S. D. MURRAY.

COTTON GIN.

APPLICATION FILED MAR. 23, 1904.

1,086,204.

Patented Feb. 3, 1914.

6 SHEETS—SHEET 1.

Fig. 1.

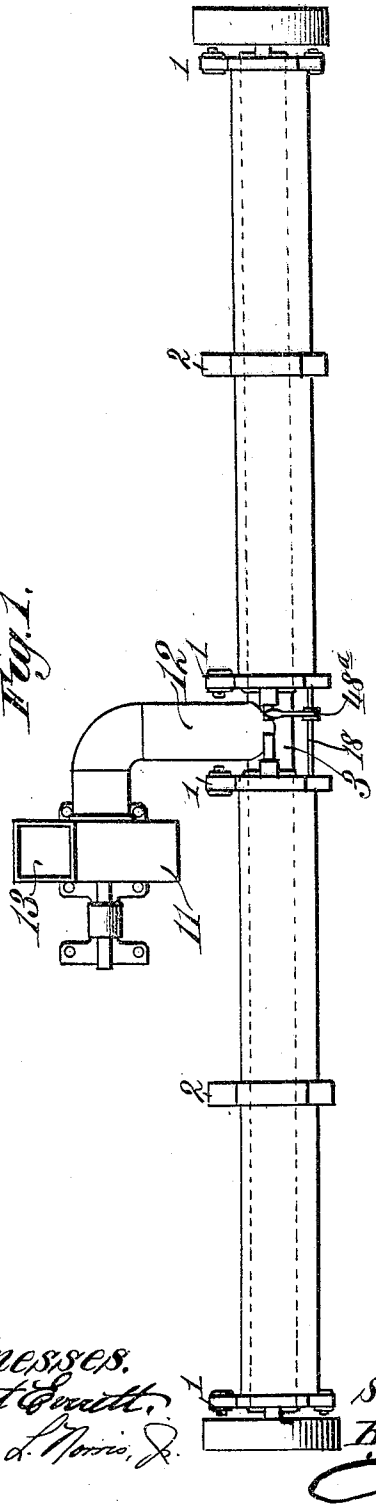
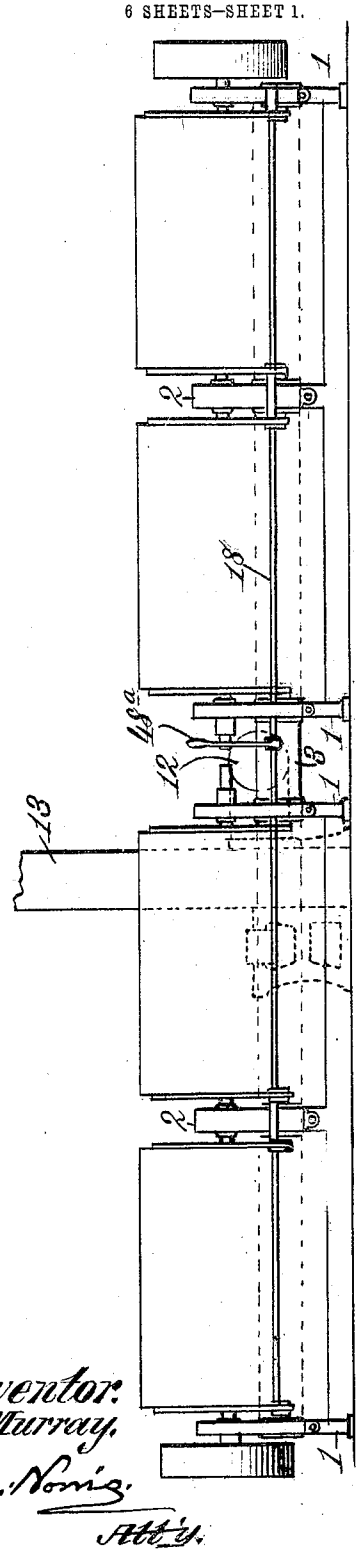


Fig. 2.



Witnesses.
Robt Gewith.
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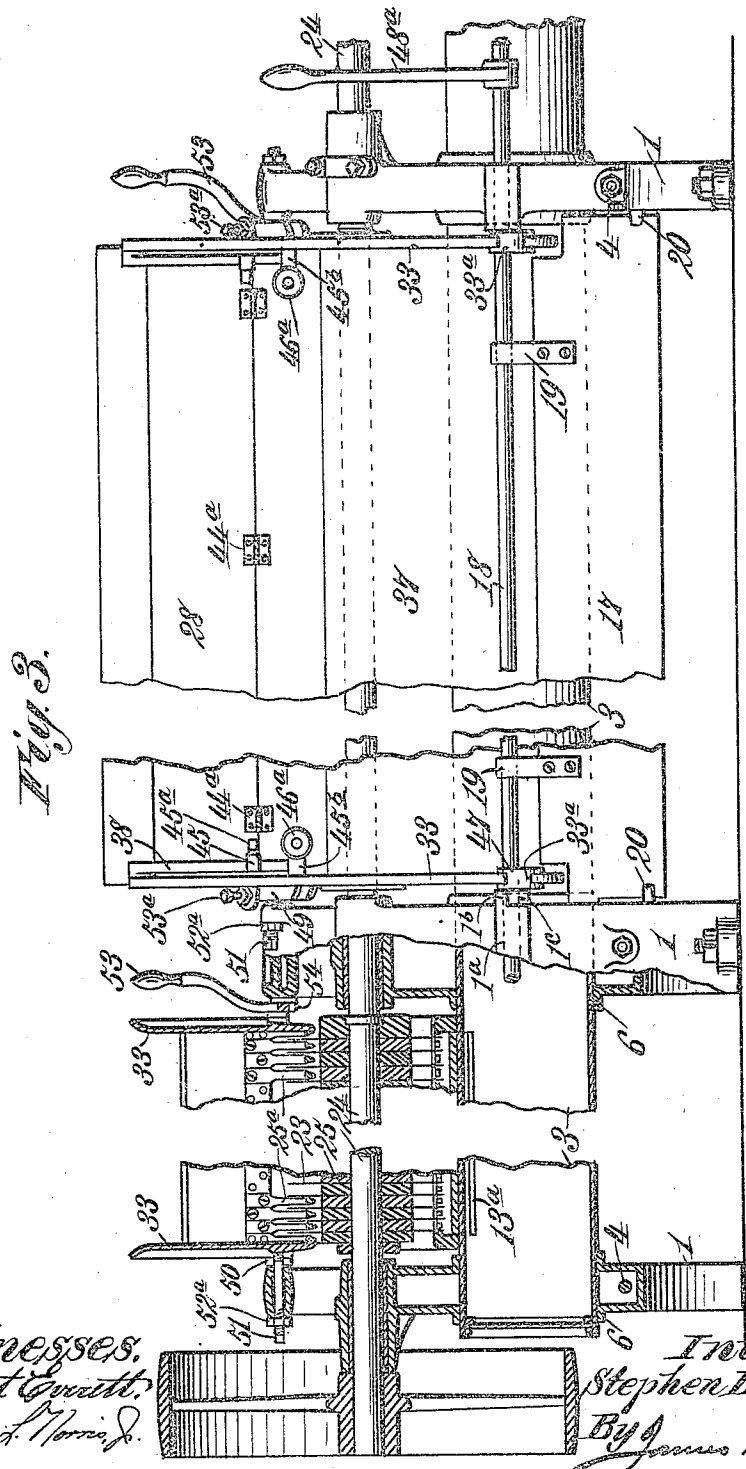
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6 SHEETS—SHEET 2.



Witnesses.
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COTTON GIN.

