

(No Model.)

2 Sheets—Sheet 1.

I. SIMONIS.

APPARATUS FOR DYEING.

No. 318,144.

Patented May 19, 1885.

Fig. 1.

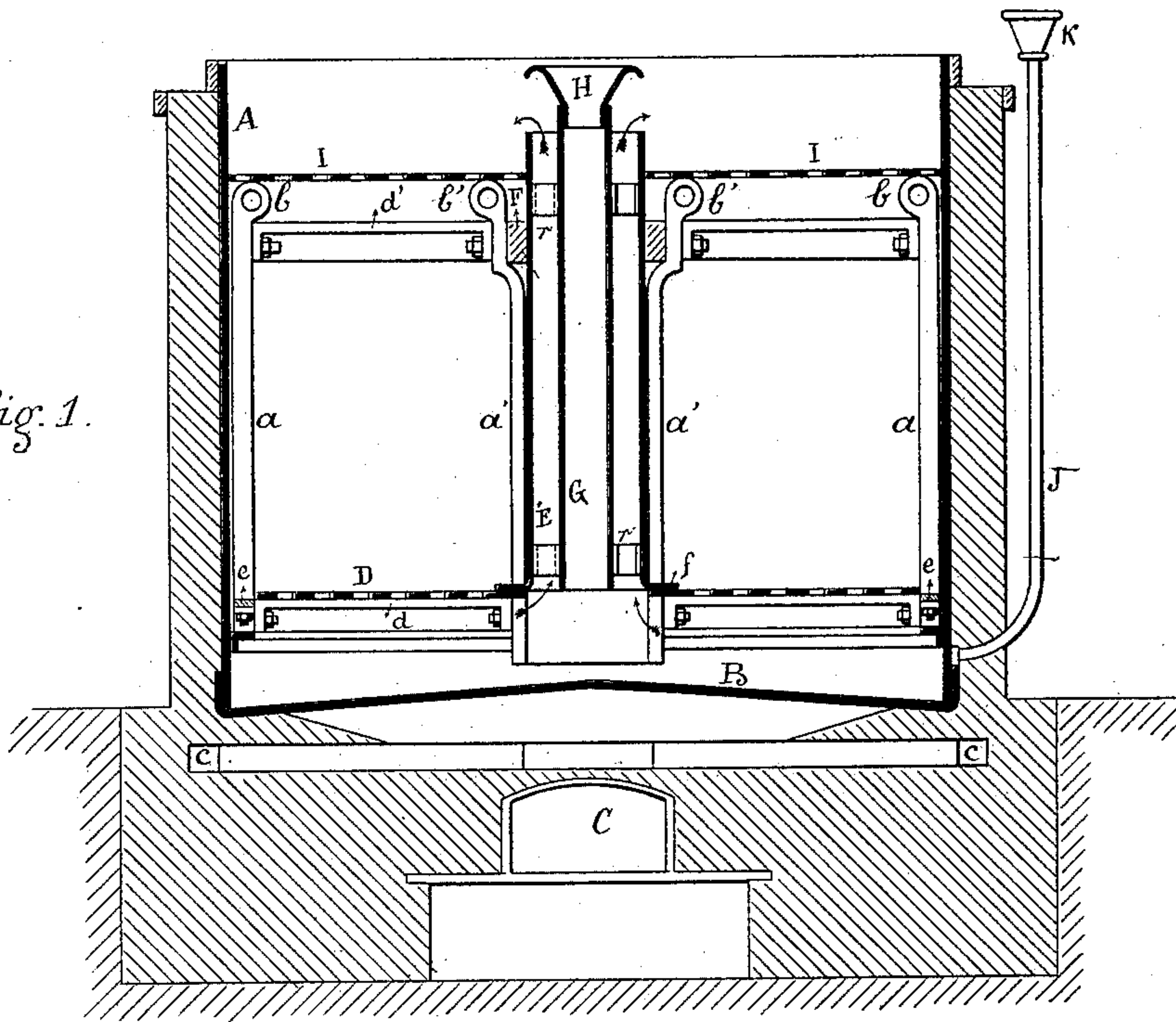
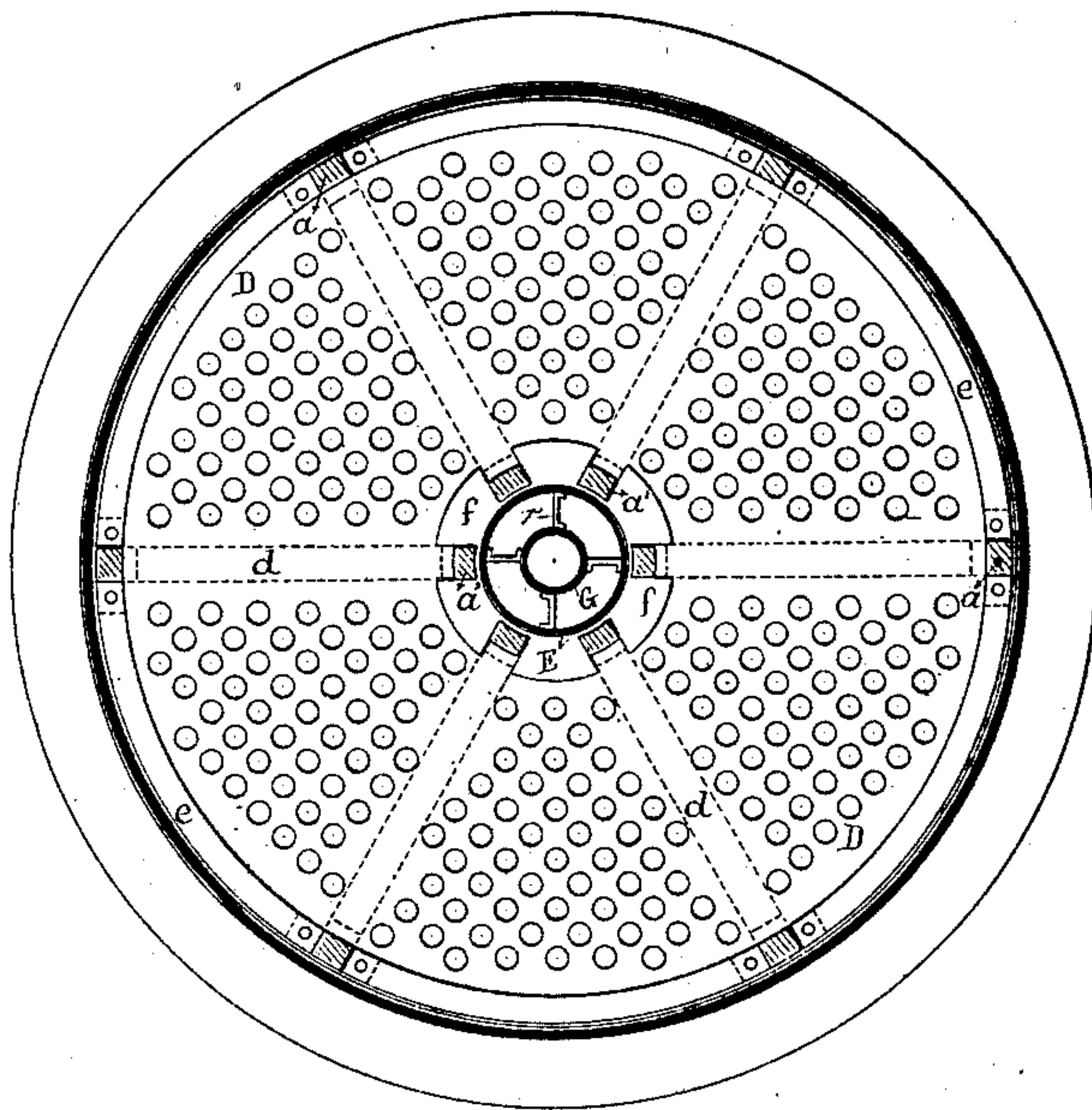


Fig. 2.



Witnesses.

