L. FAGIN.

Flour Bolting and Bran Dusting Machine.

No. 8,738. Patented Feb. 17, 1852.

Fig. 1.

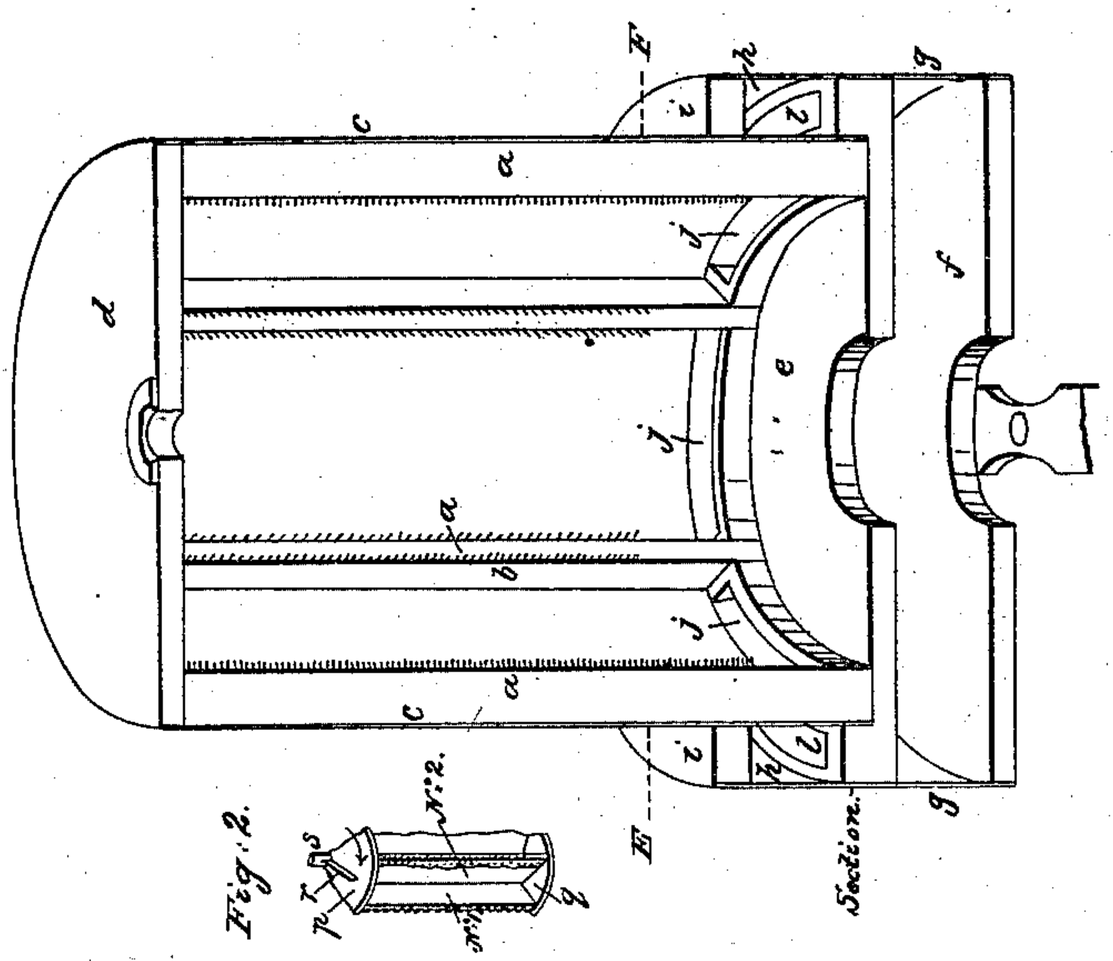


Fig. 2.

Fig. 3.

Fig. 5.