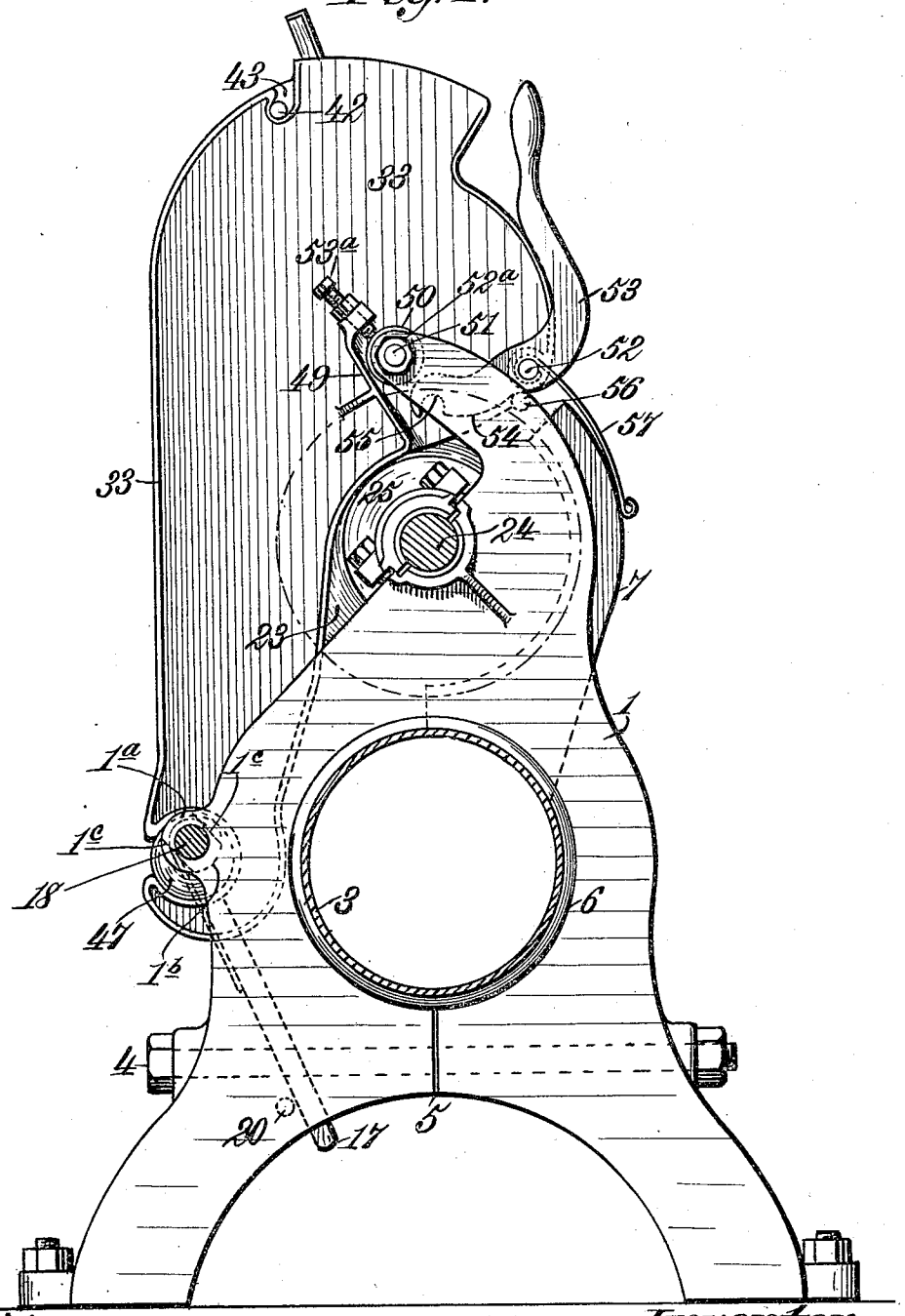
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1,086,204.

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6 SHEETS—SHEET 3.

Fig. 4.



Witnesses.
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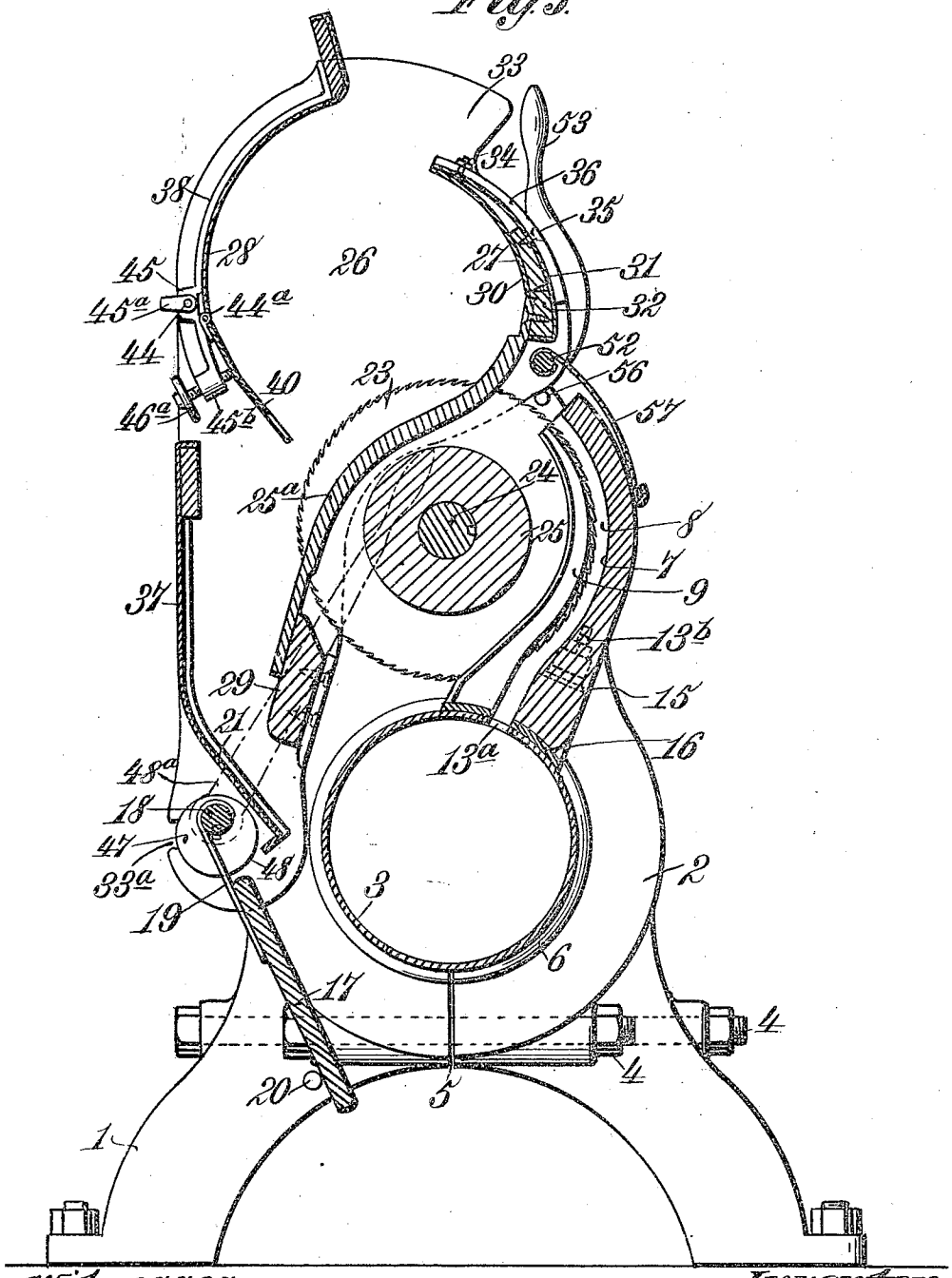
APPLICATION FILED MAR. 23, 1904.

1,086,204.

Patented Feb. 3, 1914.

6 SHEETS—SHEET 4.

Fig. 5.



Witnesses.
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APPLICATION FILED MAR. 23, 1904.

1,086,204. Patented Feb. 3, 1914.

6 SHEETS—SHEET 5.

Fig. 6.

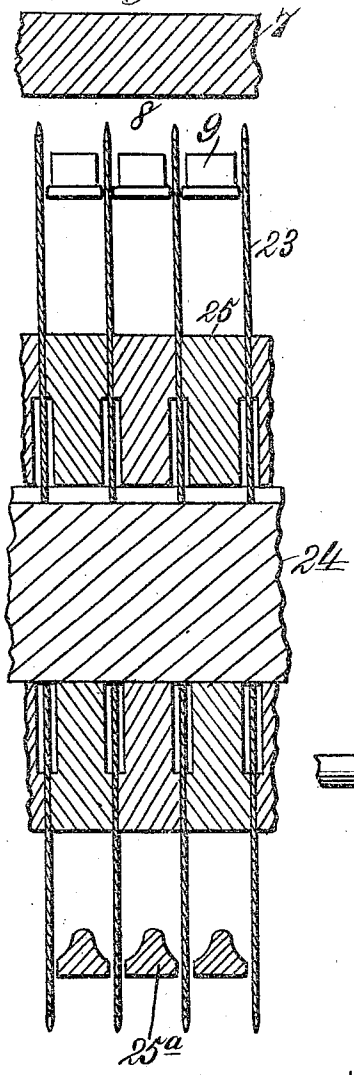


Fig. 7.