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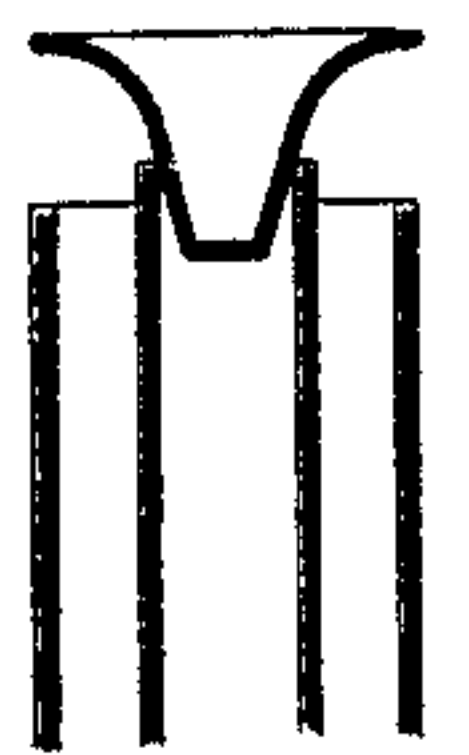


Fig. 5.

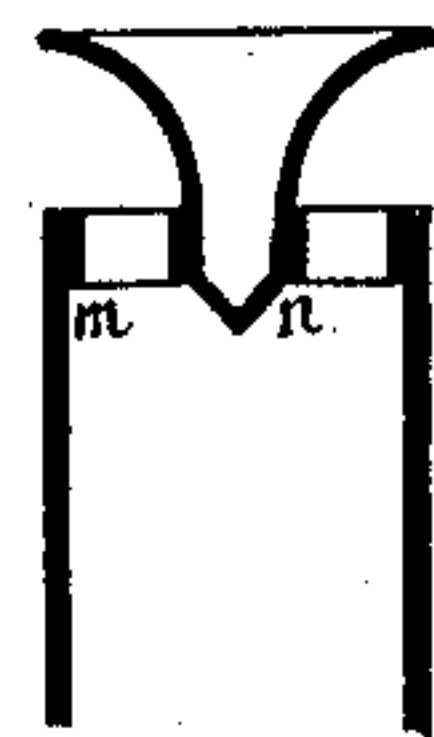


Fig. 6.

