

(No Model.)

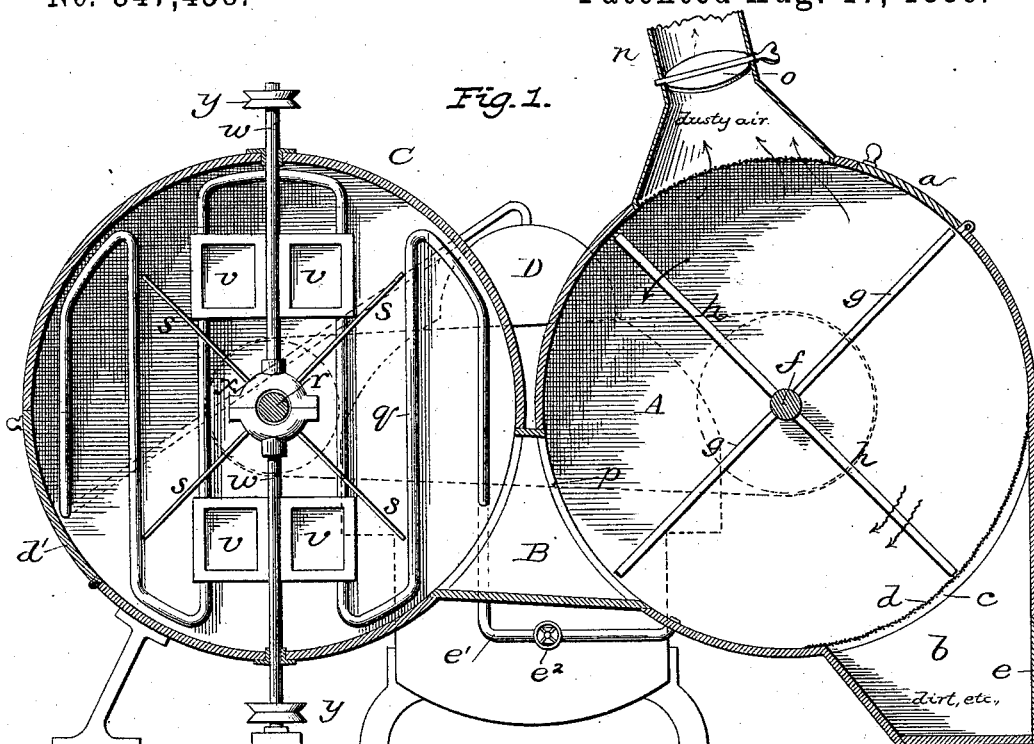
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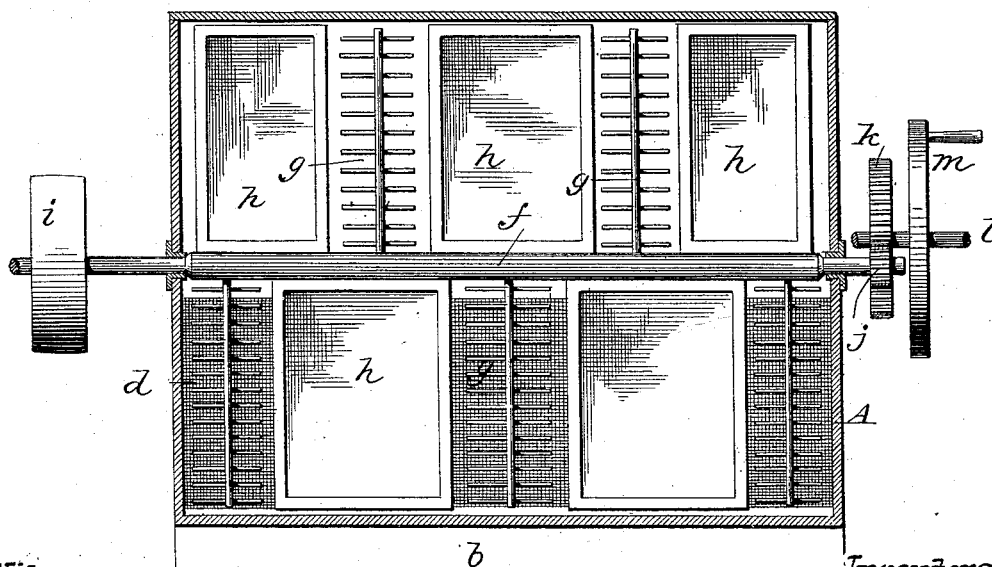
FEATHER RENOVATOR.

No. 347,458.

Patented Aug. 17, 1886.



*Fig. 2.*



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## FEATHER RENOVATOR.