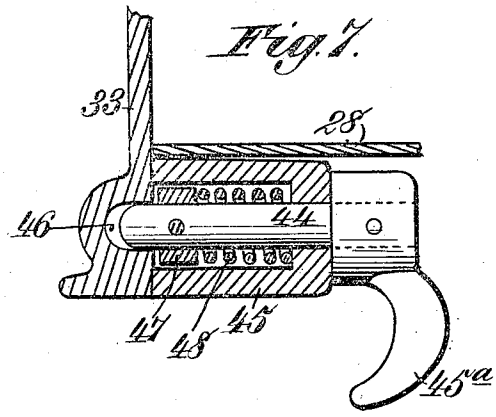


Fig. 8.

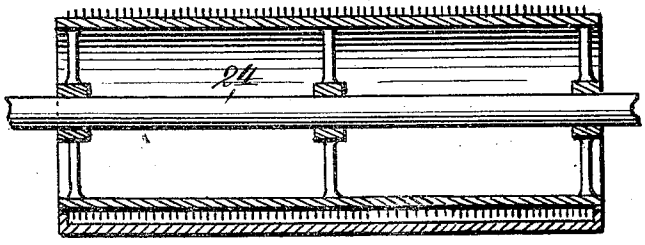
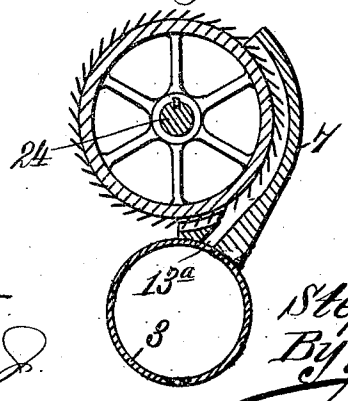


Fig. 9.



Witnesses
Robt Everett.
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COTTON GIN.

APPLICATION FILED MAR. 23, 1904.

1,086,204.

Patented Feb. 3, 1914.

6 SHEETS—SHEET 6.

Fig. 10.

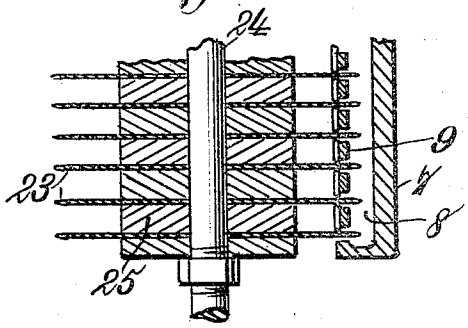


Fig. 12.

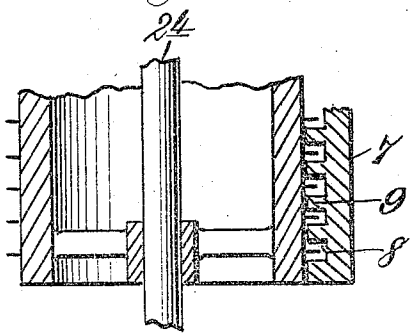
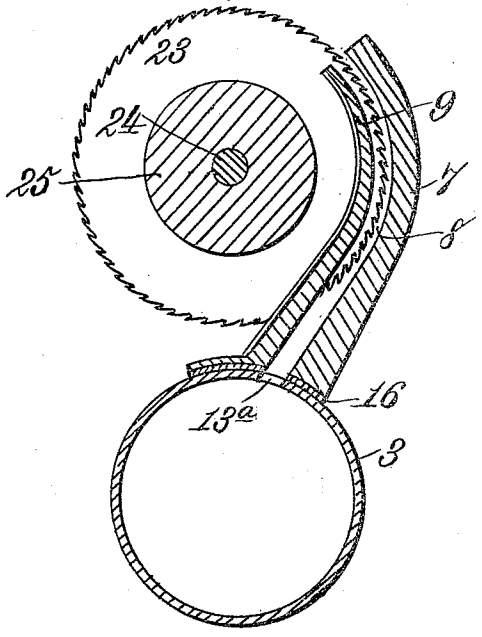


Fig. 11.



Witnesses.
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Atty.

UNITED STATES PATENT OFFICE.

STEPHEN D. MURRAY, OF DALLAS, TEXAS.

COTTON-GIN.

1,086,204. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed March 23, 1904. Serial No. 199,514.

To all whom it may concern:

Be it known that I, STEPHEN D. MURRAY, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented new and useful Improvements in Cotton-Gins, of which the following is a specification.

This invention relates to cotton gins, and the objects of the same are to provide novel means for removing lint cotton from the teeth of the gin in an expeditious and reliable manner; for economically removing lint from the teeth of the gin and conveying it to the point of delivery, such, for example, as a condenser; to provide a novel construction of cotton gin frame comprising a simple organization, wherein the parts are reduced to a minimum; and to provide the gin with a longitudinal tubular member which serves as a conduit for the passage of the lint cotton from the gin and also as a connecting means for the legs of the gin frame and serving also as an end outlet for the gin and leaving the rear of the latter unobstructed and freely accessible.

The improved construction of frame for a gin may be made to constitute a structure embracing a single gin consisting of three members, two end or leg members and a single longitudinal member, or a double gin frame may be made of only four members, three leg members and one longitudinal member.

Incidentally, the gin embodies a novel construction and arrangement of roll box, which may be completely disconnected, detached and removed from the gin proper without removing or detaching any fastening members for the purpose of making an examination, repairs, etc., or said roll box may be swung out of the way, for example, by lowering it to the floor to give access to the ginning cylinder and other parts.

The gin also includes structural details for automatically locating and holding the roll box in its proper endwise position relative to the gin saws.

The salient feature of the invention is, however, a tubular member longitudinally disposed in the body of the gin and laying along the ginning mechanism, and, as will be hereinafter noted, this tubular member will also prominently and effectively serve to connect the legs of the gin frame as shown assembled in operative relation to the gin saws, to the teeth of which air currents of high velocity are practically and continuously applied and with substantially undiminished action during a considerable portion of the revolution of the saws, the air currents being caused to travel in a path coincident with the path traveled by the saw teeth and encompassed narrowly about the ginning teeth to conserve the force of the air current for removing the lint and reduce the amount of air and power that has heretofore been necessarily employed in removing lint from gin teeth. The use of this tubular member is not confined to this particular application of air, nor with the special form of gin which will be hereinafter particularly described, but is equally well adapted for use in connection with other gins, particularly to perform two of its most important functions, and which are to connect the legs of the gin frame and act as a conduit for receiving the lint cotton from the saws or ginning apparatus and conducting it away from the gin.

In the drawings:—Figure 1 is a top plan view of a battery of gins, comprising four gins arranged in two pairs, or, in other words, a pair of double gins, said view showing the suction apparatus connected to the tubular members of the gin frames; Fig. 2 is a front elevation of the apparatus shown in Fig. 1; Fig. 3 is a view drawn on a larger scale than Figs. 1 and 2 and illustrates one double machine or a pair of machines partly in section and partly in elevation; Fig. 4 is an end view of the gin; Fig. 5 is an enlarged view in cross section of one of the gins; Fig. 6 is a detail view in horizontal section taken through the center of the saw cylinder; Fig. 7 is a detail sectional view of the bolt for locking the breast of the roll-box; Fig. 8 is a horizontal sectional view of a ginning cylinder having the ginning teeth projecting from the periphery of the cylindrical body, and showing the air channel applied to the cylinder; Fig. 9 is a vertical cross sectional view of the parts shown in Fig. 8; Fig. 10 is a broken horizontal sectional view of the arrangement of parts shown by Fig. 6, taken at the end of the cylinder and showing the ribs omitted; Fig. 11 is a vertical cross sectional view taken through Fig. 10; and Fig. 12 is a broken horizontal sectional view illustrating separate air channels applied to each row of gin teeth on the ginning cylinder shown in Fig. 8 of the drawings.

