

C. E. McNEAL.

Improvement in Smut-Mills.

No. 133,240.

Patented Nov. 19, 1872.

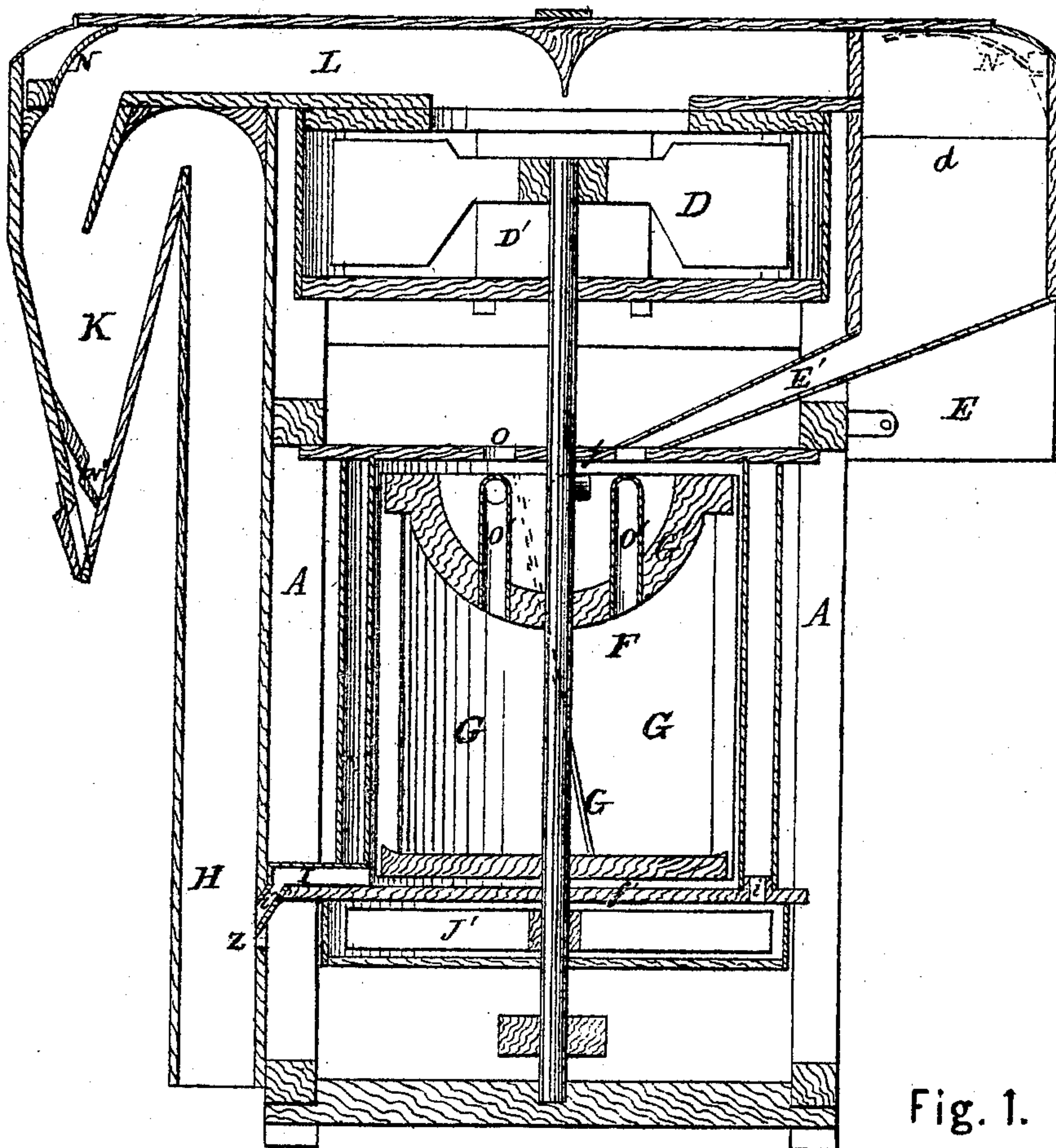


Fig. 1.

