

(No Model.)

2 Sheets—Sheet 1.

K. F. TOELLNER.
AIR DRYING APPARATUS.

No. 562,938.

Patented June 30, 1896.

Fig. 1.

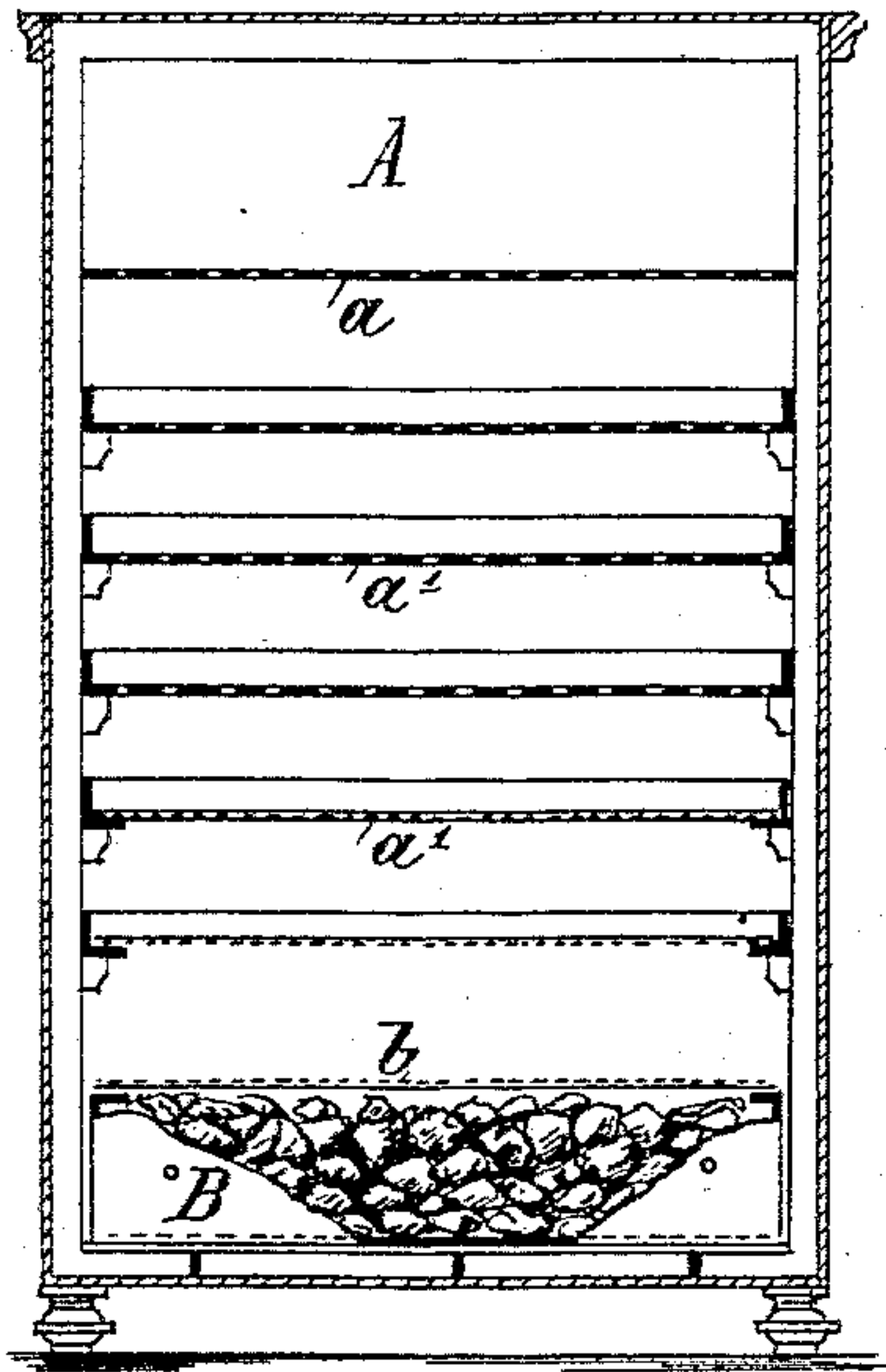


Fig. 2.

