

S. GARDNER.  
MANUFACTURE OF ZINC WHITE.

No. 12,613.

Patented Mar. 27, 1855.

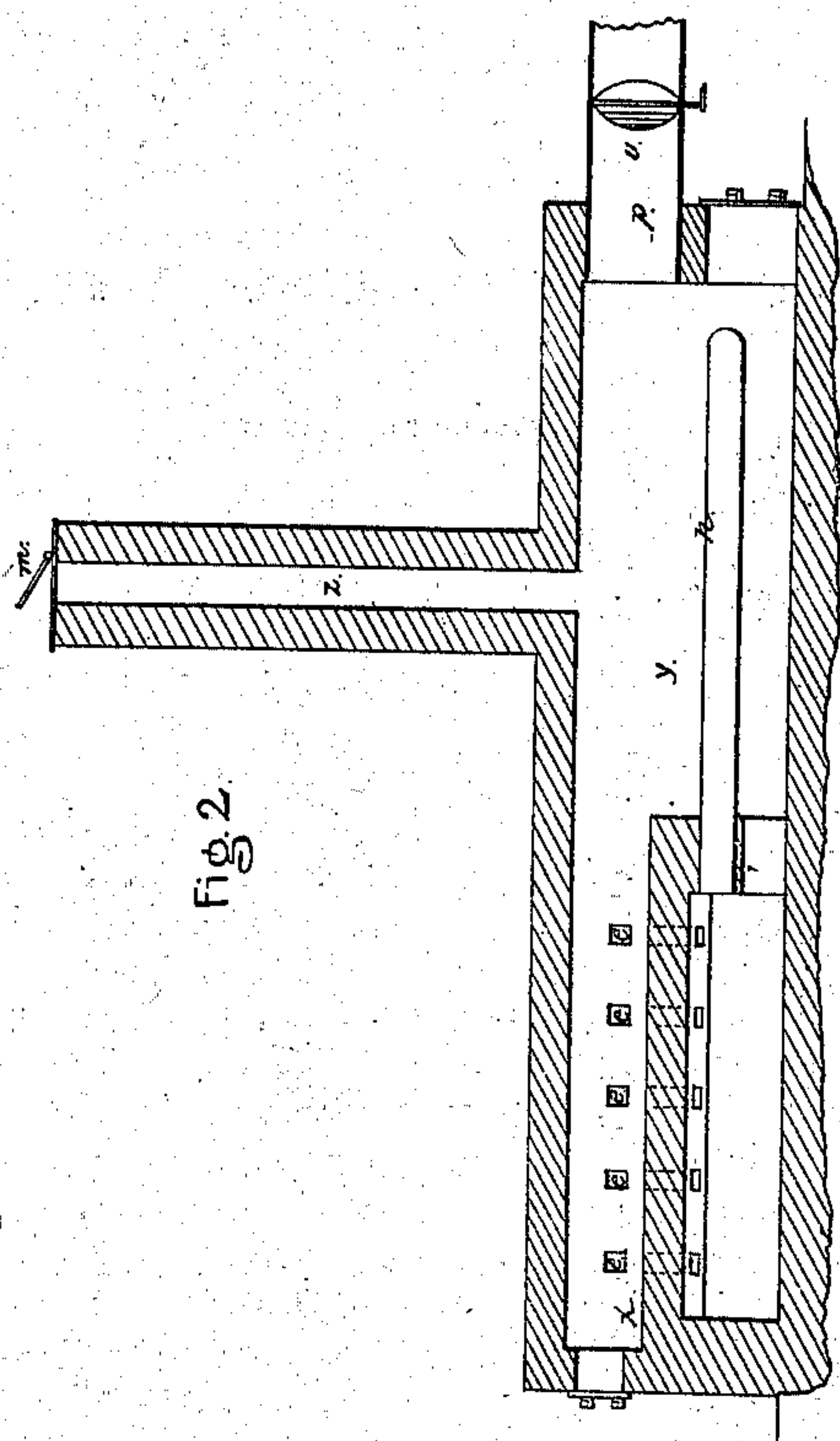


