

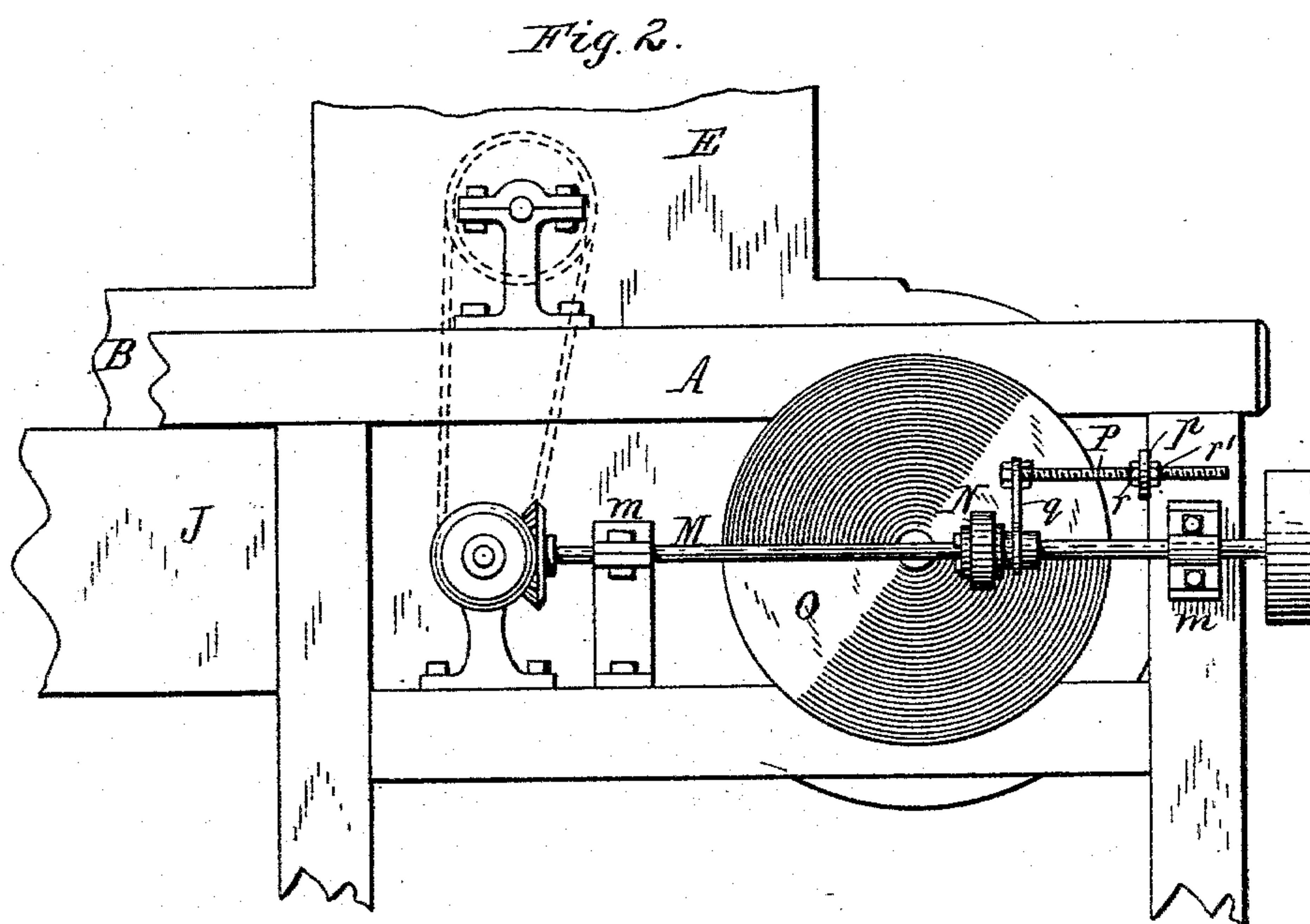
