

J. MILLS.
Bran-Cleaning Machine.

No. 223,057.

Patented Dec. 30, 1879.

Fig. 1

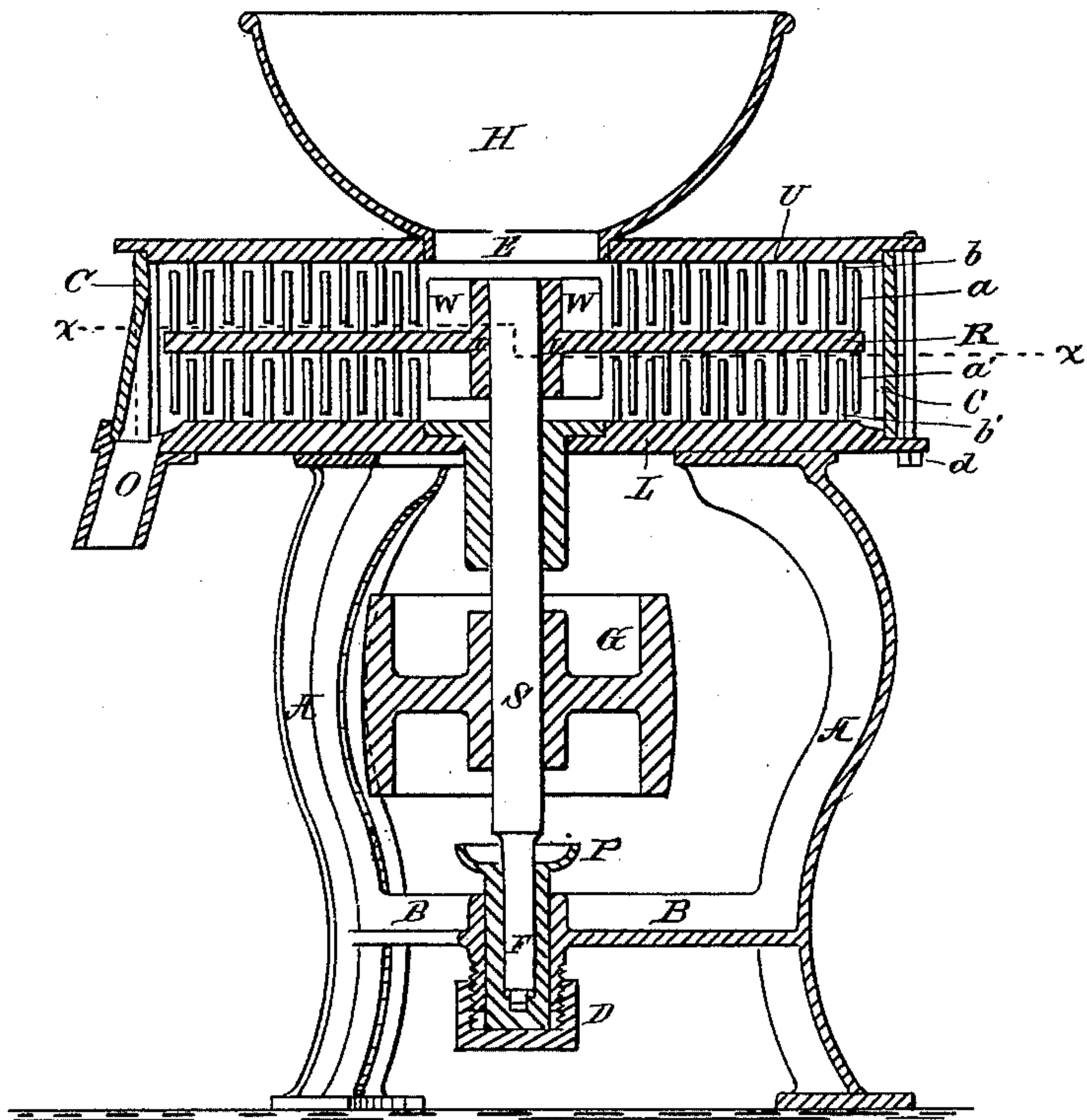
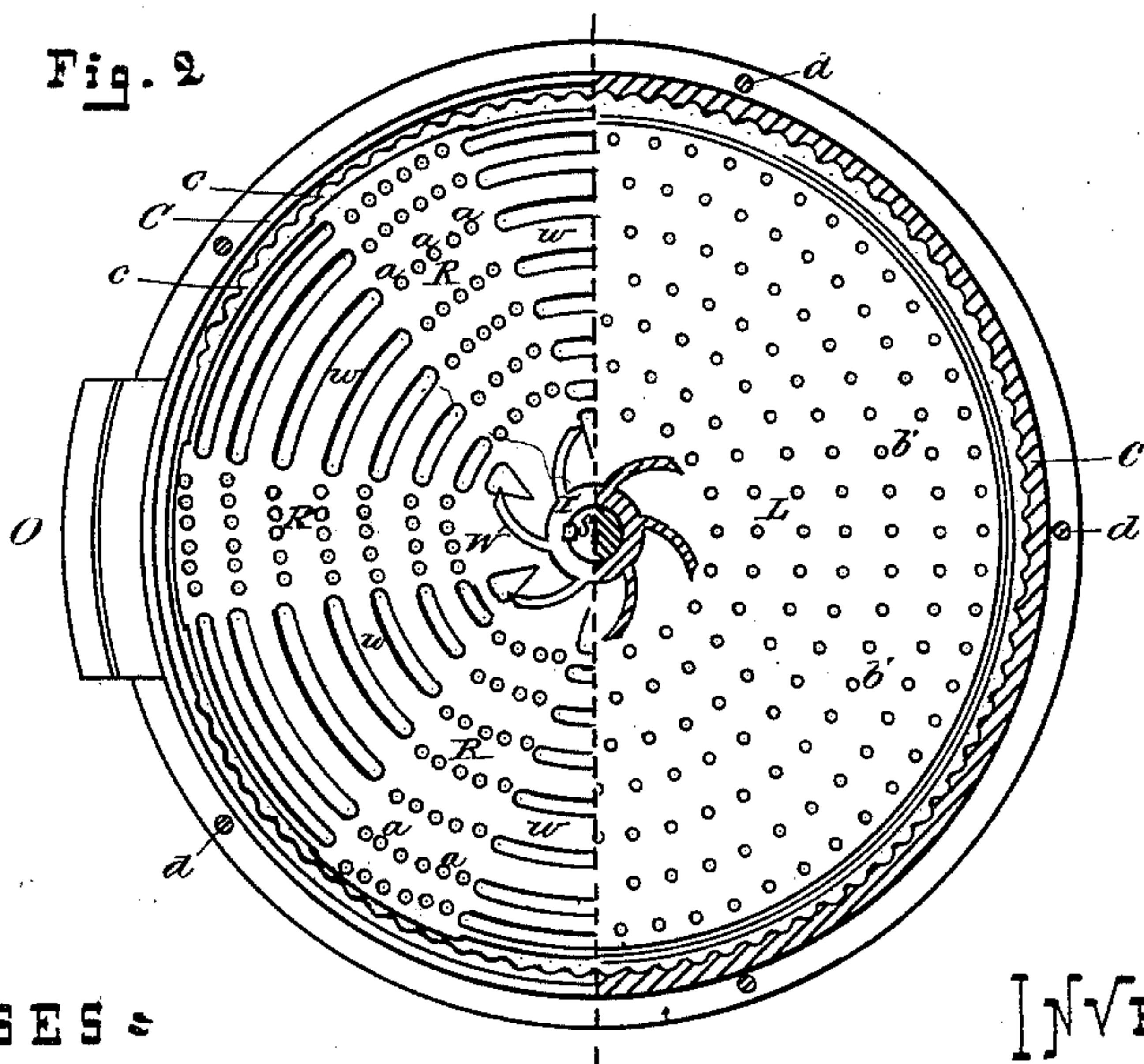


Fig. 2



WITNESSES:

J. C. Wilcke
Gas A. Wanderle

INVENTOR:

Jonathan Mills.
Per W. E. Dayton
Attorney

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Fig. 3.

