

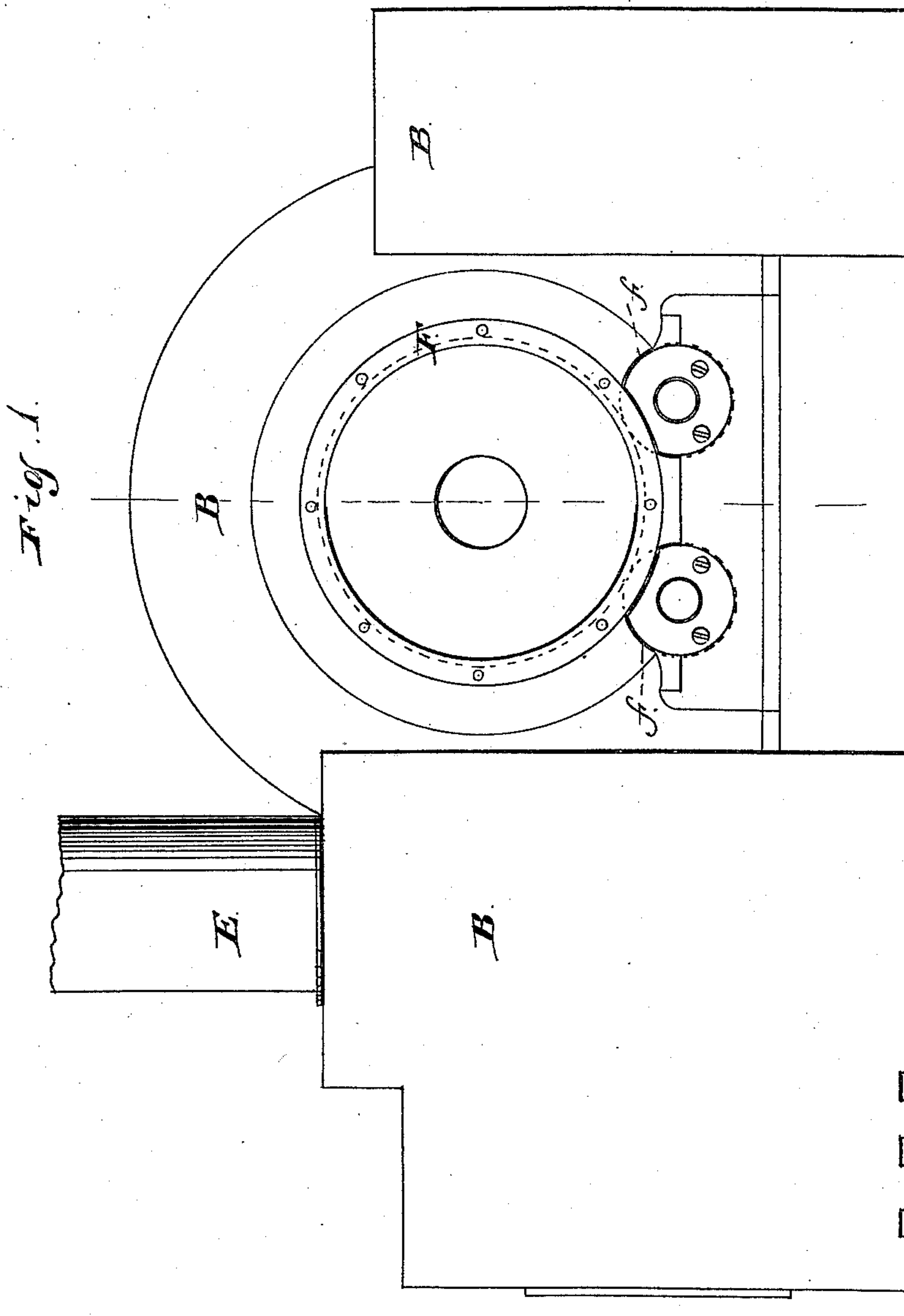
(No Model.)

3 Sheets—Sheet 1.

A. E. SPENCER.  
DESICCATING ALUM.

No. 301,174.

Patented July 1, 1884.



