

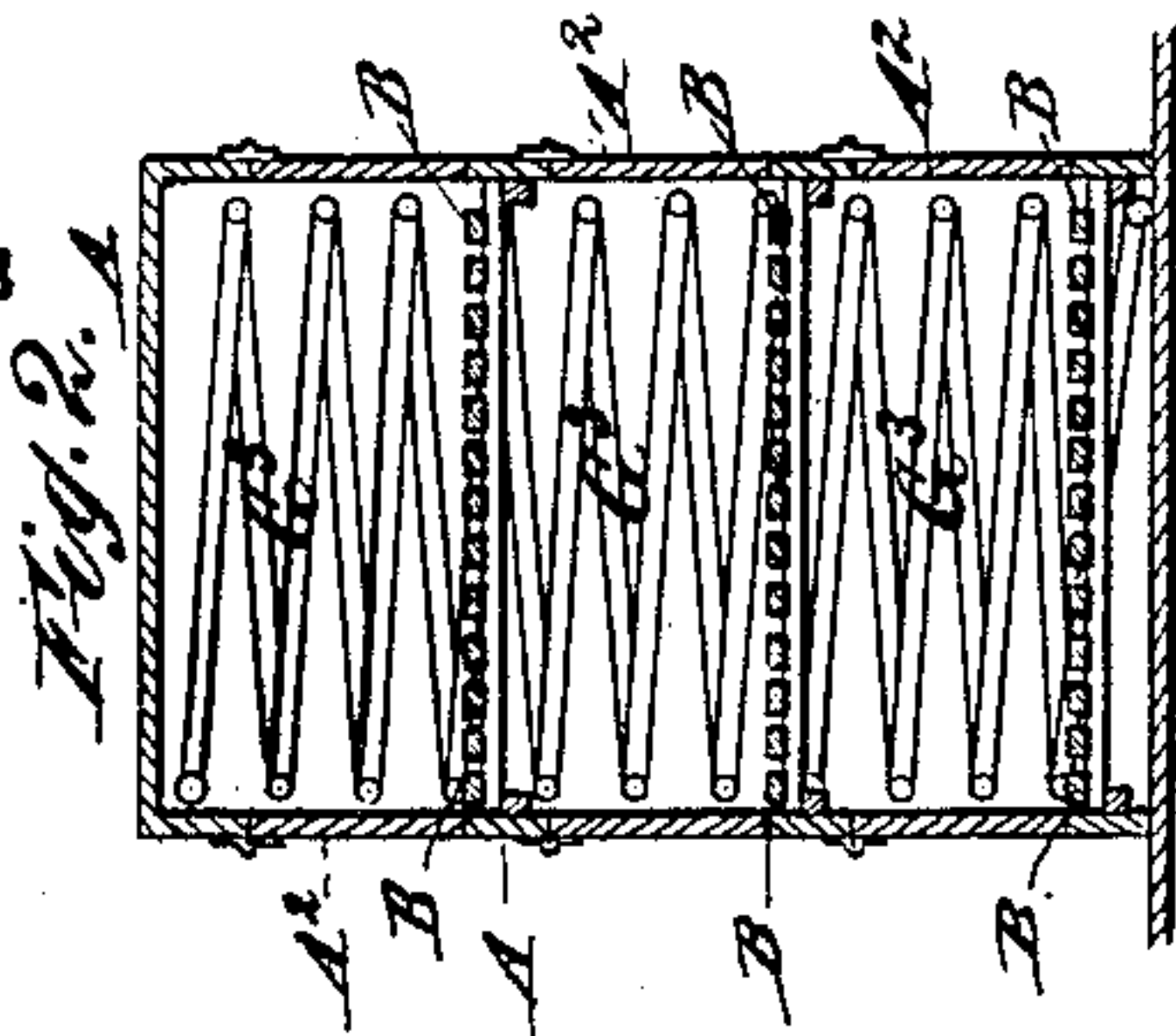
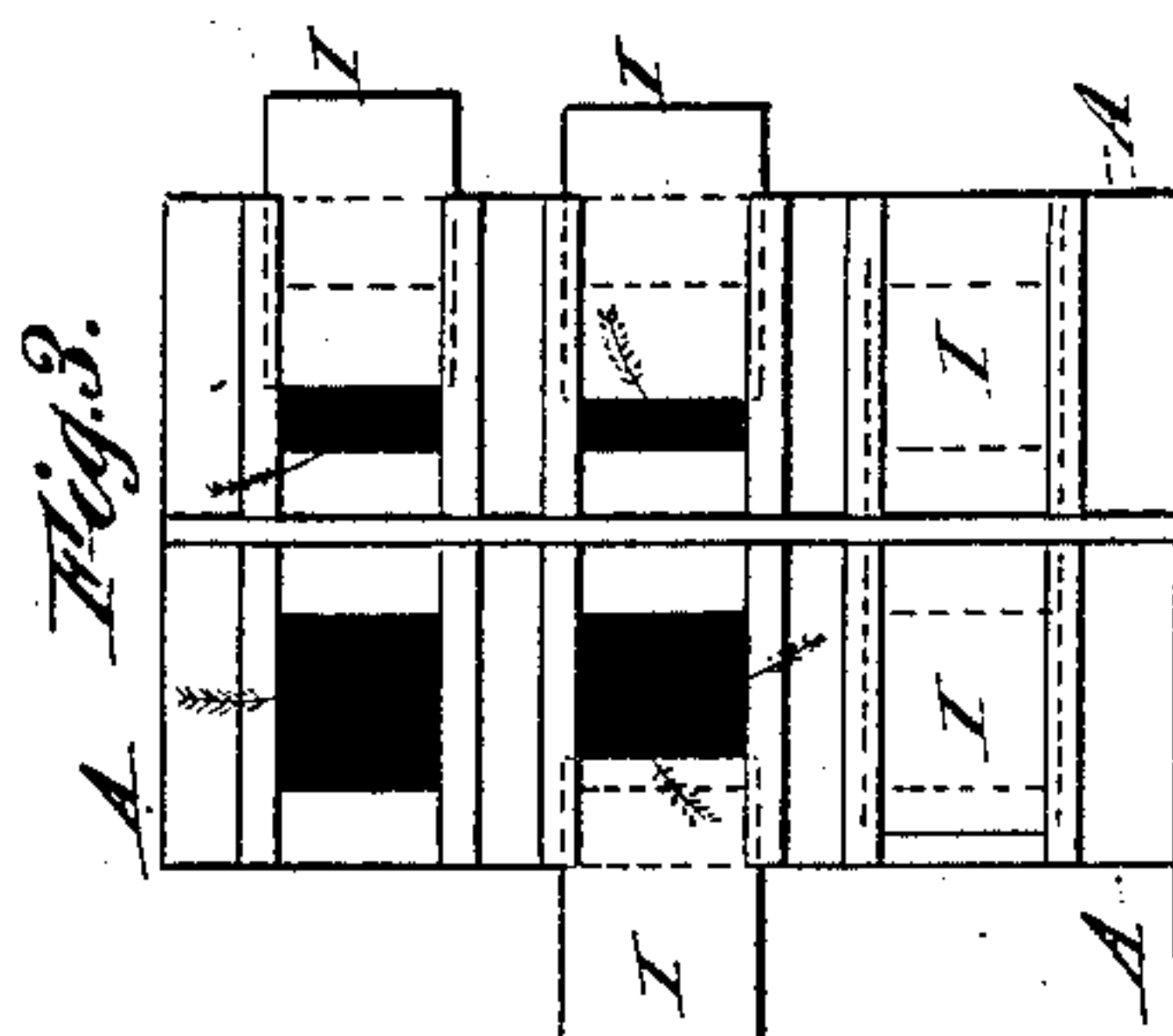
