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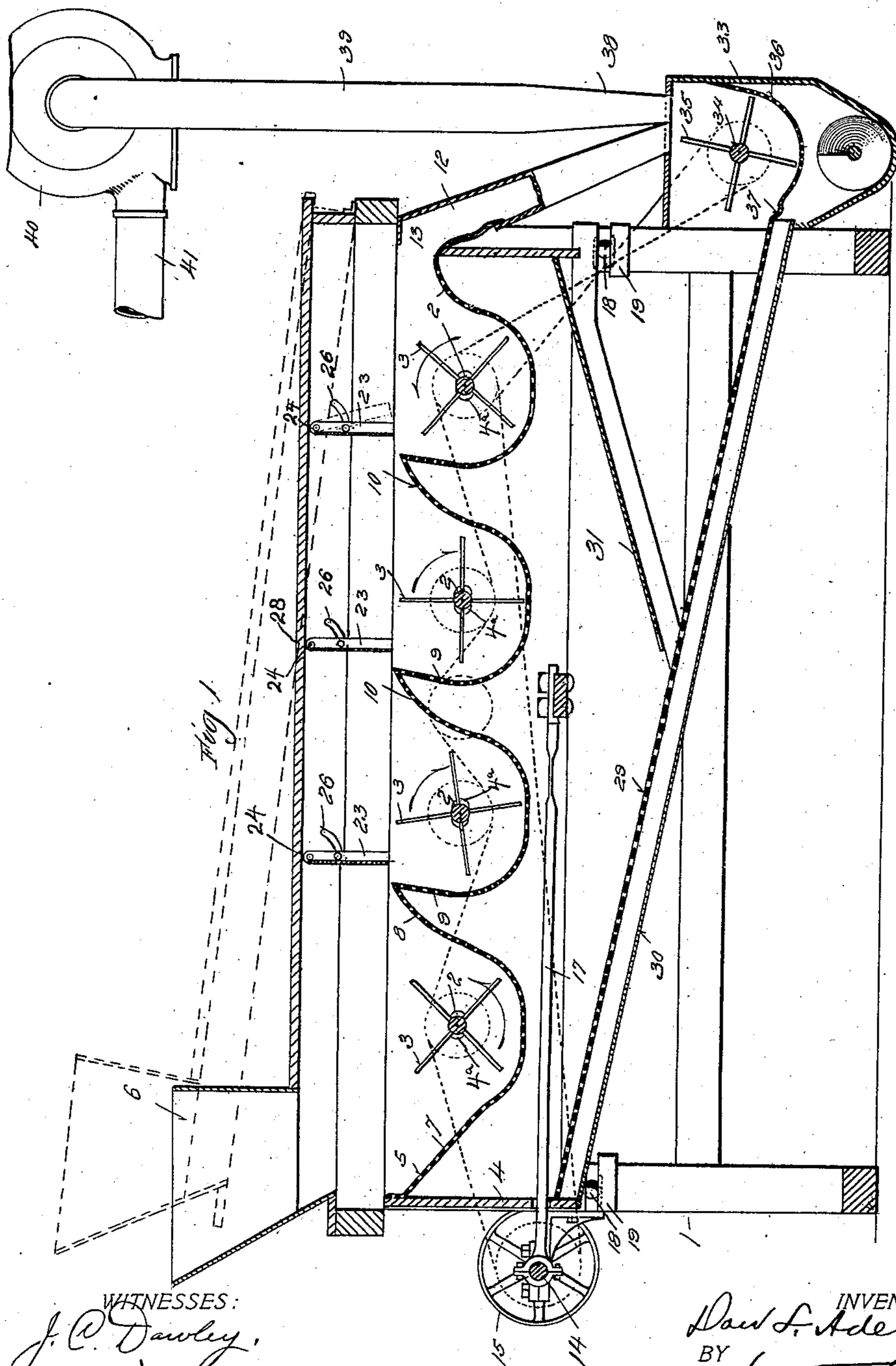
PATENTED JAN. 19, 1904.

