

(No Model.)

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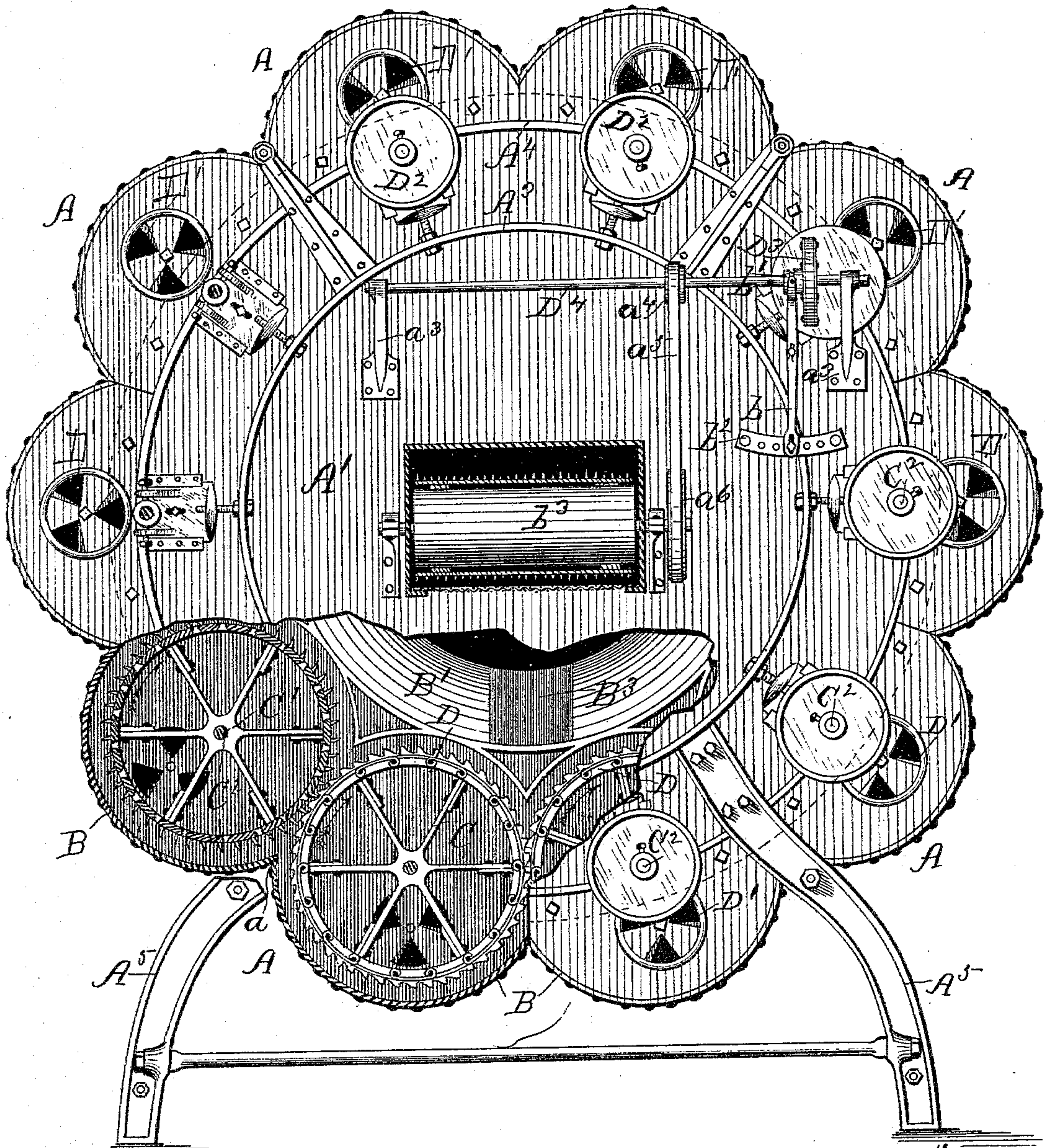
M. COVEL.

COTTON GINNING AND CLEANING APPARATUS.

No. 296,824.

Patented Apr. 15, 1884.

Fig. 1.



Witnesses:

Chas. C. Gaylord.
L. M. Freeman

Inventor:

Milo Covel
By E. B. Coupland
attys

(No Model.)