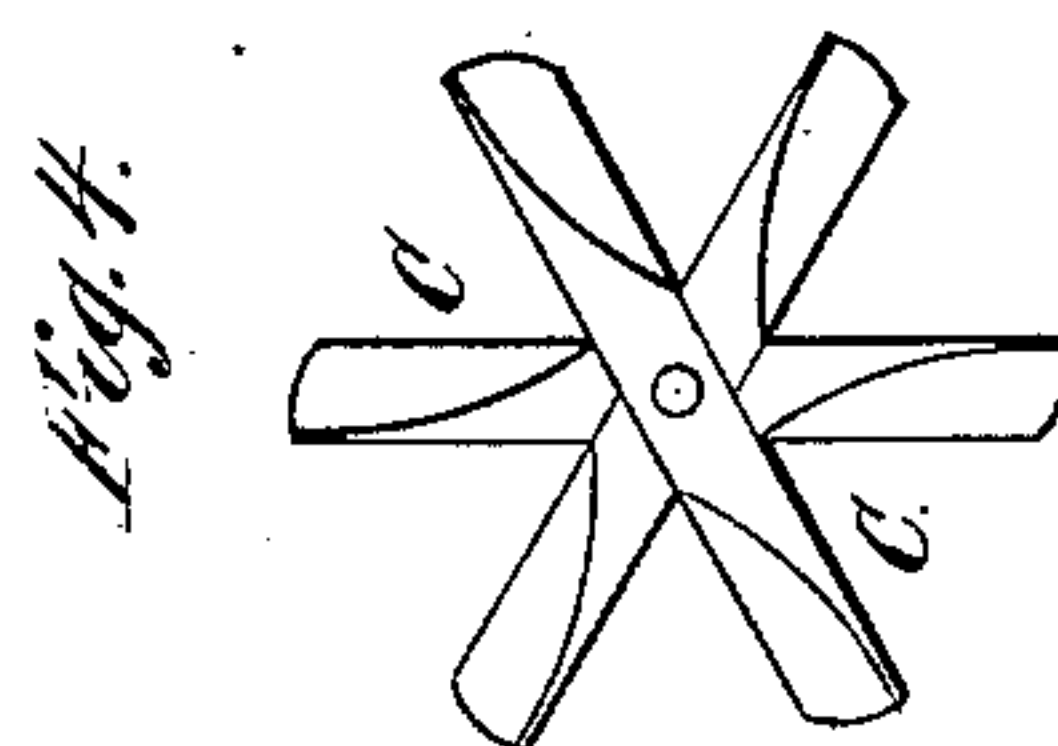
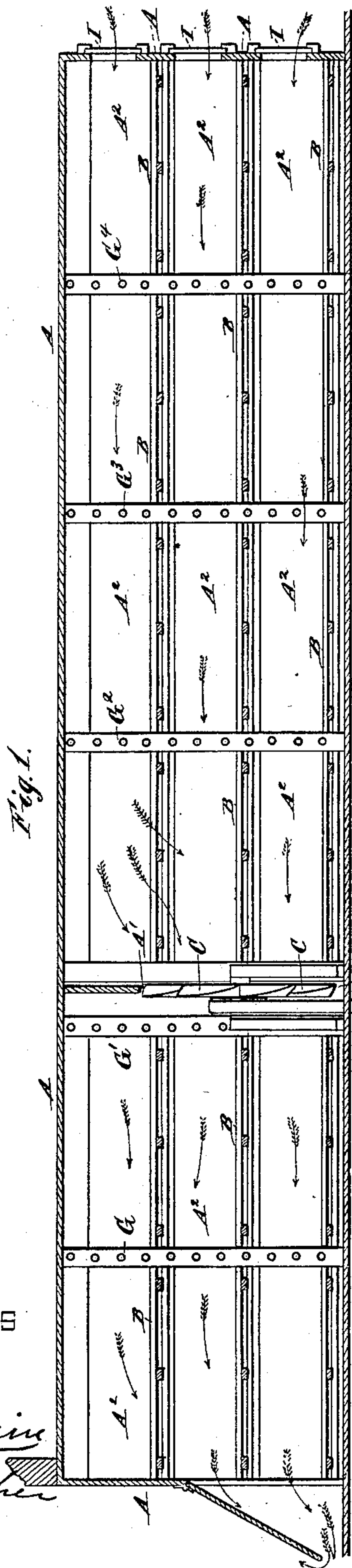
(No Model.)

