(No Model.)

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E. F. O'HAVER.

COTTON HARVESTER.

No. 326,142. Patented Sept. 15, 1885.

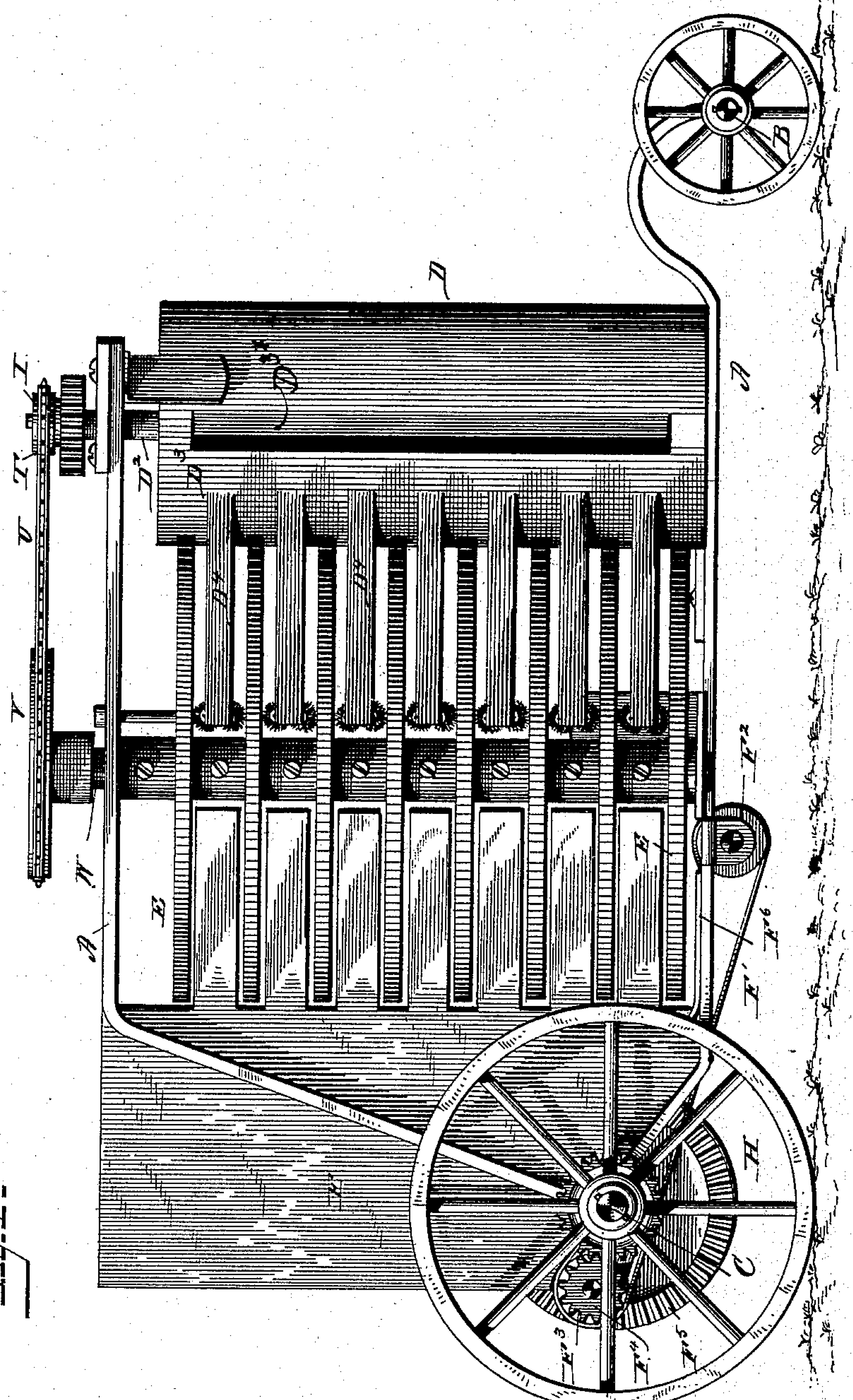

Fig. 1.

