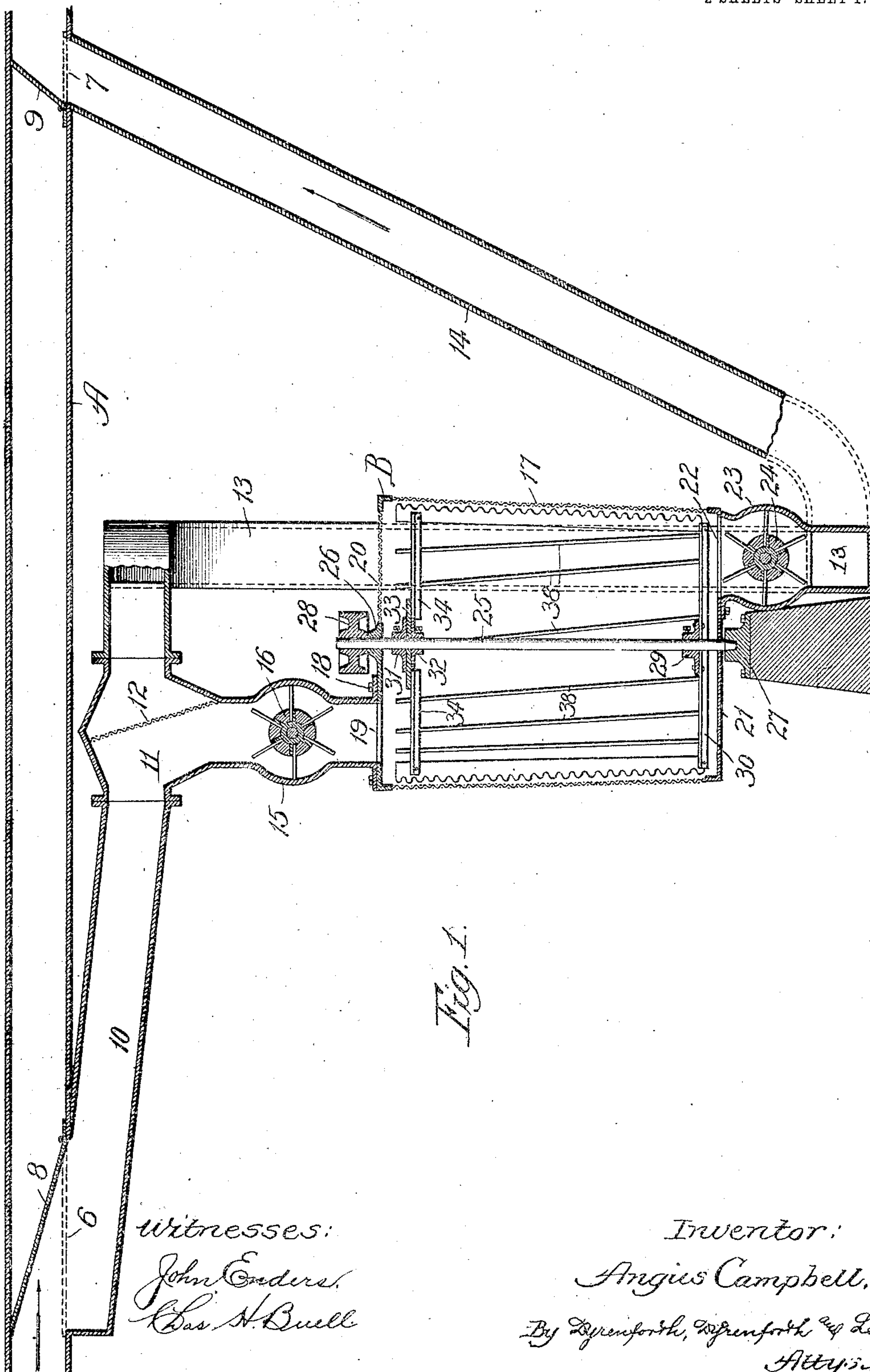


No. 829,627.

PATENTED AUG. 28, 1906.

