

(No Model.)

2 Sheets—Sheet 1.

W. PRICE.

STEAM WASHING MACHINE.

No. 350,500.

Patented Oct. 12, 1886.

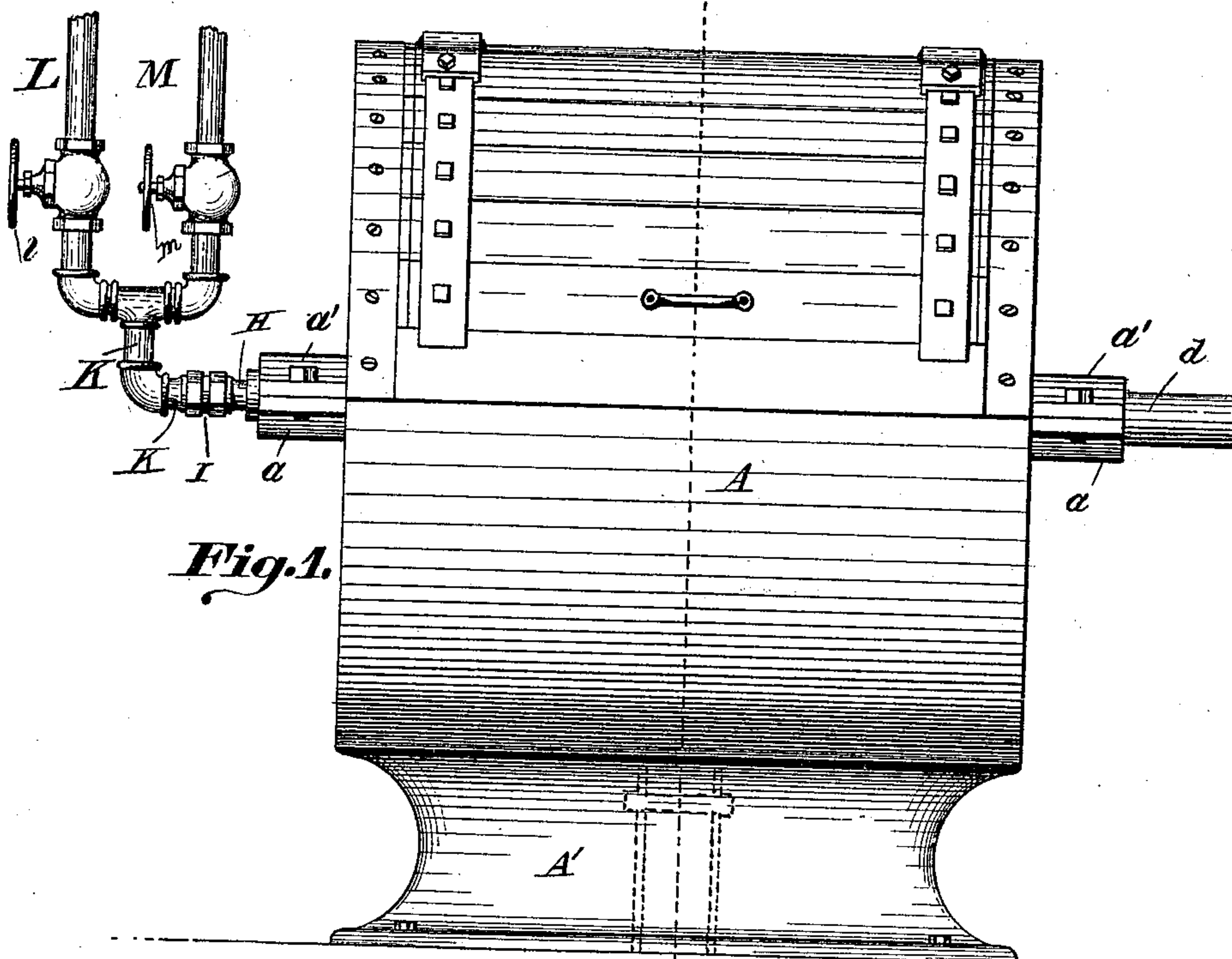


Fig.1.