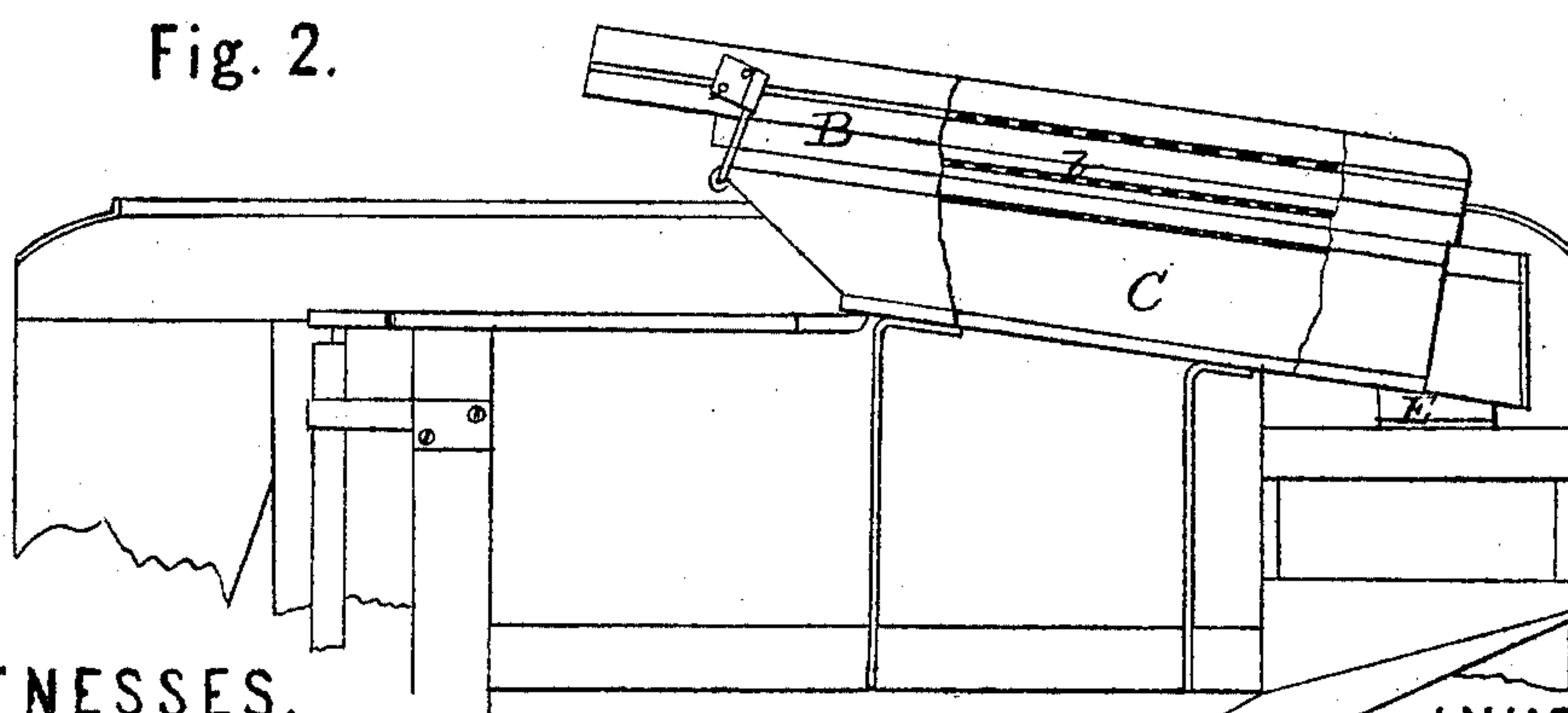


Fig. 2.

WITNESSES.

