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P. CARROLL.

MECHANISM FOR CLEANING COTTON.

No. 421,242. Patented Feb. 11, 1890.

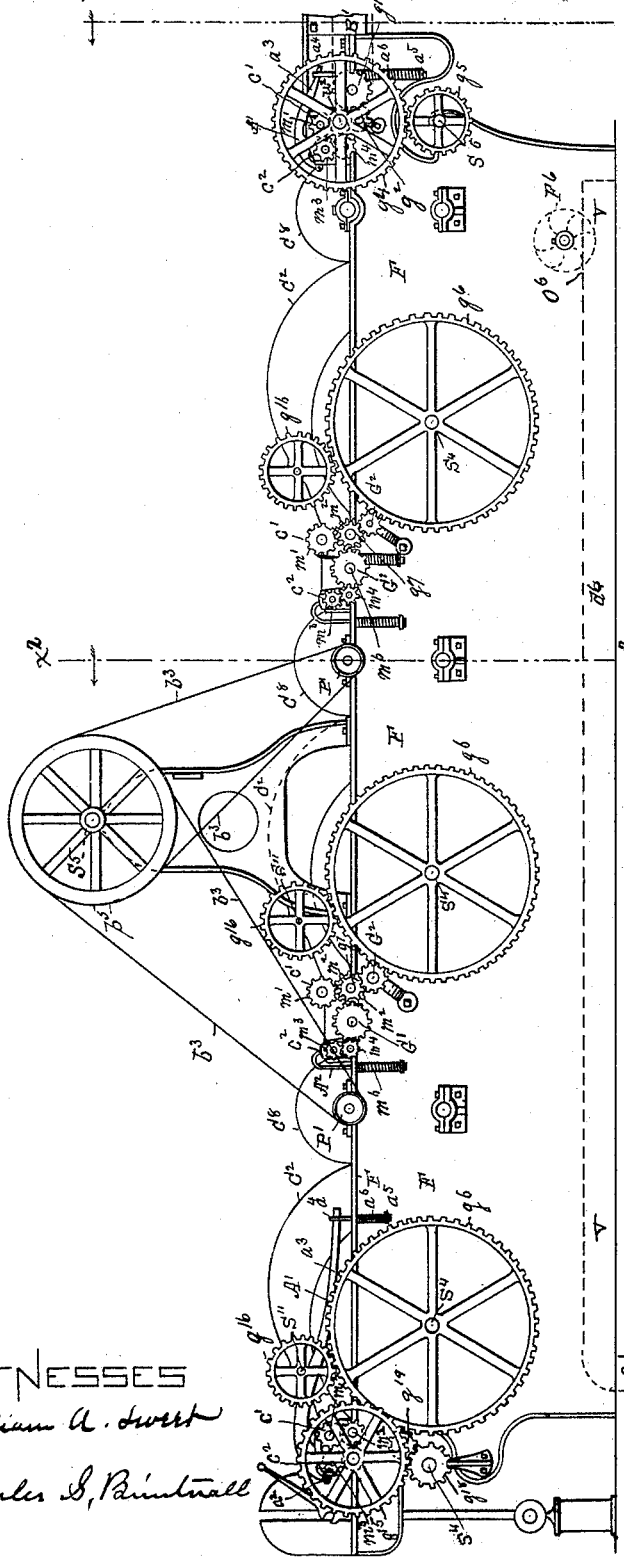

FIG 1

WITNESSES

