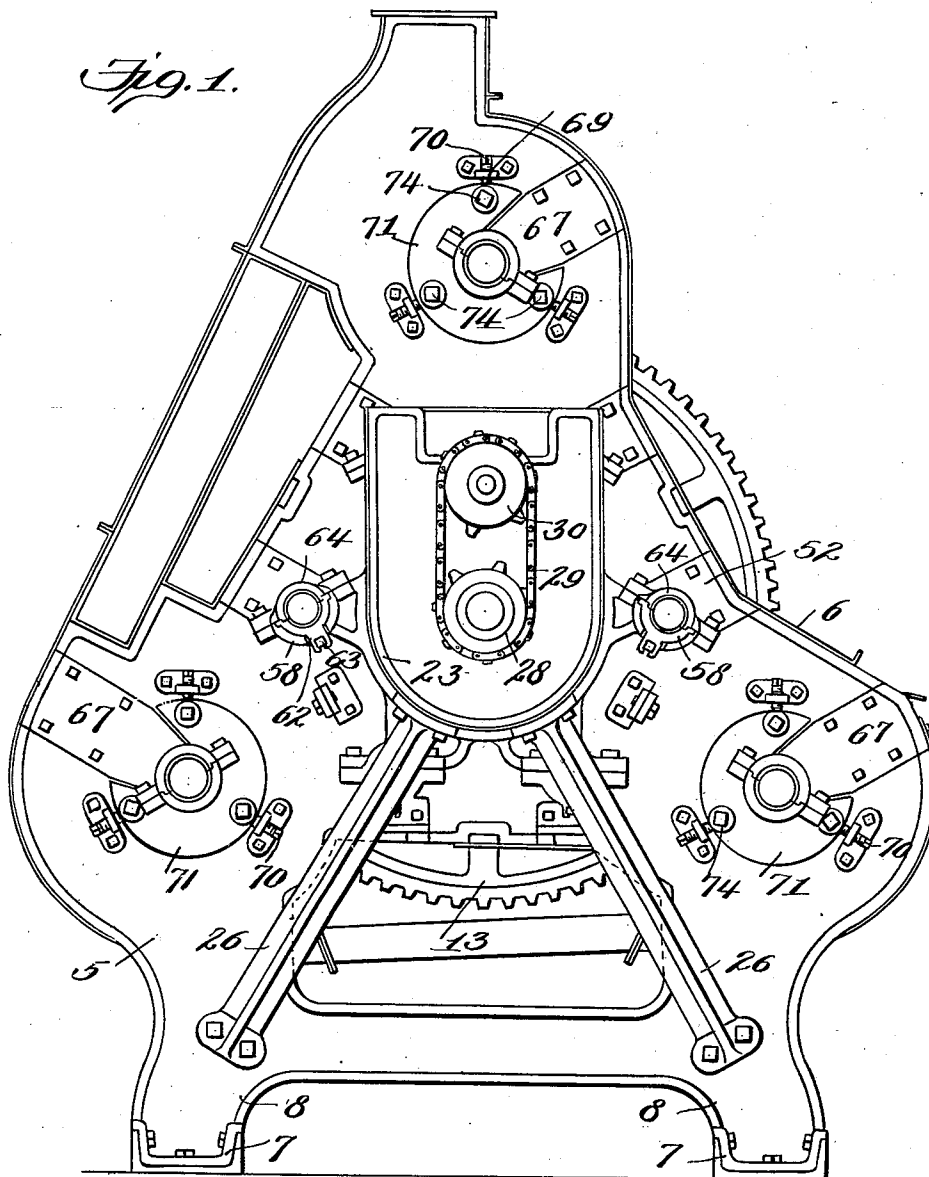


S. D. MURRAY.  
GIN.  
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1,011,832.

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7 SHEETS—SHEET 1.



Witnesses:  
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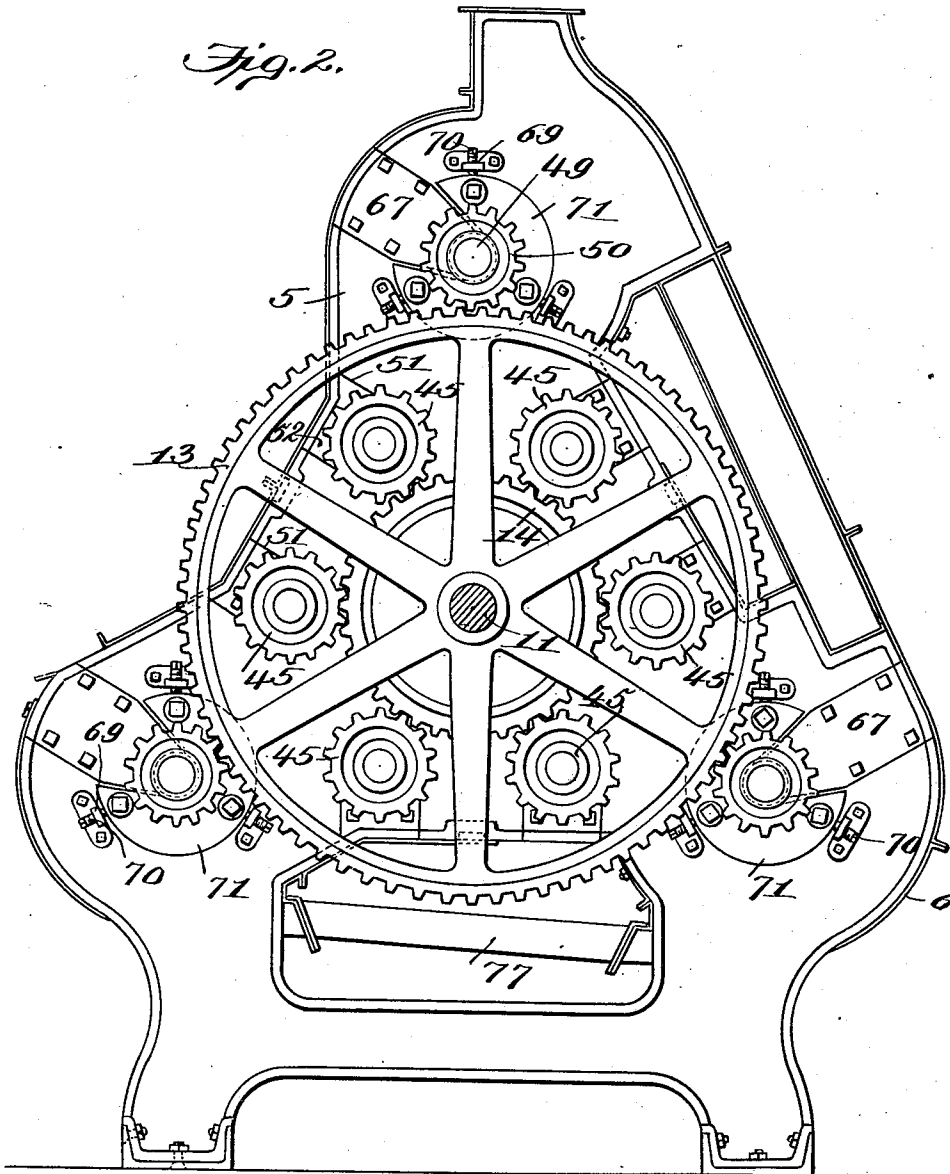
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7 SHEETS—SHEET 2.



