J. R. STAFFORD.

Grain Drier.

No. 5,518. Patented April 18, 1848.

Fig. 2.

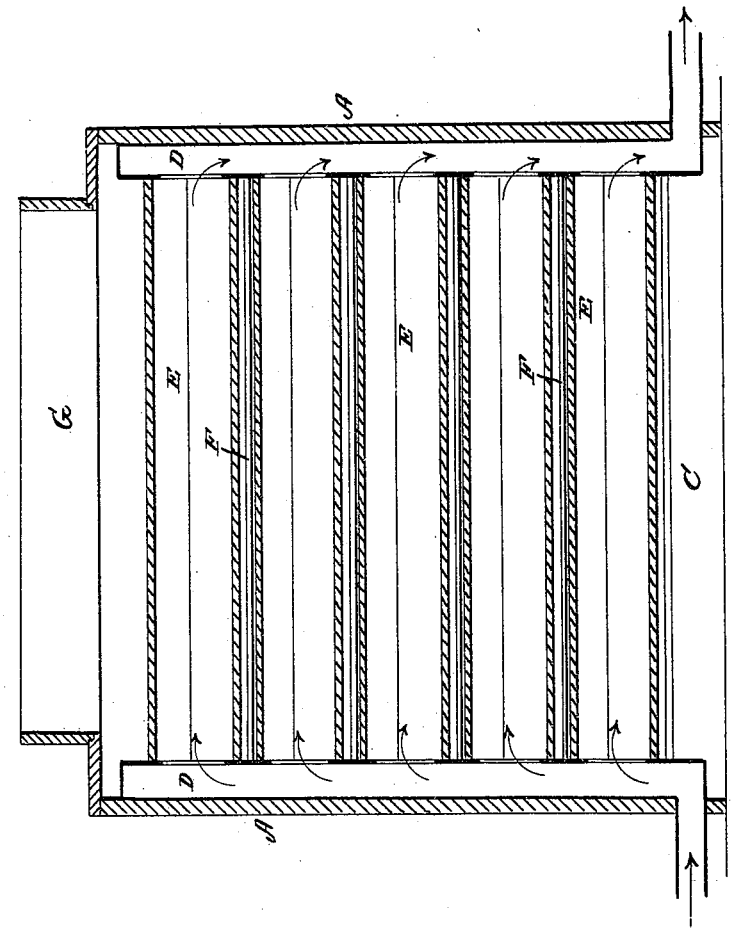
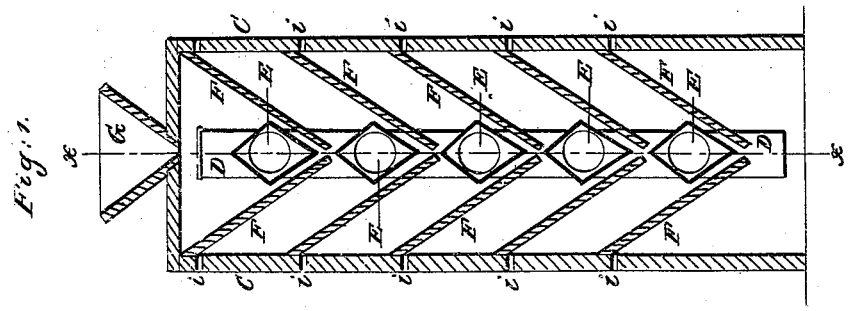


Fig. 1.



UNITED STATES PATENT OFFICE.

JAMES R. STAFFORD, OF CLEVELAND, OHIO.

GRAIN-DRIER.

Specification of Letters Patent No, 5,518, dated April 18, 1848.

To all whom it may concern:

Be it known that I, JAMES R. STAFFORD, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and Improved Process for Expelling the Moisture from Grain and other Substances; and I do hereby declare that following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, is a vertical transverse section, and Fig. 2, a longitudinal vertical section of the machine or grain drier, employed by me for effecting the above named object.

My improved grain drier is composed of an oblong vertical box (A, A, C, C,) having a series of horizontal heating pipes E, E, passing longitudinally through its center, one above another, supported by vertical pipes D, D, at each end of the box, with which they are connected and have free communication; combined with a series of wings F, F, secured to the inner sides of the box, and inclining downward under each horizontal heating pipe E, with their lower edges nearly meeting under the lowest angle of the pipe as represented in Fig. 1. The ends A, A, and sides C, C, of the box may be constructed of wood or other suitable material, and combined in any well known manner.

The form of the cross section of the horizontal heating pipes E, E, that I generally make use of, is shown in Fig. 1. They have it will be seen, two acute, and two obtuse angles; and their acute angles are placed in a vertical line with each other.

The wings F, F, are in pairs, secured to the ends and to the inner sides of the box; they incline downward toward the center of the cross section of the box, nearly parallel with the lower surfaces of the pipes E, E, and their lower edges are brought nearly together under the lower angle of these pipes. Just below the junction of the wings with the sides of the box, a series of small apertures or narrow slits *i*, *i*, are formed, through the same extending the entire length of the box.

G, is a hopper on the top of the box, extending nearly the entire length thereof, opening into the box by a narrow slit in its base, directly above the top of the upper pipe E.

The vertical pipes D, D, are closed at top, and communicate with each of the horizontal pipes E, E; or if preferred, one of the vertical pipes may be open at the bottom and closed at the top, and the opposite vertical pipe, closed at the bottom and open at the top. Steam, hot air, or the gaseous products of combustion; or any other heating agent may be employed for raising the pipes to a proper temperature; which may be conducted into, and from them, in any suitable and convenient manner. The passage of the heating agent through the series of pipes, may be governed and regulated by means of valves, so as to vary the temperature of each and all the pipes in the series, as may be found expedient.

The operation of my grain drier is as follows: The grain being placed in the hopper G, descends through the slit at the base of the same on to the upper angle of the upper pipe E, and passes down over its upper surfaces to the wings F, F; then by its own gravity it descends the inclined face of the wings, through the narrow space between the same and the under surfaces of the heating pipe, and is discharged on to the apex of the next pipe in succession; and so on to the bottom of the box. The wings arrest the moist vapor as it is driven off from the grain and convey it to the apertures *i*, *i*, through which it is discharged into the atmosphere. I generally connect the wings F, F, to the ends and sides of the box in such a manner that the space between their lower edges, and the space between the upper surfaces of the wings, and the lower surfaces of the heating pipes, may be varied and adjusted to suit the temperature of the pipes, and the description of grain or other substance to be dried. The descent of the grain through the drier, may be adjusted and regulated by varying the position of the wings; and also by a regulating discharging gate at the base of the box constructed in any convenient manner. An inclosing casing may be secured to the sides of the box, for the purpose of conducting the vapor discharged through the apertures *i*, *i*, out of the building in which the drier is located.

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

The expelling the moisture from grain or other substance by passing it through a box

in which are placed a series of heating pipes and inclined wings, arranged combined and operating with each other substantially as herein set forth; not intending by this claim to limit myself to the exact form and arrangement of the respective parts of the drying apparatus as herein described and represented, but to vary them as I may deem expedient while I attain the same end by means substantially the same.

JAMES R. STAFFORD.

Witnesses:

JOHN G. STOCKLY,

E. HESSENMUELLER.