(No Model.)

C. A. STETEFELDT.

RETORTING AMALGAM.

No. 279,840. Patented June 19, 1883.

Fig. 2.

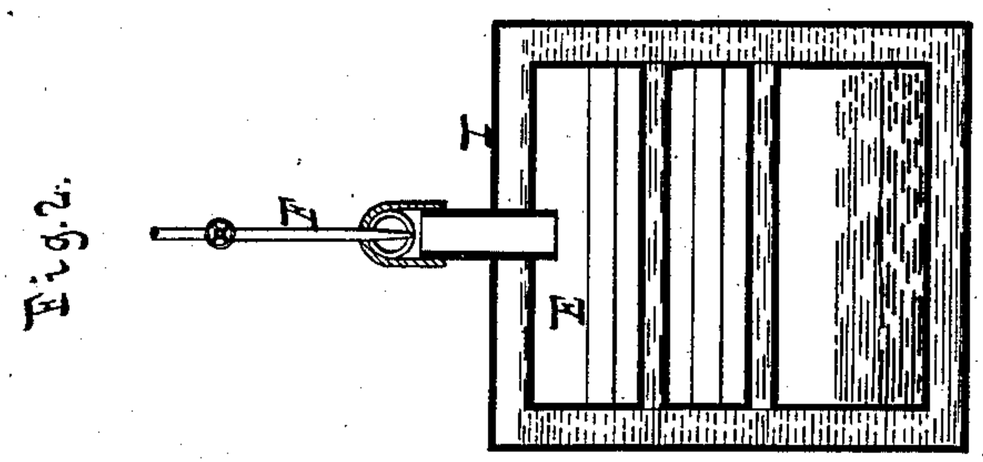
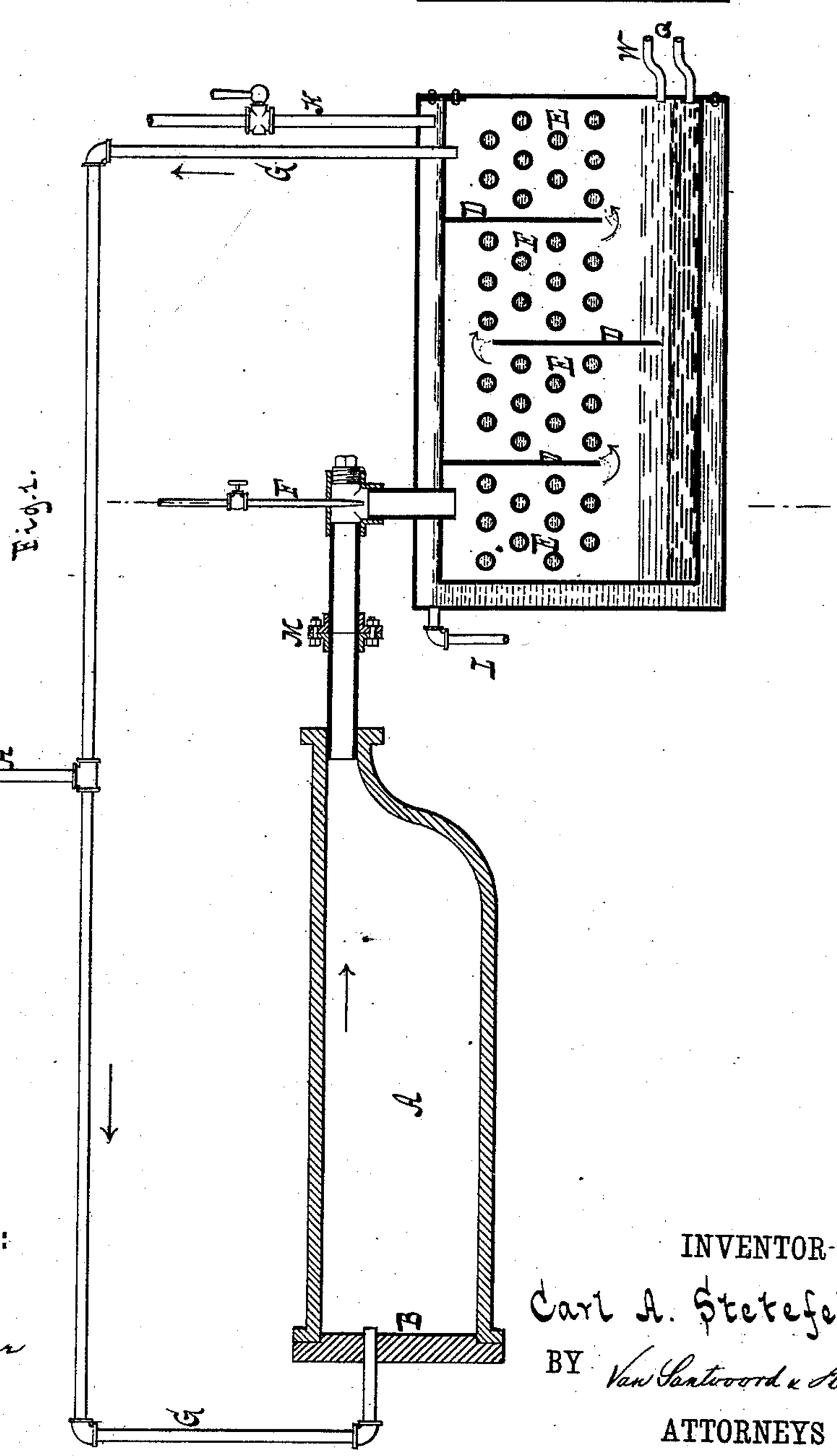


Fig. 1.