Fig. 2

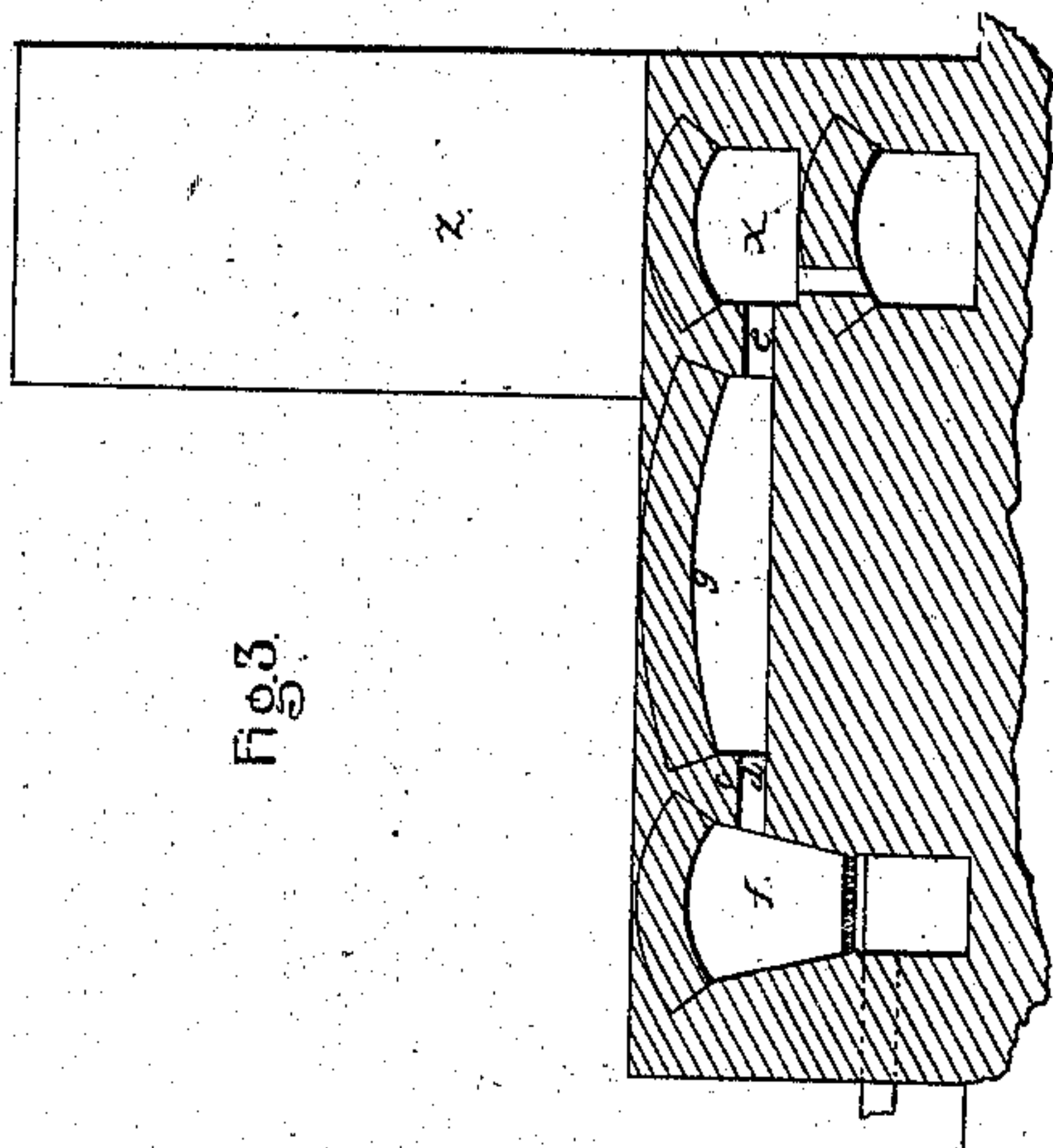


Fig. 3

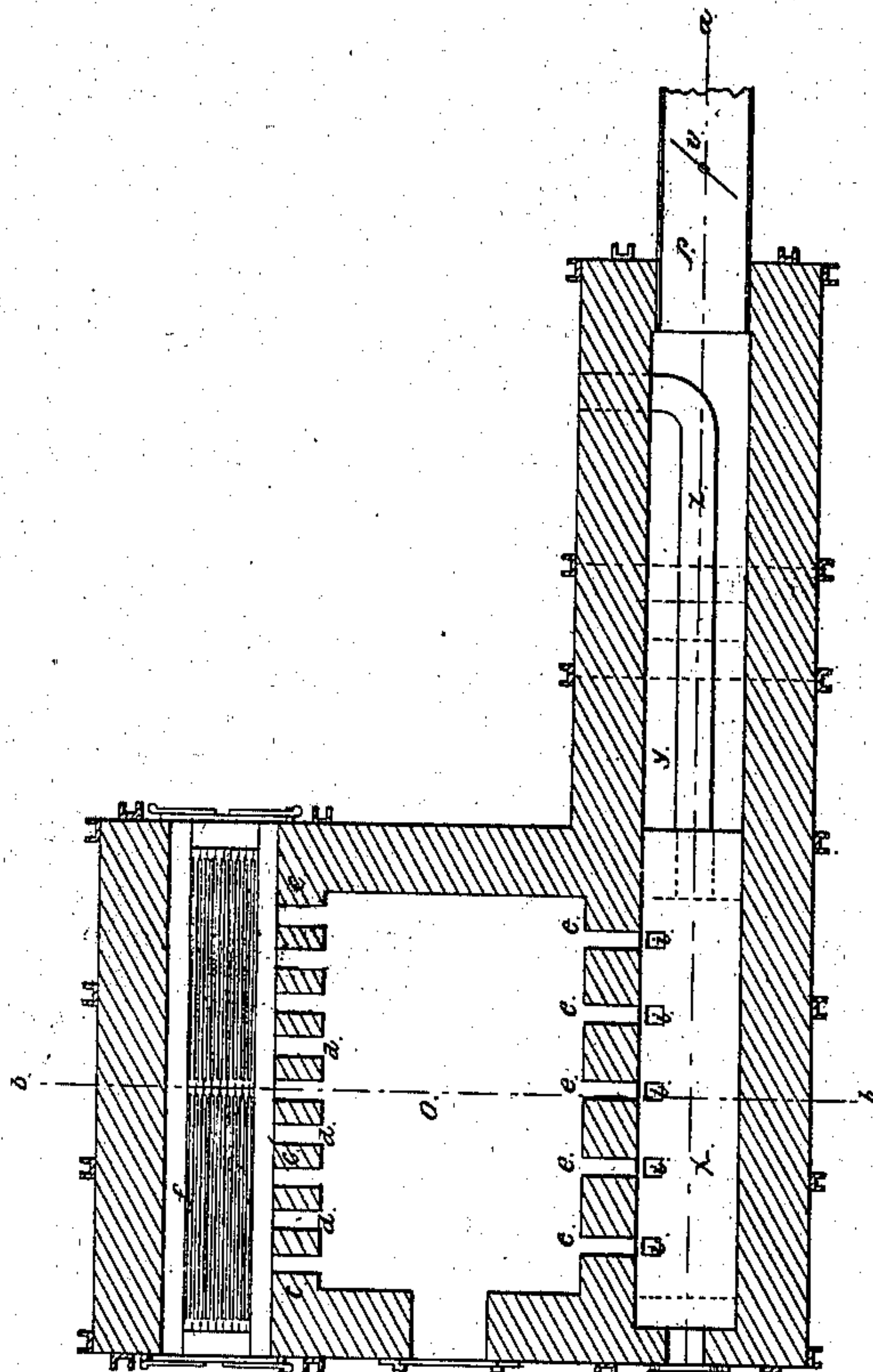


