(No Model.) 3 Sheets—Sheet 1.

R. W. O. REHMENKLAU.

ROTARY SEPARATOR, GRADER, OR BOLTER.

No. 422,974. Patented Mar. 11, 1890.

Fig. 1.

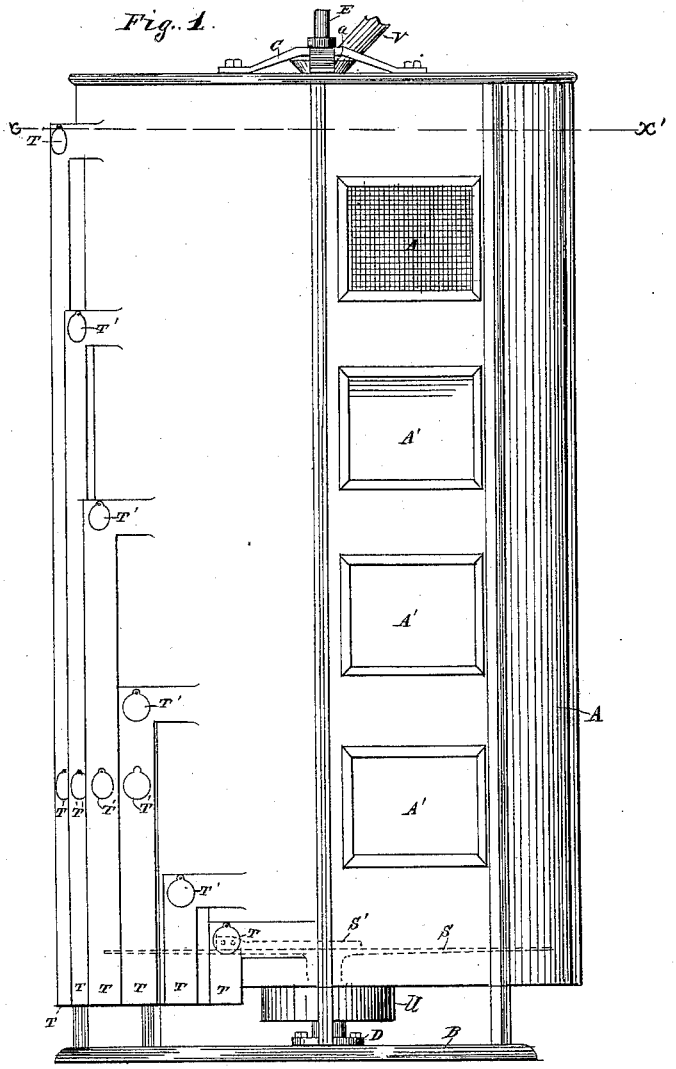
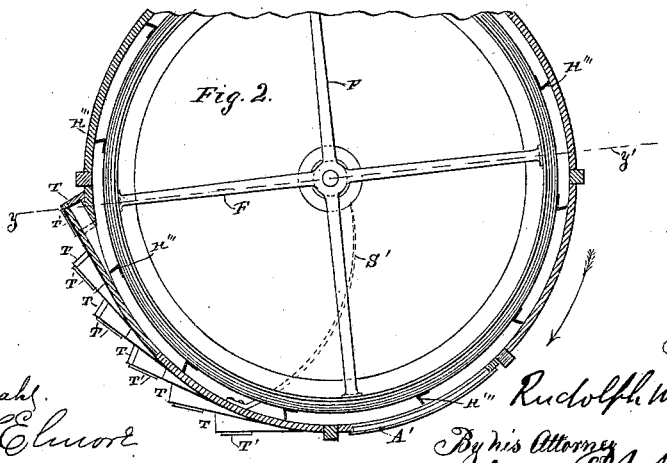


Fig. 2.



Witnesses
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Fig. 3.

