

(No Model.)

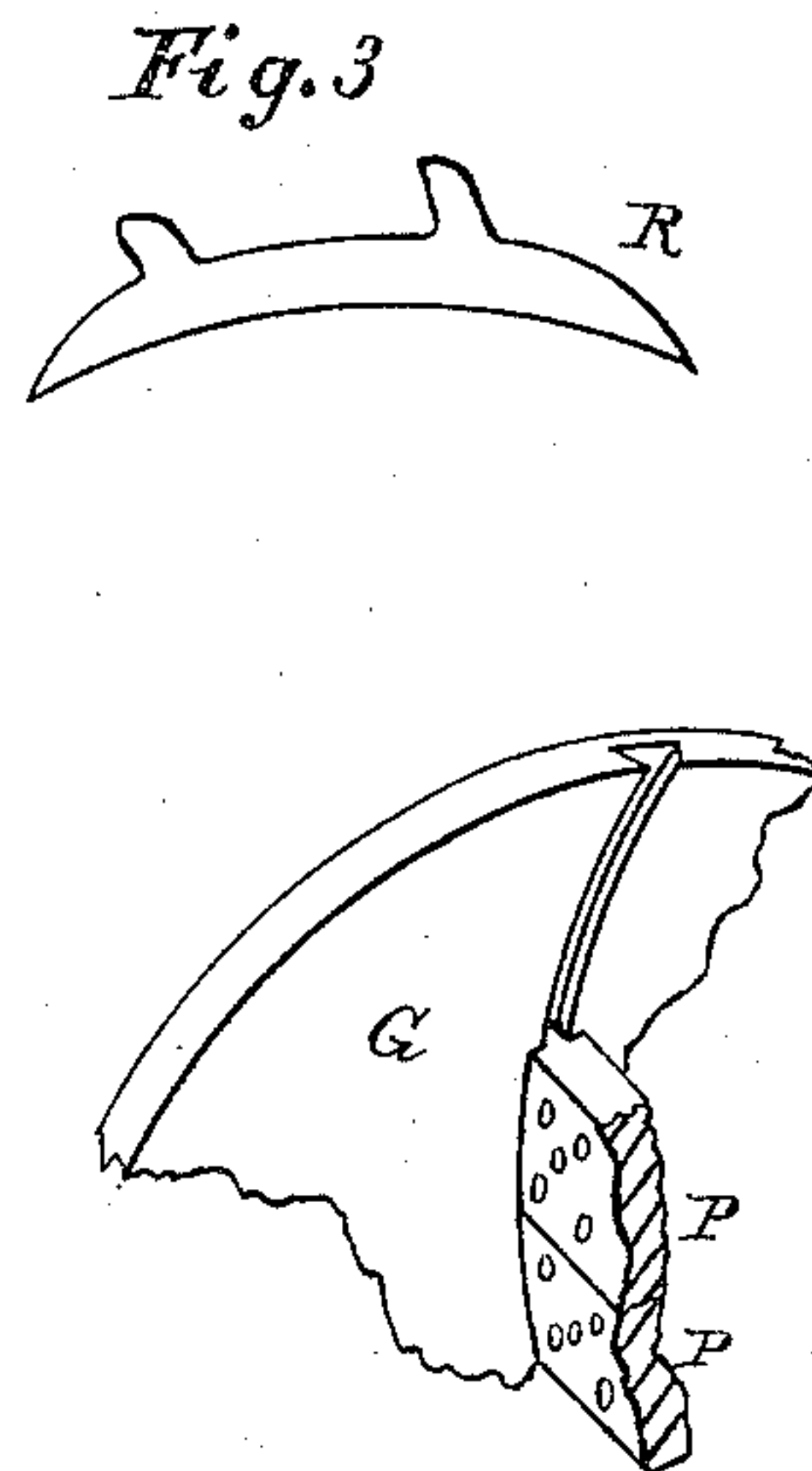