Referring to the drawings, the numeral 1 indicates the end legs of the gin frame and 2 the center support employed where two gins are arranged to form a pair, as clearly shown by Fig. 2, and said center support need not be employed as a leg but simply utilized as a support for the gin shaft, roll-box and other parts, it being unnecessary to extend this member downward to the floor in the manner of the end legs 1.

The numeral 3 indicates a tube, tubular member, or conduit of any suitable material and to which the legs 1 and the center support 2 are rigidly secured, as, for example, by pressing or clamping bolts 4, the legs 1 and central support 2 being vertically split or divided, as at 5, in such manner that the bolts 4 will be caused, when drawn to place, to draw their legs 1 and center support 2 so as to closely embrace the tube or tubular member 3 and form a rigid connection therewith. The connection between the legs, center support and tube or tubular member may be still further strengthened by any other suitable fastening devices cooperating with the tube or tubular member 3 and flanges 6 formed on the legs 1 and support 2, this additional fastening means being of a well known character and acting as an auxiliary to, without interfering with, the clamping bolts 4.

The numeral 7 indicates a concave at the rear side of the gin which, as shown, embraces a large portion of the gin saws, it being shown in the present instance as embracing about one-third of the periphery of said saws. The concave forms one wall of a channel or channels 8, the opposite wall of the channels being formed by partitions 9 when saws are used in the gin, and by the body of the gin cylinder, when the machine is constructed as shown in Figs. 8, 9 and 12 of the drawings. Partitions 9 have attached strips 9^a of felt or other similar material, said strips serving the purpose of keeping external air from entering the channel at the side of the saws. The cross sectional area of the channel is reduced to a minimum consistent with the efficient operation of the machine, and by so doing the quantity of air required and consequently the size of the current producing apparatus and the amount of power is reduced. The cross sectional area of the channel is substantially the same throughout its length to maintain substantially the same velocity and lint-removing action throughout the length of the channel. The concave together with the features of construction explained in connection therewith constitutes a preferred form of nozzle between the ginning saws or devices and the tube or hollow member 3 for conveying the lint cotton from the saws to the said tube. Within the scope of the invention the nozzle may, however, be modified, as the essential feature of this part of the invention consists of a nozzle or tubular conveying means between the saws or ginning devices and the tube or hollow member 3 irrespective of exact details of construction. The currents of air are induced by a suction apparatus shown in Figs. 1 and 2 of the drawings and comprises a suction fan 11 the inlet of which is connected by a pipe 12 with the tube 3, a discharge pipe 13 leading from the outlet of said suction fan to a suitable point of delivery, such, for example, as a condenser, not shown. A slot 13^a is formed in the tube 3 and constitutes a communication between said pipe and the channel 8. The suction apparatus causes the air to pass into and through the channel 8 along the concave and through the slot 13^a into the tube, and from the tube to the pipe 12 into the suction fan, and from the latter by the discharge blast pipe 13 to any desired point. The current of air impinges against and passes around the teeth of the gin saws over a large portion of the periphery of the latter, thus disengaging the lint from the saw teeth. The lint is then drawn down through the slot 13^a into the tube 3, and from the latter by the pipe 12 into the suction fan and is discharged through the blast pipe 13. The concave 7 is connected to the pipe 3 by means of screws 13^b which are inserted in lugs or bosses 14 forming fixed projecting portions of the legs 1, the screws 13^b pressing down upon extended portions 15 of the concave 7 and holding the same in firm contact with the tube 3. A packing 16 of felt or other suitable material is interposed between the concave 7 and the tube 3 and serves to form a tight joint between them. A deflecting seed board 17 is suspended from a shaft 18 by means of hangers 19 and the lower part of the said seed board is supported by bosses 20 formed on the legs 1, the purpose of said seed board being to guide the seeds as they fall from the lower part of the seed plate 21.

In some cases gins are constructed in which saws are not employed, the ginning teeth being set in the surface of the cylindrical body in circumferential rows, as shown in Figs. 8, 9 and 12 of the drawings. In gins constructed in this manner one of the walls of the channel 8 is formed by the surface of the cylindrical body, as illustrated in Figs. 8, 9 and 12 of the drawings, Fig. 12 illustrating a modified arrangement wherein partitions 9 are disposed between the circumferential rows of teeth making separate channels for each row. Cotton lint has heretofore been removed from ginning teeth and saws by suction and also by blasts of air which operate to blow the lint from off the teeth. A common characteristic of such devices is that the air currents are applied to the saws or teeth at the

point where said currents emerge from orifices in tubes or confined spaces into greatly enlarged spaces, the effect being merely that of a jet of air directed at or against a small portion of the ginning teeth in a direction tangential to the periphery of the saws or teeth. The expansion of the jets of air thus discharged into greatly enlarged spaces causes an immediate and great reduction in the velocity and effective force of the air currents, diminishing their power of detaching the lint from the teeth, and besides, the air currents thus expanded take on sluggish movements not capable of effectively and economically conveying the lint quickly away from the saws to the point of delivery. In the machines referred to, the air currents have been applied to the ginning teeth in the form of jets of air liberated from confined spaces and directed at or against a small portion of the periphery of the ginning teeth in straight divergent and tangential lines of diminishing force whereas in my improved apparatus herein described, a confined air current is maintained constantly at substantially its initial and maximum velocity and is applied to each point on the ginning cylinder during the time of its travel through the length of the curvilinear air channel, the air current always moving at a higher velocity than the ginning devices or mechanism. This channel embraces a large portion of the circumference of the ginning cylinder.

Again referring to the drawings, the numeral 23 indicates the gin saws, 24 the saw shaft and 25 spacer blocks arranged between the saws, all of which parts may be of ordinary and well known construction.

The improved features of the construction of the roll-box are most clearly illustrated in Figs. 3, 4 and 5 of the drawings, wherein the numeral 26 indicates the roll-box which is disposed over the gin saw cylinder and receives the cotton to be ginned, said box having a breast 28. According to the art of cotton gin building as heretofore employed, it was customary to make the end walls of the roll-box of metal and these metal ends or plates, with the ribs or grates and the back hollow, commonly constituted one rigid structure which was pivotally attached to the top front longitudinal rail of the gin frame so that when it was desired to stop the operation of the gin, the lower portion of the roll box structure was raised up and fixed at a point where the saws could not reach the cotton in the roll box. In this manner any one of the roll boxes in a battery of gins could be raised independently. While provision for simultaneously raising the roll boxes was provided by a lever attached to the rod extending along under the lower part of the roll boxes and having cams fixed thereon to lift the roll boxes as the rod was partially rotated. Frequently it became necessary to have access to the ginning cylinder in order to clean the teeth or for other purposes and such a roll box pivoted at the top as above described was not adapted to provide ready and free access to the gins because a considerable upward movement of the roll box would bring the latter into contact with the gin feeder which usually rested upon the gin. Consequently to overcome numerous disadvantages heretofore encountered and, according to my present invention, I construct the roll-box as follows:—Referring to the last mentioned figures of the drawings, the numeral 33 indicates the end plates of the roll box which are pivotally connected at their lower ends to the gin. The ribs or grates 25^a are fastened at their lower ends to a rib-rail 29 and at their upper ends to a back-hollow 27, which latter consists of a structure comprising longitudinally curved plates 30 and 31 embracing a wooden core 32, the latter being constructed of wood, preferably for the reason that the ribs 25^a can be more readily and effectively embedded or secured thereto than if the contacting parts were formed of metal. It is essential that the back-hollow structure should be quite strong, and this strength I secure by the peculiar arrangement of the plates 30 and 31. The back-hollow structure is secured to the end wall plates 33 by means of bolts 34 and screws 35 which bind the said structure to the flanges 36 formed on the end plates 33, the flanges 36 forming inwardly projecting portions of the end wall plates, as more clearly shown in Fig. 5 of the drawings. The lower rib-rail 29 is secured to the end wall plate 33 in a like manner, as is also the front plate 37. Therefore, the two end plates 33 with the back-hollow structure 27, the lower rib-rail 29, the front plate 37, and ribs 25^a constitute one rigid structure, which together with the breast 28 make up the complete roll-box. The front wall (the breast) 28 of the roll-box comprises curved end castings 38 having gudgeons 42 (see Fig. 4) at their upper ends which loosely fit in notches 43 formed in the edges of the end plates 33 and constitute pivot pins which permit the lower part of the breast to be swung outwardly when the breast is unlocked.

