

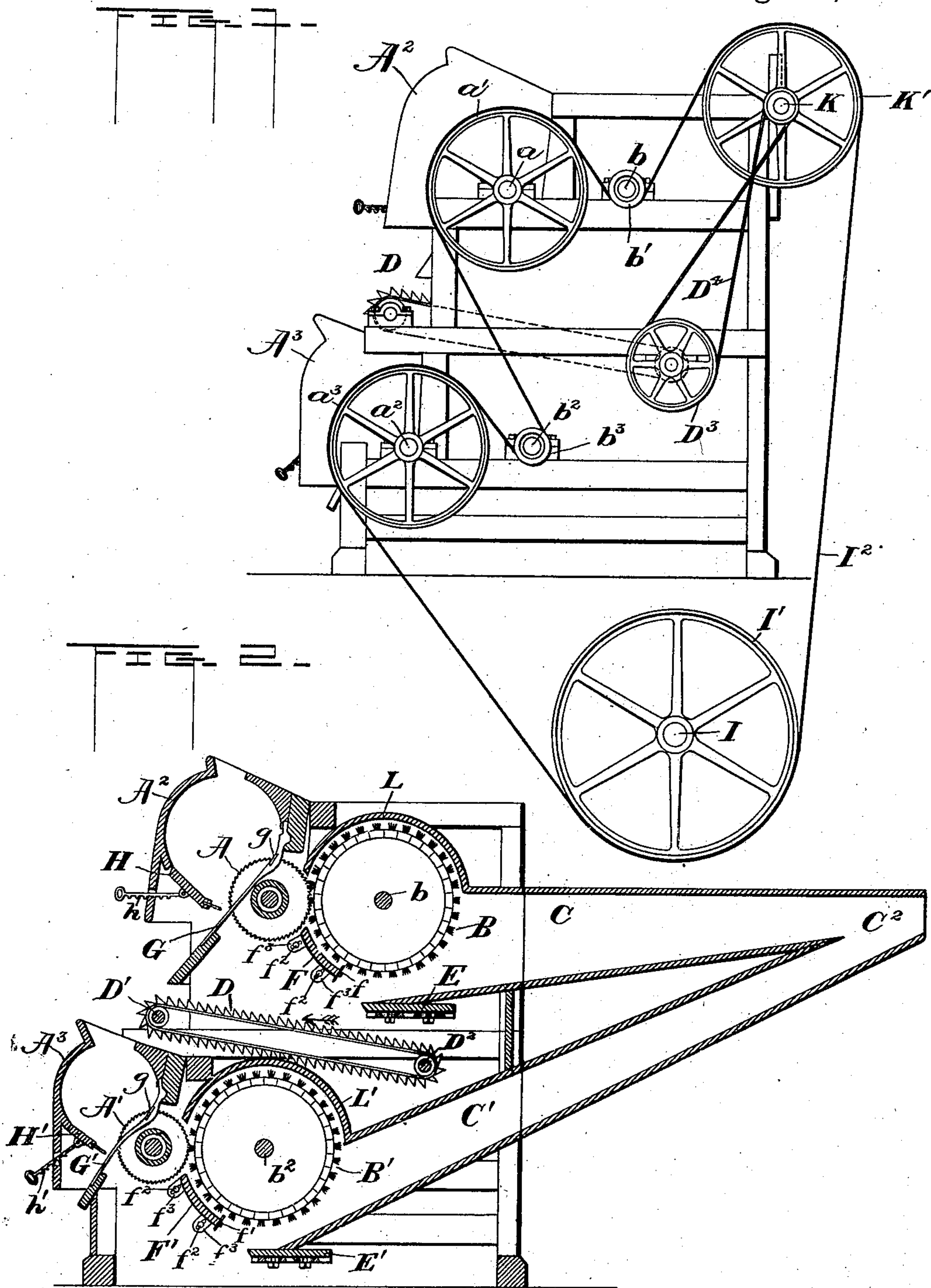
(No Model.)

2 Sheets—Sheet 1.

H. J. DAVIS, J. RICE & J. C. McDANIEL.  
SAW COTTON GIN.

No. 504,023.

Patented Aug. 29, 1893.