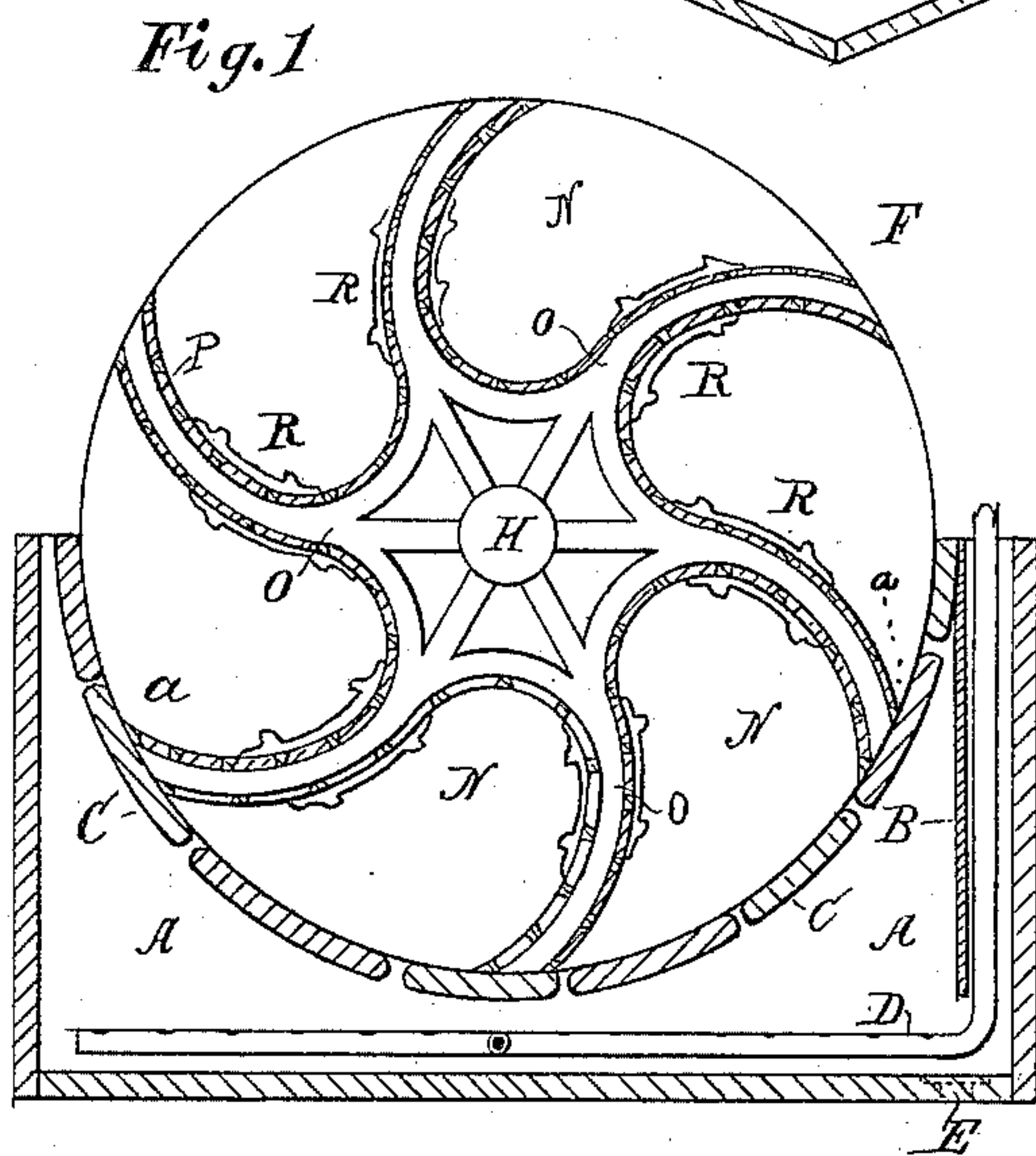
