(No Model.)

J. HENDERSON, Jr.

TUMBLING BARREL.

No. 348,011. Patented Aug. 24, 1886.

Fig. 1.

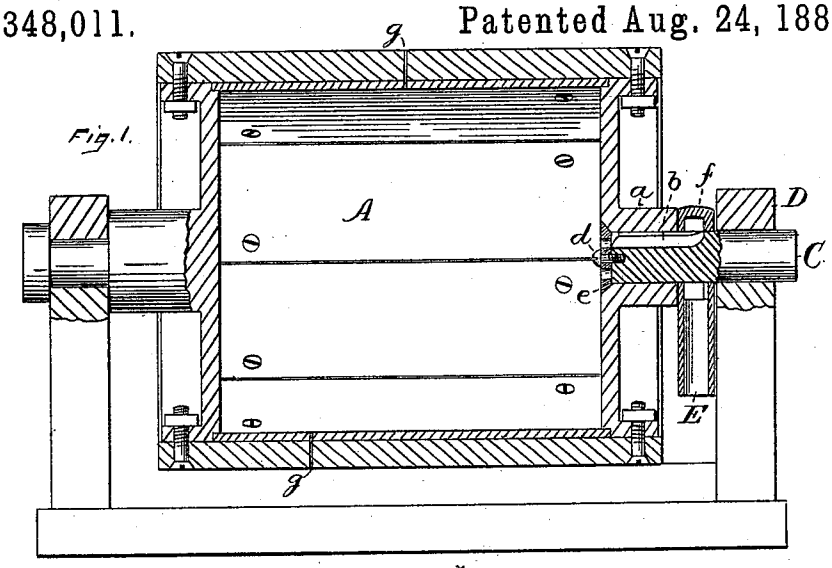


Fig. 2.

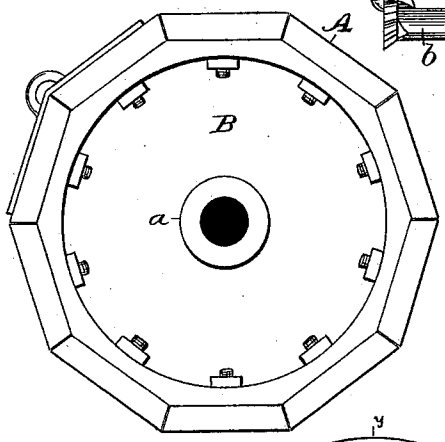


Fig. 5.

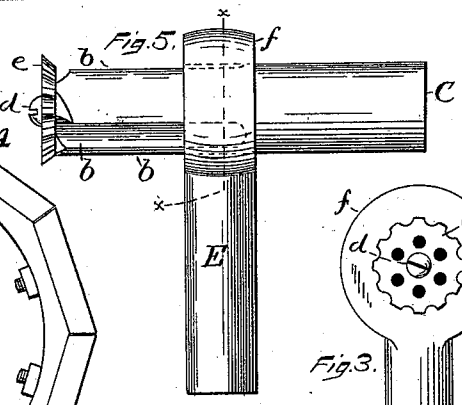


Fig. 3.

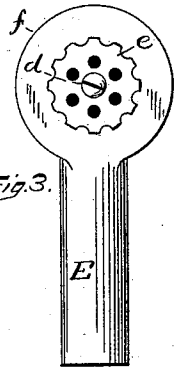


Fig. 4.

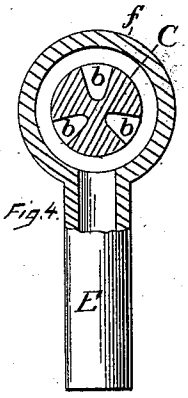


Fig. 6.

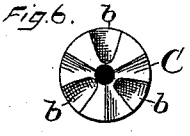


Fig. 7.

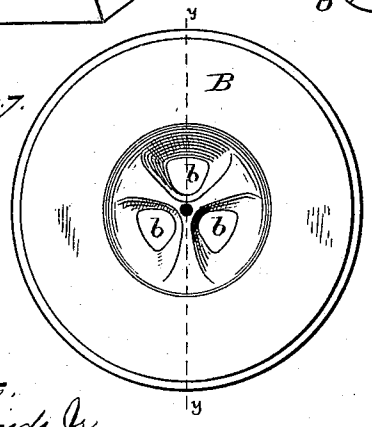
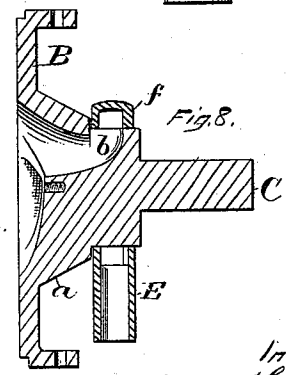


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN HENDERSON, JR., OF WATERBURY, CONNECTICUT.