D. L. ADELSPERGER.  
SEPARATOR.

APPLICATION FILED JULY 22, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

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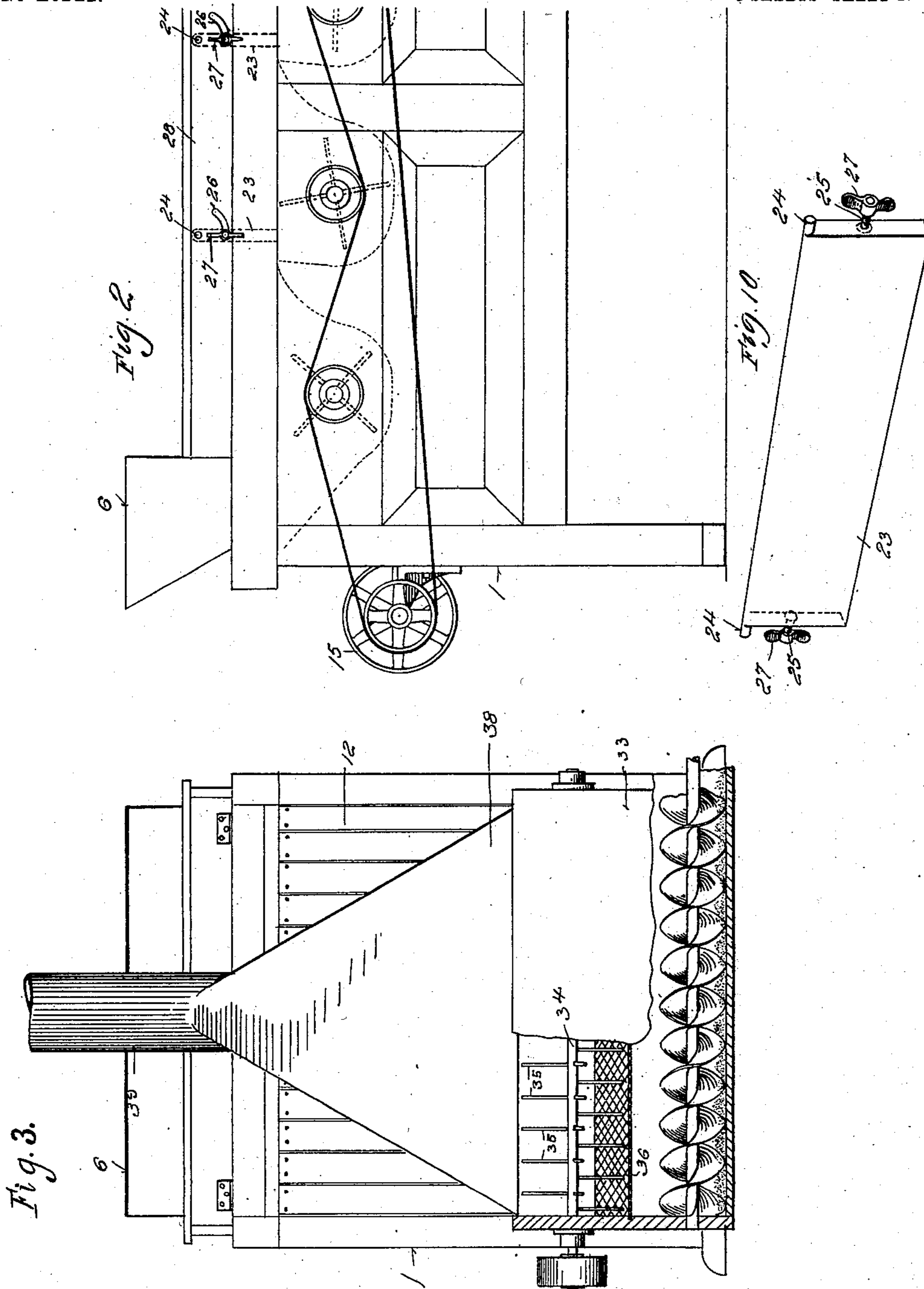
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APPLICATION FILED JULY 22, 1901.

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3 SHEETS—SHEET 2.



