

(No Model.)

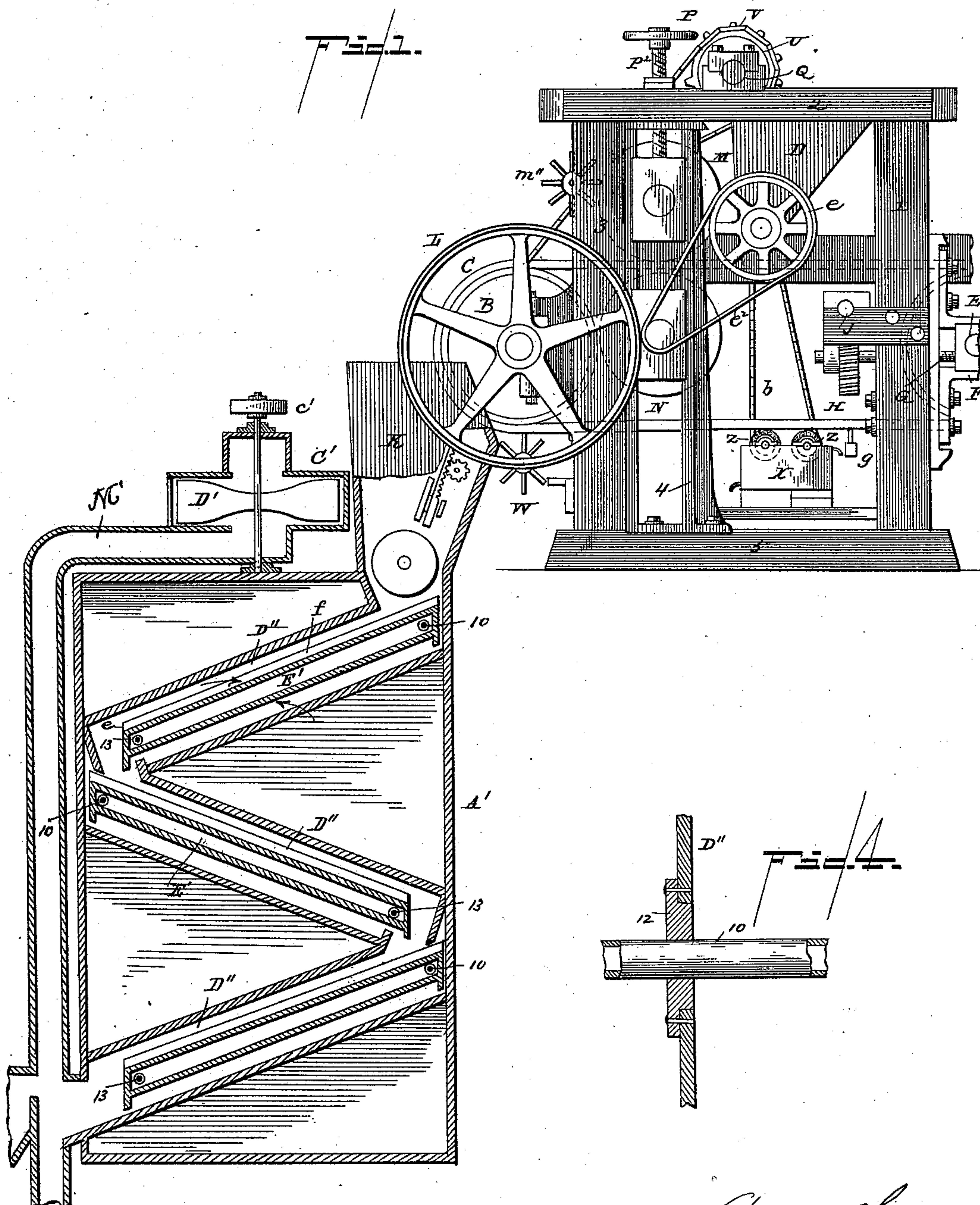
3 Sheets—Sheet 1.