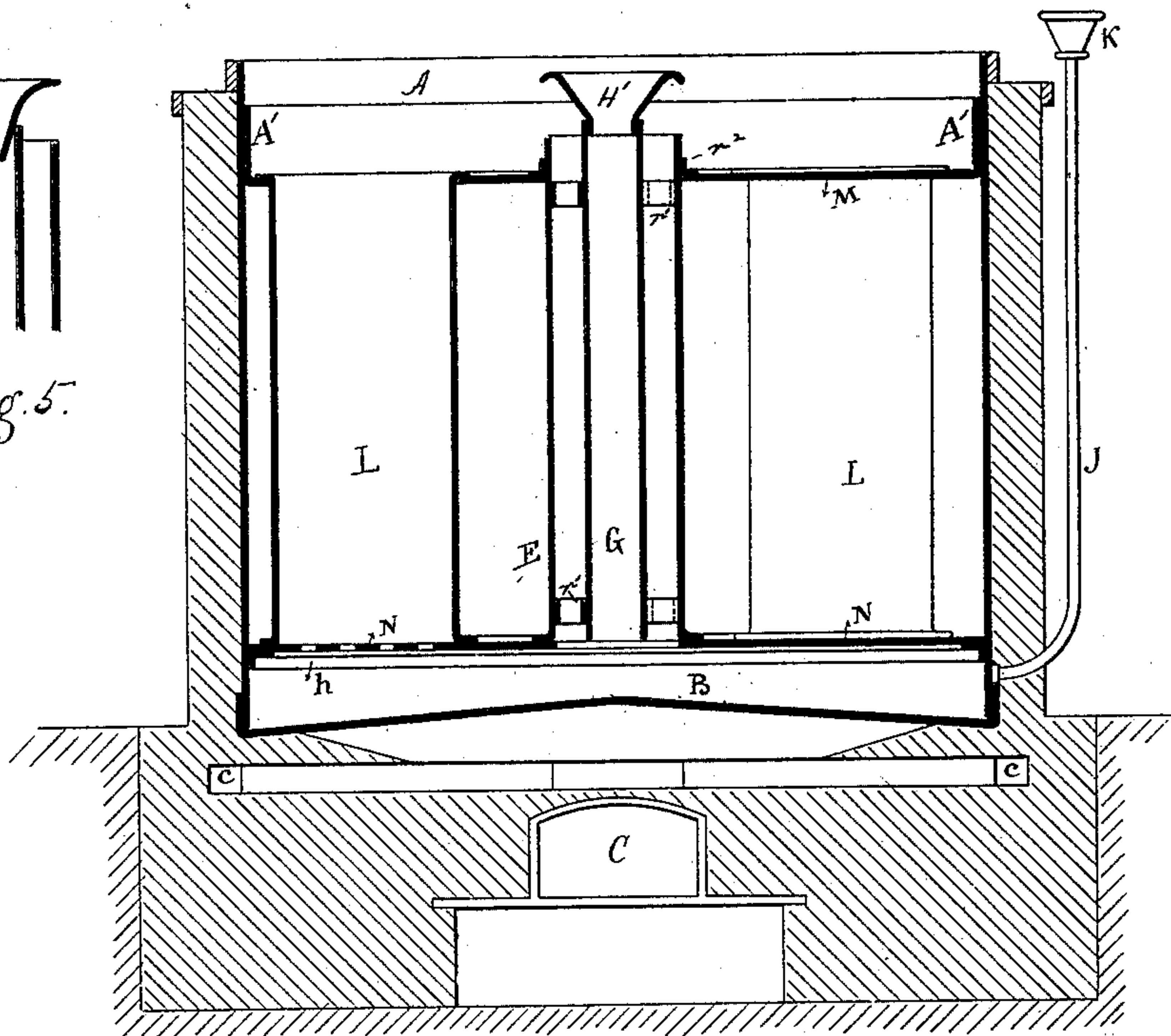


Fig. 3.

