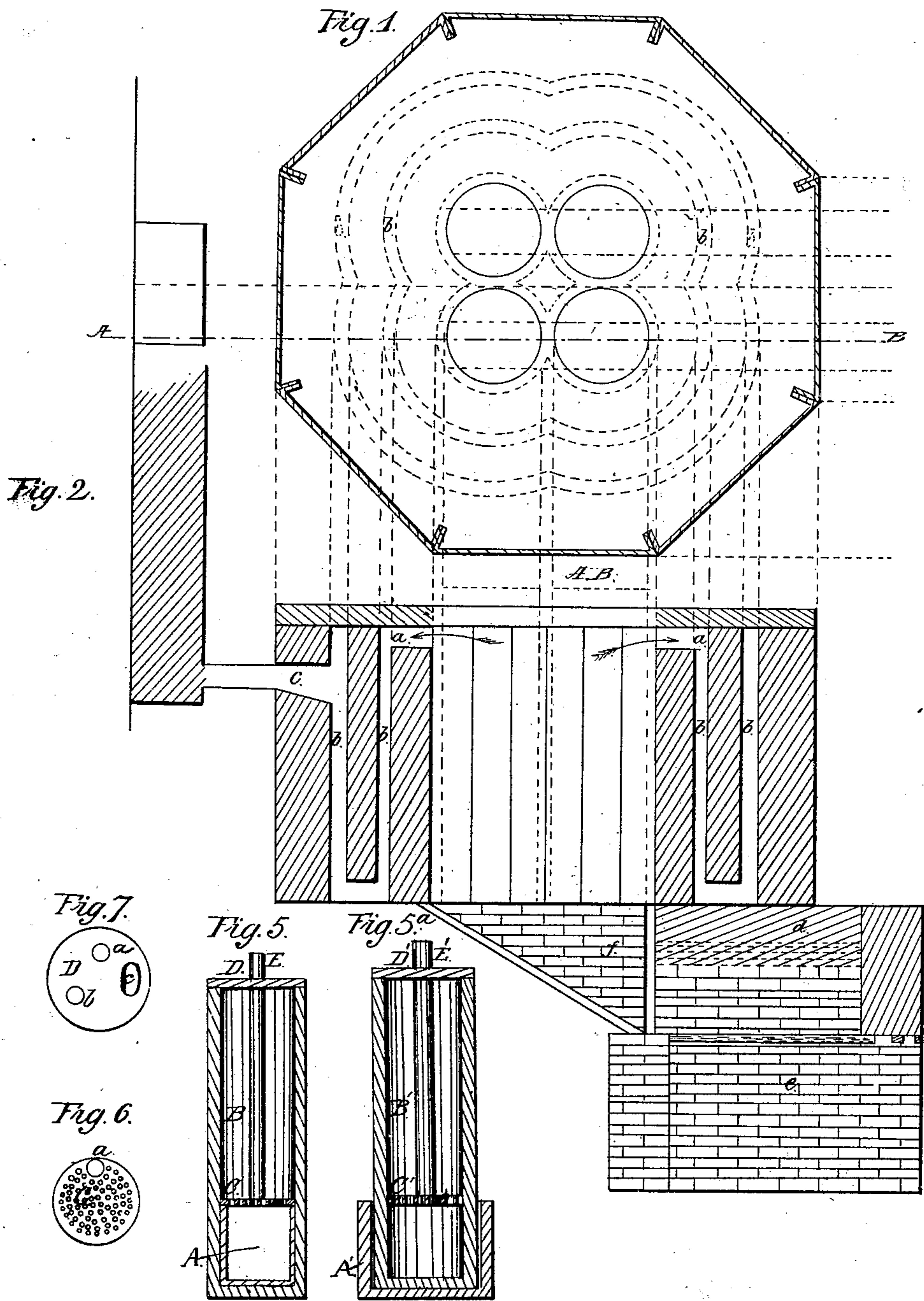


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MANUFACTURE OF SULFURET OF CARBON.

