

(No Model.)

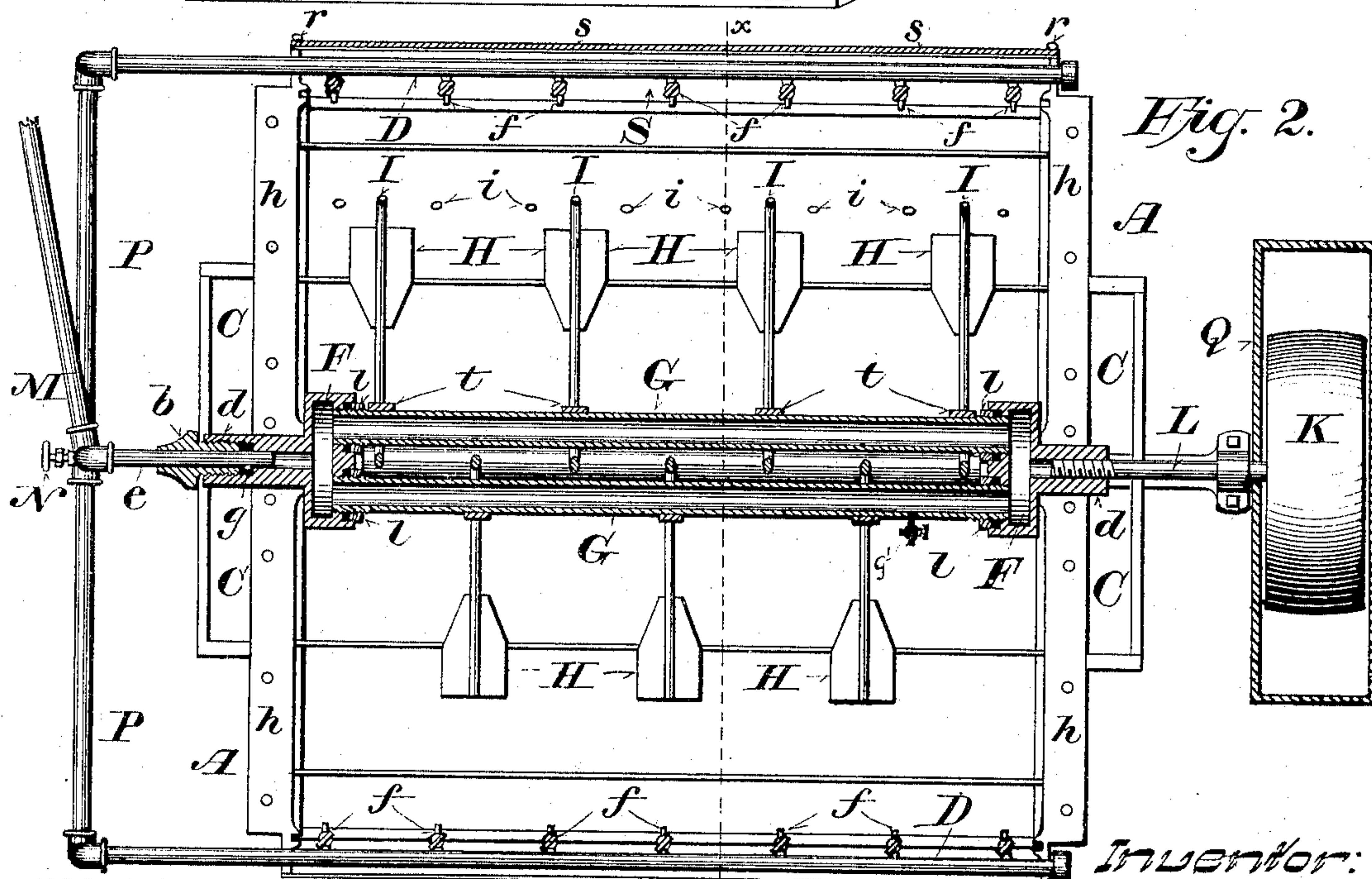
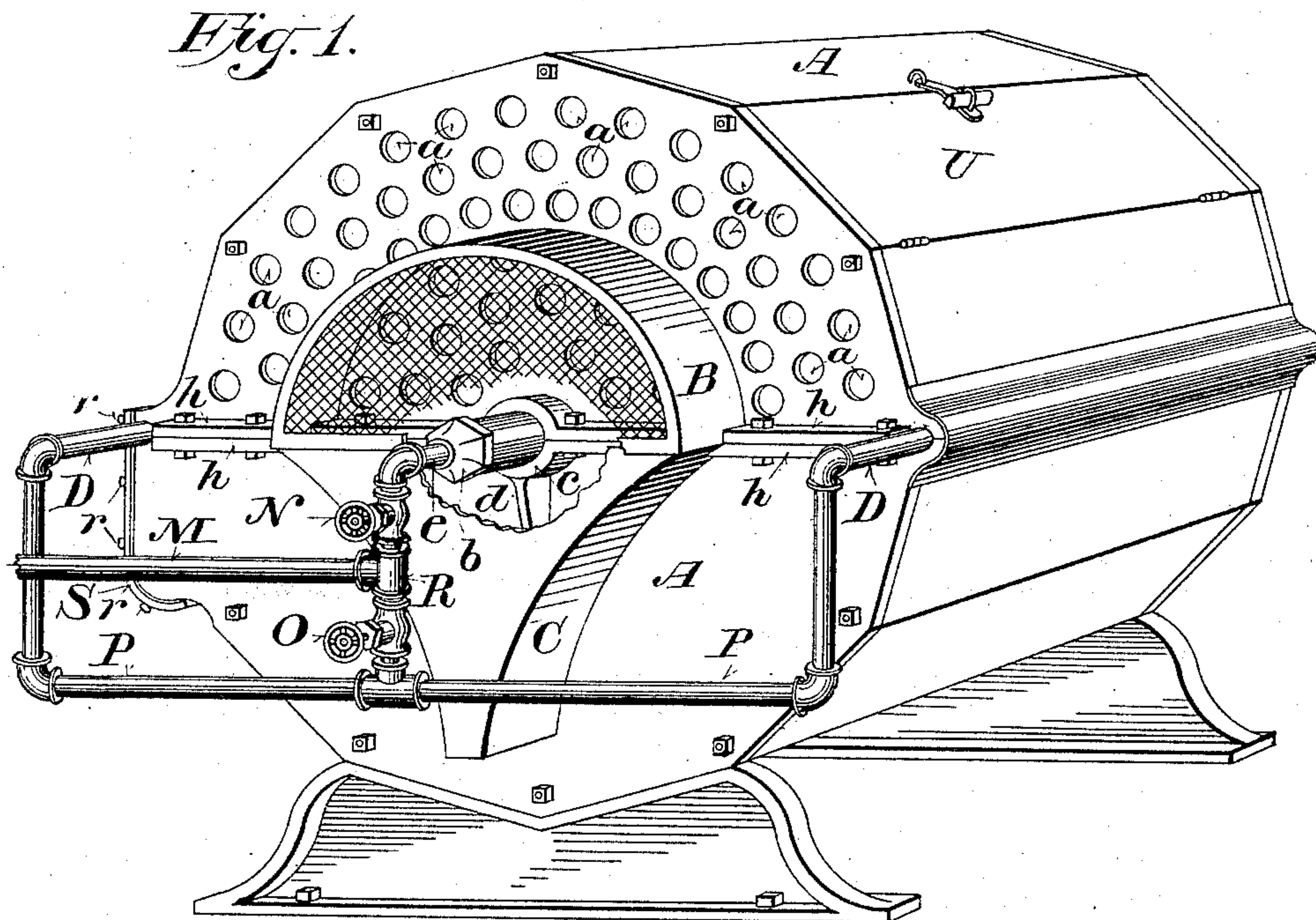
2 Sheets—Sheet 1.

