

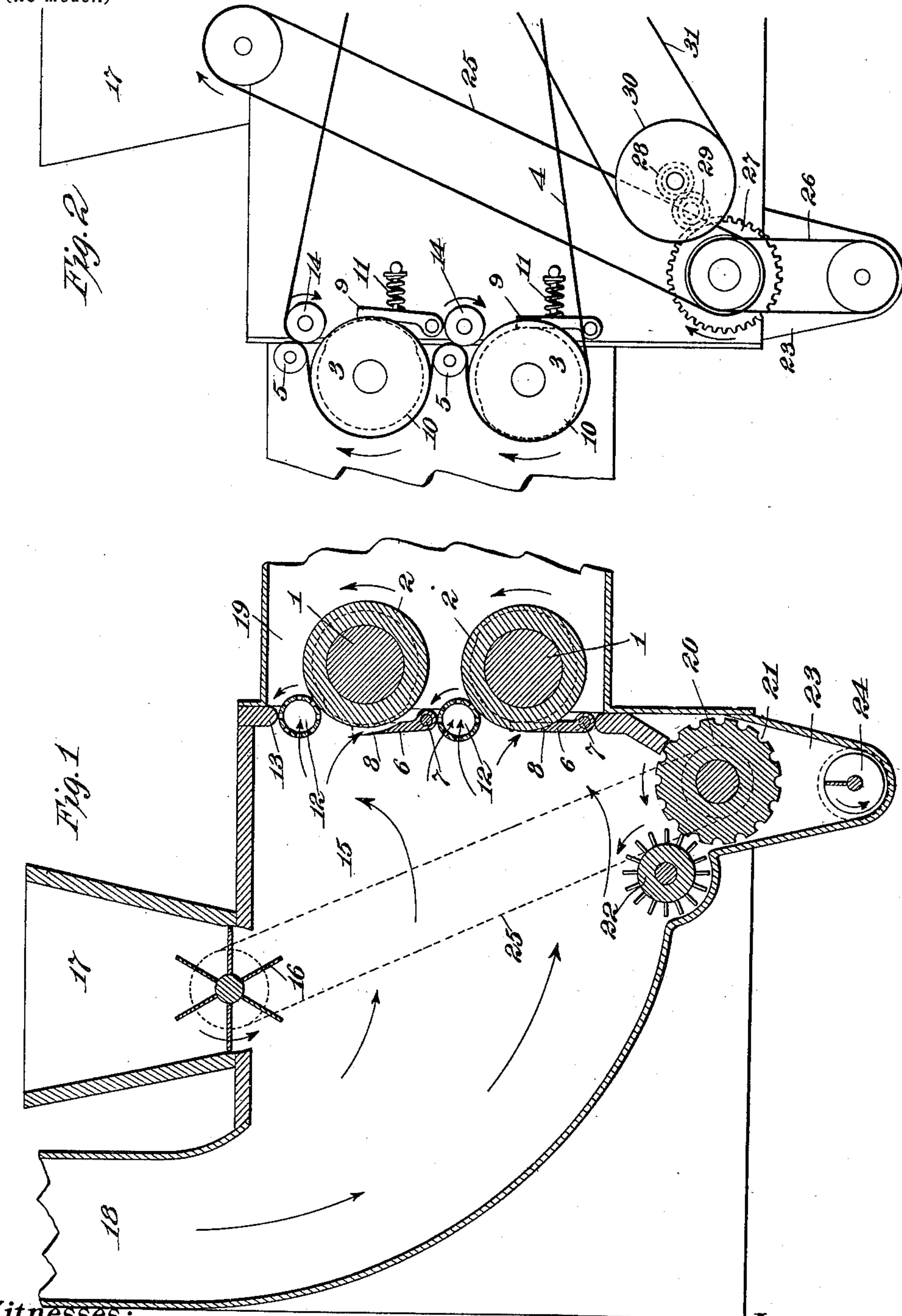
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Patented Sept. 11, 1900.

J. W. GRAVES.
ROLLER COTTON GIN.

(Application filed Jan. 30, 1900.)

(No Model.)



Witnesses:

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Att'ys.

UNITED STATES PATENT OFFICE.

JOHN W. GRAVES, OF COVINGTON, TENNESSEE.

ROLLER COTTON-GIN.

SPECIFICATION forming part of Letters Patent No. 657,734, dated September 11, 1900.