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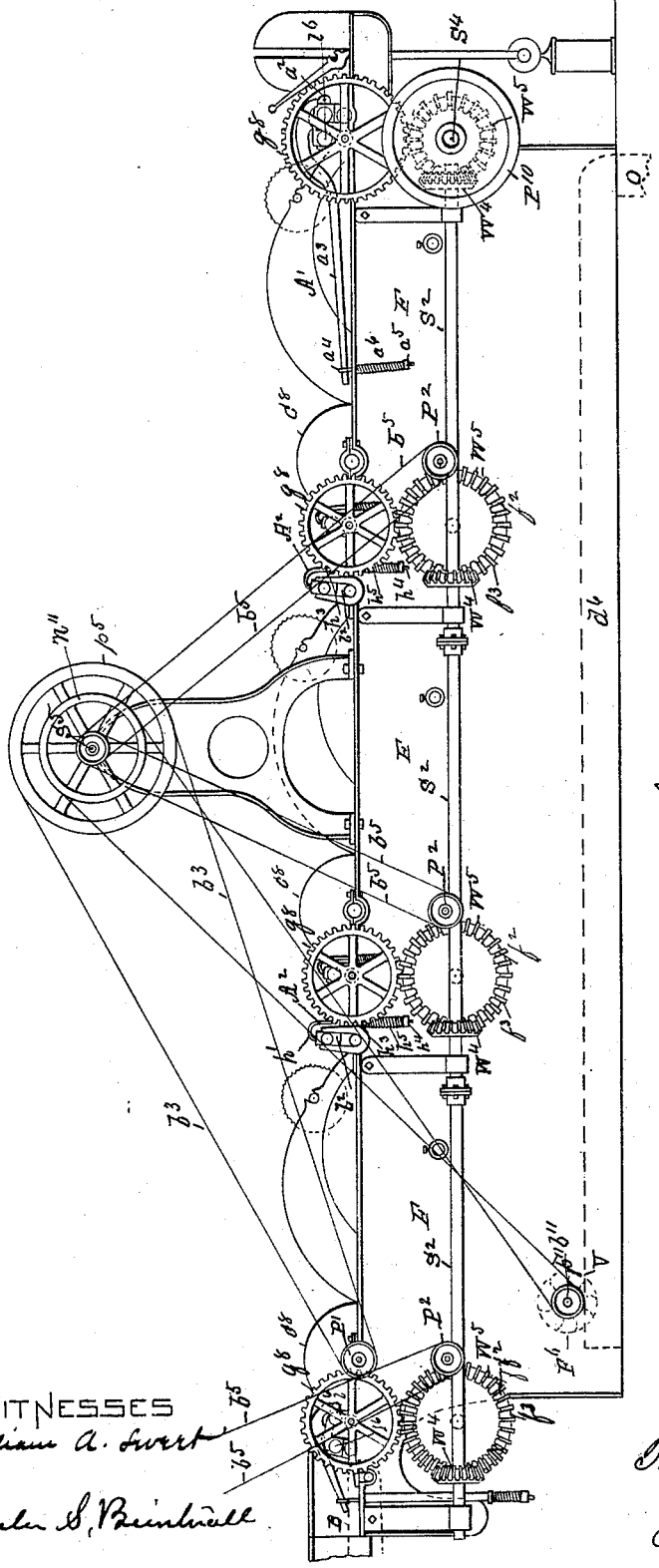

Fig 2

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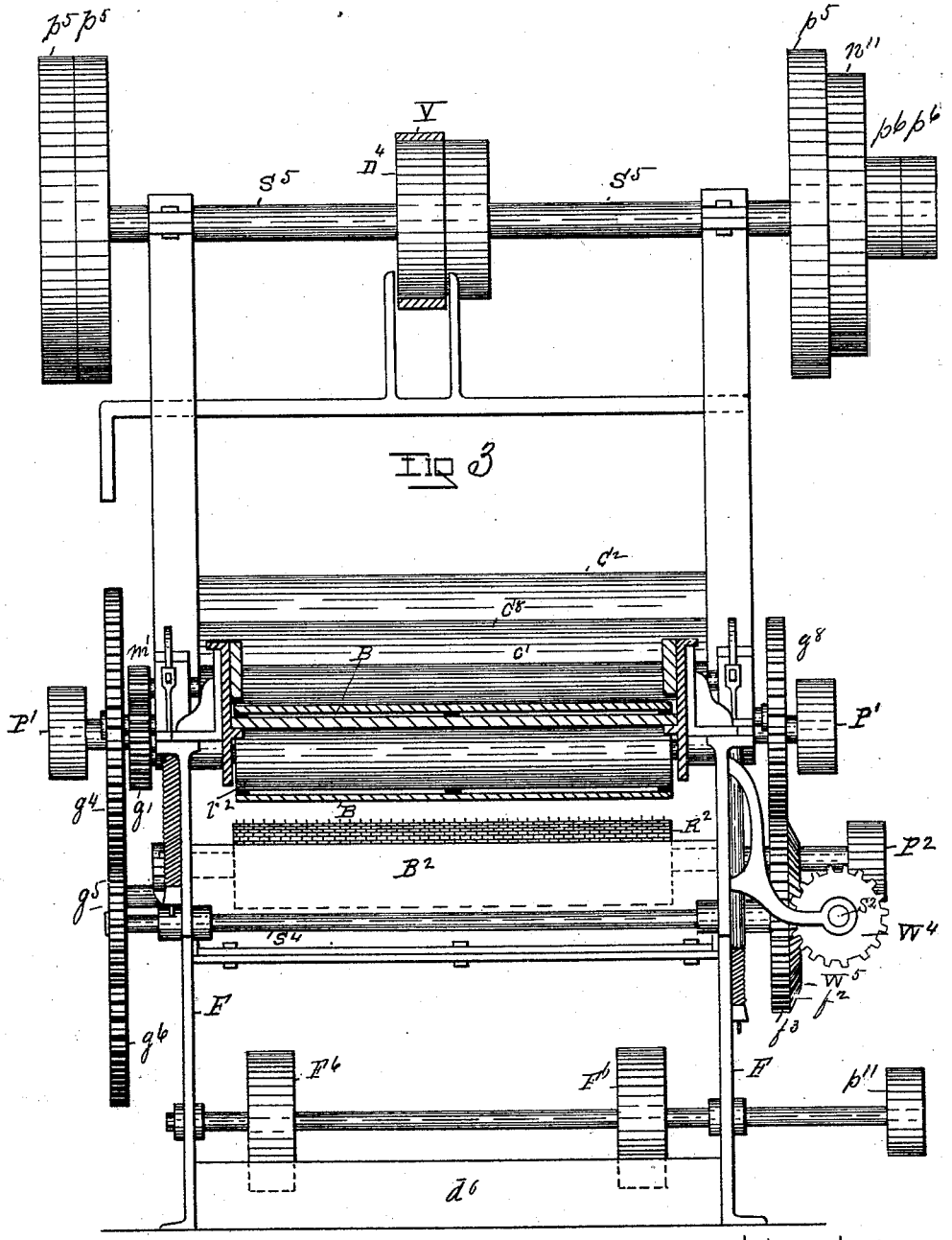