The means for locking the breast in position comprise bolts 44 (see Figs. 5 and 7) which are endwise movable in casings 45 forming a part of the castings 38 attached to the ends of the breast, and each of said bolts is provided at one end with a handle 45^a by means of which it may be operated. The opposite ends of the bolts are arranged to fit in and engage sockets 46 formed in walls 33 (see Fig. 7) and on each of said bolts is fixed a collar 47 between which and

the closed end of the casing 45 is arranged a coil spring 48. The spring 48 operates to normally hold the bolts 44 in engagement with the sockets 46. When it is desired to unlock the breast plate it is only necessary to retract these bolts so as to cause the ends of the same to disengage the sockets 46 after which the lower part of the breast may be swung outwardly. The seed plate 40 is hinged at its upper edge to the breast plate 28, as indicated at 44^a, and the lower ends of the castings 38 project below the hinge 44^a and have tapped in their lower enlarged extremities 45^b set screws 46^a which bear against the seed plate, and by screwing in or out said set screws 46^a the seed plate may be adjusted toward and from the gin saws. The lower end portions of the castings 38 are turned inwardly from the edges of the plates 33 to afford room for the insertion of the hand of the operator to manipulate the screws 46^a.

The end plates 33 are pivotally supported at their lower extremities by eccentrics 47^a which are keyed on the shaft 18, the lower extremities of said end plates being provided with partially annular recesses 48 formed in the edges of said lower extended ends and embracing said eccentrics 47^a, the unfinished formation of the annular recesses 48 being due to the slots or openings 33^a formed in the front edges of the ends of the plates 33, the purpose of which slots will hereinafter be explained. On one end of the shaft 18 is fixed a lever 48^a, and by partially turning the shaft 18 by said lever the eccentrics 47^a impart an upward movement to the roll-box. This upward movement of the roll-box moves outwardly-projecting flange portions 49 (see Fig. 4) of the end plates 33 into contact with wheels 50 which are mounted on studs or bolts 51, the studs or bolts being fixed in the upper extended portions of the vertical leg sections 1 and 2, the result being that the upper body portion of the roll-box is moved outwardly from operative relationship with the gin saws or teeth. It will be evident that a reverse movement of the lever will move the roll-box into operative connection with the gin teeth.

Where a number of gins are installed in one battery the shaft 18 will be connected preferably between the gins so that the movement of the shaft, as before described, will cause a simultaneous movement of all of the roll-boxes in the battery of gins. While this arrangement is designed to affect the simultaneous movement of all of the roll-boxes it is also essential that there be provided means, whereby any one of the roll-boxes in the battery may be moved into or out of operative connection with the gin saws or teeth, and for this purpose I provide a shaft 52, one for each roll-box, which is somewhat longer than the roll-box, the ends of the shaft being journaled in and extending through the end plates 33 of the roll-box 26.

On the extended ends of the shaft 52 are fixed cams 54 provided with notched recesses 55. One of these cams has an extended portion 53 forming a lever for turning said shaft and cam. If the cam lever be moved forward it causes the shaft 52 to be turned in its bearings and thus moves the two cams 54 into contact with fixed projecting bosses 56 formed on the legs 1. A further movement of the cam causes the entire upper body portion of the roll-box to move outwardly about the eccentrics 47^a and out of operative connection with the gin saws or teeth, the lower portions of the end plates 33 turning upon the eccentrics 47^a. The described movement of the roll-box brings the notched portion 55 of the cam levers into engagement with the bosses 56, said bosses fitting into said notches and locking the roll-box in a position in which it will be out of operative connection with the gin saws or teeth. When the roll-box is locked in this position, a portion of the saws or gin teeth will be exposed, and with a view to obviating the danger of the unginned cotton or other substances falling on the exposed teeth, and with a further view to protect the operator from the saws, I provide a shield 57 which, at its upper edge, is journaled on the rod or shaft 52 and at its lower edge rests on the concave member 7 so as to cover the exposed portions of the gin teeth. It is evident that free access may be had to the gin cylinder by merely moving the lever 53 so that the notched portion of the lever will not engage the bosses 56, thus allowing the roll-boxes to be turned outwardly and partially rotate upon the eccentrics 47^a until its main body portion rests upon the floor in front of the gin.

If it is desired to entirely detach the roll-box from the gin it may be done in the following manner:—The shaft 18 is journaled in bearings 1^a formed in the legs 1, said bearings extending inwardly and forming bosses 1^b against the faces of which the eccentrics 47^a abut. The radius of the bosses 1^b is greater than the smallest radius of the eccentrics 47^a so that if the roll-box, while in its normal position, is moved endwise, the edges of the end plates 33 surrounding the eccentrics 47^a will move against the face of one of the bosses 1^b so as to prevent any further end movement of the roll-box. One of the bosses 1^b has opposite segmental parts cut therefrom, whereby it is provided with approximately parallel sides, as indicated at 1^c. The adjacent plate has a slot 33^a in its front edge. When the roll-box is turned down so as to cause its upper body

portion to rest on the floor in front of the gin, said roll-box may be given a further endwise movement, the slot 33ª receiving the sides 1ᶜ of the reduced bosses 1ᵇ, the end plates 33 being moved to pass completely off of the eccentrics 47ª. If now the lower portion of the roll-box be elevated it may be entirely detached and removed from the gin structure without detaching or removing any fastening members, the slots 33ª receiving the reduced portions 1ᵇ on one end, and the shaft 18 on the other end passing in said slots as is most clearly shown in Figs. 3 and 4 of the drawings. Referring to the said figures, the studs or bolts 51 are shown as, in addition to carrying the wheels 50, also serving as adjusting screws for the roll-box by means of which the roll-box may be held in correct position to cause the gin saws to properly enter the ribs or grates and engage the cotton. The said bolts 51 have screw threads, the threaded ends being screwed into threaded apertures cut in the extensions surrounding them, and by the proper adjustment of these bolts or studs against the ends 33 of the roll-box, the latter is held in proper relative position to the gin saws or teeth, lock nuts 52ª being provided to secure the said bolts from shifting after they have been once adjusted.

An adjusting screw 53ª is tapped in the second extremity of the flanges 49 before referred to, the lower portion of the screw resting on the wheel 50 which supports the roll-box and prevents it from moving too far over upon the ginning cylinder. The depth of the ginning teeth in the cotton is regulated by the adjustment of this adjusting screw.

While I have shown a plurality of gins arranged in pairs and constituting the battery it will be obvious to those skilled in the art that the features of the invention hereinbefore described and shown in the drawings may equally as well be applied to a single gin. The successful operation of the improved gin herein disclosed is due largely to the tubular member or members extending longitudinally through the bodies of the gins and practically forming a single conduit or receptive outlet means for the lint when a plurality or battery of gins are connected up and disposed in endwise relation. The air current, as before noted, within the said tubular means or conduit, moves at a higher velocity than the ginning device, which higher velocity will not only result in regularly drawing the lint cotton down into the tubular member or conduit, but also effect an expeditious discharge at one end of either the battery of gins or the single gin, as the case may be. Structurally, another important advantage results in passing the tubular member or conduit through the legs of the gin, not only in view of the beneficial results accruing from the use of the tubular member, but in the economy in the organization of the elements composing the gin structure. Consequently, the construction of the gin is simplified and the cost of manufacture reduced. Furthermore, the gin including the tubular member, conduit, or lint flue, occupies about one-third the space heretofore required for the usual gin and lint flue arrangement, and in addition, the embodiment of the tubular member, conduit, or flue within the gin is more convenient in handling, transporting and installing gin machinery, and after placing a battery of gins in position it is only necessary to connect the tubular members, conduits, or flues, between the gins to complete or practically form a single tube along the entire battery. Another, and very important advantage gained by disposing the tubular member, conduit or lint flue within the body of the gin, is that the lint may be delivered endwise from the gin instead of rearwardly, as heretofore, and supplies the long felt want of having free access to the rear of a gin and the important parts concerned in the removal of the lint from the gin teeth at the rear of the ginning cylinder, as well as providing free access to the rear of the feeder of the gin.

It will also be apparent that many of the details of construction herein shown and described may be varied or altered either as to their construction or arrangement without departing from the spirit of my invention, and I, therefore, do not wish to be understood as confining myself to any of the details of construction set forth, excepting as may be hereinafter specifically pointed out in the annexed claims.