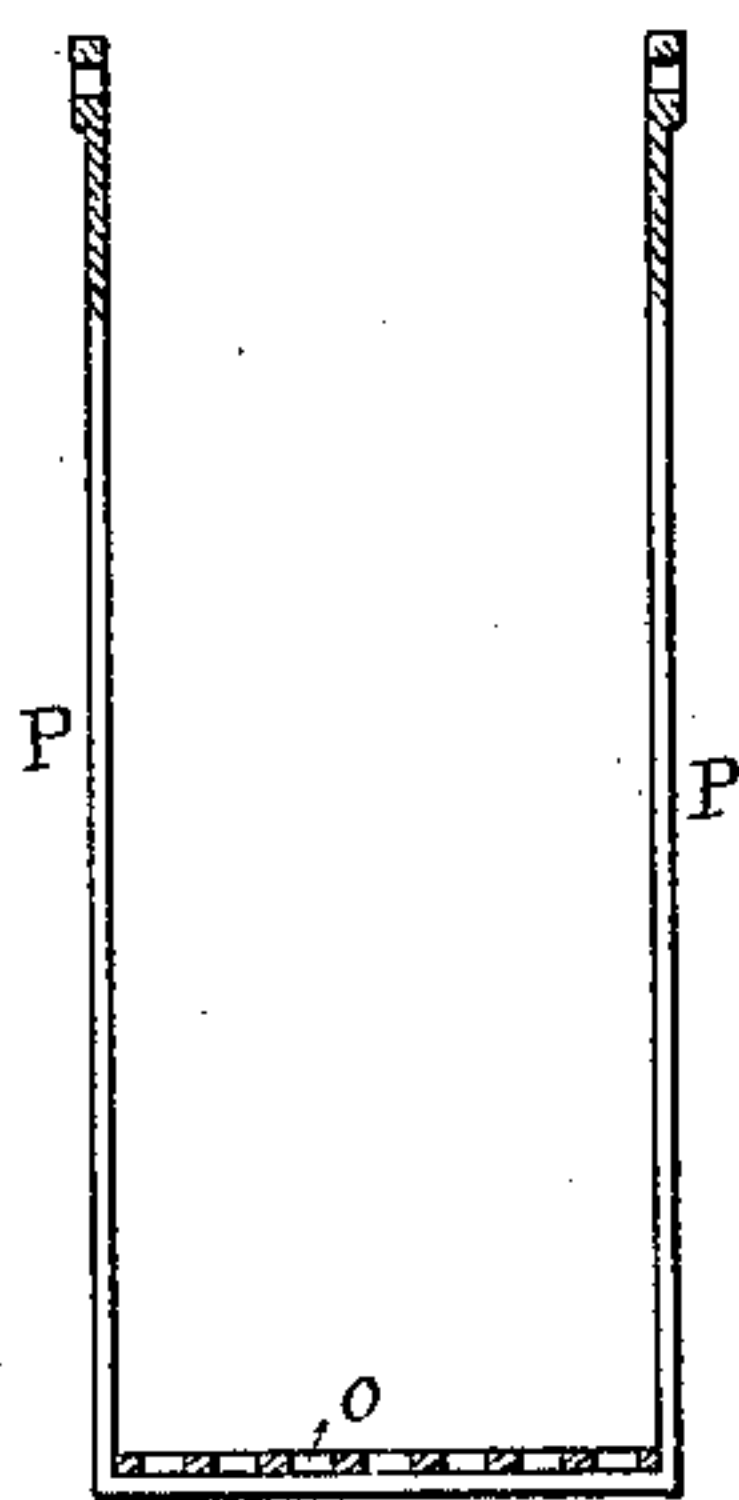


Fig. 7.