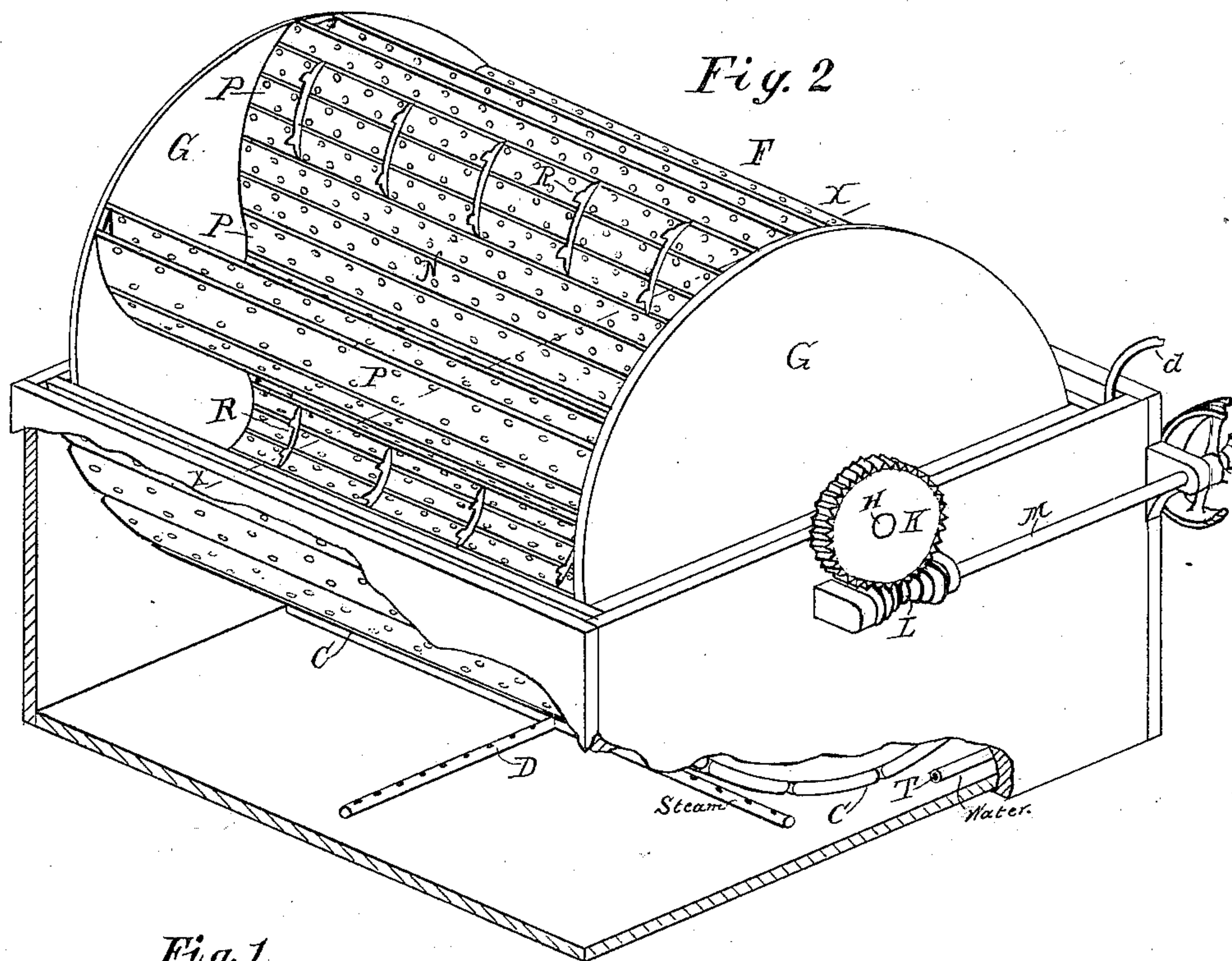
2 Sheets—Sheet 1.

