

No. 770,781.

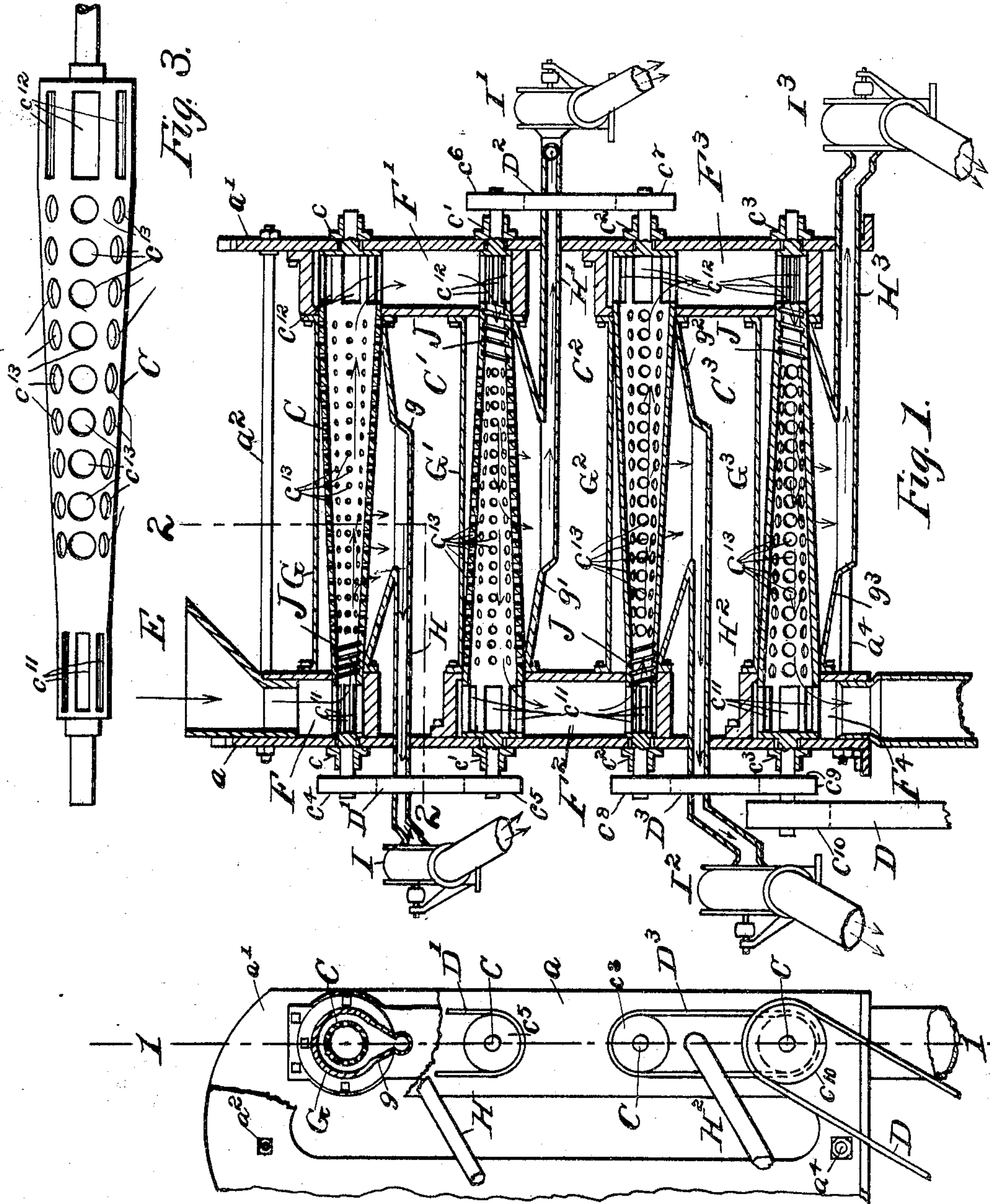
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MACHINE FOR SEPARATING, GRADING, AND POLISHING.

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NO MODEL.



Witnesses.
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Fig. 2.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR SEPARATING, GRADING, AND POLISHING.

SPECIFICATION forming part of Letters Patent No. 770,781, dated September 27, 1904.

Application filed July 17, 1901. Serial No. 68,572. (No model.)

To all whom it may concern:

Be it known that we, CHARLES T. ROWLAND and LEWIS F. LONGMORE, citizens of the United States, residing in Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Machines for Separating, Grading, and Polishing, of which the following is a specification.

