

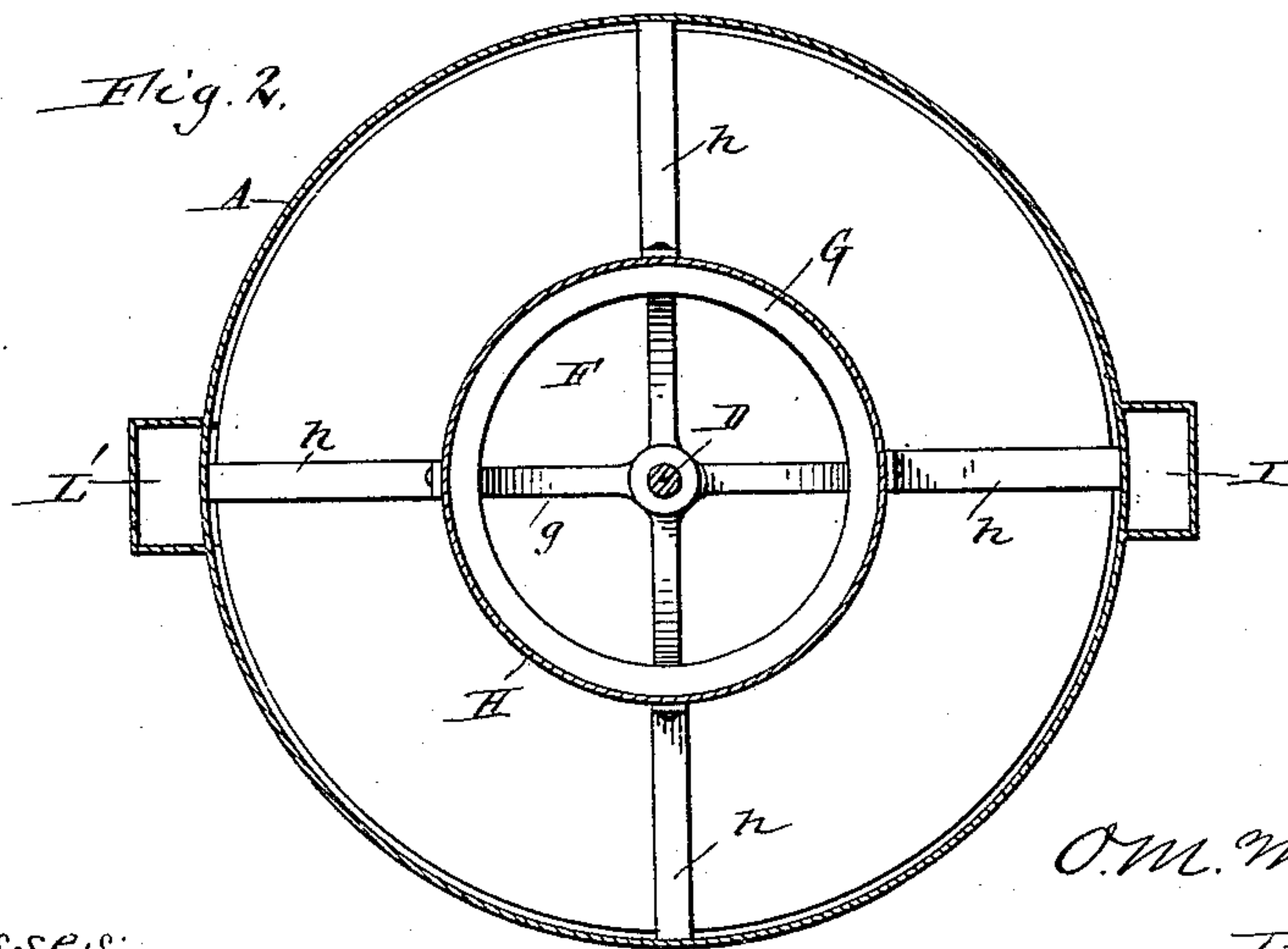