*Witnesses:*  
*Albert H. Adams.*  
*W. Bond.*

*Inventor:*  
*Archibald E. Spencer.*

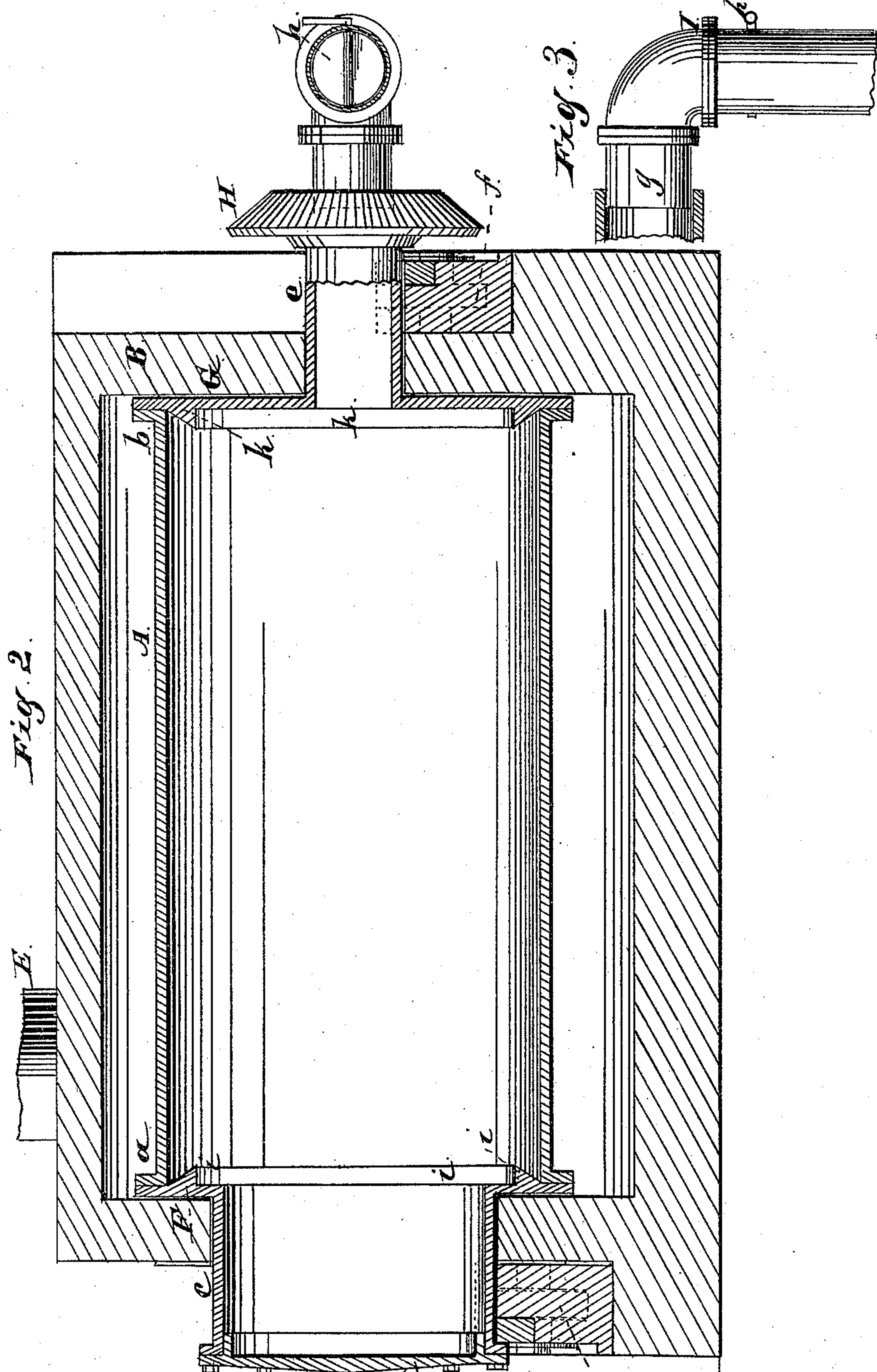
(No Model.)

3 Sheets—Sheet 2.

A. E. SPENCER.  
DESICCATING ALUM.

No. 301,174.

Patented July 1, 1884.



Witnesses:  
Albert H. Adams.  
O. W. Bond

Inventor:  
Archibald E. Spencer.