WITNESSES

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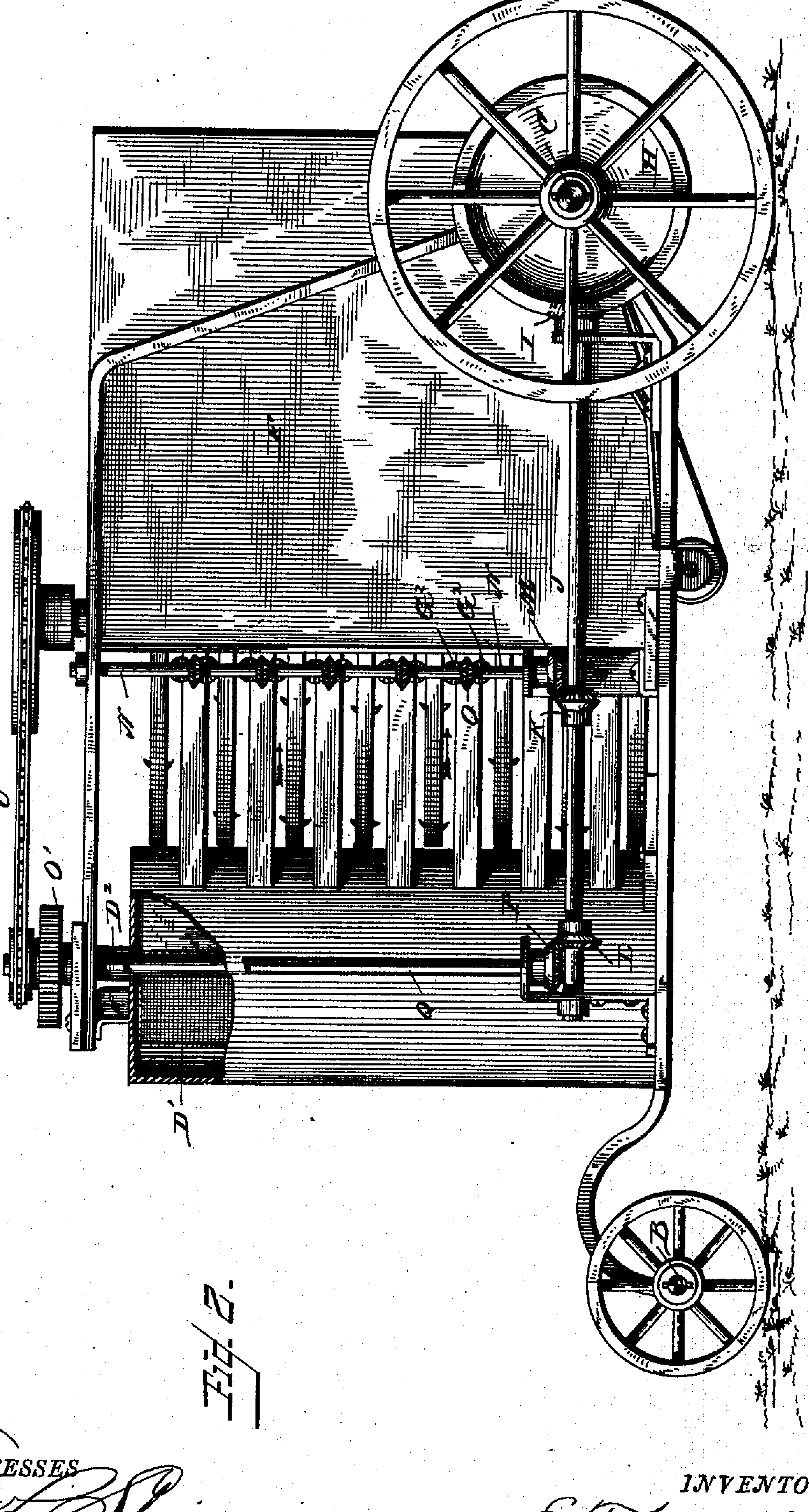

Fig. 2.