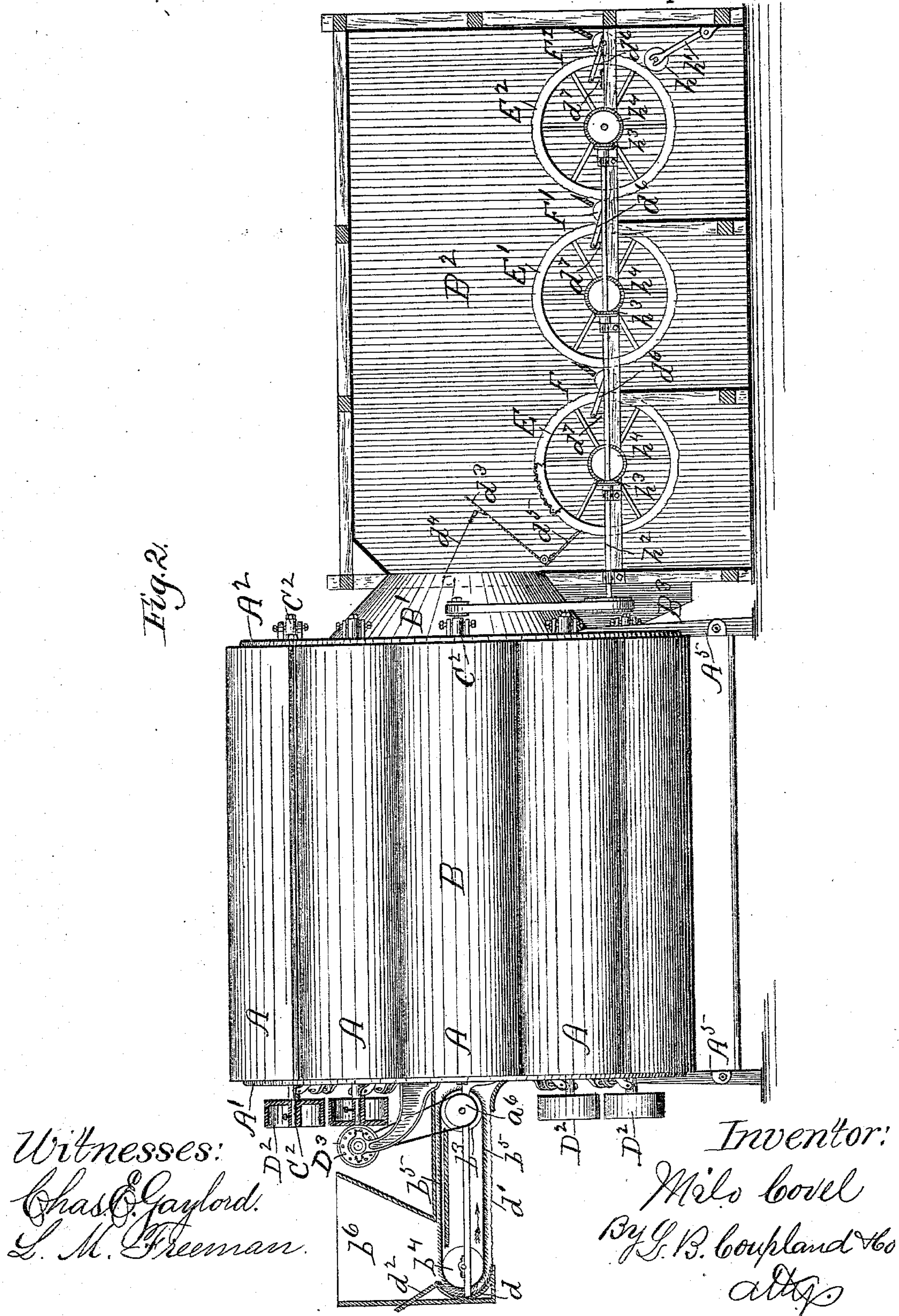
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Fig. 3.