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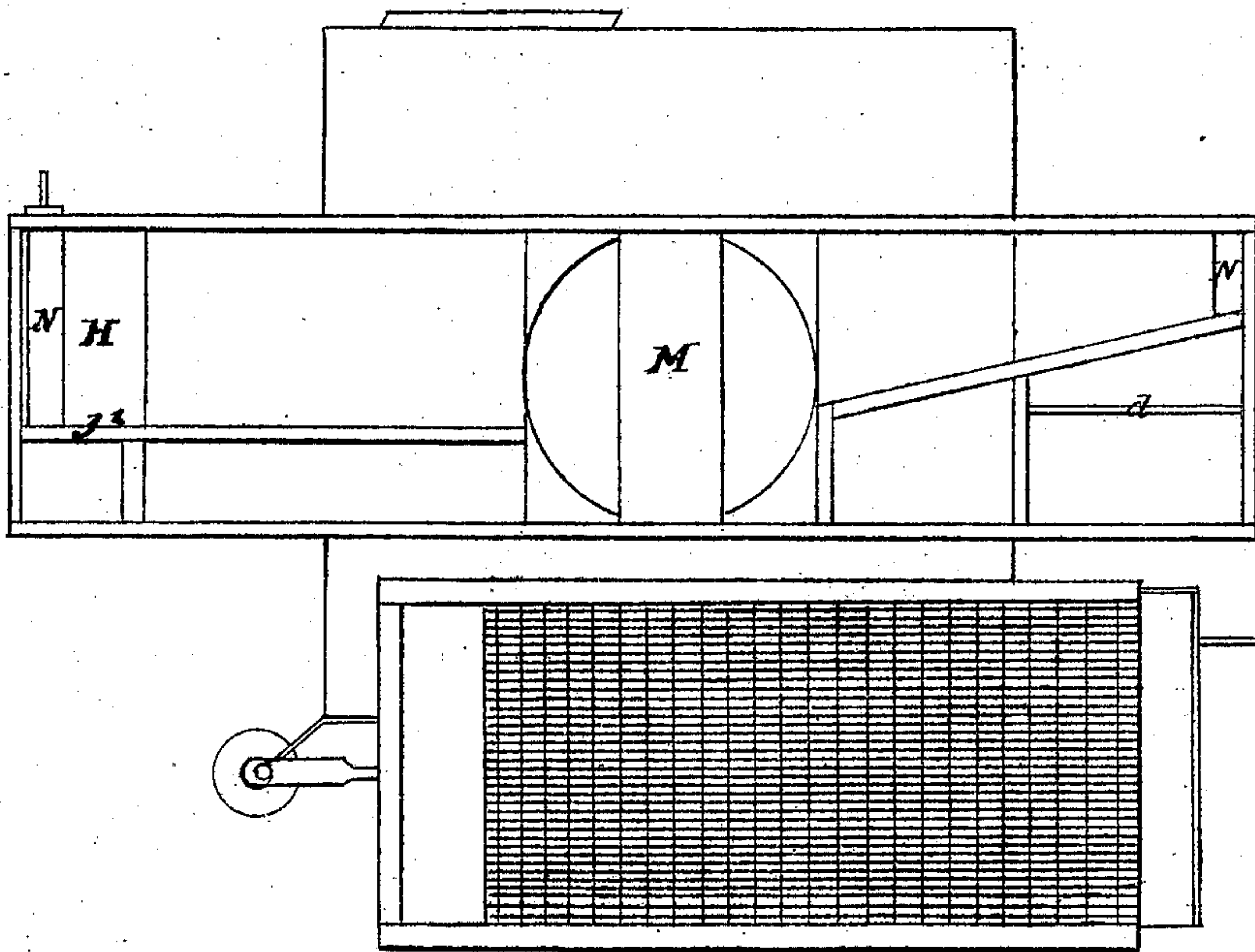


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES E. McNEAL, OF SILVER CREEK, NEW YORK.

IMPROVEMENT IN SMUT-MILLS.

Specification forming part of Letters Patent No. 133,240, dated November 19, 1872.

To all whom it may concern:

Be it known that I, CHAS. E. McNEAL, of Silver Creek, in the county of Chautauqua and State of New York, have invented a new and valuable Improvement in Smut and Separating Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a vertical section of my invention. Fig. 2 is a detail view of my invention. Fig. 3 is a top view of my invention.

This invention has relation to a smut and separating machine; and consists in the construction and novel arrangement of the sifting-screens, hopper, scouring devices, dust-fans, separating-tubes, and valves, all substantially as and for the purpose hereinafter more fully described.