Fig 3

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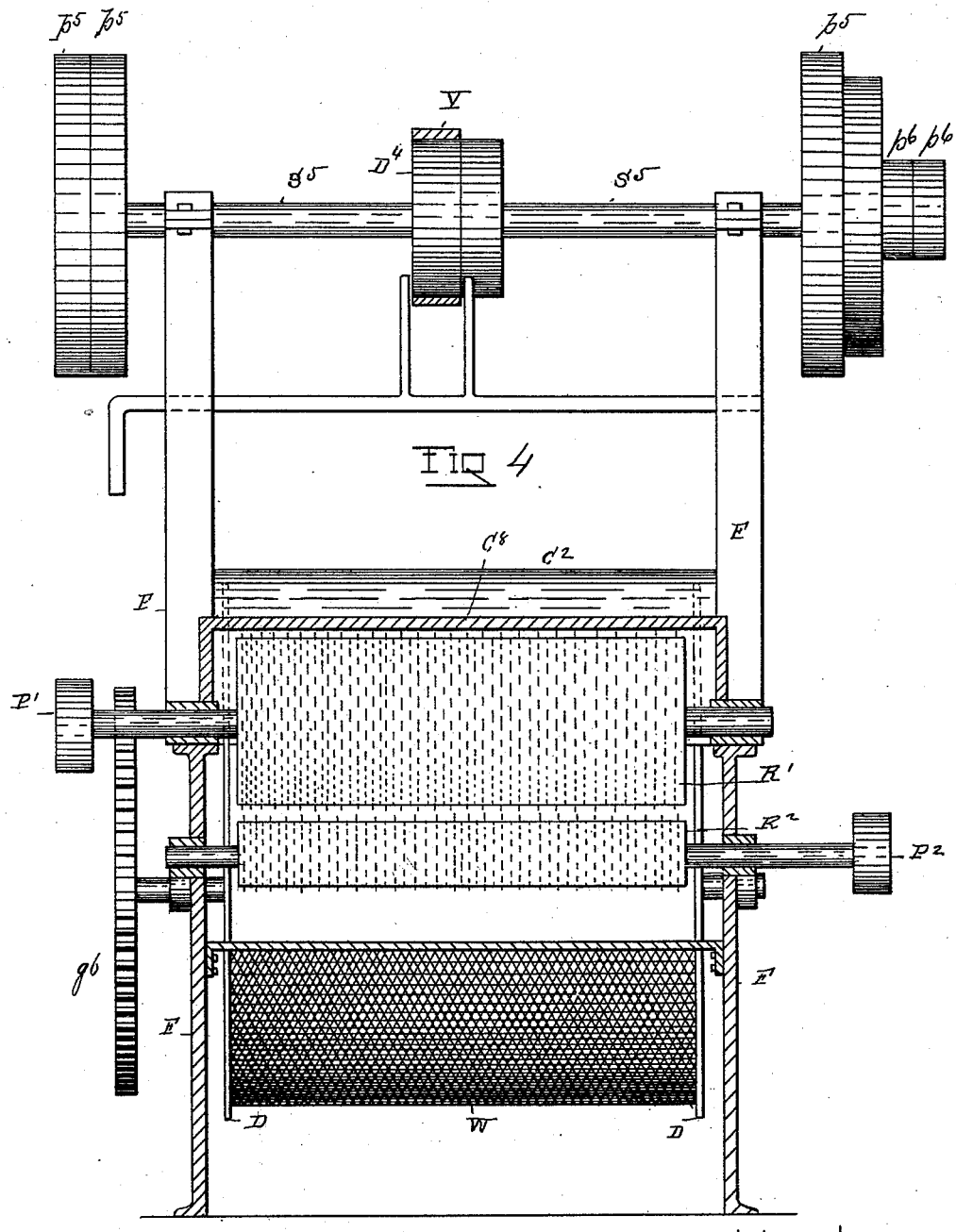

