No. 681,194. Patented Aug. 27, 1901.

D. S. CHAPIN.

ROLLER COTTON GIN.

(Application filed Aug. 13, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

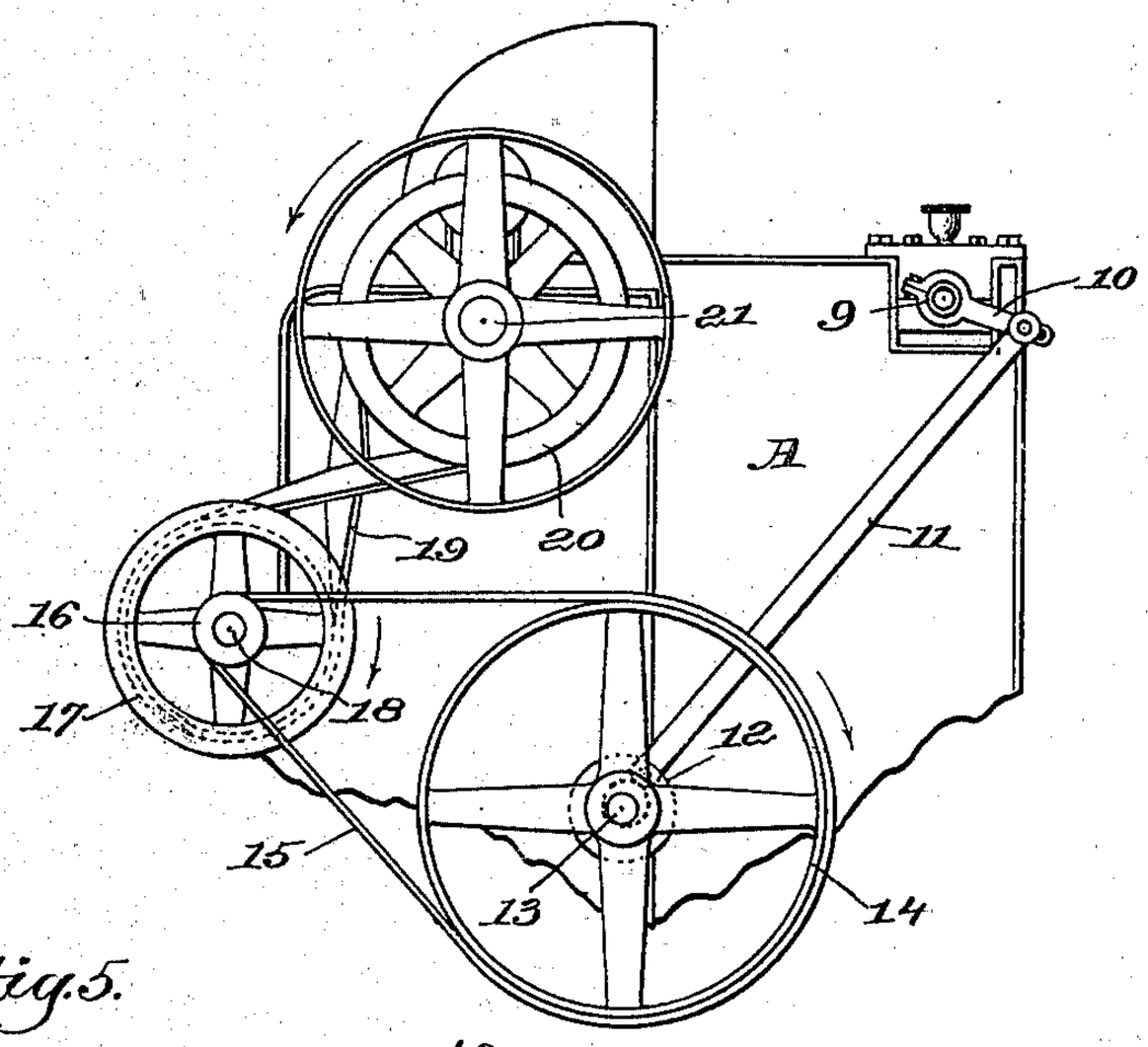


Fig. 5.