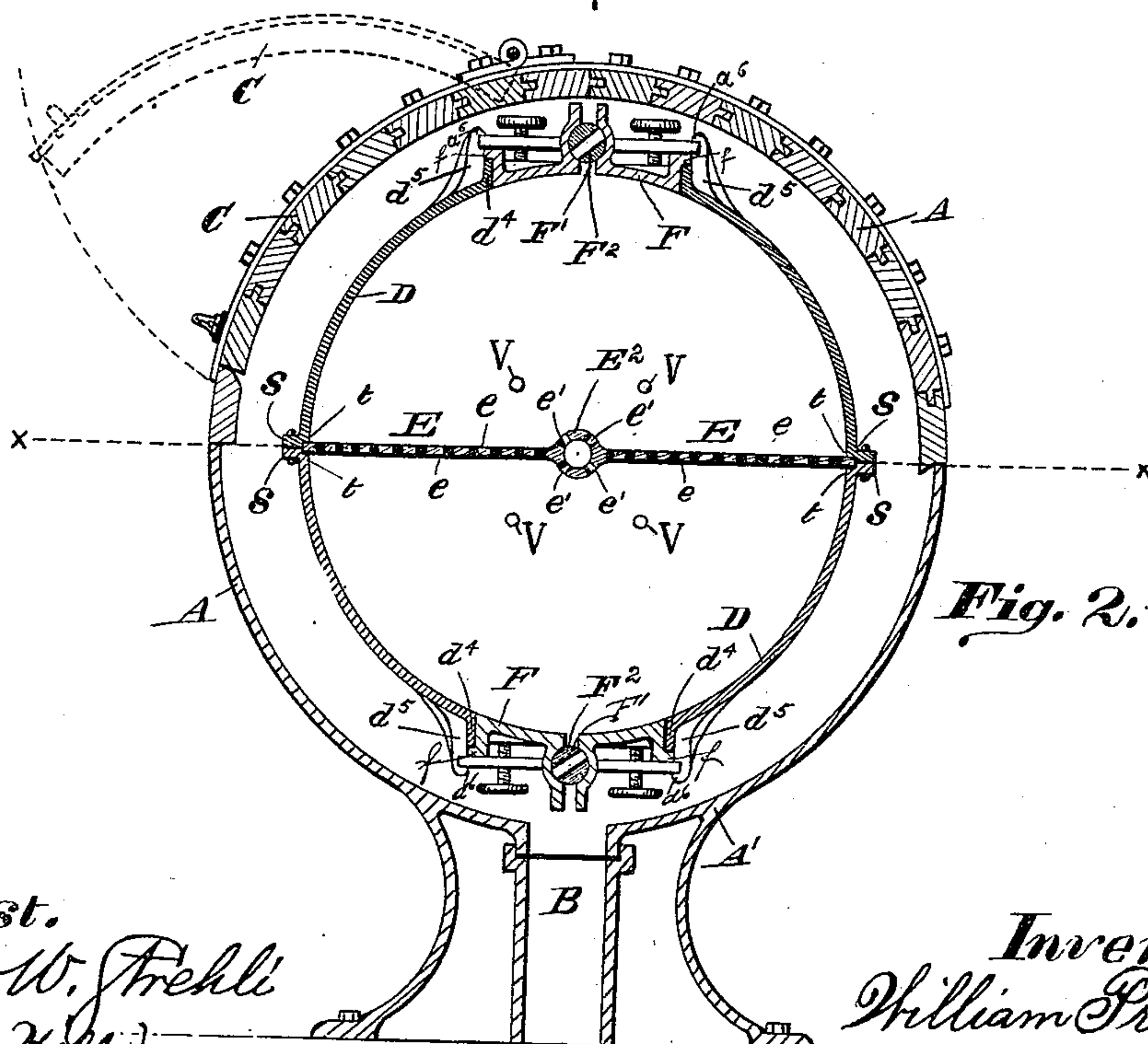


Fig. 2.

Attest.

Fr. W. Strehli
O. M. Hill

Inventor:

William Price

Per Wm. Hubbell Fisher,
Atty.

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2 Sheets--Sheet 2.