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Fig. 3.

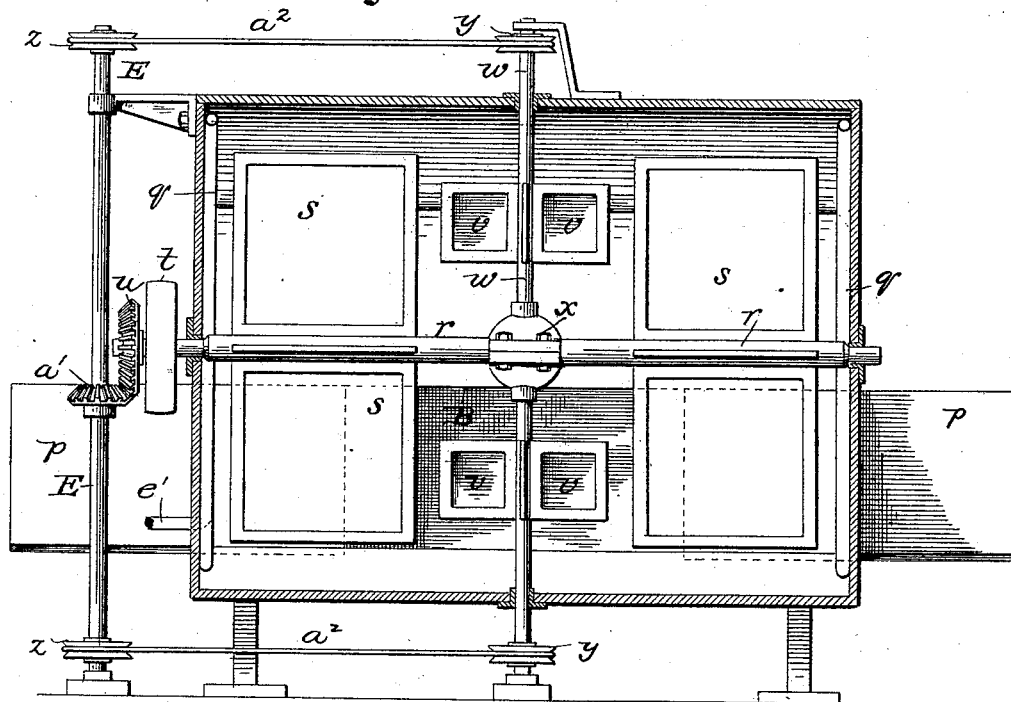
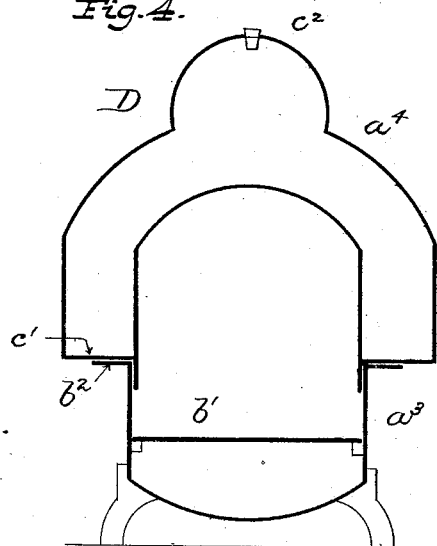


Fig. 4.



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# UNITED STATES PATENT OFFICE.

NATHAN BARUCH AND OWEN LLOYD WILLIAMS, OF ATHENS, GEORGIA.

## FEATHER-RENOVATOR.

SPECIFICATION forming part of Letters Patent No. 347,458, dated August 17, 1886.

Application filed January 6, 1886. Serial No. 187,819. (No model.)

*To all whom it may concern:*

Be it known that we, NATHAN BARUCH and OWEN LLOYD WILLIAMS, of Athens, Georgia, and Portsmouth, county of Hampshire, England, respectively, residing at Athens, Clarke county, State of Georgia, have invented certain new and useful Improvements in Feather-Renovators, of which the following is a specification.

Our invention relates to feather-renovators; and it consists in a novel construction of the same, whereby economy of space and great efficiency in action are attained.

In the drawings, Figure 1 is a vertical cross-section of our improved machine. Fig. 2 is a longitudinal section through the cleaner-cylinder; Fig. 3, a similar view of the drying-cylinder, and Fig. 4 a vertical section of the generator.

The invention, briefly stated, consists of a renovating or cleaning chamber, into which the feathers are placed, and where they are subjected to the separate or combined action of steam and beaters.

It consists of a drying-chamber, communicating with the renovating-chamber, wherein the feathers are subjected to the indirect action of steam, and also to the action of fans.

