F. H. SMITH.

DRYING TUNNEL.

No. 31,566. Patented Feb. 26, 1861.

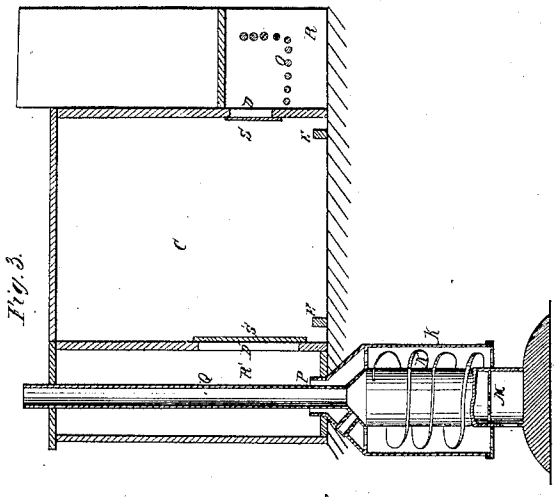


Fig. 3.

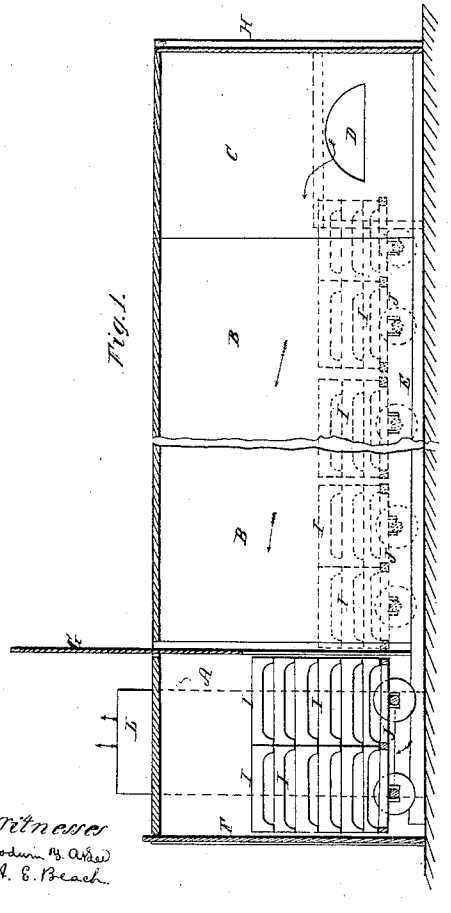


Fig. 1.

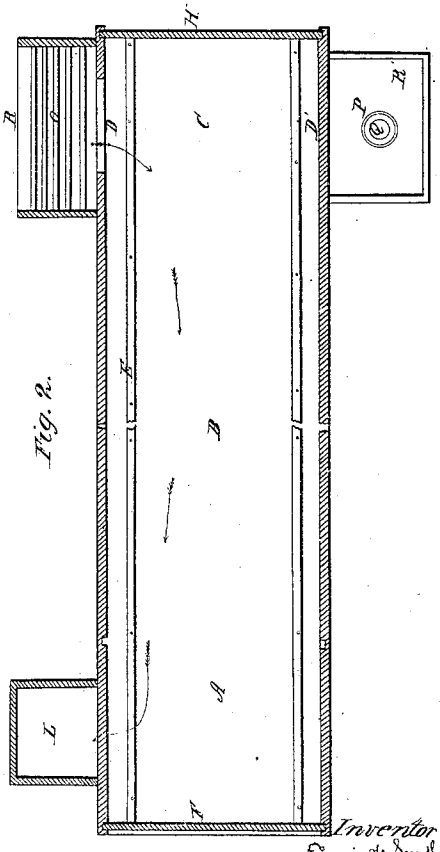


Fig. 2.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS H. SMITH, OF BALTIMORE, MARYLAND.

DRYING-TUNNEL.

Specification forming part of Letters Patent No. 31,566, dated February 26, 1861; Reissued June 30, 1868, No. 3,017.

To all whom it may concern:

Be it known that I, FRANCIS H. SMITH, of the city of Baltimore and State of Maryland, have invented a useful Improvement in Drying-Tunnels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a longitudinal vertical, Fig. 2 a horizontal, and Fig. 3 a vertical cross section of my drying tunnel. Fig. 4 is a perspective view of one of the trays, hereinafter described. Fig. 5 is a perspective view of a car with its complement of trays.

Similar letters of reference, in each of the several figures, indicate corresponding parts.