A. HERR.

DRYING OR EVAPORATING APPARATUS.

No. 408,660.

Patented Aug. 6, 1889.



WITNESSES

Edwin T. Jewell.

E. Everett Ellis

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INVENTOR

By

Yours truly, C. W. Intire Attorney

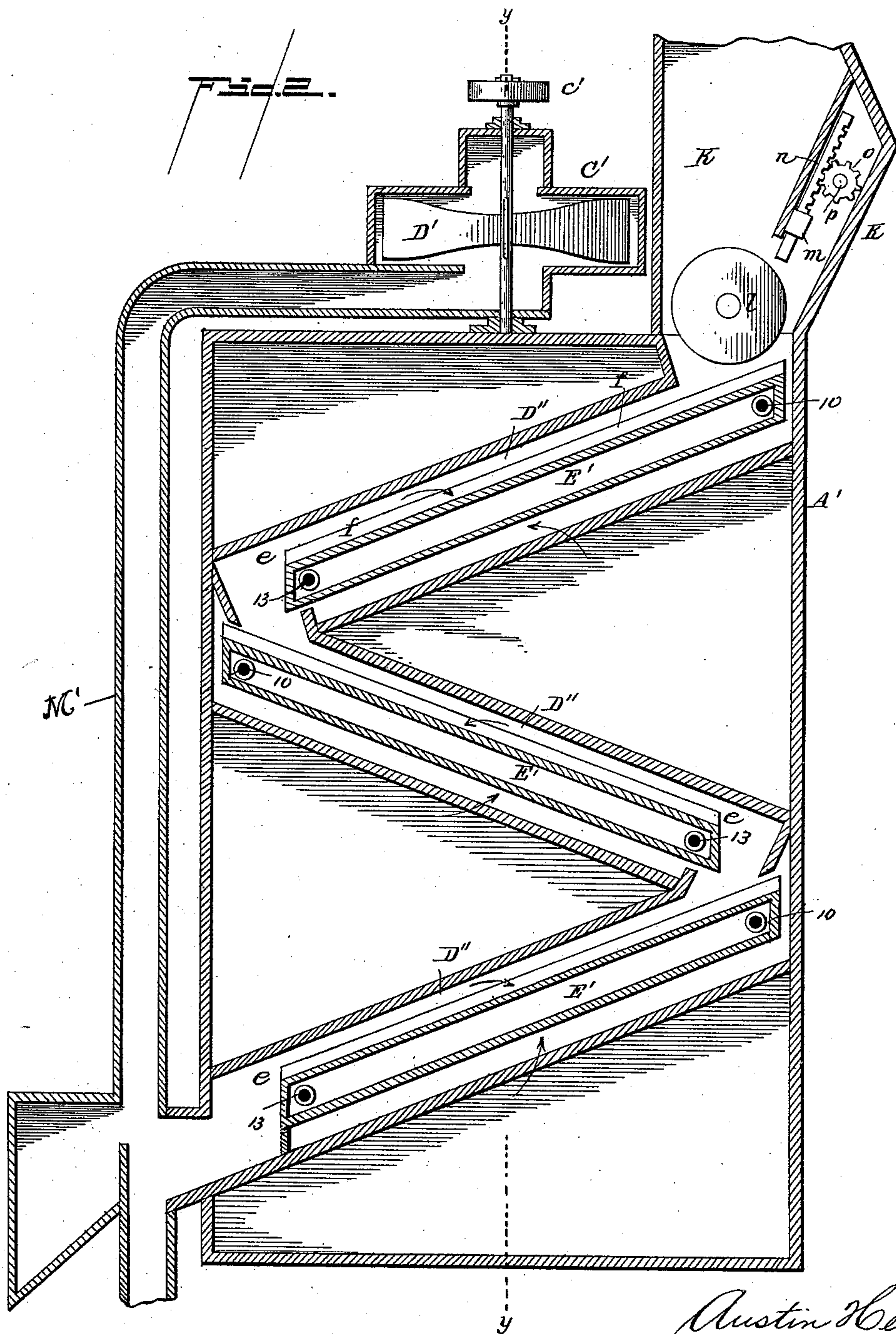
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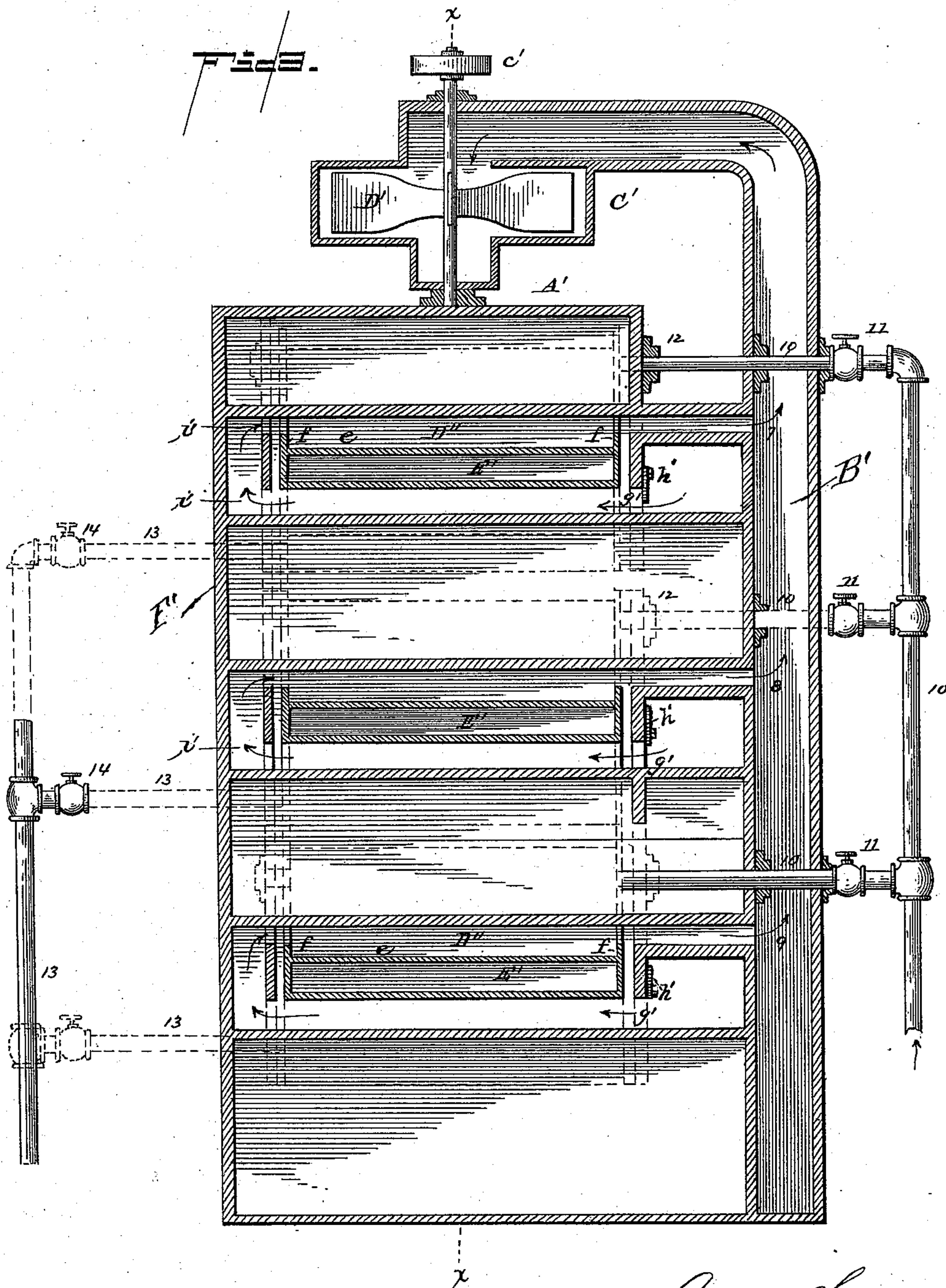
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UNITED STATES PATENT OFFICE.

