

JAMES TURNER.

Improvement in Dryers.

No. 121,915.

Patented Dec. 12, 1871.

Fig. 1.

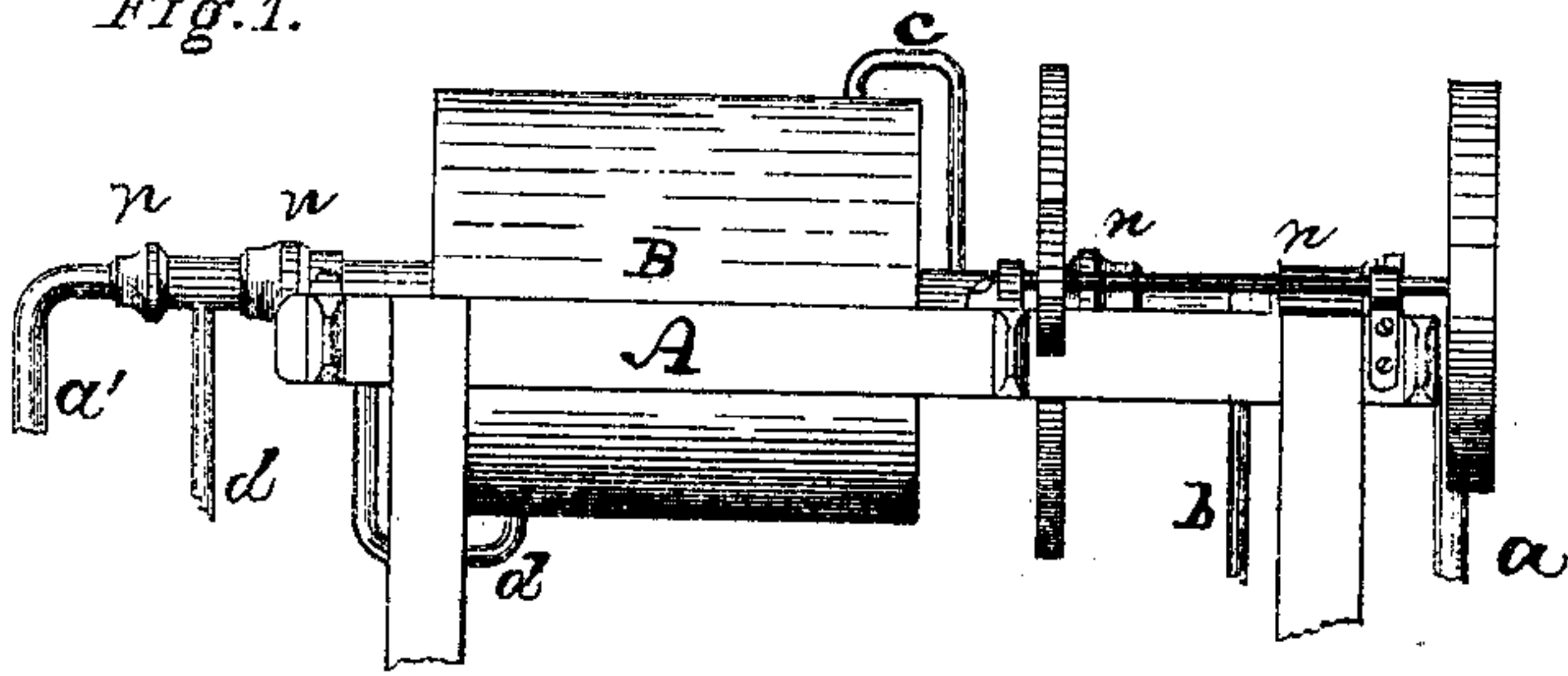


Fig. 2.