Referring to the part 3 in the foregoing description, it has been termed a "tube" or "tubular member" solely for convenience in disclosing a preferred embodiment of this particular or essential feature of the invention, but in the use of these terms it is to be understood that the exact definition of the words "tube" and "tubular" indicating a device circular in cross section is not intended, as any form of hollow member or conduit means having the application and operation or function of the part 3 will be employed and said part 3 may, therefore, be of any contour in cross section.

In my application Serial Number 392,652, filed September 13, 1907, a continuation of the essential feature of the invention in this application is shown in organized relation to a brush or brush cylinder and demonstrating that the conduit or hollow member within the gin organization is capable of use in relative position with respect to ginning mechanism having means for creating air currents to carry or drive the lint into the hollow member or conduit other than a

brush or brush cylinder or through the medium of a brush or brush cylinder, the claims in the present application being distinguished from those in the later filed copending application by the omission of the brush or brush cylinder.

Having described my invention, what I claim is:—

1. In a cotton gin, the combination with ginning teeth, of means for creating an air current, and means having an arcuate contour and closely embracing the said teeth for confining the air current in surrounding relation to the periphery of the teeth and causing said current to travel in a path coincident with the path traversed by the ginning teeth to remove the lint therefrom.

2. In a cotton gin, the combination with ginning teeth, of means for creating an air current, and means having an arcuate contour embracing the said teeth for confining the air current in surrounding relation to the periphery of the teeth and excluding external air from the ginning teeth, whereby the lint is removed from the teeth.

3. In a cotton gin, the combination with ginning teeth, of means for creating a current of air, and means closely embracing the peripheries of the ginning teeth and forming a receiving means for and confining said current of air over the peripheries of the teeth and causing the confined air to travel in a path traversed by the teeth during a large portion of every revolution of the teeth to remove the lint from the latter.

4. In a cotton gin, the combination with the ginning teeth, of a casing having an air confining passage within which the extremities of the teeth travel during a portion of their movement, means for producing within the passage an air current moving at a higher velocity than the ginning teeth, the passage being constructed and arranged to conduct the air current in a path coincident with the path traversed by the ginning teeth to remove the lint from the latter.

5. In a cotton gin, the combination with the ginning teeth, of a casing provided with a passage within which the teeth travel during a portion of their movement, means for inducing within the passage an air current moving with a higher velocity than the ginning teeth, the passage being constructed to conduct the air current in a path coincident with the path traversed by the ginning teeth and to concentrate the force of the air current along the path traversed by the ginning teeth to remove the lint from the latter.

6. In a cotton gin, the combination with the ginning teeth, of a casing having a passage within which the teeth travel during a portion of their movement, means for creating within the passage an air current moving with a higher velocity than the ginning teeth, the passage being constructed and arranged to conduct the air current in said path coincident with the path traversed by the ginning teeth to concentrate the lines of force of the air current along the path traversed by the ginning teeth for a considerable portion of the movement of the latter to remove the lint therefrom.

7. In a cotton gin, the combination with the ginning teeth, of a casing provided with a passage within which the teeth travel during a portion of their movement, means arranged for creating an air current within said passage with a higher velocity than the ginning teeth, the passage being constructed to conduct the air current along lines parallel with the lines traversed by the teeth, the air current being maintained substantially at its initial velocity while traversing the passage.

8. In a cotton gin, the combination with a ginning cylinder having circumferential rows of teeth, of a casing having a passage surrounding a portion of the periphery of the ginning cylinder, the outer wall of the passage comprising a concave disposed exteriorly to the periphery portion of the ginning cylinder, the inner wall being of cylindrical form and slotted to admit the projecting ginning teeth of the cylinder within the passage, and means for inducing an air current through the passage to remove the lint from the teeth.

9. The combination with a cotton gin having ginning devices, of an air suction apparatus for inducing inward air currents around a portion of the edges of the ginning devices, and means for preventing the diminution of the inward force of said currents in their passage about said ginning devices.

10. The combination with a cotton gin having ginning devices, of an air suction apparatus having means for inducing inward air currents around a portion of the rear edges of the ginning devices in a curvilinear path coincident with the periphery of said devices.

11. The combination with a cotton gin having ginning devices, of an air suction apparatus having means for inducing inward air currents around a portion of the rear edges of the saws or gin teeth in a path coincident with the peripheries of the ginning devices, the passage through which said air currents pass being constructed and arranged to prevent the diminution of the inward force of said currents in their passage about the said devices, and means for feeding the lint cotton to the suction apparatus.

12. The combination in a cotton gin having ginning devices of a concave cencentric with and surrounding a portion of the edges of the ginning devices, and a suction appa-

ratus for sucking air between said concave and the edges of the said devices.

13. The combination in a cotton gin having ginning devices of a concave concentric with and surrounding a portion of the edges of the ginning devices, partitions extending between the saws or rows of teeth, and a suction apparatus for inducing air currents between said concave and partitions and about the said devices.

14. The combination in a cotton gin having ginning devices of a concave concentric with and surrounding a portion of the edges of the ginning devices, partitions extending between the edges of the ginning devices, flexible strips attached to the said partitions and extending to the ginning devices on either side, and suction apparatus for inducing air currents between said concave and partitions.

15. The combination in a cotton gin having ginning devices of a concave concentric with and surrounding a portion of the edges of the ginning devices, partitions projecting between the ginning devices, and having means closely engaging opposite sides of the latter, and a suction apparatus for inducing air currents between the concave and partitions and along the edges of the ginning devices.

16. In a cotton gin, the combination with a roll-box, the lower portion of which is pivotally attached to the gin, a shaft carried by the upper portion of said roll-box, and adjustable means for engaging said shaft, and mechanism attached to the shaft operating to cause the roll-box to recede from the gin teeth.

17. In a cotton gin, a roll-box pivotally attached at its lower part to the gin, means for swinging the upper body portion of said roll-box out of operative connection with the ginning teeth, and means for locking said roll-box in its inoperative position, substantially as described.

18. In a cotton gin, the combination with a ginning cylinder, of a roll-box pivotally supported at its lower portion within said gin, means for raising the pivot of the roll-box to elevate the latter out of operative connection with the ginning cylinder, substantially as described.

19. In a cotton gin, the combination with a ginning cylinder, of a roll-box supported at its lower portion on a pivot, means for raising the pivot, and means for causing the upper body portion of the roll-box to automatically recede outwardly from the ginning cylinder when said pivot is raised, substantially as described.

20. In a cotton gin, the combination with a ginning cylinder, of a roll-box pivotally arranged in the gin, means for raising the pivot of the roll-box to elevate the latter, said roll-box being provided with means for causing its upper body portion to recede outwardly from the ginning cylinder as the pivot is raised, substantially as described.

21. In a cotton gin, a gin frame, ginning mechanism supported by the frame, a shaft carried by the end members of the gin frame, and having slotted elements pivotally supported thereby, and a roll-box detachably pivoted to the said shaft.

22. In a cotton gin, the combination with a detachable roll-box, and ginning mechanism, of a shaft arranged longitudinally along the lower part of the said roll-box, eccentrics on the said shaft near the ends and pivotally supporting slotted elements to coöperate with the roll-box, and mechanism for actuating the shaft and for causing the roll-box to recede from the ginning mechanism.

23. In a cotton gin, the combination with a roll-box, of a roll-box breast, sustaining metallic pieces fixed on the ends of said breast and having casings formed in them, and end-wise movable locking bolts arranged in the casings for locking the breast to the end plates of the roll-box.

24. In a cotton gin, the combination with a roll-box and sustaining metallic pieces fixed to the ends thereof, of casings formed in the said sustaining pieces, locking devices carried in said casings for securing the breast to the end plates of the roll-box, a seed plate, and means carried by the lower portions of said sustaining pieces for adjusting the seed plate with relation to the roll-box.

25. In a cotton gin, the combination with a roll-box breast and sustaining metallic pieces fixed to the end thereof, of casings formed in the said sustaining pieces, and locking bolts carried in said casings for locking the breast to the end plates of the roll-box, the lower portion of said sustaining pieces being turned inwardly away from the end plates of the roll-box, a seed plate and means carried by the said inwardly turned ends for adjusting the seed plate, substantially as described.

26. In a cotton gin, the combination with a roll-box breast, of sustaining metallic pieces fixed to the ends thereof, said sustaining pieces at their lower ends being turned inwardly away from the end plates of the roll-box, a seed plate, means carried by said inwarldy turned ends for adjusting the seed plate of the roll-box, and pneumatic means for relieving the gin of the cotton, substantially as described.