Application filed January 30, 1900. Serial No. 3,263. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. GRAVES, a citizen of the United States, residing at Covington, in the county of Tipton and State of Tennessee, have invented a certain new and useful Improvement in Roller Cotton-Gins, of which the following is a specification.

My invention relates to various new and useful improvements in roller cotton-gins of the type suggested by me and embodied in my Patent No. 633,994, dated October 3, 1899, wherein one or more ginning-rollers are employed having suitable roughened peripheries adapted to engage the lint to strip it from the seeds, a perforated device being interposed between the lint-bearing seeds and the ginning roller or rollers to prevent the seeds from passing therethrough, but allowing the lint to be operated upon by the ginning mechanism, the lint-bearing seeds being maintained in operative engagement with the perforated device by means of air-blasts with or without the further supplementation of other means, said blasts serving also to direct the lint through the perforations, whereby the lint may be effectively engaged by the ginning devices, and in the preferred construction the blasts also serving to remove the separated lint from the ginning roller or rollers. The particular advantage secured in my improved cotton-gins, which are thus broadly characterized, is the rapidity of operation, that advantage being obtained by a mechanical construction which in simplicity may compare favorably with the very much slower roller-gins now used in the cotton-producing countries of the world. My present improvements are designed to accomplish great rapidity of operation equal to if not greater than that secured in the specific example of my invention described in my said patent, while at the same time the construction of the device is somewhat simplified.

In carrying my invention into effect I employ either one or, preferably, a plurality of ginning-rollers, which may be effectively mounted in the same plane, for example, one above the other on horizontal shafts. Mounted adjacent to the ginning roller or rollers is a stripping device which, in the present instance comprises a plurality of bars or slats extending adjacent to and parallel with the

ginning roller or rollers. In order that the outlet for the air carrying the cotton may be increased and to further increase the rapidity of operation, as will be explained, I prefer to arrange, adjacent to each roller and within the opening corresponding thereto, a perforated cylinder rotated either positively or by friction in the same direction as the ginning-roller, the perforations in said cylinder being small enough to prevent the passage of seeds through the same. When a perforated cylinder or roller is used in connection with each ginning-roller, the two rollers are arranged to work with their peripheries very close together, and the perforated roller is arranged to work with its periphery very close to the slat or bar of the perforated device corresponding to the next adjacent ginning-roller. The bar or slot corresponding to each ginning-roller is preferably pivoted on an axis extending parallel to that of the ginning-roller, and means are provided for giving to each of said bars or slats a limited movement toward and away from their respective ginning-rollers, the movement toward the ginning-roller bringing the end of the respective bar or slat into intimate proximity or actual contact therewith, while the movement away from the ginning-roller carries the respective bar or slat thereof to a less extent than that which will permit the passage of the seeds through the opening thus formed.

In order to supply lint-bearing cotton to the effect of the ginning-rollers, any suitable feeding mechanism can be employed. Preferably, however, an air-blast is used, which is admitted within a chamber on the opposite side of the perforated device from the ginning-rollers, whereby the said blast will be divided and will pass evenly through the perforated cylinders, if employed, and also between the spaces periodically formed between each ginning-roller and the respective slat or bar therefor. A desirable arrangement is to proportion the operating devices for the improved gin in such a way that the pivoted slats or bars which constitute in the present gin the stripping device of roller-gins of this type will partake of their movements in succession, whereby at all times in the operation at least one of said slats or bars will be withdrawn from its intimate proximity with its

respective ginning-roller. By this arrangement the exit for the lint-carrying blasts will be always maintained approximately constant in area, and the operation will therefore be more uniform than would be the case if all of the slats or bars were simultaneously moved toward and away from the respective ginning-rollers to thereby periodically increase and decrease the area of exit for the blasts. When an air-blast is used for feeding the lint-bearing seeds to the ginning roller or rollers, any suitable feed mechanism is employed for admitting the cotton to the influence of said blast—as, for instance, by providing the gin with a hopper, to which the cotton may be supplied, and by providing said hopper at its bottom with a rotating feed-valve so constructed as to prevent exit of air outwardly through the same.