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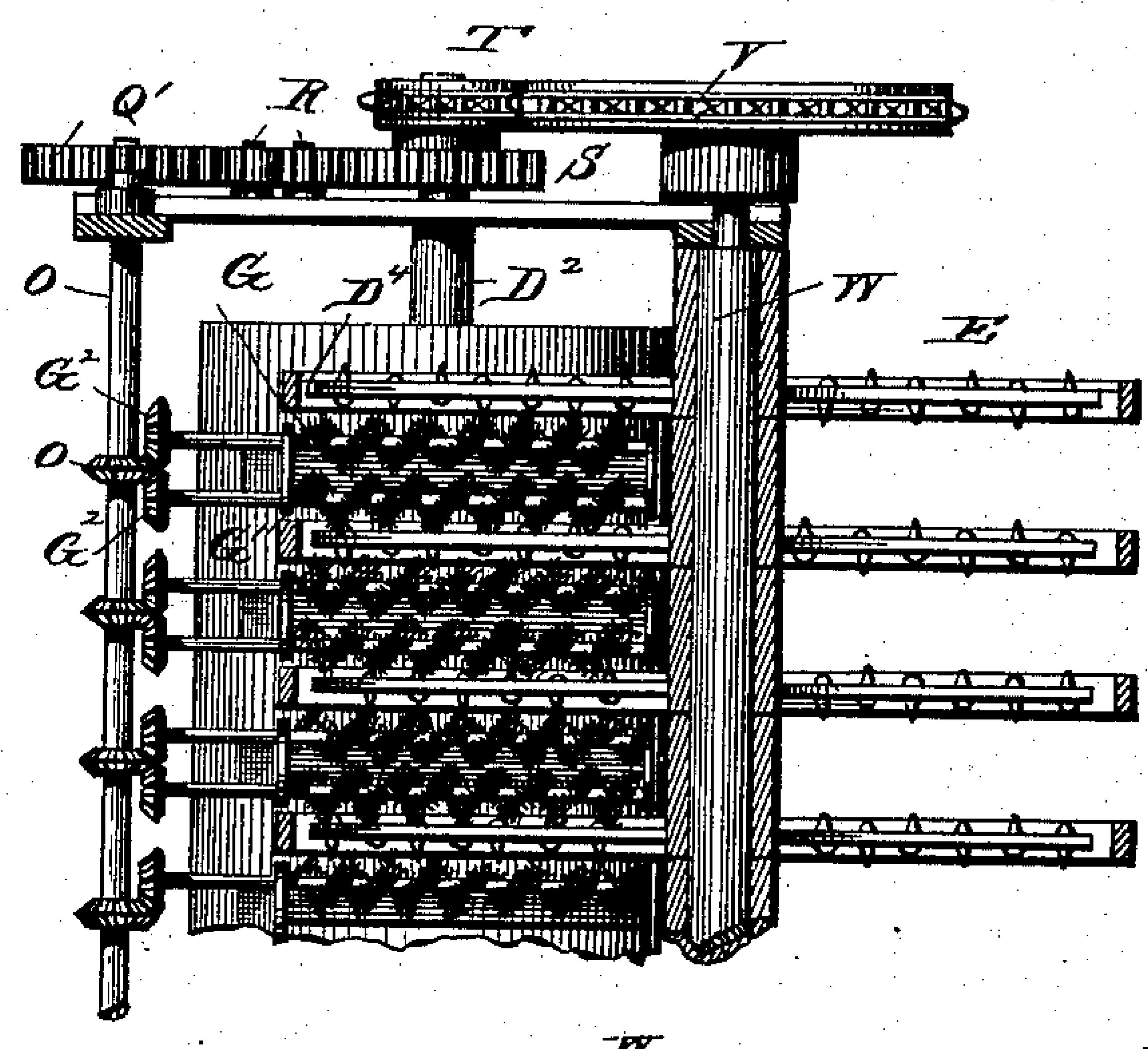

Fig. 3.

