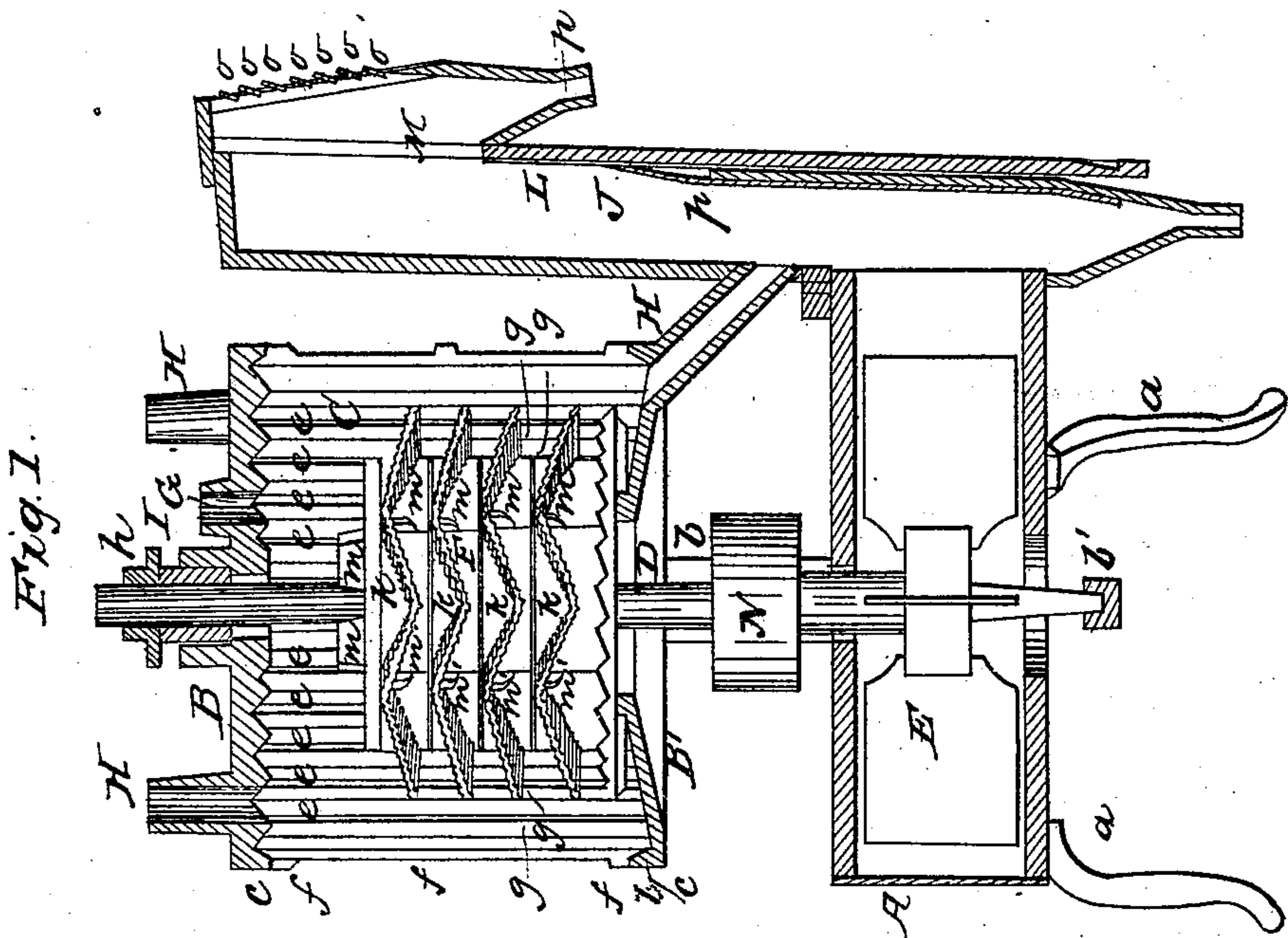