A. MORAN.

APPARATUS FOR DYEING.

No. 334,798.

Patented Jan. 26, 1886.



WITNESSES

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Edw. J. Redmond

INVENTOR

Ambrase Moran.

By His Attorney

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(No Model.)

2 Sheets—Sheet 2.

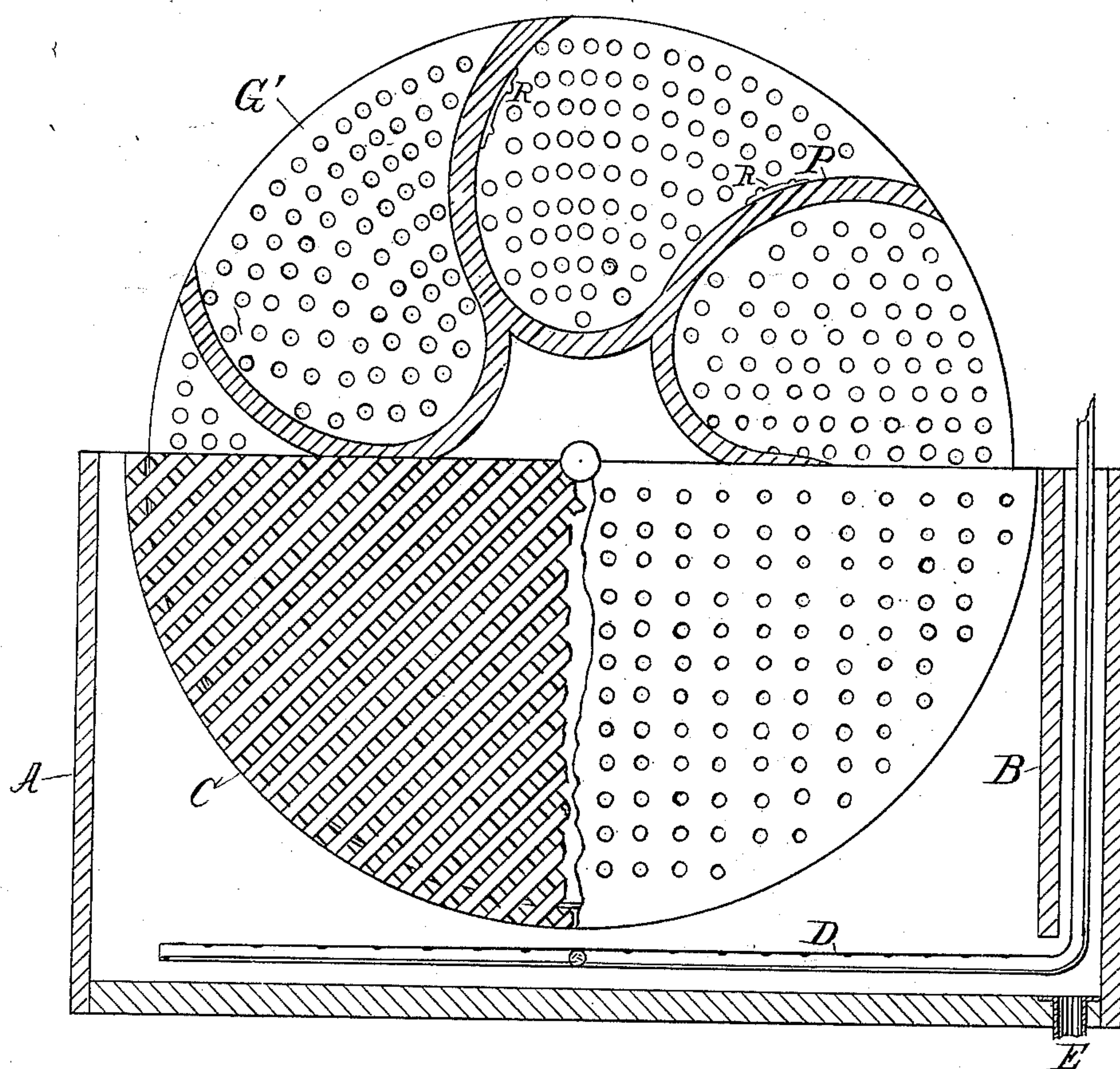
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Fig. 4.



