

# HOWES & BABCOCK.

## Smut Mill.

No. 41,703.

Patented Feb. 23, 1864.

Fig. 1

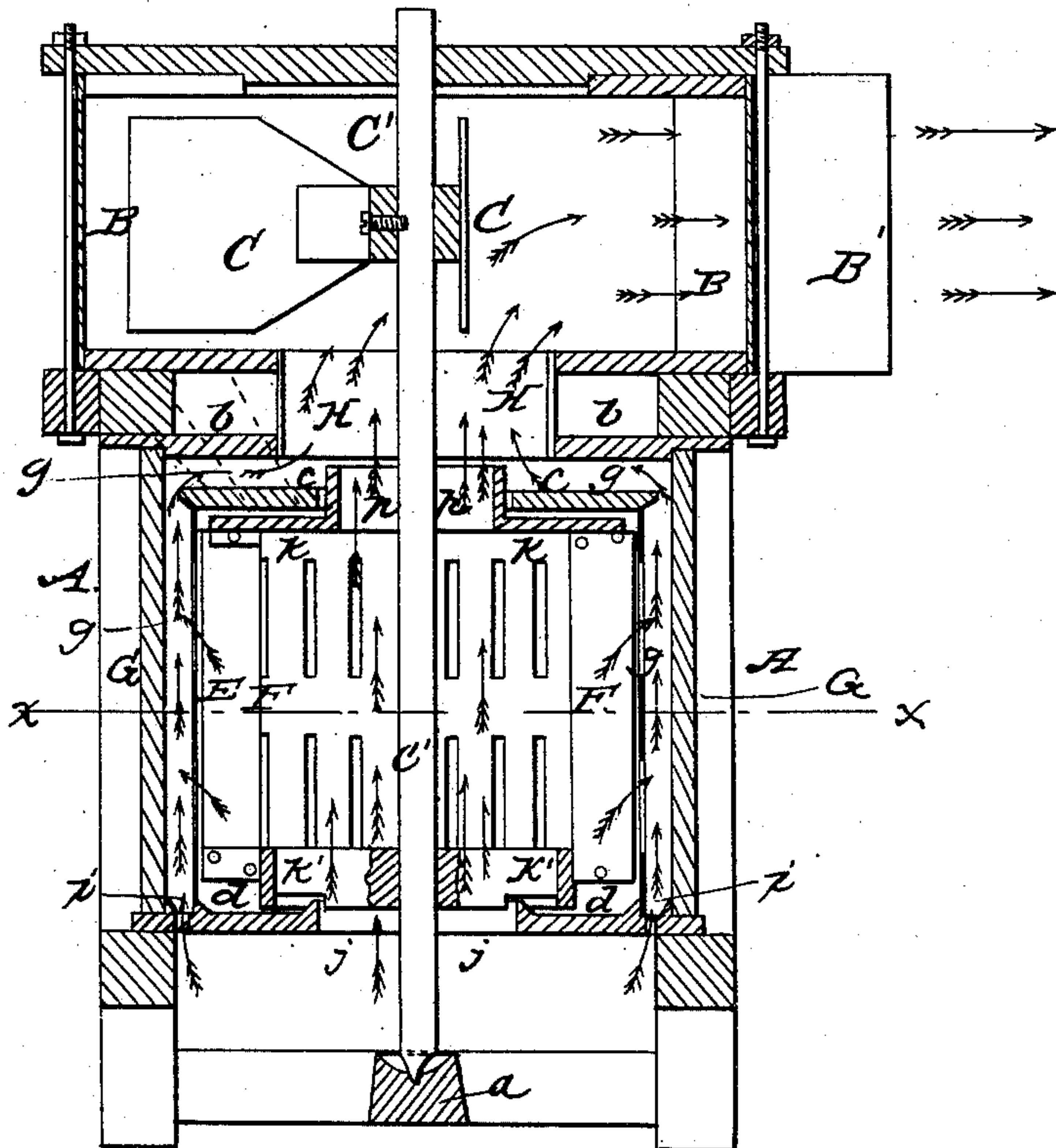
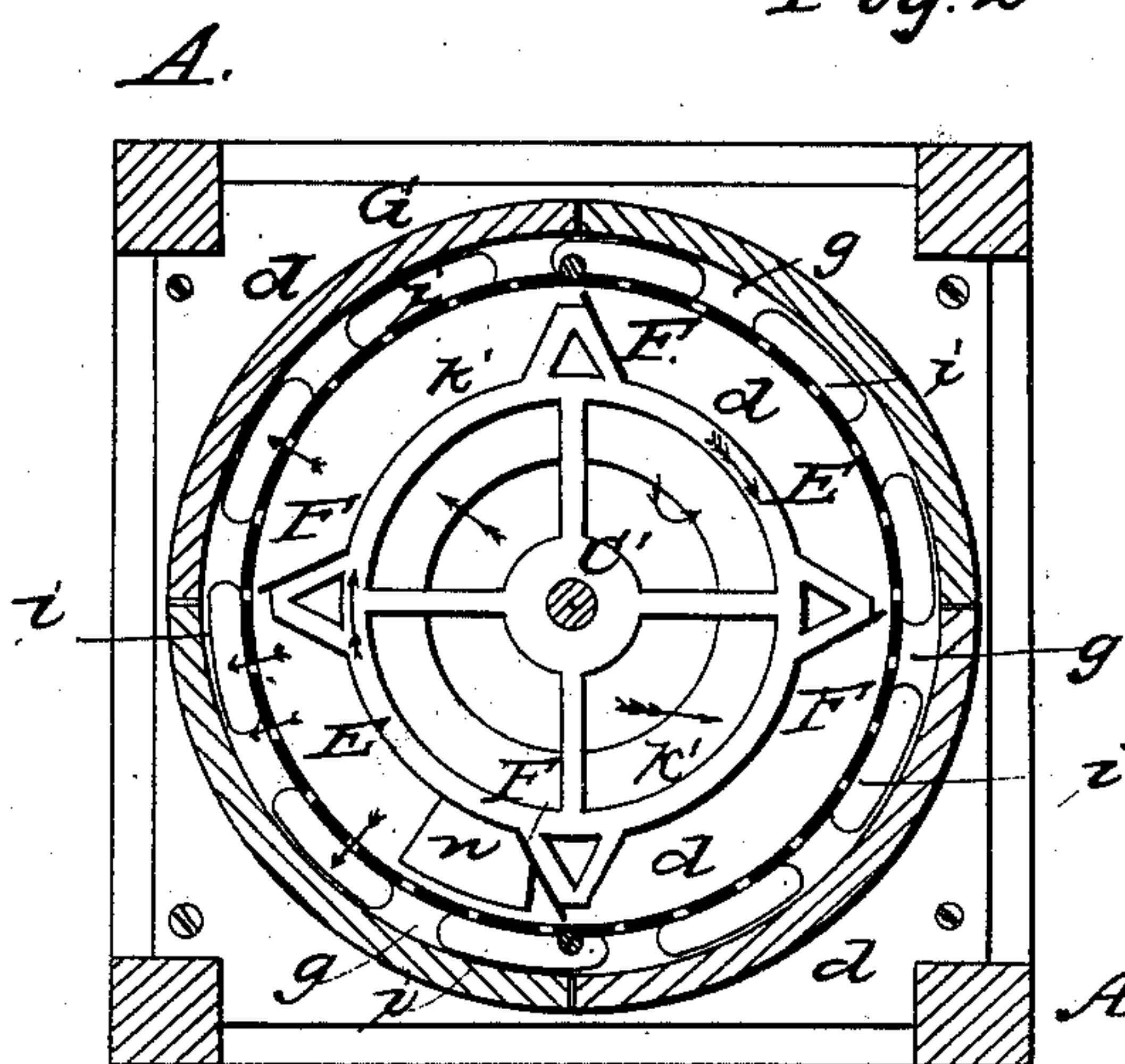