The nature of my invention consists in a tunnel having a furnace or its equivalent at the rear end and a chimney at the front end, in combination with gates, cars, trays and inclined rails, constructed substantially as and for the purposes hereinafter described.

The whole apparatus is intended for drying brick, fruit, &c., by means of cars loaded with trays upon which the articles to be dried are piled, the cars traveling through a heated tunnel. The apparatus is so arranged that the drying tunnel and loading of the cars can go on uninterruptedly for any length of time.

To enable others, skilled in the art, to make and use my invention, I will proceed to describe its construction and operation.

A, B, C, represent a tunnel of considerable length (say 300 feet) made of brick work or other suitable material. The rear and front end of the tunnel are provided with gates H, F, which can be closed or opened as may be necessary in the course of the operation. The front portion A, of the tunnel may be cut off from the main part of the tunnel by means of a gate G, which is represented half open in Fig. 1. The section A, communicates with a chimney L, while the rear end C, of the tunnel communicates through an opening D, with a furnace R, provided with a suitable grate O.

A railway is laid on the floor of the tunnel, the rails E, E, being somewhat inclined from the front toward the rear of the tunnel.

A number of cars—enough to fill the whole length of the tunnel—are provided and are to be loaded one after the other, with trays I, upon which the articles to be dried are placed. The said trays are constructed as clearly shown in Fig. 4, having each four legs *i*, fitting in cavities *i'*, in the upper corners of the tray below. This construction is needful in order to enable the trays to stand securely in four separate stacks as represented in Fig. 5, with a space between their edges to facilitate handling. The first car having been freighted in this manner, while in section A, of the tunnel, the gate F, is shut and gate G, is opened—as seen in Fig. 1—and the car is pushed into the main part B, of the tunnel, so that the gate G, can be shut behind it. The gate F, is then opened, the next car is entered into section A, and after having been freighted in the same manner as the preceding car, the gate G, is again opened and the car is moved forward into section B, pushing the first car forward. The gate G, is then again shut, gate F, is opened, and the third car is entered and freighted and so forth, each car pushing forward the preceding series of cars, as it enters the main part B, of the tunnel until the car which had been entered first, arrives at the end C, of the tunnel. The gate H, is then opened as often as a car is entered, in order to allow the last car of the series to pass out of the tunnel. The heated gases arising from the combustion of fuel in furnace R, enter through opening D, and pass through the whole length of the tunnel and finally out at the chimney L. From this, it will be seen that the substances to be dried, enter the tunnel at the end where the temperature is lowest and are gradually subjected to an increasing heat as they approach the other end of the tunnel where they finally come in contact with the intense heat arising directly from the furnace. It is intended that about twenty-four hours shall elapse from the entrance to the exit of each particular car, thereby giving ample time for drying the articles with which the cars are freighted thoroughly while they pass through the entire length of the tunnel.

The rails E, E, are inclined as shown in Fig. 1 so that the whole series of cars can be pushed along easily by the operator or operators attending the rear car.

The draft caused from the furnace R, through the whole length of tunnel toward

and out of the chimney L, serves to carry the moisture of the drying articles away as fast as it is liberated; by which means the drying process is considerably facilitated.

Fig. 3 represents—at Q, R′, D′, S′, P, N, M, K—a modification, a substitute for the furnace R, to suit the apparatus for drying fruit, vegetables and similar articles. For this purpose, the opening D, connecting the tunnel with the furnace R, is closed by means of a suitable valve or damper S, and the valve or damper S, is opened so as to effect a communication between the rear part of the tunnel and a hot air chamber R′, through opening D′. The air in this chamber is heated by means of a suitable hot air furnace which consists of a drum K, spiral hot air passage N, central fire place M, and smoke stack Q. The hot air passes from the drum through P into chamber R′, and hence through opening D′, into the tunnel, obeying the draft created by the chimney L, at the front end and thereby drying the articles upon the shelves and cars passing through the tunnel, in the same manner as already set forth.

It will be understood that this apparatus in its original or in its modified form, will answer for drying various articles, such as, for instance; bricks, tile, pottery, cores for castings, and other manufactures of clay and sand, grain, fruit, vegetables, lumber, glue, starch, whiting, sugar, bagasse, guano, leather, hides, fish, meat, saltpeter, alum and other chemicals.

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

A tunnel A, B, C, having a furnace R, or its equivalent at the rear end, and a chimney L, at the front end, in combination with gates F, G, H, car J, trays I, and inclined rails E, E, the whole being constructed and arranged substantially as and for the purposes set forth.

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Witnesses:
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