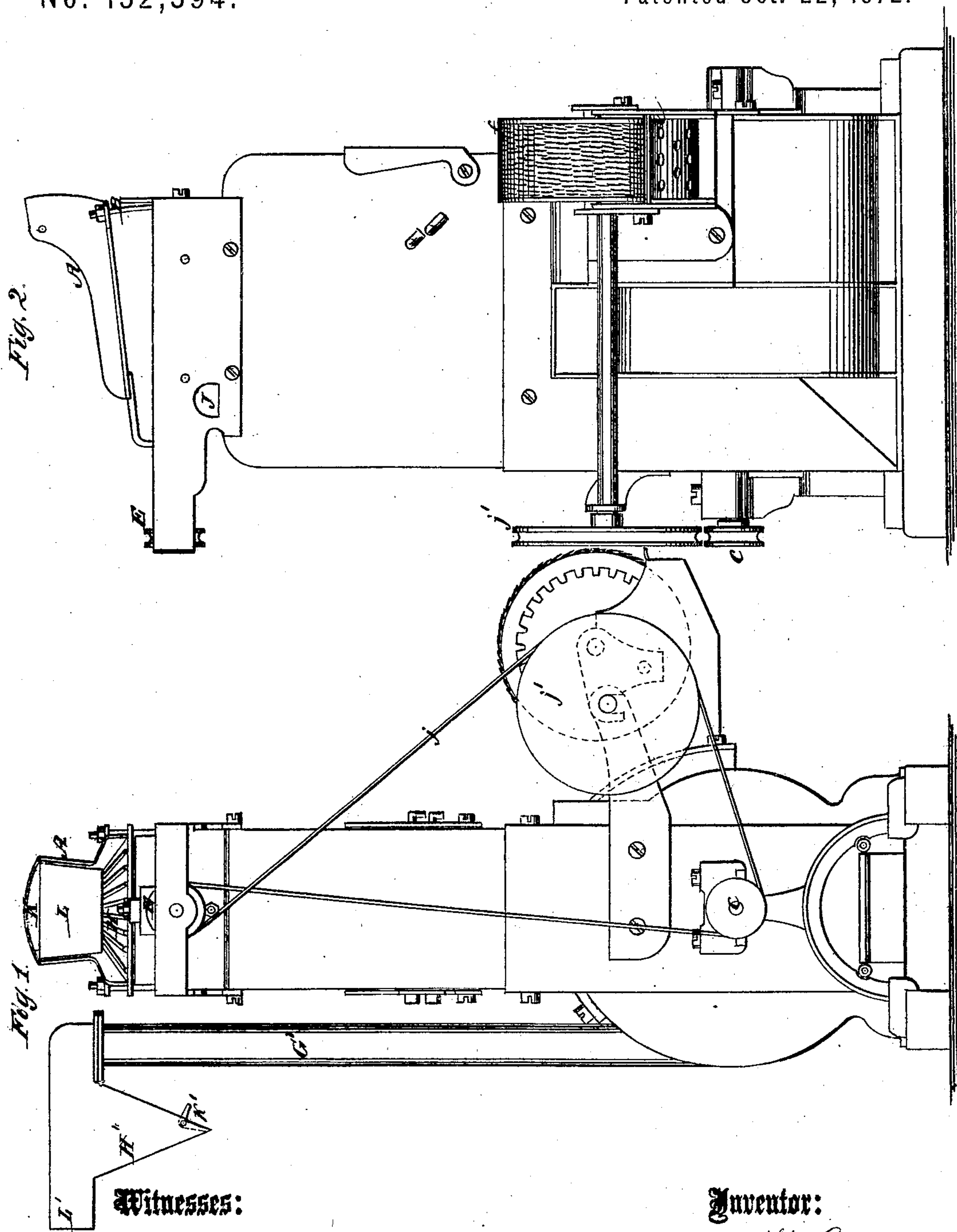


G. W. GRANT.

Improvement in Smut-Machines.

No. 132,394.

Patented Oct. 22, 1872.