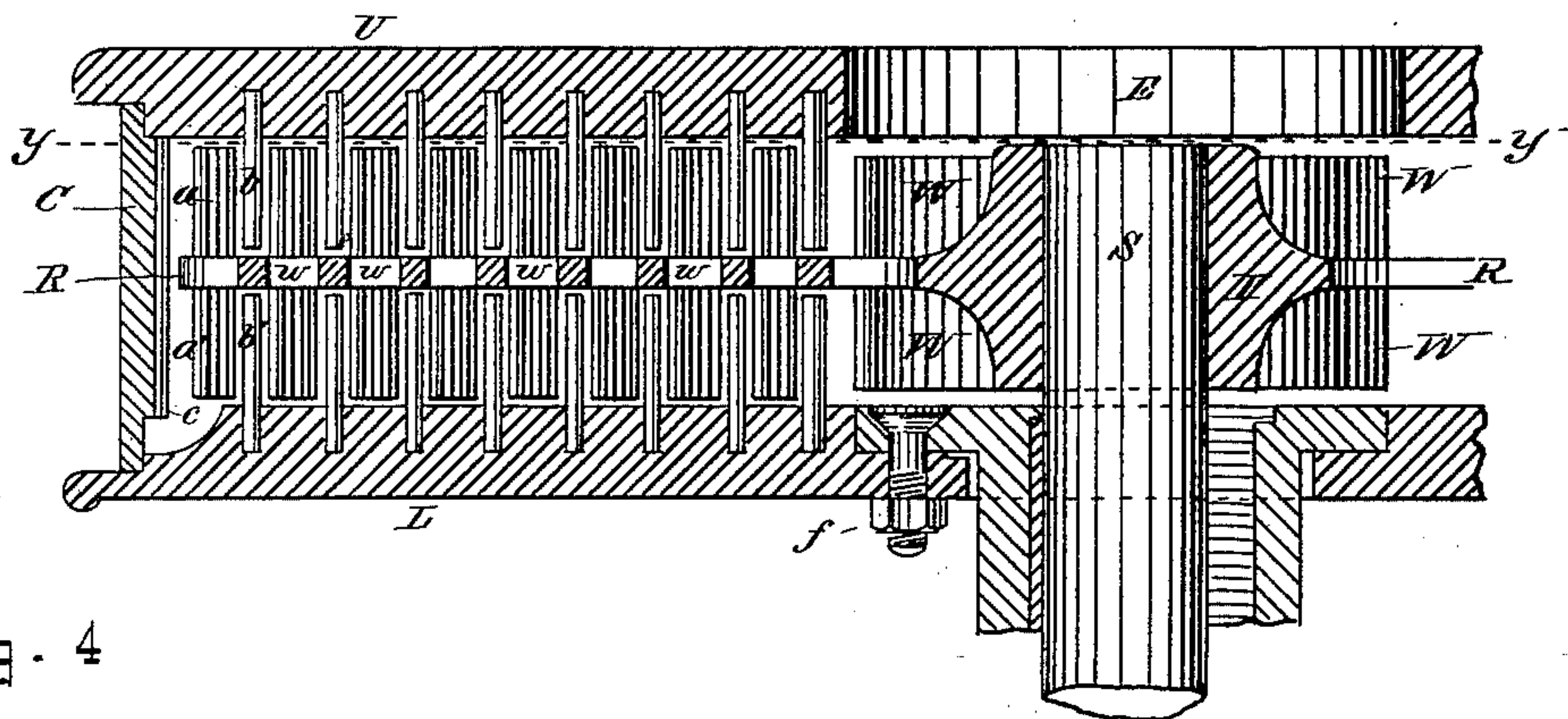
