(No Model.) 3 Sheets—Sheet 1.

J. M. GARDNER.

MACHINE FOR BOLLING AND CLEANING COTTON.

No. 458,339. Patented Aug. 25, 1891.

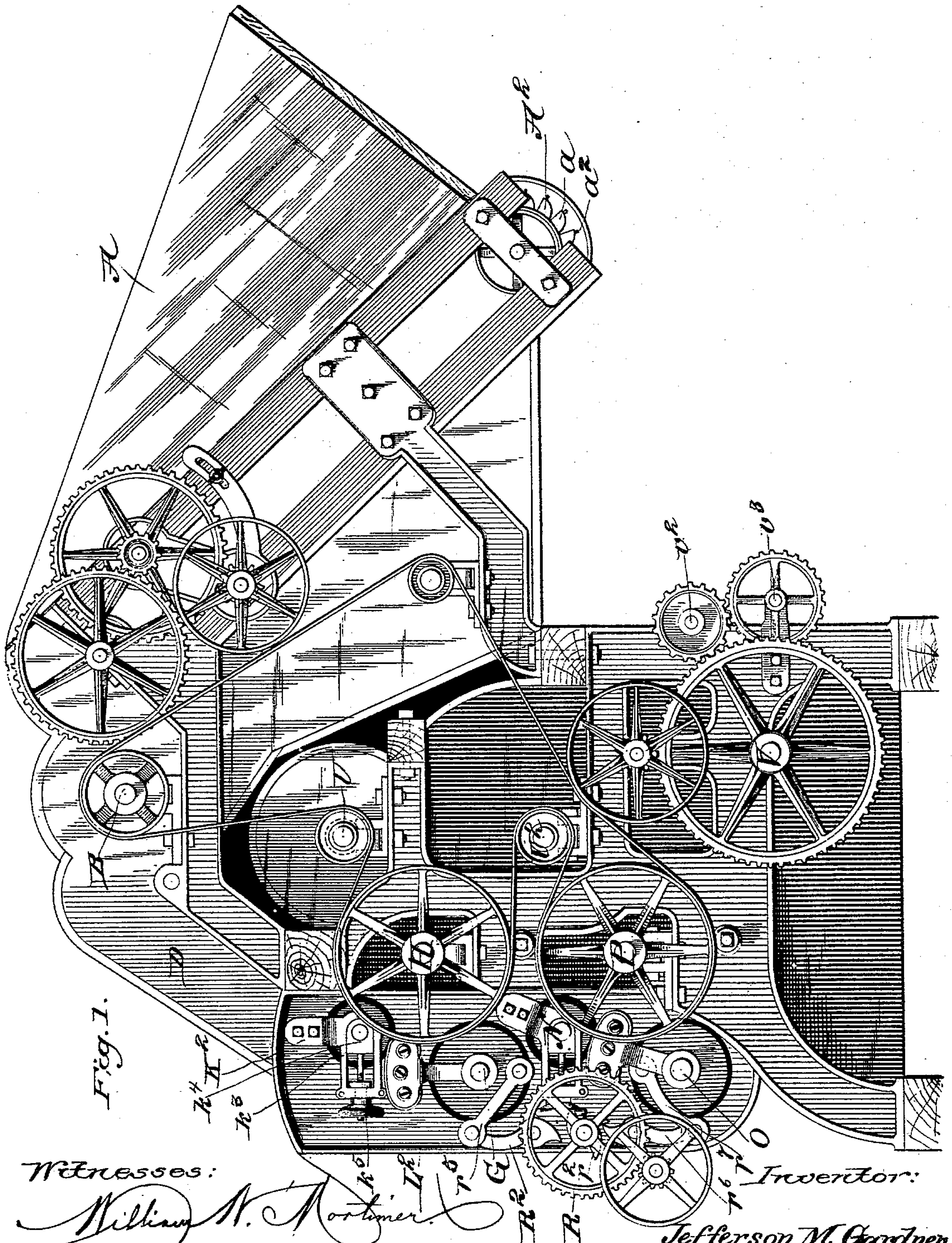

Fig. 1.

