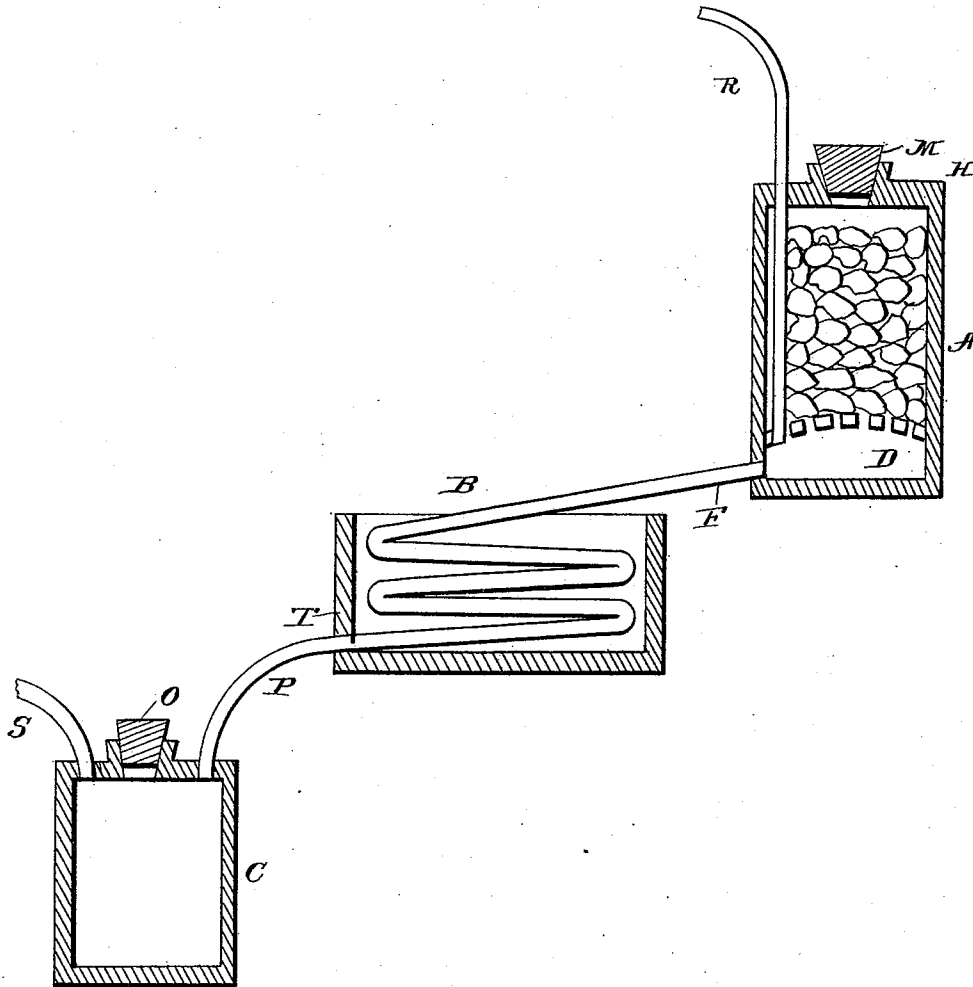


(No Model.)

A. SOMMER.  
PROCESS OF MAKING LIQUID CHLORIDS.

No. 523,715.

Patented July 31, 1894.



Witnesses:  
*J. M. Fowler Jr*  
*Wallace Mumdock*

Inventor:  
*Rudolph Sommer*  
By *Charles Chund*  
his Attorneys.

# UNITED STATES PATENT OFFICE.

ADOLPH SOMMER, OF BOSTON, MASSACHUSETTS.

## PROCESS OF MAKING LIQUID CHLORIDS.

SPECIFICATION forming part of Letters Patent No. 523,715, dated July 31, 1894.

Application filed April 22, 1892. Serial No. 430,279. (No specimens.)

### *To all whom it may concern:*

Be it known that I, ADOLPH SOMMER, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Process of and Apparatus for Making Liquid Chlorids from Solid Substances; and I do hereby declare the following to be a clear, full, and exact description of the invention.