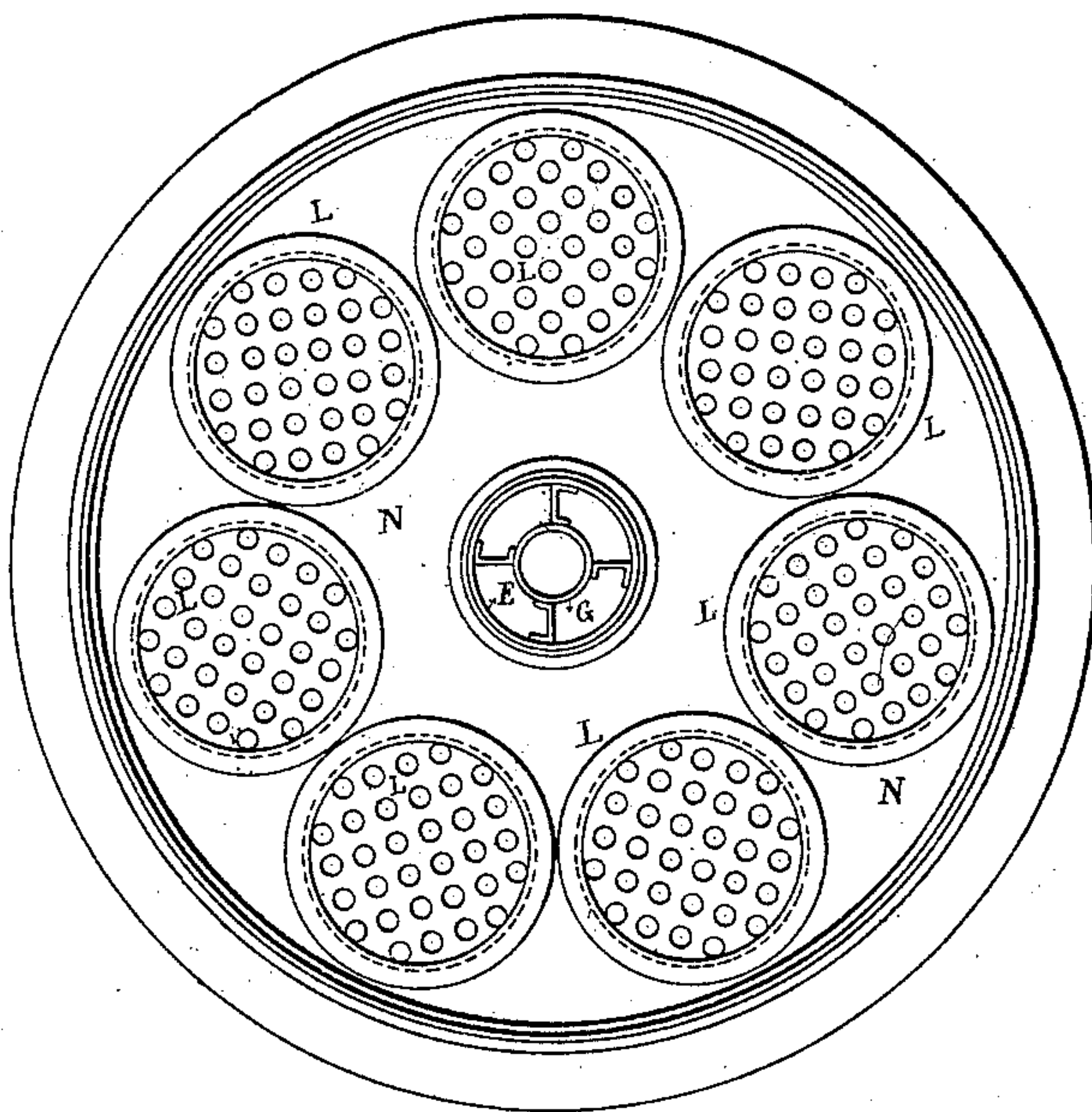
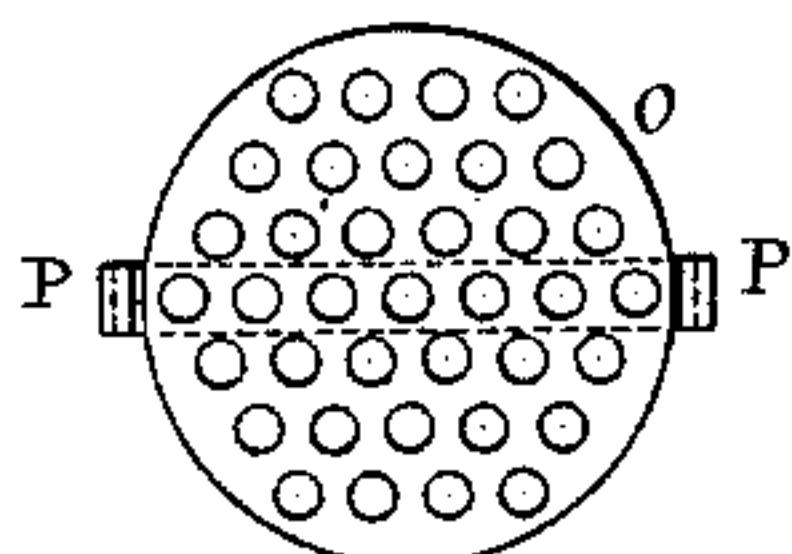


Fig. 4.

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UNITED STATES PATENT OFFICE.

IWAN SIMONIS, OF VERVIERS, BELGIUM.

APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 318,144, dated May 19, 1885.

Application filed July 8, 1884. (No model.) Patented in Belgium December 26, 1883, No. 63,661, and in France January 9, 1884, No. 159,627.

To all whom it may concern:

Be it known that I, IWAN SIMONIS, residing at Verviers, in the Kingdom of Belgium, have invented new and useful improvements in the method of dyeing textile materials, and in apparatus employed for that purpose, (for which I have obtained patent in Belgium, bearing date December 26, 1883, No. 63,661, and in France, bearing date January 9, 1884, No. 159,627,) of which the following is a specification.

My invention consists in apparatus for dyeing textiles.

