(No Model.)

# H. GLOVER.

## Apparatus for Burning Sulphur to Produce Sulphuric Acid.

**No. 234,025.** **Patented Nov. 2, 1880.**

*Fig. 1.*

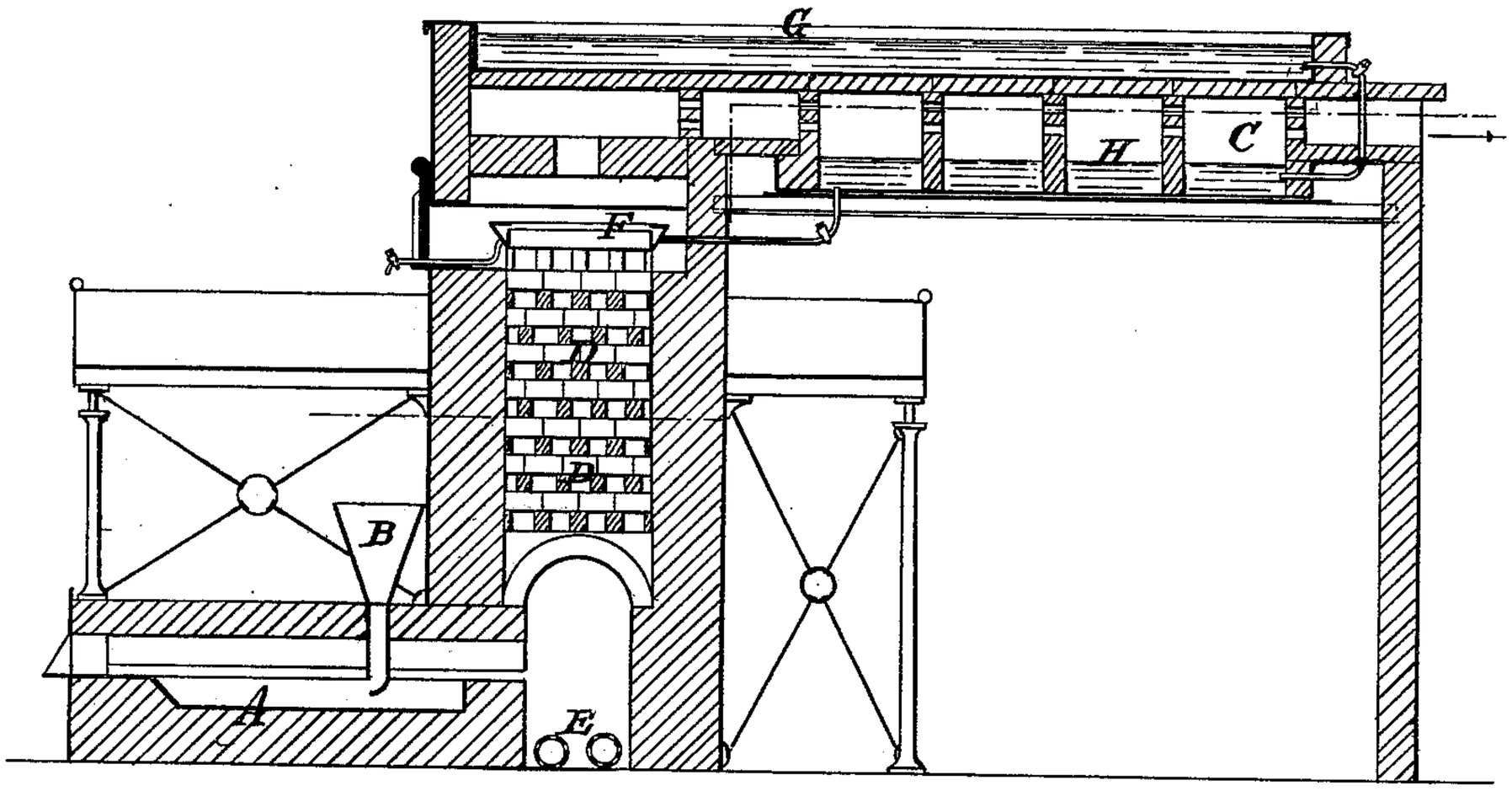



*Fig. 3.*

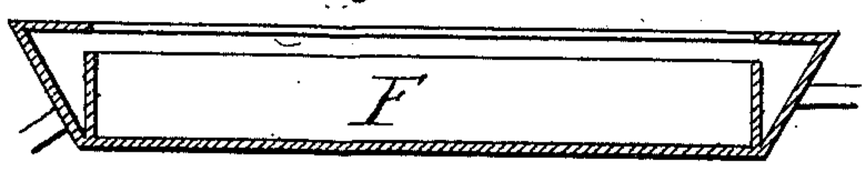
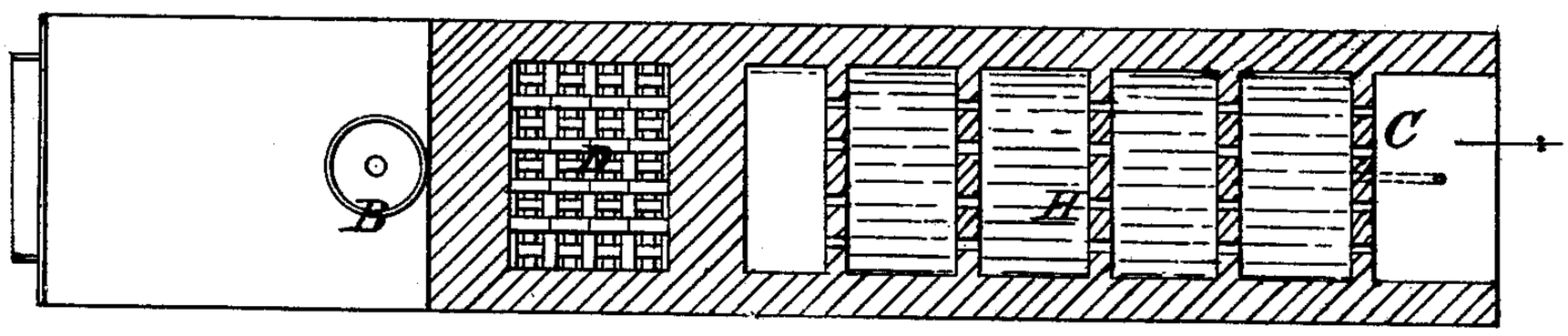



*Fig. 2.*




Witnesses
Henry Howson Jr.
Harry Smith

Inventor
Henry Glover
by his Attorneys
Howson and Sons

# UNITED STATES PATENT OFFICE.

HENRY GLOVER, OF SILVERTOWN, VICTORIA DOCKS, ENGLAND.

## APPARATUS FOR BURNING SULPHUR TO PRODUCE SULPHURIC ACID.

SPECIFICATION forming part of Letters Patent No. 234,025, dated November 2, 1880.

Application filed June 7, 1880. (No model.) Patented in England September 19, 1879.

*To all whom it may concern:*

Be it known that I, HENRY GLOVER, a subject of the Queen of Great Britain, and residing at Silvertown, Victoria Docks, in the county of Essex, England, have invented certain Improvements in Apparatus Employed in the Burning of Sulphur or of Materials Containing Sulphur, and in the application and use of the heat generated, (for which I have obtained a patent in Great Britain, No. 3,774, 19th September, 1879,) of which the following is a specification.

According to certain methods of burning sulphur, or materials containing sulphur capable of being employed in the manufacture of sulphuric acid, a certain portion of sulphur is very liable to be volatilized.

Now, my said invention relates to effecting the entire combustion of the volatilized sulphur, and at the same time utilizing the heat that is produced from the entire combustion of the whole of the sulphur; and it consists in the employment of a mass of fire-brick work or other suitable material set pigeon-hole-wise, or in any other convenient manner, between the burning-plate of the furnace and the sulphuric-acid chambers or other apparatus, so as to form a reservoir of heat, in which heat may be conserved and any sublimed sulphur after admixture with the proper proportion of air be burned. The air previous to admission may, if necessary, be heated by the waste heat of the burning sulphur, or by any other suitable means, and the quantity of air admitted may be measured by an anemometer, so as to secure the proper admixture of gases for any subsequent process. By the above-mentioned arrangements I obtain a very high temperature, and at any convenient portion of the apparatus I place platinum or other vessels, in which I concentrate sulphuric acid or other liquids.