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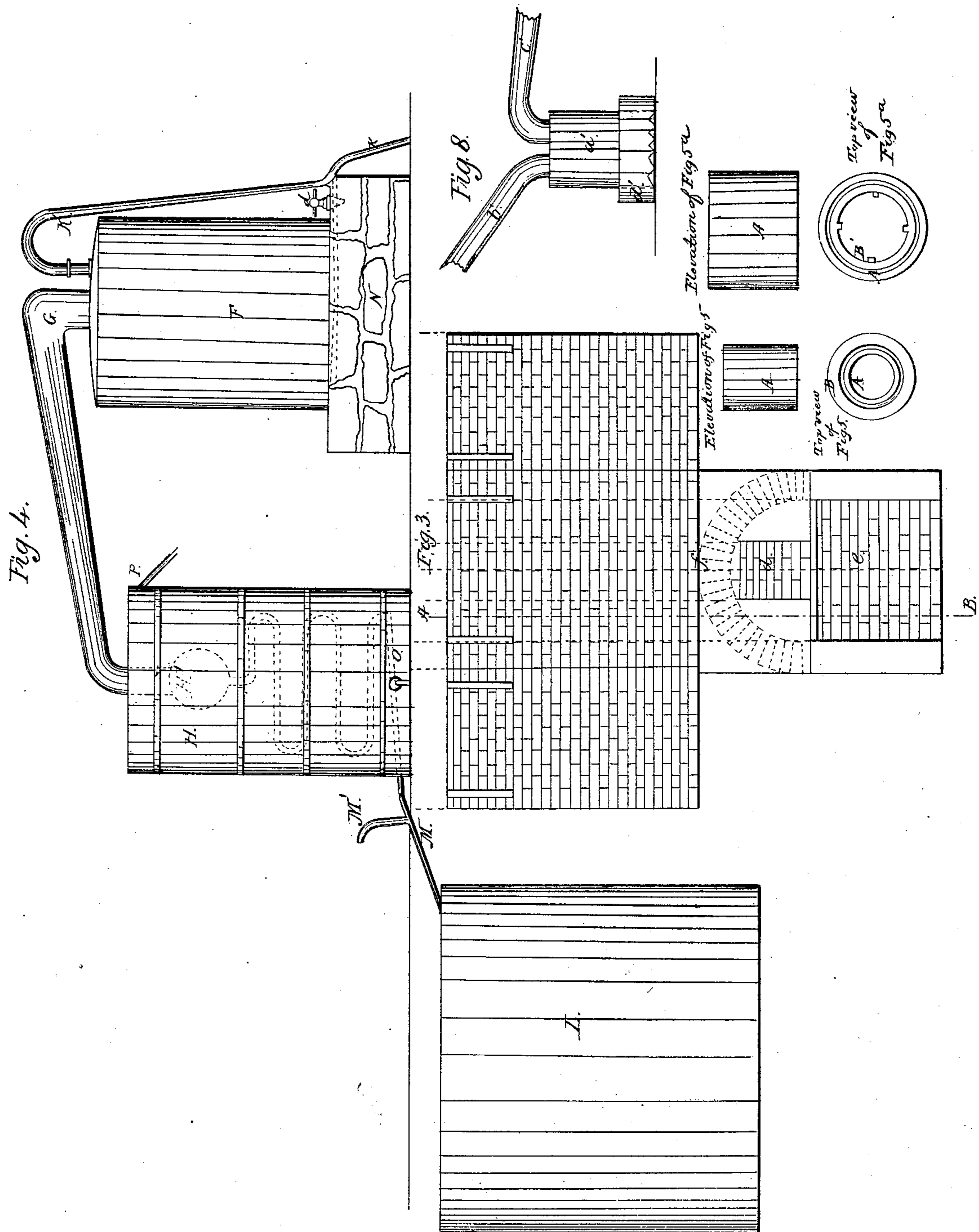
Patented Apr. 27, 1858.



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UNITED STATES PATENT OFFICE.

EDOUARD DEISS, OF PARIS, FRANCE.

APPARATUS FOR MANUFACTURING SULFURET OF CARBON.

Specification of Letters Patent No. 20,047, dated April 27, 1858.

