

No. 772,377.

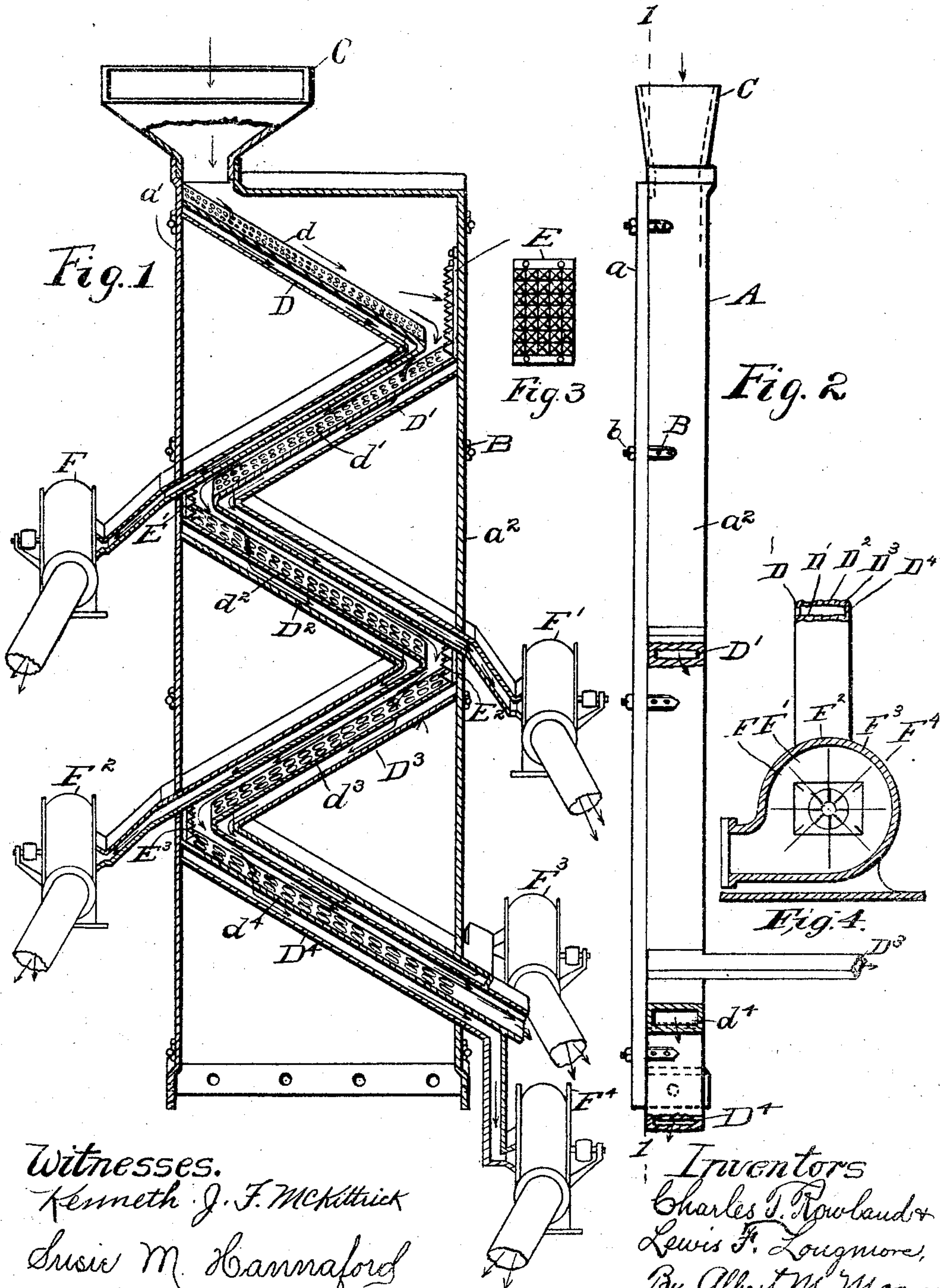
PATENTED OCT. 18, 1904.

C. T. ROWLAND & L. F. LONGMORE.

SEPARATOR OR GRADER.

APPLICATION FILED JULY 17, 1901.

NO MODEL.



Witnesses.

Kenneth J. F. McKittick  
Susie M. Hannaford

Inventors  
Charles T. Rowland &  
Lewis F. Longmore,  
By Albert M. Moore,  
Their Attorney.



# UNITED STATES PATENT OFFICE.

CHARLES T. ROWLAND AND LEWIS F. LONGMORE, OF LOWELL, MASSACHUSETTS; SAID LONGMORE ASSIGNOR TO SAID ROWLAND.

## SEPARATOR OR GRADER.

SPECIFICATION forming part of Letters Patent No. 772,377, dated October 18, 1904.