The accompanying drawings illustrate one mode of carrying out my said invention, Figure 1 being a longitudinal section, and Fig. 2 a sectional plan, of an apparatus constructed in accordance with the same, and Fig. 3 an enlarged sectional view of the evaporating-pan.

A is the burning plate or hearth of the furnace in which the sulphur or material containing sulphur is burned, the same being supplied thereto through a hopper, B, in the usual manner. C is the passage leading to the sulphuric-acid chambers, (for example,) into which the gases evolved from the combustion of the sulphur are conducted.

According to my said invention I interpose between the burning-plate A and the sulphuric-acid chambers or other apparatus a mass of fire-brick-work or other suitable material set pigeon-hole-wise, or in any other convenient manner. An example of this is indicated at D, the same forming a reservoir of heat, and in which any sublimed sulphur may be burned after admixture with the proper proportion of air admitted by the pipes E or other suitable apparatus situated in any convenient position. If found desirable, the air previous to admission may be treated by the waste heat of the burning sulphur, or by any other convenient means; and with the view to facilitate the process which is carried on in the sulphuric-acid chambers or other apparatus, the quantity of air admitted may be measured by an anemometer, so as to secure the proper admixture of gases for the process. By the arrangements hereinbefore described I obtain a very high temperature, and in order to utilize the heat thus produced I employ platinum or other vessels, one of which is shown at F, in which I concentrate sulphuric acid or other liquids, such vessels being arranged at any suitable part of the apparatus—as, for example, at the part indicated to receive and be subjected to the action of the heat generated in the manner hereinbefore described.

When the vessel F is used for concentrating sulphuric acid I prefer to construct the vessel with a surrounding trough, into which the weak acid is first conducted, and thence overflows in a partially-concentrated condition into the body of the vessel, by which means the wear of the vessel is reduced to a minimum. Pans or vessels containing sulphuric acid may also be arranged at any convenient parts to be acted upon by the heat—as, for example, at G H. The weak acid from the chambers may be first introduced into the pan G, and when partially concentrated conducted into the pan H, to be thence conducted into the vessel F, where it is finally concentrated

to the strength of oil of vitriol or such other density as may be required, while fresh acid is introduced into the pan G, and thence conducted into the pan H, to be, in its turn, subsequently passed into the vessel F for final concentration to the required strength, so that the operation proceeds in a continuous manner and much of the available heat is utilized.

It is obvious that the details of arrangement of the apparatus may be greatly varied in practice without departing from the principle of my invention—as, for example, two or more of the heat-reservoirs D may be employed either in superposition or side by side, or otherwise, or any combination of these may be used; and the concentrating vessels or pans may be placed in any convenient position, either so as to be heated by the gases before the latter enter the reservoir or in any position in or beyond. The concentrating vessels or pans may also, if desired, be provided with covers, so as to admit of the products evolved being drawn off independently of the products from the combustion of the sulphur, or when a number of vessels or pans are used one or more of them may be covered, while the other or others are left open, so that the products of evaporation from such of them as it may be desired to maintain separate are drawn off direct, while the products of evaporation from the others are allowed to pass with the products from the combustion of the sulphur to the sulphuric-acid chambers or other apparatus.

I therefore wish it to be understood that, although I have given as an example a mode of carrying out my said invention which will be found convenient in practice, I do not confine myself to the details hereinbefore described, and illustrated on the accompanying drawings; but

What I consider to be novel and original, and therefore claim as the invention secured to me by the hereinbefore in part recited Letters Patent, is—

The combination of the burning-hearth of a furnace and the flues for the products of combustion with a reservoir, D, and pan or pans adapted to be heated by said reservoirs, and air-supply conduits E between the hearth and reservoir, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY GLOVER.

Witnesses:

CHAS. MILLS,
47 *Lincoln's Inn Fields, London.*

W. I. WEEKS,
31 *Lombard Street, London.*