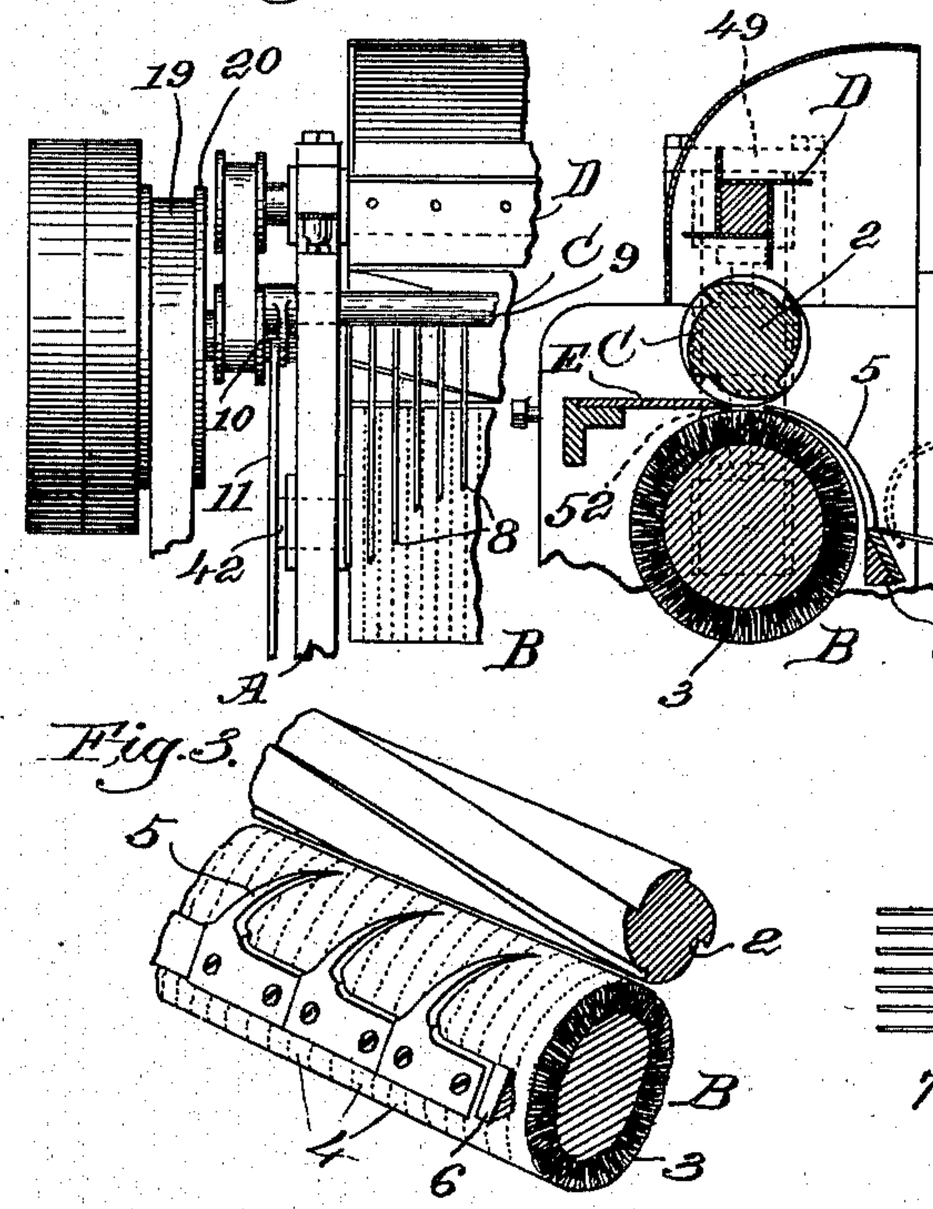


Fig. 2.

Fig. 6.

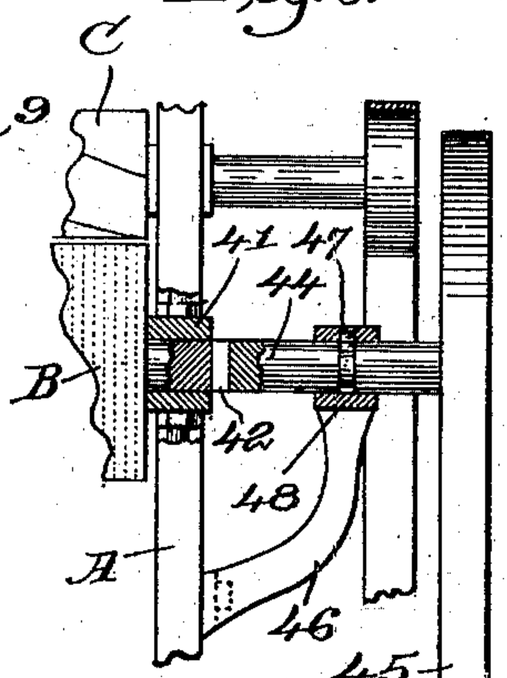


Fig. 3.

