No. 659,986. Patented Oct. 16, 1900.

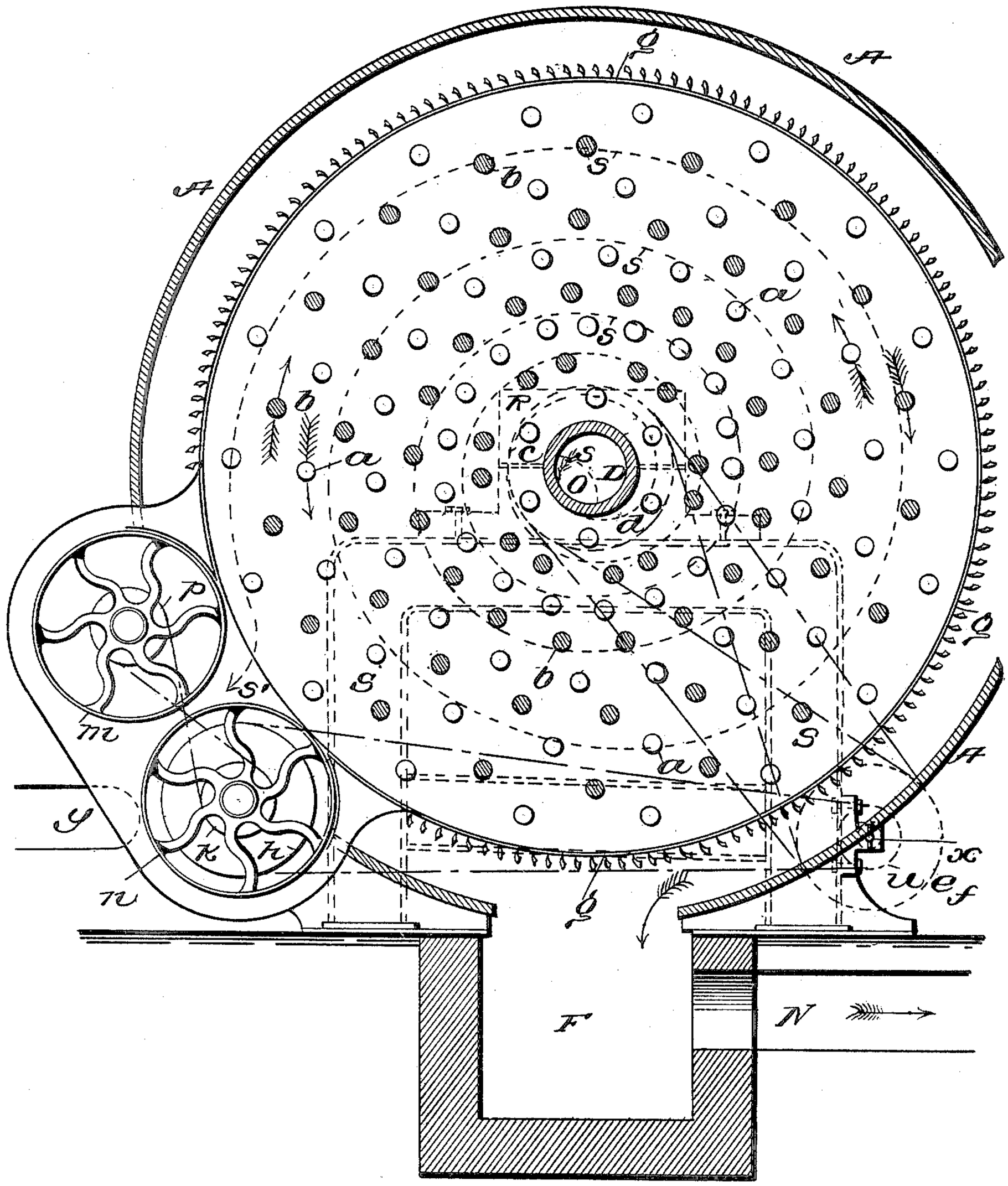
G. RAETZ.

COTTON OPENER.