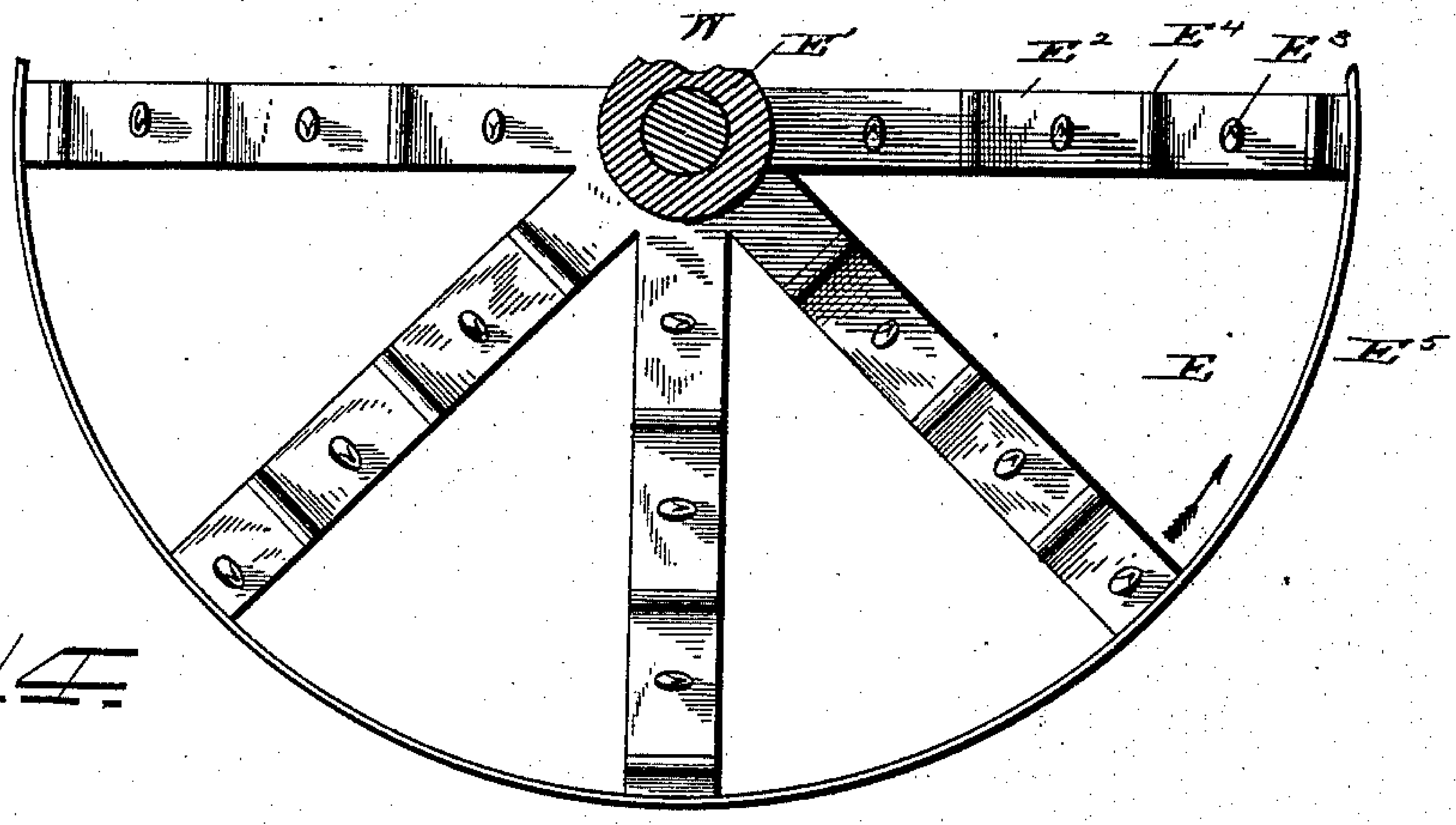

Fig. 4.