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Inventor:

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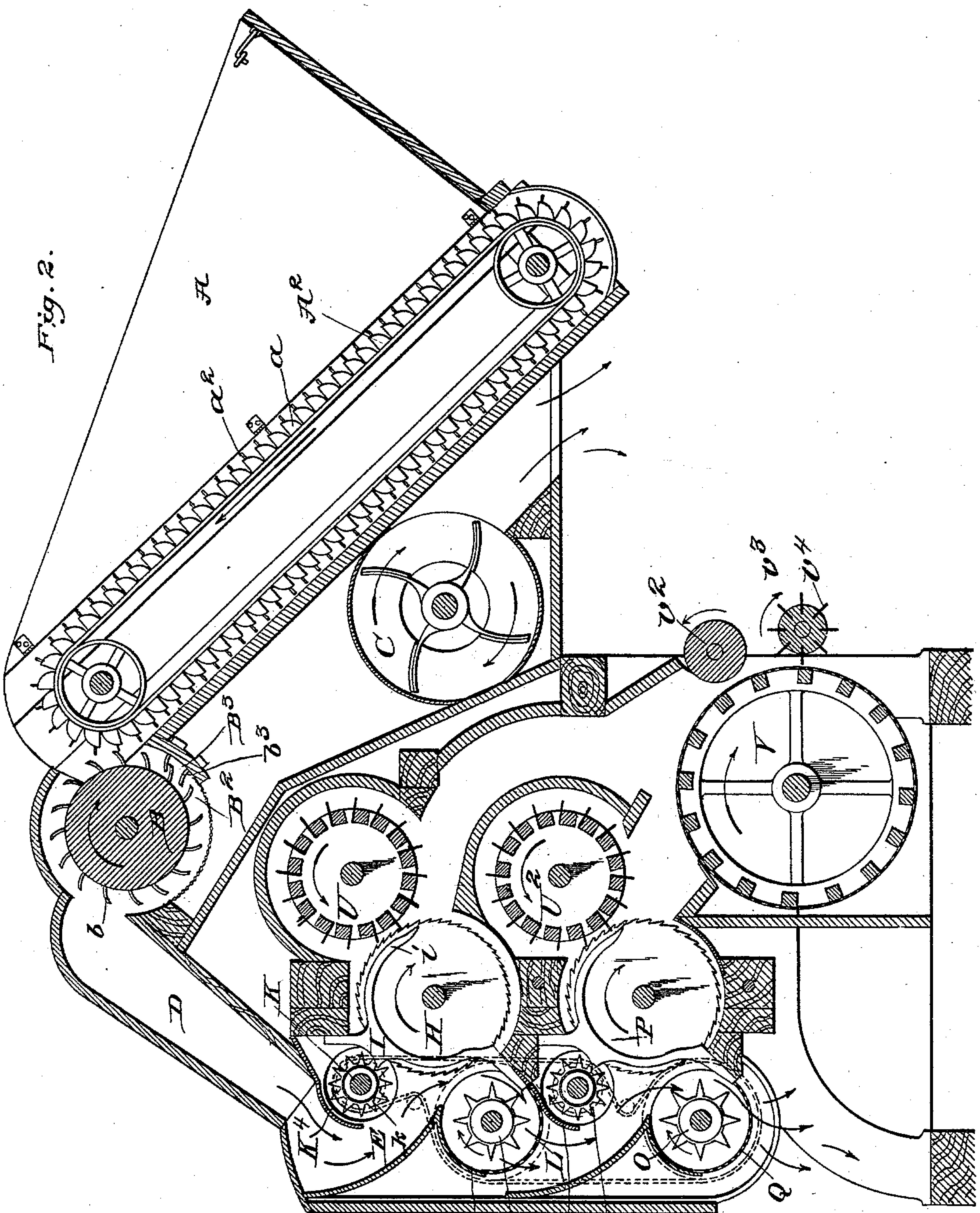
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.