To all whom it may concern:

Be it known that I, EDOUARD DEISS, of Paris, in the Empire of France, manufacturer of chemical products, have invented
5 new Improvements in the Manufacture of Sulfuret of Carbon; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters
10 of reference marked thereon.

Figures 1, 2, 3, represent a plan, section and elevation of a furnace for manufacturing the sulfuret of carbon; Fig. 4 shows an apparatus for rectifying the raw sulfuret.

15 Fig. 1 represents the furnace built of bricks in the center of which are placed one or more earthen retorts B, of cylindrical form, Fig. 5, which receive the heat from the furnace. The heat, after having passed
20 to the upper part of the retorts, escapes through openings *a*, *a*, Fig. 2, and previous to its escape into the chimney C is carried by means of two concentric flues *b*, *b*, shown in the plan Fig. 1 and section,
25 Fig. 2.

Fig. 2 represents in section the furnace, the fire place *d* and the ash box *e*. It also represents the retorts which are somewhat placed over the flue *f*, that leads the heat
30 generated in the fire place beneath the retorts and communicates an intense heat to them.

Fig. 3 represents in elevation the octagonal brick work of the furnace the flue of
35 the fire place *d* and ash box *e*.

Fig. 4, F represents a still or iron vessel containing the raw sulfuret of carbon to be rectified. H is a wooden tub or vat containing the lead coil H'; G a cap leading
40 the vapors of the sulfuret of carbon from the apparatus F into the coil H'; N, brick work upon which the apparatus F rests; K', tube leading the steam into the apparatus F. M, lead pipe leading the condensed products into the reservoir L; M' pipe through
45 which, at the beginning of the distillation, the air contained in the apparatus escapes; K, pipe leading the steam into the apparatus; O, inlet for cold water; P, outlet for
50 the tepid water.

Fig. 5 represents the section of a retort B with its crucible A in the bottom, also the grate C and the pipe E for the introduction of the sulfuret.

55 Fig. 5^a represents a retort without the crucible inside, but protected at its base by

an earthen pot similar to the crucible A, Fig. 5. The grate is placed in the retort resting on projections, as shown in the section 5^a. The retort can be used with the
60 crucible inside and the earthen pot outside in combination.

Fig. 6 represents a top view of the earthen grate C with small holes through it.

Fig. 7 represents the earthen cover D provided with three holes; the opening *a* admits the feed pipe for the sulfur; the opening *b* admits an iron tube *b'*, Fig. 8, designed to lead the vapors of sulfuret into the condensing apparatus *a'*, Fig. 8; the
65 opening *c* serves for the introduction of the coal.

Fig. 8 represents a zinc vessel *a'* open at its lower end and cut out. This vessel is closed at its upper part, admitting the tube
75 *b'* which corresponds with the retort cover; also the tube *c'* leading the vapors of non-condensed sulfuret from the apparatus *a'*, Fig. 8 into another apparatus of similar form; *d'* is a wooden box lined with lead,
80 half filled with water beneath which the condensed sulfuret is lodged.

In the operation I usually place four earthen crucibles A into the retorts B, see section Fig. 5; upon these crucibles are
85 placed the perforated grates C, Fig. 6, with the cover D, the retorts are closed and finally the feed tubes E carefully adjusted in the openings *a* of the cover D and grate C. The retorts being properly placed with-
90 in the furnace Fig. 1 B, B, B, B, and the fire kindled which is gradually increased to an intense cherry red; when at that point the charcoal is introduced through the openings *c* in the cover D and the opening closed
95 by means of an earthen plate and sealed with fire clay. Into the opening *b* of the cover D is fixed a bent pipe which is joined to the tube *b'* of the apparatus represented in Fig. 8; the pipe C' connects with a similar apparatus as represented in Fig. 8, to
100 which a third and fourth are joined of the same dimensions as the first, making four for every retort; in the last one is a pipe inserted which leads the gases which cannot
105 be condensed, into the air.