Fig. 4.

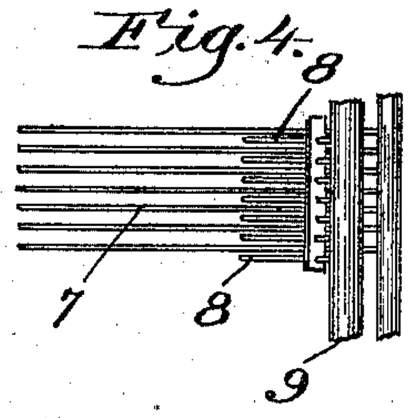
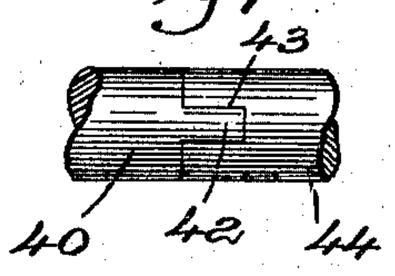


Fig. 7.



Witnesses:
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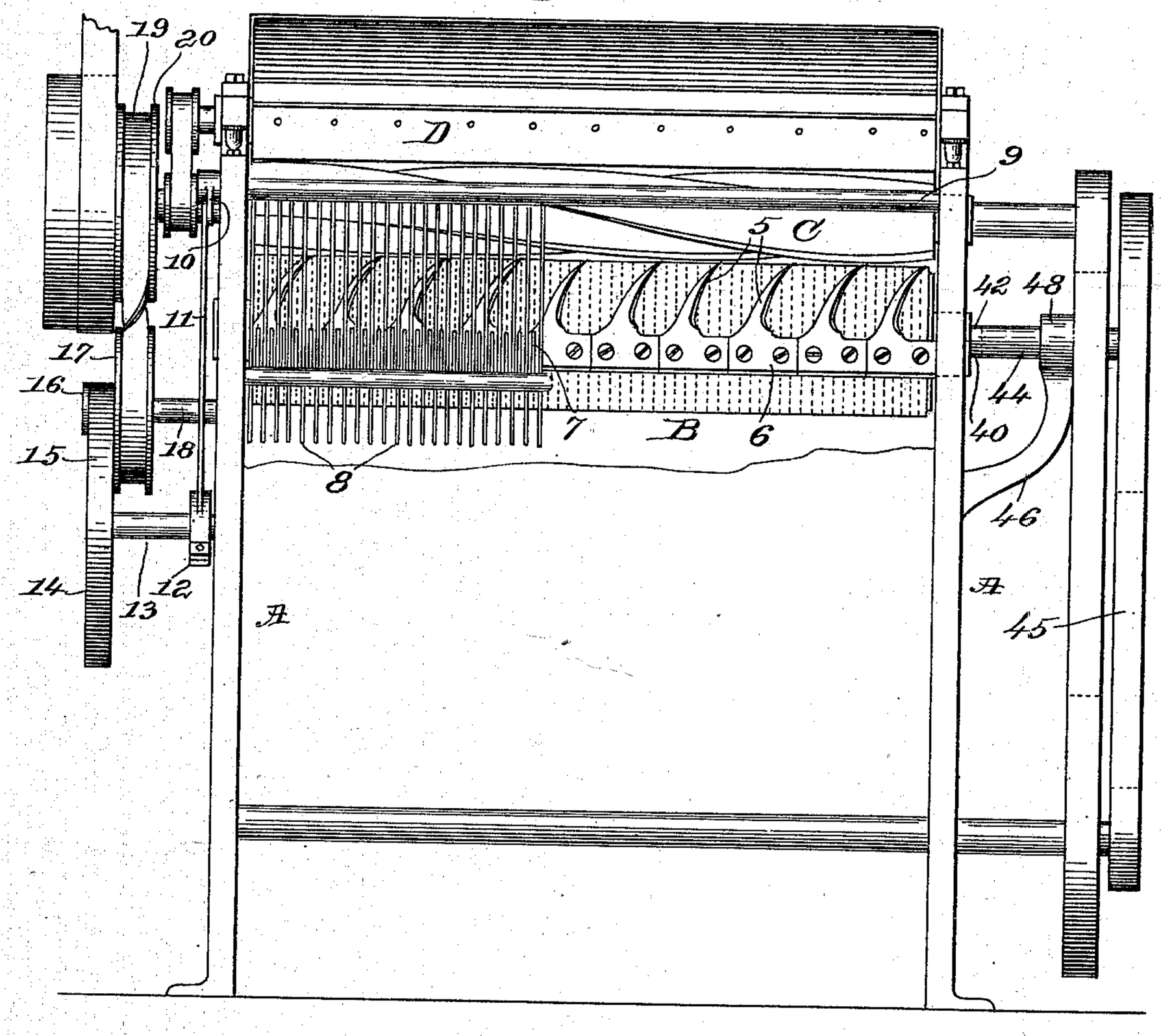
Fig. 8.