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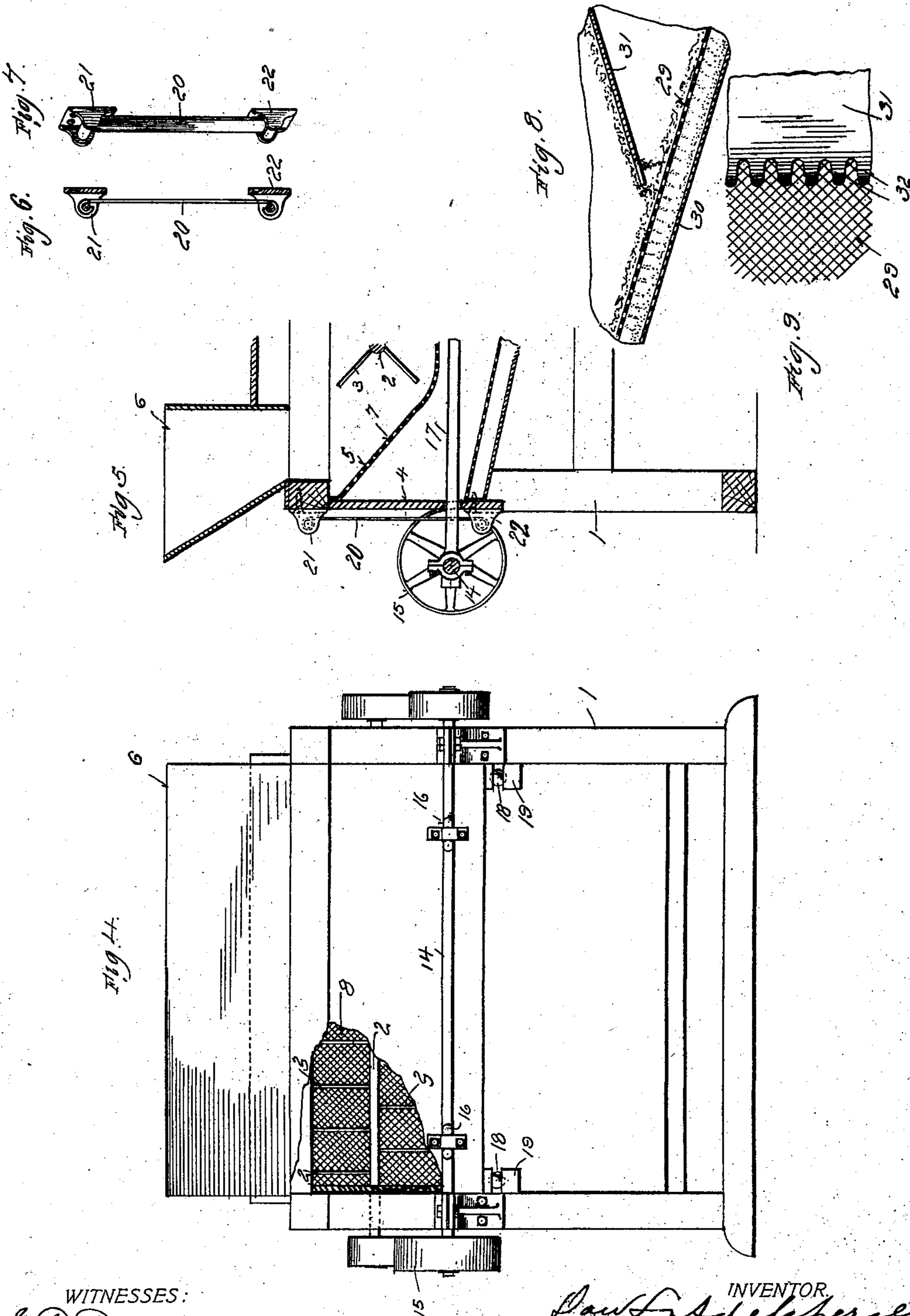
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NO MODEL.

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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

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## SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 750,071, dated January 19, 1904.

Application filed July 22, 1901. Serial No. 69,171. (No model.)

*To all whom it may concern:*

Be it known that I, DOW L. ADELSPERGER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Separators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to separators, and more particularly to that class of separators employed in the treatment of cotton-seed hulls for the purpose of separating the broken hulls or meal from the lint or fibers of cotton, and has for its object to provide an apparatus whereby such separation may be more readily effected and whereby the clogging of the screens may be avoided.

To these ends the invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of an apparatus embodying my invention in one form. Fig. 2 is a side elevation of a portion of the same. Fig. 3 is an elevation of the discharge end of the apparatus. Fig. 4 is an elevation, partly broken away, of the opposite end of the apparatus. Fig. 5 is a detail sectional view of a modification. Figs. 6 and 7 are enlarged detail views of portions of the construction shown in Fig. 5. Fig. 8 is an enlarged detail view of a portion of Fig. 1. Fig. 9 is a plan view of a portion of the structure shown in Fig. 8, and Fig. 10 is a detail perspective view of one of the deflecting-plates.

Heretofore in apparatus of this character it has been customary after reducing the hulls by treatment in an attrition or grinding mill to subject the product to treatment in a separator by the use of concave screens, in conjunction with revolving beaters, for the purpose of forcing the fragments of hull or meal through the screens, thus separating it from the lint. In practice it has been found that the lint has a tendency to adhere to the screens, and thus clog them, thereby materially impairing their efficiency. It is the

chief object of my present invention to overcome this difficulty, and I accomplish my purpose by imparting to the concave screens a vibratory motion in a direction transverse to the axis of revolution of the beater and in the direction of the feed through the machine of the material operated on. I have found that this vibratory motion of the screen, taken in conjunction with the action of the revolving beaters, serves to effectually prevent the lint from adhering to the screen, so that the latter does not clog, and its efficiency is therefore not impaired.

