(No Model.) 3 Sheets—Sheet 1.

# H. L. FOX.

## COTTON SEED DELINTER.

No. 495,167. Patented Apr. 11, 1893.

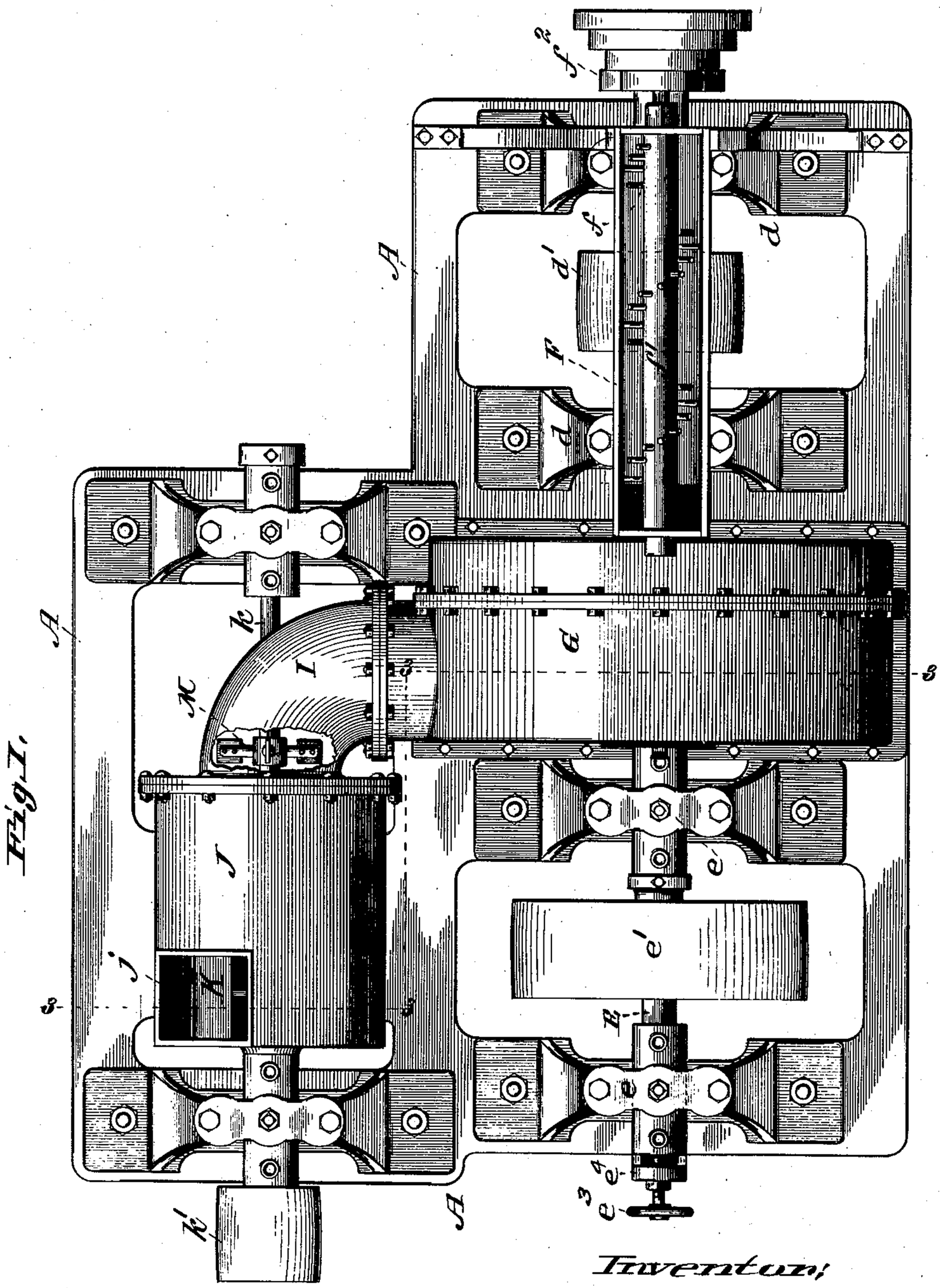

Fig. 1.

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W. J. Kesl.
Edward C. Purcell

Inventor:
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his atty

No Model.)

