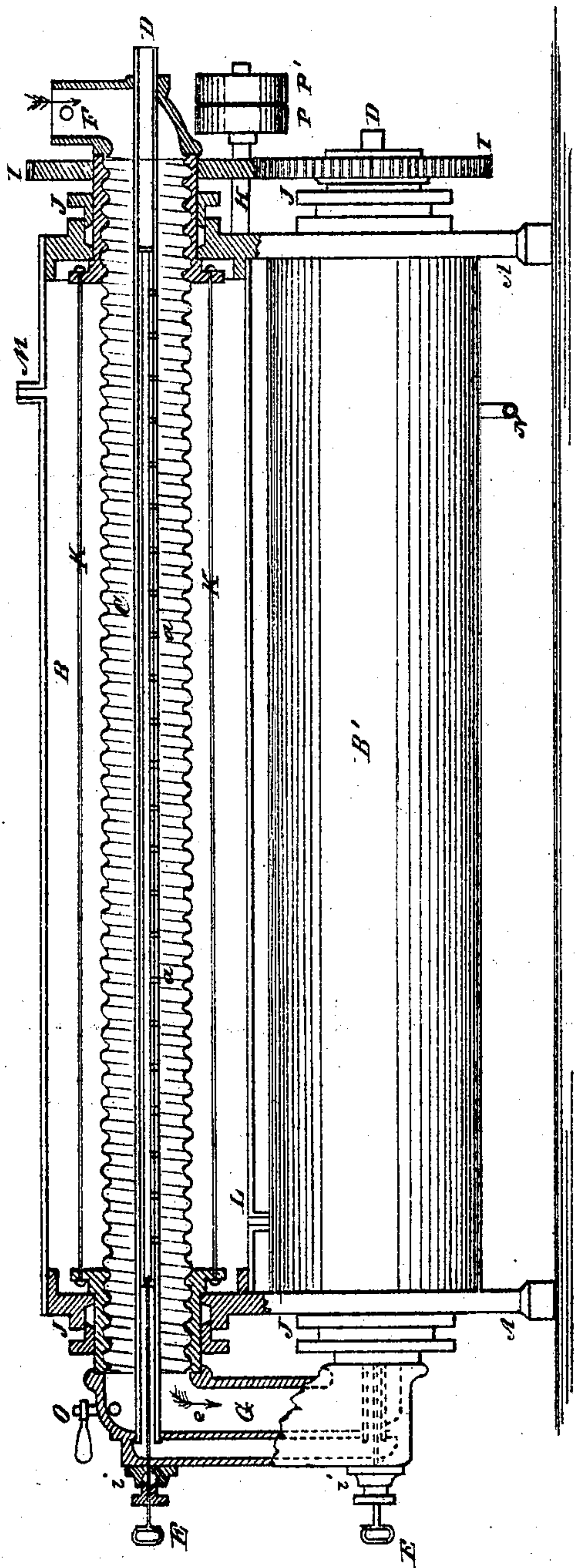


STEPHEN V. APPLEBY.

Improvement in Grain Driers.

No. 119,493.

Patented Oct. 3, 1871.



Witnesses.
John L. Thornton
A. Barnes

Inventor.
Stephen V. Appleby

UNITED STATES PATENT OFFICE.

STEPHEN V. APPLEBY, SPOTSWOOD, NEW JERSEY.

IMPROVEMENT IN GRAIN-DRIERS.

Specification forming part of Letters Patent No. 119,493, dated October 3, 1871.

To all whom it may concern:

Be it known that I, STEPHEN V. APPLEBY, of Spotswood, in the county of Middlesex and State of New Jersey, have invented a new and improved Grain-Drier; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing forming a part of this specification, and to the letters of reference marked thereon.

