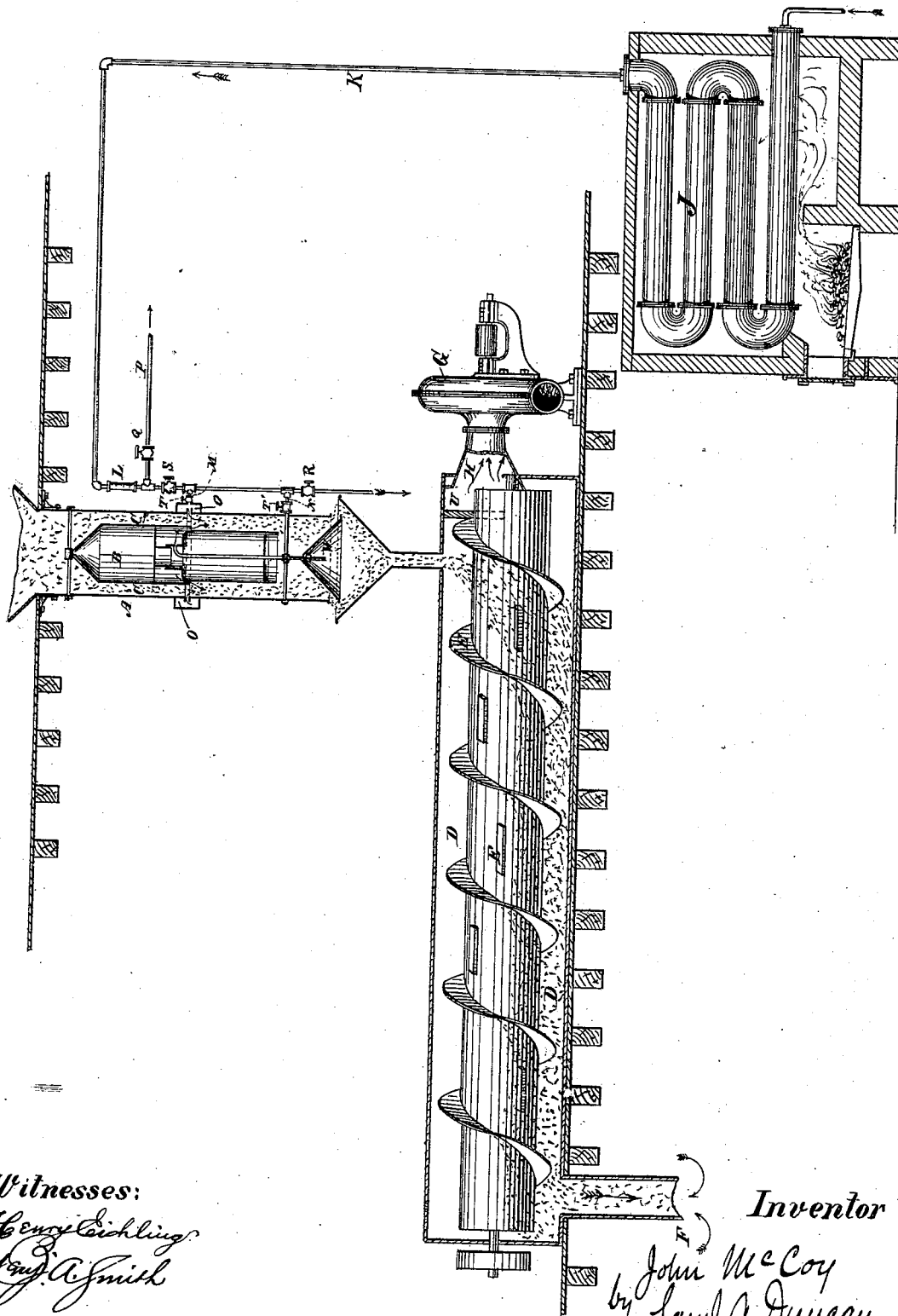


J. McCOY.
Apparatus for Drying and Renovating Grain, &c.
No. 227,376. Patented May 11, 1880.



Witnesses:
Henry Eichling
Sam. A. Smith

Inventor
John McCoy
by *Sam. A. Duysen*
att'y.

UNITED STATES PATENT OFFICE.

JOHN MCCOY, OF NEW YORK, N. Y., ASSIGNOR TO NATIONAL STEAMED GRAIN COMPANY, OF SAME PLACE.

APPARATUS FOR DRYING AND RENOVATING GRAIN, &c.

SPECIFICATION forming part of Letters Patent No. 227,376, dated May 11, 1880.

Application filed August 29, 1879.

To all whom it may concern :

Be it known that I, JOHN MCCOY, of the city of New York, in the county and State of New York, have invented a new and useful
5 Improvement in Apparatus for Drying and Renovating Grain and other Cereals, of which the following is a specification.