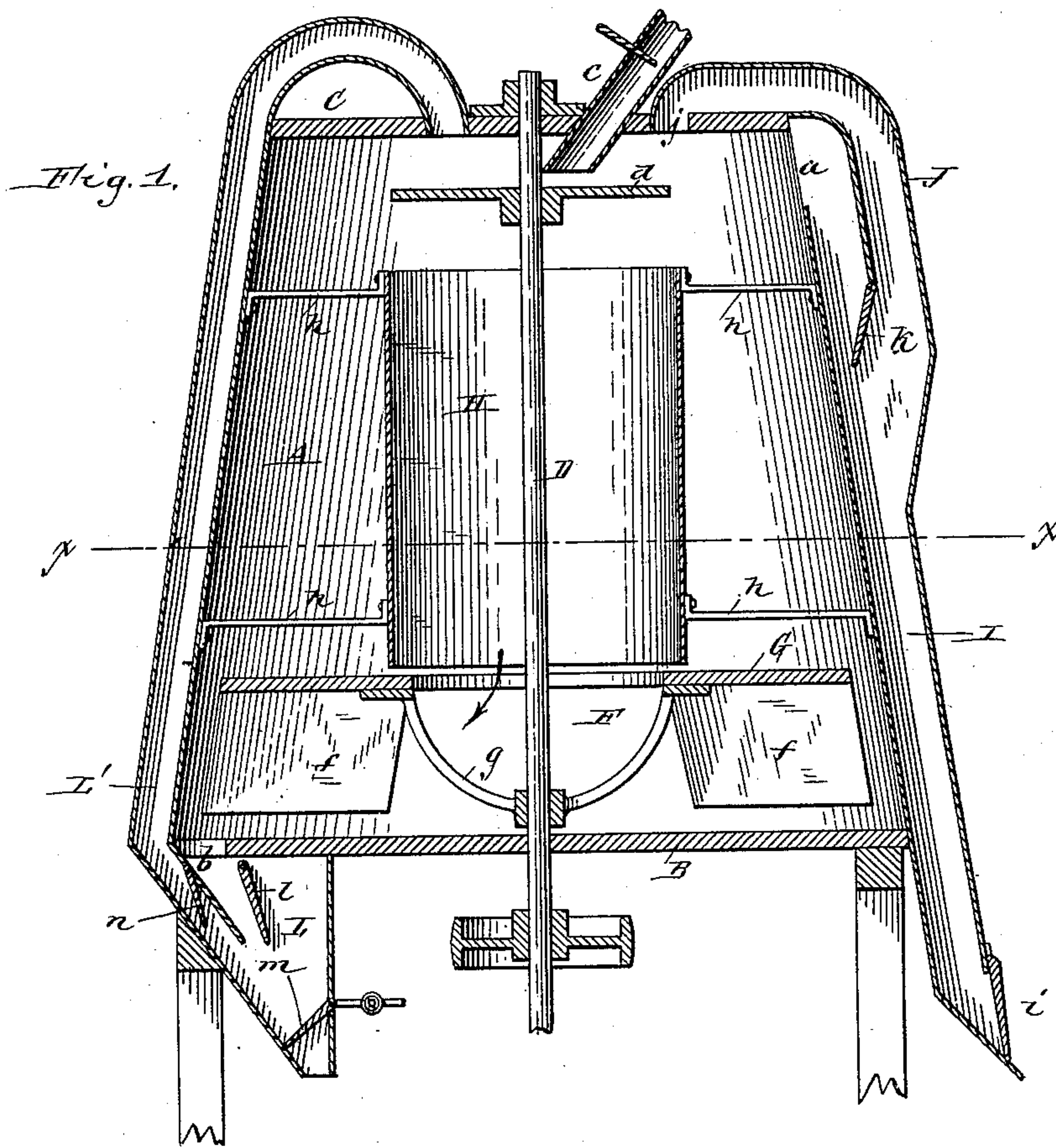
(No Model.)