AUSTIN HERR, OF WASHINGTON, DISTRICT OF COLUMBIA.

DRYING OR EVAPORATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 408,660, dated August 6, 1889.

Application filed March 29, 1888. Renewed July 18, 1889. Serial No. 317,843. (No model.)

To all whom it may concern:

Be it known that I, AUSTIN HERR, a citizen of the United States, residing at Washington, District of Columbia, have invented new and useful Improvements in Drying or Evaporating Apparatus, of which the following is a specification.

This invention relates to certain new and useful improvements in drying or evaporating apparatus for grain and like substances; and it consists, substantially, in such features thereof as will hereinafter be more particularly described, and pointed out in the claims.

The invention is more especially intended for use in connection with the method or process of and apparatus for separating garlic from wheat covered by a former application filed by me on the 29th day of December, 1886, and bearing Serial No. 222,911, and an application filed of even date herewith having Serial No. 268,844, although I do not wish to be understood as limiting the present invention to this particular use, as the same may be used independently as a drier or evaporator for various substances or materials.

In the inventions covered by my other applications referred to this drier is employed to evaporate from the surfaces of grain the expressed juices of garlic received thereon during the passage of the combined mass through certain mashing or separating apparatus; and without further reference to the intended objects I will proceed to a description by referring to the accompanying drawings, wherein—

Figure 1 represents a vertical side elevation of a portion of the separating-machine shown and described in my other applications referred to, together with a vertical sectional elevation of the evaporator embodying my present invention. Fig. 2 is an enlarged sectional elevation on the line *xx* of Fig. 3, and Fig. 3 is a vertical sectional elevation on the line *yy* of Fig. 2. Fig. 4 is a sectional detail.

Referring to the parts by the letters of reference marked thereon, *A'* represents a housing or structure for inclosing the evaporating-pans, and to one side of which is arranged a vertical air-trunk *B'*, which is closed at its base and communicates at its top with the

interior of a fan-case *C'*, located on top of the housing *A'*, and in which is contained a fan *D'*, operated from any suitable source of power by proper connection with its pulley *c'*. The trunk *B'* also communicates, as at 7 55 8 9, with the interior of several zigzag or inclined chutes *D''*, in each of which is supported an evaporating-pan *E'*, constructed of a hollow metallic box or case *e'*, whose two sides project somewhat above its top, forming 60 flanges *f*, which act to prevent the grain from falling off at the sides. These pans are preferably inclined at an angle of from thirty to thirty-two degrees from a horizontal line, and I propose in some instances to provide means 65 for varying this inclination, and also to employ suitable devices for holding them to their points of adjustment. In the present instance they are supported within the chutes by means of the pipes which lead to and from 70 the boiler to supply them with steam for heating.

It will be observed that the series of pipes 10 leading from the boiler are each provided with a regulating cock or valve 11, and that 75 they enter the upper ends of the pans at the sides through a steam-tight joint 12 (see Fig. 3) for the purpose of supplying the interior of the pans with steam. It will be further observed that the series of pipes 13 return- 80 ing the exhaust to the boiler are provided with valves 14 and communicate in like manner with the lower ends of the pans at the opposite side, and thus are the several pans supported and kept heated continuously. 85 The object of these valves 11 and 14 is to control the supply of steam to the tanks—*id est*, should I find that only one or two pans or evaporators are needed to accomplish the result desired on certain grades of wheat I can 90 close the steam from the others, &c.