The following description will enable persons acquainted with this kind of textile machinery to use the invention:

In the drawings, Figure 1 is a vertical section of an apparatus embodying my invention and intended for dyeing textile materials in the raw state. It also shows the masonry of the hearth serving to heat the liquid dye. Fig. 2 is a horizontal section of the principal parts of the apparatus. Fig. 3 is a vertical section of an apparatus embodying my invention, and serving to dye textile material in the shape of bobbins. It also shows the masonry of the fire-place serving to heat the liquid. Fig. 4 is a horizontal section of the principal parts of the apparatus shown in Fig. 3. Figs. 5, 6, 7, and 8 show details and modifications, as will be hereinafter described.

The apparatus illustrated by Fig. 1 comprises a cylindrical boiler, A, of metal, the bottom, B, of which is situated over a hearth or fire-place, C. The flames rising up from the hearth come in contact with the bottom of the boiler, and are then led through the flues *c* to the chimney. In the interior of this boiler A, and a few centimeters above its bottom, I arrange a frame consisting of rectangular posts *a a'*, provided with eyelets *b b'*, and connected at the upper end by cross-bars *d d'*, bolted to the said posts. The exterior posts *a a* are further connected with each other at their lower ends by segments *e e*, made of hoop iron or brass, while the inner posts, *a' a'*, are connected with a false perforated bottom, D, (held by the cross-bars *d*,) and with a vertical tube, E, by means of recesses arranged in

the lower flange, *f*, of the tube E, which is bent at a right angle, the said posts *a' a'* being held in the recesses.

The flange *f* may be fixed in a suitable manner to the false bottom D. The inner posts, *a' a'*, are also connected with the vertical tube E by a circle, F, and the circle F, the tube E, and the posts *a' a'* may be connected together by means of bolts with countersunk heads. (Not shown.)

In the interior of the vertical tube E, which is in direct communication with the bottom of the boiler, is arranged a central tube, G, having a diameter a few centimeters smaller than that of the latter. This small tube G is connected with the tube E by means of U-shaped sheet-iron plates, *r*, which may be riveted to the two tubes. The upper opening of the tube G is provided with a funnel, H, which may be removable or fixed, and the upper end of which is widened to a diameter at least equal to that of the tube E.

A perforated cover, I, which may be provided with handles for lifting the same, is placed on the textile material, and has for its object a more uniform distribution of the coloring-liquid poured on the said material.

A pipe, J, provided at the upper end with a funnel, K, and situated outside the boiler, with which it communicates below the false bottom D, serves for introducing an additional quantity of coloring liquid during the operation.

Having now described the different parts of the apparatus illustrated in Figs. 1 and 2, I will next describe the operation of dyeing in conjunction with the apparatus.

The boiler A is first filled up to a certain height with coloring-liquid, an additional quantity of which may be introduced during the operation through tube J. The materials to be dyed are firmly piled up on and around the movable parts comprising the false bottom D and the two tubes E and G with the funnel H, after which the material is covered with the perforated cover I. Owing to the heat generated in the fire-place C, the coloring-liquid begins to boil and rises in the space between the two tubes E and G, and, following the di-

rection indicated by arrows, uniformly spreads and penetrates the material to be dyed up to the cover I.

The funnel arranged at the upper end of the central tube G has for its object, first, to prevent any part of the coloring-liquid from falling back through the center after having risen through the annular space, and to force the coloring-liquid at its egress to spread around the exterior flange of the funnel, so as to more uniformly fall back into the material to be dyed; second, to prevent any possibility of re-entrance of atmospheric air, to spread out the surface of the ascending liquid, to facilitate its passage through the material to be dyed and its absorption by the same. This rising of the liquid produces a suction under the false bottom D, and the coloring-liquid spread in this manner over the surface of the material passes uniformly through the same, giving up its coloring substances, and, owing to its weight, owing to the pressure imparted to it by the liquid remaining on the surface of the material, and owing to the pressure of the atmosphere, the liquid gradually sinks to the bottom of the boiler after passing through the holes of the false bottom D.

By means of the frame or armature consisting of the posts *a a'* and cross-bars, as described above, the movable part of the apparatus comprising the above armature, the perforated false bottom, and the concentric tubes may be lifted out of the boiler after attaching a chain to the eyelets of the posts *a a'* and passing it over a windlass.