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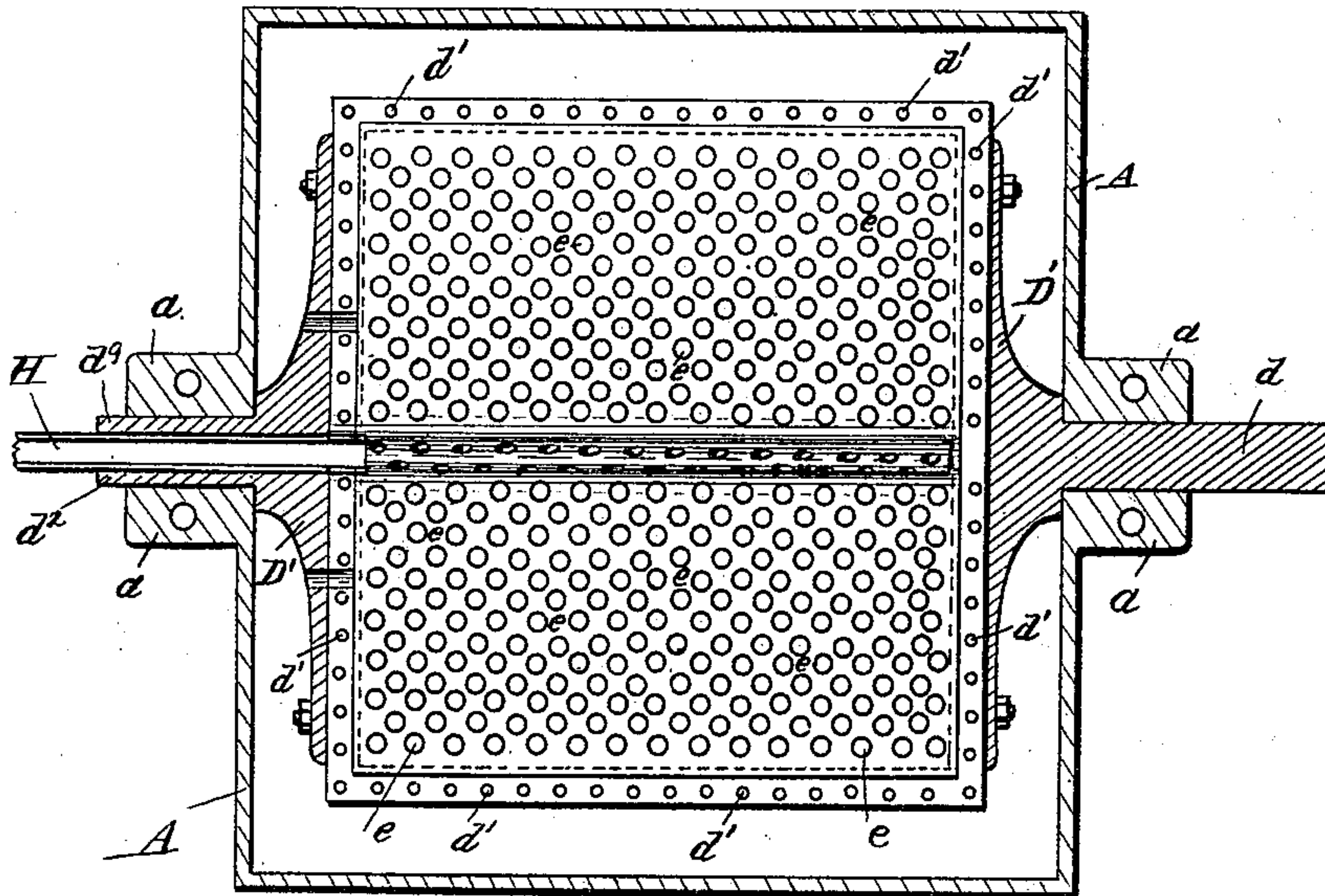


Fig. 3.