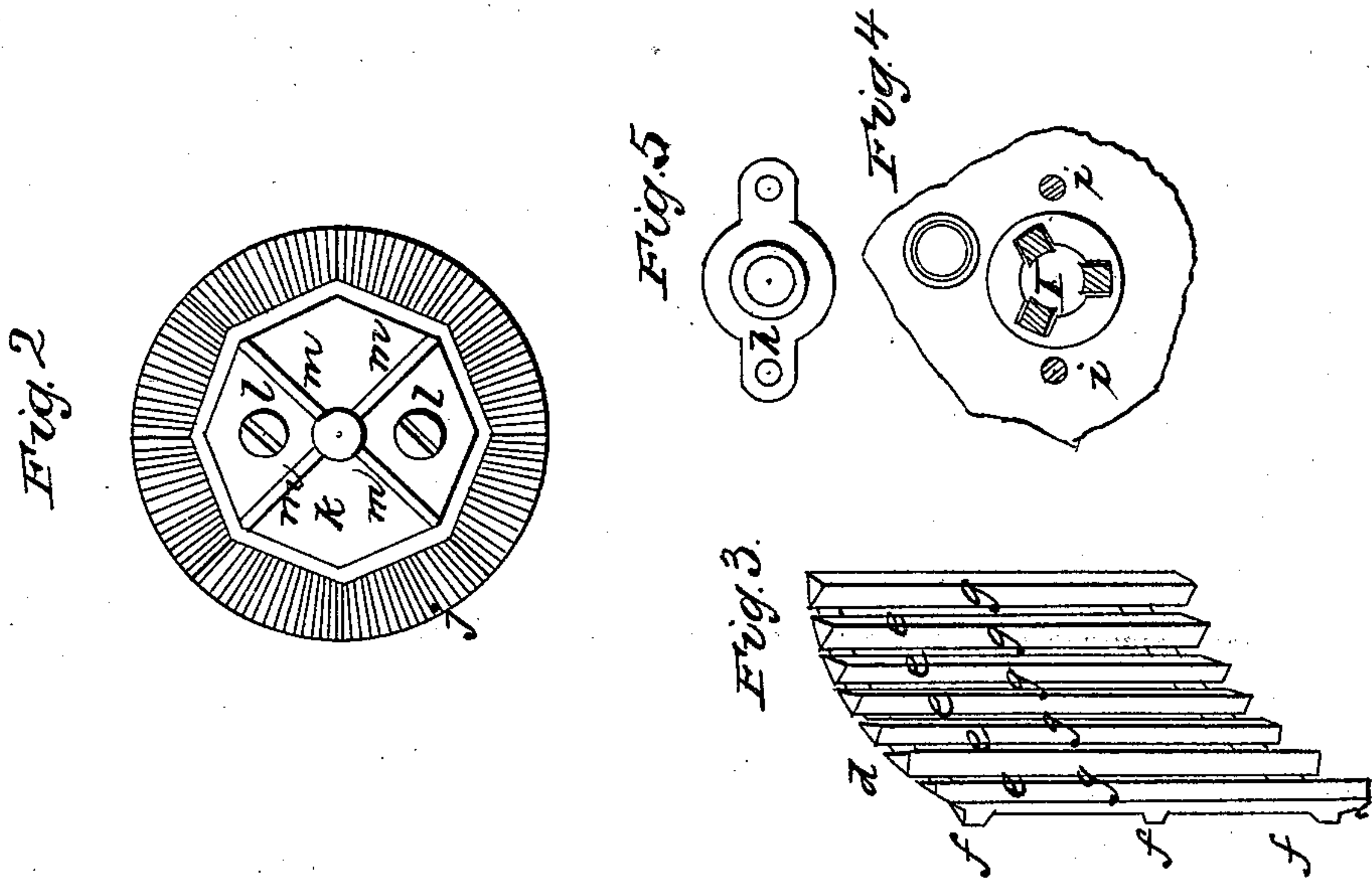