3 Sheets—Sheet 1.

O. M. MORSE.
SEPARATING MACHINE.

No. 452,581.

Patented May 19, 1891.



Witnesses:
Emil Neuhart
Thos. L. Popp.

O. M. Morse
Inventor.
By Wilhelm Bonnet.
Attorneys.

(No Model.)

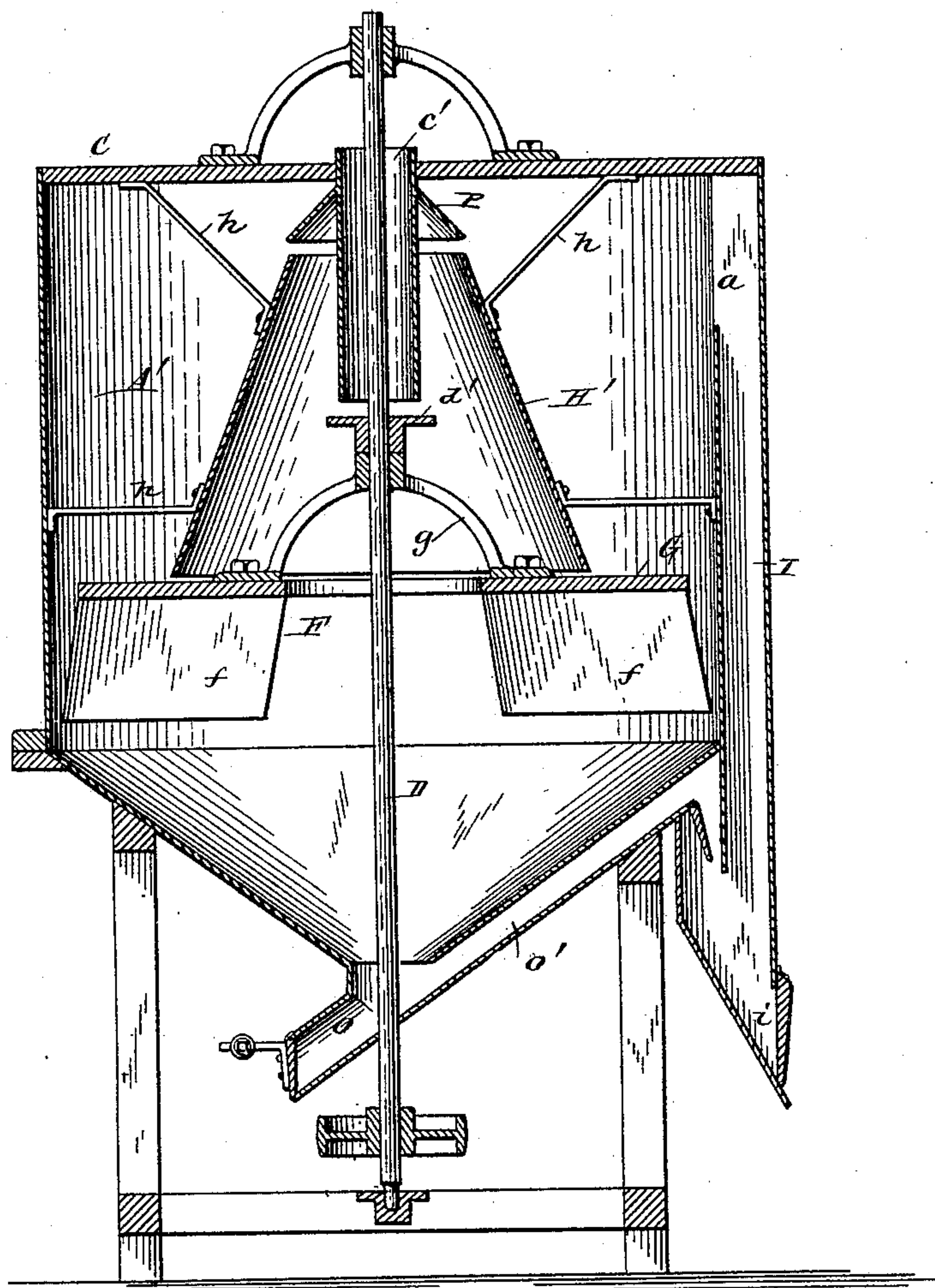
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O. M. MORSE.
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Fig. 3.