3 Sheets—Sheet 2.

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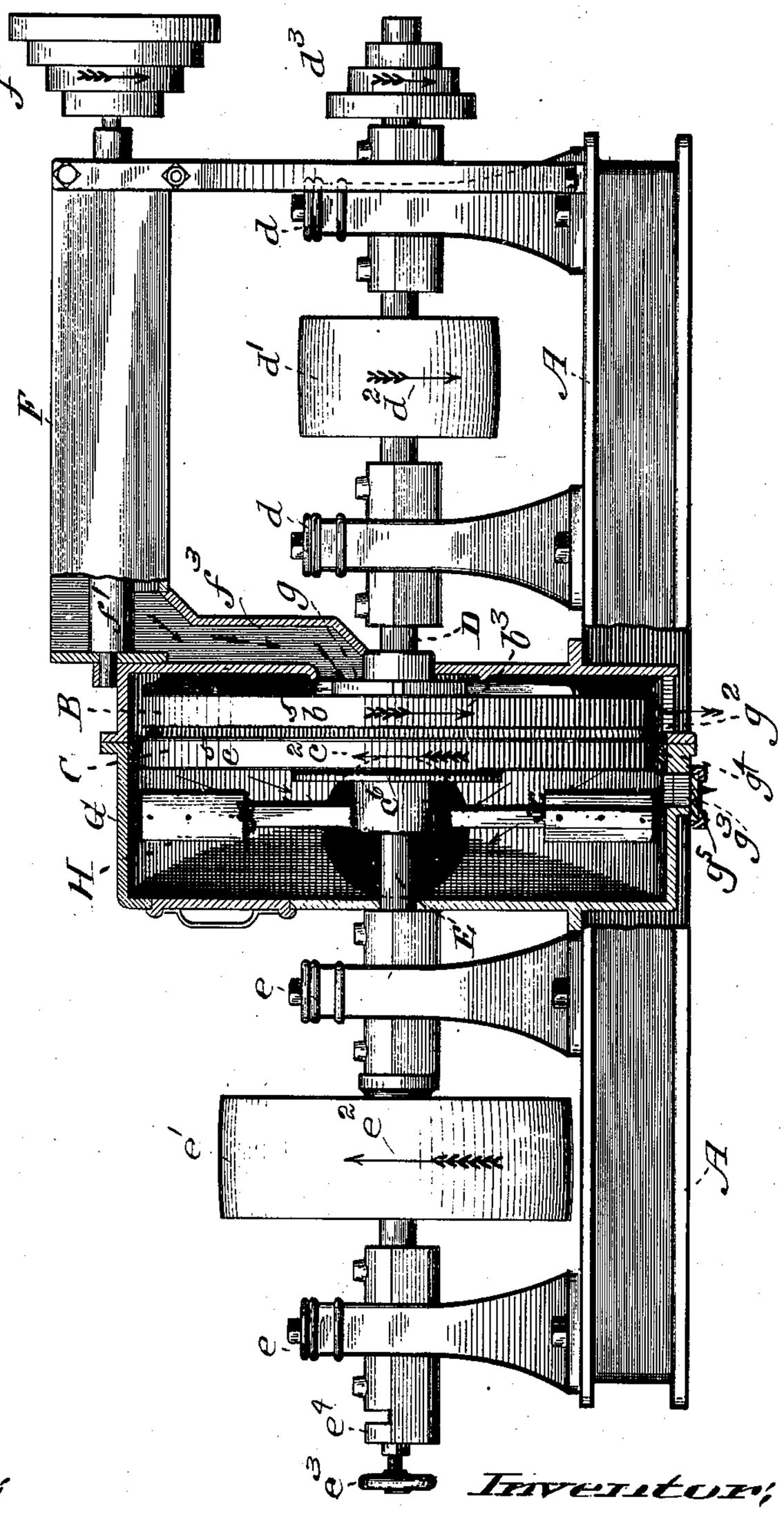


Fig. 2.

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# H. L. FOX.

## COTTON SEED DELINTER.

No. 495,167. Patented Apr. 11, 1893.

Fig. 3.