(Application filed Apr. 29, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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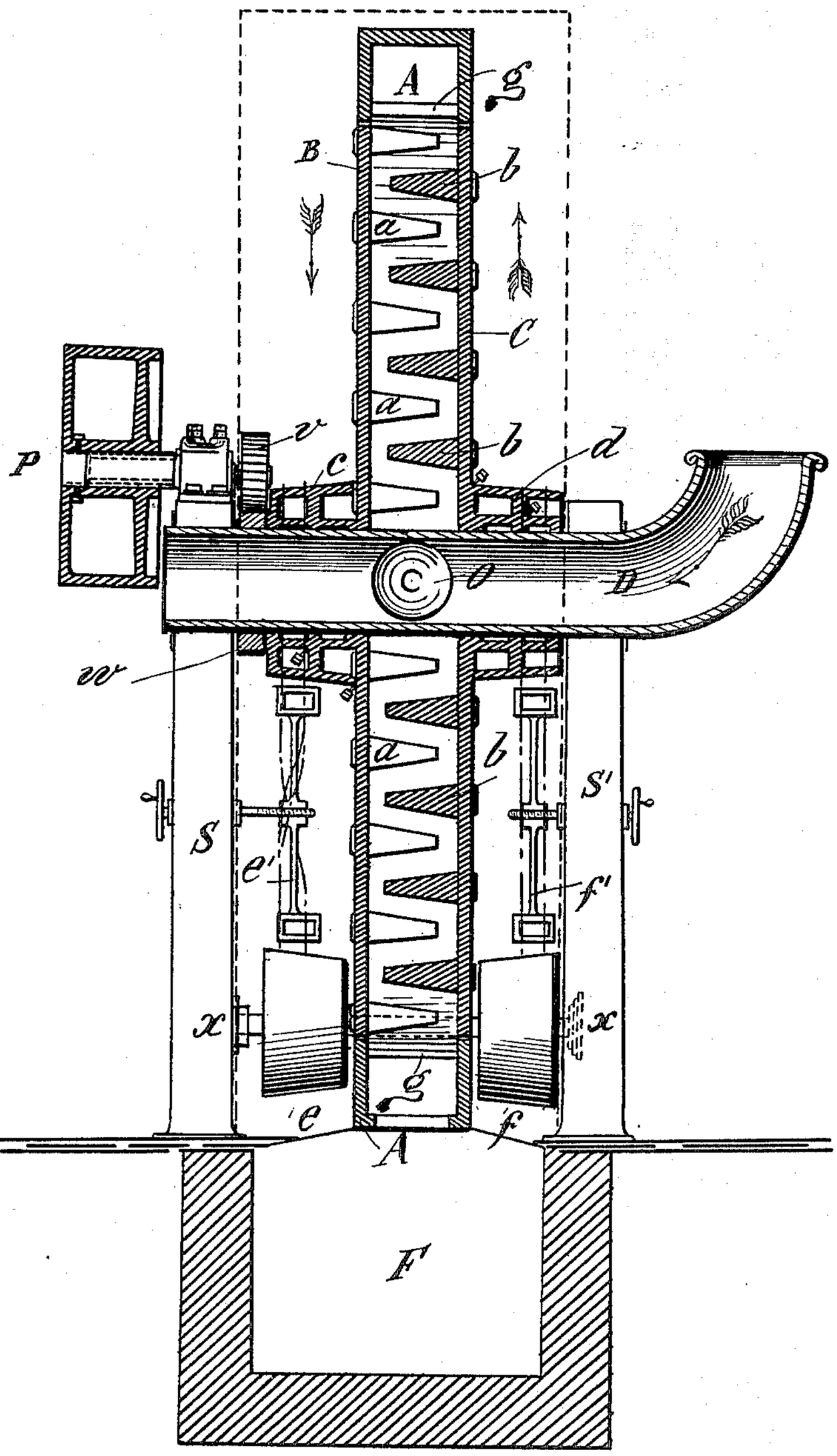
(No Model.) 2 Sheets—Sheet 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

GUGLIELMO RAETZ, OF PORDENONE, ITALY.

COTTON-OPENER.

SPECIFICATION forming part of Letters Patent No. 659,986, dated October 16, 1900.

Application filed April 29, 1898. Serial No. 679,231. (No model.)

To all whom it may concern:

Be it known that I, GUGLIELMO RAETZ, a subject of the King of Italy, residing at Pordenone, in the Province of Udine and Kingdom of Italy, have invented certain new and useful Improvements in Cotton-Openers; and I 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 an opening and cleansing machine, and is more particularly intended for the treatment of cotton.

My invention has for its object the introduction of the textile material to be treated at the center of the machine instead of radially or tangentially, as is the case with the opening-machines hitherto employed.

In openers in which the feed is tangent the effect of the centrifugal force is to concentrate the activity of the machine in proximity to its external periphery in such a manner that the output of the ordinary opening-machine is in no wise proportionate to its dimensions or to the power which it absorbs. A central feed, on the other hand, enables the entire internal capacity of the apparatus to be utilized, as under the influence of centrifugal force the machine projects the substance under treatment in a radial direction, whereby it is submitted to the action of the operative parts at all points of its travel, thus enabling a very considerable output to be obtained in proportion to the power absorbed.

One form of my invention is represented in the accompanying drawings, in which—

Figures 1 and 2 are cross-sections through the apparatus, taken at right angles one to the other.