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(No Model.)

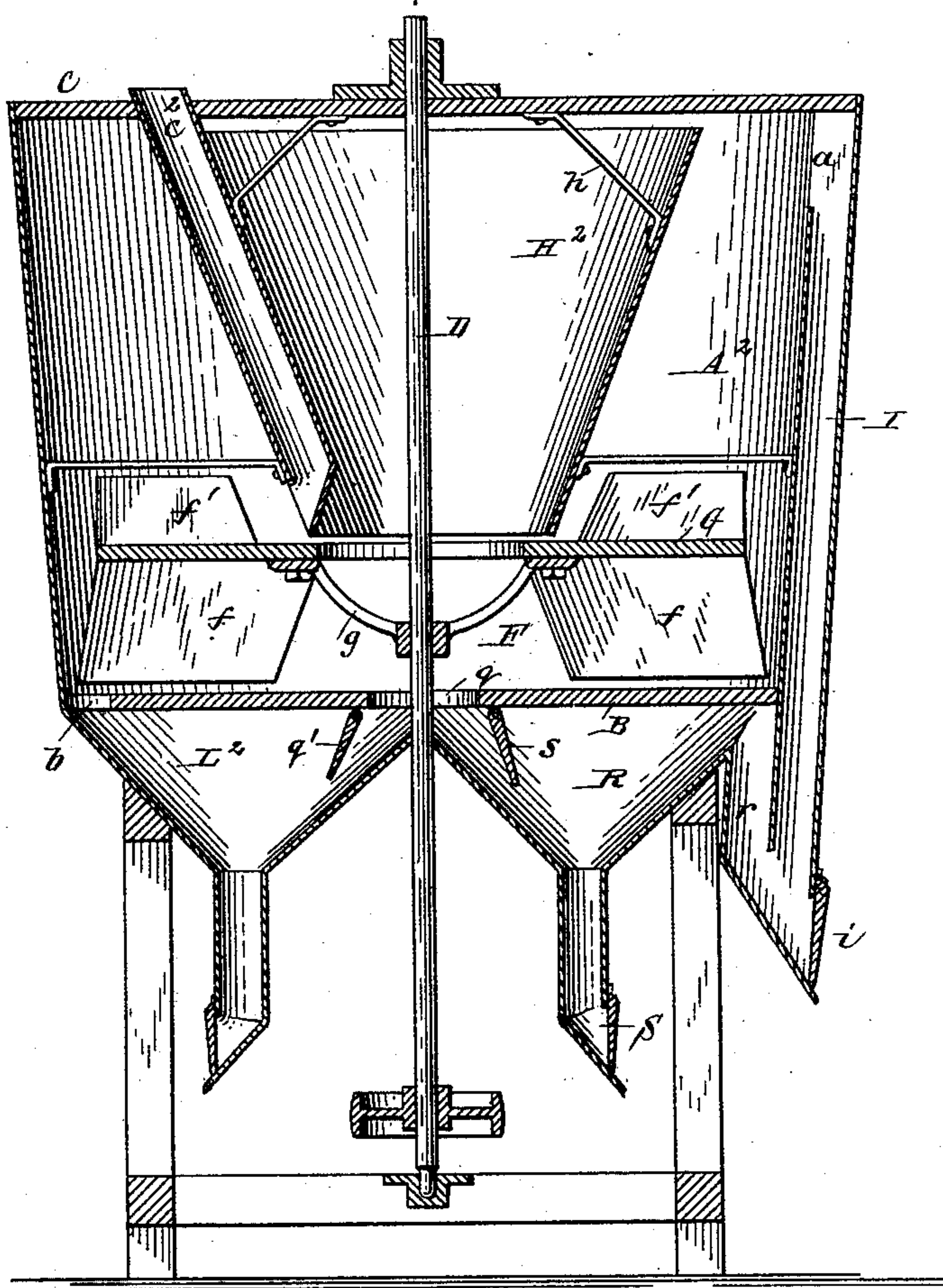
3 Sheets—Sheet 3.