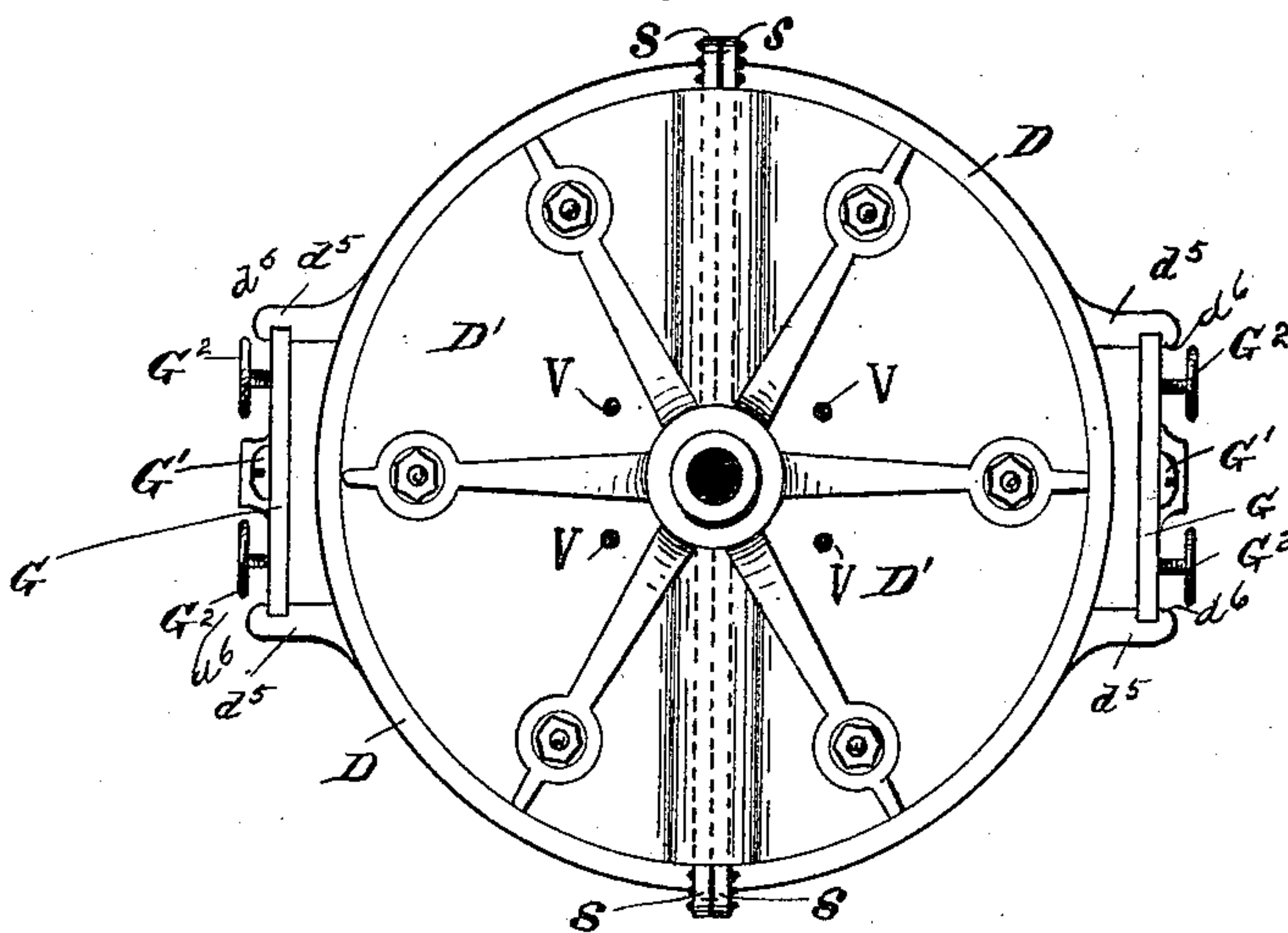


Fig. 4.