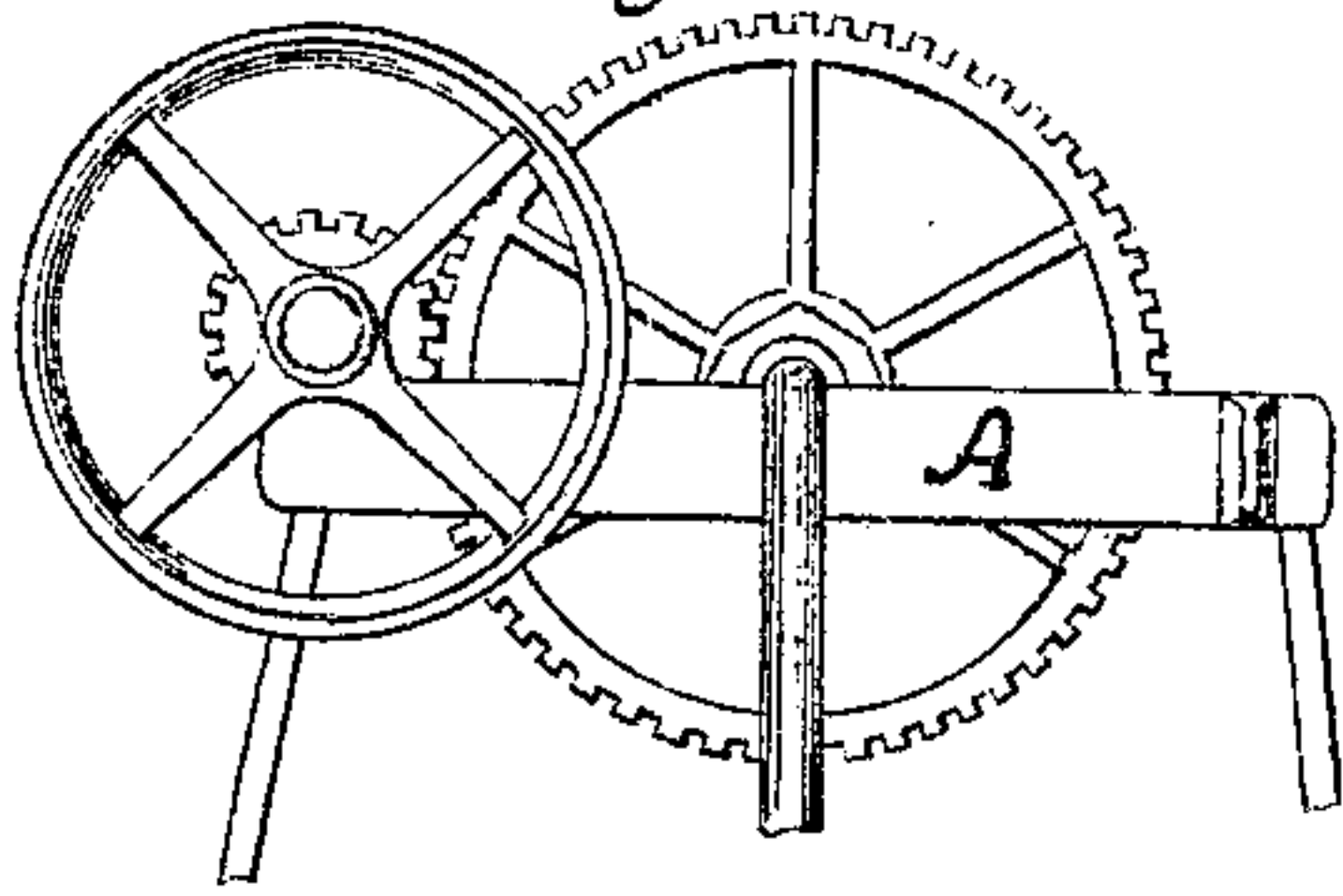


Fig. 3.