Application filed July 17, 1901. Serial No. 68,573. (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 Separators or Graders, of which the following is a specification.

This invention relates to separators and graders such as are used for separating granular materials according to the size of the particles or grains, and is adapted to be used upon separators or graders for various substances, as wheat, coal, crushed ores, and others.

The object of this invention is to remove the dust or refuse matters and to deliver the valuable materials, separated according to their fineness or coarseness, at a single operation with only one handling of the material.

The separator or grader comprises two or more trunks or tubes arranged in a suitable case and laterally filling said case and each having an inclined upper screen-surface of perforated or foraminous material, on which the granular material is thrown and down which the particles too coarse to pass through the screen are carried by their own gravity, falling upon a similar screen-surface of another trunk, and so on from trunk to trunk until the material from the last screen-surface is discharged therefrom. One such trunk may be used to separate dust from coarser particles, and where a series of such trunks are used two or more trunks may have a screen-surface of the same fineness of mesh to serve the purpose of a single trunk with a longer screen-surface. We preferably assist the operation by a current created by a suction-fan applied to the lower end of each trunk, and from the fan the dust or other material which falls or is drawn through the screen may be discharged into dust-rooms or other suitable rooms or receptacles.

In the accompanying drawings, Figure 1 is a view from a point slightly above and in front of a separator and grader of the same, the front of the case being removed and the hopper being partly in vertical section on the

line 1 1 in Fig. 2; Fig. 2, a side elevation of the same; Fig. 3, an elevation of the operative face of the break-piece; Fig. 4, a central vertical longitudinal section of a suction-fan, as on the line 4 4 in Fig. 1.

The case A is a box, preferably of metal, but not necessarily, having a removable front *a* secured to the body of said case in any convenient well-known manner, as by bolts B, fastened to the sides of the case and projecting through holes in said front, and nuts *b*, turning on the outer ends of said bolts against said front. A hopper C is supported on the top of the case and communicates with the case, and through this hopper are introduced to the case the matters to be separated or screened. The front and back of the case preferably form the sides of the trunks D D' D<sup>2</sup> D<sup>3</sup> D<sup>4</sup>, hereinafter described. Each of said trunks is preferably of sheet or plate metal and is inclined downward from one side nearly to the other of the case A and then inclined back to the other side of said case, passing through the same side of the case from which it starts and discharging outside of the case, except the lower trunk D<sup>4</sup> of the series, which discharges from the opposite side of the case from the side at which it starts. The upper trunk D starts at the side *a'* of the case and descends toward the side *a''* and is provided on the top of said inclined portion with a screen-surface *d*, which may be formed by perforating said top or by making said top of wire-cloth or in any usual manner. The inclination of this screen-surface is about thirty degrees, but may be more or less. The inclination should be such that that the matters placed upon the screen will descend said screen and fall from the lower end thereof, allowing the finer particles to fall through the meshes of said screen. The matters too coarse to fall through the screen will by their own momentum be carried against the break-piece E, which has a surface covered with pyramidal points *e*, which will cause the softer substances, like pieces of dried mud or clay, to be broken or reduced to smaller pieces. That which falls from the screen-surface of the first trunk will drop onto a



similar surface  $d'$  of the next trunk  $D'$  and in like manner will fall from the screen-surface  $d'$  against another break-piece,  $E'$ , then upon the screen-surface  $d^2$  of the trunk  $D^2$  5 and against the break-piece  $E^2$ , then over the screen-surface  $d^3$  of the trunk  $D^3$ , then against the break-piece  $E^3$  and upon the screen-surface  $d^4$  of the trunk  $D^4$ —that is to say, such of these matters as do not fall through any of 10 the screen-surfaces into the trunks, said screen-surfaces being successively coarser or having a larger mesh in the order in which they are named above, so that only the coarsest of the material is discharged from the screen-surface 15 of the trunk  $D^4$ .

$F$   $F'$   $F^2$   $F^3$   $F^4$  indicate suction-fans of ordinary construction, which may be used to create downward currents in the trunks to assist the passage of the finer materials through the 20 screens and out of the trunks, and Fig. 3 may be regarded as representing any one of said

fans. In Fig. 1 the lower end of each trunk is shown connected to one of these fans.

We claim as our invention—

The combination of two or more successively-arranged oppositely-inclined trunks, 25 each having a screen-surface on its upper side, adapted to discharge matters placed thereon and coarser than the meshes of such screen upon the next following screen, and 30 break-pieces, having points and arranged between successive screen-surfaces, to be struck by and to reduce matters discharged from one screen-surface to the next.

In testimony whereof we have affixed our 35 signatures in presence of two witnesses.

CHARLES T. ROWLAND.  
LEWIS F. LONGMORE.

Witnesses:

ALBERT M. MOORE,  
GEORGE P. MADDEN.