Fig 4

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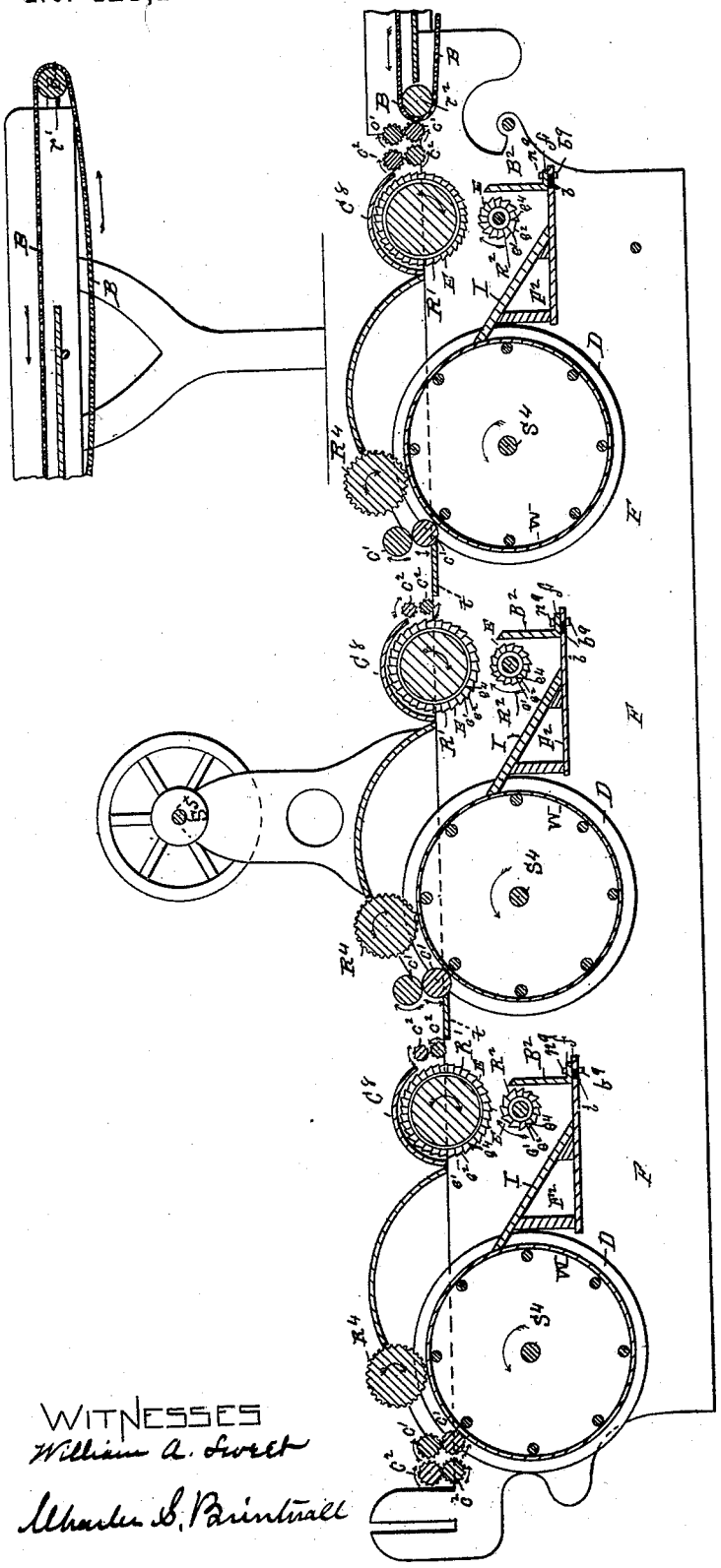

Fig 5

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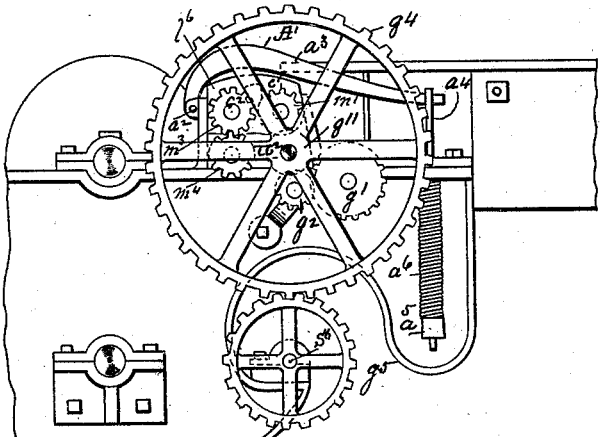

