

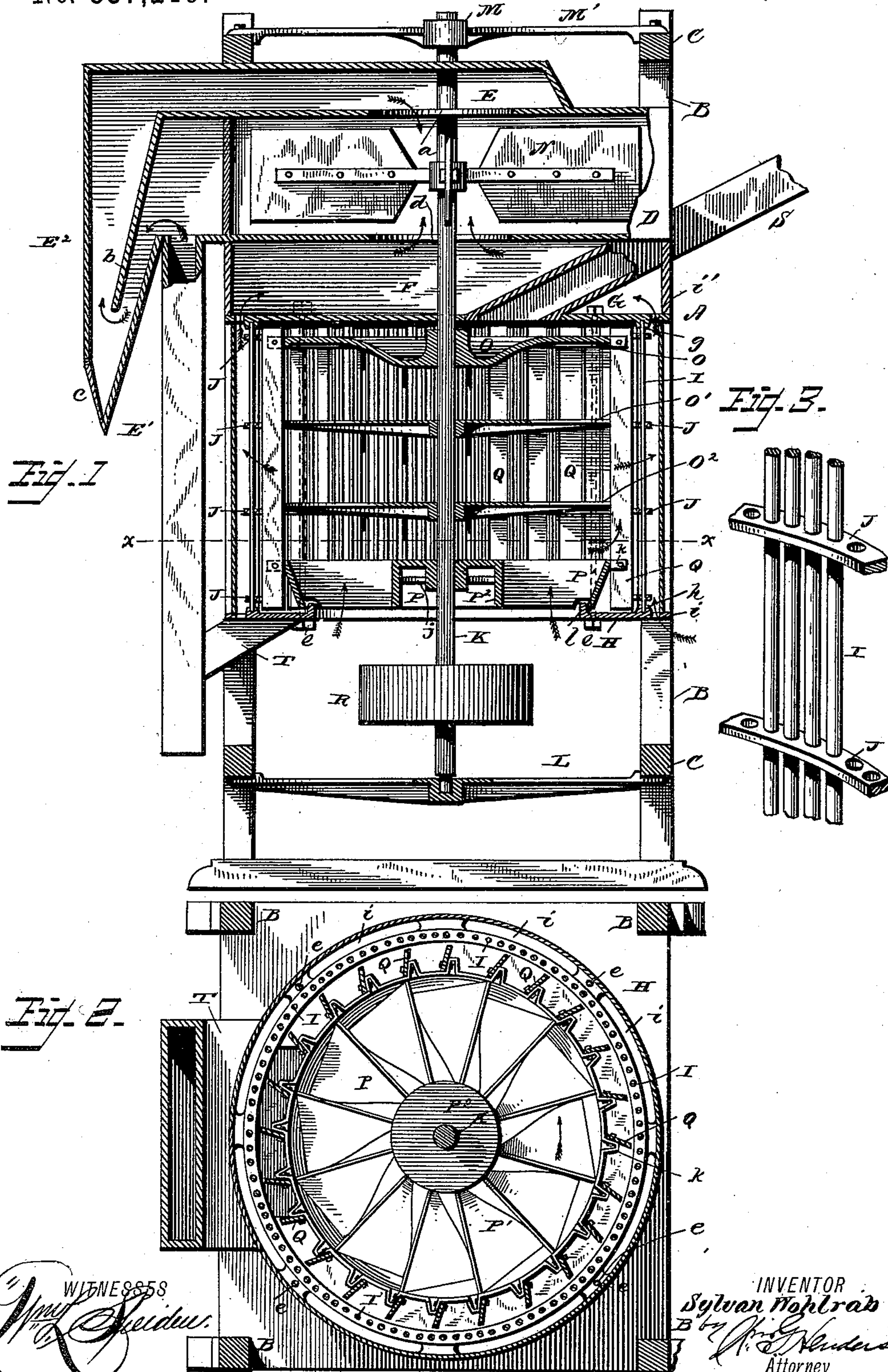
(No Model.)

2 Sheets—Sheet 1.

S. WOHLRAB.  
SMUT MACHINE.

No. 337,219.

Patented Mar. 2, 1886.



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(No Model.)