Witnesses.
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UNITED STATES PATENT OFFICE.

DANIEL SIMEON CHAPIN, OF MILFORD, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO EPHRAIM L. WIRES, OF SAME PLACE.

ROLLER COTTON-GIN.

SPECIFICATION forming part of Letters Patent No. 681,194, dated August 27, 1901.

Application filed August 13, 1900. Serial No. 26,675. (No model.)

To all whom it may concern:

Be it known that I, DANIEL SIMEON CHAPIN, a citizen of the United States, residing at Milford, county of Worcester, State of Massachusetts, have invented an Improvement in Roller Cotton-Gins, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to roller cotton-gins; and it has for its object to improve the existing machines of this class so as to render the same capable of a greater output; and it comprises, generally stated, a gin-roller having projecting from its periphery a series of fine wires, hairs, or bristles, the points of which engage the cotton fiber and carry the same to a point where it is acted upon by a rotary beater or stripper coöperating with the gin-roller, said stripper being in the form of a cylinder having on its periphery a series of shoulders or wings which operate to effectively strip the fiber from the seeds, said means operating in connection with a novel means for feeding the cotton to the roller, all as pointed out in the claims.

Figure 1 of the drawings is a partial end elevation of my gin. Fig. 2 is a vertical section of so much of a gin as is necessary to an understanding of my invention. Fig. 3 is a perspective of part of the roller and the beater. Fig. 4 is a detail of the fingers for feeding the cotton to the roller. Fig. 5 is a partial front elevation of one end of my gin. Figs. 6 and 7 are details showing the connection between the gin-roller and drive-shaft therefor. Fig. 8 is a front elevation of my improved gin with parts thereof broken away.

One of the best forms of roller-gins has been demonstrated to be that in which a rotary stripper having on its periphery a series of spirally-arranged wings or shoulders is used in connection with a rotating gin-roller, a gin of this type being illustrated in Patent No. 284,223, dated September 4, 1883, granted to G. N. Osgood; but a gin such as shown in said patent is not perfect in its action, by reason of the fact that the rapidly-rotating stripper, instead of stripping the seed from the cotton, tends to throw the cotton bodily back from the roller, the said roller being a smooth-surfaced one, and hence not having the proper construction to positively carry and hold the cotton against the stripper while the seeds are being knocked therefrom. To overcome this difficulty, I have used, in connection with a rapidly-rotating stripper having, preferably, spirally-arranged wings or shoulders on its periphery, a roller having on its surface a series of points, preferably made by incorporating in the roller during its construction fine wires, hairs, or bristles, the ends of which project slightly beyond the surface of the roller.

In the drawings, A designates part of any suitable gin-frame, which frame is adapted to support the gin-roller B and the coöperating stripper or beater C, the upper doffer D, and the seed-arrester E, said parts being driven in any suitable way—as, for instance, that shown in United States Patent No. 400,190, granted to me March 26, 1889. The stripper is carried on and is driven by the shaft 21, said stripper having a general cylindrical form and being provided on its periphery with a series of preferably spirally-arranged shoulders or wings 2, which operate during the rapid rotation of the said stripper to strip the seeds from the fiber and knock them back from the roller B.