Fig. 2



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# UNITED STATES PATENT OFFICE,

SIMEON HOWES AND ALPHEUS BABCOCK, OF SILVER CREEK, NEW YORK.

## IMPROVEMENT IN SMUT-MILLS.

Specification forming parts of Letters Patent No. **41,703**, dated February 23, 1864.

*To all whom it may concern:*

Be it known that we, S. HOWES and A. BABCOCK, of Silver Creek, county of Chautauqua, State of New York, have invented a new and useful Improvement in Machines for Cleaning Grain; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical transverse section of my improved machine, taken through the center thereof. Fig. 2 is a horizontal section taken at the point indicated by red line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

This invention has for its object the scouring of grain and the separation therefrom of smut-balls, chaff, dust, and other impurities, by means of a machine in which blasts of air are conducted upward from the bottom thereof centrally through the casing of the scouring-beaters, and also up through a space surrounding said casing, and then concentrated above the latter and carried off through a common throat, thereby subjecting the body of grain in the casing to a central upward blast of air during the operation of scouring it, and at the same time carrying off by an upward current of air the dust, smut-balls, &c., which are ejected through the casing into the surrounding space by the rotating beaters and scourers, all as will be hereinafter described.

To enable others skilled in the art to make and use our invention, we will describe its construction and operation.

A represents an upright rectangular frame, supported within the top of which is a horizontal fan-box, B, provided with a spout, B', for discharging the currents of air generated by the suction-fan C. This fan is secured to a vertical spindle, C', which extends down through the center of the frame A, and is supported at its lower end in a step, *a*, as shown in Fig. 1. A short distance below the fan-box B is a horizontal floor, *b*, and below this floor *b* is the perforated cylindrical case E, which contains the rotating beaters F. This case or cylinder is confined between two stationary heads, *c d*, the upper one of which is about equal in diameter to the case, but the lower one, *d*, is of sufficient area to form also the

floor of an outside imperforated casing or jacket, G, between which latter and the circumference of the perforated cylinder E is a space, *g*, which is open at its base, as shown at *i i i*, Figs. 1 and 2.

The upper head, *c*, of cylinder E has a central opening through it, and directly above this opening is an enlarged throat, H, communicating with and forming an extension of the fan-box B, as shown in Fig. 1, which throat is the common exit for the chaff, smut-balls, dust, &c., which are carried upward from the interior of the casing E and the space *g* surrounding this casing, as indicated by the arrows in Fig. 1, which arrows indicate the direction of the currents of air through the machine. The space *g* is continued over the casing-head *c*, where it is contracted by the throat H; hence it will be seen that the rotation of the suction-fan will cause the air to rush into the openings *i i*, and also through the central opening, *j*, in plate *d*, and descend toward and through the throat H into the fan-box.

The beaters or scourers F consist of narrow strips secured tangentially to the circumference of two circular heads, *k k'*, the lower one of which is keyed to the spindle C', as shown in Fig. 1. The plates F are bolted at their extreme ends to projections formed on their respective heads *k k'*, and these heads are constructed so as to allow the air rushing in through the central opening, *j*, to pass freely through them and escape through a like opening, *p*, at the upper end of the casing. The upper head, *k*, has a central flange projecting from its upper surface, which surrounds the opening *p* through this head, and that part of this head which surrounds this flange is solid, for the purpose of receiving the grain falling through the hopper or spout (indicated in Fig. 1 in dotted red lines) upon the upper surface of the head to be ejected therefrom against the sides of the perforated casing, where the grain will be subjected to the beating and blast action of the rotating scouring-plates.

The operation of the scouring-plates upon the grain, together with the central upward blast through the scouring-cylinder, will separate the smut-balls, chaff, and other light substances from the grain, which latter will fall by its superior gravity and escape from the machine through the opening *n* in the base-plate *d*, while the lighter substances will



be partly carried directly upward into the fan-box B by the central draft and partly ejected through the casing E into space *g*, to the similarly acted upon by the currents of air rushing up through this space.

The scouring-plates themselves generate currents of air, (indicated by the arrows pointing through the perforations in the casing E,) and thus the dust and large quantities of the foreign substances will be thrown directly off into the space *g*, where they will be carried directly off through the fan-box.

By this arrangement we have a free unobstructed passage for the air directly through the center of the scouring cylinder, and communicating at the top thereof with the fan-case, and we also have a free passage for the air surrounding the scouring-cylinder to ascend into the fan-box, both of which passages unite in one common exit-throat, which constitutes a portion of the fan-box above the scouring apparatus. In other words, the fan-case is so constructed and applied in the machine that the conflux of air will be at a point directly within the body of this case, or within a contracted central extension thereof, and by this means an eddy will be prevented from taking place in consequence of the flowing together of the two currents over the central opening, *p*, of the scouring apparatus, and hence the heavier refuse substances will be prevented from falling back into the casing E.

By this arrangement it will also be seen

that there is not a point about our machine where smut-balls, dust, or any portion of the refuse from the grain can find a lodgment or get intermixed with the grain after once separated from it, the fans are brought in a more direct relation to the scouring apparatus than hitherto, and the refuse is wafted off by the fans immediately it is separated from the grain.

What we claim as new, and desire to secure by Letters Patent, is—

So constructing a smut-mill having two stationary cylinders that a central draft of air from the bottom thereof shall be forced or drawn upward through the casing of the scouring-beaters, and also a draft between said casing and the outer casing of the mill, both drafts uniting in a fan-chamber directly at the top of the scouring apparatus and centrally thereof, substantially as described, for the purpose set forth.

Witness our hands in the matter of our application for a patent for improvement in smut-mills.

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