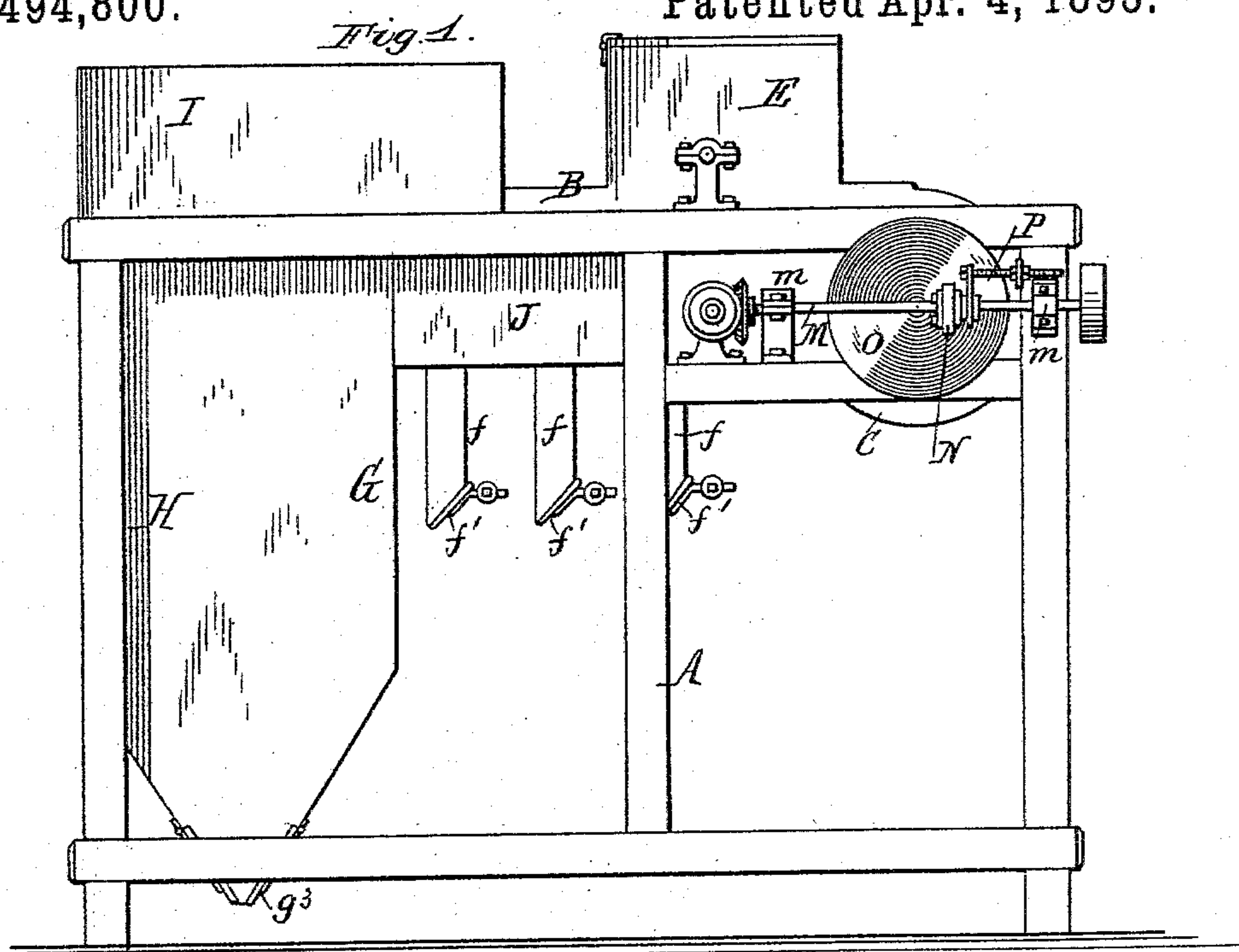
(No Model.)

