H. H. BEACH.

APPARATUS FOR CURING GRAIN.

No. 190,810. Patented May 15, 1877.

Fig: 1.

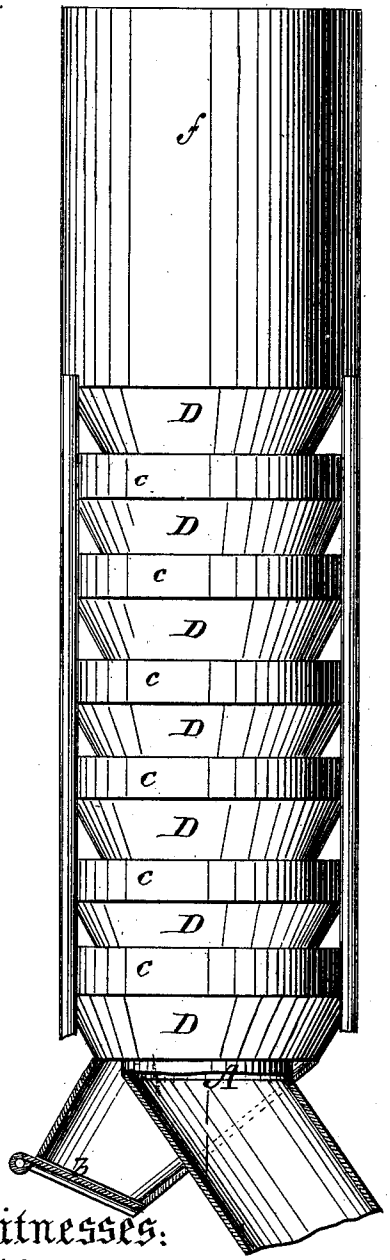
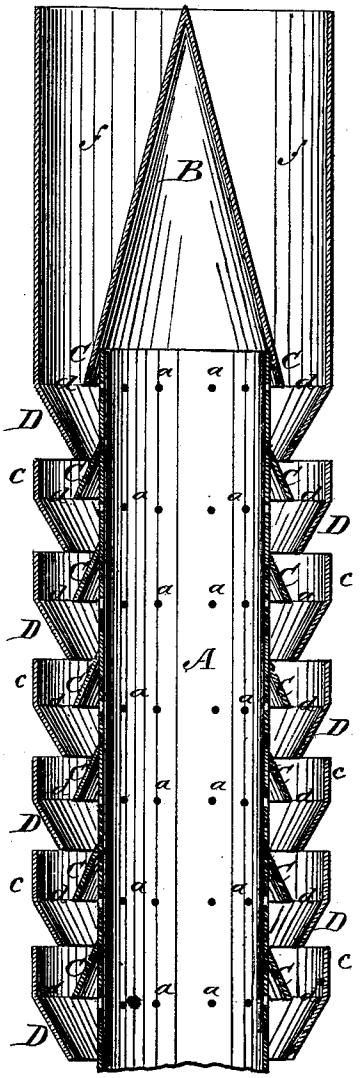


Fig: 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN APPARATUS FOR CURING GRAIN.

Specification forming part of Letters Patent No. **190,810**, dated May 15, 1877; application filed November 7, 1876.

To all whom it may concern:

Be it known that I, HENRY H. BEACH, of Rome, in the county of Oneida and State of New York, have invented a new and Improved Apparatus for Curing Grain; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making part of this specification.

This invention is in the nature of an improvement in apparatus for curing grain; and the invention consists in a device for expelling moisture from grain, constructed with a series of conically-shaped deflectors placed one above another, each deflector surrounding and being secured to a vertical perforated pipe, and each of the conical deflectors in this way secured being surrounded by a conical deflector, with its angular surface sloping downward, with an annular space between the lower edge of the first-named deflectors and the inner surface of the last-named, the entire series of both deflectors being arranged and secured vertically, forming a stack, substantially as hereinafter fully described.

In the accompanying sheet of drawings, Figure 1 is a side view of my invention, and Fig. 2 a longitudinal section of same.

Similar letters of reference indicate like parts in both figures.