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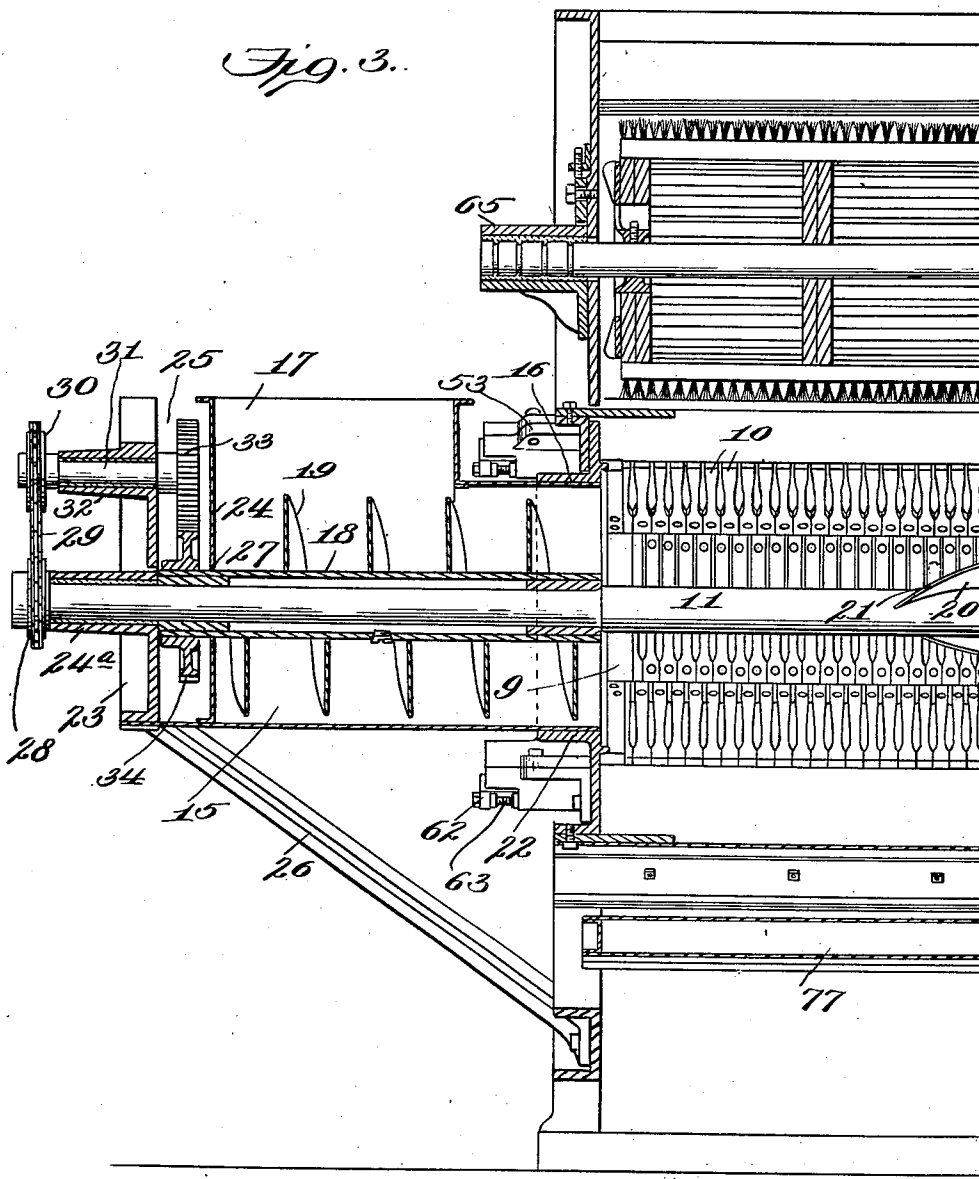
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7 SHEETS—SHEET 3.

