

No. 629,604.

Patented July 25, 1899.

A. RAYMOND.  
SEPARATOR.

(Application filed Mar. 25, 1899.)

(No Model.)

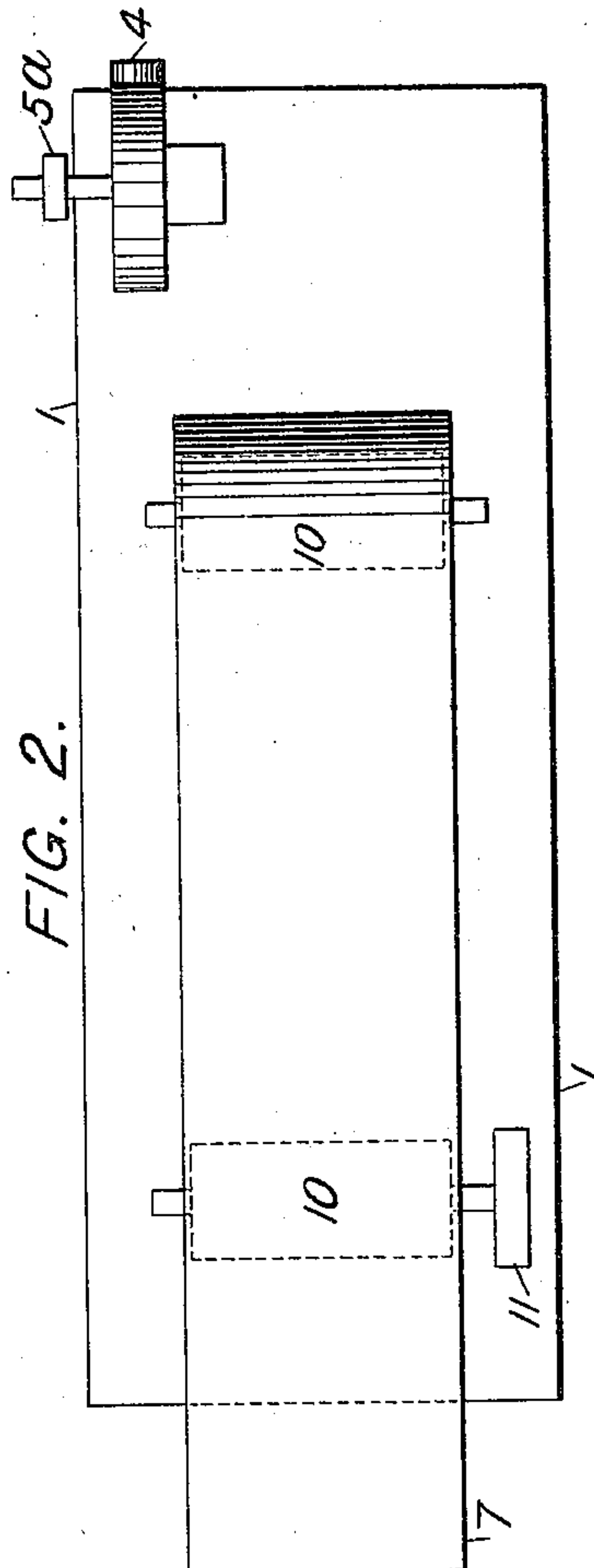
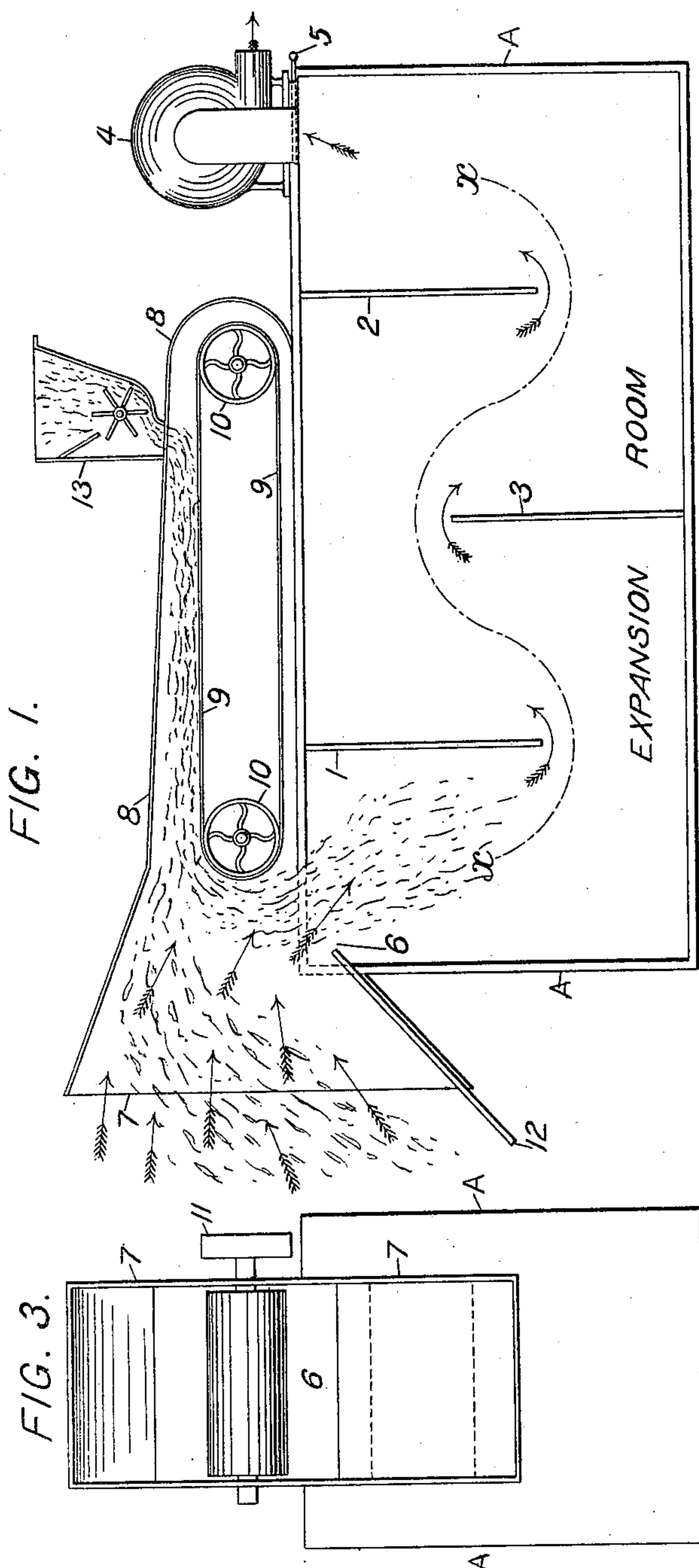
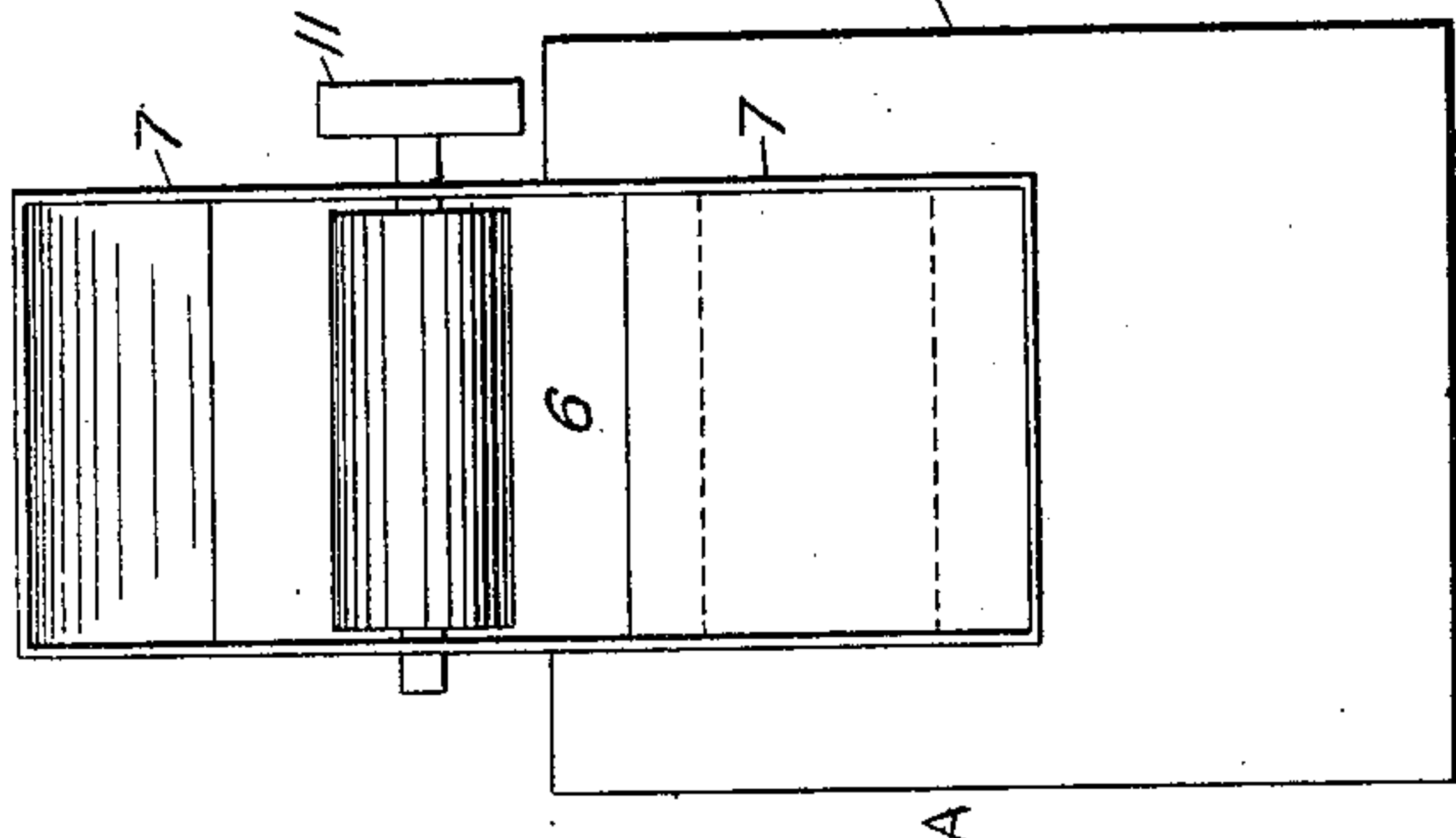