H. BERGER.


FEATHER RENOVATOR.

No. 324,521.

Patented Aug. 18, 1885.



Witnesses:
Chas. K. Goss.
George Goll

 *Inventor:*
Herman Berger,
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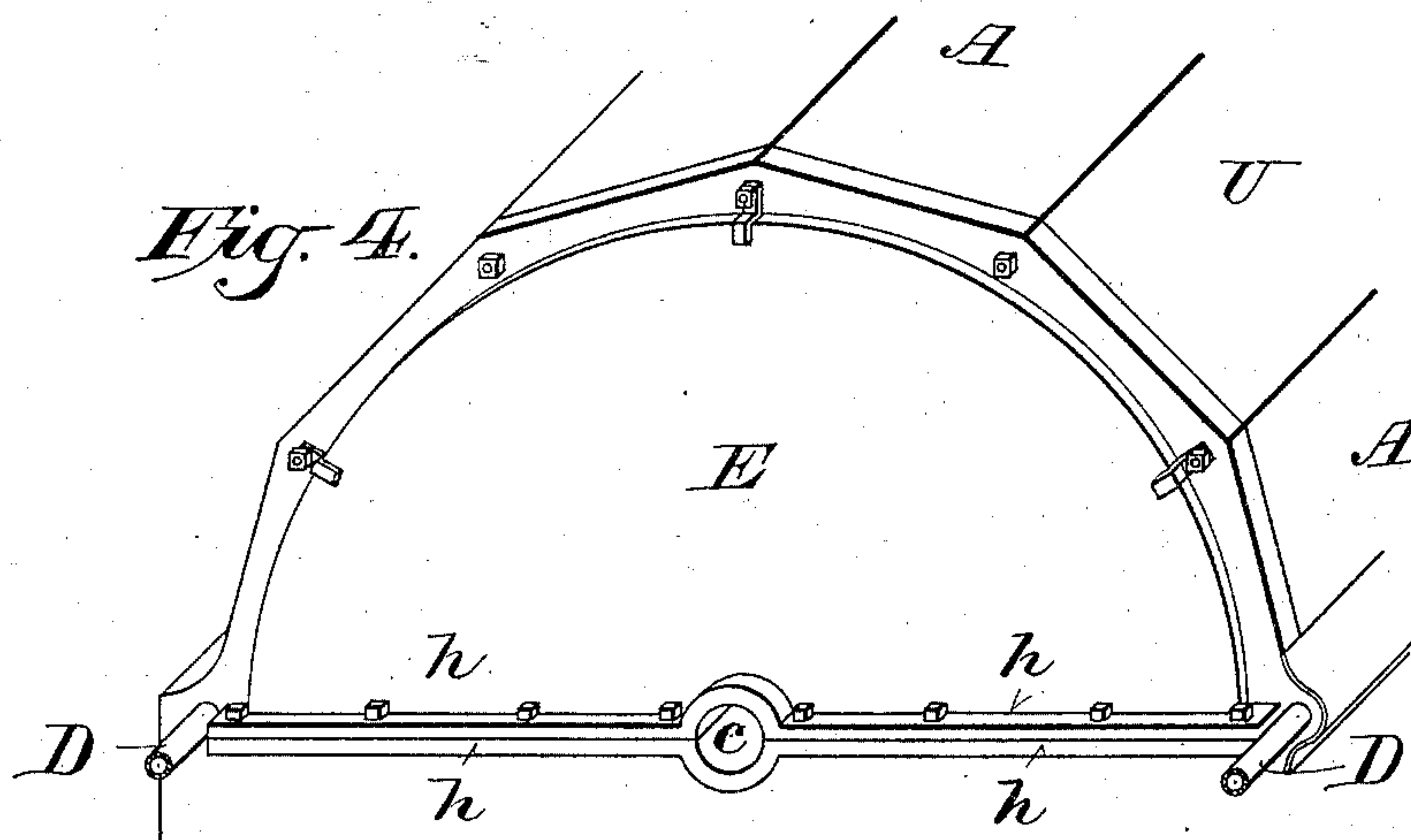
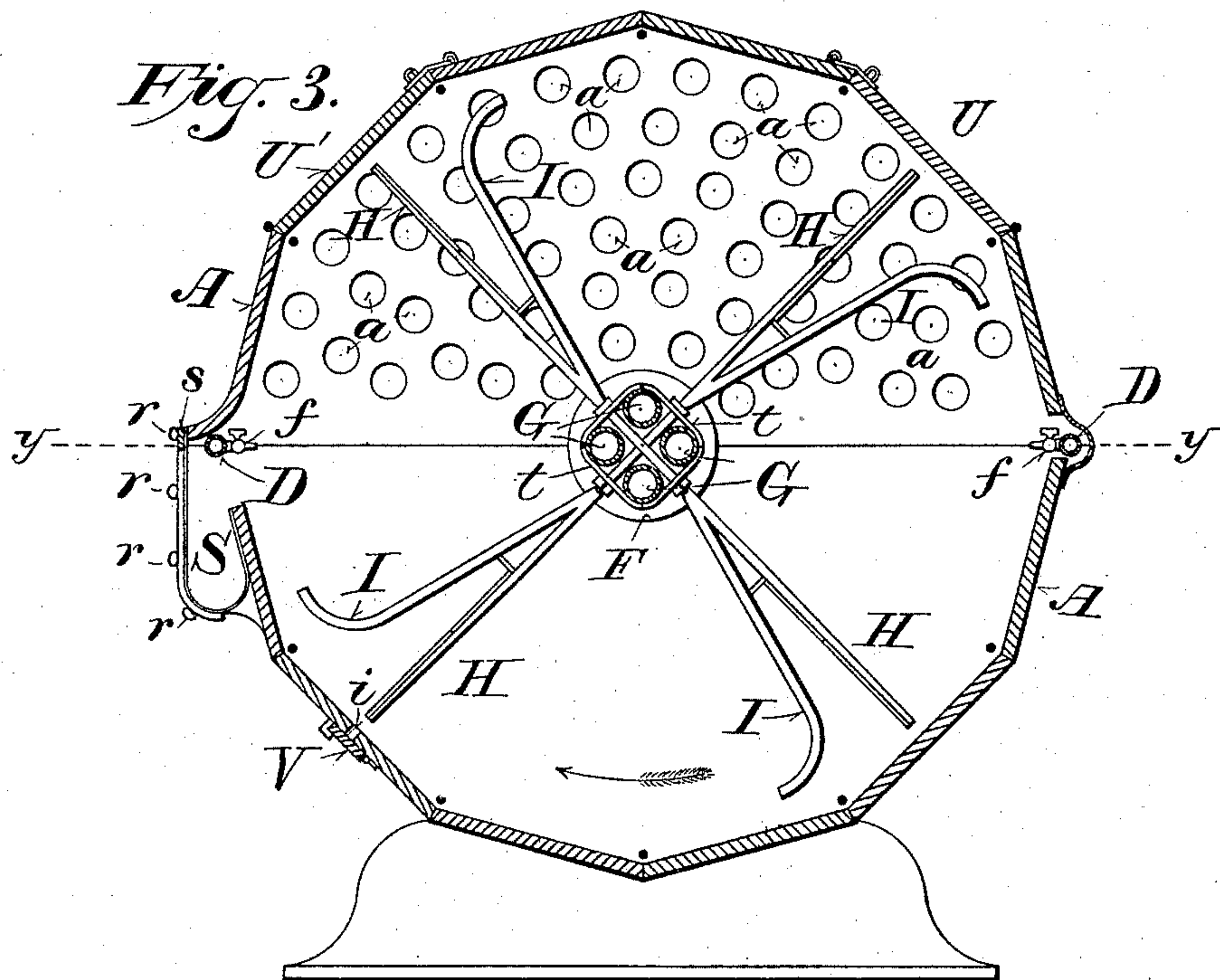
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2 Sheets—Sheet 2.