Fig. 4.

on line 4-4

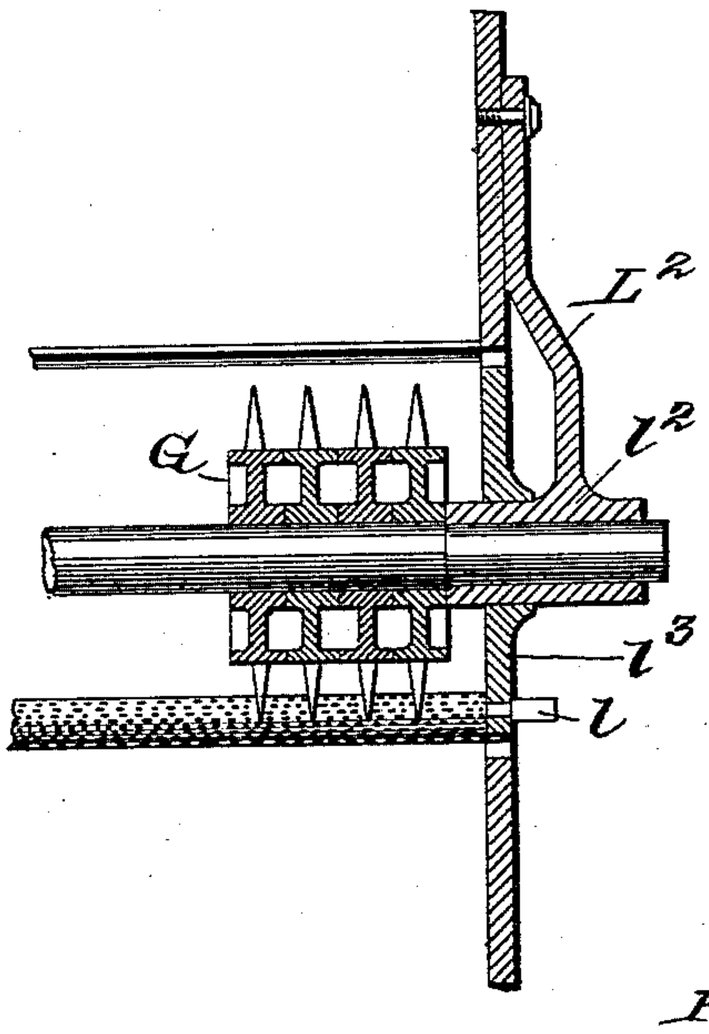
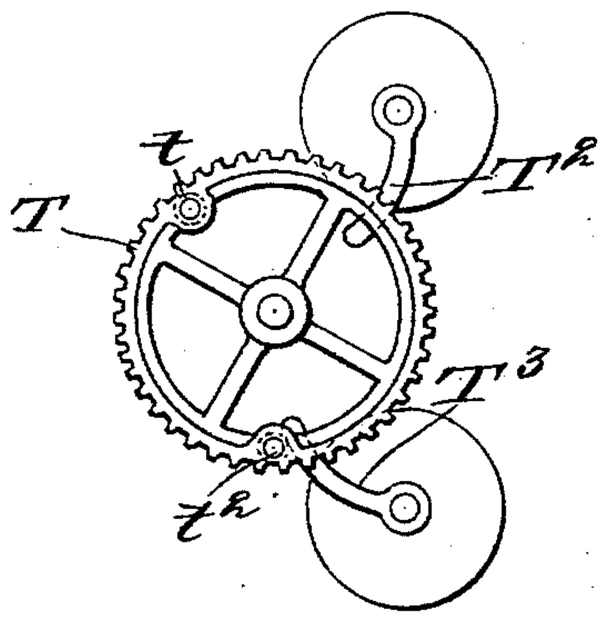


Fig. 5.