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RETORTING AMALGAM.

SPECIFICATION forming part of Letters Patent No. 279,840, dated June 19, 1883.

Application filed November 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, CARL A. STETEFELDT, a citizen of Germany, residing at New York, in the county and State of New York, have invented new and useful Improvements in Retorting Amalgams, of which the following is a specification.

In the present method of retorting amalgam the quicksilver is distilled by heat only, and the quicksilver-fumes are forced out of the retort by their own pressure. The condensation is effected by a Liebig cooler. The disadvantages of this system are, first, that at the end of the retorting the retort must remain filled with quicksilver-fumes; second, that it takes a high temperature and a long time to remove all the quicksilver from the bullion; third, that the condensed quicksilver contains a large percentage of black slum, which is merely quicksilver in a very finely divided state.

My invention consists in forcing the quicksilver-fumes out of the retort by means of a steam-blast, condensing steam and quicksilver together, and constantly circulating a stream of air through the retort and condenser. The effect is as follows, viz: At the end of each retorting no quicksilver-fumes are left in the retort. The retorting is done in less time and at a lower temperature. The condensed quicksilver does not contain a trace of the black slum mentioned above.

This invention is illustrated in the accompanying drawings, in which Figure 1 represents a longitudinal vertical section of the apparatus which I use in carrying out my invention. Fig. 2 is a transverse section of the condenser.

Similar letters indicate corresponding parts.

The letter A in the drawings designates a cast-iron retort of the usual form, which is set into a fire-place of customary construction. The retort connects, by means of the pipe M, with the condenser C. This condenser is a box made of boiler-iron, which is perforated by numerous tubes, E, like a tubular boiler, in order to give the condenser a large cooling-surface. The condenser is divided into several compartments by the partitions D.

F is a steam-blast, which creates a suction or vacuum in the retort A. In consequence of this suction the quicksilver-fumes and air from the retort are rapidly drawn into the condenser C. Here the quicksilver and the steam from the steam-blast F condense by passing up and down, as indicated by the arrows, and the air leaves the condenser through the pipe G. This pipe is connected with the retort A by passing through an opening in the cover B; hence the same air which was originally in the retort and condenser keeps in constant circulation. The base metals in the amalgam, as soon as the retort gets red hot, absorb the oxygen of the air, and finally leave only a nitrogen atmosphere, by which a possible oxidation of the quicksilver is prevented. The quicksilver and condensed water accumulate in the condenser, each one up to a certain level and then run out in a continuous stream through the pipes Q and W.

The pipe G is connected, by means of a T-connection, with the pipe H, which is open at the end. The object of this pipe is to equalize the pressure caused by the expansion of the air inside of the retort at the beginning of the operation, and the falling off of quicksilver-fumes in the retort at the end of the operation.

The condenser C is surrounded by the box I, which is supplied with cold water through the pipe K, and has an outlet for the warm water through the pipe L. The water is made to circulate through the tubes E.

The operation of the retort is as follows—viz: The retort A is charged with amalgam and closed by the cover B in the usual way. Then the pipe G is connected with the retort through the opening in the cover B. The fire is started, and as soon as the retort gets warm the steam-blast F is turned on. As soon as the quicksilver commences to run, the fire is kept very low, the distillation going on very rapidly. When the quicksilver runs light, the heat is increased. After the quicksilver ceases to run, the steam-blast is kept in operation for half an hour longer, in order to draw from the retort every trace of quicksilver-fumes. The cover of the retort can then be removed without the slightest risk while the retort is still hot.

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

1. The within-described process for retorting amalgam, consisting in exposing the amalgam

to heat sufficient to cause the quicksilver to "run," then mixing the quicksilver-fumes with steam, and finally condensing simultaneously the mixed fumes and steam.

2. The within-described process for retorting quicksilver, consisting in exposing the amalgam to heat sufficient to cause the quicksilver to run, then exposing the quicksilver-fumes to an exhausting action, mixing them with steam, and finally condensing simultaneously the mixed fumes and steam.

3. The within-described process for retorting quicksilver, consisting in exposing the amalgam to heat sufficient to cause the quicksilver to run in an atmosphere comparatively free from oxygen, then mixing the quicksilver-fumes with steam, and finally condensing simultaneously the mixed fumes and steam.

4. The combination of the retort A and the condenser C, united by the pipe M, with the air-circulating pipe G, connecting the retort and condenser, and a steam-blast arranged in the pipe M, the whole arranged to operate substantially as shown and described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

CARL A. STETEFELDT. [L. S.]

Witnesses:
W. HAUFF,
E. F. KASTENHUBER.