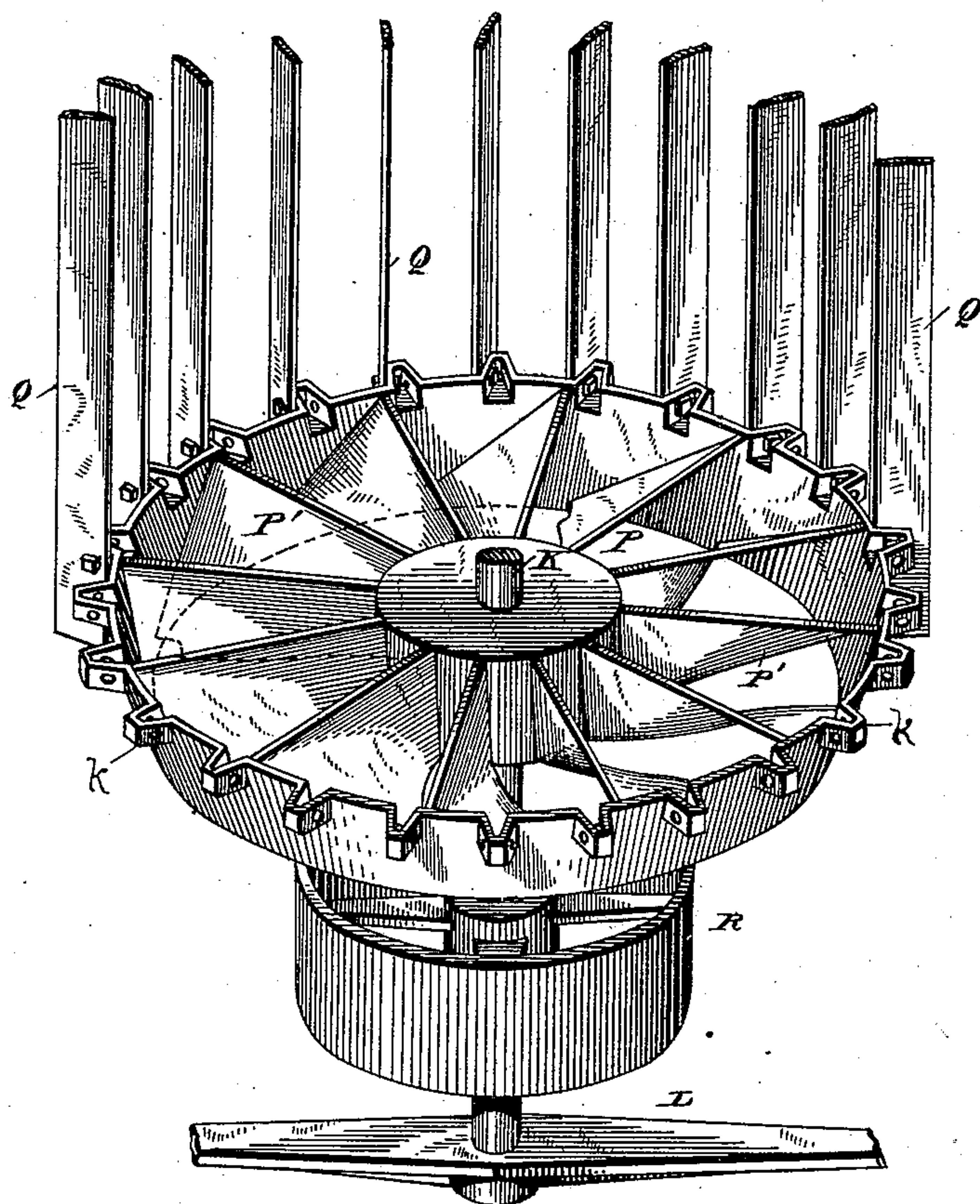
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*Fig. 4.*



Witnesses  
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# UNITED STATES PATENT OFFICE.

SYLVAN WOHLRAB, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO FAUSTIN PRINZ, OF SAME PLACE.

## SMUT-MACHINE.

SPECIFICATION forming part of Letters Patent No. 337,219, dated March 2, 1886.

Application filed February 2, 1885. Serial No. 154,598. (No model.)

*To all whom it may concern:*

Be it known that I, SYLVAN WOHLRAB, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Smut-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Figure 1 is a vertical section through the machine; Fig. 2, a cross-section through the same on the line *xx* of Fig. 1, the middle plates, *O* *O'*, being shown in full lines, except where broken away, as indicated by sectional lines. Fig. 3 is a perspective of a section of the cleaning-cylinder, rods, and cross rings or bands. Fig. 4 is a perspective of the fan with a portion of the beaters removed and part broken away.

My invention relates to smut-machines, and has for its object to produce a machine in which the grain will be most thoroughly cleansed of its smut with the least possible injury, if any, to the grain in the way of crushing or bruising or breaking the same; and it consists in the construction and also in the combination of parts hereinafter particularly described, and afterward sought to be specifically defined by the claims.

