

# UNITED STATES PATENT OFFICE.

FREDERICK WILLIAM DORN, OF NEW YORK, N. Y.

## IMPROVEMENT IN PROCESSES OF UTILIZING TINNERS' CLIPPINGS.

Specification forming part of Letters Patent No. 119,267, dated September 26, 1871.

*To all whom it may concern:*

Be it known that I, FREDERICK WILLIAM DORN, of New York, in the county and State of New York, have invented a certain new and useful Process for Utilizing Tinnners' Clippings, of which the following is a specification:

Tinnners' clippings consist of a superior kind of iron plate, partially alloyed with tin, according to Percy, to which a further quantity of tin adheres without being in combination with the iron plate. The amount of tin on the plate varies from three to ten per cent.

The object of my invention is not only to utilize the tin but also to make the iron marketable, which process I will now describe.

The chemical agents used by me for the separation of the tin from the iron is a mixture of muriatic-acid gas, hyponitric-acid gas, and steam, which, when brought in contact with the tin, form a muriate of tin, from which, if desired, the tin can easily be reduced to a metallic state, or otherwise utilized.

The apparatus used by me for carrying out this invention consists of one or more large chambers, which may be constructed of bricks, lined inside with a proper material; or it may be a wooden vat, fitted together tightly with tongue and groove. This vat may be either lined with copper sheets or coated with a mixture of pitch and tar, which I apply by means of a brush. This chamber or vat is to have several gratings inserted longitudinally, so as to be easily removed, at various distances between the top and the bottom. The scraps are first distributed over the lower grating, then the next one above is inserted, and the same process repeated until the receptacle is filled. Above the bottom is an empty space from one to six inches high, formed by a false bottom, perforated with holes five to ten inches apart, and covered with a copper gauze. On this a layer of clean quartz from one to three inches in thickness is spread.

There is a cover on the top of each of the receptacles, and a large side door, through which the clippings are removed when the process is completed.

The gases heretofore mentioned are prepared in separate retorts in the usual manner, which will be found described in works on technical chemistry, and conducted into the receptacle by means of pipes, while steam is conveyed into it at the same time. The gases are used by me in the proportion of from five to ten per cent. of hyponitric-acid gas to one hundred per cent. of muriatic-acid gas, and are mixed with an equal volume of steam.

By using this mixture the tin is not only removed without oxidizing the iron, but is more effectually separated and in a shorter time than by the use of pure muriatic-acid gas. But I will here remark that I may also make use of muriatic-acid gas and steam alone, though I prefer in general the gaseous mixture described above.

When the gas has been introduced into a receptacle and has been allowed to remain there sufficiently long to effect the separation of the tin from the iron, a jet of steam of ordinary pressure is introduced until condensation takes place, and this process is repeated until sufficient water has condensed to wash off the muriate of tin from the iron. After filtering through the layer of quartz the muriate of tin collects beneath it, and may then be drawn off.

Before discharging the contents of a receptacle the remaining gas is exhausted, by means of a ventilator, into another one, which has been previously filled in the manner described.

I claim as my invention—

1. The separation of the tin from tinnners' clippings or waste tin by means of a combination of muriatic and hyponitric-acid gas and steam, substantially as and for the purpose hereinbefore set forth.

2. The use of muriatic-acid gas and steam, substantially as and for the purpose hereinbefore set forth.

3. The alternate application of the gaseous mixture and steam, for the purposes set forth.

FREDERICK WILLIAM DORN.

Witnesses:

JNO. SCULLY,  
ALG. A. BESSE.