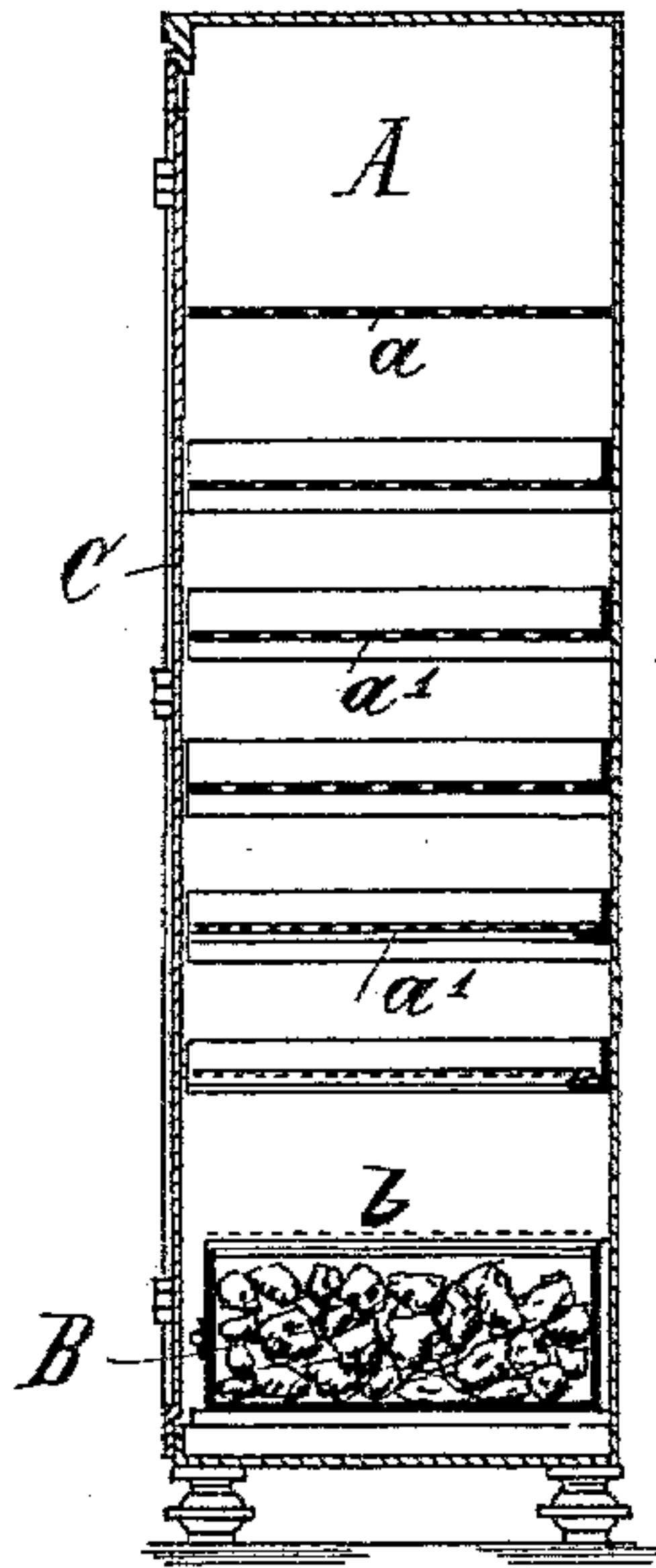
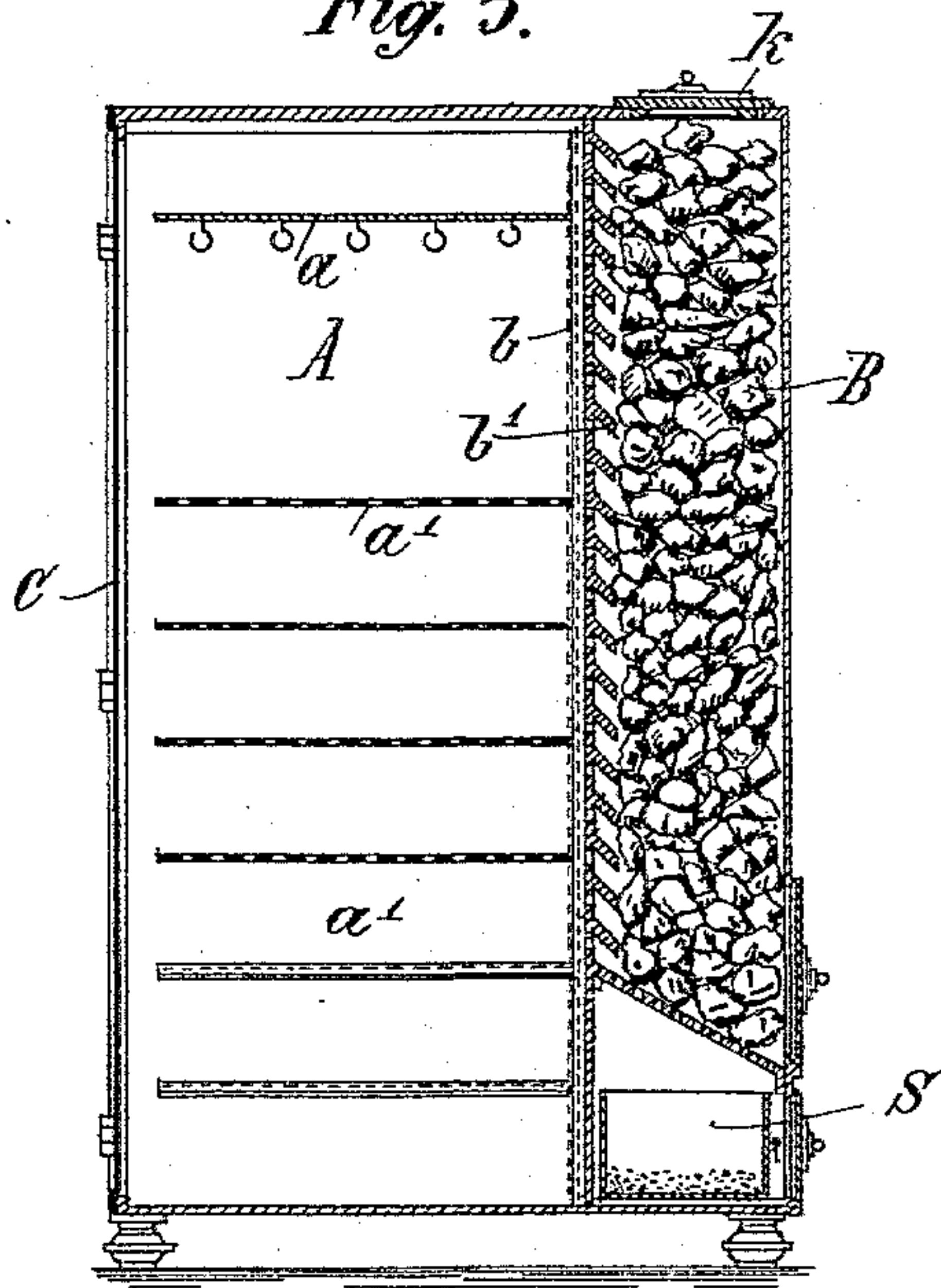