A. CAMPBELL.
SEED COTTON CLEANER.
APPLICATION FILED SEPT. 5, 1905.

2 SHEETS—SHEET 1.



Witnesses:
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Chas. H. Buell

Inventor:
Angus Campbell,
By Dyrenforth, Dyrenforth & Lee,
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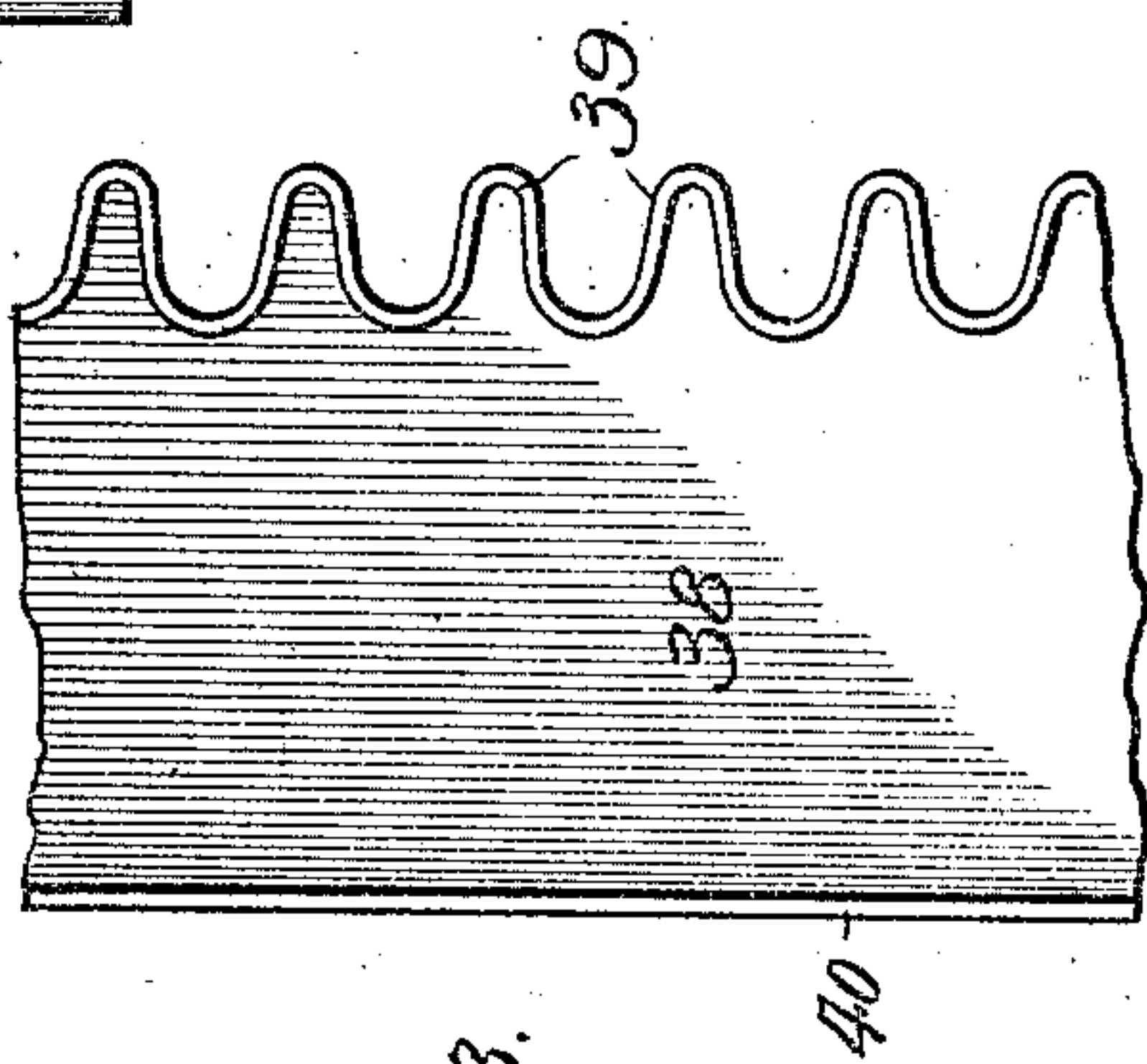
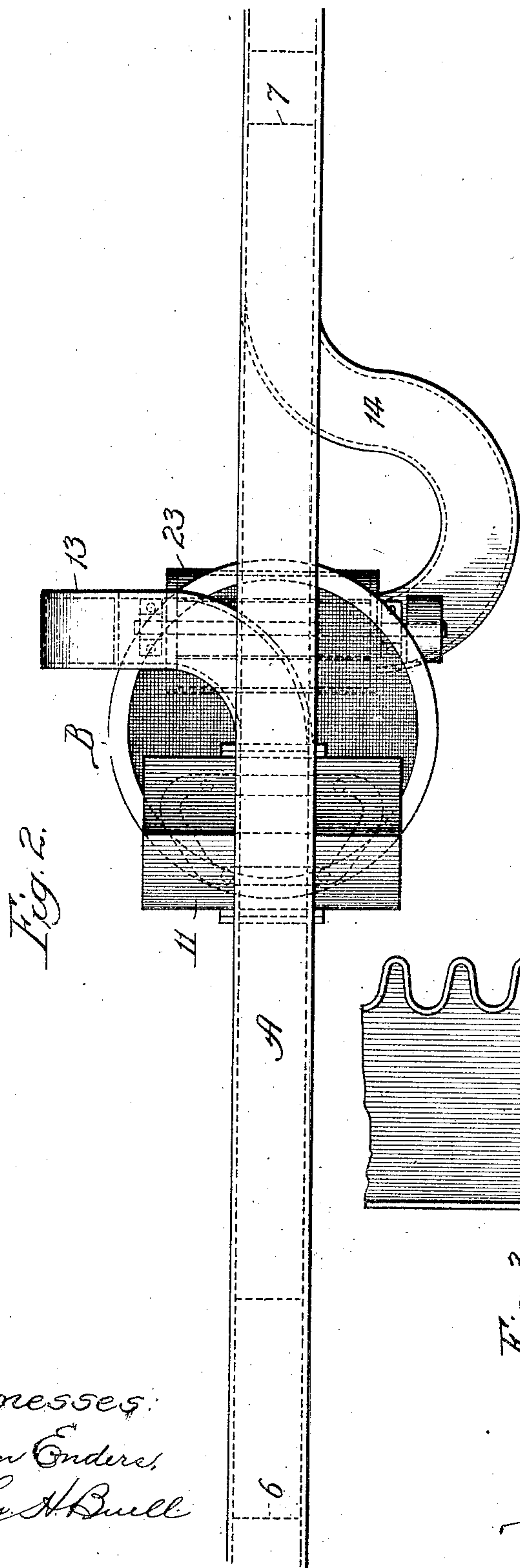