Fig. 1

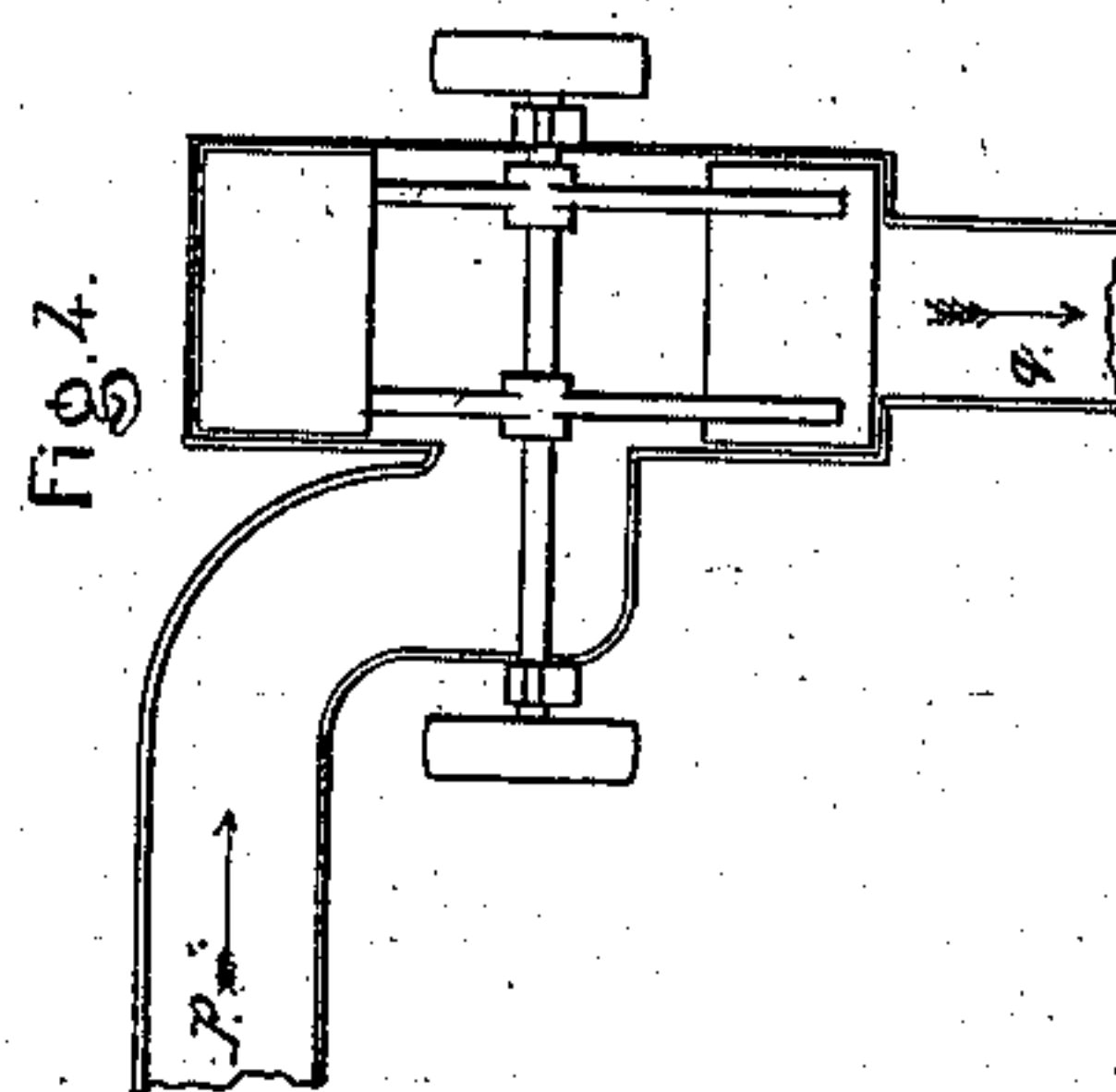


Fig. 4



# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN THE MANUFACTURE OF ZINC-WHITE.

Specification forming part of Letters Patent No. 12,613, dated March 27, 1855.

