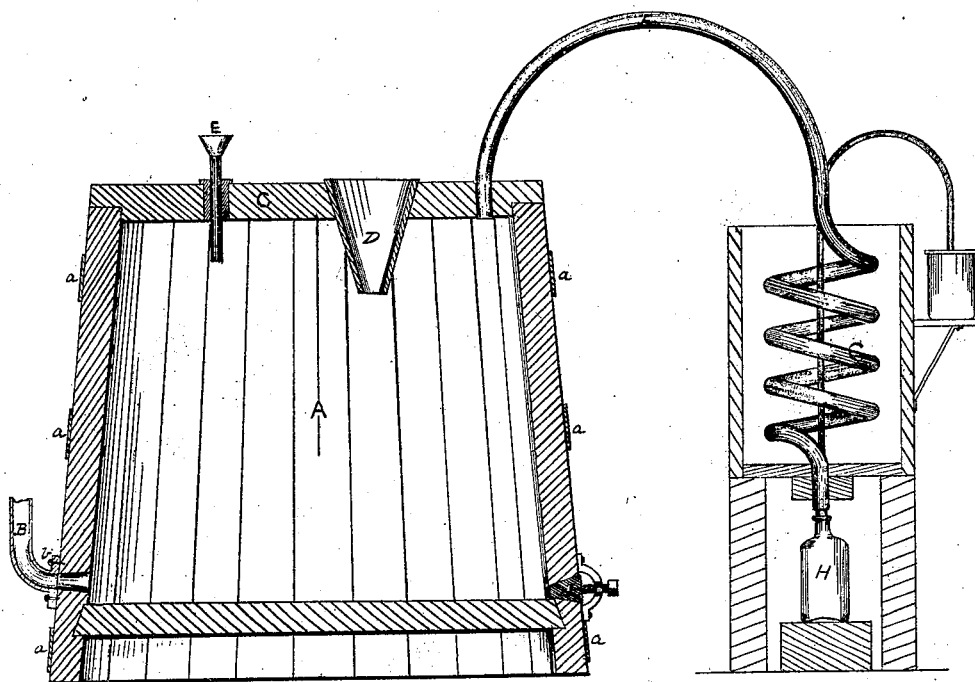


*J. J. Suhler,*

*Manf. Bromine.*

*No. 110662,*

*Patented Jan. 3. 1871.*



*Witnesses:*

*R. C. Wrenshall*

*E. C. Fitter*

*Inventor:*

*John J. Suhler*

*by his attorneys*

*Bakewell & Christy.*

# United States Patent Office.

JOHN J. JÜHLER, OF NATRONA, PENNSYLVANIA.

Letters Patent No. 110,662, dated January 3, 1871.

## IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE 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 I, JOHN J. JÜHLER, of Natrona, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for the Manufacture of Bromine; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing forming part of this specification, which represents apparatus for manufacturing bromine, with the still which forms the subject of my invention shown in section.

My invention or discovery consists of a still or stills, made of wood, for the extraction of bromine from the mother-water of salines and other substances yielding bromine.

Hitherto, in the manufacture of bromine, the stills used for extracting that substance have been made chiefly of sandstone or of lead, or at least lined with lead.

The employment of these materials has been supposed to be indispensably necessary, owing to the fact that the bromine rapidly attacks and destroys most of the metals forming bromides, and thus rendering stills made of iron, copper, or other ordinary material utterly useless for the purpose.

Bromine forms a chemical combination with lead less rapidly than with iron or copper and most other metals, and hence has been much used for vessels employed in making bromine, but even this metal is attacked and destroyed by the vapors of bromine formed in the process of distillation, which attack all metals more speedily than does bromine in a liquid state.

Vegetable substances, being speedily charred by the action of bromine, have been supposed to be entirely inapplicable as materials of which to make stills or other vessels to be used in manufacturing bromine; but I have discovered that, when the stills are made of wood, without any lining of lead, the effect of the bromine on the wood is to char it to a certain depth, varying with the kind of wood used, and that then the destructive action of the bromine ceases, or becomes so slow as not practically to prevent the employment of wood for the purpose stated.

The kind of wood to be used may be varied at pleasure, the harder sorts, such as oak and chestnut, being preferred.

The stills may be made of any suitable and convenient size and shape, according to the process and apparatus desired to be employed; and they may be conveniently heated by the introduction of naked steam, or by coils of steam-pipe made of lead or otherwise, as may be desired.

They may also be surrounded or incased externally with iron, lead, or other material, to give them strength; although I prefer to use simply wooden vessels made of staves bound together by iron hoops or bands.

In the accompanying drawing—

A represents the still made of staves of wood about three or four inches in thickness.

The form is that of a frustum of a cone, so as to be more readily bound together and rendered steam and water-tight by driving down the iron hoops or bands *a a*.

The joints between the strips or staves may be calked with oakum, and further made tight at all the joints by means of any suitable cement, such, for instance, as asphaltum, made from the residuum of the distillation of petroleum.

Common clay, made into a paste with hot bitter-water, may also be used as a luting for the joints and for the cover of the still.

The steam-pipe B, for introducing steam into the still, is inserted at one side of the vessel A near to the bottom, and may be fastened by a leaden flange, *b*, attached to the pipe, and fastened to the outside of the still.

The top or cover C of the still, also made of wood, has a hole for the insertion of a stone-ware or glass funnel, D, which is long enough to extend below the surface of the fluid contents of the still, and which serves for the introduction of the bitter or mother-water, from which the bromine is to be extracted, and the sulphuric acid and oxide of manganese or other chemicals used in the process.

A glass tube, E, is also inserted through the cover C for the admission of the chemicals during the process.

A leaden pipe, F, also inserted into the cover of the still, but not extending down below its under surface, carries off the bromine vapors to the refrigerating apparatus G, constructed in the usual manner, with a receiver, H, below to hold the condensed bromine.

A plug, I, near the bottom, closes an aperture for removing the residuum and cleaning out the still.

The process of extracting the bromine may be any which is ordinarily known and used, my improvement being confined to the use of wooden stills, or stills having an interior wooden vessel or wooden lining.

The advantages of my improvement over the use of stills of lead or lined with lead, are that the lead is more or less rapidly destroyed by the action of the bromine, while the wood, after charring to a small depth, resists, to a great degree, the further destruc-

tive action of the bromine; and the advantage of the use of wood, instead of either lead or sandstone, is the very great cheapening of the apparatus employed.

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

Stills, for the manufacture of bromine, made of wood, or with an interior lining of wood, substan-

tially as hereinbefore described, and for the purpose set forth.

In testimony whereof I, the said JOHN J. JÜHLER, have hereunto set my hand.

JOHN J. JÜHLER.

Witnesses:

R. C. WRENSHALL,

E. C. FITLER.