TUMBLING-BARREL.

SPECIFICATION forming part of Letters Patent No. 348,011, dated August 24, 1886.

Application filed November 27, 1885. Serial No. 184,032. (No model.)

To all whom it may concern:

Be it known that I, JOHN HENDERSON, Jr., a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Tumbling-Barrels, of which the following is a specification.

My invention relates to improvements in tumbling-barrels of the class which employ an air-blast for removing the dust or débris; and the objects of my improvement are to reduce the volume of air passing through the barrel, whereby I increase its velocity and efficiency, to avoid packing the staves of the barrel for making it air-tight, and to otherwise improve the construction so as to reduce the cost of production and to improve the efficiency of the barrel.

In the accompanying drawings, Figure 1 is a central vertical section, partly in elevation, of one of my tumbling-barrels. Fig. 2 is an end view of said barrel without the shaft on which it revolves. Fig. 3 is a side elevation of the perforated plate on the end of said shaft, and of the suction-pipe, said parts being detached from the barrel-head. Fig. 4 is a sectional view of said shaft on line *x x* of Fig. 5, together with the suction-pipe partly in elevation. Fig. 5 is a side elevation of said shaft and suction-pipe. Fig. 6 is an end view of the inner end of said shaft detached from all other parts. Fig. 7 is a side elevation of the inner side of one head, of a modified construction, and Fig. 8 is a section of the same on line *y y* of Fig. 7, showing also the shaft, which is integral with the head.

The general features of the barrel may be of any ordinary construction. I construct it without any perforations in either head and fit the staves together as tightly as is practicable without packing the joints. I have found by trial and experiment that such a construction of the barrel A will admit into it all the air that is neccessary, when the apparatus is constructed in accordance with my invention. The object of this construction is to cause the air to pass radially into the barrel and through the contents thereof. To this end minute passages may be made through the staves, as at *g*, Fig. 1, in addition to the spaces between them, or as a substitute for said spaces.

The spaces or perforations must not be too large or too numerous. The combined area of all the radial inlets must be made less than the area of the discharge-pipe. Ordinarily the inlet-area should be about one-thirtieth the area of the discharge-pipe. Too much inlet-area will cause the air to pass through the barrel too slowly to produce the best effect. In order to illustrate the spaces between the staves at all, it became necessary to show them in Fig. 2 proportionally too large.

The head B is of ordinary construction, and is provided with a central hub, *a*, having a round axial opening, as shown in Fig. 2. This opening is preferably countersunk upon the inner side, for the purpose hereinafter described.

C designates the shaft or journal for the head B, the outer end of which shaft has its bearing in the frame D, as shown at the right-hand end of Fig. 1. The inner end of this shaft has peripheral grooves *b*, preferably three in number, which grooves extend from the inner end of the shaft outward for about half of its length, or other convenient distance, where they are made to terminate at the periphery, as shown in Fig. 1. At the extreme inner end the mouths of the grooves are beveled off or enlarged, so as to make them come nearly or quite together, as shown in Figs. 5 and 6. A central hole is made in the end of this shaft, which hole is threaded for the reception of the screw *d*, or other suitable fastening, whereby the perforated plate or strainer *e* is secured thereon. This plate I prefer to make with a beveled edge, so that it may be adapted in shape to the countersunk portion of the axial opening through the head B, into which the shaft or bearing is fitted. The suction-pipe E is provided with a circular head, *f*, having a hole through it which will receive the shaft C. An annular space (see Figs. 1, 4, and 8) encircles this hole and communicates with the central hole in the suction-pipe E. The grooved end of the shaft C is snugly fitted to the hub *a* of the head B, in the position shown in Fig. 1, said parts preferably being secured together by shrinking the hub on the shaft. The perforated plate or strainer is then fastened directly upon the inner end of the shaft, as shown in Figs. 1, 3, and 4. The suction-pipe is placed upon the shaft between the