Witnesses

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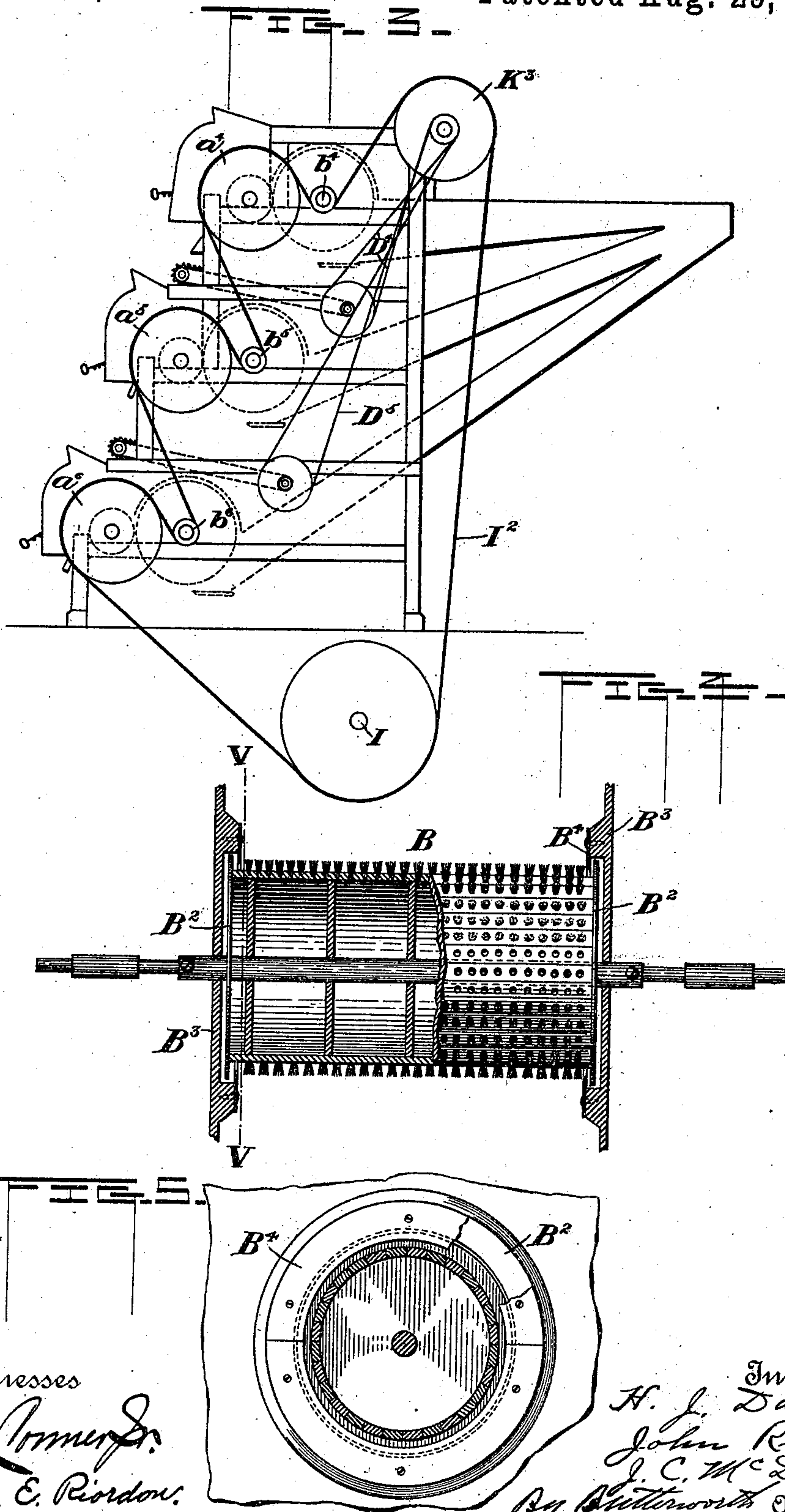
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# UNITED STATES PATENT OFFICE.

HENRY J. DAVIS, JOHN RICE, AND JOHN C. MCDANIEL, OF IRON CITY,  
ALABAMA.

## SAW COTTON-GIN.

SPECIFICATION forming part of Letters Patent No. 504,023, dated August 29, 1893.