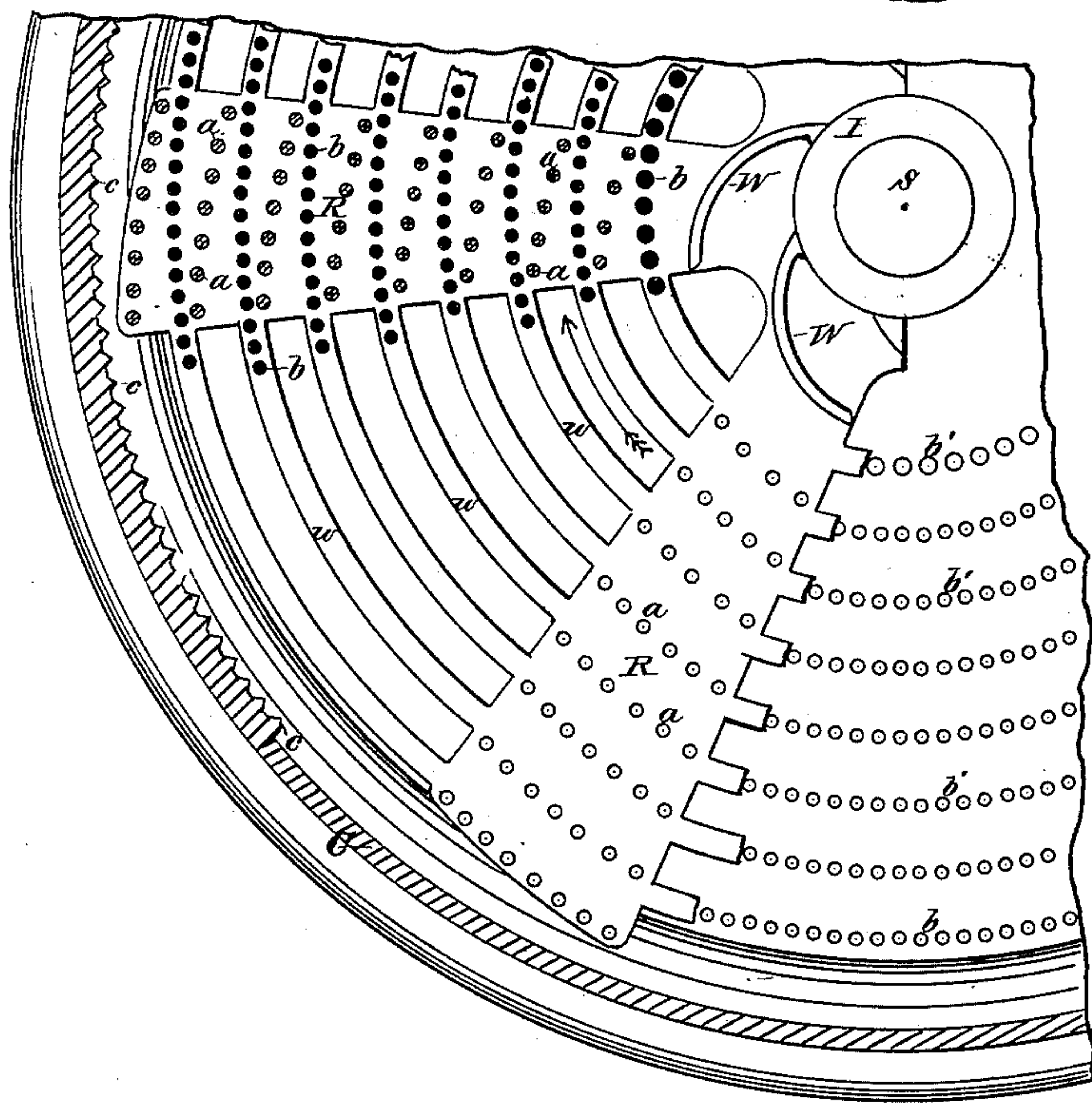