Witnesses:  
*E. Woff.*  
*W. A. Graham*

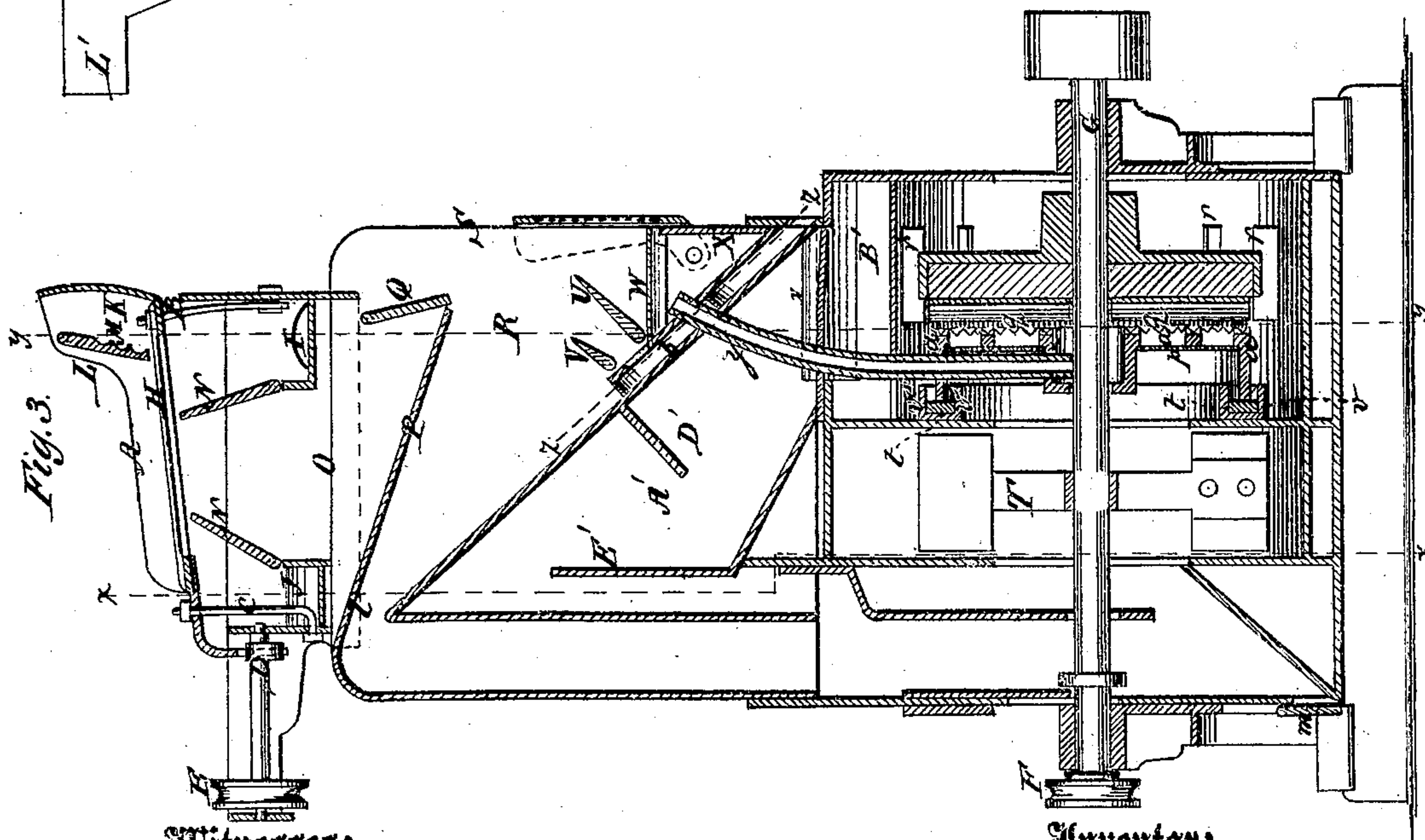
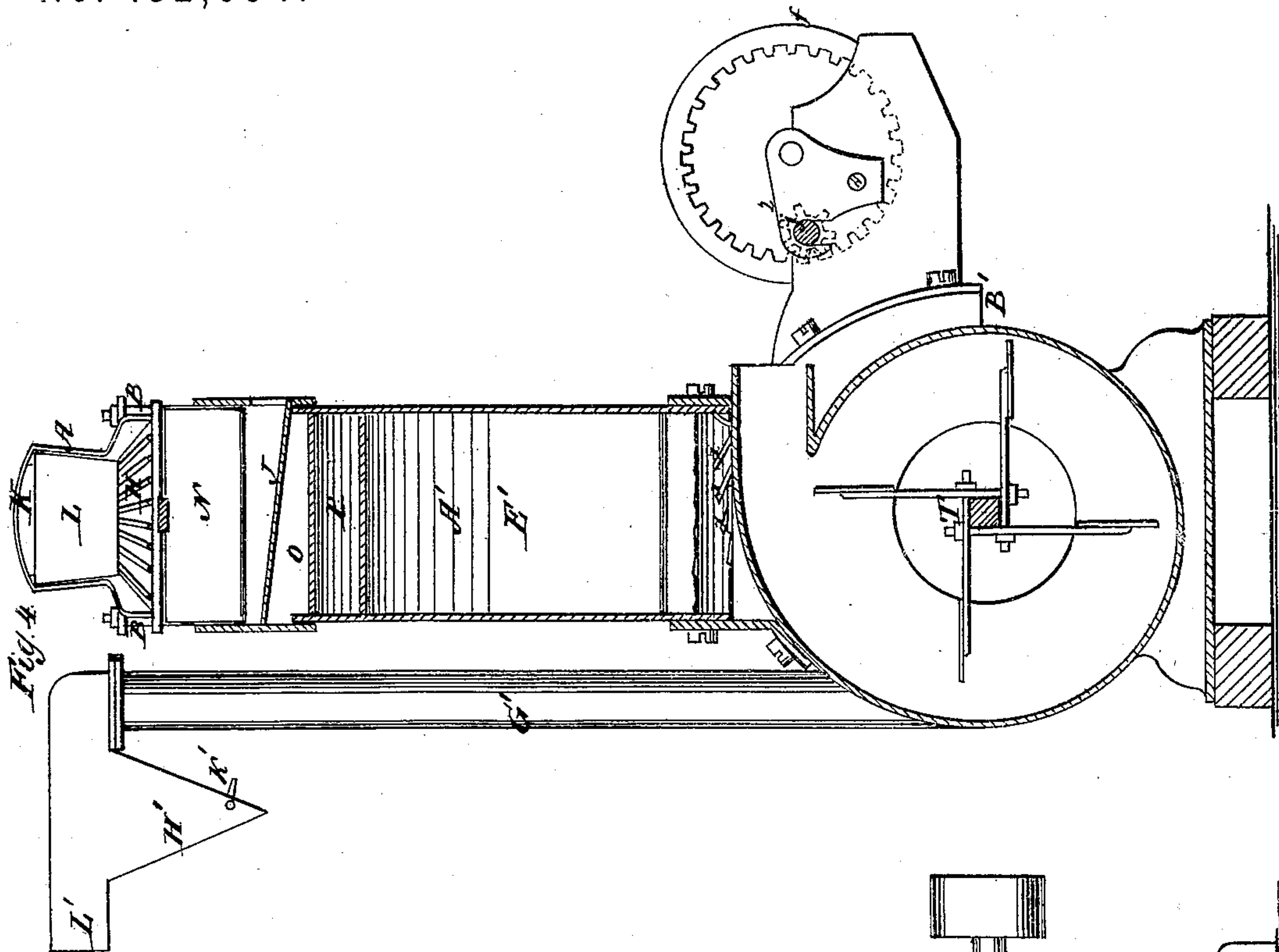