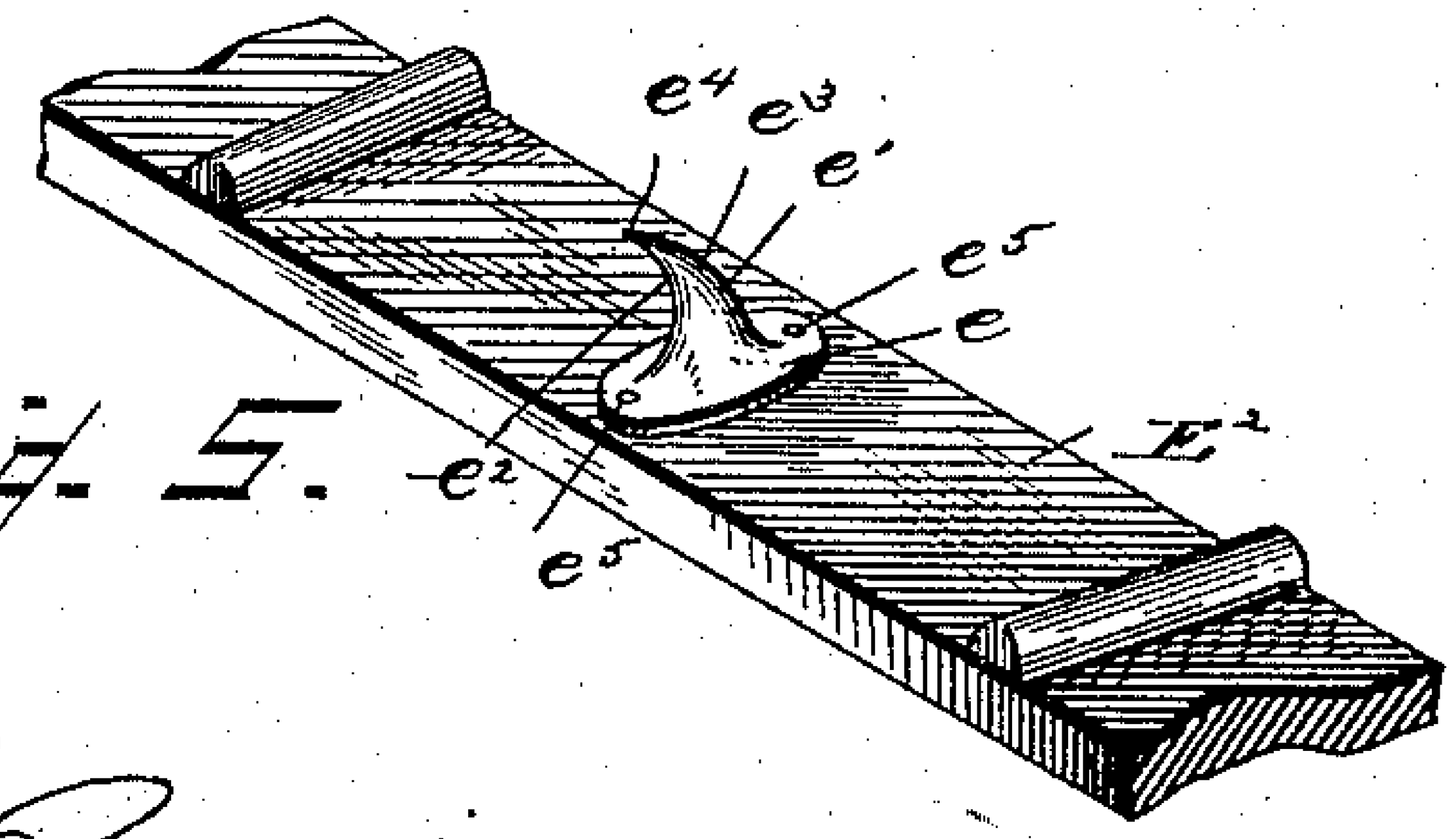

Fig. 5.

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(No Model.) 4 Sheets—Sheet 4.

