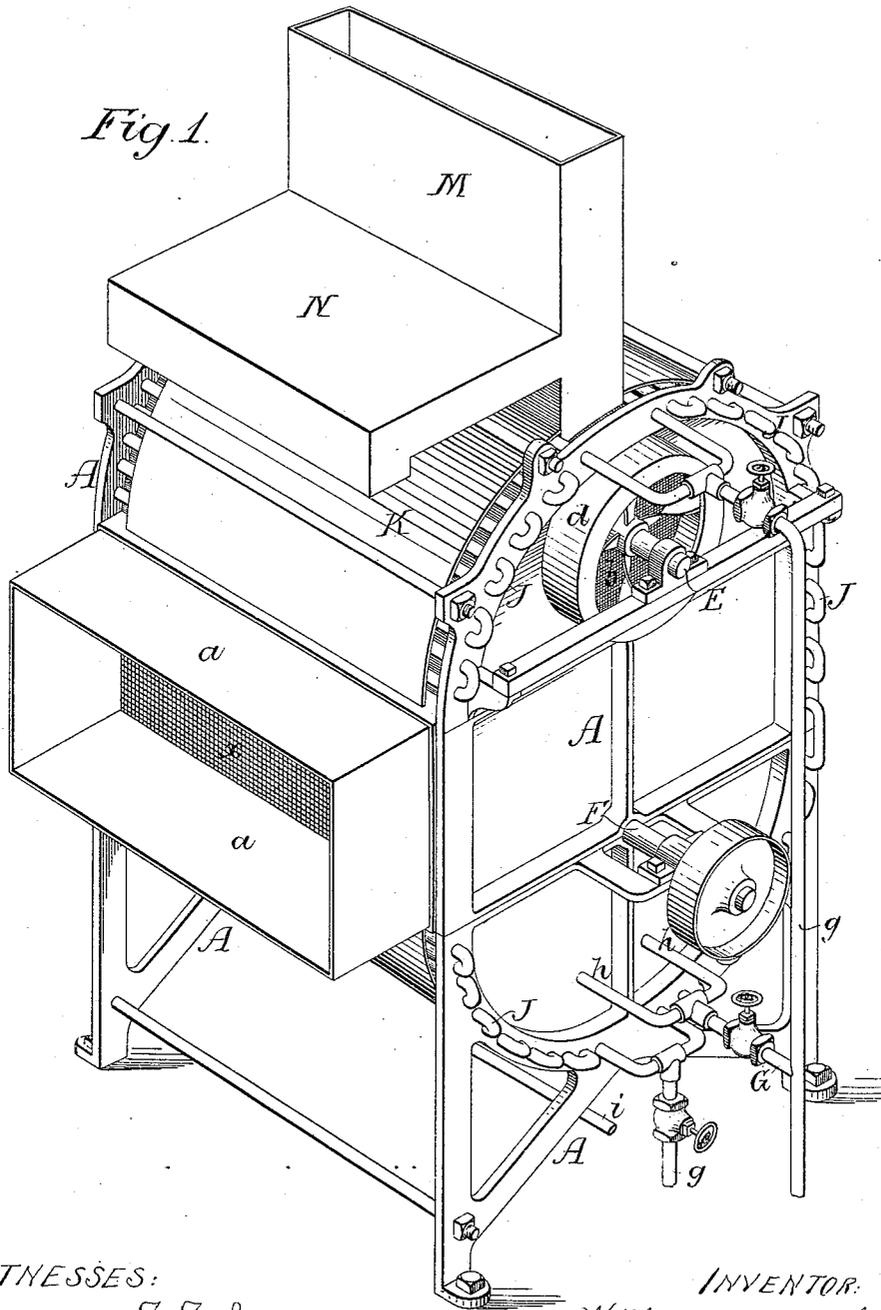


W. McARTHUR.

FEATHER PURIFYING AND RENOVATING MACHINE.