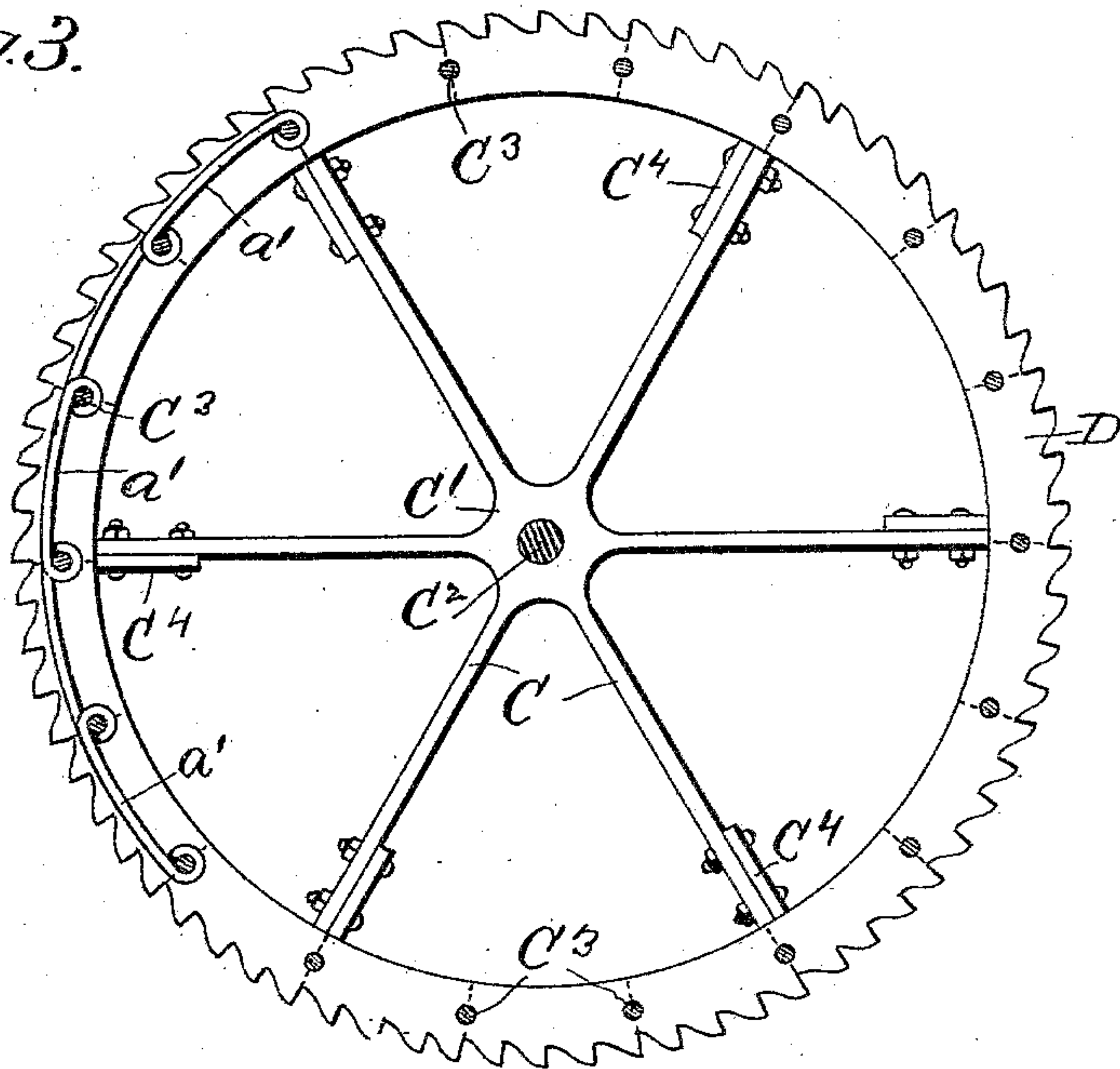


Fig. 4.