Fig. 4.



WITNESSES:
J. C. Wilke
Geo A. Wunderle

INVENTOR:
Jonathan Mills
Per M. E. Weston
Attorney.

UNITED STATES PATENT OFFICE.

JONATHAN MILLS, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN BRAN-CLEANING MACHINES.

Specification forming part of Letters Patent No. **223,057**, dated December 30, 1879; application filed May 7, 1877.

To all whom it may concern:

Be it known that I, JONATHAN MILLS, of Milwaukee, State of Wisconsin, have invented certain new and useful Improvements in Bran-Cleaning Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to a bran-scouring machine in which the bran is operated upon by fixed and movable pins, for the purpose of rubbing the bran fragments against each other and against the pins, in order to detach therefrom the middlings and flour not removed by previous operations upon the grain.

It consists, principally, in a peculiar arrangement of the pins upon stationary horizontal disks and intermediate rotating arms, whereby the bran is crowded outward toward the point of discharge, and at the same time made to violently rub upon itself and the several pins, for the purpose of detaching the middlings and flour.

It also consists in several other features of construction and arrangement, that will hereinafter be more fully set forth, and pointed out in the claims.

In the drawings, Figure 1 is a central vertical section of the machine. Fig. 2 is a horizontal section through the indirect line *xx* of Fig. 1. Fig. 3 is an enlarged vertical section of the bran-chamber, and Fig. 4 is a horizontal section through the line *yy* of Fig. 3, showing the webs that connect the radial sweeps or arms broken away and revealing the pins fixed to the lower disk.

A is a tripodal iron frame having a bridge-tree formed of the converging arms B B. P is a step or bridge pot supporting the foot E of the vertical spindle S. G is a driving-pulley secured to the spindle. L is a horizontal disk secured to and supported by the frame A, and U another disk parallel with L, supported therefrom by the curb C, which is concentric with the spindle S. The two disks are firmly clamped together and upon the interposed curb by the outer bolts, *d*.

I is a hub secured to the spindle S and pro-

vided with radial sweeps or arms R—say six in number—which lie or rotate in a plane midway between the upper and lower disks, U and L.

On the inner faces of the stationary disks U and L, respectively, are fixed the pins *b* and *b'*, arranged in concentric circles about one and a half inch apart, each circle of the upper disk being opposite a circle of the lower disk, as clearly shown in Figs. 1 and 3.

The pins are about one-fourth of an inch in diameter, and are set at from one-sixteenth to one-eighth of an inch distant from adjacent pins in the same circle.

It will be seen that the pins thus set form stationary, concentric, slotted diaphragms or partitions.

Between the upper and lower circles or partitions space is left in which the radial arms R may freely sweep, and through these arms curved oblique rows of pins *a* and *a'* are set, as also shown in the several figures of the drawings.

The inner pin of each of these oblique rows sweeps near the inner adjacent circle, and the outer one near the outer adjacent circle, as plainly indicated by Fig. 4, which also shows by an arrow the direction in which the arms are rotated with reference to the obliquity of the rows of pins borne by the arms. These pins form substantially a series of curved, oblique, slotted wings running between the slotted diaphragms or partitions already described.

The several arms R are connected with each other by the circular connections *w*, of equal thickness with the arms, which connections lie between the upper and lower opposite circles of pins, *b* and *b'*, and form with said arms a foraminated disk. About the hub I are formed the upper and lower vertical wings, W, curved backward relatively to the direction of rotation, as indicated in Figs. 2 and 4, and extended to sweep in close proximity to the inner circle of disk-pins.

The upper disk, U, is provided with the central opening or eye, E, to receive the bran, and is surmounted by the hopper H. O is a marginal spout or opening for the discharge of the bran.