The object of my invention is to construct an apparatus for drying grain of all kinds, that has been submerged in water by being wrecked in vessels while in transit from one port to another, or has been wet from any other cause; also, to make the apparatus portable, so that it may be moved from one place to another and put in operation wherever required. It is well known that large quantities of grain are annually lost by being wrecked on board of vessels, or by having seas breaking over the same and thus wetting the grain and damaging it so as to render it unfit for use of any kind, but which, if it can be dried immediately, answers well for distillation, feed, and many other purposes. My invention can be taken to the locality where the grain is and set in operation in a very short time, and will dry the grain in the most perfect manner. The nature of my invention consists in a steam-cylinder or drum, within which revolves a corrugated screw-cylinder with a spiral corrugation; (these cylinders are duplicated;) and the invention also consists in a hot-air pipe extending, unbroken, through both the corrugated cylinders. This hot-air pipe is provided with orifices or openings, over which works a slide-valve, which opens and closes the said orifices. It also consists in the combination of an air-tube with the corrugated cylinder, within which the grain is intended to be dried, and an outer steam-chamber or cylinder.

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

The figure represents a longitudinal sectional elevation of the upper cylinders, and a side elevation of the lower cylinder of my drying apparatus.

Letters of like name and kind indicate like parts in the figure.

A represents the frame, upon which I place the working parts of the apparatus embodying my invention. It may be made of any suitable

form and dimensions to support the different parts. B B' are steam-cylinders or drums, made of sufficient strength to stand a moderate pressure of steam, and of any desired capacity. Within each of the steam-cylinders B B' is placed a revolving corrugated grain-cylinder, C. Through this grain-cylinder passes a hot-air pipe, D, provided with orifices *a*, at proper distances from each other, over which works a slide-valve, the stem of which is shown at E, and works through the stuffing-box *i*. The pipe D passes out of one end of the grain-cylinder, where it turns with an elbow down to the center of the other grain corrugated cylinder, where it turns with another elbow into and through the said lower corrugated cylinder. That portion of the pipe D which passes through the lower cylinder is also provided with orifices and a slide-valve similar to those before described. F is the throat leading to the center or within the corrugated grain-cylinder, through which the grain is introduced thereto. G is a tube, which connects with both the corrugated grain-cylinders, and of the same diameter as the cylinders, for the purpose of conducting the grain from the cylinder C to the lower cylinder. Upon the short shaft H is a pinion-wheel, provided with teeth, which fit and mesh into corresponding teeth upon the spur-wheels I I, and drive the same. These spur-wheels I I are secured to the corrugated cylinders, all of which have bearings and run upon the hot-air pipes D. The heads of the grain-cylinder C are firmly held by supporting bolt-rods K K, and the cylinders are made to revolve in stuffing-boxes J J J J. Between the two steam-cylinders is a steam-connecting stand-pipe, L, which allows the steam to flow freely from one cylinder to the other, so that the heat and pressure are quite the same in each. M represents a section of the steam induction-pipe, which, in practice, connects with the generator. N represents the steam-exhaust or waste-pipe, through which the condensed steam is discharged from both cylinders. O represents a stop-cock, located in the grain-tube that connects the grain-cylinders. There may be any number of these stop-cocks for the purpose of allowing the foul air to escape that arises from the damp grain while being subjected to heat in passing through the cylinders. P is a tight pulley, and P' a loose pulley upon the shaft H, for the purpose of driving the cylinders.

The operation consists in first admitting steam

from the generator to the cylinders through the steam-pipe M, while a band is placed from a driving-wheel over the pulley P, which latter, through the medium of the gear-wheels, imparts a revolving motion to the grain-cylinders. When thus in motion any kind of wet grain is introduced into the throat F, and, by means of the spiral corrugations, the grain is conducted through the whole length of the cylinder, whence it falls down in the direction of the arrow *e*, and is then taken by the lower cylinder and carried back and discharged at the same end where it was introduced. In case the cylinders are not sufficiently heated by the steam, hot air may be introduced into the hot-air pipes before described; and in case the grain is extremely wet and does not come out sufficiently dried, the slide-valves may be drawn so as to admit hot air directly to the surface and in full contact with the grain.

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

1. The corrugated spiral cylinder C, revolving upon the hot-air pipe D within the steam-cylinders B B', substantially as shown and described, and for the purposes set forth.

2. The hot-air pipe D, provided with slide-valves and having unbroken connection through both grain-cylinders, upon which said pipe the said cylinders revolve, substantially as and for the purposes set forth.

3. The connecting-tube G, in combination with the revolving grain-cylinders C, when said cylinders revolve within the steam-cylinders B B', substantially as and for the purposes set forth.

Witnesses: S. V. APPLEBY.

JOHN S. THORNTON,
A. BARNES.