*To all whom it may concern:*

Be it known that I, SMITH GARDNER, of the city, county, and State of New York, have invented a new and useful Apparatus for the Manufacture of White Zinc; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a plan. Fig. 2 is a longitudinal sectional elevation on the line *a a* of Fig. 1. Fig. 3 is a vertical section on the line *b b*, Fig. 1. Fig. 4 is the blower attached by pipe *p* of Fig. 1.

My invention consists in the method of vaporizing or subliming spelter and charging it with oxygen, so as to make the pigment known as "white zinc" or the "oxide of zinc."

The construction is as follows: *f* is the fire-chamber, placed on one side and extending from back to front of the oven, as clearly shown by the plan. This construction is like a reverberatory-furnace fire-chamber. Between the oven or hearth *o*, upon which the spelter is placed, and the fire-chamber there is a partition-wall, *c*, with a row of apertures, *d*, in it, through which the fire passes into the oven, and on the opposite side of the oven there are similar openings, *e*, in the wall, as shown in Figs. 1, 2, and 3. The oven has a low roof, *g*. (See Fig. 3.) On the side of the oven opposite to that on which the fire-chamber is located there is another small chamber, which I call the "oxidizing-chamber," (it is lettered *x*,) and extends along the entire side of the oven, opening into an extension, *y*, that projects some distance back beyond the line of the back wall of the oven; as seen in Fig. 1, at the end of which latter chamber there is an opening, into which pipe *p* is fitted, that extends back some four hundred feet and terminates in a fan-blower, (shown at Fig. 4,) the case of which has a pipe, *q*, leading from it into a chamber where the white zinc is lodged, as will be presently described. Over the center of chamber *y* there is a chimney, *z*, erected, opening into the top of said chamber, through which the impure

gases of combustion escape while the coal is kindling or when it is removed. The top of this chimney has a hinged damper, *m*, upon it, and there is a valve, *v*, in the pipe *p*, to be closed and opened when required during the process. There is an air-pipe, *h*, that enters the chamber *y* near the rear end, and running forward opens into the chamber *x* through a series of holes, *i*, in the bottom of the chamber, said holes being directly below the apertures through from the oven before named, and through which the vaporized zinc passes.

The mode of working this furnace and its operation are as follows: A fire is made of anthracite or other coal in the fire-chamber, the valve *v* in pipe *p* being closed, and the hinged damper *m* in the chimney open. By this arrangement the sulphurous and other impure gases evolved in the combustion of the coal are driven off. When all the impure gases are expelled and the furnace and oxidizing-chamber at the proper heat, the damper *m* is closed and the valve *v* opened. The oven is charged with spelter, which is there vaporized without being oxidized, as the atmosphere is excluded therefrom. The vapor thus formed passes off through the openings *e* into the oxidizing-chamber *x*, where it meets a current of heated atmospheric air, which by the operation of the fan-blower is drawn in through the pipe *h* and holes *i*, with which it is intimately intermingled, and at which point the vaporized zinc receives its proper charge of oxygen for the purposes of the manufacture, and the oxide thus formed passes through the only place of exit—pipe *p*—and is drawn into the fan-blower and discharged through pipe *q* into the receiving-chamber, which is formed in the usual way—a frame covered with cloth, through which the gases can pass, while the zinc-white is retained. After one charge has been worked off, the valve *v* is closed and the damper *m* opened. The fire is then renewed by a new charge of coal, from which the impure gases injurious to the article of white zinc are driven off up the chimney, and the coal is thoroughly ignited, when another charge of spelter is introduced and

manufactured in the same way. These alternate firings and charges of zinc are continued during the manufacture.

Having thus fully described my improvements in the manufacture of the white oxide of zinc, what I claim therein as new, and desire to secure by Letters Patent, is—

The combination of the fire-chamber, the

vaporizing chamber or oven, and the oxidizing-chamber, substantially as herein described.

SMITH GARDNER.

Witnesses:

THOS. E. WARREN,

JACOB HATSELL.