

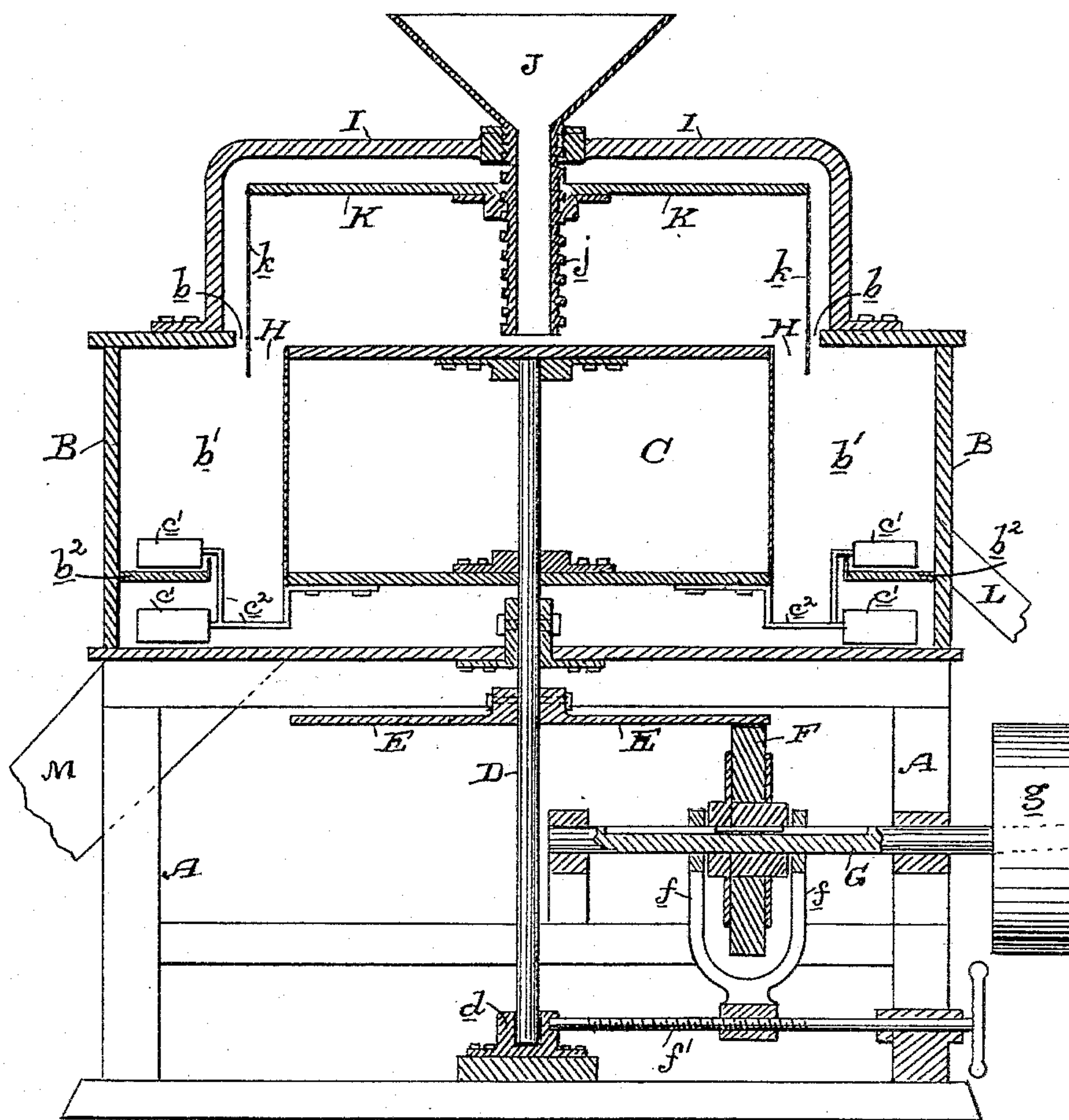
(No Model.)

J. M. FINCH.

SEPARATOR.

No. 412,172.

Patented Oct. 1, 1889.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

JOHN M. FINCH, OF CROCKETT, ASSIGNOR OF PART TO JOHN R. CROSS, OF  
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## SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 412,172, dated October 1, 1889.