Application filed April 29, 1893. Serial No. 472,396. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY J. DAVIS, JOHN RICE, and JOHN C. MCDANIEL, citizens of the United States, residing at Iron City, in the county of Calhoun and State of Alabama, have invented certain new and useful Improvements in Saw Cotton-Gins; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in cotton gins, and more particularly to a class of gins recognized in the art as saw gins.

The primary object of the invention is to provide a double or triple gin adapted to effectually take off or strip the cotton from the seed and at the same time separate motes, dirt, &c., therefrom, so as to insure a good sample or quality of cotton and at the same time accomplish a greater amount of work in a given time than is possible with gins of the ordinary construction.

A further object is to provide a double gin which shall be simple in construction, inexpensive in manufacture and efficient and reliable in use, and which while possessing all the advantages of a rapid gin shall not be subject to the objections incident to the use of gins of the same general character constructed as heretofore proposed.

The invention will first be described with reference to the accompanying drawings, which form a part of this specification, and then particularly pointed out in the claims at the end of this description.

Referring to the drawings by letters of reference, Figure 1 represents a side elevation of a machine embodying our invention. Fig. 2 is a vertical longitudinal sectional elevation of the same. Fig. 3 is a diagrammatic side elevation illustrating a modification of the invention. Fig. 4 is a detailed sectional view of one of the brushes; and Fig. 5 is a section taken on the line V—V of Fig. 4.

It has heretofore been proposed to construct a cotton gin having two or more sets of saws and brushes, the object being to produce a gin which will do a great amount of work in a comparatively small period of time; but in

such gins no provision is made for the escape of motes, dirt and other foreign matter which is carried along with the lint, thus sacrificing quality for quantity. Another serious disadvantage in the practical operation of such gins results from the method of gearing or belting the saw and brush shafts, the belts being so arranged as to cause a heavy downward pull on the brush-bearings, and owing to the rapidity of motion required such bearings are liable to be set on fire with most disastrous results, it being practically impossible to prevent total destruction of a gin when lint cotton takes fire. To overcome these and other defects in previously proposed constructions we have devised certain improvements in the general arrangement of parts and improved features of construction as will now be described.

The saws A, and A', of the upper and lower gins, respectively, may be of the form shown or any suitable construction, the upper saws being preferably larger than the lower ones, and arranged to rotate in a direction opposite to the direction of rotation of the brushes B, B', which latter will be hereinafter more particularly described. The flues C, C', which communicate with the upper and lower compartments of the frame-work or casing of the respective gins, may converge into a main flue C<sup>2</sup>, which may discharge into a condenser in the ordinary manner, or, if desired, the flues C, C', may discharge into separate condensers so as to assort the lint into different grades; the lint being forced through the flues to the condenser by a draft of air caused by the rotation of the brushes. The converging portions of the flues which extend beyond the gin frame or casing are made separable from the portions thereof communicating directly with the respective compartments of the gin so as to be readily detached for the purpose of storage or packing for transportation and to permit the attachment of separate flues, if desired.

D, denotes a traveling belt or carrier which is interposed between the upper and lower compartments and is adapted to catch all motes and other foreign matter falling with the lint from the upper gin and to discharge



the same into the roll-box of the lower gin. The ribs of the upper gin may be separated to about the same extent that is usual in gins of ordinary construction so that more or less of the motes and other objectionable matter will pass between such ribs and fall onto the mote-carrier D; but the ribs of the lower gin are placed nearer together than is usual in common gins, so that only very small motes can pass between them. The mote-carrier may consist of three (more or less) belts with transverse slats or strips of wood having a V-shaped cross-section secured thereto so as to travel with the belts, the slats being separated very slightly to permit sand, dirt, &c., to pass between the same. This carrier is placed upon cylinders or rollers  $D^1, D^2$ , which are suitably journaled transversely of the frame; the former being arranged near and above the mouth of the roll-box  $A^3$ , and the latter in rear of the inlet to the flue C, so as to adapt the carrier to catch all motes and foreign matter to which any lint might adhere and discharge the same into said roll-box so that such lint could be removed by the second set of saws.

