storage tank, to cause the transfer of acid from the storage tank to the measuring tank, a pressure tank for receiving acid discharged by gravity from the measuring tank, means for creating an air pressure in the pressure tank, and a generating still connected by a pipe with the pressure tank, substantially as specified.

2. In apparatus for the manufacture of chlorine gas, the combination of acid storage and pressure tanks having imperforate lower portions made of homogeneous acid resisting material, an open top measuring tank, a generator, and means for transferring acid from the storage tank to the measuring tank and from the pressure tank to the generator, substantially as specified.

3. The combination of the pressure tanks A and F, measuring tank D, still G and safety column M, with a safety valve N, substantially as shown and described.

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Witnesses:

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