In the drawings, the letter *A* designates an outside casing supported within a frame composed of vertical posts *B* and cross bars or timbers *C*. Above the casing there is a fan-case, *D*, formed with an exit-opening, as usual. Above the fan-case is the horizontal suction-spout *E*, communicating with the top of the fan-case through opening *a* and with the vertical suction-spout *E'* through the pendent spout *E''*, divided into two channels by the partition *b*, and provided with a drop-door, *c*, all as is common in this class of machines. Beneath the fan-case is the case or chamber *F*, communicating therewith through an opening, *d*, as usual. The bottom of chamber *F* is formed by the plate *G*, which constitutes the top of the cleaning-cylinder, and which is bolted to cross bars or timbers, as usual. Nutted rods *e* pass downward from the plate *G*, and to their lower ends there is connected the bottom ring or plate, *H*. This plate or ring is cut away

at its corners, so as to fit to the posts *B*, as shown in Fig. 2, to permit it to be raised and lowered by loosening the nuts to the rods *e*, which latter hold up the said plate *H* and connect it to the upper plate, *G*, as usual. The lower face of the plate *G* and the upper face of the ring or plate *H* are formed near their outer edges with circular ways or grooves *g* and *h*, respectively, in which fit the ends of the rods *I*, which form the sides of the cleaning-cylinder. These rods are made of steel or of any suitable case-hardened metal, and are circular or rounded in form, of about three-sixteenths of an inch in diameter, and are set preferably about one thirty-second of an inch apart, so as to leave between them corresponding spaces, which are considered to produce the best results. These rods should be strongly braced between their ends, so as to resist the wear and force with which the grain is impelled against them, and consequently I employ one or more steel rings, *J*, in which holes are drilled, and through which the rods are forced, so as to tightly fit and wedge therein. The rods are thus strongly braced and secured together and made very rigid. These rings may each be continuous or formed in cross-sections and set up in that way. The nuts to the rods *e* can be unscrewed, so that the lower plate can be moved to free one end of the rods *I* when they are to be put in or taken out of place. The upper plate, *G*, and the lower ring or plate, *H*, between the grooved ways and the outer casing, (which latter fits between the said plate and ring, as shown,) are formed with slots *i* and *i'*, for the passage of air into the bottom and out of the top of the space between the cleaning-cylinder and outer casing, said space being about one and one-half or two inches in width. There passes vertically through the cleaning-cylinder a shaft, *K*, stepped at its lower end in a bar, *L*, extending from one cross-timber *C* to the other beneath the cleaning-cylinder, and at the upper end fitting loosely within a box, *M*, formed in a cross-bar, *M'*, extending from one cross-timber *C* to the other above the top of the machine. To this shaft within the fan-case is secured the fan *N*, and to the same shaft within the cleaning-cylinder there is secured to it so as to turn therewith a dish-shaped plate, *O*,



beneath the plate G, a flat or straight plate, O', beneath the plate O, and a similar plate, O<sup>2</sup>, beneath that. There may be any desired number of these plates used. Secured rigidly to the same shaft beneath the plate O<sup>2</sup> is what will be termed a "suction-fan," P. This fan is composed of a series of wings, P', radiating from a central hub, P<sup>2</sup>, braced internally by bars or rods j. These wings are arranged so as to overlap one another, and are curved so as to form a concave face adjacent to the hub, and incline slightly outward from their lower edges upward, so as to form a better suction for the air from beneath the cylinder through the opening in the bottom ring or plate upward through the cylinder. These wings are preferably, though not necessarily so, cast in one piece with the hub P<sup>2</sup>, with their outer ends joined by a connecting web or ring, from which project hollow beveled lugs k, open at top or bottom, or both, for the passage of bolts, which secure blades Q at their lower ends thereto. The top dished plate, O, has corresponding lugs projecting from its periphery, so that the upper ends of said blades may be secured thereto in the same manner that the lower ends are secured. The blades are secured by passing the bolts through them and one wall of the hollow lugs, the heads of the bolts bearing against the blade, and the nut applied to the threaded ends of the bolts inside of the lugs. The beveled faces of the lugs cause the blades to set at an inclination in cross-section, so as to better throw the grain against the rods of the cylinder. The outer edges of these blades may come within, say, one inch of the cylinder's walls, and the outer edges of the plates O' O<sup>2</sup> may come just to the inner edges of said blades or lap the same by forking or otherwise. The lower edges of the fan-wings P', near their outer ends, are recessed so as to receive the upwardly-projecting flange l, extending around the edge of the opening in the lower ring or plate, H, for the purpose of preventing to some extent air from passing between the lower part of the fan and the upper face of the lower plate, H, and for causing it to pass up through the said fan into the cylinder beneath the lower plate, O<sup>2</sup>. A pulley, R, is secured to the lower end of shaft K, which is connected by belting or otherwise to the source of power for driving the shaft, and a spout, S, passes through chamber F and opens through the top plate, G, into the dished portion of the plate O near to the shaft, for the purpose of delivering thereto the grain which is to be cleaned.