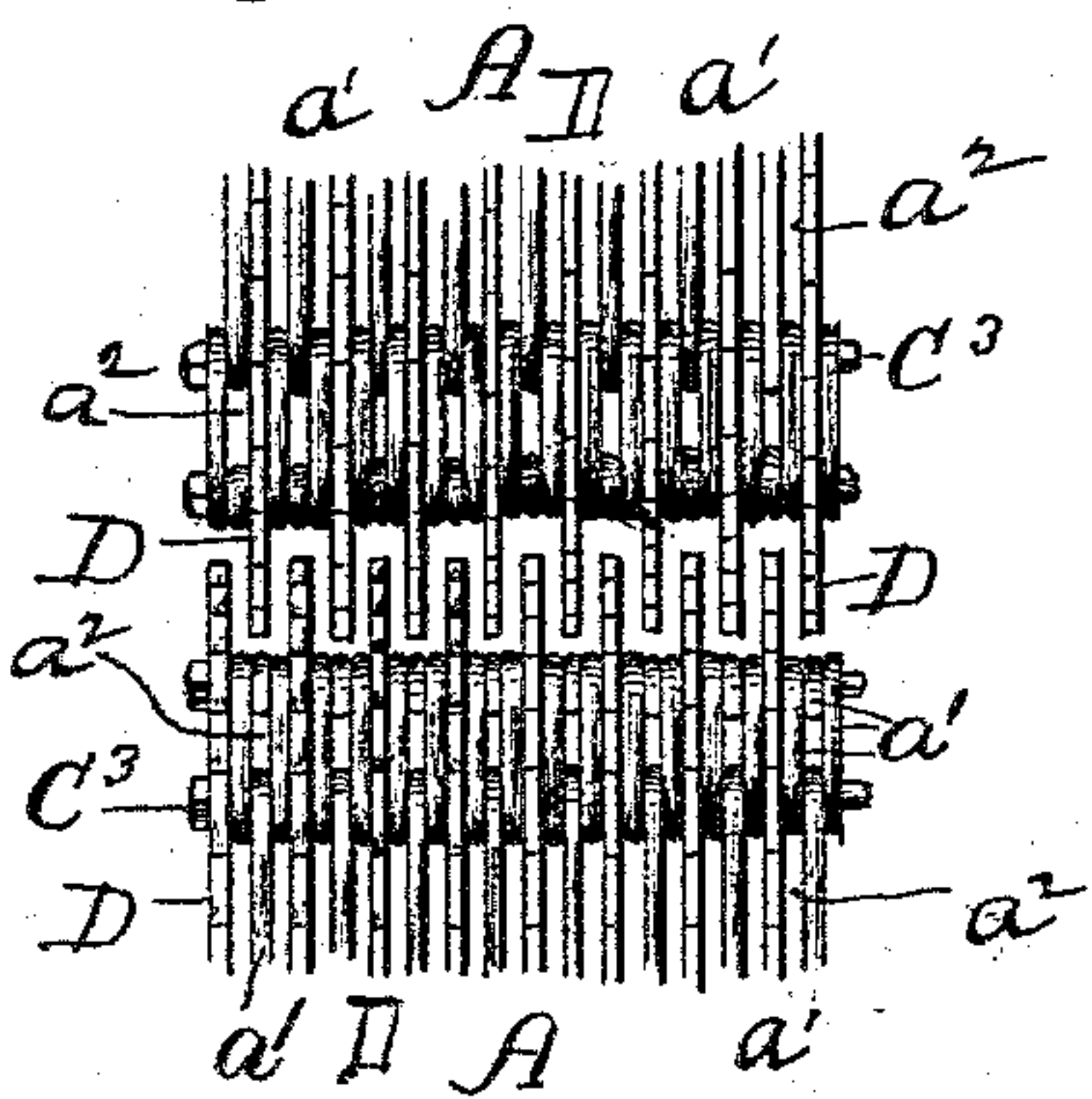


Fig. 5.