*Fig. 3.*



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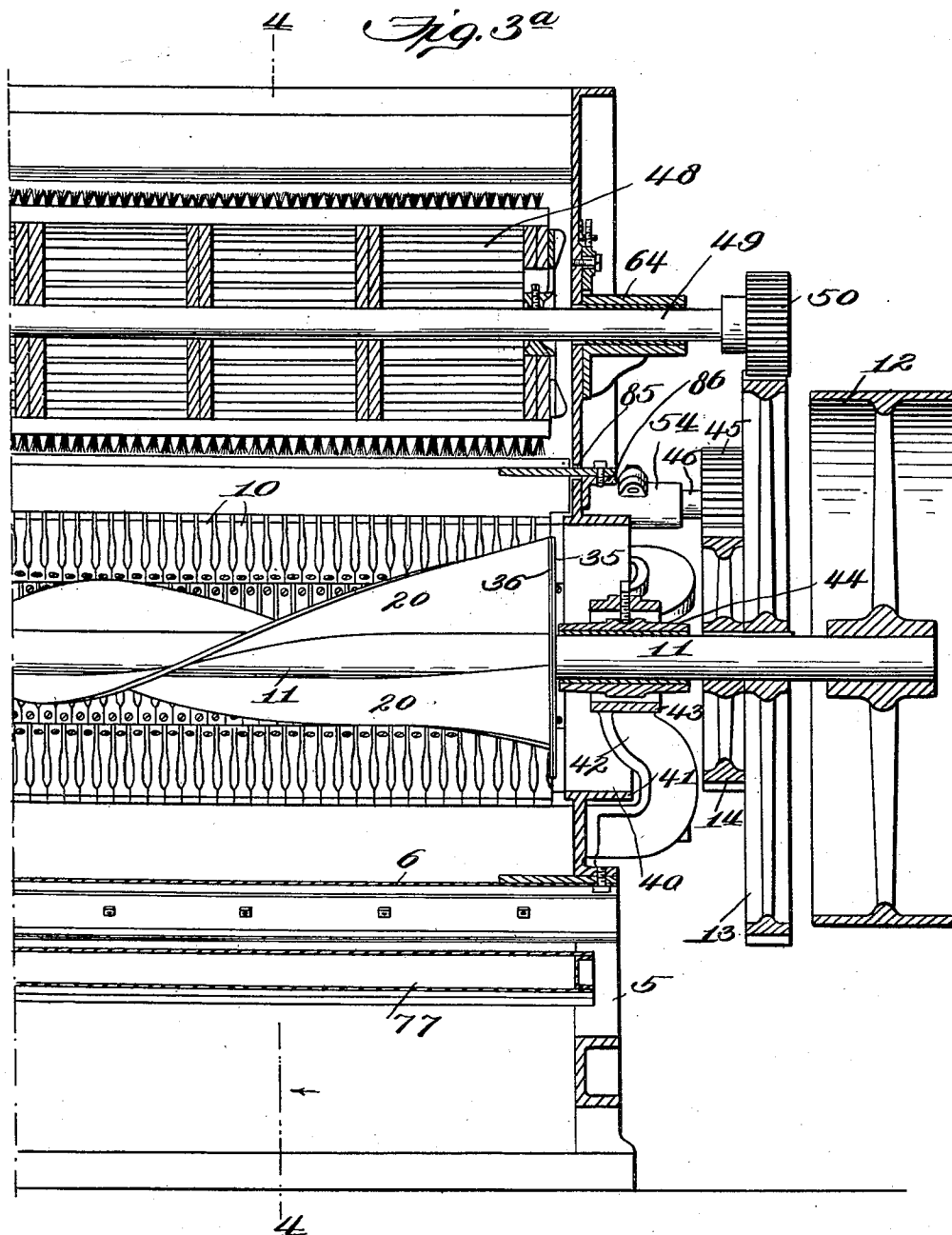
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7 SHEETS—SHEET 4.



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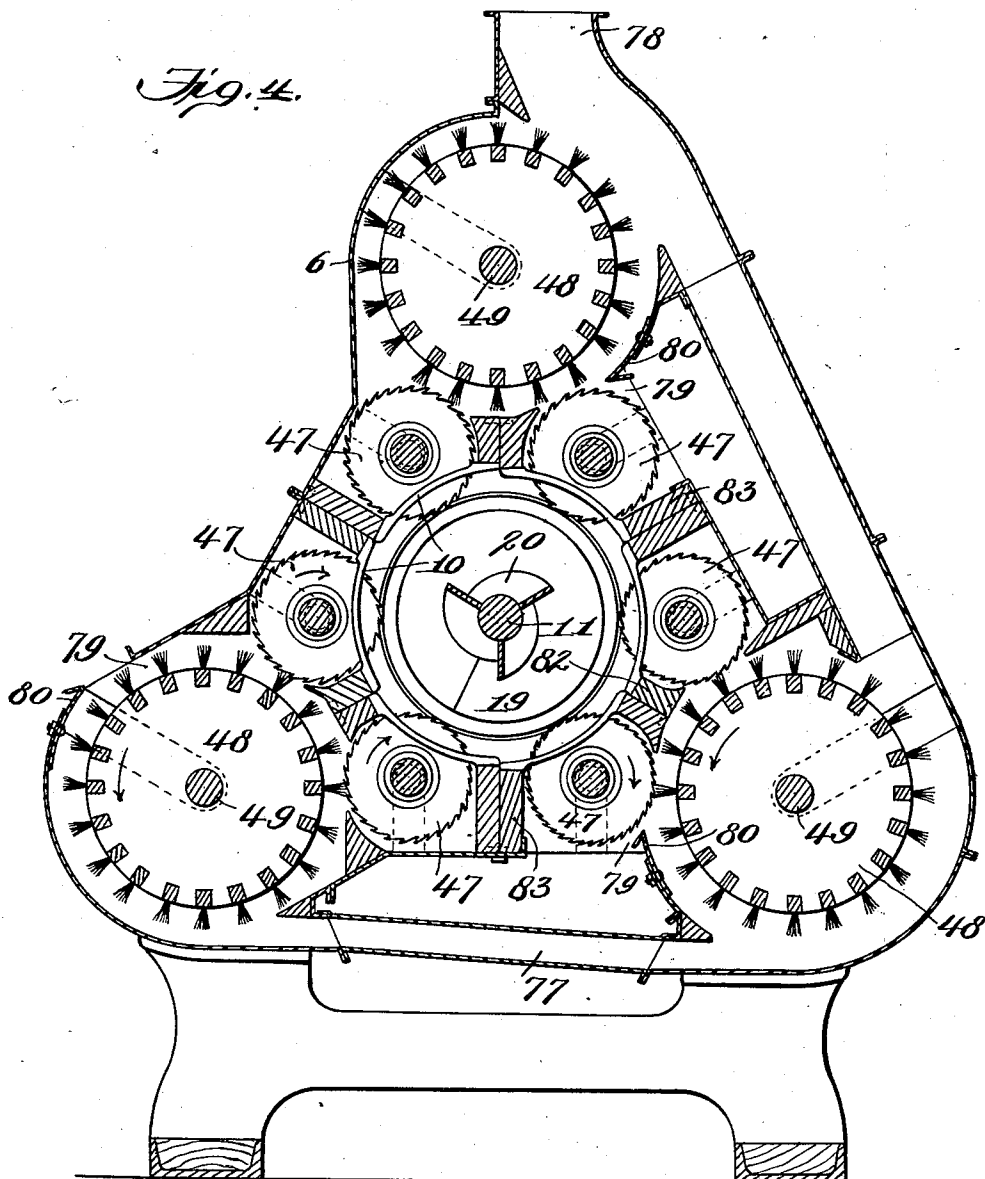
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7 SHEETS—SHEET 6.