Fig. 3.



Witnesses:

E. H. Bolton

A. S. Busing

Inventor:

Karl Friedrich Toellner

By

Richard A.

his Attorneys.

(No Model.)

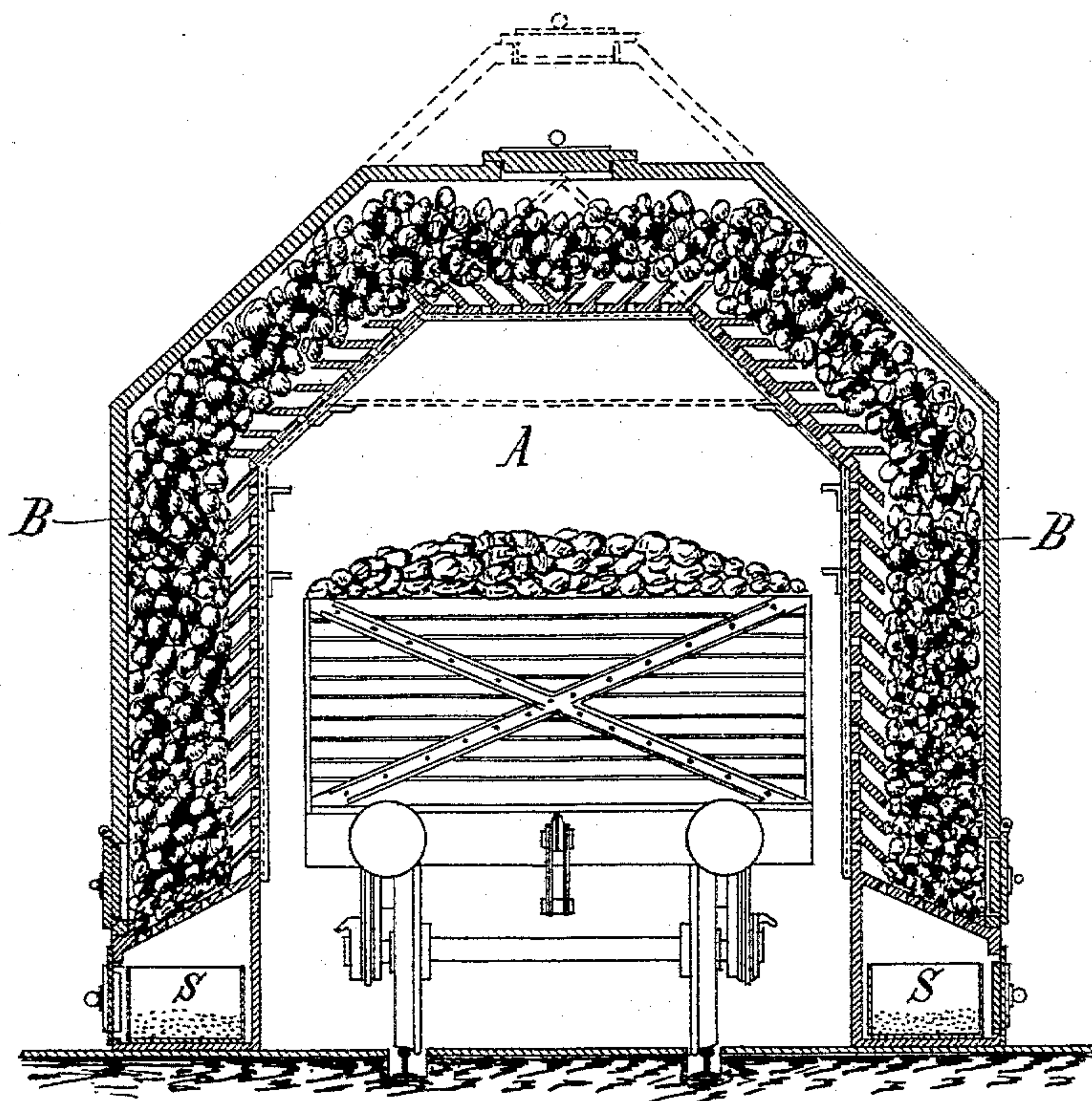
2 Sheets—Sheet 2.