No. 251,266.

Patented Dec. 20, 1881.



WITNESSES:

James F. Tobin.  
 Harry Smith

INVENTOR:

William McArthur  
 by his Attorneys  
 Howson and Jones

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Fig. 3.

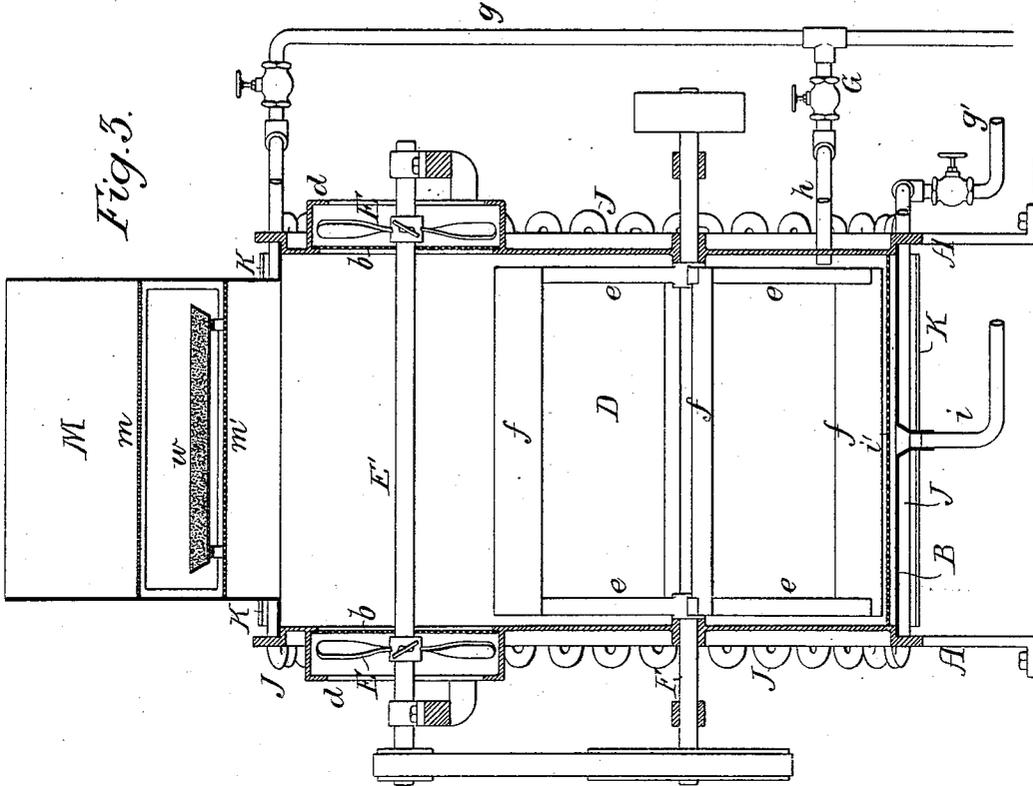
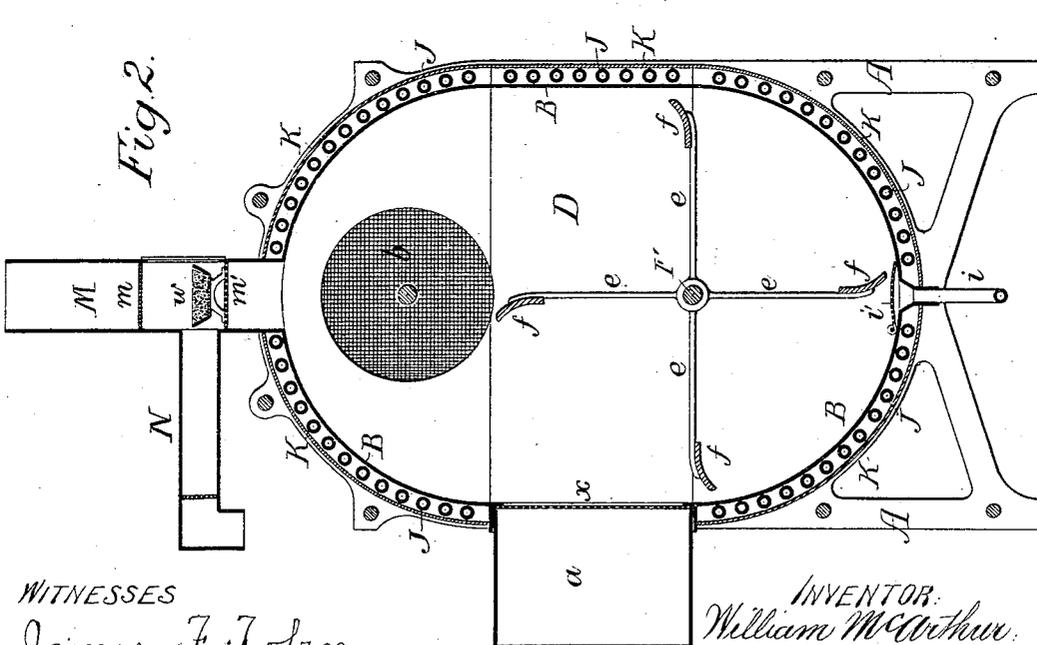