Fig. 3.

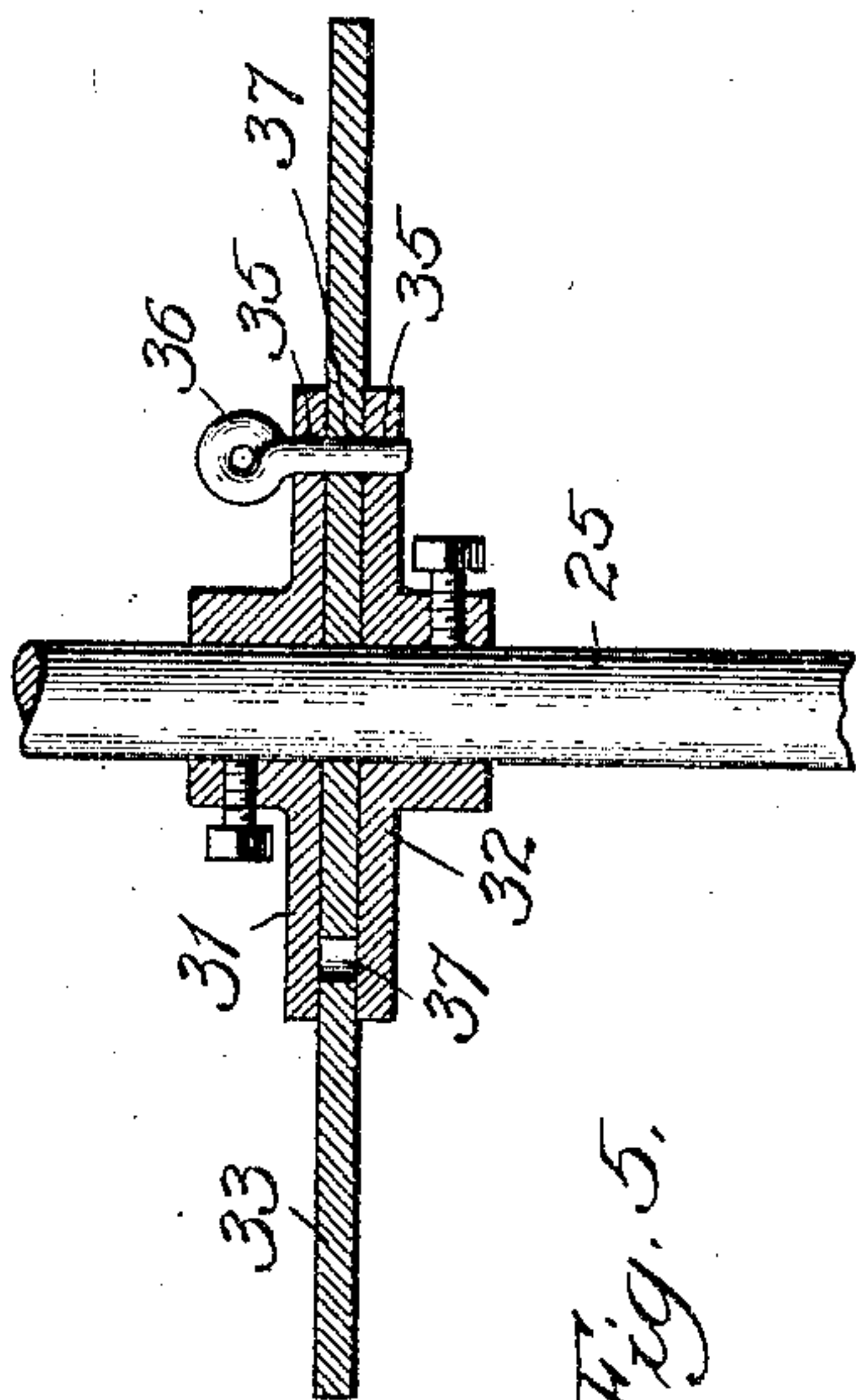


Fig. 5.



Fig. 4.

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UNITED STATES PATENT OFFICE.

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SEED-COTTON CLEANER.

No. 829,627.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed September 5, 1905. Serial No. 276,952.

To all whom it may concern:

Be it known that I, ANGUS CAMPBELL, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Seed-Cotton Cleaners, of which the following is a specification.

My invention relates to improvement in apparatus for pneumatically cleaning seed-cotton to eliminate dust, sand, dead leaves, and other foreign matter mixed therewith before it is subjected to ginning, my object being to provide such an apparatus of a simple and generally improved construction which will be peculiarly efficient in the performance of its cleaning operation without injuring the fibers and seeds and will discharge the cotton in a fine fluffy condition which permits the after treatment thereof in the gin to be performed in a manner exceptionally expeditious and satisfactory.

In carrying out my invention I interpose the cleaning apparatus in the pneumatic tube through which the cotton is conveyed from the storehouse to the gin-house.

Referring to the drawings, Figure 1 is a broken vertical section showing my apparatus in operative position; Fig. 2, a broken plan view of the apparatus; Fig. 3, an enlarged broken view of one of the toothed vanes or blades employed in the apparatus; Fig. 4, a section of the same, and Fig. 5 an enlarged broken section showing the adjustable hub portion of a reel of which the vanes form a part.

The pneumatic tube or conduit A would in practice extend from the storehouse or other receiving point to the gin-house, a suction-fan being located at the gin-house end to create a strong draft through the said conduit to convey the cotton. In the pipe A are openings 6 and 7, at which are provided hinged valves or deflectors 8 and 9, respectively, which may be raised to close the conduit or lowered to close the said openings. A pipe 10 extends from the opening 6 to a chamber or vacuum-box 11, provided with an inclined screen 12. A pipe 13 extends from the side of the vacuum-box 11 opposite the pipe 10 in a downward direction to the lower end of the cleaning apparatus B, where it connects with an upward-extending pipe 14, terminating at the opening 7. Extending downward from the vacuum-box 11 is a vertical pipe or conduit 15, in which is interposed a rotary feeder 16. The cleaning

apparatus B has an outer wall 17, of wire-mesh or other perforate material, and is of frusto-conical form, tapering slightly from the top to the bottom. The top 18 is a flanged disk to the edge of which the wall 17 is secured at its upper end. In the top at one side is an opening 19, communicating with the pipe 15, and throughout the greater part it is perforated or open and covered with a screen, as indicated at 20. The lower end 21 of the casing is formed of a flanged disk, to the rim portion of which the lower end of the wall 17 is secured, and in one side thereof is a discharge-opening 22, communicating with a pipe or conduit 23, containing a rotary discharger 24. The pipe 23 opens into the pipe 13 14.