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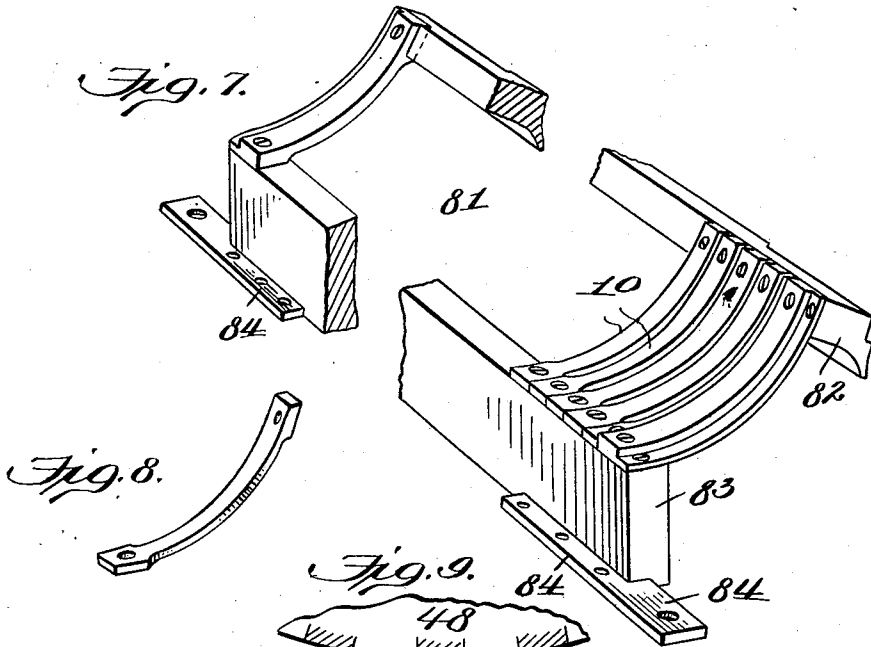
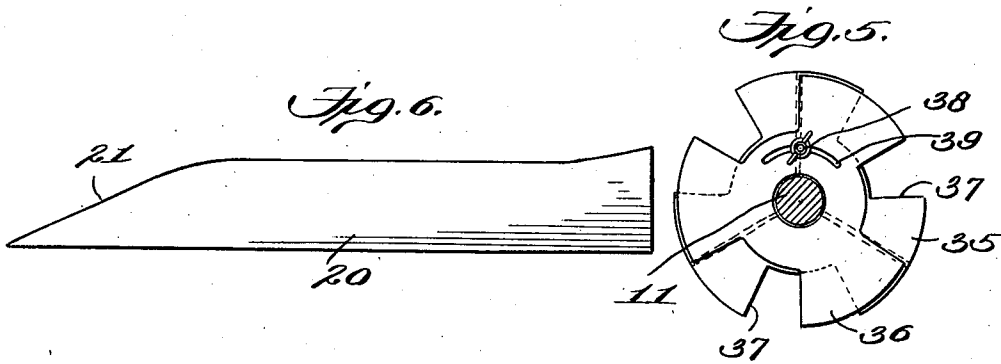
S. D. MURRAY.  
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7 SHEETS-SHEET 6.