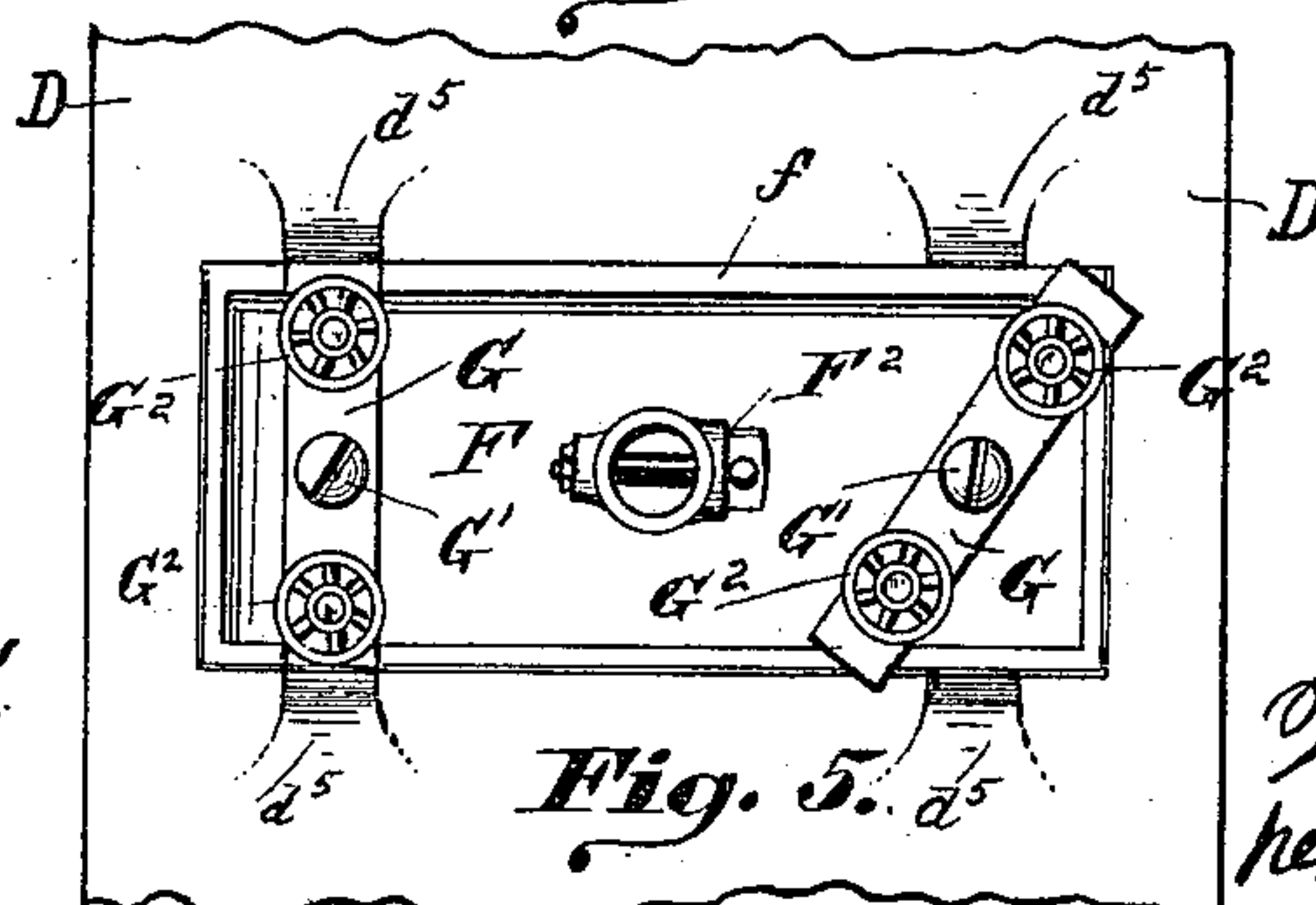


Fig. 5

Attest.
Jno. W. Strehli
Om. Hill

Inventor.
William Price
per Wm. Hubbell Fisher,
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM PRICE, OF CINCINNATI, OHIO.

STEAM WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 350,500, dated October 12, 1886.

Application filed October 8, 1885. Serial No. 179,326. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PRICE, a citizen of the United States, and residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Steam Washing-Machines, of which the following is a specification.

My invention is intended for use in general laundries, where large quantities of clothes are washed by the aid of steam.

The various features of my invention and their uses, either separately or together, will be apparent from the following description.

In the accompanying drawings, forming part of this specification, Figure 1, Sheet 1, is a front elevation of my machine. Fig. 2, Sheet 1, is a vertical section taken at the line *y y* of Fig. 1. Fig. 3, Sheet 2, is a horizontal section taken at the line *x x* of Fig. 2. Fig. 4, Sheet 2, is an end view of the inner cylinder. Fig. 5, Sheet, 2, is a plan view of one of the covers of the inner cylinder and the adjacent portion of this cylinder, illustrating the preferred mode of attachment of the cover to said inner cylinder.

The external cylinder, A, has its lower half preferably made of metal and the upper half of wood. This cylinder is mounted on a suitable base.

A preferred form of base of my invention is shown and indicated by letter A'. The waste-pipe B leads off from the bottom of the cylinder A, as shown in Fig. 2. The upper part of the cylinder A is provided with a large opening, which is closed over by a lid, C, of any desired shape, but preferably constructed as shown.