As stated above, my roller B has projecting slightly from its periphery the ends of a series of fine wires, hairs, or bristles 3, which engage the cotton fiber as said roller is rotated and positively carry the same against and under the rotating stripper, the rough surface of the roller operating to hold the cotton in position to be acted on by the stripper and preventing any of the fiber from being thrown back with the seeds. One way of constructing such a roller is to cut out a series of disks 4 of any suitable material and secure the same on the core of the roller, placing between the disks during the construction of the roller layers of radially-arranged fine wires, hairs, or bristles, which are so placed as to project slightly beyond the surface of the roller. When the roller has been built up for its entire length, as above described, it is subjected to endwise pressure and the material held in such compressed state by any suitable collars on the end of the roller.

Fig. 2 shows a section of the roller through a layer of hairs or bristles.

The particular manner of constructing the roller is no part of my present invention, as this invention relates broadly to a gin having a rapidly-rotating stripper coöperating with a roller having hairs or bristles projecting from its surface.

With a roller such as above described coöperating with a stripper having spirally-arranged wings or shoulders I have found that the rough surface of the roller catches the cotton fiber and positively carries and holds the same against the stripper, the wings or shoulders of which in their rapid rotation strip the seeds from the fiber and throw them back from the roller, all the cotton fiber being carried through the machine and none being thrown back with the seeds, as it is when a smooth-surfaced roller is used.

It will be understood, of course, that any suitable doffer is used in connection with the roller B to clear the ginned cotton therefrom, and preferably I employ an upper doffer D, of any suitable construction, to prevent any unginned cotton from passing over the stripper C.

After a gin-roller such as above described has been in operation for some time the constant strain on the projecting ends of the wires or bristles, due to carrying the cotton up to the stripper, gives said ends a backward inclination with relation to the direction of rotation of the said roller, and hence the action of the roller becomes less perfect, the backwardly-inclined projecting points failing to positively carry the cotton up to the stripper and hold it while the said stripper knocks out the seeds. I have therefore provided my gin with a reversible roller, whereby when the projecting points have become backwardly inclined, as above stated, the roller may be taken out and turned end for end, in which new position the projecting ends of the points will have a forward inclination with reference to the direction of rotation of the roller.

Various ways of making the gin-roller reversible may be employed, the one shown being a preferred way.

The gin-roller B has projecting from each end a short journal or stub-shaft 40, which is supported and rotates in any suitable bearing 41, mounted in a slot 52 in the frame A, as shown by the dotted lines in Fig. 2. The end of each journal 40 has a projecting fin or rib 42, which is adapted to set in a slot or recess 43 in the end of a drive-shaft 44 for said roller, said drive-shaft receiving power by means of the belt 45 in any suitable way, preferably in the manner shown in my patent above referred to. The shaft 44 is suitably supported on an arm 46, attached to the frame A, said shaft being free to rotate on said arm, but being held against longitudinal movement in any suitable way, preferably by means of the screw 47 in said arm engaging a groove 48 in the shaft.

As stated above, the bearing-box 41 for the roller-shaft 40 is supported in the slot 52 in the frame, and this same slot also supports the bearing-boxes for the fan or doffer D and the stripper C, said bearing-boxes being removably mounted in said slot in any approved way and maintained therein by means of the cap-plate 49. By removing the said cap-plate the fan or doffer D and the stripper C can be removed from the machine, leaving the roller B exposed and free to be lifted and turned end for end, the shaft 44 of course having previously been turned so that the slot 43 stands vertically.

With the construction above described it will be seen that I have provided for detachably securing the shaft 44 to the roller B, so that said roller can be removed from the machine without disturbing the said shaft. By thus making the roller reversible its life is materially lengthened.

Secured to the frame A in front of the roller B is a grid 7, upon which the cotton is deposited when fed to the gin, said grid being preferably formed by a series of rods fastened in any suitable way at one end to a support 31 and at the other end to the bar 6, and coöperating with said grid is a series of vibrating fingers 8, fast on the rock-shaft 9. These fingers are curved at their lower ends, as seen at 32, and are so spaced with reference to the bars of the grid 7 that one finger plays between each two bars of the grid, as shown in Fig. 4. I may employ any suitable bar 30, through which each of the fingers pass in order to assist in maintaining them in proper alinement.

The rock-shaft 9, upon which the fingers 8 are mounted, is journaled in any suitable way in the frame A and has fast thereon at one end an arm 10, which is pivotally connected to the arm 11 of an eccentric 12, mounted on shaft 13. The shaft 13 is driven from the main shaft 21, which is rigid with and drives the stripper C through the intermediate shaft 18, said shaft 18 having fast thereon the two pulleys 17 and 16, the pulley 17 being driven from the pulley 20, fast on shaft 21, by the crossed belt 19 and the pulley 16 driving the shaft 13 through the pulley 14 and belt 15. It will be noticed that the size of the pulleys is so proportioned that the shaft 13 is driven much slower than the stripper-shaft 21.