On the inner face of the circular curb C are

cast the vertical corrugations *c c*. Vertical adjustment of the spindle is obtained by the nut D, which contains the sliding step *p*.

In the operation of my bran-machine the bran is fed in at the hopper H through the central opening, E. The hub I and sweeps R being rotated at a high velocity, the wings W immediately crowd the bran outward among the pins. The inner circles of stationary pins, *b* and *b'*, are made heavier than the others, for the purpose of arresting any large or hard substance, and also for the purpose of breaking up any dough-balls that may have formed in the bran. Once forced past the inner circle of pins the bran is struck by the first or inner oblique row of pins upon the radial sweeps R, which operate to crowd the same outward through the next fixed circle, and so on until the outer circle of pins is passed. In the oblique rows or wings arranged upon the sweeps R the pins *a* and *a'* are not shown to be so close together as in the fixed circle, though they may be as close, or even in contact, if desired. If separated they do not force all the bran outward which they encounter, some portion thereof being allowed to pass through between them to be similarly met by the corresponding pins of the following arm. The radial or outward movement of the bran is, however, very rapid, and in its passage outward every fragment is exposed to severe friction upon other fragments and upon the pins in a manner to very completely detach adhering particles of middlings and flour.

At the curb the vertical corrugations *c c* operate to restrain the bran against the action of the outer rows of pins, *a* and *a'*, located at the extremities of the sweeps, and thus continue the attrition of the bran upon bran until the same is discharged through the spout O.

The arc-formed connections *w*, which join the adjacent arms R R, being arranged to fall between opposite upper and lower circles of the fixed pins *b* and *b'*, and being of equal thickness with the arms, prevent the opening of passages between the fixed pins and between the arms, through which bran might escape without being properly acted upon.

So far as the principle of its operation is concerned, each of the chambers or divisions of my machine, separated by the sweeps R and their connections *w*, is complete in itself, each having a number of similar concentric, stationary, and slotted partitions, and also of similar oblique moving wings, operating to force the bran outward through said partitions.

By arranging the disks in a vertical instead

of a horizontal position, joining the arms by a solid instead of open connections, so as to form a disk, and providing a central feed-opening and hopper on each side, with, perhaps, a double discharge-opening at the bottom, the division between the two parts is made complete, and the machine becomes, in fact, a double machine. If necessary, two qualities or conditions of bran may, in a machine so arranged, be simultaneously treated.

The partitions and wings (herein shown as being formed of pins *a a'* and *b b'*) may be cast either in one piece with the disks or in separate parts and secured to the disks. It is particularly practicable to so cast the curved oblique wings herein formed of pins *a* and *a'*, since it is not necessary of them as of the circular partitions *b b'* that they be open or slotted; but if these wings are cast I prefer to make them corrugated vertically, as though made of pins set closely together. An advantage of pins in both stationary partitions and revolving sweep-wings, however, is found in the fact that, being of steel, they possess or soon acquire a smooth compact surface that will not abrade the bran, and one that will not rapidly wear away.

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

1. In a bran-machine, the combination of the stationary disk U or L, bearing a series of concentric slotted partitions, herein formed of the pins *b* or *b'*, with the revolving disk or arms R, provided with the oblique wings described, and herein formed of the pins *a* or *a'*, substantially as and for the purposes set forth.

2. In combination with the stationary circular slotted partitions described and the central feed opening or eye, E, the revolving disk R, provided with the solid wings W, set eccentric to the disk, substantially as and for the purposes set forth.

3. In a double bran-machine having stationary concentric slotted partitions or pins *b* and *b'* and arms R, rotating between said partitions, and bearing oblique wings or rows of pins *a* and *a'*, the connecting parts *w*, joining adjacent arms, and arranged to close the space between the opposite concentric partitions or circles of pins, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

JONATHAN MILLS.

Witnesses:

M. E. DAYTON,
S. S. CHISHOLM.