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FEATHER RENOVATOR.

No. 324,521.

Patented Aug. 18, 1885.



Witnesses:
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UNITED STATES PATENT OFFICE.

HERMAN BERGER, OF MILWAUKEE, WISCONSIN.

FEATHER-RENOVATOR.

SPECIFICATION forming part of Letters Patent No. 324,521, dated August 18, 1885.

Application filed March 10, 1885. (No model.)

To all whom it may concern:

Be it known that I, HERMAN BERGER, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Feather Renovators and Separators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to machines for cleansing, renovating, and sorting feathers.

It consists, essentially, of a cylindrical or prismatic case having foraminated ends, and provided with fans or wings arranged to rotate therein, of devices for introducing either steam or heat into said case, and a device for catching and removing the dirt separated from the feathers in the renovator.

The objects of my invention are, by the use of a single machine, first, to thoroughly cleanse and renovate the feathers, and, second, to grade them according to their size or specific gravity.

In the accompanying drawings like letters refer to the same parts in the several figures.

Figure 1 is a perspective view of my improved machine. Fig. 2 is a horizontal medial section of the same on the line *y y*, Fig. 3. Fig. 3 is a transverse vertical section on the line *x x*, Fig. 2. Fig. 4 is a detail view in perspective of one of the foraminated ends of the case, showing the method of closing the same while the feathers are being cleansed and renovated.