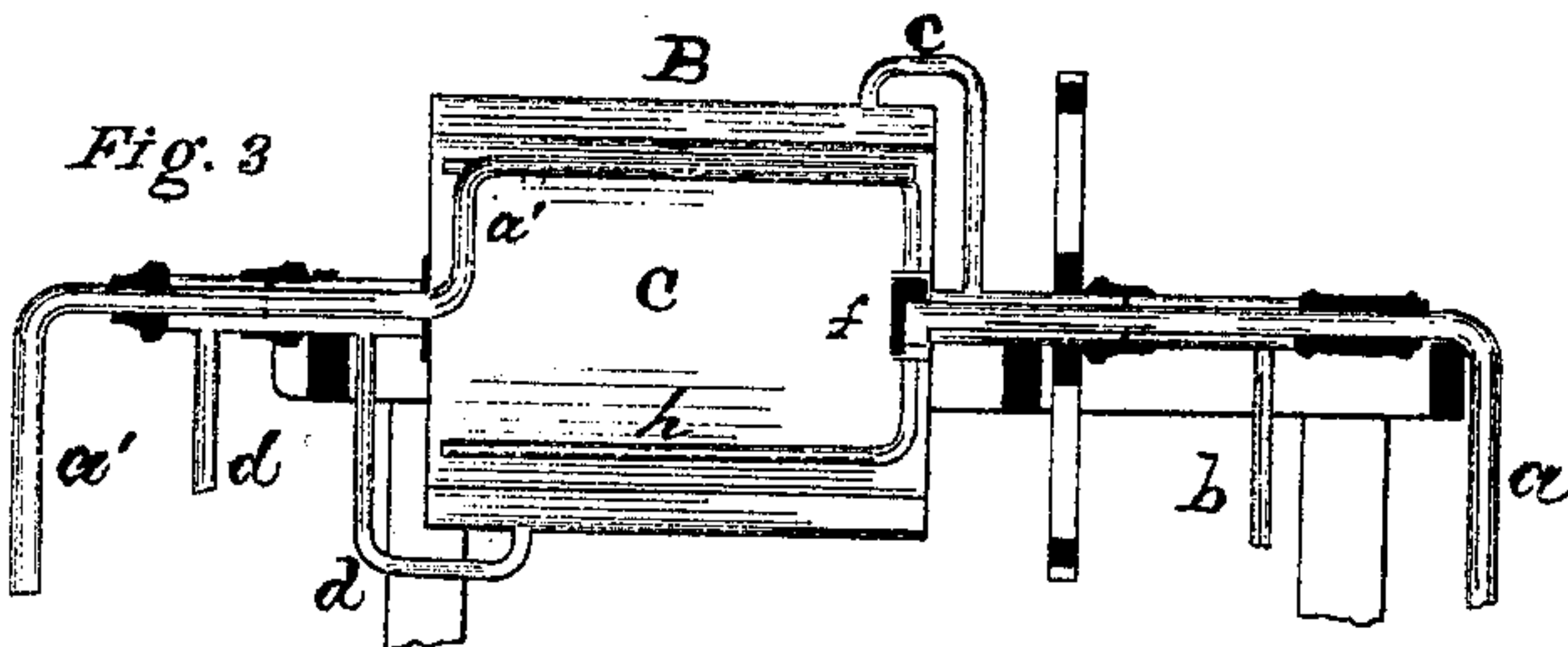


Fig. 4.