FIG. 3.



WITNESSES:

Geo. L. Fowler  
Thomas Leatt.

INVENTOR

Albert Raymond

BY

Frank Johnson

ATTORNEY



# UNITED STATES PATENT OFFICE.

ALBERT RAYMOND, OF CHICAGO, ILLINOIS.

## SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 629,604, dated July 25, 1899.

Application filed March 25, 1899. Serial No. 710,467. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT RAYMOND, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Separator, of which the following is a specification.

My invention consists of a device for separating various materials, especially those of a fibrous nature, and particularly such as contain elements to be separated that differ but slightly in specific gravity—as, for example, granulated tobacco, in which many of the fragments of the fibers to be separated from the leaf are smaller and lighter than some of the fragments of the leaf itself and have only a slight excess of specific gravity. Consequently the complete and rapid separation of the one from the other is attended with difficulties not hitherto successfully overcome; but I have discovered that by throwing or shooting such materials with high velocity against an adverse or opposite current of air the lighter portions thereof are arrested by and carried with the said current, while the heavier portions are thrown through and beyond the opposing air-current, and thereby they become separated the one from the other even though they differ but a trifle in specific gravity. To apply these principles in the accomplishment of this result constitutes the object of my invention, which I attain by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a plan view, and Fig. 3 an end view showing a flaring air-receiver.

Similar designating letters and numerals refer to similar parts throughout the several views.

A represents an expansion room or receptacle which has three partial transverse partitions 1, 2, and 3, two of which extend from the upper part of the said room downward about three-fifths of the way to the bottom of the same and one of which said partitions 3 extends up from the bottom of the said room about three-fourths of the way to the top thereof and located midway between the other two of said partitions. 4 is a fan-blower mounted on top of the right-hand end of the said room and having communication with the interior thereof; 5, a regulating-gate be-

tween the said blower and room; 5<sup>a</sup>, Fig. 2, the drive-pulley of the blower. At the opposite end from the blower, in the upper central part of the said room or receptacle, is an opening for admitting an induced current of air thereinto, caused by the draft of air therefrom by the action of the blower, as indicated by the arrows in Fig. 1. This opening 6 has connected with it an extended funnel 7, with perpendicular sides, but with flaring top and bottom, with an ample aperture in the bottom of the throat thereof. The upper part and sides of this funnel extend back over the expansion-room and, together with the top of the said room, form a housing for the belt and what I will term the "belt-chamber" 8; 9, a very fast traveling belt; 10 10, belt-carrying pulleys on which the belt runs, (this belt and its carrying-pulleys are best seen in Fig. 1;) 11, the drive-pulley of one of the said belt-carrying pulleys 10 10.