S. G. PHILLIPS.

DRYING APPARATUS.

No. 245,742.

Patented Aug. 16, 1881.



WITNESSES

A. E. Fanning  
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INVENTOR

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by his attorney  
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# UNITED STATES PATENT OFFICE.

SIMEON G. PHILLIPS, OF PERTH AMBOY, NEW JERSEY.

## DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 245,742, dated August 16, 1881.

Application filed May 10, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, SIMEON G. PHILLIPS, of Perth Amboy, in Middlesex county and State of New Jersey, have invented certain new and  
5 useful Improvements in Drying Apparatus, of which the following is a specification:

The object of my invention is to dry unburned pottery, potters' clay, or other clay, after it has been refined or washed to free it from im-  
10 purities, and has had the main portion of the water removed by pressure. The clay comes from the presses in sheets of nearly uniform thickness—say from one-half inch to one inch—and the sheets are rolled up, forming loosely-  
15 rolled bundles a little larger than a gentleman's hat. My invention provides open-work shelves, on which these are introduced through side doors into a current of air, with peculiar provisions for circulating and warming the air.  
20 The apparatus is divided into sections, both vertically and longitudinally; the air moves through horizontally. The warming is effected successively at different points as the air moves through the apparatus. The circulation is in-  
25 duced by a blower placed midway between the sections.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the in-  
30 vention.

Figure 1 is a vertical longitudinal section of my apparatus. Fig. 2 is a cross-section. Fig. 3 is an elevation of one end. Fig. 4 is a face view of the screw-wheel.

Similar letters of reference indicate like parts in all the figures.

A is a stationary casing, which may be thirty feet long, six feet high, and four feet wide. It is divided horizontally by a series of separately  
40 movable shelves, B, which are slatted to allow the free circulation of the air upward and downward past the shelves, if required. It is also divided vertically into two main sections with a shorter intermediate section, which latter  
45 contains a screw-wheel, C, of large area, mounted in a corresponding circular opening, A', and driven by a belt, D, from a steam-engine or other convenient power. (Not represented.) Each section is further divided into  
50 sub-sections.