Referring to the drawing, A designates the upright frame of the machine. B is the screen case or shoe, made in two sections hinged together. The upper section contains two screens, of which the lower, *b*, slides in grooves; hence, when the machine is in motion, the screen *b* may be removed and another substituted, the upper section of the case being raised on its hinge. C is the hopper, into which the grain passes from the lowest screen. A tube, E, leads from the hopper to the scouring-cylinder. In passing to the latter the grain is affected by a suction-fan, D, which carries upward chaff, cockle, and the light particles, and draws them toward it. Whatever oats, chaff, or heavy particles are thrown up fall over a partition, *d*, between the hopper and a spout, E, and drop down through the latter. The grain leaving the hopper descends to the scouring-cylinder through the tube E. F designates the scouring-cylinder, arranged between floors *f f'*. The inner shell is slotted to let the dust pass through. The outer shell is in two parts, which are arranged between the floors *f f'*, and may be moved around to open the space between the two shells. The two parts of the outer shell may be locked together. G represents the beaters of the scouring-cylinder. These are arranged

obliquely so as to throw the grain upward, and thus retain it longer in the cylinder and prevent it from being dashed directly against the inner shell and broken. The upper head G' of the beater-reel is concave or dish-shaped. The grain falling upon it is therefore carried upward by centrifugal force, and evenly distributed over the edge and to the beaters. Ordinarily the upper head of the reel is made flat; hence the grain falling upon it is immediately thrown to one side of the beaters, and, being thereby crowded or clogged, is more or less broken. The grain is also scoured by its friction against the surface of the reel-head. As the grain is scoured it passes from the scouring-cylinder to the leg H of the separating-spout through a spout, I, while the dust dropping between the two shells of the cylinder falls through holes *i* in the floor into a case, J, containing a fan, J¹, on the same shaft with the reel. This fan blows the dust into the leg H, which is, by a partition, J², divided in two, forming the dust and separating passages shown. Below the spout I in the wall of the separating-passage of the spout H an opening, Z, is provided, through which a current of air is made to pass by the suction action of the fan D. A current of air passing upward through the separating-passage of the leg H causes a partial separation as the grain comes from the beaters. The current introduced below the spout I spreads the grain out and enables the vertical or upward current to act with more effect. The spout I is constructed with a vertical fall at *i*², which prevents the grain from being thrown out into the separator with too much force. When the tube I is straight the current of air caused by the beaters throws the grain out into the separating-tube, and there meets with the upward current through the latter, and interferes with the separating process. By means of the fall *i*² the force of the current from the beaters is broken, and the grain allowed to pass into the separator of its own gravity. The fall *i*² also produces an air-cushion by the current striking it, and thus causes the grain to be cushioned. After the separation takes place the grain falls down and out of the leg H, while the dust and light particles ascend through the leg H, and fall into a spout, K. The leg H, besides communicating with the spout K,

also communicates with the horizontal section L of the separator. The partition J² extends along said horizontal section as far as the opening therefrom into the case of the upper fan. The particles of dust, &c., which, after being forced up through the leg H, are too light to resist the suction action of the fan D, and therefore cannot fall through the spout K, are drawn to said fan, and, together with the particles obtained from the first separation, are blown from the fan-case through the opening D' at one side. M designates a wall traversing the section L over the center of the fan D, and designed to prevent the currents caused by the fan-suction and coming from the leg H from meeting. N designates valves to control the draft in the separator. N' represents valves arranged inside the tube K. O represents perforations in the floor f, and O' tubes rising from the concave head of the beater reel, and bent at their upper ends in the direction of the reel's rotation. These tubes cause currents of air to pass through them to the beaters as the reel revolves, and thus supply the beaters with all the air they require.

I am aware that air has been introduced below the spout through a number of round perforations; but such are defective in that the air does not certainly strike all the grain passing down, while, by its introduction in a

thin sheet through the slot, the operation is performed with certainty.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a smut-machine and separator, the combination, with the reel-head having the depending or convex bottom, of the oblique beaters, substantially as specified.

2. The beater-reel, having a concave or dish-shaped head, substantially as and for the purpose specified.

3. The bent-tubes O', attached to and combined with the beater-reel, substantially as and for the purpose specified.

4. The slot-opening Z, below and lengthwise of the mouth of the tube I, for the introduction of a current of air to spread the discharge from said tube, substantially as specified.

5. The combination, with the hopper bearing a fixed screen, of the hinged upper section bearing a fixed top screen and a removable lower screen, all arranged substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CHARLES E. McNEAL.

Witnesses:

ROYAL P. WARD,
HENRY McNEAL.