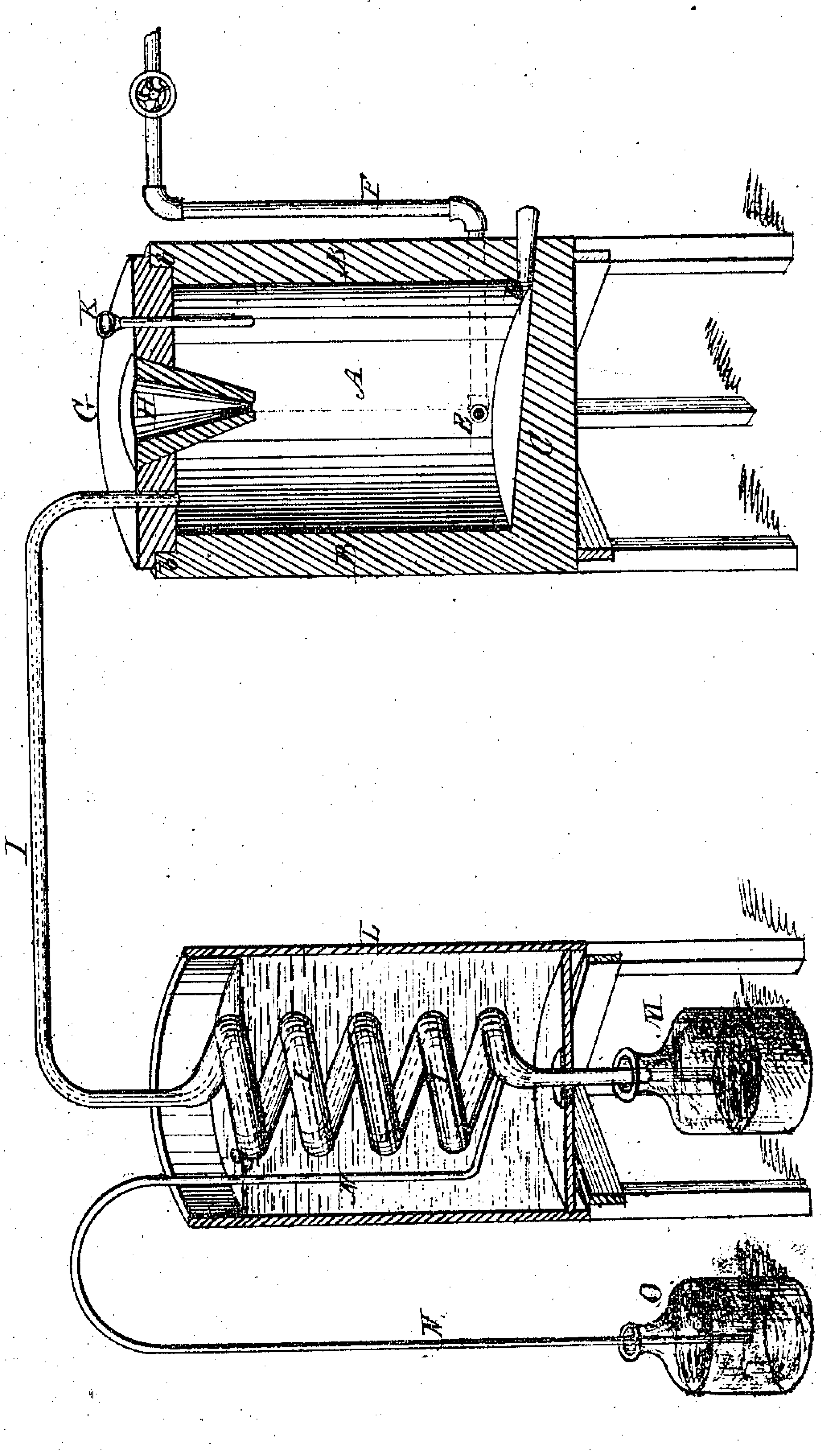
Stieren & Nisbet.

Bromine App's.

No. 103,253. Patented May 17. 1870.



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United States Patent Office.

HERMANN STIEREN, OF MASON, WEST VIRGINIA, AND WILLIAM A. NISBET, OF NATRONA, PENNSYLVANIA.

Letters Patent No. 103,253, *dated May* 17, 1870.

IMPROVEMENT IN APPARATUS FOR THE PRODUCTION OF BROMINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, HERMANN STIEREN, M. D., of Mason city, in the county of Mason and in the State of West Virginia, and WILLIAM A. NISBET, of Natrona, in the county of Allegheny and in the State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for the Production of Bromine; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which is shown a vertical central section of our improved apparatus.

Our invention is an improvement in apparatus for producing bromine, iodine, &c., from bittern or the mother-water of the salines, and

It consists, principally, in constructing the whole retort from sandstone, or its equivalent, for the purpose hereinafter set forth.