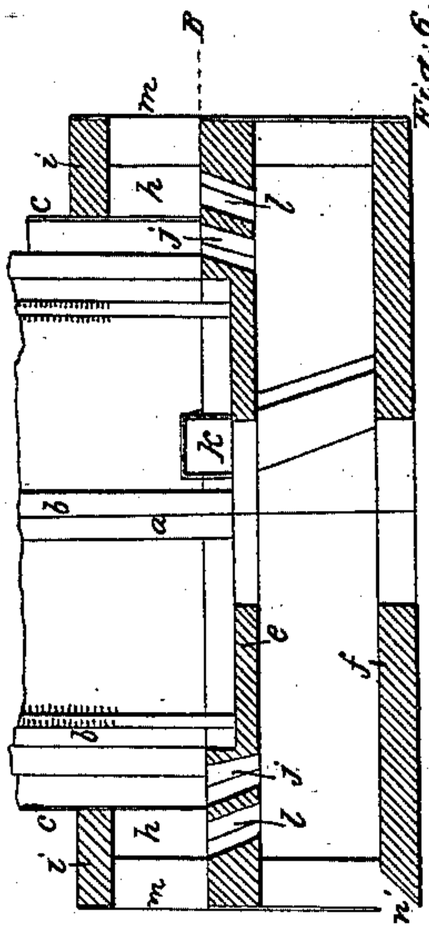


Fig. 6.

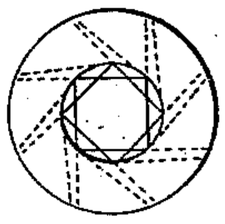
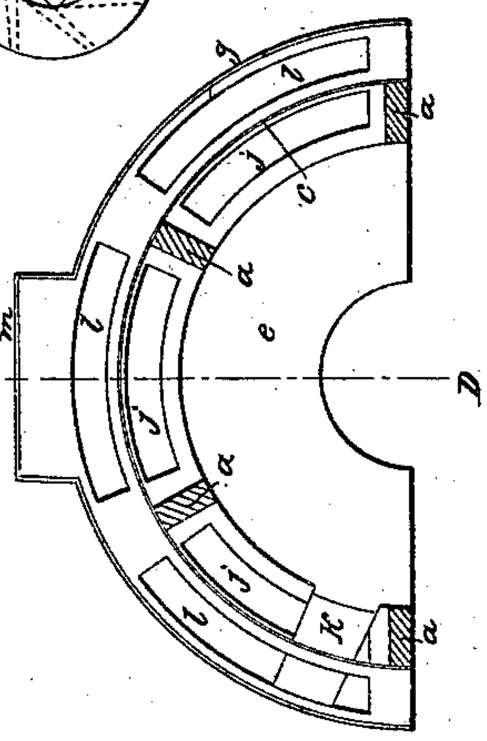


Fig. 4.



UNITED STATES PATENT OFFICE.

LEWIS FAGIN, OF CINCINNATI, OHIO.

BRAN-DUSTER.

Specification of Letters Patent No. 8,738, dated February 17, 1852.

To all whom it may concern:

Be it known that I, LEWIS FAGIN, of Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Flour-Bolting and Bran-Dusting Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, made part of this specification, in which drawings—

Figure 1 is a central and vertical section in perspective of the machine without the blast cylinder; Fig. 2 is a vertical fracture of a portion of the blast-cylinder also in perspective; Fig. 3 is an elevation of the same accompanied with a diagram in dotted lines, showing the plan of the arrangement of the vanes; Fig. 4 is a semi plan or horizontal view of one half the machine, the section thereof being taken at the height of the line A, B, of Fig. 5, which is a central and vertical section of the machine in the line C, D, of Fig. 4; the section being broken off about the height of the line E, F, where it passes through the casing and bolting-cylinder in Fig. 1. A diagram is given in Fig. 6 by which the vanes may be accurately lain off.

Referring persons interested in milling to Lewis Fagin's improvements in flouring mill, patented in October 1849 and also to Lewis Fagin's and Henry C. Hayman's joint improvements in atmospheric bolts patented in April 1851 as introductory to the following; this invention takes its origin in the practical difficulty experienced in keeping the blast-cylinder, as described in the last cited patent, properly balanced so as to remain true and in good running order.