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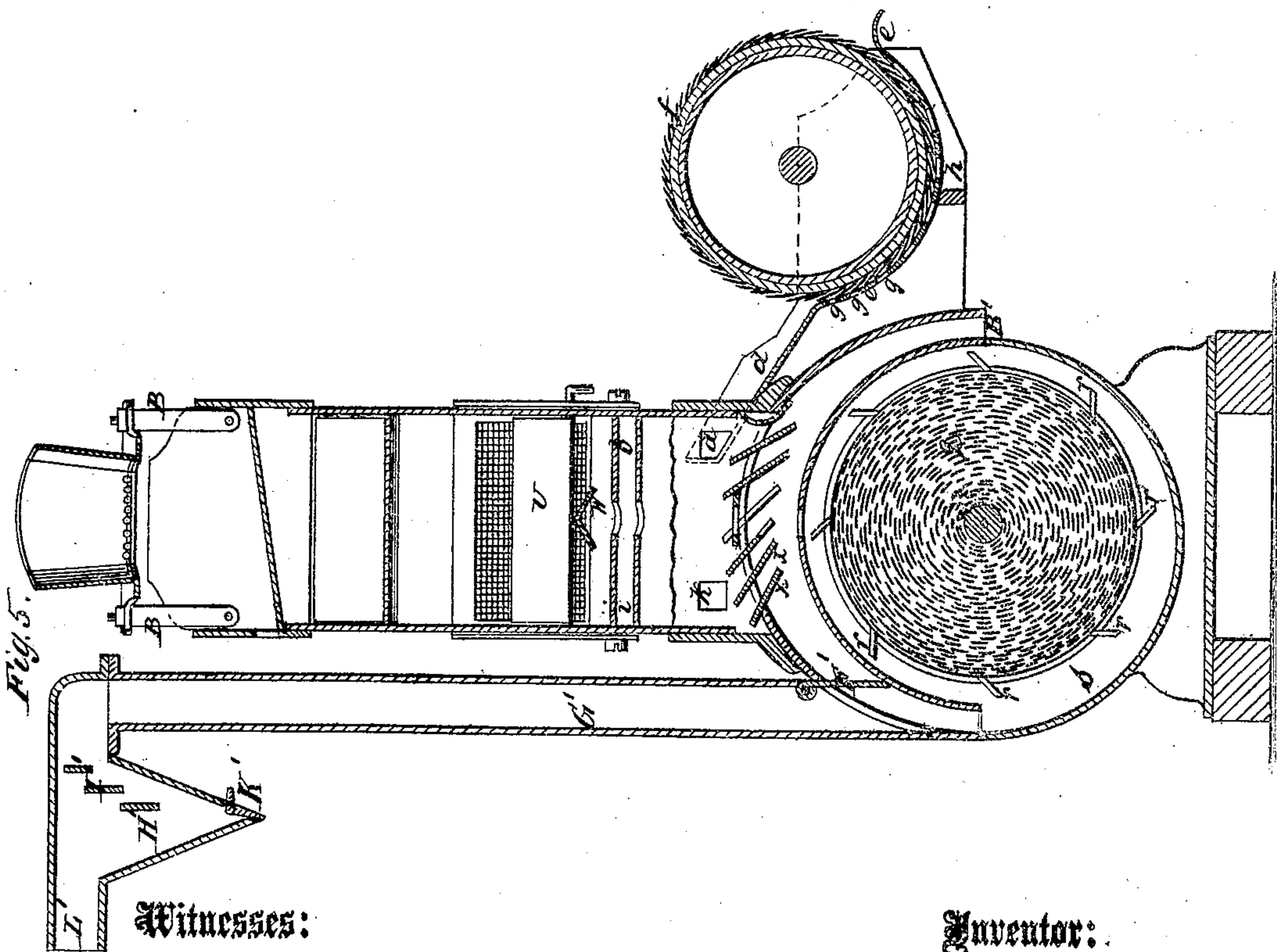
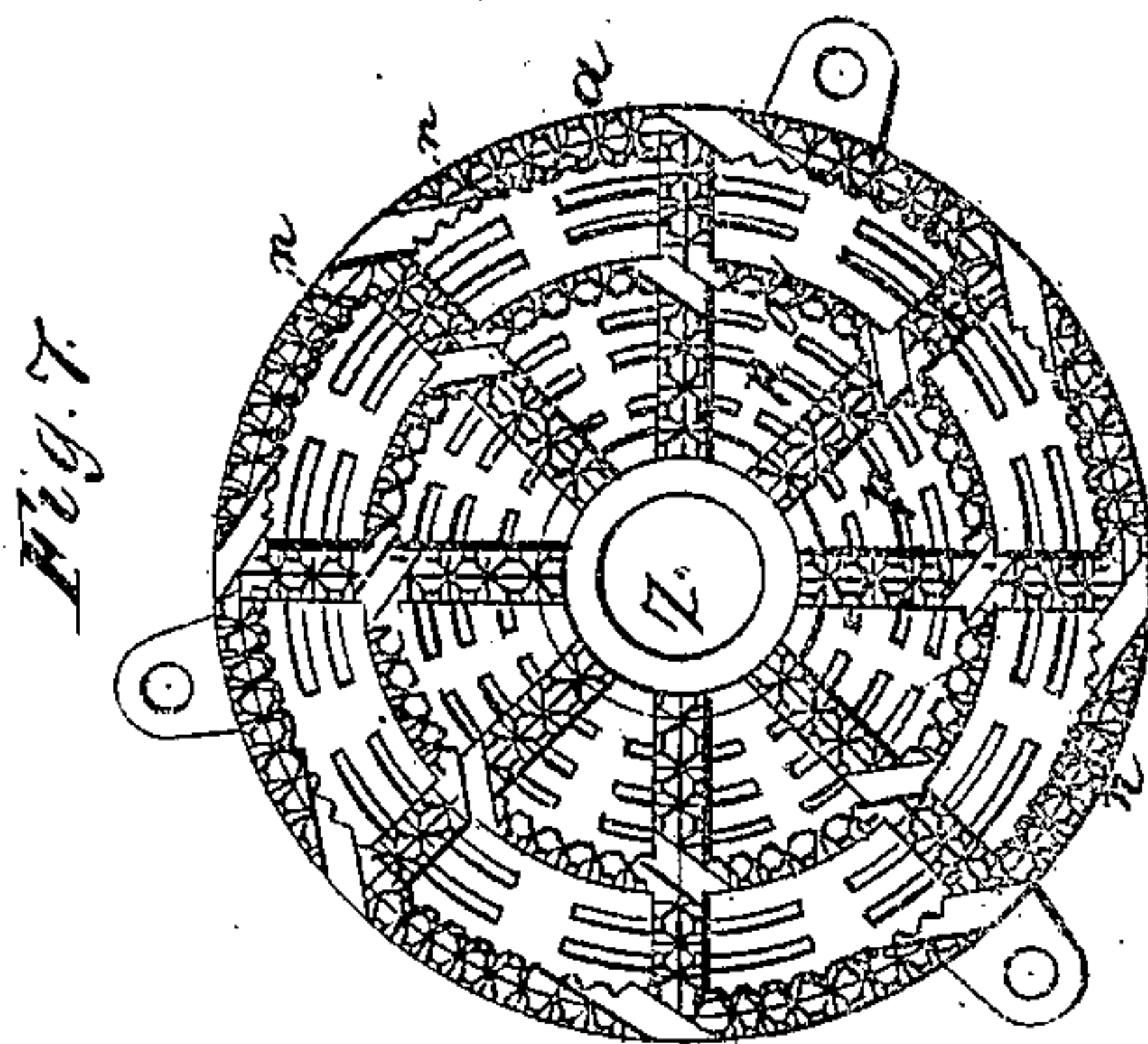