The charcoal having attained the same temperature as the retorts every five minutes sulfur is introduced through the tube E into the retort. The sulfur must be pul-
110 verized and inclosed in paper. The tube E is immediately closed after the intro-

duction of the sulfur with a stopper of clay surrounded with linen. The sulfur falling into the crucible ignites and volatilizes and passes in the form of vapor through the ignited charcoal, dissolves it and sulfuret of carbon is thus formed which passes out through the opening *b* of the cover *D* into the tube *b'*, which communicates with the condensing apparatus, Fig. 8, where it is partly condensed. The sulfur flows through the notches cut in the apparatus into the box *d'* lined with lead, filled with water to prevent its evaporation. The vapors not condensed in the apparatus *a'*, Fig. 8, pass through the tube *c'* into the other apparatus of similar form where the condensation is more complete and the rest of vapors are gradually condensed in the third and fourth apparatus.

The gases which are formed are almost entirely free of sulfuret of carbon and consist in sulfuret of hydrogen arising from the action of the sulfur on the hydrogen contained in the coal and in the paper used for the introduction of the sulfur.

The quantity of sulfur to introduce into the retorts is difficult to indicate, it depends much on the degree of heat; at a moderate intense heat about 10 pounds of sulfur can be introduced per hour into each retort, for this quantity of sulfur employed the retorts must be recharged every six hours with fresh charcoal, which is accomplished in the following manner: the introduction of sulfur is stopped for an hour in order to allow the sulfur at the bottom of the crucible to volatilize; the earthen plate is then removed from opening *c*, and the charcoal is introduced until the retort is filled; the earthen plate is placed again over the opening *c*, and when the coal is ignited, the operation of introducing sulfur can be commenced again. The operation of collecting the sulfuret of carbon is very easy, it is accomplished by means of a siphon and conducted into the wooden reservoir lined with lead.

The sulfuret of carbon thus obtained is immediately transported in the still *F* represented, Fig. 4, where it is rectified, an indispensable operation, because in the state as it comes from the retorts, it contains 10 to 12 per cent. of sulfur in dissolution. When about two thirds of the still *F* is filled with sulfuret of carbon a few pints of chlorid oxid of sodium, having the property of destroying equally well the sulfur-eted hydrogen contained in the raw sulfuret of carbon are mixed with it; the still cap is

then placed tightly upon the still *F*, the cap is connected with the still worm *H'*, the whole is well luted and the distillation is commenced. For that purpose, there is a steam pipe *K* which introduces steam under the bottom of the still *F* at a pressure of one atmosphere, the sulfuret soon begins to boil and escapes by the cap into the condenser *H*, and from there into the reservoir *L*. When the distillation begins, the air contained in the still and worm is allowed first to escape through the branch pipe *M'*. The distillation is continued until the cap *G* begins to get cold, then the steam is introduced through the upper part of pipe *K'* into the top of the still; for that purpose there is a stop cock *d'* near the junction of pipe *K* and *K'*. The steam introduced in the interior of the still *F* drives the remainder of vapors from the sulfur, and the operation is to be stopped, when the cap *G* gets very hot. To prevent the evaporation of the sulfuret of carbon in the reservoir *L*, 8 or 12 inches of water are let in upon its surface.

The high temperature which the manufacture of sulfuret of carbon requires makes it necessary that the operation should be carried on day and night without stopping. To prevent the retorts from bursting, an uniform temperature should be kept up. About every five days, the operation is stopped, in order to take out the ashes which come from the charcoal, without removing the crucibles; new grates *C* and tubes *E* are placed in the retort; both must be heated first to prevent their breaking and the operation begins again as above described.

What I claim as my invention and desire to secure by Letters Patent is:

1. The placing of the retorts over the principal flue in order to obtain an intense heat at the base of the retorts.

2. The earthen retorts, in combination with the crucibles or pots placed either within or outside the retorts for the object and in the manner above set forth.

3. The grate *C* for supporting the charcoal and tube *E*, or its equivalent for feeding in the sulfur in combination with the crucible or retort forming a chamber for the purpose above described.

EDOUARD DEISS.

Witnesses:

CH. L. FLEICHMANN,
AUGUSTUS V. DODGE.