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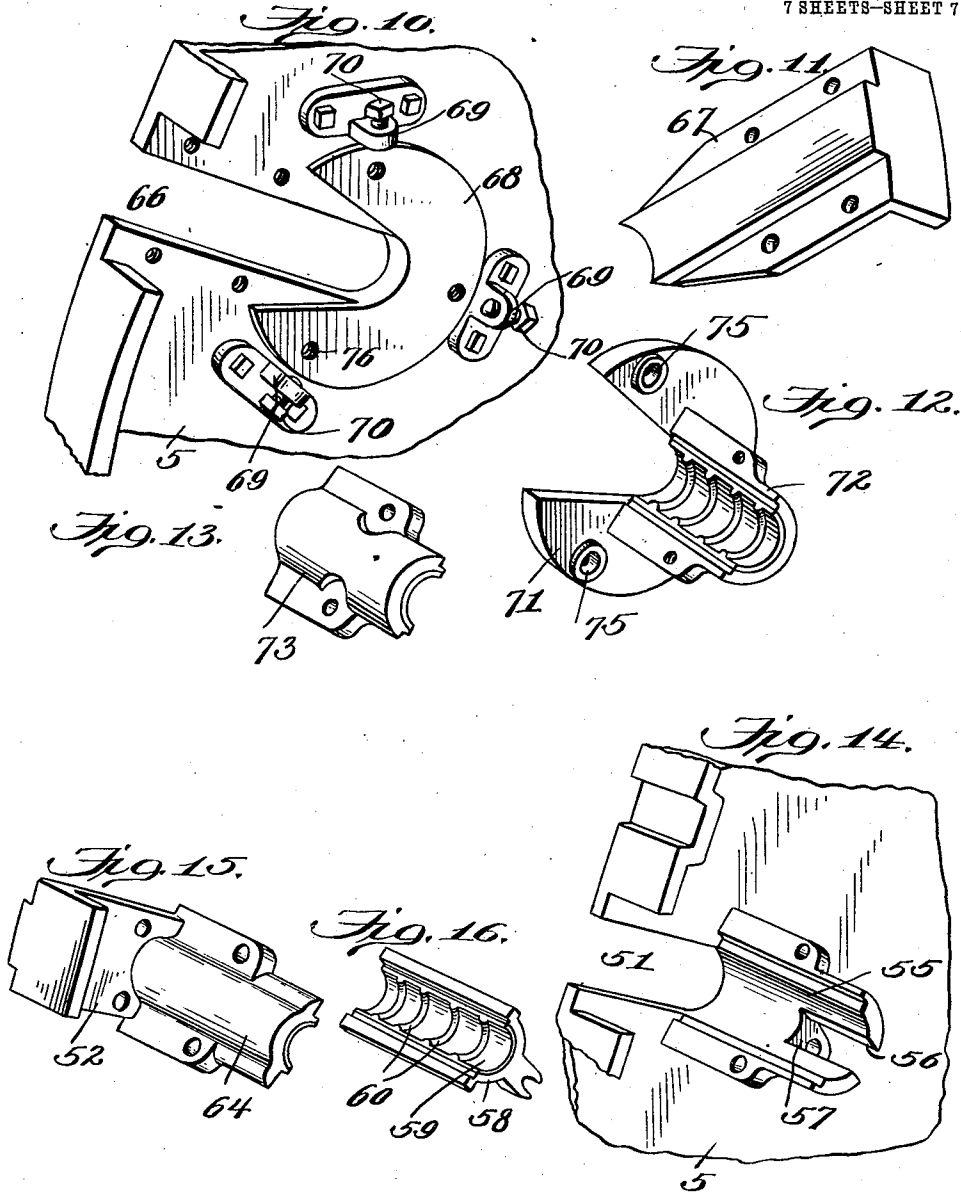
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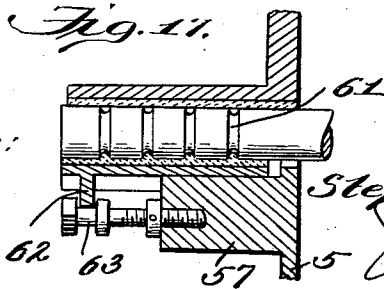
7 SHEETS—SHEET 7.



Witnesses:

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# UNITED STATES PATENT OFFICE.

STEPHEN D. MURRAY, OF DALLAS, TEXAS.

GIN.

1,011,832.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed December 19, 1910. Serial No. 598,032.

*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 Gins, of which the following is a specification.

This invention relates to cotton gins embodying numerous departures from the ordinary form of gin and particularly in the construction and arrangement of the roll box and the ginning devices.

The salient feature of this gin is the formation of a roll box enveloped by ribs and interiorly unobstructed and having in operative conjunction therewith ginning devices so disposed as to materially increase the capacity and output of the gin as compared to the ordinary form of gin.

The improved gin also includes, in conjunction with a rib enveloped roll box, a plurality of ginning devices surrounding the said box, thereby unifying in one gin organization a large number of gins as ordinarily constructed with a relative increase in the amount of cotton ginned and seed as well as foreign matter eliminated.

The improved gin also embodies in co-operation with an endwise fed roll box and ginning devices, of means independent of the ginning devices for maintaining a rotary movement of the material to be ginned throughout a portion of the roll box.

The improved gin further embodies operating accessories and details of structural convenience which have been adopted solely to present one form of practical organization of a machine comprising the essential features of the invention and are to be construed as not in any manner limiting the invention to the precise machine as shown in the drawings.

One of the objects of the invention is to embody in a single gin organization a large number of gins, so far as capacity and general efficiency are concerned, or in other words to provide a gin having a capacity equaling the number of gins ordinarily comprised in a battery of gins of maximum proportions and thereby materially decrease the necessary gin operating accessories and auxiliary machines.

With these and other objects and advantages in view, which will be hereinafter enumerated, reference will now be made to the accompanying drawings as a means of

disclosing one of the preferred embodiments of the invention, and in said drawings: Figure 1 is an end elevation of a gin embodying the features of the invention. Fig. 2 is a similar view of the opposite end of the machine with the main driving pulley removed. Figs. 3 and 3<sup>a</sup> conjointly illustrate a longitudinal vertical section of the gin. Fig. 4 is a transverse vertical section. Fig. 5 is a detail view in elevation showing the regulator at one extremity of the roll box and also illustrating the shaft therefor in cross-section. Fig. 6 is a detail elevation of one of the blades on the driving shaft for imparting rotary movement to the material to be ginned and illustrating the blade in its primary form prior to application to the shaft or before it is given a twisted configuration. Fig. 7 is a sectional perspective view of a portion of one of the roll box sections. Fig. 8 is a detail perspective view of one of the ribs. Fig. 9 is a cross-sectional view particularly illustrating the manner of disposing and securing the contiguous ends of the ribs and showing the relative position of the ginning devices. Fig. 10 is a detail perspective view of a portion of one leg of the frame in the vicinity of one of the brush shaft journals. Fig. 11 is a perspective view of a filling piece removably fitted in the leg adjacent to the brush shaft journal to permit the latter to be withdrawn from the leg. Figs. 12 and 13 are detail perspective views of the separated brush shaft journal bearing and cap. Fig. 14 is a detail perspective view of a portion of the leg in the vicinity of one of the saw cylinder journals and illustrating a lateral slot or opening for the convenient removal and application of the cylinder journal and also a bracket extension for receiving the adjustable shell of the journal bearing for the cylinder journal. Figs. 15 and 16 illustrate detail perspective views respectively of the cap and filling piece and the shell adjustably fitted in the bracket extension shown by Fig. 14. Fig. 17 is a detail longitudinal vertical section showing a portion of one of the saw cylinder journals, the adjustable shell engaging said journal, the cap coöperating with the shell and the bracket extension adjustably holding the shell and supporting the saw cylinder journal and cap.