In the accompanying drawings I have shown an apparatus embodying my invention in one form, the same consisting of a suitable supporting-frame 1, in which are mounted a plurality of beater-shafts 2, each shaft being provided with a plurality of beating-fingers 3 of any approved construction. In conjunction with these beaters I employ a screen consisting of a shoe 4, slotted at 4<sup>a</sup> for the passage of the beater-shafts and carrying the screen proper, 5, said screen being formed into a plurality of concaves corresponding in number with the number of beaters employed. In the present instance I have shown four of these concaves, all of which are similar in form, except that the first and last are suitably modified to adapt them to accomplish their receiving and discharging functions. The apparatus is provided with a suitable receiving-hopper 6 at one end, and the first concave is provided with an incline 7 to conduct the product to the first beater and with a discharge portion 8, which is curved upward and away from the body of the concave in the direction of the next beater. The second and third concaves are each provided with a receiving portion 9, preferably slightly inclined toward the axis of the beater and with a discharge portion 10, inclined upward and away from the beater in a manner similar to the portion 8 of the first concave. The discharge side of the last concave does not extend as high as the corresponding portion of the other concaves and is inclined away from the beater at a greater angle, communicating with the

lint-discharge conduit 12 by a mouth or opening 13, as shown.

It will be noted that the ends of the concaves are closed, the material being admitted at one side of the concave and discharged at the other side, thus passing successively through all of the concaves.

A vibratory motion in a direction transverse to the axes of revolution of the beaters and in the direction of the feed through the machine of the material operated on is imparted to the series of concave screens in any suitable manner, and in Figs. 1 to 4 of the drawings, inclusive, I have shown this motion as effected by means of a shaft 14, mounted on one end of the frame 1 and provided with a driving-pulley 15 and with cranks 16, connected by pitmen 17 with the shoe 4 of the screen. This latter is supported upon balls 18, which rest in grooved tracks or ways 19 on the frame 1, so as to permit the reciprocation of the screen with a minimum of frictional resistance.

In Figs. 5, 6, and 7 I have shown a modification in which the shoe 4 of the screen is supported by means of straps or links 20, pivoted to brackets 21 on the frame 1, and similar brackets 22 on the shoe 4, one of these straps, with its corresponding brackets, being employed at each of the four corners of the shoes.

In conjunction with each of the beaters and concaves, except the first or receiving one, I employ a deflecting-plate 23, which extends downward from the top of the casing, terminating at a point about on a line with the upper edge of the concave and located at a short distance from the receiving edge thereof. I prefer to employ a construction in which the distance between each deflecting-plate and the receiving edge of the cooperating concave may be adjusted, and to this end each deflecting-plate is pivoted at its upper edge, being preferably provided with pintles or pivotal projections 24 for this purpose. In order to secure the deflecting-plate after adjustment, it is provided with threaded projections 25, which pass through curved slots 26 in the casing and receive externally hand-nuts 27, which bear against the outside of the casing. By this means each deflecting-plate may be adjusted from the exterior of the casing while the machine is in operation. The deflecting-plates are connected to the top 28 of the casing, and said top is preferably hinged to the casing at one end, so that the entire top, including the deflecting-plates, may be lifted up to give access to the interior of the casing for the purpose of inspecting the concaves and beaters.

Below the concave screens and beaters the shoe 4 is provided with an inclined screen 29, upon which the meal is discharged from the concave screens, and below the screen 29 there is provided an inclined plate 30, which receives that portion of the product which passes through the screen 29. This screen is in-

clined from the receiving end of the machine downward toward the discharge end, and in order to subject the entire product passing through the concaves to its action I provide an inclined apron 31, which extends from the discharge end of the machine downward toward the receiving end in a direction opposite to the inclination of the screen 29. The edge of the apron 31 immediately adjacent to the screen 29 terminates a short distance above said screen to permit the passage under it of the material on the upper surface of said screen, and the edge of the apron is formed into a plurality of scallops or curved teeth 32, as shown more particularly in Fig. 9, for the purpose hereinafter pointed out.