In all flouring mills there is always more or less flour dust pervading its atmosphere especially while the bolting process is in operation. This dust is inevitably sucked into the blast-cylinder and hangs on its interior surfaces. If it could be equally distributed there would be no danger consequent upon operating the bolting-machine. But it is unequally distributed and for the season that it is impossible to construct a blast-cylinder, such as is described in said Fagin and Hayman's patent, or anywhere else, with interior surfaces so smooth, true and perfect that the dust sucked in can be equally distributed thereon, it being well known that flour in rotary motion under the pressure of a blast will pack itself into every crevice or depression and even on a perpendicular surface, be it planed ever so smooth. It being impossible to construct a blast cylinder with the interior cylindrical surfaces interiorly so as to be perfectly true, the result is that the atmosphere bolting process causes more flour to be packed at one side of the cylinder than at the opposite side, consequently an unequal strain is put upon the journals of the shaft or the center of motion and centrifugal action gives the superloaded part a preponderance over the opposite part of the cylinder, the result is the step and toe of the shaft heat, cut and give rise to a constantly changing center of motion. This change further results in bringing the blast and bolting cylinders into contact (as at most they are only from $\frac{3}{4}$ to 1 inch apart) and the entire destruction of the machine is effected in a very short time. This state of things I prevent by so constructing the blast cylinder that it freely discharges both the air and the dust it sucks in; so that when set to run true it will remain so, whether at rest or in operation. I effect this by using two vanes for each blast issue, the inner edges of the adjacent vanes of any two issues being joined at an angle and at such a distance from the axis of the cylinder as will cause the sharp edge thereby formed to split the blast, instead of allowing it to impinge on the untrue inside cylindrical surface of the blast-cylinder as made by said Fagin and Hayman; and the surfaces of the vanes being also located in planes least liable to collect or retain dust, the cylinder being thereby free to discharge whatever gaseous or pulverized matter is sucked in during its rapid revolution.

In laying off the issues for the blast I assume any desired draft as if I were about to dress a mill-stone. I then divide this draft circle or eye of the cylinder (in millers' language) into eight quarters or so more or less. On these eight points I erect two squares circumscribed by the draft circle, the sides of which squares produced (to the right or left according as the cylinder is to run with or against the sun) until they reach the periphery of the blast cylinder, determine and are the line of erection for one set of vanes, marked (No. 1.) in Figs. 2 and 3—then starting at a point one fourth of an inch in advance of each of these vanes at the verge of the cylinder I project lines till they meet the points of division

next in advance in the draft-circle, and erecting a set of additional vanes marked (No. 2) in Figs. 2 and 3 on these lines, it is obvious that both sets of vanes reciprocally meet each other at the draft circle and present 1stly a sharp edge to the issuing blast, and 2ndly surfaces in a plane least calculated to hold the driving dust. The angular spaces on the outside and between the vanes may be closed up to the full cylindrical form.

The bolting surfaces I have found it best to arrange into twelve divisions or thereabouts. The vertical ribs forming the framework thus afford me the bases on which to fasten vertical rows of beaters, which combined in their action with the vertical rows of beaters on the blast cylinder and the grated sheathing necessary to protect the edges of the additional vanes (No. 2) thoroughly thresh the offal throughout its entire descent between the blast and bolting cylinders.