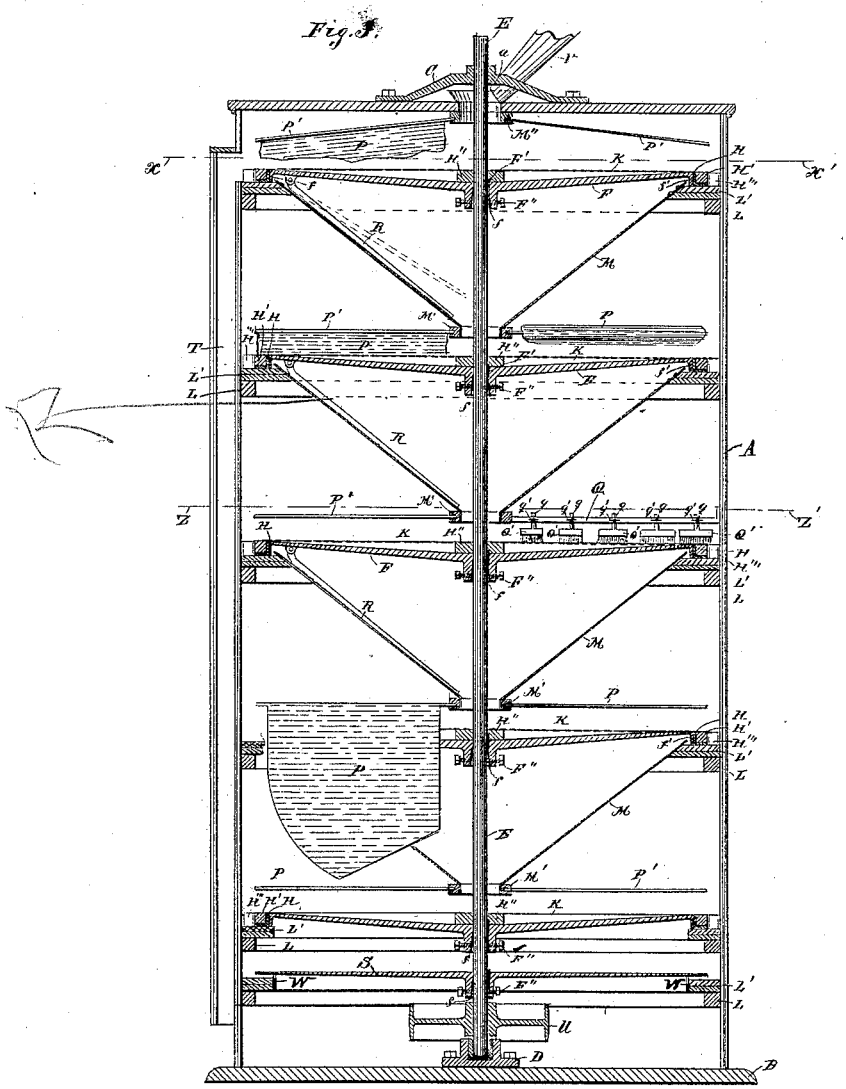

Fig. 4.

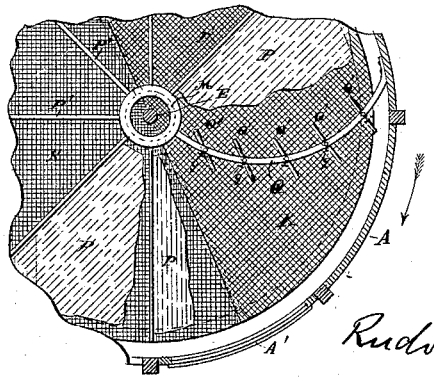

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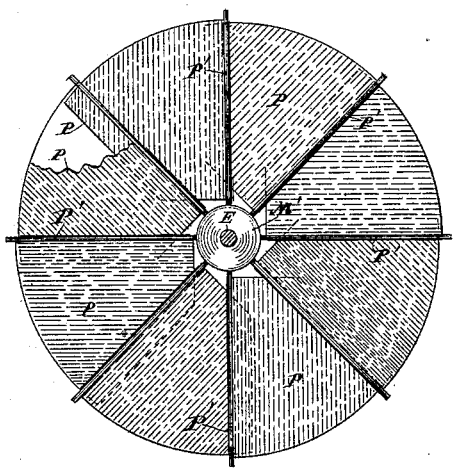
Fig. 5.



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UNITED STATES PATENT OFFICE.

RUDOLPH W. O. REHMENKLAU, OF MINNEAPOLIS, MINNESOTA.

ROTARY SEPARATOR, GRADER, OR BOLTER.

SPECIFICATION forming part of Letters Patent No. 422,974, dated March 11, 1890.

Application filed April 27, 1889. Serial No. 308,872. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH W. O. REHMENKLAU, a citizen of the United States, and a resident of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented a certain new and useful Improvement in Rotary Separators, Graders, or Bolters, of which the following is a specification, reference being had to the accompanying drawings.