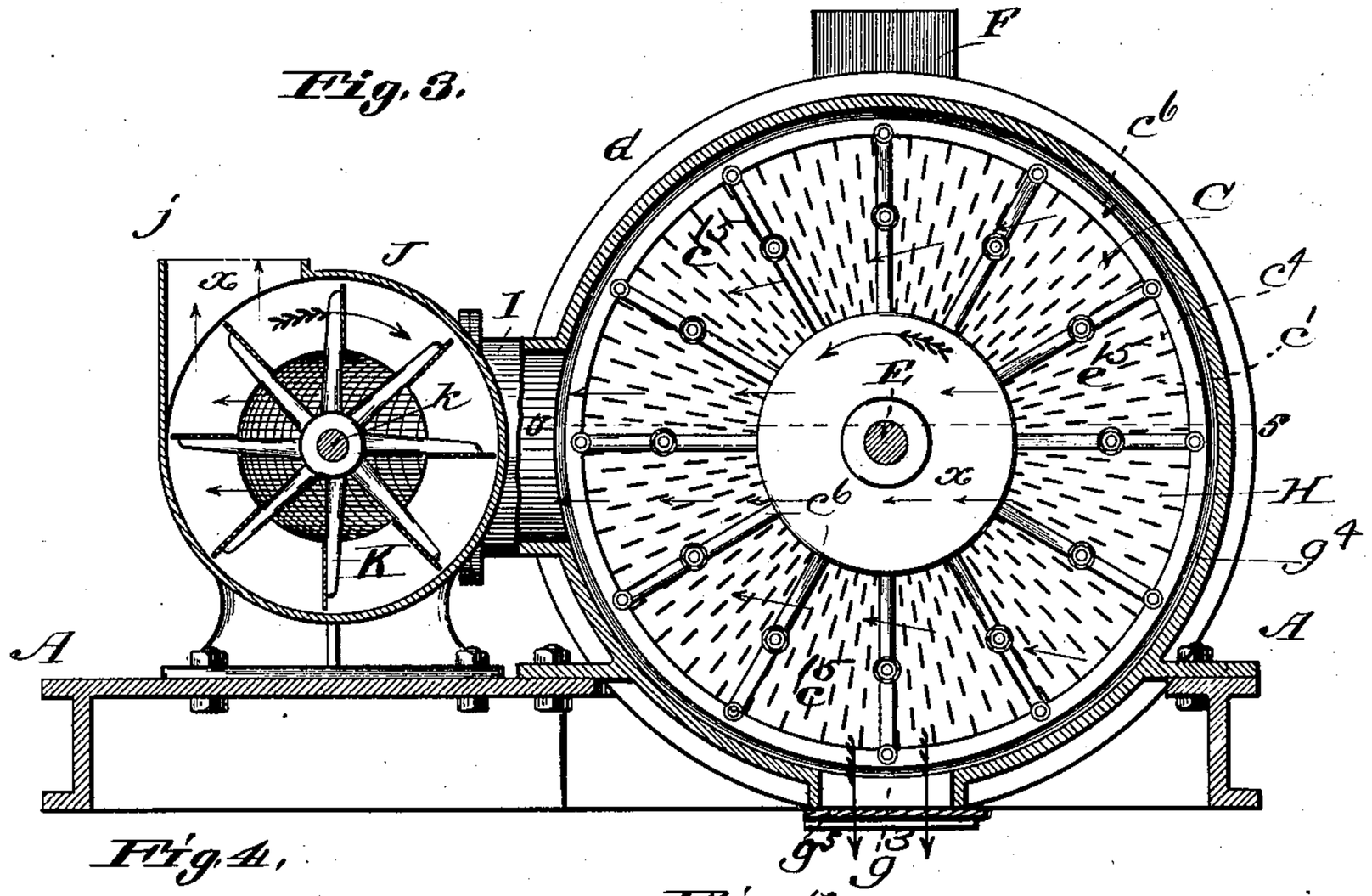
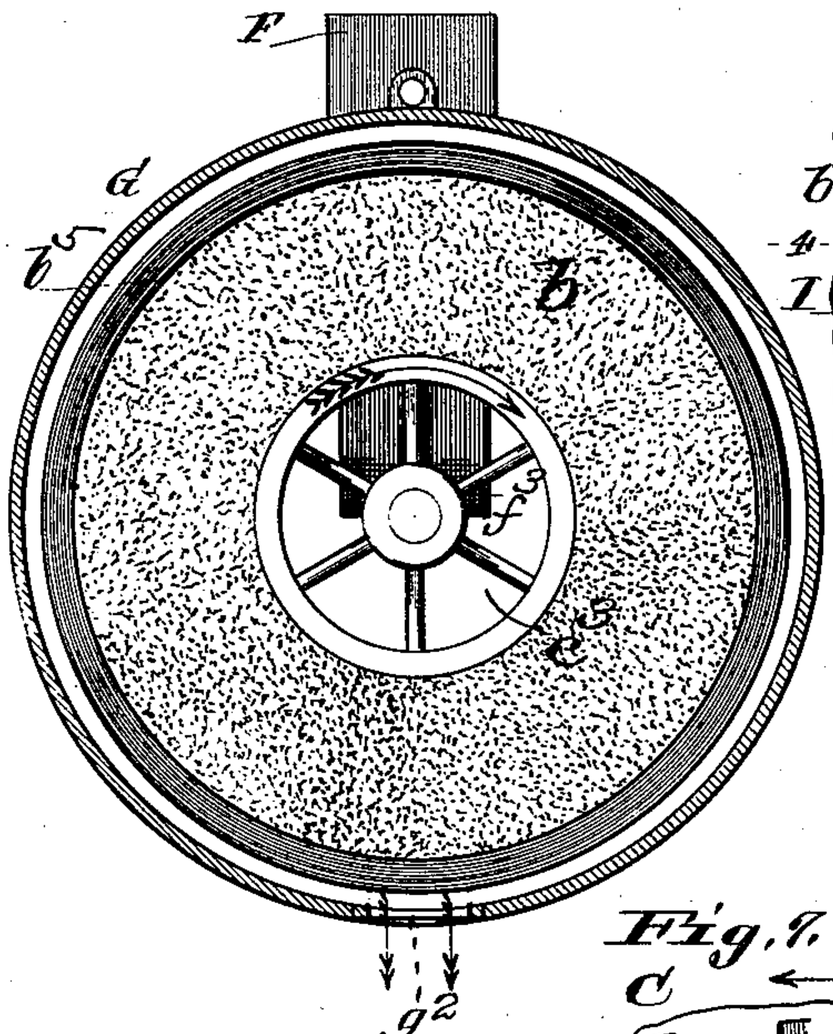