end of the hub *a* and the bearings D of the frame, as shown in Fig. 1. In this position the head *f* of the suction-pipe covers the ends of the grooves, and the annular space within said head communicates with the grooves, so that when a suitable suction device is properly connected with the suction-pipe E and operated to exhaust the air therefrom the air will enter the barrel A through the minute spaces at the joints, pass through the perforated plate or strainer *e* upon the end of the shaft C, then through the peripheral grooves *b* in the shaft, and then pass radially from the shaft into the annular space in the head *f*, and out through the suction-pipe E to any suitable discharge, thereby effectually removing all dust, sand, or other fine débris from the barrel in a very efficient manner.

By enlarging the mouths of the grooves at the inner end of the shaft C the several grooves are made to communicate with the perforations in the plate *e*; but this enlargement of the grooves, while a preferable construction, may be dispensed with.

Some of the advantages of my invention are as follows: I save the expense of packing the joints to make them air-tight, as has heretofore been supposed to be necessary in barrels of this class. I make no special perforations for the purpose of admitting air to the barrel. I cause the entering air to pass radially through the contents of the barrel, and thereby more effectually separate and carry off the intermixed dust and débris. I construct the head B of the ordinary form, with a simple axial hole to receive the shaft or journal. The passages leading from the strainer for the exit of the air are all formed in the solid shaft or journal, of ordinary size, and entirely independent of and separate from the head. Only a small space is made leading to the suction-pipe, whereby I am enabled to increase the velocity of the air, and thereby more efficiently remove the dust and débris from the barrel.

I do not wish to confine myself to the exact construction shown and described, the main feature of my invention consisting of admitting the air-current radially between or through the staves and discharging it radially from the shaft into the annular space at the end of the pipe which leads to the suction device, and it is obvious that many modifications in construction are permissible without departing from the scope of my invention.

If preferred, the shaft and the surrounding head may be cast in one piece of metal, the portion corresponding with the shaft, as described herein, being cored for forming the air-passages. Such a modification is illustrated in Figs. 7 and 8.

I am aware that a prior patent for a feather-renovator shows a barrel having a hollow shaft with radial openings communicating with a chamber inside of the barrel at one end, and then with longitudinal chambers at the periphery of the barrel, the double walls of which chambers were provided with a series of openings and valves, the same being used by closing the valves in the outer wall of the longitudinal chambers, while those in the inner wall were open, then admitting steam for a time through the hollow shaft and chambers radially into the barrel, then opening the valves in the outer walls of the chambers and closing those in the inner walls to let the steam pass out at the periphery and through the chambers to dry the contents of the barrel. Such a barrel is hereby disclaimed.

I claim as my invention—

1. A tumbling-barrel having air-passages between or through the staves, that admit the air radially into the barrel, and exit-passages leading from one end of the barrel, that discharge radially from the shaft at a point outside of the barrel into a space communicating with a suction-pipe, substantially as described, and for the purpose specified.

2. In a tumbling-barrel, the head B and shaft C, the latter provided with peripheral air-passages *b*, substantially as described, and for the purpose specified.

3. In a tumbling-barrel, the head B, the shaft C, having peripheral air-passages *b*, and suction-pipe E, communicating with the outlets of said peripheral air-passages, substantially as described, and for the purpose specified.

4. In a tumbling-barrel, the head B, shaft C, having peripheral air-passages *b*, and the perforated plate *e*, secured to the end of said shaft, substantially as described, and for the purpose specified.

5. In a tumbling-barrel, the head B, shaft C, having peripheral air-passages *b*, having enlarged mouths at the place of junction with the perforated plate, substantially as described, and for the purpose specified.

6. In a tumbling-barrel, the head B, having the shaft C secured therein, said shaft having the ordinary solid journal-bearing at its outer end, while the part inclosed within the hub of the head is provided with the longitudinal air-passages terminating at the periphery of the shaft at a point outside of said hub, substantially as described, and for the purpose specified.

7. The combination of the head B, having the hub *a*, with the axial hole therein, the shaft C, having its grooved end secured within the hub of said head, the perforated plate at the inner end of said shaft, and the suction-pipe E, having the head *f* surrounding said shaft, and having also the annular space within said head communicating with the grooves in the shaft, substantially as described, and for the purpose specified.

JOHN HENDERSON, JR.

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