S. D. BROAD.
Smut Mill.

No. 40,238.

Patented Oct. 13, 1863.



witnesses
J. W. Coombs
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UNITED STATES PATENT OFFICE.

SAMUEL D. BROAD, OF BEDFORD, PENNSYLVANIA.

IMPROVEMENT IN SMUT-MILLS.

Specification forming part of Letters Patent No. 40,238, dated October 13, 1863.

To all whom it may concern.

Be it known that I, SAMUEL D. BROAD, of Bedford, in the county of Bedford and State of Pennsylvania, have invented a new and Improved Smut and Grain Cleaning Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical central section of my invention; Fig. 2, a detached plan view of the top plate of the scouring device pertaining to the same; Fig. 3, a detached perspective view of a section of the scouring-cylinder pertaining to the same; Fig. 4, a plan or top view of a portion of the top plate of the same; Fig. 5, a detached plan or top view of the upper bearing of the shaft of the fan and scouring device.

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

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a fan-case, which is of cylindrical form, and is supported at a suitable height by legs *a*, and B B' are two circular plates, which are secured horizontally to two uprights, *b*, one of which is shown in Fig. 1, the lower ends of said uprights being attached to a cross-bar, *b'*, secured to the under side of the fan-case. Any suitable framing, however, may be employed to support the plates B B', which are at a suitable distance apart and have flanges *c* at their edges, which encompass the ends of sections *d* of a hollow cylinder, C. These sections *d* may be of cast-iron, and are provided with vertical slots *e*, extending nearly their whole length, horizontal ribs or bands *f* on the outer sides of the sections serving to connect the parts *g* between the slots *e*. The inner surfaces of the parts *g* are of V form, as shown clearly in Fig. 3, so as to produce or give to the inner side of the cylinder C a vertical corrugated surface. These sections are held firmly together by the plates B B'.

D represents a vertical shaft, which passes centrally through the fan-case A and cylinder C. The lower end of this shaft is stepped in the cross-bar *b'* underneath the fan-case A,

and the upper end has its bearing *h* secured to the plate B by bolts *i i*.

On the shaft D, within the fan-case A, the fan E is secured, which may be of ordinary construction, and on said shaft, within the cylinder C, the scourer F is secured. This scourer is formed of a series of circular plates, *j*, which have each a polygonal hub or projection, *k*, at each side, which rests one upon another, as shown in Fig. 1, and are secured in contact with each other by suitable bolts *l*. The plates *j* are corrugated radially at both sides, as shown in Figs. 1 and 2, and they are of serpentine form, as show clearly in Fig. 1, so that they will have a succession of inclined surfaces or planes. The hubs *k* admit of spaces of a suitable width being between the plates *j*, and each hub has a number of lateral wings or projections, *m'*, directly underneath its plates *j*. (See Fig. 1.) The upper surface of the hub of the top plate, *j*, is provided with radial wings *m*, the use of which will be presently shown.

G represents a feed-spout, through which the grain passes into the cylinder C, and H H are air-duction spouts.

I is a bushing in the plate B through which the shaft D passes.

J represents a vertical or slightly-inclined blast-spout, with the lower part of which the fan-case A communicates, and the interior of cylinder C also communicates with this spout J by means of an inclined spout, K, which extends from the lower plate, B', of the cylinder C.

L is a slide at the outer side of the blast-spout J, and M is a box, which is fitted on the upper end of J, and has a screen, N, at its outer side, said screen being formed of a series of inclined horizontal plates or slots, *a*, as shown in Fig. 1. The lower end of the box M terminates in a discharge-spout, *p*, and the communication between the box M and the blast-spout J may be enlarged or contracted, as desired, by adjusting the slide L, the latter being returned at any desired point by a spring, *q*, which bears against its inner side.

The operation is as follows: The shaft D is rotated by a belt passing around a pulley, N, which is placed on the shaft above the fan-box A, and divides the pull of the belt, so that an equal strain will be upon the upper and lower bearings of the shaft. The grain passes

through the spout G and falls upon the upper hub, *k*, and is cast off from the hub and distributed in cylinder C by the wings *m*. The grain as it passes through the cylinder C is subjected to a rubbing and scouring process by means of the corrugated and serpentine surfaces of the plate *j*, and the corrugated surface at the inner side of the cylinder C. By this means the grain is not broken or cut, but is cleaned from the smut by the rubbing action to which it is subjected. The smut, however, is pulverized, and with the dust is expelled from the cylinder C through the slots *e* by means of the blast generated by the fan E. The grain passes from the cylinder C, down through the inclined spout K, into the spout J, and in passing the orifice which forms a communication between the fan-case and the blast spout J is subjected to a blast from the fan E, which carries up the chaff and other impurities or screenings, the lightest of which—such as chaff, &c.—are expelled

through the screen N, while the heavier substances fall into the box M and are discharged from the spout *p*. The sound grain is discharged from the lower end of the spout J.

I would remark that the under surface of the plate B may be corrugated, and that the upper surface of the plate B' is inclined to facilitate the discharge of the grain into spout K.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The employment of the serpentine and radially corrugated plates *j*, in combination with the vertically ribbed and slotted cylinder C, pipes H, fan E, and spout J, operating together as herein shown and described, for the purpose set forth.

SAMUEL D. BROAD.

Witnesses:

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