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*To all whom it may concern:*

Be it known that I, JOHN M. FINCH, of  
Crockett, Contra Costa county, State of Cali-  
fornia, have invented an Improvement in  
5 Separators; and I hereby declare the follow-  
ing to be a full, clear, and exact description  
of the same.

My invention relates to the class of ma-  
chines for the separation of materials accord-  
10 ing to specific gravity, the separation taking  
place in a revolving body of air; and my in-  
vention consists in the construction and com-  
binations of devices which I shall hereinafter  
fully describe and claim.

15 The object of my invention is to provide a  
simple and effective machine of this class  
adapted for the separation of any materials,  
but principally applicable to mill-stock.

Referring to the accompanying drawing  
20 for a more complete explanation of my in-  
vention, the figure is a vertical section of my  
machine.

A is a stand, upon the top of which is  
mounted a shell or casing B, having a con-  
25 tracted top opening *b*. Mounted within this  
casing is a disk or wheel C, adapted to rotate  
in a horizontal plane, being mounted upon  
the upper end of a vertical shaft D, the lower  
end of which is suitably stepped in a bearing  
30 *d* below. Upon this shaft is a friction-gear  
E, with which engages a friction-pinion F on  
a drive-shaft G, the outer end of which car-  
ries the pulley *g*. The pinion F is mounted  
upon a feather on the drive-shaft, and is  
35 adapted to slide back and forth by means of a  
carrier *f*, the lower end of which is actuated  
by a screw *f'*. The movement of this pinion  
is for the purpose of increasing or decreasing  
the speed of rotation of the disk or wheel C  
40 above. It will be seen that this disk or wheel  
has such a diameter and is so mounted within  
the casing B as to leave a surrounding or en-  
circling chamber *b'*, in which the separation  
is effected. In this chamber is a flanged ledge  
45 *b<sup>2</sup>* around its outer wall, and connected by  
arms *c<sup>2</sup>* with the bottom of the disk or wheel  
are the scrapers *c'*, one set of which plays  
over the ledge *b<sup>2</sup>*, and the other set plays over  
the bottom of the shell or casing. The top of  
50 the disk or wheel is a perfectly plane surface,  
and it rises high enough to form between its

edge and the contracted top opening *b* of the  
shell or casing an annular feed-passage.  
(Represented by H.)

I is a spider on top of the shell or casing, 55  
and having secured centrally a feed-hopper J,  
the neck *j* of which extends downwardly and  
is adapted to discharge the material centrally  
upon the top of the disk or wheel C. This  
neck is externally threaded, and screwed upon 60  
it is the regulating gate or valve K, which is  
in the shape of an inverted pan, the rim *k* of  
which extends downwardly into the annular  
feed-opening H between the top of the frame,  
disk, or wheel and the contracted top open- 65  
ing *b* of the shell or casing. By screwing  
this gate or valve up or down on the neck of  
the hopper, it regulates this connecting feed-  
opening H, as will be presently described.

L is an outlet-spout from the flanged ledge 70  
*b<sup>2</sup>*, and M is an outlet-spout from the bottom  
of the shell or casing.

The operation of the machine is as follows:  
The material to be separated is placed in the  
hopper, and thence passes down through its 75  
neck to the top of the disk or wheel. A rotary  
motion is imparted to this disk or wheel, and  
it is obvious that a body of air immediately  
surrounding its periphery accompanies it con-  
stantly, as the shell or casing is substantially 80  
air-tight, it not being the intention to delib-  
erately admit or discharge any of the air  
within it, so that the rotating disk or wheel  
does not act in any manner as a blower. The  
rotary motion of the disk or wheel causes the 85  
material fed upon its horizontal plane top to  
be thrown off centrifugally toward its outer  
edge, and, falling over said edge, it passes  
down through the annular communicating-  
aperture H directly into the sphere of the re- 90  
volving body of air in the separating-cham-  
ber *b'*. In and by this revolving body of air  
the lighter portions of the material are thrown  
outwardly toward the outer wall of the cham-  
ber *b'*, while the heavier portions are thrown 95  
outwardly to a less extent, having a tendency  
to drop directly down through the body of  
air. The lighter portions, being thrown out-  
wardly, fall upon the flanged ledge *b<sup>2</sup>*, while  
the heavier portions fall down directly into 100  
the bottom of the shell or casing, and the  
scrapers *c'*, moving over said ledge and bottom,



discharge the separated materials through the discharge-spouts L and M, respectively. Now by the vertical adjustment of the pan-shaped gate or valve K the passage of the material is regulated or controlled, for by lowering said gate or valve the material is directed downwardly to a greater extent before it is subjected to the action of the revolving body of air, and therefore a less separation is had, and by raising the gate or valve the material is directed more immediately into the sphere of the revolving body of air, and is thereby effected to a greater extent, resulting in a more complete separation.