25 is a rotary shaft journaled near its upper end in a bearing 26 in the top plate 18 and passing downward through a perforation in the bottom plate 21, being journaled at its lower end in a bearing 27. The shaft carries above the bearing 26 a belt-pulley 28. Firmly fastened to the shaft 25, near the base-plate 21, is a hub or collar 29, to which are firmly secured the inner ends of a plurality of radially-extending angle-bars or spokes 30. Near the upper end of the casing the shaft carries companion collars 31 32, fastened by set-screws to the shaft and holding between them a rotatable disk 33, to which are secured the inner ends of a plurality of radially-extending angle-bars or spokes 34, corresponding in number and relative positions with the bars 30. The collars 31 32 are provided toward one edge with corresponding openings 35 to receive a pin 36, and in the disk 33 is a series of closely-adjacent openings 37, through any one of which the pin may be passed to lock the disk against independent rotation on the shaft.

38 38 are thin metal blades or vanes each provided with one corrugated edge 39 and a flanged edge 40. The corrugations 39 form round-pointed teeth, the edges of which are also rounded by flanging the metal in the manner indicated in Fig. 4. The blades or vanes are fastened at their lower ends to the ends of the bars 30 and toward their upper ends to the ends of the bars 34, the corrugated edges being adjacent to and parallel with the wall 17. By raising and lowering the collars 31 and 32 upon the shaft and turning the disk 33 the blades or vanes 38 may be adjusted to extend spirally, as indicated, and at any desired pitch.

In the event that the cotton being transferred through the tube A to the gin-house requires no cleaning the valves or deflectors 8 9 may be lowered to close the openings 6 7, so that the cotton will be drawn directly through the conduit A. In the event, however, that the cotton, as is generally the case, contains foreign substances or material which it is desirable to eliminate the valves or deflectors 8 9 may be raised to the positions indicated by full lines in Fig. 1 to direct the cotton into the pipe 10. The feed and discharge devices 16 24 are suitably connected with a driving power, to which the pulley 28 is also belted, and the latter is caused to rotate and turn the reel described, which carries the vanes 38 in the direction which causes the lower ends of the vanes to move in advance of their upper ends. The suction-fan at the gin-house creates a strong current of air through the pipes or by-passage 10 13 14. The cotton drawn into the pipe 10 moves to the vacuum-box or chamber 11 and strikes against the screen 12, dropping therefrom through the pipe 15 and is delivered by the feeder 16 to the interior of the casing. In practice the reel is rotated rapidly to have a peripheral travel of, say, five thousand feet per minute. As the cotton falls through the opening 19 it is forced by the reel and the strong air-current generated thereby against the perforate wall 17, around the inner surface of which it tends to spread in a thin sheet or layer. The reel in its rotation draws in air through the top screen 20 and forces it through the screen-wall 17, whereby the centrifugal current as it passes through the cotton blows out through the wall any dust, sand, or the like, as well as small particles of dry leaves that may be mixed with the cotton. The blades through their engagement with the cotton slide or roll the latter around and around against the wall 17, and the cotton descends by gravity to the base 21. The object more especially of causing the blades to extend spirally is to retard the descent of the cotton. Thus disposed the blades tend to produce an upward as well as outward blast of air and to beat up the cotton, thereby causing it to descend slowly and be carried around a number of times to prolong its subjection to the cleansing blast. When the cotton descends to the base 21, it is moved to the opening 22 to be discharged by the discharger 24 into the pipe 13 14. From thence it is sucked upward through the opening 7 to the conduit A and drawn to the gin-house.

The action upon the cotton in the cleaning operation is not at all severe, as it is opened up by the round smooth ends of the teeth 39, which do not injure the fiber, and after being opened up the cotton is kept in sliding or rolling contact with the wall 17, being carried around, in practice, preferably ten or more times. Thus during one hundred or

more feet of travel around the wall the cotton is subjected in a comparatively thin layer to a strong current of air through it, which blows out the dirt and leaf trash, leaving the cotton in a fine fluffy condition.