My invention has for its object to provide a separator for mill-stock which shall be of simple construction and compact form and have a large capacity. To this end I provide an upright cylinder secured in a fixed position on the floor or other suitable support, and in bearings at the opposite ends of the same I mount a vertical shaft, driving the same from a source of power in any suitable way. On this shaft I mount a series of spiders provided with wire or silk cloth screens. Below each spider is placed a hopper for conducting the material which passes through the screen to the center of the next lower screen. Above each of the screens are supported wipers consisting of loose cloths trailing upon the top of the screen to prevent flying of the stock. One or more sets of brushes may be also added to keep the screen-surface clean. Within the hoppers are scrapers to clear the same. The joint between the screens and the inner surface of the cylinder is made by annular brackets or flanges projecting from the same and an annular rim or strip secured to the outer ends of the spiders. Adjacent to each of the annular brackets at some point on a level with its top surface is an opening through the cylinder leading to a chute for conducting off the material. The periphery of the annular strips secured to the outer ends of the spiders is provided with flights for forcing the material into the outlet-chutes. The chutes are provided with hand-holes with pivoted covers for convenient examination of stock, and the stationary cylinder is provided with doors on its opposite sides for a like purpose. The screens are preferably constructed in two semicircular pieces, and the cylinder is also constructed in sections for convenience of packing and removal. The spiders are so attached to the vertical shaft as to be capable of adjustment thereon to a true horizontal plane. The shaft is driven at a comparatively high rate of speed. The material is fed in at the top of the cylinder and successive separations are effected by the different screens, the different grades being drawn off at the different levels.

In the accompanying drawings, like letters referring to like parts throughout, Figure 1 is a side elevation of my machine. Fig. 2 is a horizontal section on the line X X′ of Figs. 1 and 3. Fig. 3 is a vertical section on the line Y Y′ of Fig. 2; and Fig. 4 is a horizontal section on the line Z Z′ of Fig. 3, some of the parts being broken away. Fig. 5 is a plan view showing the position and relation of the trailing cloths.

A is the vertical cylinder, and B is the floor or other support to which it is secured. The top plate of the cylinder is provided with a central opening *a*. C is a yoke secured to the top plate of said cylinder above said opening, and provided with a central hole adapted to serve as a bearing for the driving-shaft.

D is a bottom bearing for the shaft, secured to the center of the support B.

E is the vertical driving-shaft mounted in the bearings D and C in the center of the cylinder.

F are the screen-spiders, mounted upon the shaft E. The hubs of the spiders are provided with conical holes *f*. The hubs are also provided with vertical key ways or slots for a wedge-key F′, adapted to lock the spider to the shaft. The lower ends of the hubs are provided with screw-threaded holes for set-screws F″, of which there are three or more, for adjusting the spiders to a true horizontal plane on the supporting-shaft E. The spiders are so constructed that their outer ends are at higher level than their hubs. The extremities of the spider-arms are provided with downturned flanges *f*′.

H is an angular angle-iron rim secured to the flanges *f*′, which serves as a seat for an annular wooden rim H′, rigidly secured thereto.

H″ is a wooden disk or collar encircling the shaft and secured to the top of the spider-hub.

H‴ are flights secured to the outside of the wooden strip H′.

K is the screen wire or silk cloth, having its outer edges secured to the wooden rim H′

and its center to the disk H''. The screen may be constructed in two parts divided on their center line and secured to cross-strips attached, respectively, to the disk H'' and the rim H'.

L are annular ribs secured in the inside of the cylinder.

L' are the bracket-shelves or inwardly-projecting annular flanges secured to the ribs L. The annular rim H makes a close joint with the top surface of the bracket-shelf L'.

M are the hoppers, preferably made of sheet metal, secured to the brackets L', and provided at their lower ends with annular wooden rims M', encircling the shaft E and forming the outlet of the hoppers.

M'' is a similar wooden ring secured to the top plate of the cylinder directly under and around its inlet-opening *a*. The upper rims of the hoppers M project beyond the top of the shelves L' into the angle formed by the downturned flange *f* of the spiders F, thus forming a shut-off, preventing the stock which has been thrown over the rim of the screen from passing into the hopper.