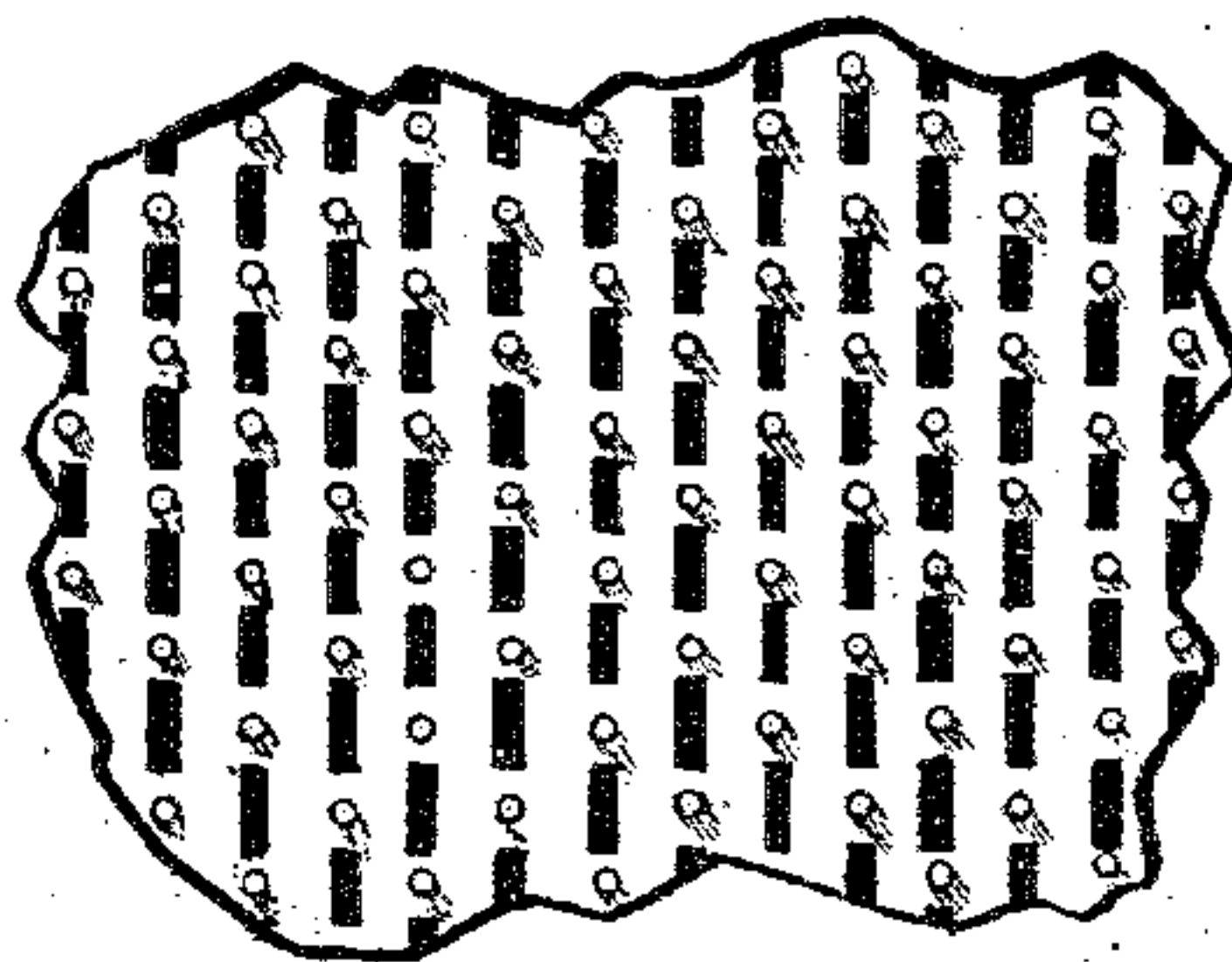


Fig. 6.



Fig. 7.



Witnesses:

Chas. C. Gaylord.
L. M. Freeman.

Inventor:

Milo Covell
By L. B. Coupland & Co
attys

(No Model.)

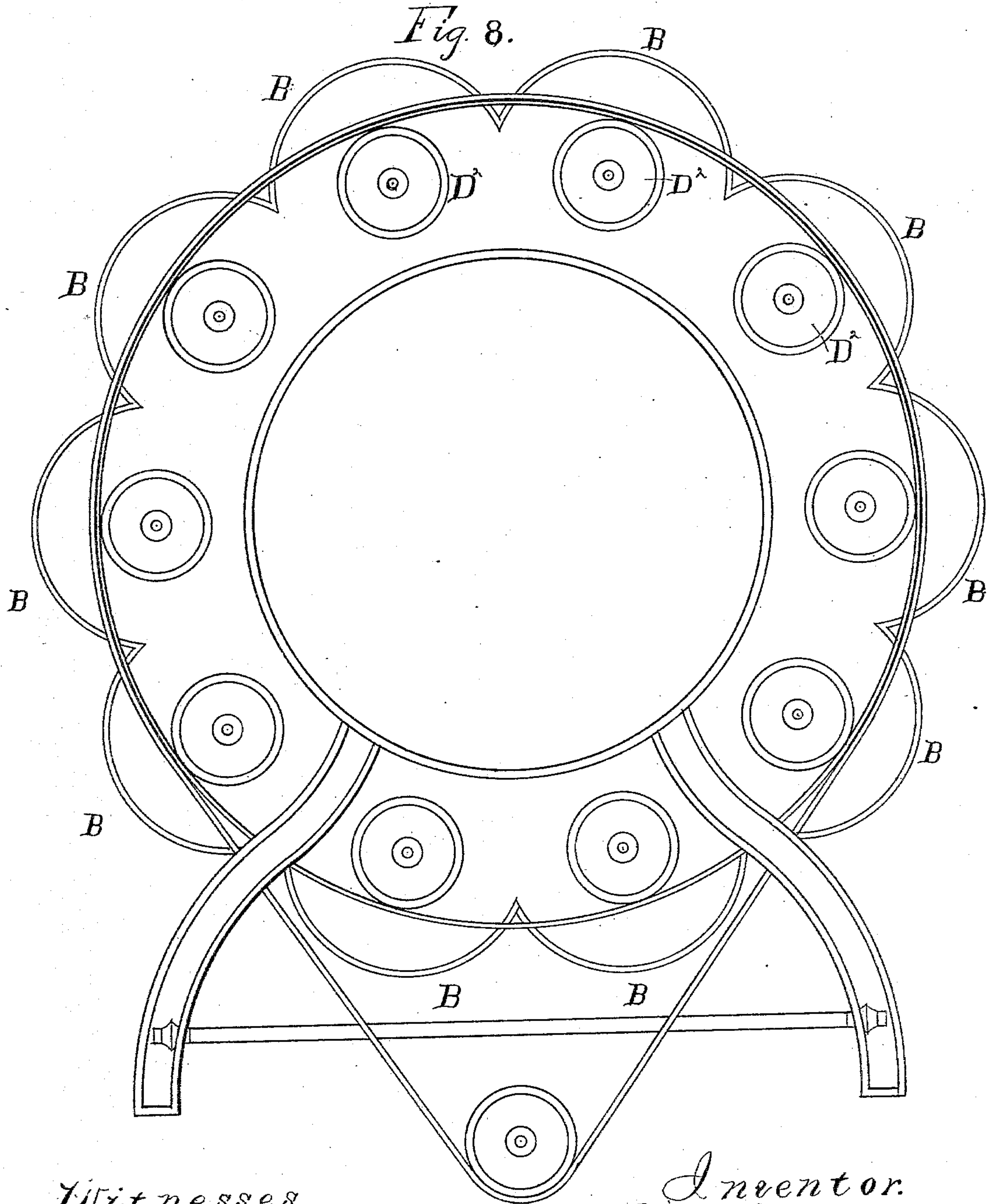
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COTTON GINNING AND CLEANING APPARATUS.