The numeral 5 designates the frame legs which constitute the ends of the machine

and have metal sheets or a casing secured to the perimeters thereof and covering all necessary points, the said sheet metal casing serving to connect the legs and hold them in relative position. The lower portions of the legs also have skids attached thereto and which are in the form of channel beams and extend from one leg to the other to positively tie the latter and in conjunction with the metal casing operate to give the legs ample supporting rigidity. The metal casing may be of any preferred sheet metal and follows the perimeters of the legs as at 6, and the skids or channel ties 7 are secured to lower projected portions 8 of the legs 5. The legs are shown as having a particular form or contour to accommodate the disposition of the ginning devices as an entirety, as will be more fully hereinafter explained, but it is possible that other forms of legs may be adopted to correspond to changes in the general ginning organization that may be made within the scope of the invention, and hence it will be understood that the effectiveness of the operation of the improved gin is not confined to any particular shape or contour of frame, though that illustrated for many reasons is preferred in view of the convenience it affords in the association of the several ginning devices and their co-operating parts.

Within the body of the gin is a roll box 9 formed or enveloped by a plurality of ribs 10, and axially extending through the said roll box is a driving shaft 11 which projects outwardly through opposite ends or legs of the gin and has on one end a driving pulley 12, a transmitting gear 13 and a pinion 14 which also serves as a transmitting gear. The opposite extremity of the shaft 11 projects longitudinally through a feed receptacle 15 which constitutes a supply chamber for the roll box, said receptacle or chamber having its inner end fully open to the roll box as at 16 and also provided with an upwardly projecting inlet 17 for the material to be ginned. Movably mounted on the extremity of the shaft 11 within the receptacle or chamber 15 is a tubular conveying shaft 18 provided with a conveyer screw or analogous or equivalent conveying means 19. As shown the part 19 is illustrated as a continuous conveyer flight of spiral form and having an operation well understood. From the description thus far given with relation to the roll box it will be understood that the material to be ginned is longitudinally fed or injected into one end of the said box, and the seed and other matter eliminated from the cotton is delivered from the opposite end of the box. The means for feeding the roll box with material to be ginned and comprising the shaft 18 and continuous spiral flight 19 as shown, operates to rapidly force the material to be ginned into

the feeding end of the roll box and around the shaft 11 and the pressure on the cotton or material to be ginned accumulates longitudinally of the roll box by reason of the continuous injection thereto of the material to be ginned, and the rotary motion of the roll of material to be ginned throughout a portion of the length of the box adjacent to the inlet extremity is produced solely by the ginning devices which will be more fully hereinafter explained. Through a remaining portion of the roll box the roll is positively given a rotary movement and sufficiently agitated to throw all portions thereof outwardly to the ginning devices by means of radiating blades 20 secured on the shaft 11 and extending to a point adjacent to the outlet end of the roll box. The blades or flanges 20 are spirally applied to the shaft 11 and gradually taper at their starting ends within the roll box as at 21 to avoid obstructing the movement of the material to be ginned longitudinally of the roll box.

The feeding receptacle or chamber 15 has its inner extremity secured within an annular flange 22 of the adjacent leg 5 and over the outer end of said receptacle or chamber is applied a U-shaped casting 23, as more clearly shown by Fig. 1, a sheet metal partition 24 providing the outer wall of the receptacle or chamber and standing inwardly a distance from the said casting to form a gear protecting chamber 25. The receptacle or chamber 15 is very rigid in its structure and to assist in maintaining the same in proper position, braces 26 extend from the lower portion of the casting 23 downwardly in divergent planes to the lower portion of the leg 5. The partition 24 has an opening 27 formed therein through which the shaft 11 and tubular shaft 18 unitedly project, the tubular shaft 18 terminating adjacent to the inner side of the casting 23 and the shaft 11 continuing through the said casting and supported in a journal bearing 24<sup>a</sup> applied to or integrally formed with the casting. On the outer end of the shaft 11 a sprocket wheel 28 is keyed to rotate with said shaft and trained thereover is a chain belt 29 which also engages the sprocket wheel 30 on a short transmission shaft 31 held in an upper journal bearing 32 also applied to or integrally formed with the casting 23. On the inner end of the shaft 31 within the chamber 25 a pinion or spur gear 33 is keyed and held in continual mesh with a corresponding pinion or spur gear 34 secured or fixed to the outer end of the tubular shaft 18 for operating the conveyer comprising the said shaft 18 and continuous spiral flight 19 from the shaft 11. The conveyer is rotated in a direction opposite or contrary to the direction of rotation of the shaft 11 and at such speed as may be

found best adapted for feeding the cotton into the roll box. On the shaft 11 within the outlet extremity of the roll box a regulator is fixed to rotate with the said shaft freely within the roll box and operates to control the outlet of seed. This regulator comprises two disks or approximately circular plates 35 and 36 having radial openings 37 extending through the peripheries thereof, the one plate or disk being movable on the other to regulate the size of the openings and held fixed as to adjustment through the medium of a suitable clamping device 38 in part projecting through a slot 39 in the outermost plate 35. The number of openings 37 will be varied in accordance with the requirements of the ginning operation. The seed liberated from the end of the roll box passes through an opening 40 in the adjacent portion of the leg 5, said opening being defined by an annular flange 41 and into which project the arms 42 of a spider having a central ring 43 provided with means for supporting the bearing 44 of the shaft 11.

The gear 14 continually meshes with a plurality of spur gears or pinions 45 surrounding the same and fixed on or secured to the adjacent projecting extremities of saw cylinder shafts 46 having thereon as usual a plurality of saws 47, as clearly shown by Fig. 4. These saws 47 project into the roll box 9 a suitable distance to perform their well known function in relation to the cotton fed into the box. It will be observed that the saws or saw cylinders surround the roll box and coöperating therewith are brush cylinders 48 having shafts 49 extended through one leg 5 and terminally provided with spur gears or pinions 50 held in continual mesh with the gear 13. As shown, three brush cylinders are used, and each cylinder operates in conjunction with a pair of saw cylinders to remove the lint cotton, but this precise number of co-operating ginning devices may be modified as desired. The ginning devices including the saw cylinders, brush cylinders and shafts therefor, may be applied within the gin structure in any suitable manner, though preferred means have been shown for mounting the same and rendering them readily removable and applicable with relation to the roll box. The essential feature irrespective of any selected manner of applying or mounting these ginning devices is the disposition of the same around the roll box so that the saws of the saw cylinders may effectively perform their functions and the brush cylinders positively relieve the saws of lint cotton.