It further consists in a novel construction and arrangement of the fans.

It further consists in a novel construction of a portable generator, and, finally, it consists of various features and details herein set forth and specifically claimed.

A indicates the renovating or cleaning chamber, preferably cylindrical in form, provided with an inlet, through which the feathers are inserted, said inlet being provided with a door, *a*, as clearly shown in Fig. 1. The renovating-chamber is also provided with a longitudinal box or chamber, *b*, on its lower side, the chamber being cut away for about a quarter of its circumference throughout its length, as shown in Fig. 2, the opening *c* thus formed being covered with wire-gauze or other perforate material, *d*, to prevent the escape of feathers into said chamber *b*. The chamber *b* is provided with a door or doors, *e*, as shown in Fig. 1.

Within the chamber or cylinder A is mounted a shaft, *f*, carrying beaters *g* and *h*, motion being imparted to the shaft through a band-wheel, *i*, from any convenient source. The

shaft *f* is provided at its other end with a gear-wheel, *j*, meshing with a larger gear, *k*, on a supplemental shaft, *l*, provided with a hand-wheel or crank, *m*, by which to rotate the shaft *f* manually.

Upon reference to Fig. 2 it will be seen that the beaters *g* and *h* are composed, respectively, of plates and rakes, and said beaters are so constructed that they may be removed and long curved teeth substituted; or the plates or the rakes may be removed, and the beater composed of rakes alone or of plates only.

The chamber A is provided with a flue or outlet, *n*, at its upper side, to allow the waste steam and light particles of dust to escape into the air, the outlet or opening being covered with wire-gauze, to prevent the escape of feathers, and also provided with a valve, *o*, as shown in Fig. 1.

B indicates a trunk or chamber opening into chamber A at the lower side of the latter, opposite chamber *b*, said trunk B being provided with sliding doors *p*, as shown in Figs. 1 and 3, whereby communication between chambers A and B may be controlled as desired.

The trunk or chamber B communicates at the opposite side with the drying-chamber C, as shown in Figs. 1 and 3, the bottom of the trunk B being a little higher than the bottoms of chambers A and C. The chamber C is about the same size of chamber A, but is provided on its rear end walls with coils *q*, of pipe, which terminate at one end in the chamber A and connect at the other with the generator D. Chamber C is also provided with a horizontal shaft, *r*, carrying fan-blades *s*, band-wheel *t*, and bevel-gear *u*, as shown in Fig. 3, the band-wheel *t* and gear *u* being outside of the casing. It will be noticed that the fans *s* occupy only the end portions of the shaft *r*, in order to make room for fans *v*, carried by shafts *w* at right angles to shaft *r*, as shown in Figs. 1 and 3, the inner ends of the shafts *w* being supported by a yoke, *x*, encircling the shaft *r*. The outer ends of the shafts *w* are carried or supported by suitable boxes or bearings, and said shafts are each provided with grooved band-wheels *y*, as shown. A vertical shaft, E, outside of the machine, carried in suitable supports or bearings, is provided with

similar band-wheels,  $z$ , and a bevel gear-wheel,  $a'$ , which meshes with gear  $u$ , carried by shaft  $r$ . Belts  $a^2$  communicate motion from shaft  $E$  to shafts  $w$ , as shown in Fig. 3.

5 The portable steam-generator used in connection with the renovator consists of two sections,  $a^3$  and  $a^4$ , as clearly shown in Fig. 4, the lower section,  $a^3$ , forming the fire-pot and ash-pit, and the upper section,  $a^4$ , forming the boiler. The lower section is formed with a grate,  $b'$ , and at its top with broad lateral flanges  $b^2$ . The inner diameter of the boiler is of about the diameter of the lower section,  $a^3$ , and has its inner vertical walls extended downward to prevent lateral displacement. The base  $c'$  of the boiler rests upon the lateral flanges  $b^2$ , as shown, and the said boiler is provided with a safety plug or valve,  $c^2$ , and connected with the coils  $q$  in any suitable manner.