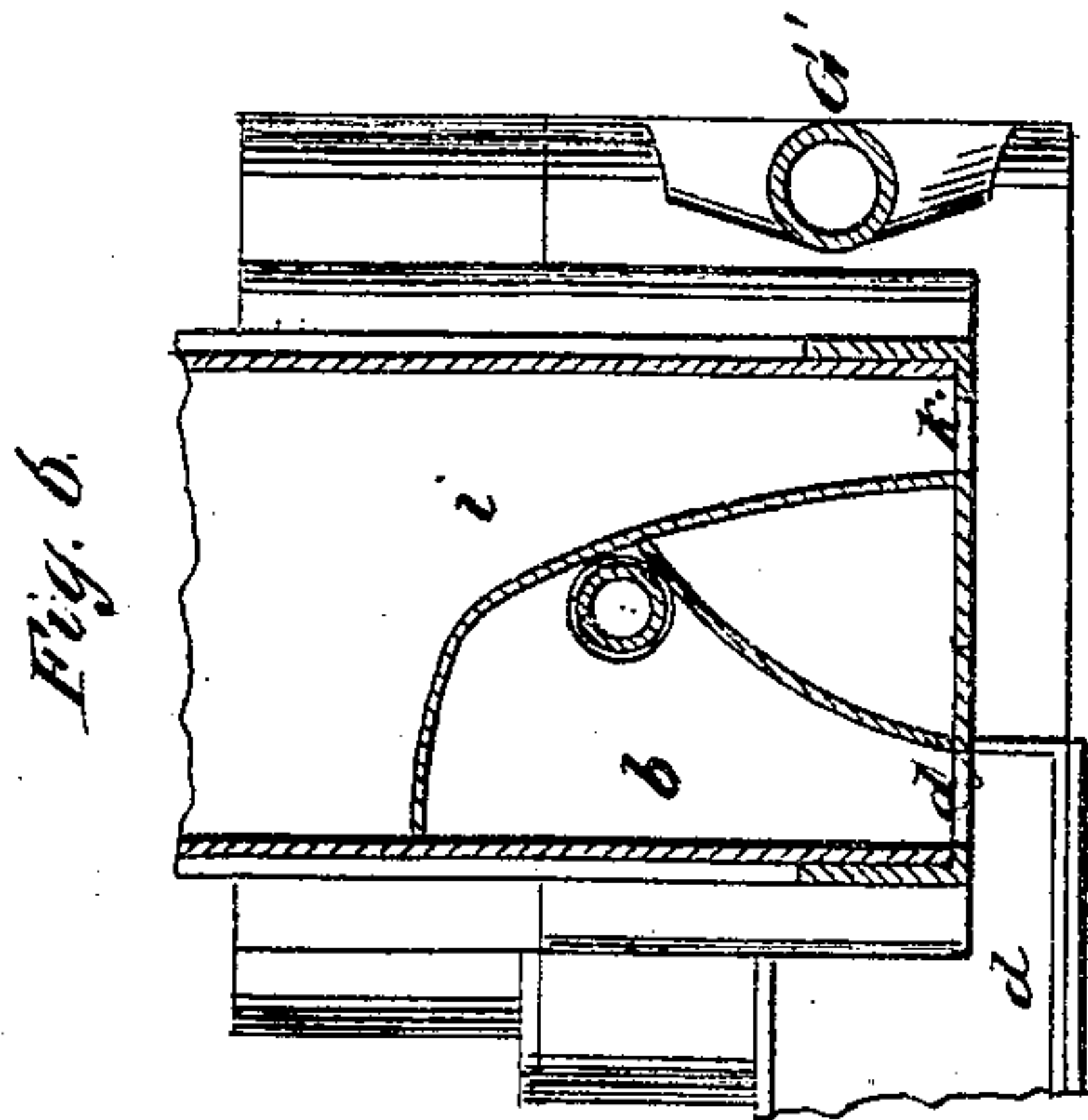