K. F. TOELLNER.
AIR DRYING APPARATUS.

No. 562,938.

Patented June 30, 1896.

Fig. 4.



Witnesses:

E. B. Bolton

A. S. Bissing

Inventor:

Karl Friedrich Toellner

By

Richard A.

his Attorneys.

UNITED STATES PATENT OFFICE.

KARL FRIEDRICH TOELLNER, OF BREMEN, GERMANY.

AIR DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 562,938, dated June 30, 1896.

Application filed January 11, 1894. Serial No. 496,451. (No model.)

To all whom it may concern:

Be it known that I, KARL FRIEDRICH TOELLNER, a citizen of the free town of Bremen, residing at Bremen, in the Empire of Germany, have invented new and useful Improvements in Cold Drying Apparatus, of which the following is a specification.

This invention relates to an exsiccator (preserving apparatus) for drying organic substances as well as inorganic substances without heat. For this reason I term my new apparatus "cold drying apparatus."

The apparatus is particularly suitable on one hand to preserve water containing substances which, when exposed to the open, *i. e.*, wet, air, would soon putrefy, and on the other hand it can serve as a receptacle for such objects which, when not used, are to be prevented from being continuously in contact with the free atmospheric air, such as instruments and the like.

The special form of construction of the drying apparatus depends on the particular use to which it is determined and on the required dimensions. All my apparatus have the common feature that there is a larger useful space, in which the drying takes place, and which is separated as hermetically as possible from the outer air, but in communication with a smaller space containing the water-absorbing substances. In practice there are preferably used sulfuric acid, chlorid of calcium or unslaked lime. When using unslaked lime or similar chemicals, which fall to a fine powder, a permeable but dust-proof partition-wall is provided to separate the two spaces of the apparatus from each other, in order to prevent the distribution of dust in the larger space.

The most essential forms to be taken into consideration of my cold drying apparatus constructed according to this invention are shown in the accompanying drawings.

For the most part the form of a case or cupboard is the most suitable and only when the dimension of the larger space in the case is not sufficient for the intended purpose I give my apparatus another form.

The accompanying drawings show, therefore, first two forms of a drying apparatus.

Figures 1 and 2 represent in longitudinal

and cross section, respectively, the simplest construction of a drying apparatus, while the case shown in longitudinal section in Fig. 3 illustrates in technical respect a more complete solution of the problem. Fig. 4 is a cross sectional view of a modification.

A in Fig. 1 is a case of sheet metal or wood with sheet-metal lining, which on one of its broad sides is provided with a door made airtight by means of india-rubber or other suitable fittings.

At the bottom of the apparatus is arranged a removable box or drawer B, made of sheet metal and containing the water-absorbing substances. To prevent the distribution of dust, when using pulverulent substances, (caustic lime,) the box B is provided with a cover *b*, consisting of a piece of flannel or other suitable material stretched between two wire-nettings and not impeding the action of the chemicals contained in the boxes on the objects to be dried.