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Fig. 1.



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UNITED STATES PATENT OFFICE.

ORVILLE M. MORSE, OF JACKSON, MICHIGAN.

SEPARATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 452,581, dated May 19, 1891.

Application filed January 23, 1891. Serial No. 378,792. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE M. MORSE, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented new and useful Improvements in Separating-Machines, of which the following is a specification.

This invention relates to a separating-machine for separating pulverulent, granular, and similar substances into different grades, according to fineness or weight, and which is provided with a separating-chamber, in which the air-current by which the material is separated moves along the peripheral wall of the separating-chamber from one end to the other and back through the axial portion of the separating-chamber and delivers the heavy and light separated materials at opposite ends of the separating-chamber. A machine of this character is described and claimed in Letters Patent No. 441,372, granted to me November 25, 1890.

The object of this invention is to separate the induced return-current from the forwardly-moving impelled air-current more completely, thereby improving the circulation, and to improve the devices by which the products of the separation are delivered, so as to prevent the escape of air and the ingress of air through the discharge devices.

In the accompanying drawings consisting of three sheets, Figure 1 is a sectional elevation of my improved separating-machine. Fig. 2 is a horizontal section in line *xx*, Fig. 1. Figs. 3 and 4 are sectional elevations, showing modified constructions of the machine.

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

A represents the peripheral wall of the separating-chamber tapering upwardly and provided at its small upper end with a peripheral opening *a*, through which the light separated material is discharged.

B represents the bottom of the separating-chamber provided near the peripheral wall with an opening *b*, through which the heavy separated material is discharged.

C represents the top of the separating-cham-

ber, provided with a feed-spout *c*, through which the material to be separated is introduced into the chamber.

D represents an upright rotating shaft provided underneath the feed-spout with a feed-saucer or disk *d*, which receives the material from the feed-spout and scatters it in the upper portion of the separating-chamber.

F represents a fan secured to the shaft above the bottom of the chamber and having its wings *f* secured to the under side of an annular plate *G*, which is connected with the shaft by a spider *g*, so as to leave a comparatively unobstructed passage for the air through the central opening or eye of the annular plate.

H represents an upright tube, which is arranged above the fan, and which has about the same diameter as the eye in the annular plate. This tube extends upwardly nearly to the feed-saucer, and is secured in place by arms *h*, fastened to the peripheral wall or by other suitable means.

The fan drives the air outwardly in the lower part of the separating-chamber and causes it to move upwardly along the peripheral wall and to return in a downward current through the axial portion of the separating-chamber. The return-current passes through the tube H to the eye of the fan, and this tube separates the induced return-current from the upwardly-moving impelled current, thereby preventing one current from interfering with the other.

The feed-disk is made so large as to throw the material outwardly beyond the top of the tube H and into the upwardly-moving current, which latter carries the light material with it to the upper end of the separating-chamber, where it is delivered through the upper opening *a*, while the heavy material descends and escapes through the lower opening *b*.

I represents the discharge-spout, which is connected with the upper discharge-opening *a* and leads downwardly therefrom. The lower end of this spout may be provided with a trap-valve *i*.

J represents a return ventilating-spout, which connects with the discharge-pipe I be-

low the discharge-opening a and enters the upper portion of the separating-chamber through an opening j .

k represents an adjustable valve arranged in the discharge-spout I above its junction with the ventilating-spout J, whereby the free opening of the discharge-spout can be regulated. The whirling motion of the air in the separating-chamber, which is caused by the rotating fan-blades, drives some of the air with the light material through the peripheral opening a , and this air is returned to the separating-chamber through the return-spout J, which relieves any excess of air-pressure in the discharge-spout back into the inner portion of the separating-chamber.

The lower discharge-opening b is provided with a discharge-spout L, which is relieved by a similar return-spout L', leading from the lower discharge-spout to the inner portion of the top of the separating-chamber.

l is an adjustable valve arranged in the discharge-spout L below the opening b .

m is a trap-valve hung to the lower end of the discharge-spout, and n is an adjustable valve arranged in the return-spout L'.