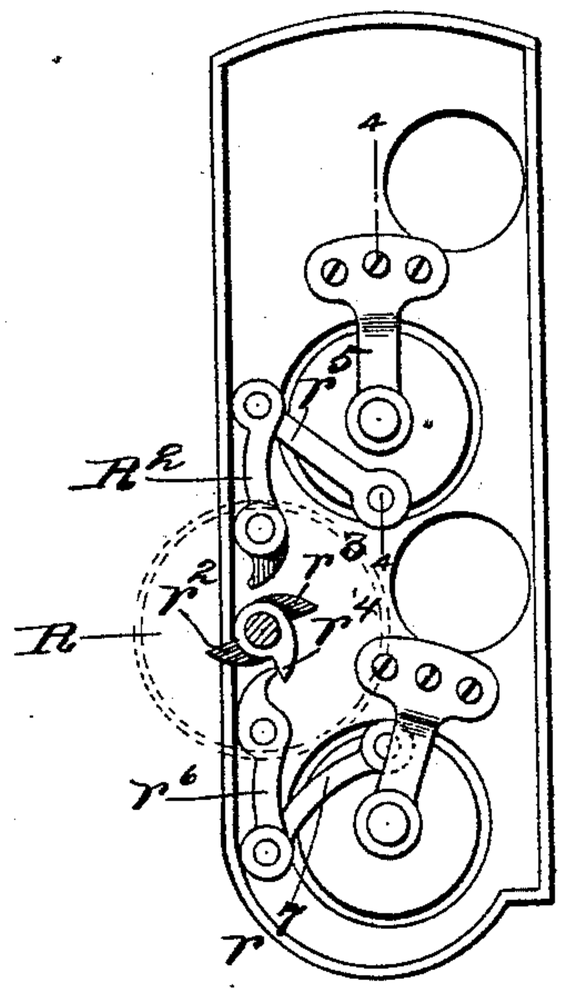
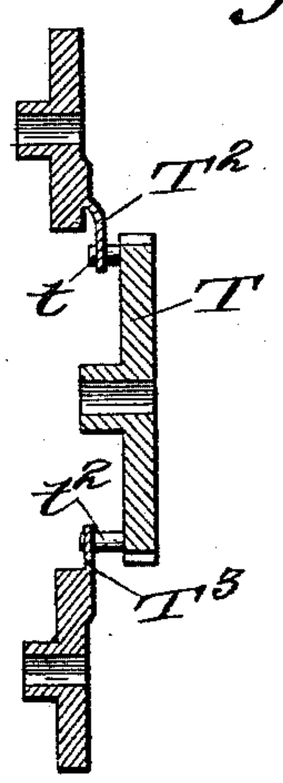


Fig. 6.



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UNITED STATES PATENT OFFICE.

JEFFERSON M. GARDNER, OF NASHVILLE, TENNESSEE.

MACHINE FOR BOLLING AND CLEANING COTTON.

SPECIFICATION forming part of Letters Patent No. 458,339, dated August 25, 1891.

Application filed February 4, 1891. Serial No. 380,230. (No model.)

To all whom it may concern:

Be it known that I, JEFFERSON M. GARDNER, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Machines for Bolling and Cleaning Cotton; 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.

This invention relates to machines for bolling and cleaning cotton.

The object of the invention is to produce a cotton-cleaner whereby the seed-cotton may be separated from the bolls, dust, and any foreign substance, no matter in what quantities such refuse may be present in the cotton.

Furthermore, the object is to produce a cotton-cleaner so constructed that the seed-cotton may rapidly be extracted from the bolls, thus allowing cotton to be picked in the bolls and be separated by machinery, with great saving of time over the usual way of picking the seed-cotton from the bolls in the fields.

With these objects in view the invention consists, essentially, in a machine comprising two or more saw-cylinders, arranged one above the other, and toothed rollers whereby the cotton is projected against the saws.

Furthermore, the invention consists in a machine comprising a feeding device, and two or more saw-cylinders arranged one above the other; also an automatic feed device by which the cotton is allowed to pass from one series of saws to the other.

Furthermore, the invention consists in a cotton-cleaner comprising two or more saw-cylinders, each provided with appropriate ribs between the saws, toothed rollers arranged to have their projections extend between the ribs at projections on the ribs, and a toothed cylinder arranged adjacent to each saw, whereby the cotton is thrown against the saws, the said toothed cylinders being inclosed in a casing having an opening toward the saws.

Furthermore, the invention consists in a cotton-cleaner comprising two or more saw-cylinders arranged one above the other, rapidly-revolving toothed cylinders arranged adjacent to each saw-cylinder, the toothed cylinders being inclosed in a casing having an opening adjacent to the saws, and the casing of each cylinder being provided with a movable bottom, and, finally, the invention resides in various novel details of construction whereby the objects of this invention are attained.

In the accompanying drawings, Figure 1 is a side elevation of a machine constructed in accordance with my invention. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a detail view, showing the means of operating the movable bottoms of the casing inclosing the toothed cylinders. Fig. 4 is a detail sectional view, the section being taken on the line 4 4 of Fig. 3. Figs. 5 and 6 are detail views of a modified form of device for operating the movable bottoms of the casings for the toothed cylinders.