2 Sheets—Sheet 1.

C. F. SHUMAKER.
SEPARATING MACHINE.

No. 494,800.

Patented Apr. 4, 1893.



Witnesses:

Emil Neuhart
Fred. C. Geyer

Chas. F. Shumaker Inventor.

By Wilhelm P. Bonnet.

Attorneys.

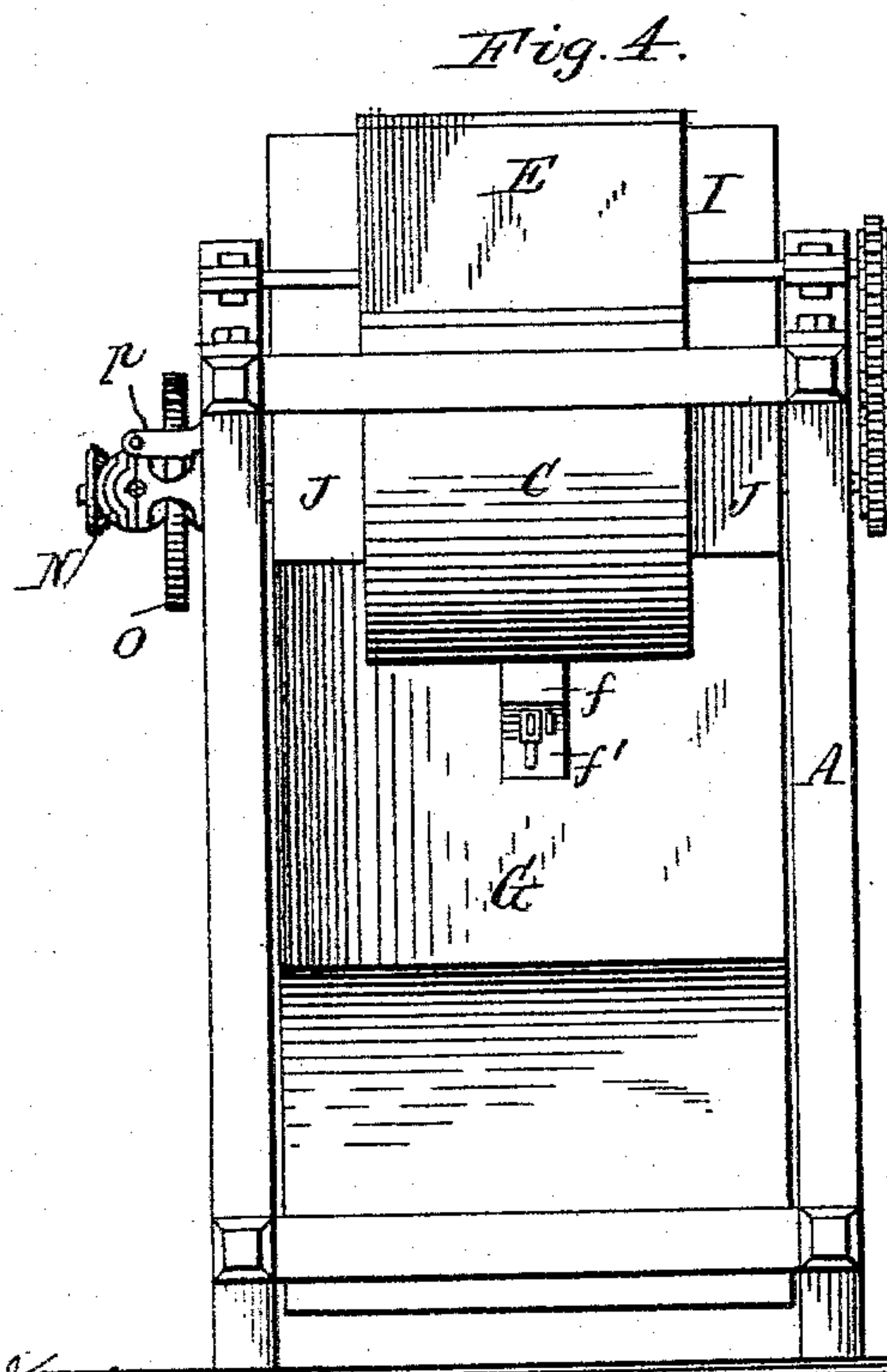
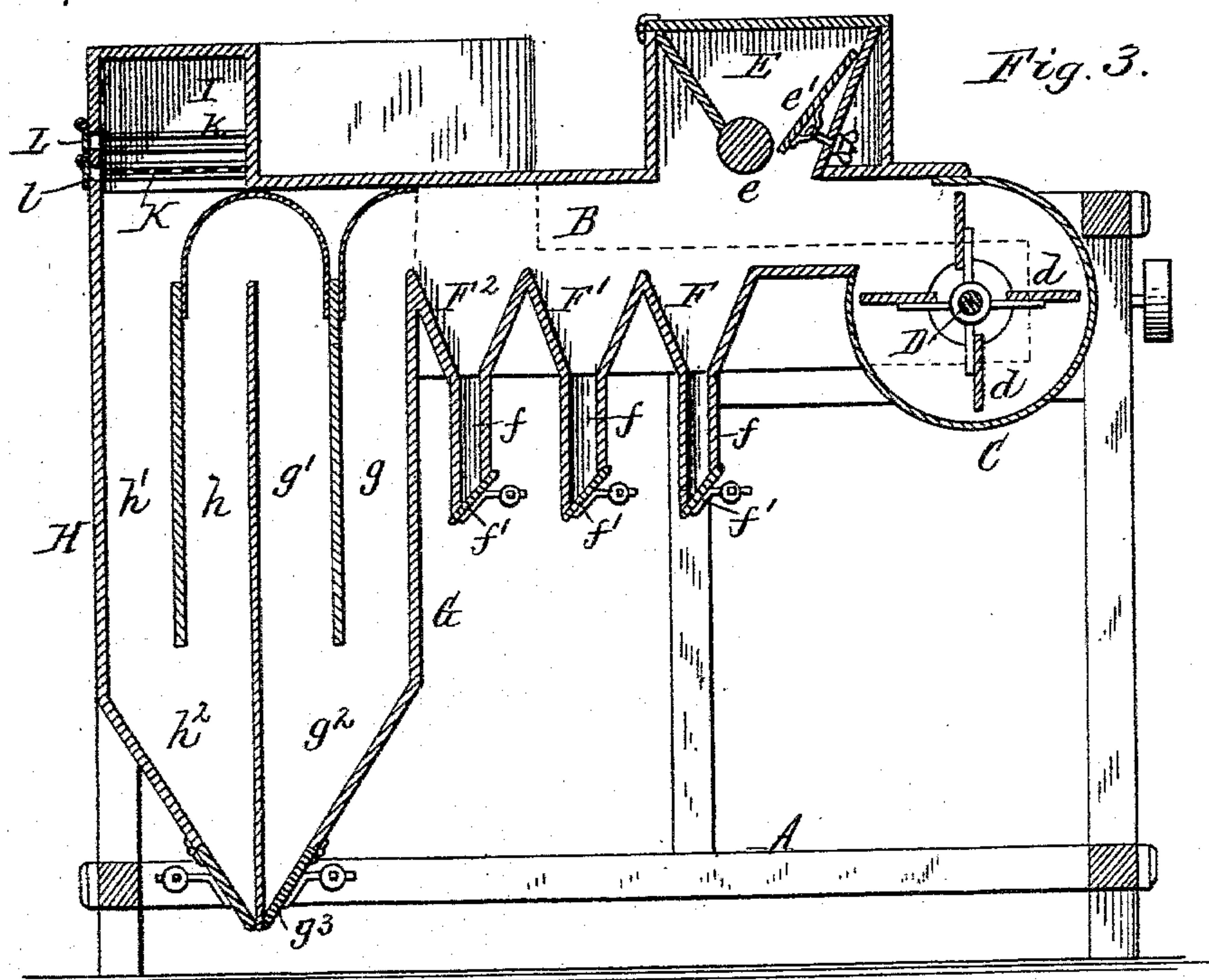
(No Model.)