10 The operation of the machine is as follows: Feathers are placed in the chamber A through the door or opening  $a$ , and the chamber is separated from the chamber C by closing the door  $p$ , the door  $a$  being also closed. The valve  $o$  in the funnel-shaped flue or outlet  $n$  is opened, and motion imparted to the shaft  $f$  and the fans and beaters  $g h$  in the direction of the single arrow, as in Fig. 1. As the shaft rotates, the beaters rub the feathers against the wire-gauze  $d$  in the lower face or side of the chamber A and remove the dirt from the feathers, the dirt, &c., passing through the gauze and into the box or receptacle  $b$ , formed upon the side of the chamber A. This rotation of the shaft and beaters causes considerable dust, which rises and escapes through the flue  $n$  and into the chimney outside of the building, the escape of feathers through the flue being prevented by a covering of wire-gauze, as seen in Fig. 1. As soon as the feathers have been beaten enough to remove the adhering dirt, and the dust has escaped, steam is admitted into the chamber, and the fans or beaters  $g h$  again set in motion. The combined action of the fans or beaters and the steam is found to have quite a beneficial effect on the feathers, removing the grease and small particles of dirt remaining after the first operation, and also destroying animalcules concealed on the feathers. After the desired length of time has elapsed the doors  $p$  are opened, as in Fig. 3, and the steam being shut off from chamber A the fans are caused to revolve in the direction of the double arrows in Fig. 1. This motion of the fans or beaters lifts the feathers up and forces them through the trunk B into the chamber C, as will be readily understood upon referring to Fig. 1. After the feathers are in the chamber C the latter is shut tightly and the fans  $v$  and  $s$  set in motion, the result being that with the aid of the heat given off by the coils  $q$  the feathers are soon dried. When the feathers are dried, the door  $d'$  is opened, a sack placed over the opening, and the fans revolved rapidly to discharge the feathers into the sack. While the feathers

are being dried in the chamber C it is apparent that the operation of cleaning in the chamber A may be carried on at the same time, the doors  $p$  effectually separating the chambers A, C and preventing the one from interfering with the other. By this plan the operation is rendered continuous—a feature of considerable importance where a large amount of feathers is to be cleaned.

The pipe  $e'$  is provided with a valve,  $e^2$ , as shown in Fig. 2, by which the steam may be shut off from the renovating or cleaning chamber.

All of the doors are preferably fitted with rubber gaskets, in order to make tight joints and prevent the escape of hot air or steam.

Before the operation of drying commences the chamber A may be filled with feathers, and the cleaning and drying operations carried on simultaneously and continuously.

Either chamber can be worked independently of the other, or both operated at the same time, it being only necessary that the band-wheels  $i$  and  $t$  be connected by a belt, as indicated in Fig. 1.

Upon reference to Fig. 4 it will be seen that our generator is exceedingly simple and obtains a very large amount of heating-surface, the interior walls of the annular water-chamber forming the walls of the stove.

It is obvious that the fans  $v$  may be placed in various positions about the shaft  $r$ , and hence we do not wish to limit ourselves to the precise arrangement shown.

We are aware that it has been proposed to construct a feather renovator with a double-walled chamber, between the walls of which were placed steam-coils, and we make no claim to such construction.

By our plan we heat the chamber with less expenditure of fuel, as the coils are directly in the chamber proper, and the necessity of heating through an interposed wall is obviated. Besides, our plan is much cheaper and simpler.

Having thus described our invention, what we claim is—

1. In a feather-renovator, the combination of a cleaning-chamber, a drying-chamber, an intermediate connecting-trunk, and a steam-pipe coiled within the drying-chamber and adapted to discharge steam into the cleaning-cylinder.

2. In a feather-renovator, the combination of a cleaning-chamber, a drying-chamber, an intermediate connecting-trunk, a steam-pipe coiled within the drying-chamber to heat the same, and adapted to discharge steam into the cleaning-cylinder, and an outlet-flue provided with a valve and guarded opening.

3. In a feather-renovator, a drying cylinder or chamber provided with two separate sets of fans, arranged and operating substantially as described.

4. In a feather-renovator, a drying cylinder or chamber provided with two separate sets

of fans substantially at right angles to each other.

5 5. In a feather-renovator, a drying cylinder or chamber provided with two separate sets of fans and mechanism for operating both sets of fans simultaneously.

10 6. In a feather-renovator, the combination, with a drying-chamber having two separate sets of fans, of steam-coils at each end of said chamber.

15 7. In a feather-renovator, the combination of a drying-chamber provided with shaft *r*, fans *s*, secured thereon at each end, yoke *x*, encircling said shaft *r*, shafts *w*, carried by said yoke and provided with fans *v*, and mechanism, substantially such as shown, for imparting motion to said fans.

8. The herein-described feather-renovator, consisting of cleaning-chamber A, intermedi-

ate trunk, B, drying-chamber C, coils *q* within the latter, and steam-generator D, composed of annular water-chamber *a*<sup>4</sup> and fire-chamber *a*<sup>3</sup>.

9. A feather-renovator comprising a cleaning-chamber, a drying-chamber, and an intermediate trunk, each provided with a door or valve, as shown, whereby the cleaning and drying operations may be carried on simultaneously and continuously, or independently, at will.

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