In the drawings, A represents a hopper, into which the cotton to be cleaned is placed, and A^2 represents an endless belt provided with slats *a*, having projecting pins a^2, whereby the cotton is engaged and carried upward to a rapidly-revolving cylinder B′, provided with teeth *b* and arranged to revolve in a chamber B^2, the concave bottom B^3 of which is formed of perforated metal, wire-net, slats, or the like. The bottom of the chamber B^2 adjacent to the portion B^3 is provided with teeth b^3, which in connection with the teeth from the cylinder B serve to break up the bolls, &c., passing into the chamber B^2.

Arranged beneath the chamber B^2 is a suction-fan C, communicating with the chamber B^2 through a suitable trunk, the purpose of this fan being to carry away any dust, leaves, or fine dirt which may be carried with or adhere to the cotton when introduced, and which is freed by the action of the teeth of the cylinder B. From the chamber B^2 the cotton is carried through a downward passage D to an upper chamber E, the lower portion of which is formed by the casing F, open at one side and having mounted in it a toothed cylinder G, by which the cotton and bolls are caught and carried around rapidly in the casing and are thrown out at each revolution against saws H, which are provided with suitable ribs I,

each rib having an extension *i* protruding rearward in a curved direction corresponding to the circumference of the saws and terminating adjacent to brush U, by which the cotton is removed from the saws. The purpose of these curved extensions of the ribs is to maintain the seed-cotton and lint after they are drawn through the ribs at the periphery of the saws and prevent them from falling between the saws until they are removed therefrom by the brushes.

In the upper portion of the chamber E is a toothed cylinder K, the teeth *k* of which pass between the ribs I at about the point where the cotton engaged by the saws passes between the ribs. The cylinder K serves the purposes of regulating the size of the opening through which the cotton is to be drawn and of preventing any clogging of the cotton at the point where it passes between the ribs. This cylinder K is mounted in adjustable bearings, consisting of the brackets K^2, secured to the frame of the machine and provided with yokes k^3, in which slides the block k^4, that forms the bearing of the shaft of the cylinders. At the end of the bracket K^2 is a swiveled screw-rod and nut k^5, attached to the block k^3, by which the position of the roller K relative to the saws is regulated. The throwing of the cotton against the saws continues so long as it remains in the chamber, and at predetermined intervals a movable portion L in the bottom of the chamber E is displaced, leaving an opening, through which the bolls and any remaining seed-cotton are dropped into a lower chamber M, corresponding to the chamber E. This chamber M is provided with toothed cylinder below, saws, ribs, toothed cylinder above, and has adjacent brushes, (these parts being marked, respectively, O P N U^2,) the same as the chamber E. The bottom of the chamber M is provided with a movable portion Q, corresponding to that of the chamber E. At the points where the cotton enters the chambers E and M are fenders K^4 and N^2, which respectively serve to prevent the cotton when entering the chambers from being engaged by the toothed cylinders K and N and allow the same to fall to the bottoms of the chambers, there to be engaged, respectively, by the toothed cylinders G and O. The mechanism by which the movable bottoms are operated is of such construction that the movable portion L of the chamber E is displaced twice to each displacement of the movable portion of the chamber M and the two chambers are never to be open at the same time. The means for accomplishing this displacement are shown in Fig. 3 of the drawings. In this figure the dotted lines represent a toothed wheel R, upon the shaft of which are mounted the three cams r^2, r^3, and r^4. The cams r^2 and r^3 are so arranged as to engage the lower end of a lever R^2, connected by a link r^5 with the head of the movable bottom L of the chamber E. The cam r^4 is so arranged as to engage only the lever r^6, which is connected by a link r^7 with the head of the movable bottom of the chamber M. As there are two of the cams r^2 and r^3 engaging the lever R and but one cam r^4 engaging the cam r^6, the movable bottom of the chamber E will be displaced twice during each revolution of the shaft of the wheel R, while the bottom of the chamber M will be displaced but once during each revolution. The purpose of this is to insure the perfect and complete engagement of all the seed-cotton by the saws and the complete separation of the seed-cotton from the bolls and from matter which may be carried with the cotton, and to prevent discharge of any lint with the refuse matter when the final discharge at the bottom of the chamber M takes place.