It also consists in the peculiar shape of the retort and of the cover inclosing the same, as is hereinafter shown.

It also consists in the arrangement of the steam-pipe with reference to the bottom of the retort, substantially as hereinafter shown and for the purpose set forth.

It finally consists in the peculiar construction of the leaden condenser, as is hereinafter specified.

In the annexed drawing—

A represents a hollow cylindrical vessel or retort, cut from a solid block of moderately fine sandstone, and having any desired size or capacity, although we preferably construct it so as to contain from eighty to one hundred gallons, in which case the retort would have a height of from three and a half to four feet, and a diameter, over all, of about three feet, the walls B being six inches thick, and its bottom C averaging about seven and one-half inches thick.

The bottom C inclines downward to one side of the retort at such an angle as to give it at the upper side a thickness of about nine inches, and at the lower side about six inches, at the latter of which points, is provided an opening, D, for the emission of the exhausted bittern.

A second opening, E, extends horizontally through the wall of the retort about one inch above the bottom, midway between its highest and lowest points, which opening serves for the introduction of the steam-pipe F.

G represents a sandstone cover inclosing the top of the retort, which, as shown in the drawing, is provided with a right-angled groove, *b*, extending around the inner corner of the wall B, into which said cover is caused to fit, and upon which it rests. The cover is secured in place, and a gas and steam-tight joint produced, by means of cement, plaster of Paris, or, better still, blue clay softened with bittern.

Passing downward through the center of the cover G, is a conical opening, which serves to contain a sandstone funnel, H, corresponding in size and shape therewith, and projecting through the cover so as to bring its upper or large end flush with the upper surface of the same.

Upon each side of the funnel H, midway between the same and the wall of the retort, is an opening passing vertically through the cover, one of which has a diameter of about one and a half inch, and serves to admit the inner end of the leaden cooler or condenser I, while the opposite opening, having a diameter of three-fourths of an inch, receives the end of a glass tube, K.

As seen in the drawing, the condenser I extends vertically upward through the cover G, from thence horizontally across to a point above the center of the vessel L, and from thence, extending downward within the same, has the usual spiral form, its lower end passing through the bottom of said vessel, L, and terminating within a jar, M, which serves as a receiver for the bromine.

The condenser I is formed of lead, and experience has proved that it is most liable to corrosion at the point where the bromine is transformed from a gaseous to a liquid state, or within the cold water contained within the vessel L. In order to guard against such corrosion, and render the condenser uniformly durable, the thickness of its walls is increased from three-eighths to three-fourths of an inch, from the point where it enters the cold water within the vessel L to a point immediately above the bottom of said vessel.

At a point a few inches above the bottom of the vessel L is connected to the condenser I a smaller pipe, N, which from thence passing upward through the vessel L, curves downward, and terminates within a vessel, O, containing soda or potash liquor, and permits the escape from said condenser of air and other gases which are absorbed by the contents of said vessel.

The especial advantages possessed by these improvements, are—

First, by constructing the retort, cover, and funnel of the same material, (sandstone,) a uniform durability of the parts is secured, and a large saving in the usual cost for repairs results.

Second, the increased bearing-surface between the cover and retort renders more easy the production of a tight joint, it being only necessary to apply to said surfaces a thin coat of plaster of Paris, or of slate-blue clay mixed with bittern, to accomplish the desired result, by which means, a considerable sav-

ing is obtained over the common method of laying the cover upon the retort, and plastering up the cracks with mud, as, by the latter method, much bromine escapes in a gaseous state and is lost.

Third, the form of the retort renders more even and thorough the distribution of heat within the same, and, consequently, greatly facilitates the decomposition of the bittern, and the production of bromine, in addition to which the vessel is much stronger, and can be made much lighter than would be possible if of another form.

Fourth, the incline bottom of the retort, in connection with the position of the inlet for steam, greatly facilitates the removal of the exhausted bittern and other refuse, so that it is but seldom necessary to remove the cover, and, consequently, interrupt the operation of the apparatus.

Fifth, the form of the condenser-pipe greatly increases its durability, without materially increasing its cost.

Having thus fully set forth the nature and merits of our invention,

What we claim as new, and desire to secure by Letters Patent, is—

The employment of a retort for use in the production of bromine, when all of its parts are constructed of sandstone, substantially as shown and set forth.

Also, the cylindrical retort A, provided with the sloping bottom C, substantially as and for the purpose specified.

Also, the cover G, corresponding with and fitting into and upon the upper end of the retort A, substantially as shown and described.

Also, the relative arrangement of the bottom C of the retort A, and of the steam-pipe inlet E, substantially as and for the purpose set forth.

Also, the lead condensation-pipe I, constructed in the manner and for the purpose substantially as hereinbefore specified.

In testimony that we claim the foregoing, we have hereunto set our hands this 27th day of April, 1870.

HERMANN STIEREN, M. D.
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Witnesses:

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