The devices 16 and 24 may rotate at comparatively slow speed and operate, respectively, to feed the cotton into and discharge it from the cleaning-chamber. While performing these functions they maintain the pipes 15 and 23 closed against the passage of air-currents. Thus practically no material portion of the cotton-conveying current set up in the pneumatic tube A passes through the cleaning-chamber to weaken the current. The screened top 20 operates as a guard to prevent any cotton from being thrown out of the chamber by the action of the reel. The force of air for cleaning the cotton is generated by the reel alone, the blades 38 of which are set at an angle, and this air which is drawn in through the screened top 20 is discharged outwardly through the cotton spread along the perforate or screen wall 17. As the wall 17 tapers in the downward direction, material forced through its perforations drops therefrom readily.

The retarding of the downward movement of the cotton by gravity through the cleaner and the extent therefore to which it is subjected to the cleaning blast depends upon the spiral pitch of the blades 38, which may be regulated according to requirements by raising and lowering the collars 31 32 and adjusting the disk 33, as before explained.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a pneumatically-operating cotton-cleaning apparatus, the combination of a vertical chamber having an air-inlet, a cylindrical screen forming the surrounding wall of the chamber, means for creating an air-blast in the chamber and for directing it outwardly through said wall, means for feeding the cotton into the upper part of the chamber, whereby it descends by gravity through the chamber across the path of the blast, an outlet for the cotton in the lower part of the chamber, and cotton-retarding means in the chamber for regulating the speed of descent of the cotton through the chamber.

2. In a pneumatically-operating cotton-cleaning apparatus, the combination of a vertical chamber having an air-inlet, a screen forming the surrounding wall of the chamber a blast-creating reel in the chamber operating to force the blast outwardly through said wall, a feed-opening for the cotton in the upper part of the chamber, an outlet for the cotton in the lower part of the chamber, and means upon the reel for regulating the speed of movement of the cotton through the chamber.

3. In a pneumatically-operating cotton-cleaning apparatus, the combination of a

chamber having its surrounding wall formed of a screen and provided with an air-inlet, an inlet for cotton at one end and an outlet therefor at its opposite end, a reel in the chamber provided with a plurality of blades having serrated edges adjacent to said wall, and means for rotating the reel.

4. In a pneumatically-operating cotton-cleaning apparatus, the combination of a chamber having its surrounding wall formed of a screen and provided with an air-inlet, an inlet for cotton at one end and an outlet therefor at its opposite end, a reel in the chamber provided with a plurality of blades having corrugated edges forming rounded-teeth adjacent to said wall, and means for rotating the reel.

5. In a pneumatically-operating cotton-cleaning apparatus, the combination of a chamber having its surrounding wall formed of a screen and provided with an air-inlet, an inlet for cotton at one end and an outlet therefor at its opposite end, a reel in the chamber provided with a plurality of spirally-arranged blades adjacent to said wall, means for adjusting the spiral pitch of the said blades, and means for rotating the reel.

6. In a pneumatically-operating cotton-cleaning apparatus, the combination with a cotton-conveying pneumatic tube, of a by-passage communicating at opposite ends with said tube, a screen in said by-passage, a

vertical chamber having its surrounding wall formed of a screen communicating at its upper end with said by-passage in advance of the screen therein, an outlet in the lower end of said chamber communicating with said by-passage, a cotton-discharger in said outlet, an air-inlet in the upper part of said chamber, a reel in the chamber provided with a plurality of spirally-arranged blades adjacent to said wall, and means for rotating the reel.

7. In a pneumatically-operating cotton-cleaning apparatus, the combination with a cotton-conveying pneumatic tube, of a by-passage communicating at opposite ends with said tube, means for opening and closing said by-passage, a screen in the by-passage, a vertical chamber having its surrounding wall formed of a screen and provided with an air-inlet, a conduit communicating with the by-passage in advance of the screen therein and discharging into the upper end of said chamber, a rotary feeder in said conduit, an outlet for cotton at the lower end of said chamber leading to said by-passage, a reel in the chamber provided with a plurality of spirally-arranged blades adjacent to said wall, and means for rotating the reel.

ANGUS CAMPBELL.

In presence of—

JNO. MCB. DONALDSON,
S. B. DONALDSON.