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UNITED STATES PATENT OFFICE.

AMBROSE MORAN, OF AMSTERDAM, NEW YORK.

APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 334,798, dated January 26, 1886.

Application filed September 23, 1885. Serial No. 177,908. (No model.)

To all whom it may concern:

Be it known that I, AMBROSE MORAN, a citizen of the United States, residing at Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Apparatus for Dipping, Draining, Airing, Coloring, Steaming, &c., Animal or Vegetable Fibers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to apparatus for dipping, draining, airing, coloring, steaming, and washing material of a fibrous nature, either animal or vegetable, particularly knitted or woolen goods, in their raw, semi-manufactured, or manufactured state.

It is usual in dyeing goods, finished goods particularly, to place them in a vat or tank containing the coloring-liquid and pole them by hand—that is, to catch them on poles to raise, air, and drain them, and again immerse them, raise, air, and drain them, until the desired shade or tint is acquired. This practice is awkward and slow, and two batches of goods so treated are rarely the exact tint or shade required. Besides, the person poling is liable to miss a part of the material, or not catch it on the pole, and it remains in the coloring-liquid until utterly ruined. The quantity that can be treated at one time is necessarily limited, which makes the process expensive. The poling also tangles or twists the goods into hard knots or bunches, into which it is almost impossible for the dye-liquid to penetrate, thus giving the goods a streaky appearance, and spoiling the sale thereof at a remunerative figure.

The object of my invention is to provide a simple and inexpensive apparatus whereby the above objectionable feature will be obviated and the goods given a uniform shade or tint, as well as dipped, drained, aired, steamed, and washed in a uniform manner; and it consists in the parts and combinations of parts herein-after described and claimed.

In the accompanying drawings, forming a part of this specification, and in which similar letters refer to similar parts throughout all the views, Figure 1 is a transverse section of my improved apparatus on the line *x x*, Fig. 2; Fig. 2, a perspective view of the same, partly

broken away to show the interior of the vat; Fig. 3, detail views, and Fig. 4 an end sectional view illustrating a modification.

A represents the vat or tank, which is of ordinary construction, either wood or metal, of suitable size and shape and water-tight. This tank is provided with a partition, B, at or near one of its sides, so as to leave a narrow space between said side and partition. Between the partition B and the side of the tank A nearest said partition a steam-pipe, D, enters, passing downward to near the bottom of the tank and then inwardly across but above its bottom, nearly to the opposite side. At about the center of the pipe D a joint is formed, and two pipes, one on each side, are connected thereto, branching outwardly to near the ends of the tank. These pipes are perforated on their upper surfaces, or all around, as preferred, so that the steam may issue in jets. A water-pipe, T, enters the tank at a suitable point, *d*.

The tank-bottom is provided with an outlet or draw-off plug, E. The concave or false bottom C is formed of slats extending from end to end of the tank, either secured to said ends or to bow-shaped pieces attached to said ends in any suitable manner. These slats may be placed at short intervals apart, or they may be close together and perforated, or they may be both spaced and perforated, as desired, so that the dye-liquid may enter and circulate freely to penetrate the goods or material under treatment in the cage or dipping-wheel F. This wheel or cage contains the material to be treated. It is formed of two disks, G, and buckets N. The disks are secured to gudgeons or a shaft, H, and have secured to them the arms O. These arms are semicircular, scroll-shaped, or formed substantially upon the line of a spiral curve having its axis at a point between the axis and circumference of the disks, and expanding outwardly toward said circumference, this latter shape being preferred. The arms are provided with mortises on their upper surfaces, into which are tenoned the slats P; or the slats may be tenoned directly in mortises sunk or formed in the sides of the disks G, as shown in Fig. 3, if preferred. The slats P are arranged at short intervals apart from the peripheries of the

disks to near the center of the wheel on the line or curve formed by the arms O, and are perforated; or the space between the slats may be sufficient without the perforations, or vice versa.