The purpose of this invention is to expel from grains its inherent moisture for the purpose of checking fermentation, so that the grain may be preserved in a sweet and pure state for an indefinite time. To effect this in a rapid as well as perfect manner, I construct my apparatus with a vertical pipe, A, into which is formed a series of perforations, *a*, the lower end of the stack being provided with a gate or valve, *b*, or entering into a chute or funnel provided with such gate, and the upper end of the pipe having fitted to it a conical cap, B. Secured to the pipe A, at suitable intervals throughout its length, are a series of conical deflectors, C, the inclined sides of which point upward. Surrounding the deflectors C are other deflectors D. These deflectors are likewise conical to some extent, but have vertically-raised sides *c* in addition to their conical surface. These deflectors D are placed one above another, and their inclination is the reverse of the inclination of the deflectors C, and each deflector surrounds one of the conical deflectors C, but with a space, *d*, between the lower edge of the deflectors C and the inner surface of the deflectors D, as shown in Fig. 2, and the series of perforations *a* in the pipe A are arranged to be formed therein, and placed in such position as to open into the spaces formed by the deflectors C, the vertical pipe, and the descending grain.

Now, my drying apparatus being constructed substantially as I have described it, a column of hot air is forced into the pipe A, and the grain is admitted into a hopper, *f*, surrounding the conical cap B, and gravitates around the conical cap, which acts as a distributer, descending until it comes in contact with the outer surface of the first of the deflectors C; thence over the surface of these deflectors, through the space *d*, and in strata of unequal thicknesses, onto the inner surface of the deflectors D; thence following the inclined surface of these last-named deflectors onto the next succeeding deflector C, and so on through the whole series or stack of deflectors, the heated air within the pipe A being, at the same time, forced through the perforations *a*, and through the descending column of grain as it passes from one deflector to the other, the heated air finally having exit through the space *d* outward.

The grain is in this way dried rapidly by the heated air, not only as it is forced through the grain out of the apertures *a*, but also by permitting a thin stratum of grain of unequal thickness to pass over the heated surfaces of the deflectors in succession, so that by the time a column of grain has reached the exit at the bottom of the stack of deflectors it will have passed over a large amount of heated surface, and been exposed to direct contact with a large quantity of heated air, the result of which is that the grain is thoroughly

robbed of its moisture, and fermentation retarded or destroyed.

It is designed that the valve *b* at the end of the stack or column of deflectors shall be opened only to such an extent as will permit the column of grain in the stack to descend through the deflectors at a rate of speed that will insure its becoming thoroughly dried by the time it finds exit at the bottom, and this rate of speed is easily regulated by the greater or less extent of the opening of the gate or valve.

The raised sides *c* of the deflectors D serve to prevent the grain, as it descends over the surface of the deflectors C, from passing outward. As the grain passes from the deflectors C to the deflectors D the angle which it forms in descending to these last-named deflectors makes, as it were, a conical wall of grain, inclosing the heated air which passes through the conical wall thus formed, and through the space *d;* and as this wall is formed at each successive pair of deflectors, it will be seen that the grain forms successively a series of conical air-inclosed spaces, which results in a thorough drying of the grain, by exposing in turn the whole column of descending grain to direct contact with the heated air. Besides, as the grain passes from one deflector to another, it alternately passes from a wide to a narrow space, insuring a complete mixing of the grain.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A grain-drying apparatus constructed with a fixed vertical perforated pipe, with a series of deflectors secured thereto, the deflectors so secured being surrounded by a second series of deflectors, the angles of one series of deflectors being reverse to the angles of the other series, substantially as and for the purpose described.

2. In a grain-drying apparatus, a fixed vertical perforated pipe, closed with a conical cap at its upper end, and constructed with a gate at its lower end, and provided with a series of deflectors, which are surrounded by a second series of deflectors, the angles of one series of deflectors being reverse to the angles of the other series, substantially as and for the purpose described.

3. In a grain-drying apparatus, a fixed vertical perforated hot-air pipe, combined with a series of deflectors, the angles of one series of deflectors being reverse to the angles of the other series, constructed and affixed in the manner described, so as to permit the grain to descend from one deflector to another in strata of varying thicknesses, which strata, together with the deflectors and vertical pipe, form spaces in which the heated air passes from the perforations into the vertical pipe, substantially as and for the purpose described.

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