(No Model.)

F. DICKERT.

APPARATUS FOR REDUCING SULPHUR.

No. 298,734. Patented May 20, 1884.

Fig. 1

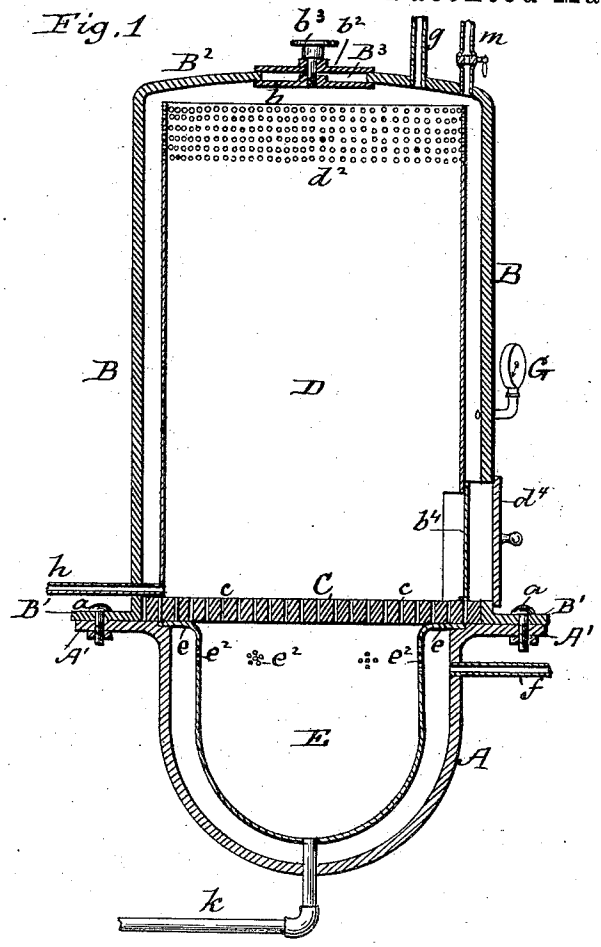
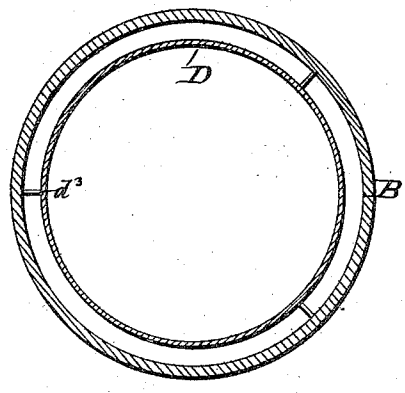


Fig. 2



Witnesses.
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UNITED STATES PATENT OFFICE.

FERDINAND DICKERT, OF SALT LAKE CITY, UTAH TERRITORY.

APPARATUS FOR REDUCING SULPHUR.

SPECIFICATION forming part of Letters Patent No. 298,734, dated May 20, 1884.

Application filed January 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND DICKERT, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and Territory of Utah, have invented certain new and useful Improvements in Apparatus for Reducing Sulphur, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a vertical section of the apparatus. Fig. 2 is a horizontal section of the same.

My invention relates to an improved apparatus for reducing crude sulphur and separating the sulphur from the foreign material with which it is intermixed in its native state, the reducing and refining being performed in one operation, as hereinafter described.

There exist in various localities mines or deposits from which free sulphur intermixed with earthy matter can be obtained in large quantities. Steam has been used to melt the sulphur, but under unfavorable conditions to effect a complete reduction of the sulphur.

My invention consists in a reducing apparatus of peculiar construction, having double walls and steam-passages between them, as will hereinafter be described, and specifically set forth in the claims.

In the drawings, A represents a large kettle-shaped receiver of cast-iron, having a flange, A′, adapted to rest upon a foundation of brick or other material. Above this kettle is placed a cylinder, B, of cast-iron, of slightly larger diameter than the kettle, and having at its lower end a flange, B′, secured to the flange A′ of the kettle by means of a series of bolts, *a*.

Within the bottom of the cylinder B is placed a grate or strainer, C, resting upon the inner portion of the flange A′ of the receiver A. This strainer has a series of fine perforations, *c*, for the passage of the melted sulphur issuing from the material placed above it, and upon said strainer a wire-gauze may be laid, if desired. The upper end, B^2, of the cylinder B is flanged over or closed, and is provided with a central opening, B^3, for the introduction of the sulphur ore. This opening is in the form of a man-hole, and is closed by a plate, *b*, resting against its under side. A bridge-piece, b^2, extending across the opening B^3, forms a rest for the hand-screw b^3, that retains the plate *b* against the edges of the opening, and forms a steam-tight seal therefor.

Within the cylinder B is placed a sheet-iron cylinder, D, open at both ends, and forming the main part of my invention. This cylinder is of slightly less diameter than the cylinder B, to form therewith steam-passages and keep the walls and contents of said cylinder at a high temperature.

Within the cast-iron receiver A is placed a similarly-shaped receiver, E, of cast-iron, of less diameter than the cylinder A, to insure the free passage of steam around the inner receiver, E. The upper end of this receiver is flanged outwardly at *e*, and rests upon the flange A′ of the outer kettle-shaped receiver. A pipe, *f*, enters within the outer receiver and admits steam around the receiver E, to keep its contents in a fluid state. A portion of the steam thus admitted will pass through openings e^2 in the sides of the receiver E, under the strainer C, and, keeping it highly heated, prevents its perforations from becoming clogged.

The material to be operated upon is introduced within the inner cylinder, D, through the opening B^3, and after closing the latter it is subjected to the heat of superheated steam admitted through the pipe *g*, at the upper end of the cylinder B, and through the pipe *h*, at the lower end of said cylinder. The melted sulphur escapes through the perforations *c* to the receiver E, from which it is drawn off through the pipe *k*, in the bottom of said receiver, said pipe being controlled by a suitable valve or cock. The tailings remaining in the cylinder D are removed through openings in the lower portion of the sides of the cylinders B and D, said openings being closed steam-tight by doors b^4 and d^4, provided with lead packing-rings. To allow the cold air and moisture within the receiver B to escape, the upper end of said receiver is provided with the pipe *m*. To allow steam within the outer cylinder to penetrate the upper strata of the contents placed within the cylinder D, the upper portion of the walls of said cylinder is provided with fine perfora-

tions d^2, and to the outside of said cylinder are secured stays d^3, to keep it centrally within the outer cylinder.

The apparatus is also provided with a steam-gage, G, to indicate the steam-pressure thereon.

Having now fully described my invention, I claim—

1. A sulphur-reducing apparatus consisting of a double-wall bottom receiver having its upper end flanged, a vertical double-wall cylinder resting upon the flange of the former, a strainer between the two receivers, and steam-pipes to admit steam between the walls of each receiver, substantially as and for the purpose described.

2. The combination of the bottom receiver, A, having steam-pipe f leading therein, the inner receiver, E, having perforations e^2 adjoining the upper end, the upper cylinder, B, having steam-pipe g, the inner cylinder, D, open at both ends, and strainer C under the latter, substantially as and for the purpose described.

3. The combination of the double-wall bottom receivers, A E, perforated plate C thereon, upper cylinder, B, having upper opening, B^3, and side opening, b^4, with inner cylinder, D, having perforations d^2 in the sides thereof, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

FERDINAND DICKERT.

Witnesses:

OTTO E. SALOMON,

EDWARD MICHAELIS.