2 Sheets—Sheet 2

C. F. SHUMAKER.
SEPARATING MACHINE.

No. 494,800.

Patented Apr. 4, 1893.



Witnesses:

Friedrich, Gustav Wilhelm.
Fred. C.eyer.

Chas. F. Shumaker
Inventor.

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Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES F. SHUMAKER, OF SILVER CREEK, NEW YORK, ASSIGNOR TO THE SHUMAKER MANUFACTURING COMPANY, OF SAME PLACE.

SEPARATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,800, dated April 4, 1893.

Application filed September 7, 1891. Serial No. 404,942. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SHUMAKER, a citizen of the United States, residing at Silver Creek, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Separating-Machines, of which the following is a specification.

This invention relates to a machine for purifying or separating middlings and similar material and more especially to separating machines of that class in which the material to be separated is fed into an air trunk or passage through which an air current is propelled by a fan.

The objects of my invention are to control the force and velocity of the air current in a more efficient manner than heretofore, so as to maintain a free circulation of the air through the machine and produce a more satisfactory separation; also to improve the construction of the separating compartments and other parts of the machine.

In the accompanying drawings consisting of two sheets, Figure 1 is a side elevation of my improved machine. Fig. 2 is an enlarged side elevation of the variable speed gear of the fan. Fig. 3 is a vertical longitudinal section of the machine. Fig. 4 is a front view thereof.

Like letters of reference refer to like parts in the several figures.

A is the stationary supporting frame of the machine.

B is a horizontal air trunk or passage secured to the upper part of the stationary frame. C is the fan case connected with the front portion of the air trunk, D the fan shaft passing through the eyes of the fan case, and *d* the rotary fan blades secured to said shaft.

E represents the feed hopper arranged over the head of the air trunk B and provided with a feed roller *e* and an adjustable gate *e'* or other suitable devices for regulating the flow of material from the hopper into the air trunk.

F F' F² are settling chambers or compartments depending from the bottom of the air trunk B and arranged one beyond the other, so as to successively receive the different grades of material which drop out of the air current. Each of these settling chambers is

provided with a discharge spout *f* having an automatic discharge valve *f'*.

G is a primary separating leg communicating with the rear portion of the air trunk beyond the settling chambers and composed of a descending passage *g*, an ascending passage *g'* and a pocket or enlargement *g*² connecting the lower ends of both passages and having a discharge opening controlled by an automatic valve *g*³. The air current descends in the passage *g*, ascends in the passage *g'*, and deposits the light material in the pocket *g*².

H is a secondary separating leg into which the air current passes from the primary separating leg and which is composed like the primary leg of a descending passage *h*, an ascending passage *h'* and a pocket *h*². Any light material still suspended in the air current is deposited in the pocket of the secondary leg H. The purified air ascending from the rear passage of said leg, enters an air chest I surmounting the secondary leg. From this air chest, the air is returned to the fan case by branch pipes J J leading to opposite eyes of the fan case.

The legs G, H, chest I and branch pipes J form with the air trunk B a closed endless passage through which the air moves continuously, so that practically the same body of air circulates through the machine over and over again.

K is a sieve or strainer arranged in the air chest I and which intercepts any fine material which may be contained in the air after the same has passed through the secondary leg H. This sieve extends across the entire area of the air passage and is loosely supported upon horizontal ways or ledges *k* arranged on the walls of the passage so that it can be removed for cleaning, through slots formed in the rear wall of the passage and closed by trap doors L.

The air chest I is provided with two sets of ways or ledges *k*, one above the other, as shown in Fig. 3, so that a fresh, clean sieve may be inserted in the chest before removing a clogged sieve, without interrupting the operation of the machine.