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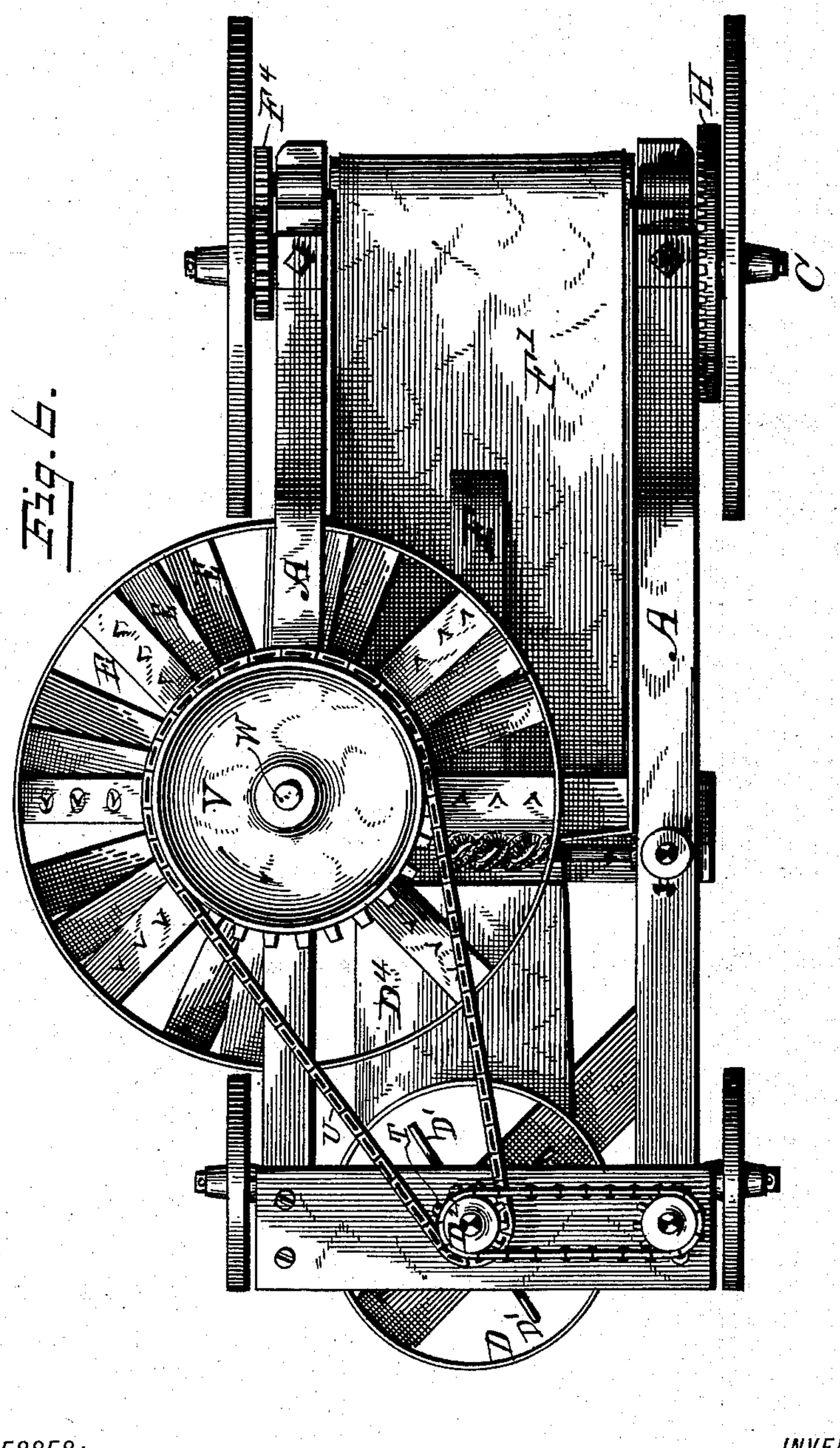
COTTON HARVESTER.

No. 326,142. Patented Sept. 15, 1885.

Fig. 4.



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UNITED STATES PATENT OFFICE.

E. FRANK O'HAVER, OF MURPHYSBOROUGH, ILLINOIS.

COTTON-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 326,142, dated September 15, 1885.

Application filed October 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, E. FRANK O'HAVER, a citizen of the United States, residing at Murphysborough, in the county of Jackson and State of Illinois, have invented certain new and useful Improvements in Cotton-Harvesters, of which the following is a specification, reference being had to the accompanying drawings.

This invention has relation to mechanism for picking cotton from the boll, the construction and operation of which is hereinafter fully described, and the novel features of the invention will be specifically pointed out in the claims.

Referring to the drawings, Figure 1 is a right-side elevation; Fig. 2, a left-side elevation; Fig. 3, a partial transverse section on the line *x* of Fig. 1, looking in the direction of the arrow. Fig. 4 is an enlarged detail in plan; and Fig. 5, an enlarged detail in perspective, hereinafter described. Fig. 6 is a plan, a chain being substituted for gearing and the ends of the cylinder being removed.

Like letters indicate like parts in all the figures.

The general object of this invention is to provide a machine which can be drawn along a row of cotton, a portion or all of which is in condition for gathering, and subject said cotton to the operation of mechanical picking devices, which shall act to strip so much of the cotton as is ripe and carry the same within the machine, where the stripping mechanism is subjected to mechanical and pneumatic cleaning mechanism for removing the cotton from the picking mechanism and delivering it into a receptacle having an endless carrier, by which the cotton gathered shall be delivered into a receiver, the details of construction being such as to give the proper motion and direction of movement to the working parts, so as to accomplish the aim in view.

A represents a suitable frame-work which, being mounted upon front and rear axles, B C, each being provided with ordinary wheels, serves as a truck or wagon for the support, carriage, and operation of the mechanism employed.