27. A back-hollow for cotton gin roll-boxes, serving as a securing means for the ribs or grates and comprising longitudinally curved metallic plates, and a wooden core secured between said plates, substantially as described.

28. A metallic back-hollow for cotton gin

roll-boxes, having a wooden core, and ribs or grates secured to said core.

29. A metallic back-hollow for cotton gin roll-boxes, having a wooden core at its lower portion, and ribs or grates secured to said core.

30. In a cotton gin, the combination with a roll-box, of a back-hollow structure comprising curved longitudinal plates, and a wooden member embraced between said plates, the ribs or grates of the roll-box being secured to the said wooden member, substantially as described.

31. In a cotton gin, the combination with a roll-box pivotally supported at its lower portion, of a shield connected to its upper part, said shield being constructed and arranged to safeguard the gin teeth when the roll-box is swung out of operative position relatively to the said teeth by preventing cotton or other substance from falling upon the said teeth, and being drawn down below the latter, substantially as described.

32. In a cotton gin, the combination with a roll-box pivoted at its lower part to the gin, of a shield constructed and arranged to safeguard the gin teeth when the roll-box is moved out of operative connection with the ginning teeth, cotton and other substance being prevented from falling upon the teeth, and being drawn down below the latter by the shield, and the said shield being constructed to automatically move into position to shield the saws when the roll-box is moved out of operative connection with the ginning teeth, substantially as described.

33. In a cotton gin, the combination with a roll-box pivotally supported at its lower part and constructed and arranged to permit the upper body portion thereof to move outwardly from operative connection with the ginning teeth, and a shield constructed to safeguard the ginning teeth when the roll-box is moved out of operative connection with said teeth and preventing cotton or other substance from falling upon the teeth and being drawn down below the latter, substantially as described.

34. In a cotton gin, the combination of a roll-box having movable pivotal means near its lower portion, and means for automatically seating said roll-box endwise as it is brought into operative position with relation to the gin teeth.

35. In a cotton gin, the combination with a roll-box pivoted near its lower portion to the gin of fixed parts arranged to contact with inclined parts therein for automatically seating the roll-box endwise as it is turned into operative position relatively to the ginning teeth, substantially as described.

36. In a cotton gin, the combination with the ginning teeth, of a casing having a passage within which the teeth travel during a portion of their movement, means to induce within the passage an air current moving at a higher velocity than the ginning teeth, the passage being constructed and arranged to conduct a current of air in a path coincident with the path traversed by the ginning teeth, and a longitudinal tubular member extending through the body of the gin frame and with which the said passage communicates for removing the lint.

37. The combination with a cotton gin having ginning devices and a casing with a passage through which the rear portions of the ginning devices have movement, of an air suction apparatus constructed to draw off the lint cotton from the rear edges of the ginning devices. a tubular device in the gin body for feeding the lint cotton through the end of the gin to the suction apparatus.

38. The combination with a cotton gin having a casing with a passage through which the rear portions of the saws have movement, of an air suction apparatus for drawing off the lint cotton from the rear edges of the saws or gin teeth, a tubular device within the body of the gin for receiving and conveying the lint cotton to the suction apparatus, and means for discharging the lint cotton from the suction apparatus to the point of delivery.

39. The combination with a cotton gin having ginning devices of a concave concentric with and surrounding a portion of the edges of the ginning devices, a tube extending longitudinally along the gin and communicating with the space between the concave and the ginning devices, and a suction apparatus connected with said tube and operating to draw off the lint cotton from the ginning devices into and through said tube to said suction apparatus.

40. The combination in a cotton gin having ginning devices of a concave concentric with and surrounding a portion of the edges of the ginning devices, a tube extending along the gin and communicating with the space between the concave and the ginning devices, a suction apparatus connected with said tube and arranged to draw off the lint cotton from the ginning devices into and through said tube to the suction apparatus, and a blast pipe leading from the suction apparatus for conveying the lint cotton to the point of delivery.

41. In a cotton gin, the combination with the ginning devices and legs for supporting the same, of a longitudinal tubular member located adjacent to and communicating with the ginning devices and secured to the legs to hold them in position, and a suction apparatus arranged to draw the lint cotton away from the ginning devices into and through the tubular member.

42. In a cotton gin, the combination with a ginning cylinder and its roll-box, of legs

for supporting the gin, a longitudinal tubular member extending through the body of the gin and rigidly securing the legs in their proper relative positions and also serving as a receptive means for the lint, and means for removing lint from the tubular member.

43. In a cotton gin, the combination with a ginning cylinder and its roll-box, of split supports for the gin, a tube arranged longitudinally between the split portions of the supports, bolts and nuts arranged to draw the legs tightly about the tube, the said tube being constructed and arranged to longitudinally hold the supports in their proper relative positions, and means for removing the lint.

44. In a cotton gin, the combination with a ginning cylinder and roll-box, of split supports for the gin, and a longitudinal tubular member passing through the split portions of the supports, the said split portions of the supports being tightly clamped onto the tubular member, the latter rigidly holding the supports in their proper relative positions.

45. In a cotton gin, the combination with a plurality of ginning cylinders, of supports for the cylinders, a tube arranged to rigidly secure the supports in their proper positions, said tube being in communication with the the ginning cylinders, and a suction apparatus arranged to draw the lint cotton from the cylinders into and through the tube.

46. In a cotton gin, the combination with a plurality of ginning cylinders arranged end to end, of supports for the cylinders, a tube arranged along the cylinders and passing through the supports, said tube rigidly securing the supports in their proper positions and in communication with the cylinders, and a suction apparatus arranged to draw the lint cotton from the cylinders and outwardly through the tube.

47. In a cotton gin, the combination with a plurality of ginning cylinders and their roll-boxes and having legs, of a longitudinal tubular member extending through the bodies of the several gins and rigidly uniting the legs to secure the latter in their relative positions, and also serving as a receptive medium for the lint, and means for drawing off the lint from the tubular member.

48. In a cotton gin, the combination with a plurality of ginning cylinders, and their roll-boxes, and supporting legs, of a hollow member uniting and rigidly securing the legs in their relative positions, and means for drawing off lint from the hollow member.

49. In a cotton gin, the combination with a plurality of ginning cylinders and their roll-boxes, of legs for supporting said parts, a tubular member uniting the legs, said member communicating with the ginning cylinders and rigidly securing the said legs in their relative positions, and a suction apparatus for drawing the lint cotton from the cylinders into and through the tubular member.

50. The combination in a cotton gin having ginning devices of supporting legs at the ends of the gin frames, a tube arranged longitudinally along the gin and rigidly fixed to the said legs for securely connecting the legs together, said tube being in communication with the gin, and a suction apparatus connected to said tube for sucking the lint cotton from the ginning devices into and through said tube.

51. The combination in a cotton gin having ginning devices of split supports at the ends of the gin frame, a tube arranged longitudinally along the gin and rigidly clamped between the split portions of said supports for securely connecting the latter together, said tube being in communication with the gin, and a suction apparatus connected to said tube for sucking the lint cotton from the ginning devices into and through said tube.

52. The combination in a cotton gin having ginning devices of split supports arranged at the ends of the gin frame, a tube arranged longitudinally along the gin and between the split portions of the supports, bolts and nuts arranged to tightly draw the split portions of the supports about the tube to rigidly clamp the supports to the tube, said tube being in communication with the gin, and a suction apparatus connected to said tube for sucking the lint cotton from the ginning devices and through said tube.

53. The combination in a cotton gin having ginning devices of split supports arranged at the ends of the gin frames, a tube arranged along the gin and between the split portions of the supports, bolts and nuts arranged to tightly draw the split portions of the supports about the tube to rigidly clamp the supports to the tube, said tube being in communication with the gin, a suction apparatus connected to the tube for cleaning the lint cotton from the said devices and through said tube.

54. The combination in a plurality of cotton gins having ginning devices and each provided with a concave concentric with the ginning devices and surrounding a portion of the edges of the latter, of a tube extending along the gins and communicating with the spaces between the concave and the ginning devices, and a suction apparatus connected with the said tube and arranged to draw off the lint cotton from the ginning devices into and through said tube.