The slatted or open-work shelves B are each

large enough to extend nearly or quite across the apparatus. Each shelf is of the proper length to match its sub-section of the casing A. It is supported on ledges at each side, and is free to be drawn partly out to facilitate the removal of the dried rolls of clay and the introduction of fresh ones.

A<sup>2</sup> are doors turning on hinges, and provided with suitable means (not shown) for holding any one or more open while the shelves or the rolls of clay thereon are removed and replaced.

G G' G<sup>2</sup> G<sup>3</sup> G<sup>4</sup> are coils or zigzags of steam-pipe supplied from a boiler, (not represented,) with liberal provisions for conducting away the water of condensation. I do not deem it necessary to represent these provisions in detail. Any of the approved arrangements for steam-heating buildings may suffice. The air enters at one end of the apparatus and emerges at the other, as indicated by the arrows in Fig. 1.

I attach importance to the fact that the heating-pipes are adjusted along the route of the air. When the air enters it is relatively dry, and a small amount of warming gives it efficiency. As it proceeds and takes up moisture the temperature is increased by passing the successive heating-pipes. The effect is to dry uniformly in all the several sections.

In conducting the business actively some one of the doors A<sup>2</sup> will be open much of the time. My arrangement of the blower not only moves the air along properly while all the doors are shut, but also insures that the action in one part of the apparatus shall not be disturbed by the opening of a door in the other part. The blower, arranged as shown, also agitates the air, and causes it to circulate effectually through the several small spaces in the apparatus and between the several coils of the clay.

I I are slides which may be drawn out and adjusted in various positions to control the entrance of the air in the several parts of the entering end. These are more especially useful when only the upper shelf or other limited portion of the apparatus is in use; but the slides may be of some value any time to compel the air to circulate in all the corners. The discharge-orifice, instead of being in one large door in the entire lower portion of the apparatus, may be similarly divided into sections by separately adjustable slides, if desired.



Modifications may be made in the proportions. A greater or less number of the sections and a greater or less number of shelves may be used. The air should be free to enter uniformly the whole area of the end of the apparatus. It may be discharged in a corresponding manner at the exit end; but I prefer to discharge it at the bottom, as shown. This insures the retention of the warmest and most efficient air, and causes it to act efficiently until it has been loaded with dampness and cooled down to allow its descent.

When an entire building is available to be used as a drying-house but little alteration is needed, if it is already divided by partitions into two or more sections connected by doors. A proper circular opening being made in the lower portion of each partition, and a proper screw-wheel analogous to a screw-propeller or windmill of proper size being mounted therein and actively turned, and the proper amount of heating-pipe being arranged in each room and supplied with steam, the shelves may be arranged in any manner most conveniently accessible. The air will, as in the other forms of the apparatus, be warmed gradually and dry with approximate uniformity all the clay or ware, and any number of doors or windows may be opened and closed in any room without affecting the current of air through the others.

Although my experiments have been directed mainly to the drying of clay which has been washed and rolled, as described, I esteem it an important use of my invention to dry the pottery-ware after it has been shaped and before it is baked. Ware in this condition, especially some qualities, is liable to check or develop incipient cracks, if the drying is hastened. My apparatus dries efficiently, but with the moderation requisite to avoid checking.

Some of the advantages due to the several features of the invention may be specially enumerated as follows:

First, by reason of the fact that the air-impelling device C is mounted in the partition A' at the mid-length of the apparatus and in the lower part thereof, I insure that the hottest air is retained longest in the first and second sections, and only allowed to move onward as it gets cooler; and further, and especially, that the motion of the air in the first half of the apparatus is not affected by the opening of the doors to change the material in the last half, and, conversely, that the motion of the air in the last half is not affected by the opening of doors in the first half.

Second, the arrangement of the steam-coils G G' G<sup>2</sup> G<sup>3</sup> G<sup>4</sup> at different points along the apparatus insures that a higher heat shall be imparted to the damper air in the last part of its course, so as to make all parts about equally efficient; and further, and especially, it allows all parts of the apparatus to work to a large extent independently of the other parts—that is to say, the opening of doors in one section to remove the dried material and insert new, by letting in and out the air at that point, does not prevent an efficient drying action in any of the other sections.

I claim as my invention—

1. In a drying apparatus having a casing, A, with a series of doors, A<sup>2</sup>, and shelves B, arranged as shown, the blower-wheel C, arranged in the lower part of the mid-length of the apparatus, as and for the purposes specified.

2. In a drying apparatus having a series of doors, A<sup>2</sup>, and blowing means C, the warming-coils G G' G<sup>2</sup> G<sup>3</sup> G<sup>4</sup>, combined and arranged to serve as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand, at New York, N. Y., this 3d day of May, 1881, in the presence of two subscribing witnesses.

SIMEON G. PHILLIPS.

Witnesses:

WM. C. DEY,  
M. F. BOYLE.