Within the outer cylinder, A, is an inner cylinder, D. The ends D' of the cylinder D are provided at their centers with journals *d d'*, which extend through the ends of the cylinder A, at or about the centers of said ends, and rest on bearings *a*, cast with or otherwise secured to the cylinder A. Caps *a'* complete these journal-joints. The cylinder D is cast or otherwise formed of suitable material, preferably of metal, and is preferably formed in two symmetrical halves which are bolted or riveted together. The bolt or rivet holes are shown as *d'* in Fig. 3. A diaphragm, E, is present in the cylinder D and divides the space within this

cylinder into substantially two halves. In connection with this diaphragm, preferably at the axial center of the latter, is located a pipe, E², for the conveyance of steam and water into said cylinder D. The whole diaphragm and pipe are preferably made of cast metal and cast in one piece. The diaphragm is perforated by numerous holes *e*. The steam and water inlet pipe is perforated with openings *e'*, which conduct the steam and water into the said cylinder and on both sides of the diaphragm.

The diaphragm E may be secured in place within the cylinder in any suitable manner. A cheap, simple, and effective mode of securing the diaphragm in position is (where the cylinder D is made in two halves, as shown) by introducing the edge of the diaphragm between the adjacent edges of the halves of the cylinder D. The diaphragm may pass between the flanges S S of the cylinder, and be bolted or riveted thereto by the rivets or bolts by which the two halves of the cylinder are held together, or it may rest in a recess formed by rabbets *t* in the edges of the two halves of the cylinder, as shown.

Access to each half of the divided cylinder D is had through the openings respectively covered by the respective caps F. The caps F are alike in construction, and the description of one applies to the other. The under surface of cap F is preferably shaped to conform to the curve of the cylinder. On its upper surface it is provided with a flange, *f*, which extends entirely around it, and rests on the edge of the flange *d'*, projecting outwardly from cylinder D around the sides of the opening in the cylinder.

A preferred means of holding the cap in place is as follows: Lugs *d⁵* project outwardly from the cylinder D and extend beyond the cap F. Each lug *d⁵* is provided with a tooth or projection, *d⁶*. Two cross-plates, G, are pivoted to the cover or cap F by pivot G', and are preferably raised some distance beyond the general surface of the cap or cover. The set-screws G² are screwed through the plates G, and when tightened jam against the top of the cap F. Each cap F has an opening, F', communicating with the cylinder D, and this opening is governed by the cock F².

To put the cap F in position the cross-plates G are turned obliquely to the length of the cap. This gives room enough for the cap to be slipped under the teeth \bar{d}^6 and let down in position.

5 When the cap is seated, the cross-pieces G are turned under the teeth or projections \bar{d}^6 and the whole clamped tight by the hand-screws G².

The journal \bar{d} —the right-hand one, as shown in the drawings—is to be provided with a suitable device for operating the central cylinder. 10 The journal \bar{d}^9 is bored out lengthwise and the pipe H passes through it, and is screwed onto or otherwise connected with the steam and water inlet pipe E².

15 The mode of operation is as follows: The door or lid of cylinder A is lifted and the cylinder D is rotated so that one of the openings into it is opposite the door of the cylinder A. The cap F is removed for the purpose of ascertaining when sufficient water has entered the 20 cylinder. The water is now introduced into cylinder D through feed-conduit H and the further supply of water cut off. Clothes to be washed are now introduced through the door 25 of cylinder A and the adjacent opening of cylinder D into the latter cylinder, and the cap F of said opening is then tightly closed. The cylinder D is then rotated a half-revolution and the cap F of the other opening in said cylinder 30 D is removed, and clothes to be washed are introduced through said opening into cylinder D. Soap is introduced in like manner into either or both of the compartments of cylinder D, the caps F being tightly closed, and steam 35 is then introduced into the cylinder D. At I is placed a swivel-joint by which the pipe H is united to the pipe K. This joint I permits the pipe H to rotate without destroying the integrity of the joint. The pipes L and M, 40 which by their junction form the pipe K, are for the admission of water and steam, respectively. The valves l and m control the openings in these pipes. At the same time the cylinder D is subjected to a partial rotation. This 45 rotation is preferably a half or little more than a half revolution. This operation is continued. Between each partial rotation, and when the diaphragm E is in a horizontal position, the cylinder may remain at rest for a short period, 50 or be then moved slowly on its axis. Each time the cylinder makes a half-rotation the bulk of the water in the cylinder is carried up to the top and then drains through the perforations e in the diaphragm down into that compartment of the cylinder D which is then below. 55 This partial rotation (or oscillation) of the cylinder, or each second partial rotation, is returned in a direction the reverse of that in which it moved on the first partial rotation, is continued for several minutes, at the close of 60 which time the dirt will be loose from the fibers of the clothes and ready to be removed with the first water. The valves or cocks F² are now opened and a portion of the water in the cylinder, along with the dirt, is discharged at each 65 movement of the cylinder. The steam in cylinder D also aids in forcing the first water out