No. 296,824.

Patented Apr. 15, 1884.



Witnesses.
J. F. Holden
M. F. Hauck

Inventor.
Miles Cove
per L. B. Compland & Co
Attys

UNITED STATES PATENT OFFICE.

MILO COVEL, OF CHICAGO, ILLINOIS.

COTTON GINNING AND CLEANING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 296,824, dated April 15, 1884.

Application filed July 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, MILO COVEL, of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in a Cotton Ginning and Cleaning Apparatus, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in machines for ginning and cleaning cotton and reducing other fibrous substances, as will be hereinafter more fully set forth in detail.

Figure 1 is a front end elevation of my improved machine, a portion of the inclosing-head being broken away; Fig. 2, a side elevation. Figs. 3, 4, 6, and 7 are detached details of construction, and Fig. 5 a modification; Fig. 8, a skeleton elevation of the front end, showing the manner of attaching the belts to the pulleys.

Referring to the drawings, A represents a series of hollow cylinders arranged in a circular plane, forming a large cylindrical body and providing an interior space inclosed by said cylinders for the reception of the material to be treated. The ends of the cylindrical body are inclosed by the heads A^1 A^2 , the head A^1 having a central opening, through which the cotton is fed into the apparatus, and being also provided with the outward-projecting rings, A^3 A^4 , for the attachment and support of the different parts of the operating mechanism. The cylindrical body is supported by the legs A^5 , which are bolted to the heads inclosing the ends of the series of cylinders. The outer sides of the series of cylinders are inclosed by the casing or jacket B, which is constructed in as many longitudinal sections as there are cylinders, so as to readily and conveniently permit of the removal of any of the segmental sections of the casing, in order to give access for examining or repairing any particular cylinder without disturbing the rest of the mechanism. Considerable space is left between the casing and the longitudinal surfaces of the cylinders, and the junctions of the series of sections composing the casing B are curved inward to a point, a , between each two cylinders, as shown in

Fig. 1 of the drawings. By following the contour of the cylinders inward in this manner, with the joining edges of the sections forming the casing B, a kind of chute is formed, which will have a tendency to conduct the air-currents created by the action of the revolving cylinders into the central space inclosed by the cylinders, and also to return any seed or other matter that might find its way into the space next to the casing B.

The opposite end or head, A^2 , of the apparatus is provided with the projecting and gradually-contracted open part B^1 , which communicates with the lint-room B^2 , that receives the fibrous product from the apparatus, the seeds and other refuse matter dropping down through the passage B^3 .

The series of ginning-cylinders A are of a peculiar construction, the two ends of the series of cylinders being each provided with a wheel or spider consisting of the arms or spokes C, having the outer ends connected by a rim, and the hub C^1 , supported on the shaft C^2 , which extends the whole length of each cylinder.

The toothed or serrated rings D, forming the surfaces of the series of cylinders, are composed of a series of segmental sections, one of which is shown in Fig. 7 of the drawings. The sections entering into the formation of the toothed rings are perforated for the passage of the supporting tie-rods C^3 , extending the whole length of the cylinder or series of cylinders, and through the rims on the wheels at each end of the cylinders. The toothed rings are arranged at regular intervals, one being held separate from the other by means of the wire-clamps a^1 , the ends of which are bent around or looped to clasp or engage with the rods C^3 , as shown in Fig. 3 of the drawings. Three layers or thicknesses of these series of clamps are arranged between each one of the series of toothed rings, as shown in Fig. 4 of the drawings, thus leaving elongated openings a^2 between each alternate row of clamps and the rods C^3 , for the passage of the air-currents from the hollow cylinders into the central space inclosed by the same. Each of the series of sections entering into the construction of the rings D is put together so as to break joints with the next succeeding or com-

panion rings, for the purpose of giving additional strength to these parts. By this arrangement should any of the toothed segments become broken or worn, all that is necessary to be done is to slip out the binding-rods passing through the particular section, when the same is readily removed and replaced by another without having to take out or replace an entire cylinder. The fans C^4 extend the whole length of the cylinders, and are bolted to the arms of the two wheels placed at each end of the series of cylinders. These fans serve to generate and maintain a continuous current of air while the cylinders are in motion.