Fig 6

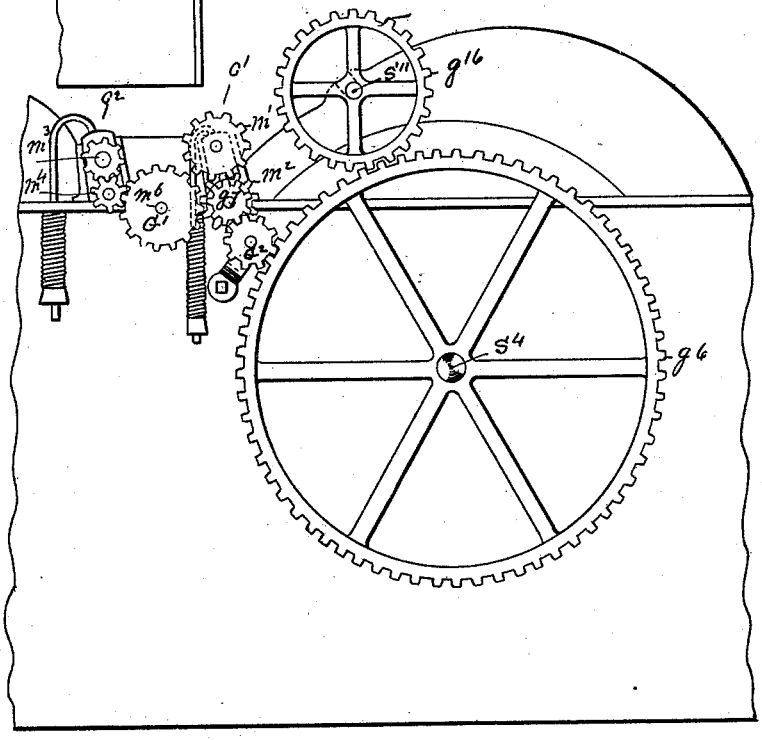

Fig 7

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UNITED STATES PATENT OFFICE.

PATRICK CARROLL, OF COHOES, NEW YORK.

MECHANISM FOR CLEANING COTTON.

SPECIFICATION forming part of Letters Patent No. 421,242, dated February 11, 1890.

Application filed September 13, 1888. Serial No. 285,270. (No model.)

To all whom it may concern:

Be it known that I, PATRICK CARROLL, of the city of Cohoes, county of Albany, and State of New York, have invented a new and useful Improvement in Mechanism for Cleaning Cotton, of which the following is a specification.

My invention relates to a mechanism for working and cleaning cotton to fit the same for batting-machines or for spinning, it being the object and purpose of my invention to clean the cotton rapidly, to remove the seeds, and to separate the bunches and knots therefrom without the usual and ordinary operation of beating.

Accompanying this specifiation, to form a part of it, there are six sheets of drawings containing seven figures illustrating my invention, with the same parts designated by the same letters in all of them.

Of these illustrations, Figure 1 shows a partial side elevation of the mechanism containing my invention, and in which three sets of like machinery are illustrated, to operate on the material being treated connectedly and in sequence. Fig. 2 is a side elevation of the same mechanism, taken from the side opposite to that shown at Fig. 1. Fig. 3 is a cross-section taken on the line x' x' of Fig. 1 through the machine-frame and conveying belt or apron, with the other parts (seen in the direction of the indicating-arrow) illustrated in elevation. Fig. 4 is another cross-section taken on the line x^2 x^2 of Fig. 1 through the machine-frame and the cover of one of the upper cleaning-rollers, with the rest of the parts (seen in the direction of the indicating-arrow) illustrated in elevation. Fig. 5 is a longitudinal central vertical section taken through the mechanism illustrated in Figs. 1 and 2, and with the addition thereto of a section of that part of the conveying apron and table which is broken off from the main figure. Fig. 6 is an enlarged representation of the gears which operate the entering set of fluted conveying-rollers and the conveying belt or apron. Fig. 7 is an enlarged representation of the gears that operate the screen-drum, the fluted pressing-roller thereof, and the two adjacent pairs of fluted conveying-rollers.

The several parts of the mechanism thus illustrated are designated by letter reference, and the function of the parts is described as follows:

The letter B designates an endless belt or apron adapted to run on the roller-pulleys r' and r^2, with its upper stretch moving toward the machine, as shown at Fig. 5 and in part at Figs. 1 and 2, the roller-pulley r^2 having upon one of its ends the actuating-gear g'.