In Fig. 4 I show a modification of the concave or false bottom C and the rotary cage or wheel F. In this view the concave or false bottom is made tight, while its ends are formed of slats crossed one over the other, or the ends are formed of some suitable perforated material, both constructions being shown in the figure named, the perforations being on the right and the crossed slats on the left hand side of the figure. This concave or false bottom is shorter than the tank A and fits down into it, so that there is a space left between it and the tank at each end. The dipping wheel or cage F is built in all respects like the wheel described above, except that the slats P of the partitions are imperforate and are placed closely together, while the disks G' are perforated, so that the dye-liquid may enter through the slatted or perforated ends of the concave and into the cage through the perforations in the disks.

While I prefer the construction first described, still I obtain good results from this last-named arrangement.

R represents the retainers. These are made of suitable material in the form of blunt hooks or rounded saw-teeth, as is clearly shown in Fig. 3, and are attached at suitable intervals apart across the length of the buckets or recesses in two or more series by means of screws or otherwise, and are intended to prevent the material under treatment from being thrown out of the buckets as the cage is rotated, and also to loosen, lift, and turn the material over and over in the course of the treatment, so that the whole will receive an equal and uniform dye or color.

The disks C may be provided with gudgeons; but I prefer to use the shaft H, which is journaled in the ends of the tank or vat A, and provided at one end with the worm-wheel K, gearing with the worm L on the shaft M, the latter being supported by brackets or hangers secured to the tank A and carrying fast and loose pulleys, and being driven from any prime mover by a belt.

I may use the wheel or cage without the concave or false bottom C, if found convenient, or in the treatment of any particular class of goods; but in such case I surround the cage or wheel with slats spaced apart or close and perforated, or with some other suitable perforated material, so that the material under treatment will not escape from its bucket or recess.

The shaft H may be provided with a hub at its center, to which are attached arms of a shape similar to the end arms, and provided with dovetail lugs in order to better brace the slats.

In operation the material to be treated is

placed in the buckets or recesses and power applied, as described, to rotate the cage or wheel, which carries the material down into the dyeing-liquid, which nearly fills the tank. The retainers R prevent the material being thrown out and at the same time lift it up and turn it over again and again, so that the air may pass under and around the material while it is out of the dye-liquid, the draining in the meantime passing through the perforations in the slats, or the spaces between the slats, back into the tank. There is no danger of the material leaving the buckets on the forward and downward turn of the wheel, for the reason that the end of the arm, as shown at a, Fig. 1, is below the top of the tank when the center of the bottom of the following bucket is directly above the center of the shaft, and the material at the bottom of said recess or bucket when this point is reached in the revolution of the wheel.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A cage or wheel for dyeing apparatus, having round-bottomed buckets with spirally-curved sides or walls expanding outwardly, substantially as described.

2. The combination, in a cage or wheel for dyeing apparatus, of the disks, the spirally-curved outwardly-expanding walls and round-bottomed buckets, and the retainers R, all as and for the purpose described.

3. The combination, in a dyeing apparatus, of a suitable vat or tank, a cage or wheel having perforated buckets, and a perforated concave or false bottom, all as and for the purpose described.

4. The combination, in a dyeing apparatus, of a suitable vat or tank, a cage provided with perforated buckets journaled therein, and suitable driving mechanism, substantially as described.

5. The combination, in a cage or wheel for dyeing apparatus, of the buckets and the saw-toothed retainers, substantially as described.

6. A dyeing apparatus comprising the following parts: a tank or vat, steam and water inlets, an outlet, a slatted perforated concave or false bottom, a cage or wheel, buckets having outwardly-expanding curved walls or sides and round bottoms, two or more series of retainers secured in said buckets, and suitable driving mechanism, substantially as set forth.

7. The combination, in a dyeing apparatus, of the cage having spirally-curved partitions forming buckets, the perforated disks, and the concave or false bottom provided with open ends, all as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

AMBROSE MORAN.

Witnesses:

LEONARD WELDON,
JOHN H. HEAGLE.