At the front of the truck is a vertical cylinder, D, in which a fan, D′, is mounted on a vertical shaft, D^2, which when, rotated, draws air through the opening D^3, having an inwardly-projecting lip, D^{3*}, into the cylinder D, and forces it from the cylinder through tubes D^4, communicating with and projecting to the rear of the cylinder. Any suitable well-known blast-producing devices may be substituted for those shown.

In rear of the cylinder and at one side of the machine is a vertical series of gathering arms or reels, E, mounted on a vertical shaft, so arranged as to project between the tubes D^4 and laterally from the side of the machine in both directions—that is, to pass into the body of the machine and to project outwardly from the body thereof. Each of the gathering-reels comprises a central hub, E′, having spokes or arms E^2, provided with a series of alternated teeth, E^3, and ribs E^4, upon both the upper and under surfaces of the arms E^2, and preferably, though not necessarily, the under series of teeth and ribs is arranged alternately with the upper series on the spokes or arms. For the purpose of strengthening the spokes, a light rim, E^5, is secured to their outer ends.

F is a receptacle for the gathered cotton, and it extends from the shaft upon which the gathering-arms are mounted to and as far beyond the rear axle as is desired. That portion of the receptacle which is in front of the rear axle is provided with a movable bottom, in this instance consisting of an endless belt, F′, running over a roller, F^2, mounted in bearings supported by the frame-work A, and over a roller, F^3, mounted in rear of the axle C, and provided with a gear, F^4, which meshes with a gear, F^5, mounted upon the axle, whereby the said endless belt is, when the machine is in operation, continuously moving, its upper surface passing from front to rear. A plate, F^6, is arranged immediately below the lower gathering-reel, E, and upon the belt F′, so as to prevent it from coming in contact with said gathering-reel.

At the discharge end of the tubes D^4 are arranged two rotary brushes, G and G′, which are operated by means of beveled gears G^2 in a manner hereinafter described. These brushes are rotated toward each other from front to

rear, and at a greater speed of movement than that given to the gathering-disks, for a purpose hereinafter described.

The side wall of the receptacle F is provided with openings for the reception of the gathering reels or arms on one side of the machine, while upon the opposite side of the machine such openings are not necessary.

In Fig. 4 will be seen a detail which clearly illustrates the arrangement of the ribs and teeth upon the arms of the gathering-reels—that is to say, the teeth have their points directed to the front in the direction of the movement of the arms, as indicated by the arrow, and the ribs are arranged half-way between each two of the teeth.

In Fig. 5 a still clearer view of one of the teeth is given, and it will be seen that it comprises a suitable base, *e*, and a body, *e'*, which is in general form that of a curved cone, the front of the teeth being concave, as at e^2, and the rear convexed, as at e^3, while the apex e^4 is directed or bent to the front. In other words, at all points upon the exterior of the tooth its surface is a curved one, no straight lines occurring at any point in the body thereof, and its size, in cross-section at any point, gradually increases from point to base. I find this form of tooth best adapted for the collection of cotton from the bolls and stalks without the collection of leaves and stems, and I consider its form as an essential feature of my invention. The base of the tooth is perforated for the passage of bolts or rivets e^5, by which it is secured to the arm.

I do not limit my invention to any particular form or system of gearing or belting for operating the individual elements of the machine; but I have herein illustrated one system of gearing for that purpose, and it comprises a master-gear, H, mounted upon the rear axle and meshing with a beveled pinion, I, fixed to the shaft J, arranged along one side of the machine and supported in suitable bearings, from which shaft motion is given to the brushes and fan by means of beveled pinions K and L, the former meshing with a beveled pinion, M, secured to a vertical shaft, N, having double beveled pinions O meshing with the beveled pinions G^2 G^2 of the brush shafts, while the beveled pinion L meshes with a similar pinion, P, fixed to a vertical shaft, Q, having at its upper end a pinion, Q', which by means of intermediate gears R drives a gear, S, mounted upon the shaft D^2 of the fan, and at the upper end of said shaft is a sprocket-wheel, T, which by means of a chain, U, drives a spocket-wheel, V, secured to the upper end of the shaft W, upon which the series of reels or arms E are mounted.