The letters c' designate a pair of fluted conveying-rollers that are operated to receive the material being treated as it comes from the apron B, one of these rollers being arranged above the other and having thereon a gear which meshes into a gear on the other roller of the pair to operate them together. These gears are designated at m' m^2, and the arrangement thereof will be perceived by reference to the illustration in Fig. 1, showing the gears belonging to the rollers c' c' adjacent to the drum D.

The letters c^2 designate another pair of conveying-rollers arranged one above the other, and which are placed alongside of the pair of rollers indicated at c'. These rollers c^2 are connected by gears m^3 m^4, arranged upon their ends opposite to that at which one of them receives power. The function of these rollers c^2 is to receive the material from the rollers c' and to bring it under the influence of the cleaning-roller R'. These conveying-rollers c' and c^2 are shown in section at Fig. 5, and the actuating-gears thereof are shown at Figs. 1, 6, and 7. Both pairs of rollers c' and c^2 at the entering and discharging ends of the apparatus are fluted; but in each of the other instances where used the rollers c' are not fluted.

The letters R' and R^2 designate the cleaning-rollers of each mechanism of the series. These rollers are arranged one above the other, and are covered with card-clothing made of blades E, having a pointed outer edge e', one beveled edge e^2 and one straight edge e^4, with the last-mentioned facing in the direction of the roller's rotation, as indicated by the arrows at Fig. 5, so that the angular points on each roller point in the direction of rotation of the roller. These rollers are arranged with the largest roller R' above the

smaller roller R^2 and are geared to turn in the same direction on their axes, so that their adjacent surfaces will travel in opposite directions. These rollers serve their purpose best when the upper one is run at a speed of from sixteen to eighteen hundred turns per minute and the lower roller at a speed of from twelve to fourteen hundred turns per minute. The letter C^8 designates the cover of the upper roller.

The letter D designates a drum used in each set of mechanism of the series shown, and each of these drums is covered with a wire screen W, arranged on the cylindrical face thereof. Each of these drums has a shaft S^4, provided with bearings in the machine-frame F, said shaft having on one of its ends an operating-gear g^6. These drums are shown in section at Fig. 5, and are operated as will be hereinafter described.

The letters R^4 designate fluted pressing-rollers, of which there is one for each drum. Each of these fluted pressing-rollers R^4 is mounted on a shaft s^{11}, the latter having upon one of its ends the operating-gear g^{16}. These rollers are shown in section at Fig. 5, and the gears that operate them are illustrated at Figs. 1 and 7.

The letter A′ (see Fig. 6) designates a presser-arm pivoted at a^2 and therefrom extended laterally at a^3 to pass through an eye made in the vertically-arranged rod a^4. This rod passes down through the flange of the frame F so as to adjust vertically therein. It is threaded on its lower end and thereat provided with a nut a^5 and a spring a^6, which encircles said rod between the flange of the frame F and the top of the said nut. This arm A′ back of where pivoted and between the latter point and where it passes through the rod a^4 rests upon the bearing-boxes l^6 of the conveying-rollers c' and c^2, and elastically so, the measure of the pressure upon the bearing-boxes being regulated by the nut a^5.

The letter A^2 designates another form of presser-arm, the function of which is the same as that of the presser-arm A′. These presser-arms A^2 have a hook-form head h', which is projected downwardly to rest on the bearing-boxes of the conveying-rollers c^2 of each one of the series of machines excepting the ones at which the material enters to be treated and at which it is discharged. These presser-arms A^2 from the hook-form head h' are extended downwardly through the flange of the machine-frame F, so as to adjust vertically therein, the shank h^3 of the arm below the frame having a threaded end and nut h^4 and being encircled by a spiral spring h^5. As thus made, this presser-arm A^2 at its hook-form end bears elastically upon the bearing-boxes l^2 of such of the conveying-rollers c^2 as it is applied to, and the measure of its pressure thereon can be regulated by the nut h^4.

The letter B^2 designates a bit-board, which is used in connection with the cleaning-rollers R′ and R^2 of each mechanism of the series illustrated. Each of these bit-boards is projected upwardly from the floor F^2, and is constructed with a foot f, that is laterally projected from its lower end. These bit-boards are each made to be adjusted as to distance from the roller R^2 by means of a slot i in the floor F^2 and a bolt b^9 and nut n^9, which bolt is passed up through the slot and foot and secured in position by the nut. The function of this bit-board in each mechanism of the series is to form a divided-off area, into which the knot, bunches, and seeds which are torn out from the passing material by the action of the card-clothing on the roller R^2 may be thrown by the roller over the bit-board B^2. This bit-board as arranged in each mechanism of the series is shown in section at Fig. 5.