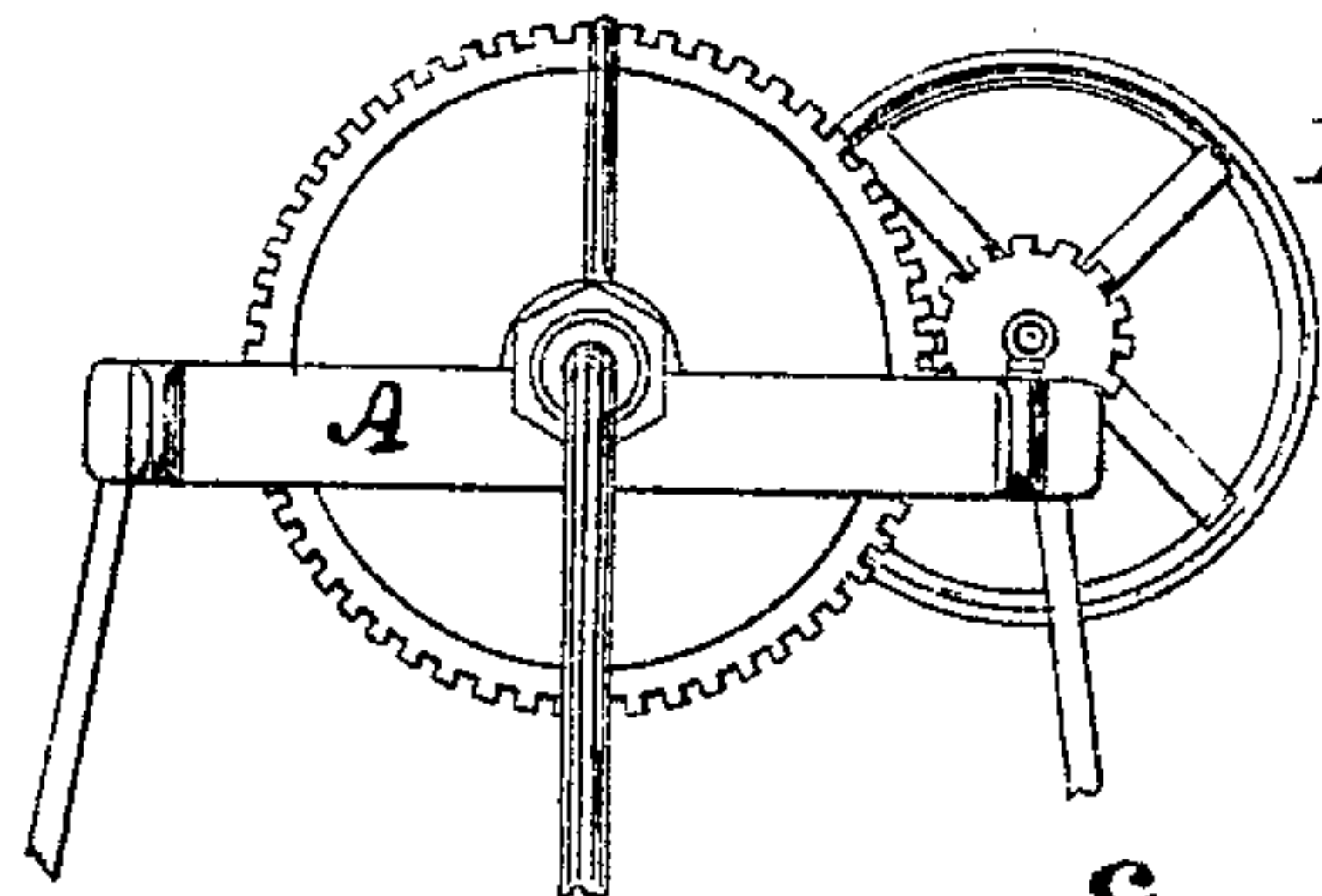


Fig. 5.