In operation, the shaft K is caused to revolve so as to rotate the plates O O' O<sup>2</sup> and blades Q and set the fans N and P into operation. The grain is then passed through spout S and dropped onto the dished portion of the plate O. The grain is thrown from this plate by centrifugal force outward and against the round rods I with such force that the grain rebounds and falls into the next lower plate, O', toward its middle, from whence it is again

forced by centrifugal force outward against the said bars, from which it rebounds onto the next lower plate, as onto the plate above, and so on until it has passed all the plates, when it falls onto the bottom ring or plate, H, from which it is moved by the blades Q into the spout T, from whence it passes into suction-spout E', where the lighter particles are carried upward, as indicated by arrows, until they pass into the fan-case and thence outside, as usual in machines of this character. As the grain falls from one plate to another it is struck by the blades Q and impelled forward and against the bars constituting the cylinder, and is subjected to the air-blast created by the fans N and P, so that the smut detached therefrom is carried, as indicated by the arrows, through the spaces between the rods into the space between the cylinder and outside casing, from whence it is carried by the same blast and the air entering through the slots i in the bottom plate, H, upward and through the slots i' in the top plate, G, into the chamber F, from whence it passes into the fan-case, as indicated by arrows, and out therefrom, as usual. By reason of the grain being thrown out from the center of the cylinder by centrifugal force against the steel rods braced by the circular rings and rebounding back so as to be thrown outward again till it reaches the bottom of the cylinder, it is, by the time it reaches the bottom, most thoroughly cleansed from the smut and in the best state of preservation, so far as the perfectness of the grain is concerned. The construction not only cleanses the grain thoroughly, but does it in a comparatively shorter time than heretofore, with the least possible injury to or wear on the machine. By locating the fan with the screw-shaped wings in the lower part of the cleaning-cylinder, and having the horizontal plates and blades with openings at the ends of the plates, a large volume of air is directed against the falling grain and carries the smut directly from it through the spaces between the rods of the cylinder, so that the smut is at once carried off from the grain and the efficiency of the machine greatly increased.

The machine also is cheap to manufacture, and the cylinder, composed of the rods and the transverse rings through which the rods are forced, and whose durability and efficiency are increased thereby, may be used on other forms of rotary smut-machines with good and improved effect over such forms.

Having described my invention and set forth its merits, what I claim is—

1. The combination, with a cleaning-cylinder composed of a series of rounded vertical rods with spaces between them, and a band or ring through which said rods pass, of a series of revoluble horizontal plates inclosed within the space described by the said bars, the upper one of said plates being concave, a series of vertical blades at the outer edges of said plates, and a fan for creating an air-current through said cylinder, substantially as described.



2. The combination, with the cylinder composed of vertical rods and the cross bands or rings through which the rods pass, of the revoluble horizontal plates inclosed within said cylinder, the fan composed of the curved blades, the inclined rim connected to the ends of the blades and provided with lugs, and the vertical blades connected to said horizontal plates and to the lugs on the rim of the fan, substantially as described.

3. In a smut-machine, a fan composed of the blades P<sup>2</sup>, curved substantially as described, and an inclined rim, to which the outer ends of the blades are connected, substantially as described.

4. In a smut-machine, the combination, with a cleaning-cylinder, and a ring or plate at the lower part of said cylinder provided with an upwardly-extending flange, of a fan in the lower part of said cylinder, composed of a series of wings having their lower edges recessed to receive the upwardly-extending flange on the plate at the lower part of the cleaning-cylinder, substantially as described.

5. A smut-machine comprising an outer

casing, a cleaning-cylinder composed of a series of rounded vertical rods with spaces between them, and cross rings or bands through which said rods pass and are rigidly held apart, a series of revoluble horizontal plates, the upper one of which is dish-shaped, a series of vertical blades at the outer edges of said plates, a fan in the lower part of the cylinder composed of a series of blades inclining outwardly from their lower edges upwardly, and plates above and below said cylinder, casing, and horizontal plates, both said plates being formed with openings for the passage of air into and out of the space between the cleaning-cylinder and outer casing, and the lower plate, also formed with an opening for the passage of air to the fan above it, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

SYLVAN WOHLRAB.

Witnesses:

E. WEHE,

H. NOLL.