Fig. 4.

Fig. 5.



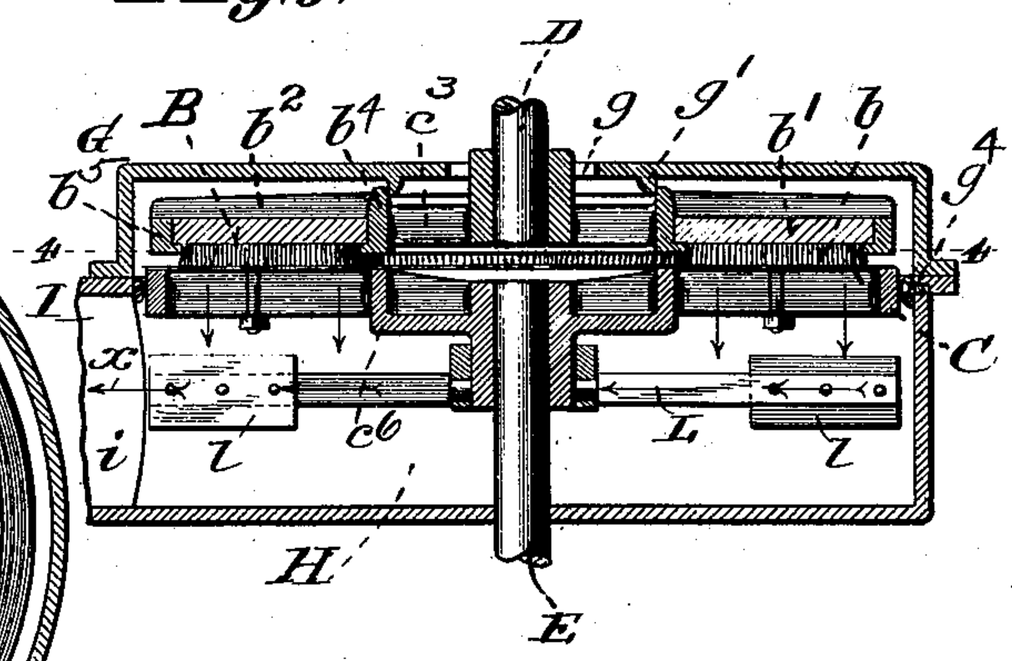




Fig. 6.