When unpurified middlings are fed into the machine through the feed-pipe c , the middlings fall upon the revolving saucer and are scattered by the same in the separating-chamber and drop through the air-current ascending between the peripheral wall and the return-tube. The heavy middlings drop through this air-current and are thrown by the revolving fan-plate G and wings f against the lower portion of the peripheral wall, from which they escape through the lower opening b . The light dust is carried upward by the ascending air-current and is discharged through the upper opening a .

In the modified construction of the machine represented in Fig. 3 the peripheral wall A' of the separating-chamber is made cylindrical and the return-tube H' is made upwardly tapering. The feed-pipe c' extends into the return-tube, and the feed-disk or saucer d' is arranged within the return-tube. The bottom of the separating-chamber is hopped to the center, and its central discharge is provided with a trapped discharge-spout O. The discharge-spout I, which connects with the upper discharge-opening a , is relieved by a return-spout O' leading to the central opening of the lower hopper. The return-tube H' is surmounted by a conical hood P, which surrounds the feed-pipe, and is separated from the top of the return-tube by a narrow opening, through which the return-current enters the tube.

In the modified construction represented in Fig. 4 the peripheral wall A² of the separating-chamber and the inner return-tube H² taper downwardly. The feed-pipe c^2 is arranged within the return-tube and opens with its lower end outwardly through the return-tube, so as to deliver the material upon the annular plate of the fan. This plate is pro-

vided with wings f' on its upper side in addition to the wings f on its lower side, the upper wings serving to throw the material outward. The bottom plate B of the separating-chamber is provided with a central opening q , through which the discharge-spouts are ventilated back into the center of the machine. The discharge-hopper L² of the lower opening b connects with this central opening q on one side of the shaft and is provided with an adjustable valve q' . The discharge-spout I of the upper opening connects by a return-spout r with a hopper R, arranged on the other side of the shaft and communicating with the central opening q . This hopper is provided with an adjustable valve s , and with a trapped discharge-spout S for the discharge of any material which may be deposited in this hopper.

I claim as my invention—

1. The combination, with a separating-chamber provided at opposite ends with outlets for the heavy and light separated materials and with a feeder which delivers the material to be separated into the chamber, of an air-propelling device arranged within the chamber and causing the air contained therein to move along the peripheral wall of the separating-chamber from one outlet to the other, and an internal tube through which the air returns in the axial portion of the chamber, substantially as set forth.

2. The combination, with a separating-chamber having outlets at its top and bottom for the escape of the heavy and light materials and an air-propelling device in its lower portion, of a return-tube arranged above the air-propelling device, whereby the air is caused to move upwardly between the peripheral wall of the separating-chamber and the return-tube and downwardly through the return-tube, substantially as set forth.

3. The combination, with a separating-chamber having outlets at its top and bottom for the escape of the heavy and light materials, and an air-propelling device in its lower portion, of a return-pipe arranged above the air-propelling device, and a revolving feeder arranged above said return-pipe, substantially as set forth.

4. The combination, with a separating-chamber provided at opposite ends with outlets for the heavy and light materials and with a feeder which delivers the material to be separated into the chamber, of an air-propelling device arranged within the chamber and causing the air contained therein to move along the peripheral wall from one outlet to the other and to return through the axial portion of the separating-chamber, and a discharge-spout connected with one of said outlets and having a relief-passage through which the excess of escaped air is returned to the interior of the separating-chamber, substantially as set forth.

5. The combination, with a separating-chamber having peripheral outlets at its bot-

tom and top for the escape of the heavy and
light materials, and an air-propelling device
in its lower portion, whereby the air is caused
to move upwardly along the peripheral wall
5 of the separating-chamber and downwardly
through the axial portion thereof, of dis-
charge-spouts communicating with said out-
lets, and relief-spouts connecting said dis-
charge-spouts with the upper portion of the
separating-chamber, substantially as set forth. 10
Witness my hand this 17th day of January,
1891.

ORVILLE M. MORSE.

Witnesses:

CARRIE A. MUNDY,
J. G. MUNDY.