The seeds after they have been denuded of their lint can be removed from the apparatus in any suitable way. Preferably, however, when a plurality of ginning-rollers are used, which are arranged in a vertical plane, I employ at the lower portion of the device a seed-expelling cylinder having longitudinal pockets therein into which the denuded seeds may be deposited by gravity, the rotation of the cylinder thereby removing the seeds from within the ginning-chamber and allowing them to drop off. In order to prevent lint-bearing seeds or cotton-bolls from being removed from the ginning-chamber by this device, a rotating cylinder is employed having, preferably, a series of radial teeth in its periphery and arranged to turn adjacent to the seed-removing cylinder in the same direction, but at higher speed, whereby any lint-bearing seeds will be engaged by said teeth and be again forced within the influence of the blast. After the seeds have been thus removed from the ginning-chamber they are preferably deposited in a closed pocket supported below the ginning-chamber and from which air is excluded. The denuded seeds may be allowed to accumulate in said pocket and be periodically removed therefrom, as may be required, or they may be automatically and continuously removed from said pocket by any suitable device—as, for instance, a feed-screw of common construction.

My improved gin is not only simple and durable in its construction, but is capable of rapid and effective operation, since the lint-bearing seeds will be directed by the blasts into immediate proximity with the several ginning-rollers, while the lint or fiber will be carried by said blasts into actual contact with the ginning-surfaces thereof. The main ginning operation, which is effected by the engagement of the lint or fiber with the ginning-surface of the rollers, is supplemented in the preferred construction by two additional ginning effects. In the first place, by employing, as is preferable, a series of pivoted slats or bars, one cooperating with each ginning-roller, the movement of the operat-

ing edge of each slat or bar toward its respective ginning-roller will act to remove a part of the lint or fiber which may adhere to any particular seed and which may during such movement be held by the rotation of the ginning-roller in the path of said engaging edge, and, in the second place, when a perforated cylinder or roller is used in connection with each ginning-roller a part of the lint or fiber will be blown by the blasts through the perforated roller, so that as the roller is turned the seeds which may be attached to said lint or fiber will be engaged with the respective ginning-roller and such seeds effectively separated by the rotation of the latter. A further advantage of employing a perforated cylinder or roller cooperating with each ginning-roller and turning in the same direction thereas is that any tendency of lint or fiber to accumulate on the ginning-roller will be overcome, the perforated cylinder serving as a cleaning device for each ginning-roller. The lint or fiber which is separated by any or all of the operations thus described will be removed from the ginning-rollers or from the perforated rollers, if used, by the passage of the several blasts around the several ginning-rollers and thence through the usual flue or flues leading to any desired form of accumulating device, by which the blast will be separated from the lint or fiber—as, for instance, a condenser of any desired type.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a longitudinal sectional view of the operative parts of a gin, showing the preferred embodiment of my invention; and Fig. 2, a side elevation illustrating a convenient form of driving mechanism.

In both the above views corresponding parts are represented by the same numerals of reference.

1 1 represent one or more shafts mounted in bearings in a suitable frame and carrying proper ginning-surfaces 2. The preferred construction of ginning-roller is that which I have described and claimed in my application for Letters Patent filed on the 24th day of January, 1900, Serial No. 2,573, said roller comprising a core on which are placed alternating disks of leather and horsehair, said disks being placed at an angle to the plane of rotation of the roller. It will be understood, however, that any desired and usual form of ginning-roller can be employed. The outer ends of the shafts or cores 1 may carry pulleys 3 3, by which the ginning-rollers will be rotated in the same direction and at the desired peripheral speed. A belt 4 may be employed, passing over idlers 5 5, for driving the pulleys 3 3. Cooperating with each of the ginning-rollers is a slat or bar 6, pivoted on a rock-shaft 7, and with a concave face 8, arranged concentric with the periphery of

the ginning-roller, whereby each of said bars or slats will be formed with a sharp upper edge, which assists in the ginning operation. Preferably the slats or bars are given a limited movement toward and away from the periphery of the corresponding ginning-roller to allow the lint to be blown by the blast between the said bar or slat and the said ginning-roller, whereby the lint will be drawn off of the seed by its contact with the ginning-surface. This movement of each of the slats or bars can be effected in any suitable way—as, for instance, by employing a cam-lever 9 on one or both ends of each of the rock-shafts 7 and engaging said lever with a cam 10, carried by the pulleys 3 or by the shaft or core 1. The cam-levers 9 are held in contact with the cam-surface by springs 11. The cams 10 for the several rollers are preferably arranged in alternation, so that when one of the slats or bars 6 is moved away from its cooperating ginning-roller the other slat or bar will be in contact, or nearly so, with its cooperating ginning-roller. In other words, when there are two ginning-rollers, as shown, the cams 10 will be placed one hundred and eighty degrees apart. When there are four ginning-rollers, said cams will be placed ninety degrees apart, and so on. By thus moving only one at a time of the slats or bars away from its cooperating ginning-roller the blast area will be kept approximately uniform and will not be increased and decreased, as would be the case if all the slats or bars were successively moved toward and away from all of the ginning-rollers.