In the manufacture of liquid chlorids from solid substances, such as sulfur, antimony, arsenic, tin, it has been customary to place the solid substance in an ordinary glass or earthenware vessel,—then to conduct the chlorin by means of a tube protruding over the upper edge of the vessel and hanging or standing in a vertical or slanting position, into the bulk of the solid substance, until the whole or the greater part of the substance has been converted into the liquid chlorid desired,—and finally to separate any remaining unchloridized or insufficiently chloridized portion by decantation and distillation. Owing to the liberation of a large amount of heat in this reaction, which being retained causes a considerable portion of the liquid chlorid to evaporate whenever the reaction becomes energetic, it has heretofore been impossible to operate in this manner with a strong current of chlorin upon large quantities of material. Other disadvantages of this method are: that it requires the chlorin to be kept or liberated under considerable pressure, in order to overcome the column of liquid chlorid accumulating in the chloridizing vessel, thereby increasing the danger of leakage and loss of chlorin, and that it necessitates a separate operation, generally distillation, in order to free the product from such portions of the original substance as have either not combined at all with chlorin or united only with an insufficient amount thereof. These defects I have overcome in the following manner:

I employ an apparatus illustrated in the accompanying drawing, which is constructed of glass, earthenware, lead or any other material capable of resisting the action of both chlorin and the chlorid to be produced, and which consists, in the main, of a chloridizing vessel A, a cooler B, and a receiver C. These parts are placed in such a position with respect to each other that A occupies the highest, B an intermediate and C the lowest elevation.

Chloridizing vessel A is provided a short distance from its real bottom, with a perforated false bottom D and, at some point between the false and real bottom, with an outlet F.

Other, though not essential attachments to vessel A are: pipe R extending from the space between the false and real bottom somewhat beyond the upper edge of A, and cover H with opening M.

Outlet F is connected with the upper end of cooler B, the body of which stands in a tank of water T. The lower end of cooler B is connected through pipe P with the upper part of the closed receiver C which is further provided with pipe S and opening O.

The manner in which this apparatus may be used is two-fold. After the space above the false bottom in vessel A has been filled with lumps or coarse pieces of the substance to be chloridized a chlorin generator or some other apparatus furnishing a supply of chlorin is connected either with pipe S or with pipe R. In the former case opening O and pipe R should be closed and opening M left open, in the latter case opening M should be closed and either opening O or pipe S left open. If connection has been made with S, the chlorin passes into the closed receiver C, thence through pipe P into cooler B, and thence through pipe F into vessel A, which it enters underneath the false bottom D. Ascending through the holes in the false bottom it comes in contact with the substance to be chloridized, and combining therewith forms the liquid chlorid. If connection has been made with pipe R, the chlorin passes first into the space between the false and real bottom of vessel A, then partly descends through outlet F into cooler B and finally into receiver C, and partly ascends through the holes of the false bottom and combines, as in the first instance, with the solid substance.

The liquid chlorid, which forms in either case at the point where the ascending body of chlorin comes in contact with the solid substance to be chloridized, drops, as rapidly as formed, through the false bottom, then runs through outlet F into cooler B and finally through pipe P into receiver C. In thus traversing the apparatus continuously in contact with an abundance of chlorin any unconverted or insufficiently chloridized particles

of the substance which, whether dissolved or suspended, are carried along by the liquid chlorid in its downward course to the receiver are soon acted upon and perfectly chloridized.

5 With a cooler having ample surface for cooling the liquid chlorid and for exposing it to the action of chlorin gas, the liquid chlorid, which is generally hot and impure when it enters the cooler, reaches the receiver both  
10 cool and free from unconverted or insufficiently chloridized particles of the original substance. But if the cooler is deficient in length or does not spread out the liquid sufficiently to enable it to take up a sufficient  
15 amount of chlorin, the absorption of chlorin continues in the receiver.

If the liquid chlorid accumulating in the receiver is withdrawn occasionally through opening O, and a continuous supply of chlorin is provided, the operation may be carried  
20 on without interruption by simply recharging from time to time vessel A with the substance to be chloridized.

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

1. The herein described improvement in the process of making chlorids from solid sub-

stances consisting in forming the liquid chlorid from the solid substance by exposure to  
30 chlorin and separating the liquid chlorid from the solid substances by draining away the liquid as rapidly as it is formed, without previous volatilization; substantially as described.

2. The herein described improvement in the process of making chlorids, consisting in forming a liquid chlorid as before stated and subjecting the said liquid chlorid to the action of chlorin gas while flowing in a relatively  
40 thin stream to a receiver.

3. The herein described improvement in the process of making chlorids from solid substances consisting in forming the liquid chlorid from the solid substance by exposure to  
45 chlorin, draining away the liquid to a receiver as rapidly as it is formed without previous volatilization, and treating the liquid chlorid to the action of chlorin during its passage to the receiver; substantially as described.  
50

ADOLPH SOMMER.

Witnesses:

L. F. CLAR,  
E. M. WHITE.