The point of communication of the trunk *B'* with the several chutes is at the top or above the pans *E'*, while the spaces beneath the pans are open to the atmosphere of the 95 room in which the machine is located, through inlets *g'*, which are preferably provided with adjustable sliding covers *h'*, for controlling the admission of air. The side of the chutes opposite to that referred to is formed with 100

openings i' above and below the pans, while external to or beyond such sides is a wall F' , that forms a conduit for the passage of the incoming air up over the tops of the pans, as indicated by the arrows.

It will be observed that the chutes communicate with each other, thus forming a continuous passage, and that the lower chute communicates at its extremity with a duct for conveying the grain off, as is usual in separating contrivances. This duct also communicates with a trunk M' , extending up and communicating with the fan-case, through which the lighter particles are drawn off by suction after having their specific gravity reduced by evaporation. As the material passes down over the pans the rotating fan will cause induced currents of air to pass in under the pans through the inlets g' , thence through the openings i and over the tops of the pans, whence it passes up through the trunk B' , and is discharged through the mouth of the fan-case. In the passage of the air beneath the pans it becomes very thoroughly heated, (the bottom of the pans being blackened for retaining the heat of the steam,) and it is evident that in passing across the surface of the material traveling over the tops thereof every possible trace of the juice expressed from the garlic will be evaporated and carried off through the trunk.

The separator shown in Fig. 1 of the drawings is only intended to indicate one of the applications of my improved drier, and in order that the same may be understood I would refer to the several parts thereof in a general way, as follows:

A and B each represents a metallic or other cylinder around which passes an elastic belt C, the said belt also passing between the bites of two hard-faced rolls M and N, the upper of which is adjustable by means of the screw P^2 , having hand-wheel P. 1, 2, 3, and 4 represent different parts of the frame-work of the separator and 5 the base thereof.

D is a hopper through which the material is fed onto the elastic belt.

E represents movable box-bearings for the cylinder A, that are supported in guides F, G, being a screw rod or bolt carrying on its inner end a worm-wheel H, designed to gear with a worm on shaft J, and on the turning of this screw-rod the boxes E are adjusted.

W and M^2 are scrapers, and X is a tank having washers $z z$, g being a squeegee or scrubber.

L is a drive-wheel on one end of the shaft of cylinder B.

Q is an idle-shaft, U being a sprocket-

wheel, and V a sprocket-chain passing over the same. The washing-rolls $z z$ are revolved by means of a chain B, and e is a pulley on the hopper-feed roll having a belt e^2 passing around the same and connected to the shaft of the lower roll N.

From the foregoing description it is thought that the operation of my invention will be thoroughly understood, and I desire to state that while I have herein shown and described certain constructions and arrangements of parts, I do not wish to be understood as limiting myself thereto in precise detail, as very material changes could be resorted to and still be within the scope of my invention.

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

1. In a drier, the combination of the series of inclined chutes, the pans E' , located in said chutes, the steam-supply pipes entering the pans in one side at or near their upper ends, and the discharge or exhaust pipes entering the same in like manner on the opposite sides at near their lower ends, openings g in one side of the chutes beneath the pans, and similar openings $i i'$ in their opposite sides, an air-trunk communicating with the chutes above the pans, and a fan for inducing air-currents, substantially as shown and described.

2. In a drier, the housing A' , constructed of an outer wall F' , and a series of inclined chutes D'' , having in one side the openings $i i'$ and in the other the inlet g' , controlled by slides h' , in combination with the hollow pans E' , arranged as shown, and having upper side flanges $f f$, an air-trunk communicating with the chutes above the pans and with a fan-case, and valve-controlled inlet and discharge pipes entering the sides of the pans at near their opposite ends, which also serve as supports for the said pans, substantially as described.

3. The combination, with the inclined chutes having in one side the openings $i i'$ and in the other the inlets g' , of the hollow pans E' and the outer wall F' , whereby air entering beneath the pans will be induced to pass up and over the tops thereof, substantially in the manner described and indicated.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

AUSTIN HERR.

Witnesses:

JNO. IRWIN, Jr.,
J. W. HULSE.