Mounted above each of the ginning-rollers is preferably a perforated cylinder 12, bearing in close proximity to the ginning-surface or into actual contact therewith. The perforated cylinder which cooperates with the lower ginning-roller is located immediately below the slat or bar for the upper ginning-roller, so as to prevent any fiber from being wound up on said cylinder, while the cylinder for the upper ginning-roller works adjacent to a corresponding ridge 13, which performs the same function. Each of the perforated cylinders is driven in the same direction as its cooperating ginning-roller and at preferably the same surface speed. This may be effected in any suitable way, as by mounting a friction-pulley 14 on the shaft of each of said rollers and engaging said pulley with the drive-belt 4, as shown.

The seed-cotton is fed to the ginning-chamber 15 behind the ginning devices in any suitable way—as, for instance, by a rotating valve 16, which is placed at the bottom of a feed-hopper 17. A blast of air may be directed through an air-pipe 18, so as to sweep down along the bottom of the ginning-chamber, as indicated generally by the arrows, which air finds an escape through the perforated cylinders 12 and between each of the slats or bars and its cooperating ginning-roller when the said slat or bar is retracted.

The air-blast which is thus directed into the ginning-chamber carries the cotton, which tends to fall vertically through the chamber from the feed-valve 16 and blows the lint or fiber through the interstices of the perforated cylinders 12 and through the passage which is presented between each of the slats or bars and its cooperating ginning-roller when the former is retracted. Any fiber which is blown through the interstices of the perforated cylinders will be denuded of its seed by the engagement of the cylinder with the ginning-surface, since these devices turn in the same direction, and when the fiber has been thus denuded from the seed it will be carried off through the perforated cylinders into the lint-flue 19, which may lead to any desired bat-forming device. The fiber which is blown into the passage presented between the withdrawn slat or bar and its cooperating ginning-roller will be denuded of its seeds by its engagement with the ginning-surface, as is common in gins of this type. A further ginning action will also be effected as the slat or bar tends to move toward the ginning-roller under the stress of the springs 11, since the reduced upper edge of the slat or bar will engage with the fiber presented in its path and effectively strip it from the seeds. The fiber which is thus removed from the seed by the action of the ginning-roller, either alone or in connection with that of the movable slats or bars, will be carried off through the lint-flue 19 by the blast, as will be obvious. The denuded seed, presenting a small area to the effect of the blast, will fall by gravity to the bottom of the ginning-chamber and can be removed in any suitable way. The preferable devices for removing the denuded seed comprise a rotating cylinder 20, having pockets 21 extending longitudinally in its periphery and only large enough to accommodate a denuded seed, and a stripping-roller 22 turning in the same direction and located sufficiently close to the said roller 20 as to throw back into the ginning-chamber any unlinted bolls or masses of fiber which may have fallen upon the cylinder. A closed chamber 23 is located beneath the seed-roller 20, so as to prevent a blast from passing up around said roller, and into this chamber the seeds which are removed from the ginning-chamber may accumulate and be removed from time to time. If desired, a screw conveyor 24 may be located at the bottom of said chamber to remove the seed continuously.

Any suitable gearing may be utilized for driving the cotton-feeding devices and the seed-removing devices as described. For instance, the shafts of the seed-cylinder 20 and the rotating valve 16 may be connected by a belt 25, while the shaft of the screw conveyor 24 may be connected to the shaft of the seed-roller by a belt 26. The shaft of the seed-roller may carry a gear 27, which is driven from a pinion 28 through an idler 29. The pinion 28 may be carried on the shaft of

the stripping-roller, which shaft may be driven from a pulley 30 by a belt 31.

The operation of my improved gin has been already indicated.

5 Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a roller cotton-gin, the combination of a ginning-roller, a perforated cylinder mounted adjacent to said roller to provide for the escape of air but preventing the passage of seeds, and means for rotating the roller and said cylinder, substantially as set forth.

2. In a roller cotton-gin, the combination of a ginning-roller, a perforated cylinder mounted adjacent to said roller to provide for the escape of air but preventing the passage of seeds, and means for rotating the roller and said cylinder in the same direction, substantially as set forth.

3. In a roller cotton-gin, the combination of a ginning-roller, a perforated cylinder mounted adjacent to said roller to provide for the escape of air but preventing the passage of seeds, means for rotating the roller and said cylinder, and a slat or bar mounted adjacent to the roller, substantially as set forth.

