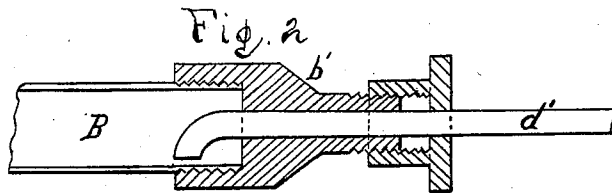
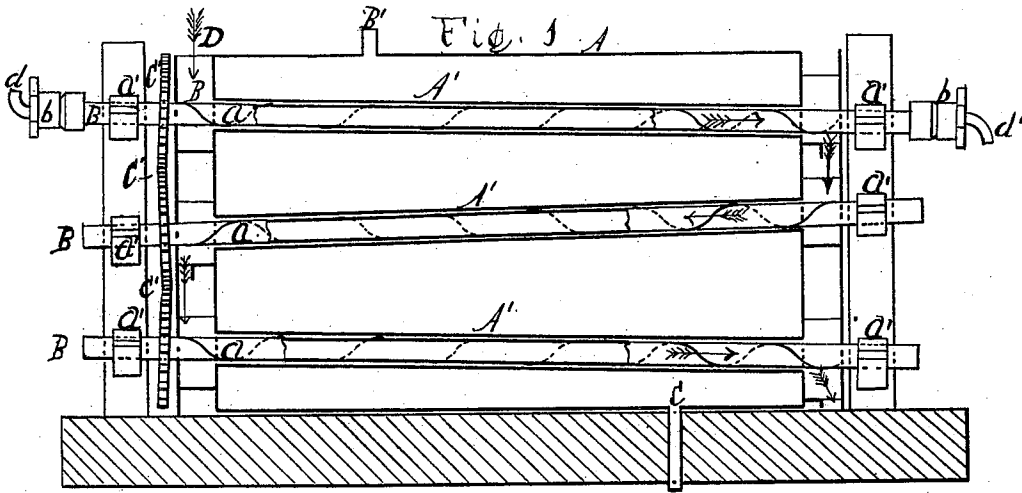


S. DAVIS.
 DRYING APPARATUS.

No. 177,103.

Patented May 9, 1876.



—Witnesses—
 R. D. Engersoll

—Inventor—
 Samuel Davis.
 by R. D. Engersoll
 Atty.

UNITED STATES PATENT OFFICE.

SAMUEL DAVIS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN DRYING APPARATUS.

Specification forming part of Letters Patent No. **177,103**, dated May 9, 1876; application filed January 12, 1876.

To all whom it may concern:

Be it known that I, SAMUEL DAVIS, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Heating and Drying Apparatus for Treating Animal Matter; and I hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention relates to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a longitudinal section; Fig. 2, longitudinal section of stuffing-box and exhaust-pipes.

My invention relates to heating and drying apparatus for treating animal matter for fertilizing purposes; and consists in a stationary vessel provided with a tube or tubes passing longitudinally through the same, and through which tube or tubes longitudinally passes a revolving pipe or pipes, around the outer surface of which is secured a screw or worm.

The matter treated in this instance is what is commonly called by those familiar with the business "tank stuff" and is that portion of animal matter that remains after the lard or tallow has been extracted. It therefore becomes necessary, in order to convert the article into a merchantable fertilizer, to remove the dampness as well as the odorous smell that emanates from the same.

Various methods are in operation at the present time for accomplishing the results to which my invention relates. Some of them are expensive in their construction, and all consume too much time in accomplishing what is desired, and, in the manipulation of the same, they require too much labor. By my invention the labor is less, and a larger amount of material treated in the same number of hours than by any other. I have demonstrated the same by actual test, and it has proved satisfactory in every respect. I will now proceed to describe the same.

In the accompanying drawing, A represents the heater, of any suitable shape, through which pass longitudinally the tubes A', the ends being secured in the heads of the heater; B, revolving steam-pipes, passing longitudinally through the tubes A', and carrying upon

its outer surface the screw or worm *a*, and journaling in the boxes *a'*, upon the ends of which revolving pipes are also fitted the stuffing-boxes *b* and *b'*. The box *b* secures the packing at the point where the steam enters the pipe B through the smaller pipe *d*, and the box *b'* secures the packing around the pipe *d'*, through which the steam passes out of the pipe B.

It will be observed that the pipes *d* and *d'* remain stationary, and the boxes revolve around the same; consequently the stuffing-boxes are necessary to form a tight joint at the point where the stationary and revolving pipes connect. The inner end of the pipe *d'* is also turned downward, so that the steam in passing out of the same will carry off any water that would otherwise accumulate in the pipe B. Any number of tubes can be placed in the heater, and as many revolving pipes can be placed in the same as are required, and all be connected together in such a manner that the steam passes in at the end of one pipe, and continues through the series and exhausts from the last one.

I have in the drawing shown the stuffing-boxes only upon the top pipe; but when more than one pipe is used it becomes necessary to provide each one with boxes, the same as the pipe illustrated.

B', pipe through which the steam enters the heater; C, exhaust-pipe to heater; C', gear-wheels secured to the revolving pipes B, and engaging each other, so that when the power is applied to the same they revolve the pipes in the required direction; D, hopper into which the material is placed that is to pass through the heater and drier.

Having given the different parts of my invention, I will now describe its operation. The heat is supplied by passing steam into the heater A, and through the pipes B, and the power is applied to the gears C', which causes the same to revolve the pipes. The animal matter that is to be operated upon is placed in the hopper D. The worm *a* upon the revolving pipe comes in contact with the same, and carries it through the heated tube to the hopper at the opposite end, when it passes through the aperture in the bottom of the same into the hopper below, when the worm upon that

pipe again forces it through that tube, and it passes to the next tube, as before. It can be carried through as many successive tubes as required to accomplish the desired result. It will also be observed that the hoppers at each end of the tubes are open at the top. The matter is allowed to drop from the hopper above to the one below, and in the fall is broken into small particles, which greatly facilitates the evaporation, and as the process arrives at completion the matter is presented in a dry and pulverized condition.

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

1. The combination, in a heating and drying apparatus for treating animal matter, of

the steam-heated vessel A, provided with a tube or tubes, A', through which tube or tubes pass a revolving steam pipe or pipes, B, carrying upon the outer surface a screw or worm, *a*, substantially as and for the purpose specified and described.

2. In combination with any suitable steam-heating vessel, the tube or tubes A', hoppers D, revolving steam-pipes B, worm *a*, gears C', and the stuffing-boxes *b* and *b'*, substantially as and for the purpose specified and described.

The above specification signed by me this 8th day of August, 1875.

SAMUEL DAVIS.

Witnesses:

R. D. INGERSOLL,
T. A. COLE.