Preferred means of applying or mounting the ginning devices including the shafts therefor will be presently described, but it will be understood that the invention is not

limited to the construction and arrangement of parts in this particular and has been adopted only as a convenient means of association and dissociation of the ginning devices. The legs 5 have outwardly opening slots 51 for the removal of the saw cylinders and normally closed by filling pieces 52. The ends of the saw cylinder shafts 49 extended beyond the legs 5 are mounted in journal bearings 53 and 54, the journal bearings 53 being of the construction shown by Figs. 14, 15 and 16 and adjustable for moving the cylinder shafts longitudinally to dispose the saws in proper relation to the ribs 10. The journal bearings 53 each comprise a bracket extension 55 on the leg 5 at the inner terminal of each outwardly opening slot 51, the free extremity of the said bracket extension being longitudinally slotted as at 56 and formed as a part of a lug 57 on the leg. Fitted within the bracket extension 55 is a shiftable shell 58 provided with a Babbitt lining 59 formed with corrugations or semi-circular ribs 60 which fit in grooves 61 of the shaft extremity, as clearly shown by Fig. 17. Depending from the outer extremity of the shell 58 is an ear 62 having a lower slotted extremity engaged by an adjusting screw 63 mounted on the lug 57. The journal bearing 53 is completed by a cap 64 removably applied thereover and as shown for convenience, said cap is a part of or carried by the filling piece 52. By means of the screw and the movable shell as just explained the shaft may be shifted longitudinally as found necessary. The extended portions of the shafts 46 engaging the journal bearings or boxes 54 have simply a shifting movement in the latter in a longitudinal direction, it being unnecessary in practice to have both extended ends of the shaft adjustable. The filling pieces 52 carrying the caps 64 are held by suitable removable fastenings, and when it is desired to remove any one of the saw cylinders from the legs 5 the said filling pieces with their caps are detached to clear the slots 51 with which they co-operate, and after the removal of such filling pieces the saw cylinder and its shaft may be readily drawn outwardly and afterward replaced and held in relative position to the roll box by the said filling pieces.

Each of the brush cylinder shafts extends at opposite extremities beyond the legs 5 and into and through journal bearings 64 and 65 located at the inner terminals of outwardly opening slots 66 which are normally closed by filling pieces 67, as clearly shown by Figs. 10 and 11. The slots 66 with their filling pieces 67 permit the shafts 49 with their brush cylinders to be readily removed from and operatively applied to the legs 5 and the saw cylinders with which they coöperate. At the inner terminal of each slot 66 the leg 5 is formed with a segmental boss 68 and

surrounding the said boss are adjusting devices 69 including adjusting screws 70. The journal bearing 64 at one end of each brush cylinder shaft is shown in detail by Figs. 12 and 13, and comprises a segmental base or support 71 having a journal bearing shell or extension 72 standing outwardly therefrom and adapted to receive a removable cap 73, the base or support 71 serving as a flange which is brought to bear against the boss 68 and secured to the latter by suitable fastenings 74 engaging openings 75 and 76 respectively formed in the base or flange 71 and the boss 68 and adjacent portion of the leg. The base or flange 71 is adjustably held between the screws 70, the inner ends of the latter engaging the peripheral edge of the said base or flange 71 and operating to prevent loose movement of the bearing 64 and end of the shaft 49 engaging said bearing and also providing means for truing the brush cylinder relatively to the saw cylinders.

The lint cotton removed by the brush cylinders 48 from the saw cylinders is delivered by the blast of the said brush cylinders into and through the conduit or flue 77 communicating with all the brush cylinder chambers, said flue having an outlet 78 at the top of the gin. Mote outlets 79 provided with mote boards 80 are also constructed and arranged in proper position relatively to each brush cylinder.

As hereinbefore indicated, the ribs 10 of the roll box 9 envelop the latter and are composed of separable sections 81, each section comprising a segmental series of ribs terminally secured to rails 82 and 83. In assembling the sections to form the enveloping roll box, the rail 82 of one section, for instance, is placed against the rail 83 of an adjacent section and when so disposed the rib terminals at the inner edges of the rails have an offset relation to each other, as clearly shown by Fig. 9, and also illustrated in complete arrangement by Fig. 4, the purpose of this offset relation being to give a clearance for the material in its passage from one set of saws to the next adjacent set of saws. The action of the saw teeth in drawing the lint from the seed leaves a considerable quantity of lint projecting down from the mass in the roll box into the spaces between the ribs and the cotton in the spaces between the ribs is disposed to clog in its movement from one set of ribs to the next set of ribs below, and to avoid this the terminals of the ribs arranged adjacent as shown by Figs. 4 and 9 are offset. The associated rails of the rib sections 81 are jointly secured to attaching plates 84, or in other words each set of rails disposed in adjacency is united by the said plates and the latter project through openings 85 in the legs 5 and secured to angle flanges or lugs

86 on the outer sides of the legs. The rib sections 81 may be removed and reapplied when found necessary or desirable by first removing the brush and saw cylinders, and, furthermore, to facilitate the removal of the said cylinders, portions of the sheet metal casing and of the flue or conduit 77 will also be constructed for ready removal.

From the foregoing the operation of the gin will no doubt be readily understood, and generally it may be further explained that the material to be ginned is deposited in the receptacle or chamber 15 and fed into the open end of the roll box 9 by the conveyer composed of the tubular shaft 18 and continuous spiral flight 19. As hereinbefore specified, the delivery of the cotton into the roll box is very rapidly carried on and is pushed forward by the accumulated pressure, and the roll formed and rotated adjacent to the feed end of the box by the saws projecting between and through the ribs 10, as clearly shown by Fig. 4. As the cotton progresses through the box in a longitudinal direction it is engaged by the blades 20 on the shaft 11 and its rotation assisted at a point where it might otherwise become dead or cease rotating by reason of the fact that a major portion of the lint has been taken from the seed and a consequent depreciation of the effectiveness of concatenation and action of the saws on the seed results. The seed is delivered from the outlet end of the roll box, and the lint cotton taken from the roll box by the saw cylinders is deposited in the flue 77 through the medium of the brush cylinders, and from said flue is delivered through the outlet 78.