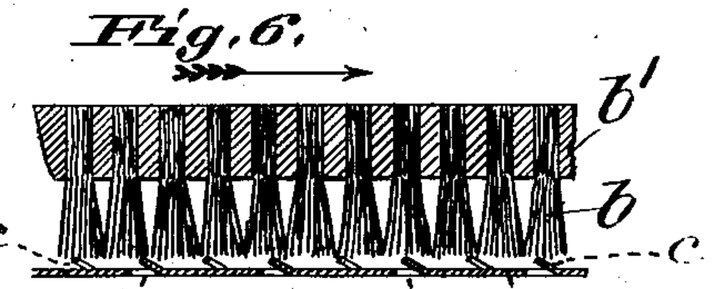
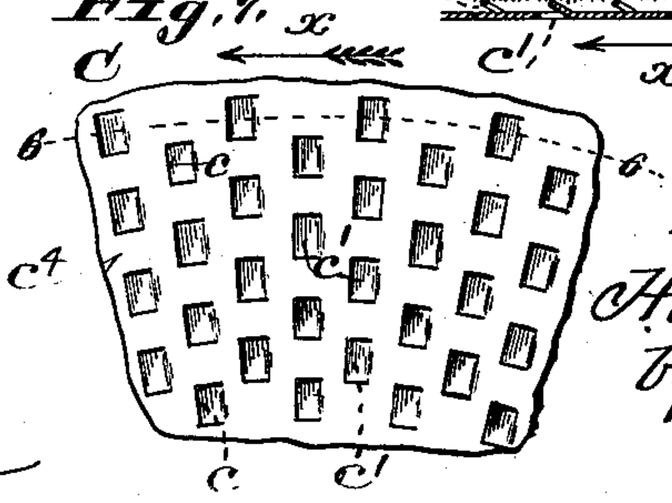



Fig. 7.




Attest;

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by C. D. Moody

his Atty

# UNITED STATES PATENT OFFICE.

HUGH L. FOX, OF ST. LOUIS, MISSOURI.

## COTTON-SEED DELINTER.

SPECIFICATION forming part of Letters Patent No. 495,167, dated April 11, 1893.

Application filed September 16, 1892. Serial No. 446,044. (No model.)

*To all whom it may concern:*

Be it known that I, HUGH L. FOX, of St. Louis, Missouri, have made a new and useful Improvement in Cotton-Seed Delinters, of which the following is a full, clear, and exact description.

The improvement under consideration has for its object to thoroughly separate the lint and seed, and to discharge the seed substantially denuded and unbroken in one direction, and the lint free from seed-particles in another direction, and all at a rate sufficiently rapid to render the operation a profitable one, and to that end the improvement relates mainly to the means immediately used in separating the lint from the seed. It also has reference to the general arrangement of the mechanism, and to certain details of construction, all substantially as is hereinafter set forth and claimed, aided by the annexed drawings, making part of this specification, in which—

Figure 1 is a plan of the improved mechanism in its most desirable form; Fig. 2 a side elevation of the same, the casing which contains the brush and the coacting abrading-disk, as well as a portion of the seed-supply passage, being in section; Fig. 3 a vertical section on the line 3—3 of Fig. 1; Fig. 4 a vertical section on the line 4—4 of Fig. 5, which, in turn, is a horizontal section on the line 5—5 of Fig. 3; Fig. 6 a detail, upon an enlarged scale, being a section, of a portion of the brush and also the disk, upon the line 6—6 of Fig. 7, which is a view, also upon an enlarged scale, of a portion of the disk, the view being from the rear, or outlet, side thereof.

The same letters of reference denote the same parts throughout the several views.

A represents a suitable frame for the working parts of the machine.