This invention relates to machines for separating, grading, and polishing granular materials, and comprises a series of perforated hollow cones arranged to rotate on horizontal axes at a considerable speed, so that crushed or granulated materials fed into the small end of a cone will be carried outward by centrifugal force and caused to move toward the larger end of said cone, and means of feeding the material from the large end of one cone to the small end of the cone next in operation, the last cone discharging into a suitable receptacle. The perforations of the cones are gradually larger from the first to the last of the series of cones, and means are provided for carrying to separate receptacles or places the materials which pass through the perforations of the respective cones, such means consisting of jackets, each surrounding a cone and having an outlet through which air is drawn from one of the cones through the perforations thereof into the jacket and through said outlet by means of a suction-fan, said jackets being except for the perforations of the cones and the outlets of said jackets airtight. The cones are also provided with internally-arranged spiral conveyers which facilitate the introduction of the material into the small end of the cones.

In the accompanying drawings, Figure 1 is a vertical longitudinal section on the line 1 1 in Fig. 2 of a machine embodying our invention, the suction-fans and part of the driving means being in front elevation; Fig. 2, a side elevation of the same, partly in vertical transverse section, on the line 2 2 in Fig. 1; Fig. 3, a side elevation of a cone detached.

The frame of the machine consists of two upright sides a a' , connected by cross-girths a^2 a^4 in an obvious manner. The cones C C'

C^2 C^3 are represented as having parallel horizontal axes and are rotatory in suitable journal-boxes c c' c^2 c^3 , supported in the sides a a' . The cones are in reversed position alternately with each other, and each cone may be driven from the next by any usual gearing, as by a belt D' D^2 D^3 , chain, or other flexible connection passing over suitable pulleys c^4 c^5 c^6 c^7 c^8 c^9 , the last cone of the series being driven from a belt D , connecting the pulley c^{10} to a pulley driven by a suitable motor. Each cone is provided at each end with openings, represented, Fig. 3, as longitudinal slits c^{11} c^{12} , to receive and discharge the crushed or granulated material, the slitted parts of said cones running in the trunks F F' F^2 F^3 F^4 , described below, and the cones between the trunks being perforated at c^{13} or constructed of wire-cloth, punched sheet metal, or other foraminous or screening material. The meshes or perforations c^{13} in each cone are smaller than those in the following cone and larger than those in the preceding cone.

The crushed or granular material is first turned into a hopper E , which discharges into a trunk or spout F , closed at its lower end, and in this trunk F turns the small end of the first or upper cone C , the trunk closely fitting said cone or being properly packed around said cone to prevent the escape of dust between said trunk and cone. In a similar manner the large end of the first cone C has a dust-tight running fit in the second trunk F' , and the smaller end of the second cone C' is similarly fitted in said second trunk below said cone C . Both the top and bottom of the trunk F' are closed, so that the only inlet and outlet of said trunk F' is through the cones C C' , respectively. The trunks F^2 F^3 are like the trunk F' and in like manner respectively connect the cones C' C^2 and the cones C^2 C^3 . The trunk F^4 , closed at its upper and open at its lower end, receives the larger or discharge end portion of the last cone C^3 of the series and delivers the coarsest grade of material.

Each cone between the trunks connected by it is surrounded by a jacket G G' G^2 G^3 , which fits both of said trunks in an air-tight

manner and is provided with a hopper-like enlargement g g' g^2 g^3 below the cone, from which enlargement leads an outlet or pipe H H' H^2 H^3 , through which a current of air is drawn by a suction-fan I I' I^2 I^3 of any usual construction, the air entering through the ends of the cone into the jacket and passing out through the perforations and drawing out the matters small enough to pass through said perforations. Each cone is preferably provided with a conveyer J , represented as a spiral thread on the inside of the cone to draw the material into the cone.

We claim as our invention—

1. The combination of a series of perforated hollow cones, means of introducing granulated materials into the smaller end of the first cone of the series, trunks connecting the larger end of each cone, except the last, with the smaller end of the next following cone, means of rotating said cones to discharge the finer portions of said granular material through said perforations and to cause the materials too coarse to pass through the perforations of any cone to pass through said cone, as many air-tight jackets as there are cones, each jacket surrounding one of said cones, and separate discharging means for each of said jackets.

2. The combination of a series of perforated hollow cones arranged one above another, the larger end of each cone, except the last, being arranged above the smaller end of the cone next below, a series of trunks connecting the larger end of each cone, except the last, with the smaller end of the next cone, air-tight jackets, each surrounding a cone and receiving air only through the perforations of said cone and having an outlet, and means of creating currents of air from said cones through said jackets and outlets.

3. The combination of a series of perforated hollow screens, arranged one above another with their bottoms inclined alternately in opposite directions, connecting-trunks, air-tight jackets, each surrounding a screen between said trunks and provided with an outlet, means of rotating said screens and means of causing an air-current to pass from said screens through said jacket and outlets.

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

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LEWIS F. LONGMORE.

Witnesses:

ALBERT M. MOORE,
GEORGE P. MADDEN.