Another desirable object to attain, is to discharge the blast freely and yet combine this feature with such an arrangement of chambers for catching and retaining that portion of the floating flour-dust carried along with the blast that it may be settled and returned and carried away by the ordinary scraper, and yet the whole arrangement be compact and within small limits. This object must be attained as much as may be previous to the passage of the blast from the bolting machines which blast is conducted through an ordinary spout or other conveyance to the hopper-boy room, which is a flour to settle. Now it is a well-known feature in every flouring mill. If this object was not attained, too much flour would pass with the blast to the hopper-boy room and thus a greater loss (than now sustained) would be suffered through the air-leakages, which must be left in the hopper-boy room, as it is obvious that nearly as much air must leak out of that room as enters the blast-cylinder. The hopper-boy room is intended to admit of great expansion to the air driven into it and to reduce it to as quiet or calm a condition as possible and thereby allow the flour to settle. Now it is a well-known feature in newly ground wheat, that the flour adheres with great tenacity or is very sticky. The fact therefore is that notwithstanding the great body of the flour falls into a receptacle provided for it, which receptacle is in immediate connection with the bolting machine, yet a portion of the dust passes beyond this receptacle and further arrangements must be made to intercept, retain and secure the passing dust. To effect this I erect upon the verge of the first-named receptacle another chamber communicating with the foregoing and therefore such particles of flour as do not adhere in the first or lower chamber, ascend with the blast into the upper chamber in which they to some extent accumulate until by their own weight (so much as have adhered in the upper chamber) they fall in a body back into the lower chamber while the remaining portion passes with the blast through an opening to which a spout or other conveyance is appended for the purpose of conducting whatever passes out at this opening to the hopper-boy room or settling chamber, in which suitable provision is made for deadening the blast by expansion and gathering the remaining portion of flour dust.

In Fig. 1 (*a*) designates the ribs of the bolting cylinder; (*b*) the vertical rows of beaters on each rib and (*b'*) the vertical rows of beaters on each additional vane (No. 2) of the blast cylinder, see Fig. 3. The colored parts between the ribs represent the bolting cloth. (*c*) is the sheathed cylinder or cylindrical casing. (*d*) is the head of the stationary part of the machine. The center is perforated for the shaft of the blast cylinder and for the feed opening. The machine is operated with the cylinders in a vertical position. (*e*) is the bran-floor, and so far as it extends, forms the ceiling of the flour-chamber, the floor of which is seen at (*f*) and is closed in by the cylinder (*g*) which rises up above the lowest portion of the sheathing cylinder (*c*) sufficiently to allow the construction of the air chamber (*h*). The openings (*j*) admit the flour to the flour-chamber. The opening and spout (*k*) carry off the bran to a suitable place.

(*l*) are the openings between the flour and air chambers, up through which openings the air and remnant of floating flour or dust has to ascend previous to their discharge at (*m*) Figs. 4 and 5, whence they pass into suitable rooms or settling chambers usually found in every flour-mill. The flour chamber is cleared by the scraper (*n*) Fig. 3, there being an outlet for the flour at (*n'*) Fig. 5. The bran-chamber is cleared by the scrapers (*o*) Fig. 3.

In Figs. 2 and 3, (*p*) is the upper and (*q*) the lower head of the blast cylinder. On the top of the upper head vanes (*r*) radiate from the shaft of the cylinder for the purpose of facilitating the progress of the feed, as without these vanes there is a tendency in the blast to escape at the feed opening. The shaft (*s*) of the blast cylinder is surmounted by a driving pulley and the shaft passes down through a throat (*t*) which is fitted to the draft-circle, the lower head being cut out to that effect. The shaft is firmly attached by arms to the throat, which passes through the bran and flour chambers through suitable and air-tight openings and the shaft is properly stepped below.

Having thus fully, clearly, and exactly described the nature, construction, and operation of my improvements in flour-bolting

and bran-dusting machines, what I claim therein as new and desire to secure by Letters Patent, are,

1. The arrangement of the vanes in the blast cylinder substantially as described in the specification and illustrated by the diagram Fig. 6, whereby I attain a free escape for the blast and effectually prevent the accumulation of flour within the blast-cylinder and thus keep the cylinder truly balanced on its shaft or axis.

2. The insertion of vertical rows of beaters on each rib of the bolting cylinder and on the vanes (No. 2) of the blast-cylinder from top to bottom for the purpose of alternately beating the offal at each successive rib and vane, and preparatory to each jet of blast, substantially as described.

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Attest:
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