Fig. 2.



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# UNITED STATES PATENT OFFICE.

WILLIAM McARTHUR, OF PHILADELPHIA, PENNSYLVANIA.

## FEATHER PURIFYING AND RENOVATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 251,266, dated December 20, 1881.

Application filed June 6, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM McARTHUR, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain  
5 Improvements in Feather Purifying and Renovating Machines, of which the following is a specification.

The object of my invention is to construct a machine for rapidly and effectively cleaning,  
10 purifying, and increasing the bulk of a mass of feathers, whether new or old, and for restoring to old feathers their original elasticity; and this object I attain in the manner which I will now proceed to describe, reference being had  
15 to the accompanying drawings, in which—

Figure 1, Sheet 1, is a perspective view of my improved feather purifying and renovating machine; Fig. 2, Sheet 2, a transverse section of the same; and Fig. 3, a longitudinal section.

20 A A are the opposite end frames of the machine, made preferably of cast-iron; and B is a sheet-metal casing extending from one end frame to the other, and serving, with said end frames, to inclose the chamber D, into which  
25 the feathers are introduced, and in which they are treated as described hereinafter.

At one side of the casing B is an inlet, *a*, and in each end frame, A, near the top of the same, is an opening, *b*, covered with finely-perforated  
30 sheet-metal plate or wire-gauze, an external annular shield, *d*, surrounding each of these openings and partially inclosing a rotary fan, E, the two fans being carried by a transverse shaft, E', which is adapted to suitable bearings  
35 on bars carried by the end frames, A, of the machine. Another transverse shaft, F, is adapted to bearings in the frames A, and this shaft is furnished, within the chamber D, with a series  
40 of arms, *e*, provided at the outer ends with blades or paddles *f*, slightly curved in cross-section, as shown in Fig. 2, the lower portion of the casing B being made of semi-cylindrical form and concentric with the shaft F, so that  
45 the blades travel in close proximity to said casing.

Surrounding the casing B are coils J of tubing, through which steam is caused to circulate, as described hereinafter, *g* being the steam-inlet pipe, and *g'* the pipe for the escape of the  
50 water of condensation from the coils. A pipe, G, extends from the inlet-pipe *g*, and has two

branches, *h*, terminating within the chamber D of the machine at points adjacent to the bottom thereof, the flow of steam through the pipe G being controlled by a suitable valve. Water  
55 of condensation is withdrawn from the chamber D through a pipe, *i*, the entrance to which is protected by a screen, *i'*.