Secured to the discharge end of the frame 1 is a transverse box or casing 33, in which is mounted a beater-shaft 34, provided with beating-fingers 35 and a cooperating concave screen 36, which is connected with the discharge end of the screen 29 by a flexible apron 37, of canvas or the like. The material from the upper surface of the screen 29 is thus discharged into the concave 36, while the material from the plate 30 is discharged below said concave 36. The discharge-chute 12 discharges into the box or casing 33, as shown in Fig. 1, and said box or casing communicates, by means of a boot 38, with an uptake-pipe 39, connected with a fan-blower 40, provided with a discharge-pipe 41.

So far as that feature of my invention is concerned which relates to the vibration of the concave screens relatively to the beaters the direction of rotation of the beaters may be varied as desired. I have found, however, that a material advantage in the operation of the separator may be obtained by causing certain of the beaters to rotate in a direction opposite to the direction of rotation of the others, as indicated by the arrows in Fig. 1, and this constitutes another feature of my invention. In this latter case I have shown the first and last beaters as revolving in such a direction that their lower portions move toward the discharge side of the cooperating concave, and this serves to facilitate the accomplishment of their receiving and discharging functions. The intermediate beaters are, however, shown as revolving in the opposite direction, and this arrangement I prefer, for the reason that it subjects the material operated upon to a more thorough separating action. The flights may be adjusted according to the direction of revolution of the beaters and according to the amount of work which is desired to have them accomplish. They serve in an obvious manner to prevent the material from being carried back to the preceding concave and beater, cooperating to this end with the inwardly-inclined receiving side of the concave.

I have indicated in dotted lines in Fig. 1 a system of belting and pulleys whereby the several beaters may be conveniently driven;

but it is obvious that any suitable method of imparting motion to these devices may be employed.

The operation of the device will be readily understood from the preceding detailed description. The product to be operated upon is received in the hopper 6 and subjected to the action of the first beater and concave, from which it passes over into the succeeding concaves and beaters, being discharged through the chute 12. The vibratory motion imparted to the screen is found in practice to prevent the lint from adhering thereto, and thus clogging the screen, so that the meal or hull and fiber are effectually separated, the meal passing downward through the concaves and falling upon the screen 29 or apron 31, while the lint is carried out through the chute 12. The screen 29 effects a further separation, the particles of lint being discharged from the top of the screen into the concave 36, while the fragments of hull are separately discharged. I have found in practice that the lint upon the screen 29 has a tendency to form into waves or rolls, and these waves or rolls are effectively broken up by the scallops or fingers 32 of the plate 31, so that the fiber is discharged into the concave 36 in a loose or free form. The concave 36 and beater cooperating therewith effect a still further separation of the fiber and hull, the former being carried up through the uptake-pipe 39 by the blower 40 and being discharged through the pipe 41, while the latter is discharged from the casing 33 in any suitable manner.

In practice a series of apparatus such as I have shown are or may be employed, each one treating the product or a portion of the product of the preceding apparatus in order to render the separation more effectual.

I do not wish to be understood as limiting myself to the precise details of construction hereinbefore described and shown in the accompanying drawings, as these details may obviously be modified without departing from the principle of my invention.

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

1. In a separator of the character described, a series of revolving beaters, in combination with a corresponding series of concave screens,

each having closed ends and lateral admission and discharge of the material operated on, said series being arranged to successively operate on said material, and means for imparting to said screens a vibratory motion transversely to the axes of revolution of the beaters and in the direction of the feed of the material, substantially as described.

2. In a separator of the character described, the combination, with a series of revolving beaters, of a corresponding series of concave screens having their receiving edges inclined toward the cooperating beater and their discharge edges inclined away from the same, said series being arranged to successively receive the material operated on, and means for imparting a vibratory motion to said screens transversely to the axes of revolution of the beaters and in the direction of the feed of the material, substantially as described.

3. In a separator of the character described, the combination, with a series of revolving beaters, of a corresponding series of concave screens, said series being arranged to successively receive the material operated on, the first and last of the beaters revolving in the same direction, and the intermediate beaters revolving in the opposite direction, and means for imparting to said screens a vibratory motion transversely to the axes of revolution of the beaters and in the direction of the feed of the material, substantially as described.

4. In a separator of the character described, the combination, with a plurality of revolving beaters arranged in a series, of a corresponding plurality of concave screens, an inclined screen located below said concave screens, means for imparting a vibratory motion to said screens, an auxiliary beater provided with a concave adapted to receive the surface discharge of the inclined screen, a casing, a conduit connecting the last concave screen with said casing, an uptake-pipe, and means for creating an ascending current of air in said uptake-pipe, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DOW L. ADELSPERGER.

Witnesses:

IRVINE MILLER,  
WILL O'LAUGHLIN.