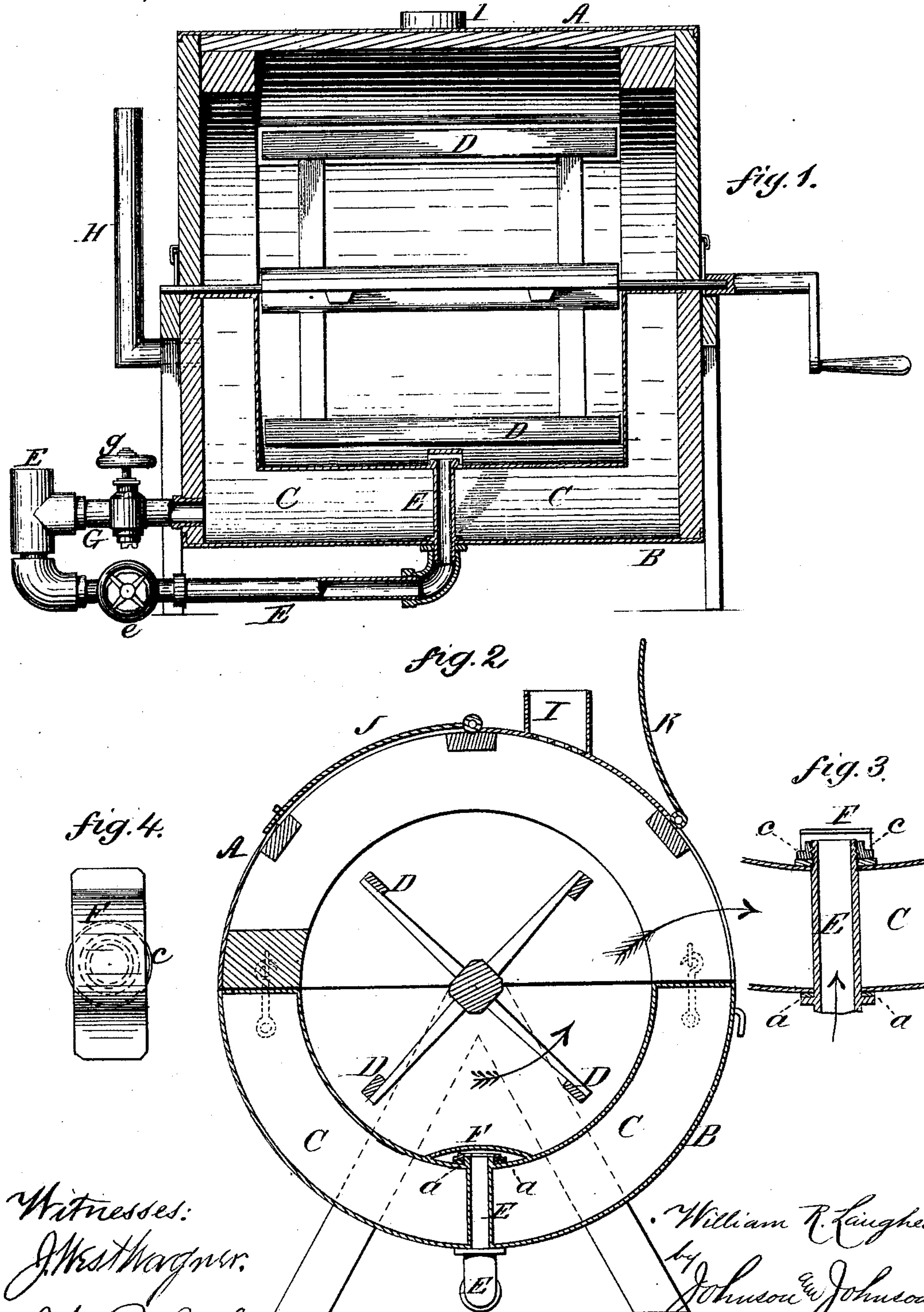
W. R. LAUGHEAD.

FEATHER-RENOVATOR.

No. 180,893. Patented Aug. 8, 1876.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM R. LAUGHEAD, OF HAMILTON, OHIO.

IMPROVEMENT IN FEATHER-RENOVATORS.

Specification forming part of Letters Patent No. **180,893**, dated August 8, 1876; application filed July 10, 1876.

To all whom it may concern:

Be it known that I, WILLIAM R. LAUGHEAD, of Hamilton, in the county of Butler and State of Ohio, have invented certain new and useful Improvements in Feather-Renovators, of which the following is a specification:

My object is to renovate and purify the feathers of beds by steam, and to destroy and prevent the feather-midge or animalcule which are found in all unrenovated beds, and to eradicate from the feathers all unhealthy secretions from fevers and diseases.