The apparatus to which the present invention relates is designed for renovating and
10 drying wheat, corn, and other grains which may have become injured by overheating or by exposure to the weather, or otherwise, or which it may be desired to bring into the best condition for storage or for transportation, and it is specially intended for carrying out
15 the process of treatment which forms the subject of another application for a patent filed contemporaneously with this.

It consists in an upright annular conduit or
20 chamber, through which the grain can descend by the force of gravity, and in which it is subjected to currents of superheated steam entering through the walls of the chamber, together with a supplemental cooling-chamber,
25 into which the grain passes while still in a highly-heated state, and through which it is slowly moved by means of some suitable mechanical conveyer, being at the same time subjected to the action of a strong current of
30 air produced by any suitable appliance.

The invention is illustrated in the accompanying drawing, in which there is shown a sectional view of the more important parts of the apparatus.

35 As shown in this drawing, the vertical conduit or chamber in which the grain is first received consists of two cylinders, A and B, arranged the one within the other, and of such relative diameter as to leave an open annular
40 space, C, between them, through which the grain, entering the hopper above, will freely descend, falling at the lower end into the conveyer or cooling-chamber D, in which there is placed a screw, E, driven by any convenient
45 power, and so constructed and arranged as to move the grain gradually forward from the end where it enters the chamber to the discharge-orifice F at the other end.

50 G is an exhaust-fan, also driven in any convenient way, and communicating, by the pas-

sage H, with the interior of the chamber D. The action of this fan is to induce a strong current of air, hot or cold, as may be deemed advisable, to flow through the chamber D from F to H in a direction opposite to that in
55 which the grain is progressing under the action of the screw, by which means the air becomes intimately commingled with the entire mass of the grain, and takes up and carries off whatever of surplus moisture and steam
60 there may be in it, as well as the gaseous products of the various foreign matter (the animalcules and the fungoid growths) which have been volatilized by the action of steam in the vertical chamber C.

65 It is plain that instead of using an exhaust-fan, G, the air may be driven through by any other form of apparatus capable of doing the work, the special object being to compel the air to move through the chamber D in large
70 quantities and in a direction opposite to the movement of the grain.

J is a superheater, which may be made on any of the numerous plans in use. From this superheater the steam passes through the supply-pipe K to the pyrometer L, which indicates the temperature to which it has been brought, and thence it passes to the two service-pipes M and N. One of these pipes, M,
75 leads into the annular chamber O, which surrounds the outer cylinder, A, and communicates with the interior thereof by openings extending all around it. The other pipe, N, discharges into the interior of the inner cylinder, B, whence the steam flows through an
85 aperture or a series of apertures extending all around it into the annular space C, which is filled with the falling grain. In this way two thin sheets of steam in a highly-superheated state are delivered into the mass of grain in
90 such way as to become most thoroughly commingled with it. By raising the temperature of the steam by superheating to from 500° to 900° Fahrenheit the action upon the grain will be very quick; but it is plain that, so far
95 as regards the double cylinder and its connection with the supply-pipes, it would also be adapted for use with steam not superheated, or with hot air, if one should so desire.

P is a mere circulation-pipe for use in bring- 100

ing the steam up to the proper degree. It is provided with the cock Q, which, of course, must be closed when the apparatus is in operation, and, on the other hand, is to be open, and the cock S closed, when raising the steam to the working temperature.

R is a drip-cock for discharging the water of condensation that may accumulate in the supply-pipe, and T T' are cocks for closing the two service-pipes M and N whenever required.

At U, inside the chamber D, is shown a shield or diaphragm. The object of this is to prevent the kernels from being diverted from their direct fall by the currents of air and drawn into the tube H.

An efficient apparatus of the above nature is constructed by making the cylinder A about eight feet high and two feet in diameter, the cylinder B being at the same time about eighteen inches in diameter, and the conveyer or chamber D being sixty feet in length. No attempt is made to preserve these relative proportions in the drawing.

From the foregoing description the operation of the apparatus will be fully understood without further explanation. One of its chief merits is that the operation is continuous, the construction being such that the grain passes through the steaming-chamber with a constant flow, instead of, as in a large class of apparatus, being divided up into separate

charges to be treated independently, and, of course, intermittently.

The flow of the grain can readily be regulated by means of a conical valve, W, which can be so adjusted upon the central supporting-rod as to enlarge or diminish, at the pleasure of the operator, the annular discharge-orifice at the lower end of the steaming-chamber, through which the grain falls into the hopper that leads to the chamber D. This device, in connection with the cocks on the service and supply pipes, gives absolute control over the manipulation of the grain and the steam, enabling the operator to regulate the time and intensity of the exposure with great nicety.

What is claimed as new is—

The combination, in a grain drying and purifying apparatus, of an annular chamber through which the grain can descend by the force of gravity, means for supplying such chamber with superheated steam, a supplemental cooling-chamber into which the steamed grain passes in a highly-heated state, and through which it is carried by a conveyer, and means for producing therein a strong current of air, substantially as and for the purpose set forth.

JOHN McCOY.

Witnesses:

SAML. A. DUNCAN,
BENJ. A. SMITH.