The upper part of the case is provided with guide-battens for receiving, according to the intended use, shelves provided with hooks *a* or hurdles *a'*, having bottoms of perforated sheet metal, wire-nettings, or permeable webs.

The apparatus, the cross-section of which is shown in Fig. 3, is constructed as above described, except that the removable boxes B are dispensed with. In lieu thereof it is provided with a separate compartment B' for receiving the water-absorbing solid substance. This compartment extends, preferably, over the whole back wall of the apparatus.

The space B' is closed toward the drying-space, made hermetically close by a door C, by a grate or lower blind *b'*, in front of which a permeable particular closure-wall is still provided. The space for the water-absorbing substance is at bottom also closed by a grate. Upon the latter is arranged the easily-removable drawer S, into which falls the material, which has crumbled off. The permeable wall between the two spaces consists also of a piece of flannel stretched between two wire-nettings or of a filling of felt or preferably of asbestos board arranged between the wire-cloth walls.

The space B' is provided at top and bottom

with filling and emptying openings having hermetically-closing lids for the purpose of easily introducing fresh water-absorbing substances without producing dust.

5 The action of the apparatus commences as soon as the door is closed. Its effect is surprising, as in particular in the last-described construction the air column is surely kept dry in its whole height. I have dried in a
10 relatively short time freshly-pickled meat to such an extent that for an indefinite time it remains in a good condition, so that owing to its good quality and relative cheapness it is in particular highly suitable for victualing
15 purposes. Also other articles of organic or inorganic nature have advantageously been preserved for any optional time.

The construction of the above-described cold drying apparatus having the shape of a
20 case or cupboard is limited to certain dimensions, because the depth of the drying-space A of this case, *i. e.*, the distance between the door in the front wall and the partition-wall in front of the grate, must not surpass a given
25 limit unless the action of the apparatus be prejudiced.

For drying or preserving objects requiring a greater depth and width of the drying-space in a similar advantageous manner I arrange,
30 on both sides of the latter, spaces B for receiving the water-absorbing substances, so that each space B acts on the half-width of the drying-space. By this means the useful space of the cold drying apparatus can
35 considerably be increased, because there is no obstacle to lengthen also the apparatus, as on both frontal sides doors may be provided and the apparatus may be charged on the two narrow sides.

40 If it be desirable to render the apparatus still larger, it is advantageous to arrange the water-absorbing substances in such a manner that they act not only from the sides, but also from above on the objects to be dried. For
45 this purpose the lateral spaces B, containing the water-absorbing substances, are connected with each other preferably by means of a saddle-roof, separated from the drying-spaces by means of suitable grates and permeable walls in the same manner as above
50 described with respect to the spaces B. This arrangement gives the drying-space inclosed laterally and at top by spaces containing the water-absorbing substances the form of a

tunnel, and the apparatus illustrated in Fig. 55 4 of the accompanying drawings may be considered as a fundamental form for cold drying apparatus of larger dimensions. The space A is provided in this case on both head ends with doors, which can be closed her- 60 metically. At the side walls and at the top the space A is closed by the gratings, in front of which permeable partition-walls are arranged in a suitable manner. The box B is made so as to correspond to the size of the 65 free space A, so that the water-absorbing substance heaped up in the compartment B can entirely produce its effect.

The apparatus, which at top is rounded off or flattened, as shown in the cross-section of 70 the drawings, or which has a roof pointed at top, as indicated in dotted lines, is charged from the upper edge, while downward on both sides closing-gratings are provided, and below them drawers C, by means of which the 75 pulverulent substance falling through may be removed without producing dust.

By these means I can construct apparatus of such dimensions that they are capable to receive directly the matters to be dried in 80 whole carriage-loads. The drying-space may also be provided with shelves, guides of angle-iron, and the like, so as to dry also on hurdles.

Having now fully described and ascertained my said invention and in which manner the 85 same is to be performed, I declare that what I claim is—

1. In a drying apparatus, a compartment for the material to be dried, a separate compartment for the drying substance and the 90 partition between the two compartments, said partition being dust-proof but pervious to moisture, substantially as described.

2. In combination in a drying apparatus, the compartment for the material to be dried, 95 a separate compartment, the dust-proof partition between the compartments pervious to moisture, and the absorbent material in the second compartment in solid form the dust from which is retained in said compartment. 100

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

KARL FRIEDRICH TOELLNER.

Witnesses:

W. G. GERLACH,
JOHN H. SCHNABEL.