A is the box or casing, cylindrical or prismatic in form. I prefer the form of a twelve-sided prism, as shown in the drawings, and to construct the sides of wood and the ends of iron, though any other suitable material may be employed. The ends are preferably made in two sections formed with flanges *h h*, by means of which they are joined together horizontally. The upper sections of both ends are thickly perforated with small round openings *a a*, which may vary in diameter according to the grade of feathers desired to be obtained. By thus constructing the ends in two sections, interchangeable foraminated sections having

perforations of different sizes may be employed in the same machine for separating various grades of feathers.

The casing A is horizontally recessed internally near the middle of each side, to receive steam-pipes D D, which are provided with a number of inwardly-projecting jets or cocks, *f f*. The case A is also provided with a compound shaft composed of a number of iron pipes, G G, secured at the ends in cylindrical castings inclosing steam-chambers F F, and provided with hollow gudgeons *d d*, by which said shaft is mounted axially within said casing A in boxes *c c*.

The gudgeon *d* at the front end of the machine, as shown in Fig. 1, is extended to receive a steam-pipe, *e*, and a packing-nut or gland, *b*, between the inner end of which and a shoulder formed within said gudgeon *d* packing *g* is inserted to prevent leakage around said pipe *e*. The gudgeon *d* at the opposite end of the machine is internally threaded to engage with the threaded end of shaft L, upon the outer end of which is mounted the driving-pulley K, suitably protected, as shown in Fig. 2, from down and feathers by a casing, Q. To insure steam-tight joints, packing-rings *l l* are screwed on the threaded ends of the pipes G G, and packing interposed between said rings *l l* and the castings inclosing chambers F F.

To withdraw the water produced in the shaft G G by the condensation of the steam therein, I attach to one of the pipes G, or to any other convenient part of said shaft, a cock, *g'*, as shown in Fig. 2.

M represents the steam-supply pipe connected with a short vertical branch, R, which communicates at the top with pipe *e*, and at the bottom, through branches P P, with side pipes, D D, and is provided with valves N O, by means of which steam may be admitted into side pipes, D D, pipes G G, or both. This central shaft is provided with radiating arms or wings H H, as seen in Figs. 2 and 3, secured thereto by means of the clamping-plates *t t*, through which they pass. Said arms or wings are provided with branches I I, diverging therefrom at a point near the central shaft, and forwardly curved at their ends, as shown in Fig. 3.

To prevent the feathers discharged through

the outer openings, *a a*, from being drawn back into the machine through the openings *a a* nearer the center, where there is more or less of an inward draft, I cover the inner rows of openings with coarse detachable wirescreens or cages B, which rest upon converging spouts C C, attached to the lower sections of the ends of case A.

The cages B are preferably made semi-cylindrical in form, open at the ends, which rest against said case, and covered at the opposite ends with screens, which permit the passage of air to the openings *a*, covered by said cages, but prevent the passage of feathers. Said cages B are fitted at the base to and rest upon the flaring mouths of spouts C, which converge to small openings at the bottom, through which any feathers escaping through openings *a* into cages B are discharged.

S is a pocket attached to one side of the case A, extending the entire length thereof, and made of canvas or any other suitable flexible material. The end sections of case A are extended to close the ends of said pocket S, which is suspended at the top by means of a cleat, *s*, and thumb-screws *r r*, from the outwardly turned edge of a side section, and permanently attached to the section next below, as shown in Figs. 2 and 3, so as to leave a long narrow opening at or near the top into said case A. By removing the thumb-screws *r r* at the top and ends the pocket S may be turned down and the dirt collected therein removed.

For the purpose of separating the down from the feathers, a number of very small openings, *i i*, are made in one or more of the lower side sections of the case A. By means of the lid or cover V the openings *i i* may be closed when desired.

U U' are doors opening into the sides of case A for the purpose of filling it with feathers, and removing the coarse residuum after the finer grades have been separated therefrom, and for adjusting the cocks *f f* and repairing the internal mechanism.

By means of the detachable covers E, Fig. 4, the foraminated end sections of the case may be closed for cleansing and renovating the feathers by the introduction of steam and heat and the agitation of the wings.

I may provide openings in the sides of the case A, similar to those in the end sections, or in the form of longitudinal slots, to accomplish the same results attained by the construction shown in the drawings, although I prefer the latter arrangement. I may also dispense with the steam-pipes D D or the pipes G G, or both; but as feathers generally need to be cleansed and renovated as well as graded it is more convenient to associate all these parts in one machine.