Both the heads inclosing the ends of the apparatus are provided with a number of adjustable registers, D' , opening into and corresponding with the number of cylinders employed. One of the plates of each register is adapted to move upon the other plate for the purpose of increasing or decreasing the size of the wedge-shaped slots, and said registers are adapted to be retained at any-sized opening to which they may be set, so as to admit a greater or less volume of air, as may be necessary, in accordance with the nature and condition of the substance being treated, and also to admit a variable volume of air into different parts of the apparatus. The volume or quantity of air required will depend greatly upon the condition of the cotton or other fibrous substance to be treated, for when the same is damp or wet a greater volume of air will be required to dry it as the fibers are picked or separated by the series of toothed cylinders.

The series of toothed rings of the companion cylinders overlap or project a little beyond each other alternately, as illustrated in Fig. 4 of the drawings, which shows a portion of two cylinders.

The shaft or shafts C^2 , supporting the series of cylinders, are provided with suitable bearings in the ends or heads inclosing the apparatus. The front ends of the shafts are each provided with a band or driving pulley, D^2 , one belt connecting the whole, whereby the series of cylinders are all simultaneously rotated in the same direction. Motion is transmitted to these cylinders by throwing a second belt over the first one connecting the series of cylinders, the same as though there were but one pulley in common to all the cylinders.

The pulley D^3 has frictional contact with one of the pulleys, D^2 , and is supported on the shaft D^1 , which in turn has suitable bearings in the brackets a^3 a^3 , bolted to the front end of the apparatus, as shown in Fig. 1 of the drawings. The shaft D^4 is provided with the band-pulley a^4 , receiving the belt a^5 , which connects the same with the pulley a^6 . By this arrangement motion is transmitted to the feed mechanism described farther along. The pulley D^3 is adapted to have a longitudinal adjustment on the shaft D^4 , for the purpose of

regulating the speed of the feed mechanism. This adjustment is accomplished through the medium of the lever b , the upper forked end of which engages with the clutch-collar b' , while the lower end may be moved on the perforated radius-bar b^2 .

The pulley a^6 is on the same shaft with the feed-drum b^3 , which is in turn connected with the companion drum b^4 by means of the endless traveling apron b^5 , having the outer surface studded with lag-points, as shown in Fig. 2 of the drawings. The cotton being fed into the hopper b^6 it is carried down into the concave part d , also thickly studded with lag-points, and rolled or dragged along in the direction indicated by the arrow over the wire screening-surface d' , which allows most of the heavier and finer refuse matter to drop out of the cotton or other fibrous substance before it passes into the ginning apparatus. The lags in the feed-apron are inclined back instead of forward, while the lags in the concave part d are inclined in the opposite direction, which arrangement prevents the cotton from choking up the passage as it is dragged or rolled along, instead of being forced and crowded by the points of the lags, as would be the case were the lags in the feed-apron inclined forward. This arrangement of feed mechanism also has the effect of crushing the bolls or pods and loosening up the fiber, which greatly facilitates the after process in the ginning apparatus. Ordinarily the cotton is carried directly forward into the gin without being first subjected to a renovating process. The quantity of feed and the opening in the concave passage are regulated by means of the adjustable slide d^2 , which is susceptible of being moved in or out, as circumstances may require. As the cotton passes from the feed mechanism into the apparatus, it is subjected to the action of the series of toothed cylinders, which revolve in a direction to first bring the backs of the teeth in contact with the substance under treatment, thus stranding out and producing a long fiber, instead of chopping up the fiber, as would be the case were the ginning-cylinders run in the opposite direction, striking the fibers with the points of the teeth, as is the case in the ordinary saw-gin. The bringing of the backs of the teeth in contact with the substance also has a tendency to avoid breaking or cutting the hulls of the cottonseed, which is a very desirable feature in this class of mechanism, as it is a difficult matter to separate the broken hulls or shells from the fiber. The series of cylinders are all revolved at a very high rate of speed, and the fans suck the air into the case through the openings in the registers, and the blast and cylinders separate the heavier from the lighter particles and force the lighter ones into the lint-chamber, while the heavier matter—such as seed and refuse—drop into passage B^3 . The continuous air-currents passing inward to the center from all directions, through the many

openings in the series of cylinders, prevent the fiber from adhering to or being again brought in contact with the toothed surfaces after being once separated from the seed and other refuse.

5 The contracted passage leading from the apparatus into the lint-room serves to catch the lighter refuse matter against the contracted walls and drop the same down the passage B³. In front of the contracted passage, and inside
10 of the lint-room, is placed the adjustable apron \bar{d}^3 , which may be set at any desired angle by means of the cord \bar{d}^4 . The lower edge is hinged to the partition \bar{d}^5 , which extends to near the
15 discharge-opening, and has a space between it and the wall of the lint-room, next to ginning apparatus, these parts serving to prevent the passage of any refuse matter into the lint-room that may find its way through the contracted passage, and also to spread out and
20 separate the fibers, so that the same will the more readily gravitate or divide into different lots in the lint-room.