The material to be separated is fed into the air trunk and encounters the blast of air mov-

ing through the trunk, by which the heavier particles are merely deflected out of the perpendicular course, while the lighter particles remain suspended in the air current. The heaviest particles drop into the first settling chamber F, the next heaviest into the second settling chamber, and the third heaviest into the third settling chamber. Of the light particles which are carried past the settling chambers the heavier grade drops into the pocket of the primary separating leg and the lighter grade into the secondary leg. Any remaining dust or very light material is arrested by the sieve K, and the purified air is conducted back to the fan.

M is the horizontal driving shaft of the machine arranged on one side thereof at right angles to the fan shaft, and supported in bearings *m* secured to the side frames of the machine.

N is a friction wheel mounted upon the driving shaft and running with its periphery in contact with the face of a friction disk O secured to the adjacent end of the fan shaft so as to transmit motion from the driving shaft to the fan shaft. The friction wheel N is connected to the driving shaft by a spline or feather so as to turn therewith while being free to slide lengthwise thereon.

P is an adjusting screw arranged parallel with the driving shaft and capable of sliding lengthwise in a lug *p* secured to the stationary frame. To the inner end of the screw is attached an upright shifting arm *q* which is connected with the sliding friction wheel N. The arm *q* is provided at its lower end with an eye or yoke which engages in an annular groove in the hub of the friction wheel, so as to allow the wheel to turn in the yoke of the arm and at the same time move with the arm.

r r' are adjusting nuts arranged upon the screw P on opposite sides of the supporting lug *p* and bearing against the latter. Upon loosening one of these nuts and tightening the other, the screw is adjusted inward or outward in the lug *p* and the friction wheel is moved toward or from the axis of the friction disk. After effecting the adjustment, the loose nut is tightened against the lug, whereby the screw is firmly held in place in the same. The speed of the friction disk and the fan is increased as the friction wheel approaches the center of the disk and diminished as it approaches the periphery thereof. The force and velocity of the air current through the separating air trunk may thus be nicely regulated in accordance with the special character of the material under separation

without throttling or restricting the separating passage, as has been hitherto done, thereby preventing the creation of sharp currents through contracted openings and eddies which interfere with the separation, but on the contrary, causing the body of air to circulate freely through the machine with that speed which is best suited to the work in hand and with a steady motion which is modified only in the different parts of its course by the form of the air passages and not by variable obstructions placed in its path.

The variable friction speed gear for driving the fan which I have shown and described is well suited for the purpose, but it is obvious that variable speed gears of different construction may be substituted therefor.

I claim as my invention—

1. The combination with the valveless separating air trunk or passage of a separating machine and the fan whereby the air current is caused to flow through the same, of a variable speed gear whereby the fan is driven and the speed of the fan can be changed, thereby regulating the speed of the air current flowing through the separating passage without throttling the same, substantially as set forth.

2. The combination with the unobstructed horizontal air trunk, of a fan having its blast spout connected therewith, a feed hopper connected with said trunk beyond the fan, settling chambers connected with the bottom of the air trunk at different distances from the fan, a descending and ascending separating leg receiving the air current from said air trunk beyond the settling chambers, and a return spout connecting the upper end of the ascending portion of the separating leg with the eye of the fan, substantially as set forth.

3. The combination with the unobstructed horizontal air trunk, of a fan having its blast spout connected therewith, a feed hopper connected with said trunk beyond the fan, settling chambers connected with the bottom of the air trunk at different distances from the fan, a descending and ascending separating leg receiving the air current from said air trunk beyond the settling chambers, a return spout connecting the upper end of the ascending portion of the separating leg with the eye of the fan, and a removable screen arranged in the return spout, substantially as set forth.

Witness my hand this 29th day of August, 1891.

CHAS. F. SHUMAKER.

Witnesses:

CHAS. N. HOWES,
W. H. MERRITT.