The operation of my machine may be described as follows: A quantity of crude feathers is placed in the case A, the foraminated end sections closed by covers E, cocks *f f*

opened, the doors U U' securely closed, the wings or fans H H set in motion, and steam admitted into side pipes, D D, and shut out of pipes G G by closing the valve N and opening the valve O. The forwardly-curved arms I I advancing before the wings H H separate the feathers and prevent them from massing in front of said wings H H sufficiently to bend or break the same. The feathers thus agitated are brought in contact with the steam-jets at the sides, and are thereby thoroughly cleansed and their vanes or flues separated and rendered fluffy. When the feathers have been sufficiently steamed, the valve O is closed, disconnecting the side pipes, D D, from the supply-pipe M, and steam admitted through pipe *e* into chambers F F and pipes G G by opening the valve N. The feathers thus subjected to a high degree of heat are thoroughly dried and the process of cleansing and renovating is completed. The machine is now stopped, the valve N closed, covers E E removed, and the cages B B placed in position, as shown in Fig. 1. The wings H H are again set in motion, the finer feathers being blown out through the openings *a a* and separated from the coarser heavier feathers, which are retained in the machine. The down is expelled from the machine first, then follow the finer feathers, the grade becoming coarser as the operation continues. By interrupting the operation at proper intervals the feathers may be very accurately graded according to size and weight.

As before described, the process of grading may be assisted by the use of interchangeable foraminated end sections having openings *a a* of different sizes ranging in diameter from one and one-half to two and one-half inches.

For obtaining the down apart from the feathers, the ends of the case A may be closed and the small openings *i i* in the side of the case opened, or if desired, both the openings *i i* and *a a* may be operated at the same time. When said openings *a a* and *i i* are operated together, down will escape with the feathers through the former, but down alone is obtained through the latter.

I claim—

1. In a feather-separator, the combination of the case A, agitating arms or fans H H, and small unobstructed openings *a a*, formed in the side or end of said case, and communicating with the interior thereof, so as to permit feathers of and under any desired size to be expelled from said case, substantially as and for the purposes set forth.

2. The combination, in a feather-separator, of the case A, small unobstructed openings *a a*, through one or both ends, agitating wings or arms H H, and cages or screens B B, placed over the openings *a* nearest the center of said case, substantially as and for the purposes set forth.

3. In a feather-separator, the combination of the case A, provided with openings *a a*, rotary wings H H, and branches I I, which rotate

with and in advance of said wings H H, substantially as and for the purposes set forth.

4. In a feather-separator, the combination of the case A, having small unobstructed openings *a a* through its walls, agitating wings or arms H H, whereby feathers of and under any desired size are expelled from said case through said openings *a*, and pipes D D, provided with cocks or jets *f f*, opening into said case
10 A, substantially as and for the purposes set forth.

5. The combination, in a feather renovator and separator, of the case A, having openings *a a*, a central shaft composed of pipes G G, and mounted axially in said case, wings or arms H H, radiating from said central shaft, pipe *e*, communicating with a heat-generator and with said pipes G G, and means for rotating said wings or arms, substantially as
15 and for the purposes set forth.

6. The combination, in a feather-renovator, of the case A, a central shaft composed of the pipes G G, gudgeons *d d*, chambered castings F F, in which the ends of said pipes G
20 are secured, pipe *e*, communicating through one of said gudgeons with pipes G G, and wings or arms radiating from said shaft, substantially as and for the purposes set forth.

7. The combination, in a feather-renovator,

of the case A, the central shaft, composed of pipes G G and chambered castings F F, journaled in said case, wings H H, attached to said shaft, and side pipes, D D, provided with jets *f f*, substantially as and for the purposes set forth.

8. The combination, in a feather-renovator, of the case A, agitating wings or arms H H, and a flexible pocket, S, applied to and communicating with the interior of said case, and detachably connected therewith at its upper
35 and outer edge, so as to be opened and discharge the dirt, &c., collected therein, substantially as and for the purposes set forth.

9. The combination, in a feather-renovator, of the case A and central rotary shaft composed of pipes G G, stationary side pipes, D D, provided with jets or openings *f f*, connecting pipes, and valves N O, whereby steam is supplied to or shut off from either or both said
40 central shaft and pipes D D, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HERMAN BERGER.

Witnesses:

CHAS. L. GOSS,
GEORGE GOLL.