Heretofore open circular gratings have been arranged under the under cleaning-roller, through which the separated débris eventually found its way. I have substituted instead of the grating this vertically-arranged bit-board, having its upper edge extending to a line just below the top of the roller, so that the débris is thrown clear of the roller over the edge of the bit-board and not carried under, as in the case of a circular grating. The edge of the bit-board acting as a separator and the bit-board being solid, the current created by the rotation of the roller cannot draw the discharged stuff back under the roller.

The letter I designates an inclined platform arranged within the interior of each mechanism of the series. This inclined platform rises from the floor F^2, from where it extends under the roller R^2 to the drum-screen W, and the function of this inclined platform is to guide the material being treated to the screen-drum.

The several parts of the mechanism thus illustrated and described are actuated as follows: There are two driving-shafts proper, which are indicated at S^2 and S^5, the latter having its bearings in standards that are upwardly projected from the machine-frame F, and the shaft S^2 is located upon the side of the machine, as indicated at Figs. 2 and 3. The driving-shaft S^5 receives power from a driving-pulley D^4 and belt Y, as is shown at Figs. 3 and 4. The driving-shaft S^2 receives power from a pulley P^{10}, arranged on the shaft S^4, having thereon the beveled gear W^5 back of the said driving-pulley and a beveled gear W^4 on said shaft S^2, said gears W^4 and W^5 being shown by dotted lines in Fig. 2. The shaft S^2 has thereon a beveled gear W^4, that meshes into another beveled gear W^5, for each set of mechanism to drive the conveying-rollers thereof. Each of these beveled gears W^5 has one beveled face f^2 and one straight face f^3, the beveled face thereof meshing into one of the gears W^4 to receive power and the straight face f^3 thereof meshing into the gear g^8, arranged on the shaft of the lower roller of each pair of conveying-rollers c^2 (except-

ing that pair of these rollers in the last machine of the series) at the end of the latter opposite to that at which are located the gears m^3 m^4, and by means of which the rollers c^2 of each set, excepting the last, are driven, as illustrated at Figs. 1 and 2.

The conveying-rollers c^2 of the last mechanism of the series are operated by means of the gear g^{18} on the shaft S^4, the latter being operated by the gear-wheel W^5, meshing into the gear-wheel W^4 on the shaft S^2, said gear-wheel g^{18} meshing into the gear-wheel g^{15} on the shaft of the lower one of the pair of rollers c^2 of the last mechanism of the series.

The conveying-rollers c' of each of the series of mechanisms connect at the ends of their shafts by gears m' and m^2, arranged thereon to mesh into each other, and each pair of these rollers c' (excepting the pair operating in connection with the first and last series of the mechanisms) is actuated by the gear G', running on the pintle-shaft m^6, which gear meshes into the gear m^4 on the shaft of the lower roller of the adjacent pair of rollers c^2 to receive power from the latter, and also meshes into the gear m^2 on the lower roller of the pair c' of said second and third series of mechanisms.

The pair of conveying-rollers c', operating in connection with the first series of mechanisms, is actuated by the gear g^5, arranged on the shaft S^6, the latter being actuated by that one of the gear-wheels W^5 which receives power from the shaft S^2 through the gear-wheel W^4, located at the entering end of the mechanism. This gear g^5 meshes into a gear g^4 on the shaft u^2 of the lower roller of the pair c' of the first mechanism to operate said rolls.

The pair of conveying-rollers c' operating in connection with the last set of mechanisms is actuated by the gear-wheel g^8, arranged on the shaft of the lower roller of the pair, said gear-wheel g^8 receiving power from the gear-wheel W^5, the latter meshing into the adjacent gear-wheel W^4 on the shaft S^2.

The screen-drums of each mechanism of the series (excepting the last one of the latter) are operated by a gear G^2, having a pintle-shaft, and which gear meshes into a gear g^7 on the shaft of the lower one of the conveying-rollers c', this gear g^7 being arranged on the shaft of said lower roller outside of its gear m^2 to receive power from said connection. This geared connection between the gear G^2 and the gear g^7 transmits power from the latter to the former, and the gear G^2 also operates the gear g^6 on the screen-drum shaft S^4 to operate the latter. This gear g^6 meshes into the gear g^{16} on the shaft of the roller R^4 to actuate the latter.

The screen-drum of the last machine of the series is operated by the gear g^{18}, which meshes into the gear g^{19}, and the latter into the gear g^6 on the screen-drum shaft to actuate the latter, and the gear-wheel g^{16} on the roller R^4 of the last machine of the series meshes into the said gear g^6, adjacently located, to operate said roller R^4.