In order to prevent undue radiation of heat from the coils J, I provide a shield, K, which  
60 incloses the coils, and is preferably made of some non-conducting material, or of sheet-iron coated or covered with non-conducting material.

M is an escape pipe or chimney communicating with the upper end of the chamber D, and having a lateral branch, N, bent downward at the outer end. In the chimney M are two  
65 screens, *m m'*, arranged respectively above and below the branch N, the upper screen, *m*, being much finer than the lower screen, *m'*, which supports a tray or box, *w*, containing chloride of lime or other suitable disinfecting agent, this tray being introduced into the chimney through  
70 an opening in one side of the same, the opening, after such introduction, being closed by a suitable door or cover.

The operation of the machine is as follows: The feathers are introduced into the chamber D of the machine through the opening *a*, and  
80 the latter is then closed by means of a screen, *x*, of wire gauze or perforated plate, as shown in Figs. 1 and 2. The shafts E' and F are then caused to rotate, and steam is permitted to enter the chamber D through the pipe G and  
85 branches *h*. The feathers are kept in a continual state of agitation by the tossing action of the blades or paddles *f*, and are subjected to the combined action of the live steam and of the currents of air thrown into the chamber D  
90 by the fans E. The impurities absorbed by the steam and air are carried off with the latter, and escape through the chimney M, being deodorized in the passage by the material in the tray *w*, so as to leave the chimney in an inoffensive condition. Fresh air is induced by the  
95 draft to enter the chimney M through the branch N, and this assists the disinfecting operation. After this treatment has been continued until the feathers have been thoroughly steamed, the  
100 supply of steam is cut off from the pipe G, and steam is admitted to the coils J, surrounding

the casing B, which soon becomes highly heated, the heat being radiated into the chamber D, in which the feathers are still kept in a state of agitation, by the blades or paddles *f*, and are still subjected to the currents of air induced by the fans E. The effect of this treatment is to rapidly dry the feathers and to drive off through the chimney M the solid impurities which have not been carried off by the steam. The fine down is also carried up by the draft through the chimney M, but its progress is arrested by the fine screen *m*, and the down is caused to pass out through the branch N of the chimney, from which it is delivered into a suitable receptacle. The feathers are prevented from passing off through the chimney by the screen *m'*, and when said feathers are thoroughly dried and purified the screen *x* is removed from the inlet *a*, and the feathers are discharged therefrom by the combined action of the blades *f* and the drafts of air from the fans E.

By forcing currents of air into the machine during both the steaming and drying operations the feathers are aerated, and not only is the drying operation facilitated, but the feathers are opened out and the bulk of the mass materially increased, the feathers, when old, being restored to their original elasticity.

The blades or paddles *f* exercise a lifting action on the mass of feathers and keep the same in a state of constant agitation without the tendency to bruise or break the stems of the feathers, which is an objection to that class of feather-renovators having radial arms or stirrers.

All of the parts of the machine with which the steam comes in contact are made of metal, as it has been found that when wood is used the steam causes the rapid rotting away of the wood and necessitates continual repairs.

I claim as my invention—

1. The mode described of purifying and renovating feathers, said mode consisting in subjecting the feathers, while being agitated, first to the combined action of currents of air and live steam, and then to the combined action of currents of air and external heat, as set forth.

2. The combination of the casing of the machine, the agitator therein, the chimney or outlet, the screened openings *b*, and the fans E, as set forth.

3. The combination of the casing A, its agitators, and air-supplying fans, with the external heating-coils, J, as specified.

4. The combination of the casing of the machine with the chimney M and its deodorizing-tray *w*, as set forth.

5. The combination of the casing of the machine, the chimney M, with its screens *m m'*, and the branch N, as set forth.

6. The combination of the casing B, the external heating-coils, J, and the shield K, as specified.

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

WILLIAM McARTHUR.

Witnesses:

JAMES F. TOBIN,  
HARRY SMITH.