A band-wheel or pulley  $D^3$ , on the projecting end of the shaft  $D^2$ , is connected by a belt  $D^4$ , with a band-wheel or pulley on a counter-shaft K, which latter is geared to the main driving-shaft so as to impart motion to the mote-carrier as will be presently described.

E,  $E'$ , denote mote-boards one of which is placed under each of the flues C,  $C'$ , and which are adapted to be adjusted either forward or back so as to vary the size of the discharge opening beneath the brushes at will. These boards preferably extend across the full width of the gin parallel with the brushes and below the same and may be readily adjusted in such manner as to regulate the discharge of the motes and other objectionable matter falling from the brushes as may be desired and necessary in the operation of the machine.

F,  $F'$ , denote whipper-boards one of which is arranged under each of the brushes just below the saws, and they are adapted to be adjusted toward or from the brushes as may be desired. These boards are adapted to knock the motes, dirt and trash loose from the lint cotton so as to cause the former to fall through the opening between the whipper-board and the mote-board, while the lint is forced on through the flues by the current of air caused by the revolving brush. The whipper-boards extend across the gin-frame parallel with the brushes and in proximity thereto and are preferably formed with concave faces conforming to the convexity of the brush and are each provided on their lower depending edges with a flat strip or band of sheet iron or other suitable material as at  $f, f'$ , which strips are adjustably secured to the lower edges of the boards by suitable fastenings such as set screws passing through slots in the strips so that they may be moved toward or from the brushes as occasion may re-

quire. The adjustment of the whipper-boards may be accomplished by means of set screws  $f^2$ , passing through slotted ears or brackets  $f^3$ , projecting from the lower sides of the boards as shown, or in any proper manner.

The gin ribs G,  $G'$ , may be of the usual or any preferred construction, but in order to prevent wear each may be provided with a steel plate  $g$ , having beveled edges and fitted in a corresponding dovetailed groove or recess in the upper face of the rib, to which it is secured by a set screw so as to be readily detached and renewed when worn, thereby saving the cost of renewing the entire rib.

H,  $H'$ , denote regulating plates or seed-boards of ordinary construction fitting in the respective roll-boxes  $A^2, A^3$ , and adapted to be adjusted and secured in the desired position by means of the toothed bars or racks  $h, h'$ , respectively, in the usual manner.

I, denotes the main driving-shaft which may be located beneath the floor on which the gin is placed.  $I'$ , denotes a band-wheel or pulley upon said shaft I, and  $I^2$ , a band or belt for imparting motion from said shaft to the gin-saws, brushes and mote-carrier. The belt  $I^2$ , passes from the band-wheel  $I'$  over a similar band-wheel  $K'$ , upon a counter-shaft K, which may be mounted in adjustable bearing upon the gin frame or casing in any proper manner. From the band-wheel K, the belt passes under a small band-wheel or pulley  $b'$ , on the shaft  $b$ , of the upper brush B; thence over a larger band-wheel  $a'$ , on the shaft  $a$ , of the upper set of saws A; thence under a small band-wheel or pulley  $b^3$ , on the shaft  $b^2$ , of the lower brush  $B'$ ; thence over a larger band-wheel  $a^3$ , on the shaft  $a^2$ , of the lower set of saws  $A'$ , back to the band-wheel  $I'$ . By this arrangement motion will be imparted from the main driving-shaft to the brushes and saws so as to cause the same to rotate in opposite directions, and at the same time, by means of the cross-belt  $D^4$ , motion will be imparted to the mote-carrier D. The several band-wheels and belts may be and are preferably duplicated at the opposite side of the machine so as to prevent the shafts from being pulled out of true, or line, which is liable to occur when only one set of band-wheels or pulleys and belts is used at the side of the machine. It will also be observed that by the described arrangement the weight upon the brush bearings, (the brushes being required to revolve at a much more rapid rate of speed than the saws) is partially lifted so as to relieve the bearings and prevent the same from becoming heated so as to set the gin on fire, which is a very important advantage of this method of belting.

L,  $L'$ , denote semi-circular casings which are fitted over the respective brushes B,  $B'$ , and partially encircle the same, so as to exclude the air from the brush except at the exposed lower portion thereof where it is necessary to create a current of air to carry the



lint up the flue. By thus housing the brush closely within the casing and excluding the air therefrom it is enabled to do its work with more ease and in a more perfect manner than if a current of air were allowed to be set up past the point of delivery of the lint from the brushes into the chute or flue, and the forcing of the lint into and up the flue is also facilitated.