of cylinder D through said valves, and at the same time steams and whitens the clothes. At this point in the process of washing, the 70 cocks F² may be closed and the supply be cut off and a supply of fresh water be introduced into the cylinder D, the partial rotation of the cylinder D being continued. Steam is now turned on and heats the fresh water to the 75 boiling-point, and continues boiling the water, and the clothes are thereby subjected to a thorough steaming and boiling. The second water is now drawn off by opening cocks F², and when drawn off the cocks are closed and 80 the steam supply is cut off. Fresh water is now introduced into the cylinder D, and the cylinder D continuing to partially rotate, the clothes are thoroughly rinsed and cooled and are then in condition to be removed from the 85 washing-machine. The clothes are now removed from the cylinder in a manner similar to that whereby they were introduced therein.

When preferred, the process can be easily performed in one operation by allowing steam 90 and water to together enter the cylinder D and gradually escape through the cocks F², the latter being opened more or less, as desired, and before the close of the operation the steam-supply should be cut off, and the cold water 95 still entering will thoroughly rinse and cool the clothes. During this last-named process the cylinder D will be subjected to a partial rotation or oscillation, as aforementioned.

In this machine the clothes are not subjected 100 to any beating process, but the dirt is removed by action. In this way the machine, while thoroughly effective, does not injure the clothes. Indeed, the most delicate fabrics may be safely washed in this machine. Another advantage 105 is its economical use of steam, water, and soap.

In order to prevent undue pressure of steam, a suitable outlet or outlets therefor may be provided. For example, a valve may be constructed and applied to automatically allow the 110 steam of undue pressure to escape, or orifices or openings may be provided for the escape of steam. One description of such openings is shown in Figs. 2 and 4 as present in the end 115 of cylinder D, and is indicated by letter V.

While the various features of my invention are preferably employed and used together, one or more of said features may be used without the remainder, and, in so far as applicable, may be used or employed in connection with 120 washing-machines other than the one specifically herein set forth and described.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination of the cylinder D and 125 perforated diaphragm E, provided with perforated steam and water inlet conduit, substantially as and for the purposes specified.

2. The combination of the cylinder D and the perforated diaphragm E, and the central- 130 ly-located conduit E², formed integral with diaphragm E, perforated on both sides, substantially as and for the purposes set forth.

3. The cylinder D, made in two parts or por-

tions, having flanges S, and the perforated diaphragm E, secured between the said parts or portions, substantially as and for the purposes specified.

5 4. In a washing-machine, the combination of the outer shell, A, and the rotatable inner cylinder, D, having journals and diaphragm, and journal-bearings $a a'$, and hollow journal d^9 , and swivel-joint and pipe K, and branch pipes
10 L and M, substantially as and for the purposes specified.

15 5. In a washing-machine, the inner shell, D, having journals and provided with perforated diaphragm E, and central conduit, E^2 , having perforations in its sides, one of said journals having an axial perforation or conduit connecting with the conduit E^2 , substantially as and for the purposes specified.

6. The combination of shell A, having door and journal-bearings $a a' a'$, and cylinder D, 20 having perforated diaphragm, and conduit E^2 , and doors and journals d and d^9 , the latter being perforated, and swivel-joint I, pipe K, branch pipes L and M, and cocks m and e^2 , substantially as and for the purposes set forth. 25

7. The combination of the cylinder D, having perforated diaphragm, doors, and valves, shell A, provided with door C, and hollow base A' , and wasteway B, located within the hollow base, substantially as and for the purposes 30 specified.

WILLIAM PRICE.

Witnesses:

A. E. HIGBEE,
JNO. W. STREHLI.