The cotton to be ginned is fed to the gin by any suitable or usual means and is deposited on the grid 7. The fingers 8 during their vibratory movement carry the cotton thus deposited to a position where it is caught by the roller B, and thus carried positively against the stripper C, said stripper operating to knock the seeds from the cotton and throw them back from the said roller. The seeds from which the fiber has been stripped pass through the fingers 8 and fall upon the grid 7, and as said fingers are swung into the full-line position in Fig. 2 they push the seeds

which have collected on said grid down through the same, the seeds falling into any suitable receptacle. The extreme positions of the fingers in their vibratory movement is shown by the dotted and full lines in Fig. 2. The fingers 8, having the curved portions 32 at their ends, operate to feed the cotton to the roll more evenly than would be the case if the fingers were perfectly straight. Another advantage of the said curved fingers is that by reason of such curve the said fingers can oscillate through a larger angle without withdrawing the ends of the fingers from the grid. The dotted lines in Fig. 2 show one extreme position of the fingers, and it will be observed that if the fingers were straight the ends thereof would be lifted some distance above the grid should they be vibrated to the position shown in dotted lines. It is of course obvious that lifting the ends of the fingers above the grid would destroy the usefulness of the device as a feeding mechanism, for such ends would catch in the fiber and pull the same down between the bars of the grid. It is to be noted that the fingers not only serve to feed the cotton evenly to the roller, but they have the further function of forcing the seeds that collect on the grid 7 down through the same.

In order to assist the fingers 8 in feeding the cotton to the roller B, I may provide a second series of stationary horns or pointed fingers 5, which are mounted in any suitable way on the arm 6, extending the length of the gin, said fingers being curved to conform to the surface of the roller B and having their pointed free ends somewhat nearer the surface of the roller than their bases, where they are attached to the bar 6, and being inclined slightly with reference to the said bar 6, as shown in Fig. 3. With the horns or fingers 5 so arranged that their bases are farther from the surface of the roller than their free ends (see Fig. 2) and inclined relatively to the bar 6 it will be seen that as the cotton is pushed against the roller B by the vibrating fingers 8 it is caught by the projecting hairs or bristles of said roller and quickly drawn under the horns or fingers 5, said fingers by their shape holding it firmly against said roller, whereby the cotton is positively and instantly carried past the seed-arrester E, the stripper operating, as above described, to strip the seeds from the fiber and knock the same back from the roller.

It will be evident also that many other changes may be made in the details of my device without departing from the spirit of my invention.

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

1. In a cotton-gin, a gin-roller, a coöperating rotary stripper having shoulders arranged on its periphery, a grid upon which the cotton is deposited and a series of vibrating curved fingers coöperating therewith to feed the cotton to the roll.

2. In a cotton-gin, a gin-roller having on its surface a series of points serving as fiber-catching means, a coöperating rotary stripper having spirally-arranged shoulders on its periphery, a grid and a series of vibrating curved fingers coöperating therewith to feed the cotton to the roll.

3. In a cotton-gin, a gin-roller, means to rotate the same, a rotary stripper coöperating therewith, a grid upon which the cotton is deposited as it is fed to the roller, a shaft supporting a series of curved fingers which project through said grid, and means operated directly by the stripper for oscillating the said fingers.

4. In a cotton-gin, a gin-roller having on its surface a plurality of points serving as fiber-catching means, and means to drive the roller, said roller being detachably connected to its driving-shaft, whereby the roller can be reversed, combined with a grid upon which the cotton is deposited, and a series of curved vibrating fingers coöperating therewith to feed the cotton to the roll.

5. In a cotton-gin, a gin-roller having a series of points projecting slightly beyond its surface and serving as fiber-catching means, a coöperating stripper provided with spirally-arranged shoulders on its periphery, means to rotate the roller and stripper, the roller being detachable from its rotating means whereby it may be reversed, a grid upon which the cotton is deposited as it is fed to the gin, a series of curved fingers suspended above and projecting through said grid, and reducing-gearing driven directly by the stripper to vibrate said fingers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DANIEL SIMEON CHAPIN.

Witnesses:
JOHN C. EDWARDS,
LOUIS C. SMITH.