All the impurities in the operation of the machine go off by evaporation with the steam at the top of the renovating-chamber.

The feathers are renovated within a cylindrical case, the lower portion of which is double, and forms the drying-chamber, while a revolving shaft of beaters thoroughly agitates the feathers. The steam is introduced to the feathers by a pipe, which enters the bottom of the cylinder, and is hooded by a cap, against which the steam impinges, and by which it is deflected and diffused throughout the body of the feathers from a point in the middle of the bottom. This plan I have found to be much more effective than by introducing the steam in jets from a pipe along the length of a cylinder, because, by the open tube and cap, the steam enters with much greater force among the feathers, and does its work of inflating the feathers better and quicker than can be accomplished by jets issuing from small perforations, which are more or less covered up, while the cap-hooded exit of the steam-pipe is always open, and the steam issues therefrom in such volume as to insure the proper degree of steam-heat to destroy the animal life and render the feathers buoyant and light, and to accomplish which satisfactorily both force and heat are found to be essential. A branch from this pipe leads into the double casing which forms the drying-chamber, but the steam must not enter both chambers at the same time, since it does not do to dry the feathers while subjecting them to the direct action of steam, and I therefore provide both branches of the steam-pipe with stop-cocks, so that the steam is cut off from the drying-chamber while the feathers are being subjected to its direct action, and when this is continued a sufficient length of time it is cut off, and the pipe leading to the drying-chamber opened. This arrangement of the stop-cocks is important to insure a proper and separate treatment of feathers. A ventilating pipe rises from the top of the renovating-chamber to allow all the fumes and vapors to pass out with the steam, and thereby prevent their condensation at the bottom of the renovating-chamber, which is objectionable, as it prevents a complete purification of the feathers. The top section of the case is provided with a door for introducing the feathers, and one through which the feathers are fanned out by the continued operation of the revolving beaters.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of a feather-renovator embracing my invention; Fig. 2, a cross-section of the same, showing the manner of discharging the feathers from the renovating-chamber; and Figs. 3 and 4, detail views.

The case is composed of two sections, A and B, the ends of which are wood, and the cylindrical casing is of zinc or sheet iron. The lower section B is double, and forms the drying-chamber C, being supported upon suitable legs, while the upper section is removable, and is secured in place by hooks and eyes, and forms, with the lower section, a circle about five feet in diameter. Within the chamber formed by this casing the feathers are renovated while under the agitating action of radial beaters D, the shaft of which is revolved by a belt from the engine. A steam-pipe, E, leads from a boiler, and enters the bottom of the lower section, passes through the drying-chamber C, and opens into the renovating-chamber at the middle thereof, where it is secured and clamped by a screw-nut, *c*, a rubber packing, *a*, closing the joint at the bottom of the case. A cap or hood, F, placed over the open end of the steam-pipe E, serves to deflect and diffuse the steam in all direction among the feathers in the chamber while they are under agitation, the force with which it enters from the open pipe and the heat of the volume serving to produce the desired effect upon the feathers. A branch, G, from the steam-pipe enters the double chamber C,

for heating the inner casing of the lower section to dry the feathers after the renovating operation is over, and for this purpose the pipes E and G are provided with stop-cocks *e* and *g*, by which the direct action of the steam upon the feathers is cut off while they are being dried, and vice versa. This treatment of the feathers under separate and distinct operations is very important to insure their proper cleaning and drying in the same chamber. A pipe, H, leads from the drying-chamber to let out the steam. A pipe, I, having a perforated bottom, also leads from the top section of the renovating-chamber to carry off the fumes and impure steam, and prevent its condensation at the bottom of said chamber. The beaters revolve over the cap of the steam-pipe, and the latter is thereby kept from being filled by the feathers. The removable section of the case is secured by hooks and eyes at the ends, and it is provided with two doors, J and K, through one of which, J, the feathers are turned into the chamber, and through the other, K, they are emptied therefrom by being fanned out by the beaters into the cooling-room, the operation being completed by the continuous rotation of the beaters or arms and the changing of the steam from one chamber to the other, and during which the escape-pipes from both sections are open. The shaft of beaters may be turned by crank-handle, if desired.

I claim—

1. The open cap or hood F, arranged at the bottom of the casing, which forms the drying-chamber C, in combination with the steam-pipe E, having its open end entering the bottom of the fixed renovating-chamber beneath said hood, and the beaters D, revolving over said hood, as and for the purpose herein set forth.

2. The combination, with the renovating and drying chambers, and the steam-pipe E, arranged as described, of the clamp-nut *c* and the packing *a*, as and for the purpose herein set forth.

In testimony whereof I have affixed my signature in the presence of two witnesses.

WILLIAM R. LAUGHEAD.

Witnesses:

J. G. MASSEY,

JOSEPH A. CUNNINGHAM.