55. The combination in a plurality of cotton gins having ginning devices and each provided with a concave concentric with the ginning devices and surrounding a portion of the edges thereof, of a tube extending along the gins and having openings commu-

nicating with the spaces between the concaves and the ginning devices, the openings being restricted in their communication to the rear portions of the ginning devices, a suction apparatus connected with said tube and arranged to draw off the lint cotton from the ginning devices into and through said tube to said suction apparatus.

56. The combination in a plurality of cotton gins having ginning devices and each provided with a concave concentric with the said ginning devices and surrounding a portion of the edges of the latter, of a tube extending along the gins and communicating with the spaces between the concaves and the ginning devices, a suction apparatus connected with said tube and operating to draw off the lint cotton from the ginning devices into and through said tube to said suction apparatus, and a blast pipe leading from the suction apparatus to convey the lint cotton to the point of delivery.

57. The combination in a plurality of cotton gins having ginning devices and each provided with a concave concentric with the said ginning devices and surrounding a portion of the edges of the latter, of a tube extending through the gins and communicating with the spaces between the concaves and the ginning devices, a suction apparatus connected to said tube and arranged to draw off the lint cotton from the ginning devices into and through said tube to said suction apparatus.

58. The combination in a plurality of cotton gins arranged end to end and having saws or teeth, of split supports for the gins, a tube arranged along the gins and extending through the split supports, means for clamping said split portions tightly about the tube, said tube being in communication with the gins, and a suction apparatus connected with the tube and arranged to suck the lint cotton from the gin saws or teeth and through said tube.

59. The combination in a plurality of cotton gins arranged end to end and having saws or teeth, of split supports for the gins, a tube extending through the bodies of the gins and through the split supports, means for clamping said split supports tightly about the tube, said tube having communication with the upper portions of the gins, and a suction apparatus connected with said tube and arranged to suck the lint cotton from the gin or teeth and through said tube.

60. In a cotton gin, the combination with a ginning cylinder and roll-box, of supporting legs therefor, a longitudinal tubular member uniting the legs and constructed and arranged to rigidly hold the legs in their proper relative positions, whereby the employment of other longitudinal members is dispensed with, and a suction apparatus for removing the lint from the saws, substantially as described.

61. In a cotton gin, the combination with a ginning cylinder and roll-box, of supporting legs for the gin, a longitudinal hollow lint receiving member uniting the legs, said member rigidly securing the legs in their proper relative positions, and a suction apparatus for removing the lint from the ginning cylinder and the hollow member.

62. In a cotton gin, the combination with a ginning cylinder and roll-box, of supporting legs for the gin, a longitudinal tubular member uniting the legs, said member rigidly securing the legs in their proper relative positions and serving as a conduit to convey the lint cotton away from the ginning cylinder, and means for drawing the lint from the cylinder.

63. In a cotton gin, the combination with ginning devices, of supporting legs, a longitudinal tubular member uniting the legs and communicating with the cylinder, said member being constructed and arranged to rigidly secure the legs in their proper relative positions, and a suction apparatus arranged to draw the lint cotton from the ginning cylinder into and through said tubular member.

64. In a cotton gin, the combination with legs for supporting the same, of a longitudinal conduit extending through the body and legs of the gin and serving to receive the lint cotton and to rigidly unite and secure the said legs, and means for drawing the lint cotton through and from the conduit.

65. A cotton gin having a ginning cylinder and containing within itself a conduit extending from end to end thereof, said conduit serving to conduct the lint cotton out through the end of the gin, and means for relieving the conduit of the lint cotton therein.

66. A cotton gin having ginning mechanism and containing within its body a conduit having an opening in communication with said mechanism and serving to receive and conduct the lint cotton out through the end of the gin.

67. In a cotton gin, the combination with legs for supporting the gin, of a longitudinal hollow member extending through the body of the gin and uniting the legs, the said longitudinal member having communication with the interior of the gin and forming an end exit for the lint, the back of the gin being unobstructed and freely accessible.

68. In a cotton gin, the combination with ginning teeth, of means for creating an air current, and a casing having means for surrounding the peripheries of the ginning teeth and confining the air current over said peripheries and causing the said current to move at a higher velocity than the ginning

teeth, and a lint cotton receiver with which said casing communicates.

69. In a cotton gin, provided with a gang of saws and a flue confined within and projecting endwise through the gin and disposed below the saws and along the latter to receive lint therefrom, an air feeding means in close surrounding and embracing relation to a portion of the saw teeth for directing air under pressure to said teeth, and means coöperating with said air feeding means for causing the air to strike the teeth of the saws and to force the lint cotton therefrom into said lint flue.

70. In a cotton gin, the combination with a gang of saws, of a flue confined within and projecting endwise through the gin and extending along and adjacent to the saws to receive lint from the latter, and an air current confining means in surrounding and embracing relation to a portion of the saw teeth to concentrate air currents on the saw teeth and past the saws to remove the lint from the saws and carry it into the flue.

71. In a cotton gin, the combination with ginning devices, means in close embracing association with portions of the peripheries of the ginning devices to confine air currents in relation to the teeth of said devices, and means other than the ginning devices for creating air currents within the said confining means and causing said currents to travel in the direction of movement of the ginning devices.

72. In a cotton gin, the combination with ginning devices, of confining means in close relation to portions of the teeth of the ginning devices to confine air currents close to the said teeth, and means other than the ginning devices for creating air currents in and causing them to move through the said confining means at a higher velocity than the velocity of movement of the ginning devices.

73. In a cotton gin, the combination with gin saws, of a tubular member disposed along the lint saws to receive cotton from the latter and located within the confines of the gin and extending through one extremity of the latter, and a nozzle between the saws and tubular member for directing the lint cotton from the saws into said member.

74. In a cotton gin, the combination of a roll box, ginning devices coöperating with said roll box, a tubular member disposed under the ginning devices and along the latter, and a nozzle between the tubular member and the ginning devices to direct the lint cotton from the latter into said member, the tubular member being located within the confines of the gin and extending through at least one extremity of the latter.

75. In a cotton gin employing air suction means for the removal of cotton from the saws, the combination of a series of saws, a suction nozzle having its upper portion close to and extending about a portion of the periphery of the saws to cause increased velocity of the suction currents over the saw teeth, and a suction chamber connected to said suction nozzle.

76. In a cotton gin employing air suction means for the removal of cotton from the saws, the combination of a series of saws, a suction nozzle disposed adjacent to the saws and having the top of one of its walls close to and extending along a portion of the periphery of the saws to cause increased velocity of the suction currents in the direction of saw movement, a series of partition devices projecting between the saws at the nozzle opening, and a vacuum chamber connected to said suction nozzle.

77. In a cotton gin employing an air force for the removal of cotton from the saws, the combination of a series of saws, nozzle means rendering the air force effective with relation to the saws and extending about a portion of the periphery of the saws to cause increased velocity of the air currents over the saw teeth, and a vacuum chamber connected to the said means.

78. A cotton gin comprising a supporting frame, ginning saws mounted therein, and a suction nozzle having its inlet opening directed in opposition to the saw movement and extended to a point within the peripheries of said saws to induce suction currents into said nozzle in the direction of saw movement.

79. A cotton gin comprising a supporting frame, ginning saws mounted therein, and a suction nozzle having its opening directed in opposition to the saw movement and provided with separated partition devices extended between said saws and affording a suction opening into the nozzle in the direction of saw movement.

80. In a saw gin employing suction currents of air for removing cotton from the saws, the combination of a series of saws, a suction nozzle having its opening disposed adjacent the saw teeth, and a suction chamber in communication with the suction nozzle.

81. A cotton gin comprising ginning devices provided with teeth, a nozzle having its one open end adjacent to and partially surrounding the teeth of the ginning devices for confining air currents in close relation to the said teeth to remove lint cotton from the saws, and a tubular lint receiving member extending along the saws and having the opposite terminal of the nozzle communicating therewith to provide a direct passage of the lint cotton from the saws to the member.

82. In a cotton gin employing suction cur-

rents of air for carrying cotton from the saws, the combination with a ginning cylinder comprising devices having teeth, of a casing provided with a passage surrounding a portion of the periphery of the cylinder and constituting a nozzle, said passage having slots in one of its walls coincident with the rows of teeth to permit the teeth to project into said passage, and a suction chamber for inducing air currents through the passage and to receive the lint cotton, the passage communicating with the said chamber.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

STEPHEN D. MURRAY.

Witnesses:
THEODORE LIEBISCH,
LEM BRALEY.