10 The brushes B, B', being required to run at a very high rate of speed any lint falling upon the shaft will wrap around the same and as it accumulates thereon will become heated by the heat from the bearings of the brushes and is liable to set the gin on fire. We therefore provide lint and dust guards, which may be constructed as follows: Referring particularly to Figs. 4 and 5, at each end of the brush is placed a sheet metal or other suitable circular plate or disk B<sup>2</sup>, the periphery of which projects slightly beyond the ends of the bristles or brushes, as shown more clearly in Fig. 4. The plate B<sup>2</sup>, is encircled by a second circular plate or disk B<sup>3</sup>, which may be formed in sections for convenience of attachment, and has formed therewith or secured to a projecting portion or rib on the inner face thereof a circular sectional flat plate or ring B<sup>4</sup>, which is adapted to overlap the periphery of the disk B<sup>2</sup>, as shown in the last-mentioned figure, so as to effectually house the end of the brush and prevent lint or dirt from getting access to the brush-shaft or bearings. The brushes are also made adjustable endwise upon the shaft by means of set screws entering the sleeves or hubs at the heads thereof to adapt the brush to be moved so as to cause all the bristles to be worn before re-filling the brush. This feature of construction, together with the housing on and around the brush-head, gives durability and safety in operation by protecting the bearings so as to prevent injury to the same or the gin by over-heating, and makes it possible to wear the brush entirely out before it is necessary to have the same renewed.

The upper framework or casing supporting the upper gin is preferably made separate from the lower framing so as to simply rest and be secured thereon, for convenience of handling, storage and transportation.

When it is desired to provide three or more sets of saws, the same may be accomplished by making the connections as illustrated in Fig. 3, wherein the belt I<sup>2</sup>, is shown passing from the band-wheel or pulley on the main driving-shaft successively over the several pulleys K<sup>3</sup>, a<sup>4</sup>, a<sup>5</sup> and a<sup>6</sup>, and under the smaller band-wheels or pulleys b<sup>4</sup>, b<sup>5</sup> and b<sup>6</sup>, of the saw and brush shafts, respectively, in a manner similar to that described with reference to Fig. 1; an additional crossed belt D<sup>5</sup>, being provided for driving an additional mote-carrier, as will be readily understood from the drawings without further description.

The operation of the invention will be

readily understood from the foregoing description taken in connection with the accompanying drawings. The regulating plate or seed-board H, in the upper roll-box being properly adjusted and the machine put in motion, the raw cotton is fed into said box, and the saws therein remove the best and longest-fibered lint from the seeds. The lint is delivered from the brush B, into the flue C, while the partially ginned seed drops into the roll-box A<sup>3</sup>. The finer saws in the latter box separate the remaining portion of the lint from the seeds, and the same is removed by the brush B', and delivered into the flue C'. The motes, dirt and other foreign matter passing through the grate of the upper gin drop onto the mote-carrier D, and are carried thereby and dumped into the roll-box A<sup>3</sup>; the finer particles of dirt and sand being permitted to pass between the slats of the carrier and fall onto the casing encircling the lower brush. The lint from the respective brushes may be delivered into the chute or flue C<sup>2</sup>, which is common to both compartments of the gin, and thence into a condenser, or the lint from the respective compartments may be conducted into separate condensers, if desired. It will thus be seen that the gin while working more rapidly than gins of ordinary construction, also produces a finer quality of cotton by separating the motes and objectionable matter from the lint; the work being accomplished partly in one roll-box and the remainder in a lower box or boxes. Each box is provided with a grate and saws especially adapted to the varying conditions of the cotton at different stages in the process; the coarser grate and saws being above so as to deliver the partially ginned seeds into a box with saws and grates of finer grade.

We do not desire to make any broad claim to a double or triple gin as the same is not broadly new, but

What we do claim, and desire to secure by Letters Patent of the United States, is—

1. A cotton-gin comprising a frame-work or casing having two or more compartments therein, each provided with a roll-box arranged so as to adapt one to deliver into the other, a flue for each roll-box, grates and saws of different sizes or grades for the respective boxes, a brush for each set of saws, a mote-carrier arranged below the upper brush and means for rotating said brushes and saws in opposite directions and simultaneously imparting motion to said mote-carrier, substantially as described.