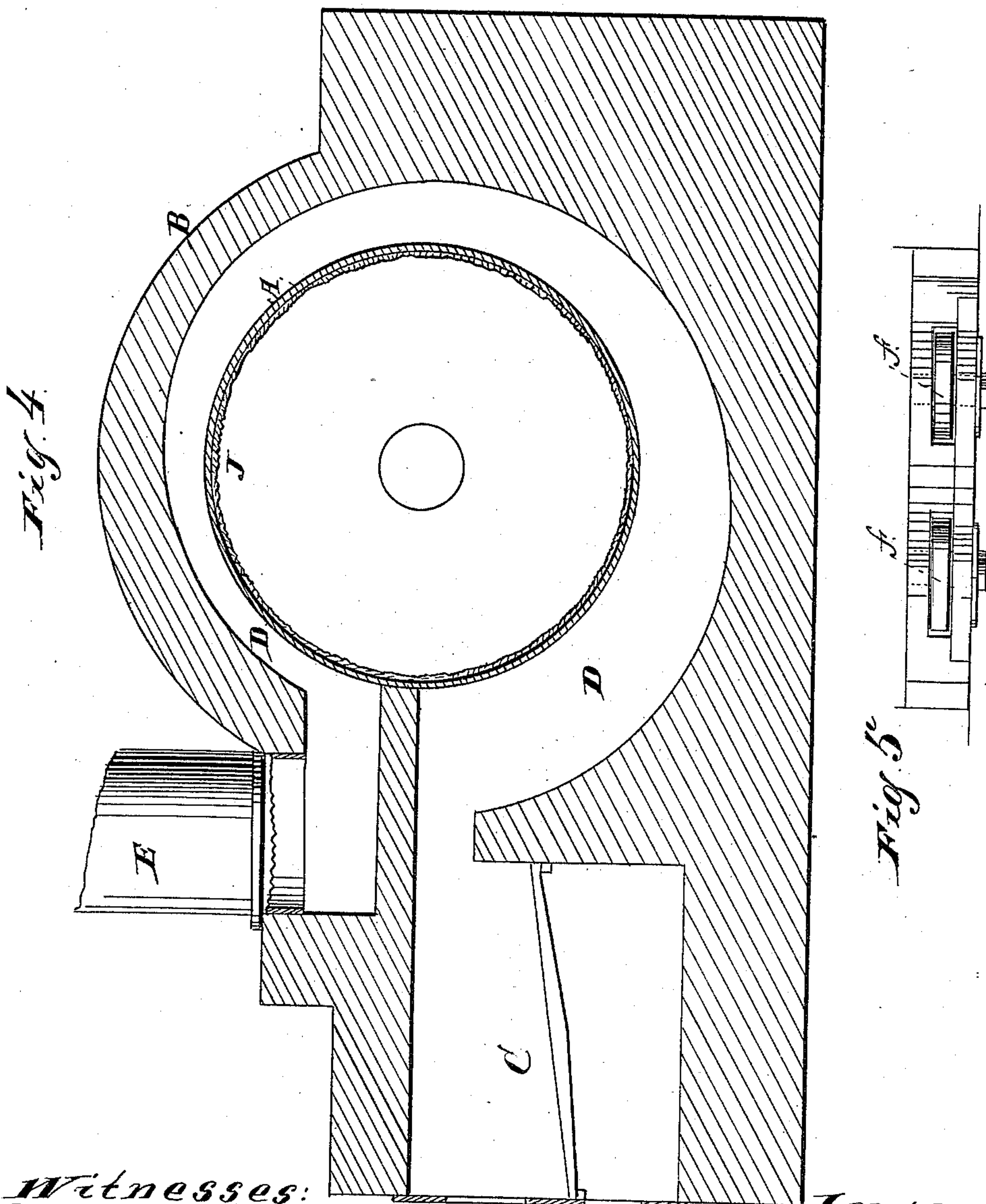
(No Model.)

3 Sheets—Sheet 3.

A. E. SPENCER.  
DESICCATING ALUM.

No. 301,174

Patented July 1, 1884.



Witnesses:  
Albert H. Adams.  
O. W. Bond -

Inventor  
Archibald E. Spencer.



# UNITED STATES PATENT OFFICE.

ARCHELAUS E. SPENCER, OF CHICAGO, ILLINOIS, ASSIGNOR TO DERASTUS H. SPENCER, JR., OF CORINNE, UTAH TERRITORY.

## DESICCATING ALUM.

SPECIFICATION forming part of Letters Patent No. 301,174, dated July 1, 1884.

Application filed October 26, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ARCHELAUS E. SPENCER, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented new and useful Improvements in Desiccating Alum, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is an end elevation. Fig. 2 is a vertical longitudinal section. Fig. 3 is a detail. Fig. 4 is a vertical cross-section. Fig. 5 is a top view of two of the rollers.