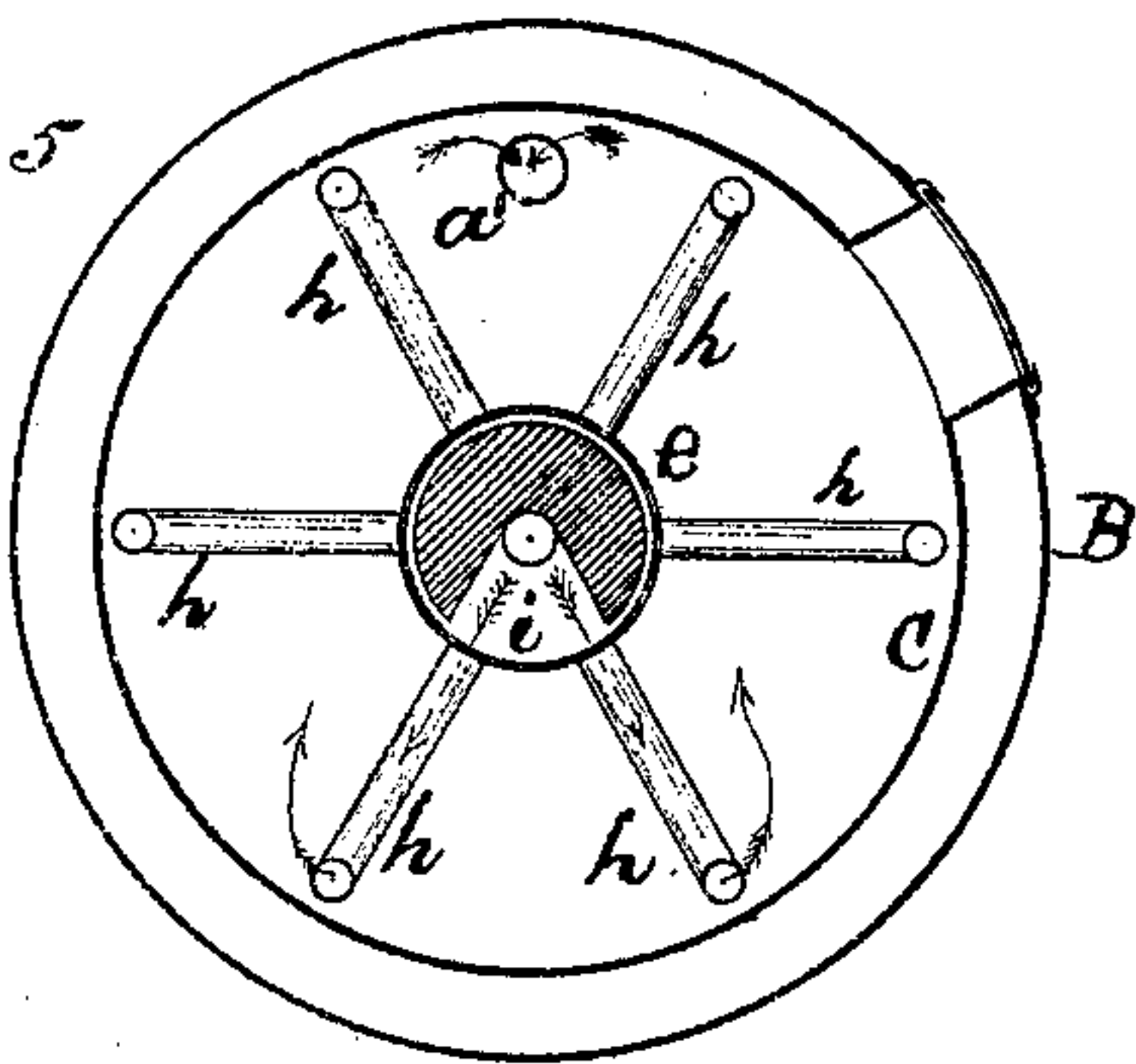
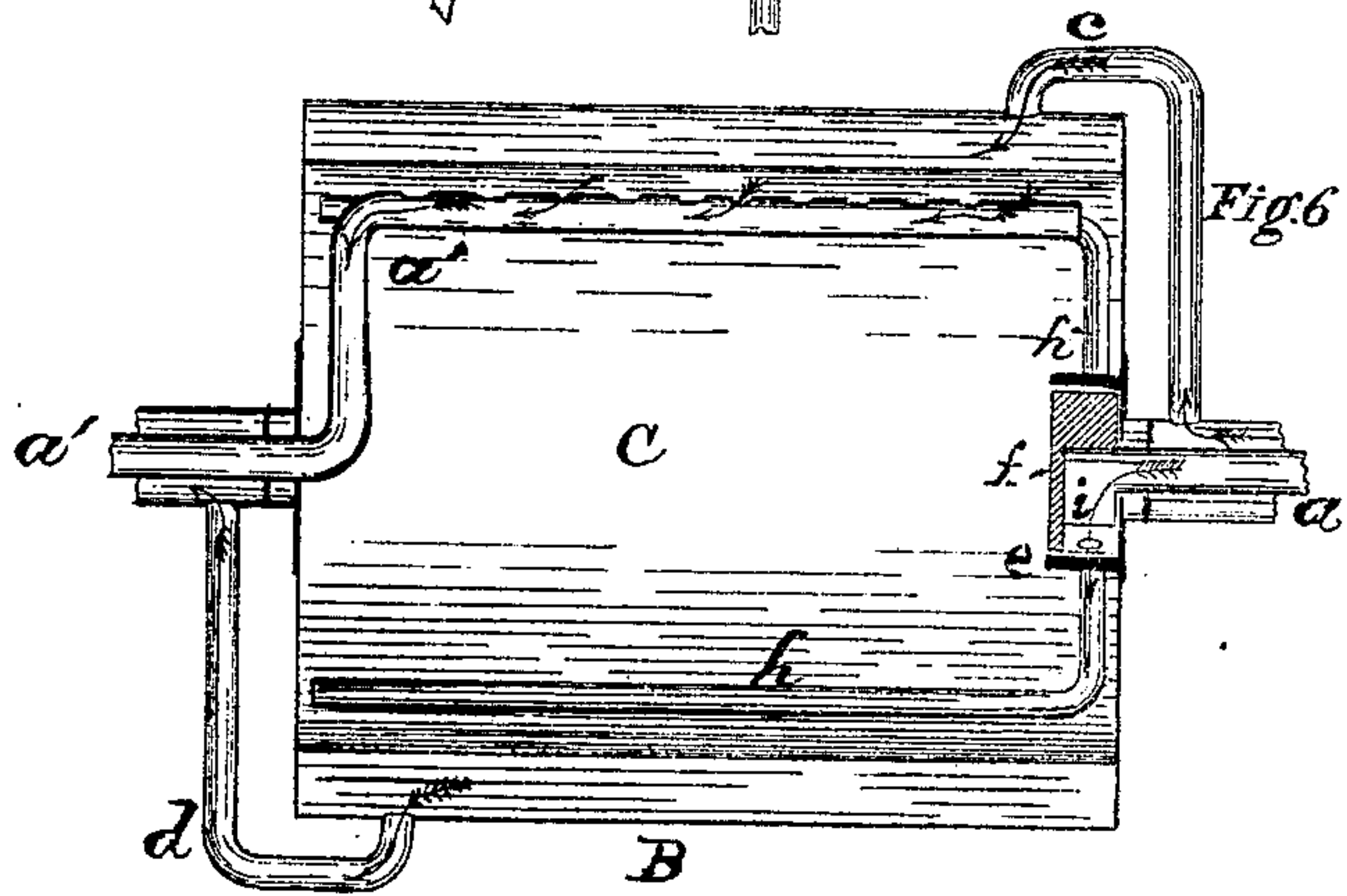


Fig. 6.