The belt or apron B is operated as follows: The letter g^5 designates a gear on the shaft S^6, operated by one of the beveled gears W^5, as before described, and this gear g^5 meshes into a gear g^4 on the shaft u^2 of the lower one of the first pair of rolls c' outside of its gear m^2, and this gear g^4 has upon its inner face a pinion g^{11}, (indicated by a dotted line at Fig. 6,) and which pinion meshes into a gear g^2, having a pintle-shaft, and the latter meshes into the gear g' on the belt-pulley roller r^2, to communicate motion to the belt or apron B.

The upper cleaning-roller R' of each set of mechanism excepting the one at the series where the material to be treated enters is operated by a belt b^3, running on a pulley P' on the shaft of said roller, and a pulley p^5 on the shaft S^5, as shown at Figs. 1, 3, and 4. The other one of the upper cleaning-rollers is operated by the belt b^3, running on its pulley P' and on one of the pulleys p^5 on the upper driving-shaft S^5.

The lower cleaning-rollers R^2 of the sets of mechanism illustrated are operated by pulleys P^2 on their shafts, and the belts b^5 running on the pulleys p^6 of the upper driving-shaft S^5, with the exception of that one of the lower cleaning-rollers which is located near the feeding-apron, which is operated by a pulley P^2 on its shaft and a belt b^5 running to a pulley. (Not shown.)

The letter F^6 designates a revolving fan or fans operated by the belt b^{11} on a pulley p^{11} on the fan-shaft, said belt receiving power from a pulley n^{11} on the shaft S^5.

The letter d^6 designates a duct, into which the blast of the fan or fans goes to carry away the dust set free by the action of the cleaning-rollers upon the material being treated. This fan or fans take air and dust from the frame, forcing it into the inclosure V, which discharges at O. This inclosure V extends along the floor upon which the frame of the machine rests, and also extends across the space inclosed by the sides of the frame F. It receives dust and floating material from the action of the fan or fans at O^6 and discharges the same under the current impulse produced by the fan at O. I am aware that a current of air operated by a fan for the same uses is an old application.

In the accompanying drawings there are shown three sets of cleaning-rollers, each set being arranged to operate in connection with a bit-board and screen-drum, and each set of them to operate connectedly and in sequence, and this operation is described as follows: The material, being placed upon the apron or belt B, is moved into the first set of conveying-rollers c', from which it passes to the second set of conveying-rollers c^2, to be caught by the card-clothing upon the cleaning-roller R' of the first set of mechanism in the series illustrated. This roller R' moves rapidly, and as it draws in the material it straightens out its fiber and

combs it, and the material then passes downwardly as moved by the roller R′ until it comes under the action of the roller R^2, moving in a direction opposite to that of the upper roller at the points adjacent, so that the material is combed by two rollers running at high speed and in opposite direction of rotation. The effect had upon the material is that as the lower roller tears through it seeds, knots, or bunches are caught and thrown out over the bit-board. Thus combed and cleaned by the rollers R′ and R^2, the material, with its fiber opened out, is by the incline I guided to the screen W on the drum D, and is carried around on the latter to be pressed by the fluted roller R^4 into a bat, and then taken from the screen by the conveying-rollers c' of the second set of mechanism, from which rollers it passes across board t to the pair c^2 of the second mechanism, from which it is delivered to the cleaning-rollers of the latter to be treated as before, and thence to the third mechanism, from which it is delivered from the conveying-rollers c^2 of that mechanism.

The function of the presser-arms A′ and A^2 being to bear elastically upon the bearing-boxes of the conveying-rollers, any other well-known form of arms adapted to perform the same function in substantially the same manner may be used.

While I have shown and described a series composed of three machines operating in the same manner connectedly, if desired, one machine can be used and perform good service, although better results are had by a series of them working connectedly.

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

1. The combination of the cleaning-roller R′, provided with card-clothing, the lower cleaning-roller R^2, provided with card-clothing, said rollers being actuated to rotate on their axes in the same direction and with their adjacent points moving in opposite directions, the rollers c' c^2, and the vertically-arranged bit-board B^2, substantially as described, and for the purpose specified.

2. The combination of the cleaning-rollers R′ R^2, provided with card-clothing and actuated to turn on their axes in the same direction and with their adjacent surfaces moving in opposite directions, the floor F^2, having inclined platform I, the bit-board B^2, the screen-drum D, and the fluted presser-roller R^4, substantially as and for the purpose specified.

3. The combination of the cleaning-rollers R′ and R^2, mounted one above the other, with their adjacent faces moving in opposite directions, the floor F^2, having the vertically-arranged bit-board B^2 and inclined platform I, and the screen-drum D, substantially as and for the purpose specified.

Signed at Troy, New York, this 1st day of June, 1888, and in the presence of the two witnesses whose names are hereto written.

PATRICK CARROLL.

Witnesses:
W. E. HAGAN,
CHARLES S. BRINTNALL.