B represents a brush suitable for rasping cotton-seed, or for forcing cotton-seed against a rasp or abrading surface. Its bristles *b*, are preferably steel wires attached to a suitable back *b'*, which, in turn, is held in a head $b^2$, substantially as shown. C represents an abrading, perforated, part which coacts with the brush, and, with the brush, constituting the mechanism immediately employed in removing the lint from the seed. The brush is a revolving one, and the part C is also adapted to rotate, although the parts, B, C, might be adapted to move reciprocatingly with reference to each other and the improvement thereby in a measure carried out. In its present form the part C is in effect a revolving disk having projections, *c*, extending in the direction of the brush, and openings, *c'*, the projections, in conjunction with the brush-teeth, serving as scrapers, knives or points to remove the lint from the seed, and the openings, *c'*, providing outlets through which the lint, after being separated from the seed, is withdrawn. That is, the seed to be delinted is introduced between the brush and the disk, and the lint is separated from the seed by being in the first place cut from the seed by means of the coacting brush-teeth and disk-projections, and in the second place by being removed from between the brush and the disk immediately after being detached from the seed. As now shown both the parts or disks B and C, being placed on a horizontal shaft will be vertically arranged.

A leading feature of the improvement is withdrawing the lint from out of the field in which the brush-teeth and the opposing abrading-disk coact as soon as possible after it (the lint) has been separated from the seed, and not allowing the separated lint to be carried around and around between the brush and surface, or to remain in, and more or less close, the outlets in the disk.

The improvement is more effectively carried out by causing the two parts, the brush and the disk, to revolve in opposite directions, as thereby the seed is more effectively worked between the brush and disk, and the openings in the disk, which constitute the outlets through which the lint is discharged, are better kept open. To these ends the brush is attached to one shaft D, and the disk is attached to another shaft E, and these shafts are independently journaled in the machine and adapted to be rotated at different rates, and, in opposite directions. For this purpose the shaft D is journaled in the bearings *d*, *d*, and is provided with the pulley *d'*, and the shaft E is journaled in the bearings *e*, *e*, and is provided with the pulley *e'*, and by means of belts (not shown) leading to the pulleys *d'*, *e'*, respectively, and in different directions respectively; the pulleys are driven in different directions, as indicated respectively by

the arrows, $d^2$, $e^2$, and the brush and disk accordingly rotated, and as indicated by the arrows $b^5$, $c^2$. The disk-projections also point suitably, as shown substantially, to coact with the brush. The rates at which the brush and disk respectively rotate is a matter of importance, as I have discovered that the parts in question, to obtain the best result, should not be rotated at the same speed, but the brush should be rotated faster than is the disk. By means of the screw, $e^3$, working through a bearing, $e^4$, and against the end of the shaft E, that shaft can be adjusted to hold the disk nearer to, or farther from, the opposing brush, as may, in practice, be desired.

The seed to be treated is delivered between the brush and disk preferably by introducing the seed through an annular opening, $c^3$, at the center of the brush, and a desirable arrangement therefor is as follows:

F represents a trough arranged at a suitable height, and containing a feed-screw, $f$, whose shaft, $f'$, is journaled in the ends of the trough, and which is furnished with a pulley $f^2$. The feed-screw is conveniently rotated by means of a belt, not shown, which leads from a pulley, $d^3$, upon the shaft D to the pulley $f^2$, and the seed, having been delivered into the trough, is fed thence through a suitable passage, $f^3$, and through an opening, $g$, in the casing, G, which contains the brush and disk, and, after entering the casing, the seed passes through the opening $c^3$, in the brush and thence finds its way to between the brush and disk. The joint between the side of the casing and the brush is suitably closed by means of the flanges, $g'$, and $b^4$, upon the casing and brush respectively, and which lap upon each other substantially as is shown in Fig. 5.

The casing, G, is constructed to inclose the brush and disk, and also a chamber, H, at the rear, or outlet-side, of the disk. The most desirable form for the disk-projection, $c$, is the one shown, namely, a knife-like edge extended in a radial direction upon the disk and being the edge of a lip which overhangs the opening $c'$, and which serves to support a cutting or rasping edge in position to coact with the brush-teeth, and as a deflector to direct the lint to the opening $c'$, substantially as shown. The described openings and projections extend throughout the disk, $c^4$, which constitutes the body or principal part of the abrading-device, and they are readily formed by striking up portions of the disk which is usually of sheet-steel, the edge of the struck-up portion forming the rasp or knife, and the hole made by striking up the metal being the lint outlet. There is an outlet, $g^2$, in the casing opposite the space between the brush and disk for the discharge of the denuded seed, and another opening, $g^3$, may be formed in the lower part of the casing through which dirt collecting in the chamber H can be discharged. The joint between the rim, $c^5$, of the disk and the shell of the casing is suitably closed by means of the flange or packing ring $g^4$. Any other suitable means may be employed to prevent the air from being drawn, to an undesirable extent, between the periphery of the disk and the shell of the casing.