12, Fig. 1, is an adjustable tail-board, which serves to regulate the inflow of air to the expansion-room and controls the relative amount of the lighter parts of the material that will be separated from the heavier parts.

13 is the hopper, which communicates through the top of the belt-chamber 8 and delivers the material to be separated on the belt 9. (See Fig. 1.) This belt, owing to the function it performs and for convenience, I will term the "shooting-belt."

Having pointed out the various parts of my invention, I will now briefly explain its operation, which has been proven by use to be very efficient, especially on granulated tobacco.

The material to be separated falls from the hopper 13 through the top of the belt-chamber 8 on the shooting-belt 9, which travels at the rate of about two thousand feet per minute and which shoots the material through the mouth 7 of the belt-chamber, wherein it meets the opposing induced current of air, as indicated by the arrows. The great velocity with which the material is thus thrown into this reverse current of air causes the heavier portions thereof, owing to their greater momentum, to be carried through and beyond the said current, while the lighter portions thereof, because of their lesser momentum, are arrested by the said current of air, being



induced by the blower 4 drawing an equivalent current of air from the said room. The partial transverse partitions 1, 2, and 3 cut off the direct flow of the air from the ingress to the egress of the expansion-room, as indicated by the line  $x\ x$ , which prevents any of the material from being drawn out of said room by the air passing through it.

While I consider the shooting-belt running at high speed as the preferable means of giving great velocity to the material to be separated before it enters into the reverse current of air, I wish it understood that I do not limit myself to this method of giving great velocity to the material, as for this purpose other means may be employed. Neither do I limit myself to any particular arrangement of the belt-chamber, expansion-room, and blower, as they may be combined in different ways to produce the same result. Neither do I limit myself to an induced current of air, as a direct blast of air may be employed.

What I claim as new and useful, and desire to secure by Letters Patent, is—

1. In a separator a traveling belt mounted on pulleys and inclosed in a suitable case having a funnel-mouth at one end and an aperture in the bottom thereof, said belt being provided with any suitable ordinary means of running it at high speed and receiving and shooting the material to be separated out of the funnel-mouth of the said case with great velocity, in combination with any suitable means of producing a reverse current of air through the said funnel-mouth and its said aperture, whereby the particles of material to be separated which have greater momentum will be thrown through the said reverse current of air and the particles which have lesser momentum will be arrested by the said current of air and carried and deposited through the said aperture.

2. In a separator a rapid-traveling belt mounted on pulleys and inclosed in a case having a funnel-mouth at one end and an aperture at the bottom thereof, said belt being

provided with suitable means of running it at a high speed and receiving thereon the material to be separated, in combination with an expansion-chamber having a passage between itself and the said funnel-mouth and having connected therewith at the opposite end an exhaust fan-blower, whereby the exhaustion of the air by the said blower from the expansion-chamber will induce a reverse current of air into the said funnel-mouth and through its said aperture and passage between itself and the expansion-chamber into the said chamber and arrest and carry with it into the said chamber the particles of said material of lesser momentum while the particles having greater density and therefore greater momentum are shot through and beyond the said reverse current of air and deposited outside of the said chamber.

3. In a separator a belt mounted on pulleys and inclosed in a case having a funnel-mouth at one end and an aperture in the bottom thereof and a feeding-hopper at the other end, the said belt having any ordinary means of being run at high speed and to receive thereon and convey and shoot the material to be separated out of the funnel-mouth of the said case with great velocity, in combination with an expansion-chamber having a passage between itself and the said funnel-mouth and an exhaust fan-blower, whereby the exhaustion of the air from said chamber by the said blower will cause an induced current of air to flow through the said mouth and thence through the said passage between the said mouth and the said chamber and arrest and draw therewith into the said chamber the lighter particles of the material to be separated while the heavier particles will be thrown through and beyond the said reverse current and deposited outside of the said chamber.

ALBERT RAYMOND.

Witnesses:

GEO. L. FOWLER,  
THOMAS LEAK.