The improved gin hereinbefore described materially reduces the number of the ginning mechanisms ordinarily used as auxiliaries to cotton gins in the usual ginning plants and also the floor space usually occupied and consequently the dimensions of ginning inclosures and the general cost of installation.

What is claimed as new is:

1. A cotton gin having a fixed roll box with a completely surrounding wall composed of ribs, and ginning devices surrounding the roll box and disposed above and below and intermediately of the upper and lower portions of the latter.

2. A cotton gin having a fixed roll box with a completely surrounding wall composed of ribs, ginning devices surrounding the roll box and disposed above and below and intermediately of the upper and lower portions of the latter, and means for feeding the material to be ginned into one end of the roll box.

3. A cotton gin having a fixed roll box with a completely surrounding wall composed of ribs, ginning devices surrounding the roll box and disposed over and below

and intermediately of the upper and lower portions of the latter, and means within the roll box for imparting rotary and longitudinal movements to the material ginned.

5 4. A cotton gin having a fixed roll box with a completely surrounding wall composed of ribs, ginning devices surrounding the roll box and disposed over and below and intermediately of the upper and lower  
10 portions of the latter, and means in the roll box for imparting a rotary and a longitudinal movement to the material ginned throughout a portion of the length of the roll box.

15 5. A cotton gin having a fixed roll box with a completely surrounding wall composed of ribs, ginning devices surrounding the roll box and disposed over and below and intermediately of the upper and lower  
20 portions of the latter, means for feeding the material to be ginned into one end of the roll box, and means for imparting rotary and longitudinal movements to the material throughout a portion of the length of the  
25 roll box.

6. A cotton gin having a fixed roll box defined by a surrounding wall of ribs, and ginning devices disposed under, over and intermediately of the upper and lower portions and cooperating with said roll box.  
30

7. A cotton gin having a fixed roll box defined by ribs completely surrounding the same and through which the material to be ginned has longitudinal movement, and ginning devices disposed under, over and intermediately of the upper and lower portions of and cooperating with the roll box.  
35

8. A cotton gin having a fixed roll box defined by ribs completely surrounding the same and provided with means for moving the material to be ginned longitudinally therethrough, and ginning devices disposed under, over and intermediately of the upper and lower portions of and cooperating with  
40 said roll box.  
45

9. A cotton gin having a fixed roll box defined by a wall of ribs completely enveloping the same, ginning devices over, under and intermediately of the upper and lower portions of the roll box, means for feeding the material to be ginned into one end of the roll box, and outlet regulating means at the opposite end of the roll box.  
50

10. A cotton gin having a fixed roll box defined by a wall of ribs completely enveloping the same, ginning devices over, under and intermediately of the upper and lower portions of the roll box, means for feeding the material to be ginned into one end of the roll box, means in the roll box for rotating and longitudinally moving the material through the roll box, and outlet regulating means at the end of the roll box opposite the feeding end.  
55  
60

11. A cotton gin having a roll box with  
65

a completely surrounding wall composed of ribs, the roll box having a fixed operative position, and ginning devices disposed over, under and intermediately of the upper and lower portions of and cooperating with the roll box. 70

12. A cotton gin having a roll box provided with a surrounding wall composed wholly of ribs and interiorly unobstructed, the roll box having a fixed operative position, and ginning devices disposed over, under and intermediately of the upper and lower portions of and cooperating with the roll box. 75

13. A cotton gin having a roll box with a surrounding wall composed wholly of ribs and interiorly unobstructed to permit material to be ginned to move longitudinally therethrough, and ginning devices disposed over, under and intermediately of the upper and lower portions of and cooperating with the roll box. 80

14. A cotton gin having a fixed roll box with a surrounding wall composed wholly of ribs, a feeding means at one extremity, the opposite extremity of the roll box serving as an outlet for the seed, a regulating means in the outlet extremity of the roll box to control the discharge of the seed, and ginning devices disposed under, over and intermediately of the upper and lower portions of and cooperating with the roll box. 85  
90

15. A cotton gin having a roll box with a surrounding wall composed of ribs made up of a plurality of segmental sections, and means for supporting the rib sections in associated relation. 100

16. A cotton gin having a roll box with a surrounding wall composed of ribs made up of sections embodying sets of ribs, and means for supporting the sets of ribs in associated relation. 105

17. A cotton gin having a roll box with a surrounding wall composed of ribs made up of sections embodying sets of ribs, the terminals of one set of ribs being offset with relation to the terminals of the adjacent set of ribs, and means for supporting the sets of ribs in associated relation. 110

18. A cotton gin having a roll box with a surrounding wall composed of ribs made up of sections embodying sets of ribs, the inner surfaces of the terminals of one set of ribs being offset with relation to the inner surfaces of the terminals of the adjacent set of ribs, and means for supporting the sets of ribs in associated relation. 115  
120

19. A cotton gin having a roll box with a surrounding wall composed of ribs made up of separate sections embodying sets of ribs, and means for supporting the sets of ribs in associated relation. 125

20. A cotton gin having a roll box with a completely surrounding wall composed of ribs, means for feeding seed cotton to the 130

roll box, gin saws disposed under, over and intermediately of the upper and lower portions of the roll box and coöperating with the latter, brush cylinders coöperating with the gin saws, and a common conduit into which all the brush cylinders deliver the lint cotton removed from the saws.

21. A cotton gin having a roll box with a surrounding wall composed of ribs, saw cylinders disposed under, over and intermediately of the upper and lower portions of the roll box and coöperating with the

latter, brush cylinders operatively associated with the saw cylinders, and a conduit common to all of the brush cylinders and into which the latter deliver the lint cotton from the saws. 15

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

STEPHEN D. MURRAY.

Witnesses:

JOHN L. FLETCHER,  
M. R. MULLEN.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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