Inventor

Witnesses.

E. A. West  
O. W. Bond

James Turner



# UNITED STATES PATENT OFFICE

JAMES TURNER, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN DRIERS.

Specification forming part of Letters Patent No. 121,915, dated December 12, 1871.

*To all whom it may concern:*

Be it known that I, JAMES TURNER, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Drying Apparatus, of which the following is a full description, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a side elevation. Figs. 2 and 4 show the driving-wheels. Fig. 3 is a longitudinal vertical section. Fig. 5 is a transverse vertical section, enlarged; Fig. 6, an enlarged view of a portion of Fig. 3.

It is customary to dry various substances by the use of steam. My invention consists mainly in applying to the drying apparatus one or more air-pipes so constructed and arranged that a current of air can be made to pass through the material while being dried.

In the drawing, A represents the frame which supports the apparatus. B is a steam-jacket or cylinder surrounding the inner cylinder C, in which the material to be dried is placed through suitable openings, not shown in the drawing, which openings are made and closed in the usual manner. *a* is an air-tube, the inner end of which passes into the cylinder C in such a manner that the cylinder can revolve while the pipe *a* remains stationary. On the inside of the head of the cylinder C, through which *a* passes, is a projection, *e*, to which is secured a number of air-tubes, *h*, which pass through *e*. A cap, *f*, is secured to the inner end of the air-tube *a*. This cap has a recess or opening, *i*, Fig. 5, in the lower side, with which *a* communicates; and the cap is so fitted that the air which passes through *a* will not pass directly into C, but will pass through *i* into the tubes *h* one after another as they pass the recess *i*, being carried around with the revolving cylinders. These tubes *h* are perforated and the air passes from them into the cylinder C, permeating the material therein. *a'* is another tube passing through the other head of the cylinder C, and is bent upward and passes across the cylinder as shown in Figs. 3 and 6. This tube also remains fixed while the cylinders revolve. That portion which extends across the cylinder is perforated, and the air which enters

through *a* passes out through *a'* after having passed through the material in the cylinder. Steam is admitted between the cylinders through *b c*, both of which communicate with a passage around *a*, and are so arranged that *b* remains stationary, while *c* revolves with the cylinders. Steam passes out through *d*.

The cylinders may be revolved in any suitable manner. The air which is forced through the apparatus may be of any desired temperature, and will greatly facilitate the drying process, passing into the cylinder C dry, and taking up and carrying out the moisture therein contained.

As shown, air passes through only two of the pipes *h* at the same time; but I do not limit myself to this precise arrangement, as a greater number of pipes *h* than is shown may be used, and the number through which air passes at the same time may be increased.

The rotation of the cylinder C has a tendency to carry the material therein away from the lowest point of the cylinder, especially when only a small quantity of material is subjected to the drying process; and in order that the air going through *a* may enter the cylinder, where the material has a tendency to accumulate, the pipe *a*, with its cap *f*, is so constructed that it can be placed and secured in any desired position, so that the opening *i* can be located wherever it may be necessary or desirable.

The exit air-pipe may be carried into water or to any convenient place to remove unpleasant odors.

Suitable stuffing-boxes, some of which are shown marked *n*, are provided to prevent the escape of steam in its passage to and from the cylinder. Such a box should be placed at or near each head of the cylinder to prevent the escape of steam into the cylinder. The size of the several parts must be adapted to the work to be performed.

The openings through which the material to be dried is introduced into the cylinder are to be closed so as to be air-tight while the drying process goes on; hence a much higher temperature can be produced in the cylinder than heretofore, while ample provision is made for the escape of moisture through *a'*.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The inlet air-pipe *a*, cap *f*, with its opening *i*, and one or more air-pipes, *h*, in combination with the cylinder C, all constructed and operating substantially as set forth.

2. The combination of the inlet air-pipe *a*, the

air-pipes *h*, and outlet air-pipe *a'* with the cylinder C, substantially as and for the purposes specified.

JAMES TURNER.

Witnesses:

E. A. WEST,

O. W. BOND.

(48)