The rear wheels, receiving motion by contact with the ground and giving it to the axle, serve as the motive power for driving the gearing described, by which the desired movement and velocity of the operative parts are secured.

This being the construction, the operation is as follows: As the machine advances along the side of a row of cotton the gathering-arms rotate, so as to enter the machine at the front in the direction of their gathering movement, and in passing through the stalks and bolls of cotton the teeth take hold of the latter, and by their peculiar formation said cotton is drawn toward the base of each tooth as the arms rotate, while at the same time the ribs at either side of the tooth serve to prevent in a great measure the drawing toward the base of the tooth twigs and leaves which come in contact with the ribs at their upper surfaces, while the cotton, being more flexible, is drawn down, as described. The teeth, being loaded, advance with the arm into the machine, and (taking the arm below the second as an example) they pass in front of the discharge end of the tubes D^4, from which a blast of air is passing toward the rear of the machine, which of itself is sufficient to deliver from the teeth the more loosely-held fibers of cotton, while the more snugly-held fibers are removed by the rotary brushes, which rotate at a greater speed than that of the movement of the arm, so that the cotton is stripped from the teeth to be freely influenced by the blast and carried into the receptacle F. At this point the curvature and formation of the teeth will also serve a valuable function in that no portion of its outline presents obstacles to prevent the delivery of the cotton therefrom. As the cotton falls into the receptacle it is received upon the endless carrier, which is constantly moving toward the rear, and delivers the cotton into a portion of the receptacle not covered by the belt, or into a supplementary receptacle, as may be desired.

The alternated arrangement of the teeth and ribs gives further surety of preventing the gathering of twigs in that a leaf gathered by a tooth and partially freed from the tooth by the ribs at each side thereof is positively freed by the presence and advancement of the next following arm with a rib in line with the teeth of the next preceding arm.

Having described my invention and its operation, what I claim, and desire to secure by Letters Patent, is—

1. A gathering-reel for a cotton-harvester, comprising arms provided with teeth and ribs, alternately arranged side by side on said arms, substantially as specified.

2. A gathering-reel for a cotton-harvester, comprising arms having alternately-arranged parallel ribs and teeth upon their upper and their lower surfaces, and across the same, substantially as specified.

3. A gathering-reel for a cotton-harvester, comprising arms having alternately-arranged parallel teeth and ribs, and a strengthening hoop or rim, substantially as specified.

4. A tooth for a cotton-harvester having the outline or form of a curved cone, and the integral base united to said tooth by curved

surfaces and perforated for attachment to an arm, substantially as specified.

5. In a cotton-harvester, the combination of a series of teeth and a series of ribs arranged parallel with each other and transversely on horizontally-rotating arms, so that a rib follows a tooth to prevent collecting fibers delivered from a preceding tooth, substantially as specified.

6. In a cotton-harvester, the combination of a vertical fan having independent separated discharge-spouts, with a series of gathering-arms arranged and rotated between the spouts, substantially as specified.

7. In a cotton-harvester, the combination of a vertical fan having a series of independent discharge-spouts, a series of gathering-arms arranged to rotate between the spouts, and intermediately-arranged rotating brushes, substantially as specified.

8. In a cotton-harvester, the combination of a vertical fan having a series of independent discharge-spouts, a series of gathering-arms arranged to rotate between the spouts, and a receiver, substantially as specified.

9. In a cotton-harvester, a vertical fan having a series of independent discharge-spouts, a series of gathering-arms arranged to rotate between the spouts, and a series of rotary brushes arranged between the arms and adapted to rotate at a greater speed than the disks, substantially as specified.

10. The combination of a suitable frame-work, A, a fan, a cylinder or air chamber having independent discharge-spouts D^4, and a series of gathering-arms arranged to project outwardly from the frame-work, and a receiver, F, substantially as shown and described.

11. The combination of the frame A, axles B and C, provided with suitable ground-wheels, and gears F^4 F^5, the endless belt F′, the roll F^2, the plate F^6, and the receiver F, substantially as shown and described.

12. The combination of the frame A, axle C, master-gear H, the horizontal shaft J, the vertical shafts N and Q, the gears Q′, R, and S, fan-shaft D^2, gathering-shaft W, sprocket-wheels T V, and chain U, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

E. FRANK O'HAVER.

Witnesses:
W. W. KIMBALL,
BURT R. BURR.