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# UNITED STATES PATENT OFFICE.

GEORGE W. GRANT, OF MIDDLEPORT, OHIO.

## IMPROVEMENT IN SMUT-MACHINES.

Specification forming part of Letters Patent No. 132,394, dated October 22, 1872.

*To all whom it may concern:*

Be it known that I, GEORGE W. GRANT, of Middleport, in the county of Meigs and State of Ohio, have invented a new and Improved Smut-Machine, of which the following is a specification:

My invention consists of certain novel combinations and arrangements of screening, separating, scouring, and fan-blowing apparatus, as will be hereinafter described, all comprising an efficient machine by which wheat may be cleaned more effectually and with less waste than with the machines now in use.

Figure 1 is an end elevation of my improved machine. Fig. 2 is a side elevation. Fig. 3 is a longitudinal sectional elevation. Fig. 4 is a transverse sectional elevation taken on the line *x x*. Fig. 5 is a transverse sectional elevation taken on the line *y y* of Fig. 3. Fig. 6 is a section of Fig. 3 on the line *z z*. Fig. 7 is a face view of one of the scouring devices.

Similar letters of reference indicate corresponding parts.

A represents a vibrating shoe mounted on the spring supports B at the rear end and the oscillating support C at the front end, which is shaken by the eccentric D, which is turned by the pulley E and a belt from the pulley F on the main shaft G. This hopper has a bottom composed of wires H extending from the rear to the front, and diverging so that the spaces increase in width toward the front. Said spaces at the rear are too close together to let the grain fall, for allowing the sand and other small matters to escape to the spout I below and be discharged through it, the coarse matters passing off at the front escape through spout J. The rear end K of this hopper is arranged in the concave form shown, for breaking the force of the grain discharged against it, and a short distance in front of this back is a valve, L, which is swung up by the flowing grain in passing along the wires. This valve has the longitudinal grooves, shown at M, in the side against which the grain comes, which grooves are designed to so act on the straws, sticks, and other matters having considerable length as to turn them at right angles to the wires before letting them pass, to prevent them from falling through the wires, although they may be much smaller than the width of the spaces. This will be insured be-

cause the lower edge of the valve will rest on the surface or extend slightly below, while the said long matters will float entirely on the surface, so that they will come in contact with the valve and be obstructed by it until turned parallel with it, when they will roll under and escape. Along the middle portion of the bottom H the grain falls through, between the gates N, into the hopper O below. Said gates can be adjusted toward or from the ends to shift the points of the separation between the grain and the sand at one end and said grain and the refuse matters at the other, as required by the character of the grain. At the lower end of the bottom P of this hopper is a gate, Q, which checks the descent of the grain and causes it to fall in a thin even stream through the space of the upper portion R of the separator to the space below, to be exposed in such fall to a blast of air drawn in through the opening S by the fan T, to deflect the lighter grains and other matters inward to be separated into two grades by the gate U, and to separate light matters from the second grade by the gate V, both of which gates may be shifted to vary or regulate the separation. The first grade, consisting of the heavy grain, falls on the deflector W, and is thereby chuted into the sides and bottom of the hopper X, from the upper portion of which the spout Y conducts it into the central cavity Z of the scouring-frame *a*. This deflector is designed to cause the nails, stones, or whatever hard and heavy matters that may be in the grain to pass away from the mouth of the spout and be lodged in the bottom of the hopper, from which they may be removed from time to time. The spout Y will extend above the bottom as another means of excluding such matters from the grain. The second grade falling between the gates U and V passes through the spout *b*, out of the case at *d*, and into the oats and cockle-separator, consisting of the concave metal plate *e* and the wire brush or cushion-wheel *f*. This plate *e* is perforated at *g* with small holes, that will allow the cockle and other small seeds to escape, but not the wheat, which will be kept sidewise in the plate by the brush in passing over these holes. At *h* the holes will be large enough for the wheat to escape, and the oats, too long to escape through these holes, will be discharged over the end of the said plate *e*.