2. In a cotton-gin, the combination with the frame-work or casing having the upper and lower compartments therein and provided with a flue for each compartment, of the upper and lower roll-boxes one of which is adapted to deliver into the other, a grate for each box, the revolving saws projecting through said grates, the oppositely revolving brushes, the whipper-boards arranged below said brushes, the mote-boards and means for di-



recting the motes falling from the upper board into the lower roll box substantially as described.

3. In a double or triple cotton-gin, the combination with the roll-boxes having the grates and regulating boards therein, the revolving saws, the oppositely revolving brushes, and the traveling mote-carrier interposed between the upper and lower brushes so as to deliver into the lower roll-box, and means for imparting motion to said saws, brushes and carrier, substantially as described.

4. In a cotton-gin, the combination with the upper and lower roll-boxes, of the revolving saws, the oppositely revolving brushes, the whipper-boards, the mote-boards, the mote-carrier below the upper brush, and mechanism for imparting motion to said saws, brushes and carrier, substantially as described.

5. In a double or triple cotton-gin, the combination with the frame-work or casing having the upper and lower compartments therein provided with a common flue, of a roll-box for each compartment, one adapted to deliver into the other, grates of different sizes for the respective roll-boxes, revolving saws of different sizes mounted in said compartments, revolving brushes mounted in rear of the saws, the adjustable whipper-boards arranged in close proximity to said brushes, the adjustable mote-boards arranged below the brushes and means for discharging the motes falling from the upper brush into the lower roll box, substantially as described.

6. In a double or triple saw-gin, the combination with the upper and lower revolving brushes and oppositely revolving saws, of the intermediate traveling belt or mote-carrier, the adjustable whipper-board, and the adjustable mote-board arranged and adapted to operate substantially as described.

7. In a double or triple cotton-gin, the combination with the frame-work or casing having two or more compartments therein, each provided with a flue, of a roll-box for each compartment, one adapted to deliver into the other, revolving saws and oppositely revolving brushes for each roll-box, and an intermediate mote-carrier adapted to deliver into the lower roll-box, substantially as described.

8. In a double or triple cotton-gin, the combination with the frame-work or casing having two or more compartments therein provided with a common flue, of a roll-box for each compartment one being adapted to deliver into the other, revolving saws and oppo-

sitely revolving brushes for each roll-box, a mote-carrier arranged between the upper and lower compartments, whipper-boards for the brushes, and adjustable mote-boards for regulating the discharge of motes &c., from said compartments, substantially as described.

9. In a cotton-gin, the combination with the revolving brush, of the lint and dust guard comprising the circular plate or disk revolving with the brush, and the stationary plate or ring encircling said disk and provided with a corresponding flat circular plate or ring overlapping the periphery of said disk so as to shield and protect the brush-shaft and bearings, substantially as described.

10. A cotton-gin comprising a frame-work or casing having two or more compartments therein one arranged above the other and provided with a common flue, a roll-box for each compartment one adapted to deliver into the other, and each provided with a grate, revolving saws of different sizes for the respective compartments projecting through said grates oppositely revolving brushes arranged in proximity to said saws, the adjustable whipper-boards having concave faces presented to the brushes, the mote-carrier adapted to deliver into a lower roll-box, the adjustable mote-boards, and means for imparting motion to said saws, brushes and carrier, substantially as described.

11. In a double or tripple cotton-gin, the combination with the upper and lower roll-boxes, the revolving saws and their oppositely revolving brushes, and means for directing the motes falling from the upper brush into the lower roll box of a main driving-shaft having a band wheel thereon, a counter-shaft carrying a similar band-wheel, a band-wheel on each saw-shaft, smaller band-wheels on the brush-shafts, and an endless belt or band passing from the band-wheel on said main shaft over the band-wheel on the counter and saw-shafts, and under the band-wheels of reduced size on the brush-shafts so as to lift and relieve the bearings of the latter shafts, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY J. DAVIS.  
JOHN RICE.  
JOHN C. McDANIEL.

Witnesses:

C. PARKER,  
JOHN D. ENGLISH.