4. In a roller cotton-gin, the combination of a ginning-roller, a perforated cylinder mounted adjacent to said roller to provide for the escape of air but preventing the passage of seeds, means for rotating the roller and said cylinder, a slat or bar mounted adjacent to the roller, and means for moving the slat or bar toward and away from the said roller, substantially as set forth.

5. In a roller cotton-gin, the combination with a ginning-roller, of a slat or bar cooperating with said roller, means for moving the slat or bar toward and away from said roller to present a passage between the bar and the periphery of the roller into which the fiber may pass, a ginning-chamber partly surrounding the roller, and means for directing an air-blast into the ginning-chamber and for feeding the seed-cotton to the effect of the blast, whereby the lint will be carried by the blast into the space formed between the slat or bar and the ginning-roller, substantially as set forth.

6. In a roller cotton-gin, the combination with a ginning-roller, of a slat or bar cooperating with said roller, means for moving the slat or bar toward and away from said roller to present a passage between the bar and the periphery of the roller into which the fiber may pass, a ginning-chamber partly surrounding the roller, means for directing an air-blast into the ginning-chamber, a feed-hopper placed above the ginning-chamber, and means cooperating therewith for permitting the seed-cotton to fall vertically through the ginning-chamber so as to be acted upon by said blast, substantially as set forth.

7. In a roller cotton-gin, the combination with a ginning-roller, of a slat or bar cooperating with said roller, means for moving the

slat or bar toward and away from said roller to present a passage between the bar and the periphery of the roller into which the fiber may pass, a ginning-chamber partly surrounding the roller, means for directing an air-blast into the ginning-chamber, a feed-hopper placed above the ginning-chamber, and a rotating valve at the bottom of said hopper for permitting the cotton to fall vertically through the ginning-chamber so as to be acted upon by the blast, substantially as set forth.

8. In a rotary cotton-gin, the combination of a ginning-chamber, a ginning-roller located adjacent to or within the chamber for removing lint from the fiber-bearing seeds, and a longitudinally-grooved seed-removing roller mounted at the bottom of said chamber for removing the seed therefrom, substantially as set forth.

9. In a rotary cotton-gin, the combination of a ginning-chamber, a ginning-roller located adjacent to or within the chamber for removing lint from the fiber-bearing seeds, a longitudinally-grooved seed-removing roller mounted at the bottom of said chamber for removing the seed therefrom, and an inclosed chamber beneath said seed-removing roller into which the seed may be deposited, substantially as set forth.

10. In a rotary cotton-gin, the combination of a ginning-chamber, a ginning-roller located adjacent to or within the chamber for removing lint from the fiber-bearing seeds, a longitudinally-grooved seed-removing roller mounted at the bottom of said chamber for removing the seed therefrom, an inclosed chamber beneath said seed-removing roller into which the seed may be deposited, and means for continuously removing the seed accumulated in said chamber, substantially as set forth.

11. In a rotary cotton-gin, the combination of a ginning-chamber, a ginning-roller located adjacent to or within the chamber for removing lint from the fiber-bearing seeds, a longitudinally-grooved seed-removing roller mounted at the bottom of said chamber for removing the seed therefrom, an inclosed chamber beneath said seed-removing roller into which the seed may be deposited, and a screw conveyer for continuously removing the seed accumulated in said chamber, substantially as set forth.

12. In a rotary cotton-gin, the combination of a ginning-chamber, a ginning-roller located adjacent to or within the chamber for removing lint from the fiber-bearing seeds, a longitudinally-grooved seed-removing roller mounted at the bottom of said chamber for removing the seed therefrom, and a picker-drum cooperating with said seed-removing roller for preventing the removal from the ginning-chamber of lint or bolls, substantially as set forth.

13. In a roller-gin, the combination of a ginning-roller, a slat or bar mounted on a rock-shaft adjacent to the ginning-roller, a

lever carried by said rock-shaft, and a cam on the shaft of the ginning-roller engaging said lever, substantially as set forth.

14. In a roller-gin, the combination of a
5 ginning-roller, a slat or bar mounted on a rock-shaft adjacent to the ginning-roller, a lever carried by said rock-shaft, a cam on the shaft of the ginning-roller engaging said lever, and a spring for maintaining the lever

in contact with said cam, substantially as is set forth.

This specification signed and witnessed this 11th day of January, 1900.

JOHN W. GRAVES.

Witnesses:

FRANK L. DYER,
JNO. R. TAYLOR.