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

1. In a separator, the combination of a practically air-tight shell or casing, a disk or wheel mounted therein so as to rotate in a horizontal plane, and having a diameter sufficiently less than that of the shell or casing to leave a surrounding separating-chamber in which a horizontally-revolving body of air accompanies said rotating disk or wheel, and a feed device for directing the material to be separated into the sphere of the revolving body of air, substantially as described.

2. In a separator, the combination of a practically air-tight shell or casing and a disk or wheel mounted therein so as to rotate in a horizontal plane, and having a diameter sufficiently less than that of the shell or casing to leave a surrounding separating-chamber in which a revolving body of air accompanies said disk or wheel, and a feed-hopper above for directing the material upon the top of said rotating disk or wheel, whereby it is discharged centrifugally over the edge thereof and into the sphere of the revolving body of air, substantially as described.

3. In a separator, the combination of a practically air-tight shell or casing and a horizontally rotating disk or wheel mounted therein, and having a diameter sufficiently less than that of the shell or casing to leave a surrounding separating-chamber in which a revolving body of air accompanies the rotating disk or wheel, separate receiving floors or compartments with separate outlets in said surrounding chamber, scrapers operating on said floors, and a feed-hopper for directing the material upon the top of the rotating disk or wheel, whereby it is directed centrifugally over its edge into the separating-chamber and into the sphere of the revolving body of air therein, substantially as described.

4. In a separator, the combination of a practically air-tight shell or casing having a contracted top opening and a horizontally-rotating disk or wheel mounted in said shell or casing, leaving a surrounding separating-chamber in which a revolving body of air ac-

companies it, and an annular communicating-aperture between its top edge and the edge of the top of the shell or casing, a feed-hopper above for directing the material upon the top of the rotating disk or wheel, whereby it is thrown centrifugally outwardly and discharged over its edge and through the annular communicating-aperture in the sphere of the revolving body of air, and an adjustable gate or valve for controlling and regulating said communicating-aperture and the feed of the material through it, substantially as described.

5. In a separator, the combination of a practically air-tight shell or casing having a top opening and a horizontally-rotating disk or wheel mounted in the shell or casing, leaving a surrounding separating-chamber in which a revolving body of air accompanies it, and an annular communicating-aperture between its top and the edge of the top opening of the shell or casing, a feed-hopper above having a downwardly-extending neck adapted to direct the material centrally upon the top of the disk or wheel, whereby said material is thrown outwardly by centrifugal force and discharged over its edge through the communicating-aperture into the sphere of the revolving body of air, and the inverted pan-shaped gate or valve seated and vertically movable upon the neck of the hopper and having its rim extending down into the communicating-aperture, whereby the feed of material through said aperture is regulated and controlled, substantially as described.

6. A separator consisting of the combination of the shell or casing, the horizontally-rotating disk or wheel mounted therein and leaving a surrounding separating-chamber between its periphery and the wall of the shell or casing, in which a revolving body of air accompanies it, and an annular communicating-aperture from the top of said disk or wheel into said chamber, a flanged ledge within said chamber, scrapers secured to the disk or wheel and operating in the bottom of the shell or casing and over the flanged ledge separate outlets for said ledge and the bottom of the shell or casing, a feed-hopper adapted to direct the material upon the top of the disk or wheel, whereby it is thrown outwardly by centrifugal force and discharged into the surrounding separate chamber, and the vertically-adjustable gate or valve for controlling the communicating-aperture from the top of the disk or wheel into the separating-chamber, substantially as described.

In witness whereof I have hereunto set my hand.

JOHN M. FINCH.

Witnesses:

S. H. NOURSE,  
H. C. LEE.