A tube D, preferably formed of iron, is immovably held and supported by stays S S′, carrying the bearings R. Two plates B and C, arranged at a suitable distance one from the other—say fifteen centimeters—turn loosely upon the pipe D in opposite directions, as indicated by the arrows, Fig. 1. The plate B rotates, preferably, rather more rapidly (at a speed of about two hundred and forty revolutions per minute) than the plate C, the speed of which may be two hundred and twenty revolutions per minute. The internal faces of the two plates B and C are provided with teeth or conical points arranged in circular lines concentric with the plates. In the drawings the teeth which are upon the internal face of the plate B are indicated by the letter *a*, those upon the plate C being indicated by the letter *b*. The circles upon which are arranged the teeth *a* and those upon which are arranged the teeth *b* are alternated in such a manner as to enable the teeth or points of one of the two systems to mesh with those of the other system, so that proceeding from the center to the periphery a set of teeth *a* is first encountered, then a set *b*, then again a set *a*, and so on.

The two plates B and C are surrounded by an annular cage A, which is closed on all sides except below. A grating *g*, with triangular bars which are arranged parallel with the axis of rotation of the rotating plates, separates the interior of the cage from the field of action of such plates and allows passage to the impurities, which pass into the space F through the opening at the bottom of the cage A. This same opening permits of the passage of the air drawn in through D, either by the rotation of the plates only or by means of an aspirator in addition, which aspirator may be arranged in the air-exhaust conduit N.

Two hollow drums *m* and *n*, which are covered with a kind of metal grating and are maintained constantly rotating, receive the cotton opened and cleansed by the machine and direct it onto the endless sheet *y*, which carries it to an elevator, by which it is conveyed to the mixing-room.

The cotton or other textile fiber upon issuing from the bale-breaker is introduced into the tube D. Owing to the suction which exists it is carried to a position corresponding to the central plane between the plates B and C, where the tube D is pierced with an opening O, situated opposite the drums *m n*, the contour of which being slightly curved guides the cotton to the middle of the plates. It is here seized by the first teeth of the plate B, which are arranged in such a manner as to exert a centrifugal action and which carry it in the direction of the movement of this plate. The cotton, however, immediately encounters the teeth of the plate C, which are rotating in the opposite direction and are so arranged

as to exert a centrifugal action, so that it is again carried in the reverse direction. Owing to these two contrary tendencies the cotton is forced to traverse a line *s s'* of spiral form, Fig. 1, proceeding from the outlet O to the drums *m n*. The cotton in traversing this long path occupies sufficient time for the operations of opening and cleansing to be effectively performed. The length of the spiral *s s'*, and consequently the intensity of the action to which the cotton is submitted, may be modified by increasing or diminishing the number of revolutions of one of the plates B C, (the plate C in the example illustrated.)

In the constructional form of machine given by way of example the movement of the plates is effected in the following manner: Upon a single shaft are rigidly mounted the pulley P, to which motion is transmitted—say three hundred and seventy revolutions per minute—from a driving-shaft or from an electromotor, and the gear-wheel *v*, which imparts motion to a pinion *w*, rigidly connected with the cone-pulley *c*, which pulley is in turn rigidly connected with the plate B. The plate C receives motion from the pulley *c* by means of the cone-pulley *d*, which is rigidly connected with C and with the conical pulleys *e* and *f*, mounted upon the counter-shaft *x x*. It is obvious that by means of the belt-retaining forks *e' f'* the speed of the plate C may be varied within considerable limits.

The drums *m n* are driven in the example shown in the drawings from the pulley *u*, rigidly mounted upon the said counter-shaft *x x* by means of pulleys *h k p;* but these are details which may of course be modified.

My improved machine has a very large output, (five hundred kilograms per hour,) requires very little power, effects economy both in labor and in the number of machines employed, occupies but little space, and finally turns out a well-cleansed product without injury to the fibers.

What I claim is—

1. A machine for opening and cleansing cotton, consisting of two circular plates journaled vertically in parallelism on a central hollow sleeve having an opening on one side between the plates, said plates on their inner adjacent faces being provided with concentric rows of teeth, the teeth of one plate passing between the teeth of the other plate, a cage surrounding the peripheries of said plates and closed on its sides and circumference and provided with a discharge-opening at its bottom, a grating arranged between the inner edges of the sides of said cage, and means for rotating said plates in opposite directions at different speeds, substantially as described.

2. A machine for opening and cleansing cotton, consisting of two circular plates journaled vertically in parallelism on a central hollow sleeve having an opening on one side between the plates, said plates on their inner adjacent faces being provided with concentric rows of teeth, the teeth of one plate passing between the teeth of the other plate, a cage surrounding the peripheries of said plates and closed on its sides and circumference and provided with a discharge-opening at its bottom, an air-exhaust conduit communicating with said discharge-opening, a grating arranged between the inner edges of the sides of said cage and having an opening at one side, and two rotatable drums arranged opposite said opening for leading away the opened and cleansed cotton, and means for rotating the said plates in opposite directions and at different speeds, substantially as described.

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

GUGLIELMO RAETZ.

Witnesses:

LO. FRETTE,

SANTO FIRREO.