In Fig. 4 I have shown a coating of alum on the interior of the cylinder, which coating is not shown in Fig. 2. Commercial alum usually contains about forty-seven per cent. of water of crystallization, and for some uses it is desirable and customary to expel the greater portion of such moisture, which has heretofore been done by placing the alum in shallow pans and exposing the same to heat in an oven. In such case the central portion of the alum in each pan does not dry as rapidly as other parts, and if the process be continued long enough to dry the center thoroughly there is danger of burning portions of the alum. I have discovered a much more efficient method of desiccating alum than any heretofore used, and have also made some improvements in machinery for that purpose.

My process consists in placing the alum to be desiccated in a revolving cylinder, which is to be subjected to a heat sufficient to melt the alum, which will flow evenly over the interior surface of the cylinder, forming a coating thereon, which may be about one-half an inch thick, and which can be easily detached from the cylinder and removed therefrom when sufficiently dry.

In the drawings, A represents a revolving cylinder, which may be made of cast iron, about one inch thick. As shown, this cylinder is supposed to be eight feet long and four feet in diameter. The cylinder is surrounded with brick-work B.

C is a furnace located at one side of the cylinder.

D is a passage for smoke and heat, which passes nearly around the cylinder.

E is a smoke-pipe.

a b are flanges upon the opposite ends of the cylinder.

F is a head upon one end of the cylinder, bolted to the flange a.

c is a hollow cylindrical part or journal, extending out from the head F, and preferably cast therewith.

d is a removable cover upon the outer end of the part c, which, when in place, may be held in any suitable manner.

G is a head at the opposite end of the cylinder, and is bolted to the flange b. This head is also provided with a hollow cylindrical journal or part e.

f are friction-rollers arranged in the brick-work, upon which the parts c e rest and rotate.

H is a gear-wheel, permanently attached to the part e, which extends out beyond the brick-work.

I is a pipe, supported in any suitable manner, the inner end, g, of which enters the part e, but is not connected therewith.

h is a damper in the pipe I.

Upon the inside of the head F there is, as shown, an inwardly-inclined projection, i, and upon the other head there is a similar projection, k.

J is a coating of alum on the interior of the cylinder.

The operation is as follows: A quantity of alum is to be placed in the cylinder when at rest, which can be done by removing the cover d, the alum being thrown in through the hollow part c, after which the cover is to be replaced and secured in position. The cylinder is to be rotated in any suitable manner, which may be done by means of a gear-wheel, which is not shown, engaging with the bevel-wheel H. A suitable fire being provided in the furnace, the alum in the cylinder will be melted, and will be evenly distributed upon, and will adhere to the interior surface of the cylinder, forming a coating thereon, the thickness of which will of course depend upon the quantity of alum in the cylinder. In a cylinder of the size shown I place about one hundred pounds of alum to be dried, and that quantity will form a coating upon the interior of the cylinder about one-half an inch thick. With a hot fire the quantity of alum mentioned will be



thoroughly desiccated in one hour. The expelled moisture will pass off through *e* and the tube I. When the alum is sufficiently dry, I stop the cylinder and remove the cover *d*.  
5 The alum does not adhere very tenaciously to the cylinder, and can be readily detached therefrom by means of a scraper, and can be readily removed from the cylinder through the hollow part C. After the alum has been  
10 first melted, and during the earlier stages of the drying process, its consistency is such that it will drip more or less from the upper part of the cylinder, and the inclined projections *i* & *k* serve the office of directing the drippings a  
15 little inward from the extreme ends of the cylinder. The coating upon the interior of the cylinder is continuous, and it is evident that if it be, say, half an inch thick there will be a self-supporting tendency in addition to  
20 the adhesion to the surface of the cylinder; but this self-supporting tendency will only continue so long as the alum remains unbroken. I am thus able, rapidly and efficiently, to desiccate alum, all parts being thoroughly dried  
25 without any danger of burning.

I ordinarily rotate the cylinder slowly, not to exceed one revolution per minute. By increasing the speed, say, to thirty or thirty-five revolutions per minute, the capacity of the machine can be largely increased, as a much 30 greater quantity can be put into the cylinder at one time; but the wear and tear of the machinery will be very much greater. If the cylinder be run at the high rate of speed mentioned, it will prevent the dripping of the 35 alum.

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

The within-described process of desiccating alum, consisting in introducing the alum into 40 a cylinder, then melting the same by heat applied to the outside of the cylinder, and then distributing the melted alum over the interior surface of the cylinder by rotation of the cylinder to dry the alum, substantially as de- 45 scribed.

ARCHELAUS E. SPENCER.

Witnesses:

ALBERT H. ADAMS,  
O. W. BOND.