In Fig. 4 of the drawings I have illustrated by a detail sectional view the manner in which the movable bottoms L and Q of the chambers E and M, respectively, are arranged. In this figure L^2 represents a bracket secured to the outside of the casing of the machine and provided with a bearing l^2 for the shaft of the rollers G and O. Around each bearing l^2 is placed a collar or head l^3, provided with a projection *l*, to which are attached means for shifting the positions of the movable heads. To this collar or head are attached the movable bottoms. As the bottoms are attached only to the lower portions of the heads, their own weight will return them to their normal position after displacement.

In Figs. 5 and 6 of the drawings I have illustrated a modified form of device for accomplishing the displacement of the movable bottoms of the chambers E and M.

In the modified form a wheel T is provided with two pins *t* t^2, and the projections T^2 and T^3 are connected, respectively, with the movable bottoms of the chambers E and M. The pin t^2 is shorter than the pin *t*, and the arm T^3 is arranged a sufficient distance from the wheel T to escape the pin *t* and at the same time is near enough to be engaged by the longer pin *t*, while the projection T^2 is arranged a suitable distance from the wheel to be engaged by both pins. By this arrangement it will be seen that the movable bottom of chamber E is displaced twice during each operation of the wheel, while that of the chamber M is displaced but once.

From both the upper and the lower brushes the cotton taken from the saws is thrown upon a revolving cylinder V, provided with a wire or perforated covering, between which and a presser-roller v^2 the cotton passes downward and is taken off by a stripper v^3, being a wheel provided with leather projections v^4,

The real point of the part of the invention which has reference to the opening of the two or more chambers like E and M is that the one receiving the greater quantity of stock to be operated upon shall open more frequently than the next, and so on down, and so that the chambers open properly according to quantity of stock, as above, it is im-

material whether the chambers open by sliding, hinged, or other gates, and the chambers may be combined with card-clothed, toothed, or other cylinders instead of with saws.

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

1. A cotton-cleaner comprising two or more series of saws arranged one above the other, chambers for receiving the cotton while being operated upon, the chambers being provided with movable bottoms, and means for automatically opening the bottoms, substantially as described.

2. A cotton-cleaner comprising two or more chambers for receiving the cotton, each provided with a series of saws and ribs on one side, and a toothed roller arranged adjacent to the saws and having its teeth projecting into the space where the cotton passes between the saws and the ribs, substantially as described.

3. A cotton-cleaner comprising two or more series of saws arranged one above the other, chambers for receiving the cotton while being operated upon, the chambers being provided with movable bottoms, means for automatically opening the bottoms, and a toothed roller arranged in each chamber adjacent to the movable bottoms, whereby the cotton, after being acted upon once by the saws, is thrown against them to be acted upon again, substantially as described.

4. A cotton-cleaner comprising two or more chambers arranged one above the other, a series of saws projecting into each chamber, toothed cylinders whereby the cotton is thrown against the saws, each chamber being provided with a movable bottom, projections from the movable bottoms, and revolving pins or cams engaging projections from the movable bottoms, whereby the bottoms are displaced.

5. A cotton-cleaner comprising two or more chambers arranged one above the other, each chamber being provided with a series of saws and each being provided with a revolving toothed cylinder by which the cotton is thrown against the saws, each chamber being provided with a movable bottom attached to a revolving head, a projection from the head, and a wheel provided with cams or pins engaging the projections from the heads, whereby the bottoms are displaced, substantially as described.

6. A cotton-cleaner comprising two or more chambers arranged one above the other, a series of saws projecting into each chamber and provided with ribs, a revolving toothed cylinder for throwing the cotton against the saws, and a cylinder arranged at the point where the cotton passes between the saws and the ribs, substantially as described.

7. A cotton-cleaner comprising two or more chambers arranged one above the other, a series of saws projecting into each chamber and provided with ribs, a revolving toothed cylinder for throwing the cotton against the saws, a toothed roller arranged at the point where the cotton passes between the saws and the ribs, and fenders arranged over the toothed rollers, which are arranged between the saws and the ribs, substantially as set forth.

8. A cotton-cleaner comprising two or more chambers for containing cotton to be operated upon, each chamber being provided with means for separating the seed-cotton from the bolls and each being provided with a movable bottom, substantially as described.

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

JEFFERSON M. GARDNER.

Witnesses:

DAVID H. MEAD,

F. B. KEEFER.