Fig. 3 illustrates an apparatus designed for dyeing textile materials, especially combed wool in the form of bobbins. This apparatus comprises, similar to that illustrated in Fig. 1, a boiler, A, with its bottom B placed over the fire-place C. This boiler incloses a series of cylinders, L, which may be soldered and riveted at the upper end to the plate M, and at the lower end to a perforated false bottom, N, held by a circular flange, *h*, fixed to the lower part of the boiler. The false bottom N is perforated at those parts which are situated immediately under the cylinders L. The cylinders L have at both ends flanges, which may be soldered or otherwise fixed to the upper plate, M, and to the false bottom N. The upper plate, M, is provided with a flange, *A'*, which fits the interior wall of the boiler, but is not attached to the same.

In the center of the false bottom are situated, as in the apparatus represented on Fig. 1, two concentric tubes, E and G, the tube G being also provided at the upper end with a funnel, H'. The outer tube, E, is joined to the upper plate, M, by means of a flange-ring, *r'*, and fixed to the perforated false bottom in any suitable manner.

The central tube G may be fixed to the perforated false bottom in any suitable way.

The two concentric tubes E and G are joined near their upper and lower ends by

or channel irons *r'*, serving not only to maintain the two tubes perfectly concentric, but also for attaching the hooks of a chain passing over a windlass, and by means of which the movable part of the apparatus comprising the upper plate M, the cylinders L, the perforated false bottom N, and the two concentric tubes E and G with their funnel, may be lifted out of the boiler.

Similar to the apparatus represented in Fig. 1, a pipe, J, having a funnel, K, terminates near the bottom of the boiler A, and serves for the admission of coloring-liquid to the boiler.

Having now described the different parts of the apparatus illustrated in Figs. 3 and 4, I need only add that the method of operation of this apparatus is in principle the same as in the apparatus above described, and illustrated in Fig. 1, with the only difference that in this latter apparatus the materials to be dyed are introduced in the shape of bobbins into the cylinders L, into which falls and through which passes the coloring-liquid after rising through the annular space between the two concentric tubes E and G. The liquid passes through the bobbins formed of textile materials, giving up its coloring substances, and gradually sinks to the bottom of the boiler after passing through the holes of the false bottom N.

Fig. 5 represents the same funnel as that shown in Fig. 1, with the difference that the former is closed at the lower end.

Fig. 6 represents a modification of the movable central part of the apparatus, the latter being provided with only one central tube, which carries at the upper end a circle, *m*, provided with a concentric ring, *n*, serving to receive the closed end of the funnel, which is made conical for the purpose of facilitating the passage of the liquid. This arrangement, by preventing the ingress of atmospheric air, and by spreading out the ascending surface of the liquid, (thereby assisting the absorption of the liquid by the material to be treated,) produces the best results.

When using the apparatus represented in Fig. 3, I prefer in certain cases to cover each bobbin introduced in the cylinder with a perforated plate, the diameter of which is from one to two centimeters smaller than that of the cylinders L.

If desirable, the movable part of the apparatus comprising the upper plate, M, the cylinders L, and the tubes E and G, with the funnel H', may be fixed, in which case the bobbins are removed from the cylinders by means of a perforated plate, *o*, situated at the bottom of the cylinders L, and provided with rods P, as illustrated by Figs. 7 and 8, the material being placed on these plates, and after treatment lifted out of the cylinders by means of the rods P.

I am aware of Patent No. 106,451, also of

Patent No. 244,509, and disclaim the construction shown therein.

What I claim is—

- 5 1. In a dyeing apparatus, the combination, with the fire-place, of a boiler provided with one or more central vertical tubes, having a distributing-funnel at the top, and vertical cylinders surrounding said tubes and having perforated bottoms, as set forth.
- 10 2. In an apparatus for dyeing, the combination, with the cylinders L L, of the fabric-

removing apparatus consisting of the rods P P, united at the bottom, and having the perforated disk o, as set forth.

In testimony whereof I have signed this 15 specification in the presence of two subscribing witnesses.

IWAN SIMONIS.

Witnesses:

H. DODT,
E. N. KRISCHER.