Suitable spouts will be provided with this cockle and oats separator for conducting the separated matters to the proper receptacles. This brush will have a slow rotary motion, being driven by the belt *j*, pulley *j*<sup>1</sup>, and pinion *j*<sup>2</sup>. The matters passing over gate *V* will escape through spout *ik*, unless carried over the top at *l*, in which case they will escape at the trap *m*. The scourer consists of the cast-metal frame *a*, with chilled-iron points *n* on the arms and rims, and the slotted plates *p*, and in connection therewith the disk *q*, with a wire-brush acting against the hardened points, and the blades *r* acting with the case *s*. The metal plate *p*, which is made in sections, is placed so far from the front of the points as to allow spaces between the arms and rims of *a* for retaining the grain long enough to be thoroughly acted upon by the brush. The said sectional plate *p* is made of sheet-iron, and the slots are to be cut by sheet-metal disks run at such high velocity as to melt away the metal and leave the edges of the slots very hard and sharp. These slots are for allowing the fan to act on the grain while being scoured. The rim of this pointed scouring-frame is fitted in an annular groove, *t*, of the case with a flexible ring, *u*, of packing behind it, and is clamped against the packing by bolts in such manner as to allow of "tramming" or adjusting it parallel with the face of the brush, and yet keeping the joint tight. From between these scouring devices the grain passes out into the case, between the blades *v*, to the scouring action of which it is subjected for a considerable time, and is then forced up by them through the spout *w* to the deflectors *x*, where it is again subjected to the blast passing up through the lower space *A'* of the separator to have the light matters scoured off, blown away; thence it passes out through the spout *B'*. In case any of the grain is drawn up through the openings at these deflectors it will be arrested by the plates *D'* and *E'* and fall back to the spout *w* again. In case the grain is to be elevated the valve *F'* at the bottom of the vertical spout *G'* will be so adjusted as to shut the spout *w*, when the grain will be forced up by the blades into the hopper *H'*, discharging against the deflector *I'* and falling upon the weighted valve *K'*, while the dust will be carried off through the spout *L'*. The weighted valve *K'* will retain a sufficient quantity of grain in the hopper to prevent the air from escaping with the grain. The wire-brush device acting with the pointed frame will consist substantially of a wire-cushion secured to a back of cast metal by casting the latter around the ends of the wires, the

casting being of bars of suitable shape. Or the said brush can be made of wire and rubber and sheet-iron, secured to a cast-iron back. The sheet-iron will be arranged in tubes on the face and the wires bent over them to form an even and smooth face. The tubes will ventilate the brush. The rubber will be in narrow sheets and placed under the wires to increase the elasticity of the brush. The wires will be turned or bent down to a face by running in a lathe against a file or a stone. It is not intended that the wire brush or cushion shall run against the points, but so as just to clear them, whereby they will only rub on the grain. The cushion or brush for the cockle-screen will have the wire bent downward in the same manner, and it may have rubber or leather under the wire for increasing the elasticity or not, as preferred. A good cushion or brush may also be made by covering the face of the disk with rubber or leather without the wires, and stuffing the space with suitable elastic material.

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

1. The combination, with the hopper *A*, of the valve *L* provided with flutes or grooves *M*, substantially as specified.
2. The said hopper, having the wire-bottom *H* constructed as described, combined with the hopper *O*, adjustable gates *N*, and spouts *I* and *J*, substantially as specified.
3. The hopper-bottom *P*, gate *Q*, wind-passage *R S*, gates *U V*, hopper *X*, and spouts *Y*, *d*, and *i*, combined and arranged substantially as specified.
4. The scourer *a* and separator *U V W X*, connected by spout *Y*, and operating substantially as and for the purpose described.
5. The combination of the scouring-frame *a* and the wire-brush *q*, constructed substantially as specified.
6. The scouring-blades *r*, case *s*, spout *w*, deflectors *x*, the wind-passage *A'*, and spout *B'*, combined and arranged substantially as specified.
7. The combination of the vertical spout *G'*, hopper *H'*, weighted-valve *K'*, deflectors *I'*, and spout *L'*, constructed and arranged substantially as specified.
8. The scouring-frame, consisting of the cast-metal arms and rims with points, and the slotted back plate, constructed and arranged substantially as specified.

GEORGE W. GRANT.

Witnesses:

L. O. SMITH.

E. S. BRANCH.