The lint-room is provided with the drums EE' E², for the purpose of dividing the product
25 or fibers into different lots. The heaviest or coarsest drops onto the first drum, the next grade onto the second drum, and the finest quality is carried along and lodged on the drum E². The shell or periphery of these
30 drums is composed of wire-gauze, through which the air escapes that enters from the apparatus. One of the drums is partly broken away to show the gauze, which is shown on a comparatively large scale, to prevent confusion
35 as to the lines.

The rollers F F' F² have frictional contact with the series of drums, as shown in Fig. 2 of the drawings, which serves the purpose of condensing and compacting the fiber as it is carried down by the revolving drums and dropped
40 into the bin or compartment underneath. The rollers have bearings in one end of the arms \bar{d}^6 , the opposite ends of the arms being pivoted to the standards \bar{d}^7 . This arrangement serves
45 to retain the rollers in contact with the drums by their own weight, and at the same time allows them to rise up for the passage of a greater or less quantity of fiber, and prevents clogging. By this arrangement the fiber in
50 the lint-room is not collected in one lot, but is separated into different lots or grades by the combined action of the air-blast and force of gravity.

The roller h is placed so as to rest against
55 the lower part of the drum E², as shown in Fig. 2 of the drawings, and is rotated by frictional contact therewith. The roller h is journaled and supported in the upper forked end of the arm h' , the lower end of which is pivoted to the frame-work of the structure. This arrangement permits of an automatic adjustment upward and away from the drum as the roller thickens from the accumulation of fiber. The function of this roller is to collect the lint
65 or fiber from the gauze-drums and form it into laps ready for the carding-machines or baling-

press. One of these rollers may be placed under each of the gauze-drums, and so arranged that it may be readily removed for the purpose of removing the laps or temporarily
70 dispensing with the use of the same. The series of gauze-drums in the lint-room revolve away from the ginning apparatus, motion being transmitted to the same from one of the series of cylinders, A, by means of a belted
75 connection with the horizontal shaft h^2 , provided with a number of beveled pinions, h^3 , which engage with corresponding gear-wheels h^4 on the journal-shafts of the gauze-drums.

Instead of constructing the series of cylinders A, as described, the shell or toothed periphery of the same may be formed of a single piece and provided with rectangular openings for the passage of the air-currents, and with
80 circular apertures for the insertion of the prickers or toothed points, as shown in the modification, Fig. 5, of the drawings.

This apparatus may also be used with advantage in cotton-factories for working over and preparing the baled cotton for the card-
90 ing-machine which has been ginned in the ordinary machines.

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

1. In a cotton-gin, the combination of a series of inclosed toothed cylinders arranged in a circular plane, the whole inclosing an annular interior space, where the cotton or other fibrous substance to be treated is subjected to
95 the action of the continuous moving toothed cylinders, substantially as described.

2. The combination, with a series of hollow cylinders and a casing or jacket provided with openings for the admission of air into each
105 of the cylinders, of a series of fans arranged longitudinally on the inside of each of the said cylinders for the purpose of generating a blast to assist in separating the fiber from the refuse matter and depositing the same in
110 the lint-room when so separated.

3. In an apparatus as described, the combination, with the series of toothed rings D, and the tie-rods C³, of the series of wire-clamps \bar{a}' , placed between each pair of rings, for the purpose of retaining the same with proper relation
115 to each other, and arranged to provide openings or air-passages, substantially as set forth.

4. The combination, with a cotton-gin, of a feeding apparatus consisting of the drum b^3 ,
120 the companion drum b^4 , the feed-apron b^5 , having the outer surface thereof studded with lag-points which are inclined back from a forward movement of the apron, the concave part \bar{d} , provided with lag-points, and the wire screening-surface \bar{d}' , arranged in the under side of the feed-passage, whereby a portion of the refuse matter is expelled from the substance before it passes into the ginning apparatus, substantially as set forth.
125

5. The combination, with a ginning apparatus, of a lint-room provided with a number
130

of gauze-drums arranged in a horizontal plane, and self-adjusting rollers F F' F^2 , for the purpose of separating the fiber into as many grades or lots as there are drums.

- 5 6. The combination of a ginning apparatus having a discharge-opening, and a lint-room having adjustable shield d^3 , hinged to par-

tion d^5 , having a space between it and the wall of the lint-room below the discharge-opening.

MILO COVEL.

Witnesses:

L. M. FREEMAN,
C. F. JONES.