I represents a flue leading from the chamber H to a chamber J. This last named chamber contains a fan, K, attached to a shaft, $k$, and rotated preferably by means of a belt, not shown, leading to a pulley $k'$, attached to the shaft $k$. The flue I is for delivering the lint from the chamber H, and the fan K is a suitable air-moving device for drawing the air and lint through the disk into the chamber H and thence into the chamber J whence, through a suitable outlet, $j$, therefrom, the lint is discharged, all as indicated by the arrows $x$. The flue, I, is turned, and the shaft $k$ and fan arranged, as shown to bring the shaft $k$ parallel with the shafts D, E, and thus facilitate the application of the driving-power to all parts of the machine.

The disk C, is, in practice, made in sections, $c^{15}$, which are secured to a frame $c^6$, as shown. The back of the brush may also be in sections which are bound upon the head by means of the hoop $b^5$.

A certain amount of dirt and foreign matter is liable in practice to pass with the lint into the chamber H. This chamber not only serves as a passage for the lint but also as a dust-settling chamber, and quite a portion if not all of the dirt carried into it, by reason of its gravity, falls to the bottom of the chamber, and it may be withdrawn therefrom through any suitable outlet such as shown at $g^3$. This outlet, by any suitable means as by slide $g^5$ is adapted to be closed; saving when it is desired to withdraw the dirt from the chamber. To more thoroughly separate the dirt from the lint a beating-device may be employed, such for instance as shown at L, Fig. 5, but not shown elsewhere. This device may be any revolving wheel having means such as the paddles, $l$, for striking the lint and shaking the dirt therefrom. In the present instance the beater is shown secured to the hub of the disk C. But it may be otherwise constructed and operated to accomplish the desired purpose. If desired another beater, M, may be, and for an analogous purpose, arranged at some point in the lint-discharge flue in the vicinity of the fan K. In the present instance this last named beater is shown secured to the fan-shaft $k$.

In operation the seed to be delinted is fed at a suitable rate through the brush to be received between the brush and the disk. The lint is removed by the brush-teeth and the disk-projections jointly acting upon the seed, and the denuded seed is discharged through the outlet $g^2$ and the lint is drawn through the openings, $c'$, into the chamber H. The fan K exerts sufficient force to draw the lint from between the brush and disk and, *via* the chamber H and flue I into the fan-chamber and, ultimately, to dis-

charge it through the outlet, *j*, to any desirable point. The action of the fan is facilitated, and the lint more effectively discharged in the direction mentioned, by reason of the described rotation of the disk. Such rotation operates not only to agitate the particles of the lint, and to facilitate their transit through the disk-openings, but also to bring all portions of the disk equally into position for the suction of the fan to act most favorably thereupon. The inlet, *i*, to the flue I is, as seen, at one side of the chamber H, and, by reason of the revolution of the disk all parts thereof are successively carried into the most direct line between the brush and the inlet *i*, and there is no tendency to clog in any part of the disk.

The brush must be rotated at a sufficiently rapid rate to cut the lint from the seed, and the disk must also be rotated and in the opposite direction to that of the brush, but at a slower rate. In practice the brush is run from five hundred to six hundred revolutions a minute, and the disk from one hundred and eighty to two hundred.

I claim—

1. In a cotton-seed delinter, the combination of a revolving brush, an opposing perforated disk, revolving slower than the brush and in an opposite direction, and an air-exhausting device, said brush and disk being adapted for jointly effecting the separation of the lint from the seed, and said air-exhausting device withdrawing the detached lint through the disk, substantially as described.

2. The combination of the trough for receiving the lint-bearing seed, the casing, the passage leading from said trough to said casing, the revolving brush having the central opening, the opposing perforated disk, revolving slower than the brush and in an opposite direction, the chamber within the casing in the rear of the disk, the air-exhausting device, and the flue connecting said chamber and device, said casing having an outlet for the denuded seed, substantially as described.

Witness my hand this 13th day of September, 1892.

HUGH L. FOX.

Witnesses:
C. D. MOODY,
A. BONVILLE.