P are the wiper-cloths, mounted upon sticks P', secured to the rings M' and M''. The cloths are rolled about their supporting-sticks and made of sufficient length so that they can be trimmed as the wearing of the outer ends may require. These cloths are so applied that they overlap or underreach each other, the free end of any given cloth extending underneath the fixed end of the next adjacent cloth, thus forming a continuous cover to the stock. Their purpose is not to clean the screens, but to prevent the stock from flying by holding it down on the screen, causing such of it as is not fine enough to pass through to roll off over the edge of the screen.

Q is a curved bridge having one end secured in the ring M' and the other to some part of the cylinder. Q' are brushes mounted in the same in such a manner as to have both a vertical and an angular adjustment thereon. As shown, this adjustment is secured by vertical holes in the bridge-truss and stems *q* on the heads of the brushes passing through these holes, and set-screws *q''* passing through transverse holes in the bridge for clamping the brushes in any desired position. One or more of these bridges with brushes therein may be used, if found necessary, above each screen.

R is a hopper-scraper pivotally secured at its upper end to the outer part of one of the spider's arms, and dragging against the inside of the hopper.

S is an imperforate disk mounted on the lower end of the shaft E by constructions similar to the spiders F.

S' is a scraper attached to the cylinder in proper position to clear the disk S.

T are the outlet-chutes. T' are pivoted covers over hand-holes in the same.

A' are the doors, preferably provided with cloth panels, in the cylinder A for giving access to the screens. Of these there are preferably two sets at diametrically-opposite parts of the cylinder.

U is a driving-pulley fixed to the shaft E. As shown, it is arranged for application of power at the lower end of the shaft. It could equally well be at the top.

V is an inlet-spout for conducting the stock to the head of the cylinder.

To secure a close joint between the lower bracket L' and the imperforate disk S, the inner edge of the bracket is provided with an upturned lip or flange W.

The cylinder may be constructed in two parts or segments for convenience of handling.

The special function of the trailing cloths is to prevent the stock from flying.

The trailing cloths and the adjustable brushes are the most important features in this machine. By the former the stock is held in the best possible position for separation, and by the latter the screens may be kept constantly clean, the adjustability of the brushes enabling them to be set at any desired angle necessary to sweep the screen without interfering with the outward passage of the stock. These angles will vary for different rates of revolution and different kinds of stock. The conical holes in the spider-hubs and the set-screws constitute also an important feature, as it enables the screen to be trammed up to an exact level, which is necessary to the successful operation of the screens.

The operation is evident from the description already given.

The advantages of the machine are large capacity and compactness of structure. It will do the work of five ordinary bolts and occupies less space than one.

The machine may be used for making any desired separation of mill-stock. It is especially well adapted for bolting and grading flour.

Any desired number of separations may be effected by simply increasing or decreasing the number of screens and their accessory parts.

It will be understood that changes may be made in the details of the constructions shown without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination, with a stationary case, of a vertical shaft therein, a series of screens mounted thereon, and trailing wipers of flexible material suspended from said frame over the top of said screens, overlapping and underreaching each other, so as to form a continuous cover, substantially as described.

2. The combination, with the stationary case, of the vertical shaft, the horizontal screens mounted thereon, the annular flanges on the case making joints with the rims of the screen, the hoppers between adjacent screens

secured to said flanges and projecting into the angle formed by the rim of the screen, radial arms secured to the lower part of said hopper, and rolls of cloth or other flexible material mounted on said arms, the free ends of which may be made to overlap and underreach each other, so as to form a continuous trailing cover in contact with said screens, substantially as described.

3. The combination, with the stationary case and the vertical shaft therein, of a screen mounted on said shaft and a brush supported from said frame angularly adjustable with reference to the top of the screen, substantially as described.

4. The combination, with the stationary case and the vertical shaft therein, of a screen mounted on said shaft and a brush supported from the frame angularly and vertically adjustable with reference to the top of the screen, substantially as described.

5. The combination, with the stationary case, of the vertical shaft therein, the horizontal circular screens mounted thereon, the hoppers between adjacent screens supported from the case, the curved bridge-truss secured to said hopper and said case, and the brushes angularly and vertically adjustable in said bridge, substantially as described.

6. The combination, with the stationary case, of the vertical shaft within the same, the horizontal circular screen mounted on said shaft, the hoppers between adjacent screens supported from the frame, and the hopper-scrapers pivoted to the screens, substantially as described.

7. The combination, with the supporting-shaft, of the concave spider for supporting the screen, having a conical hole in its central hub, and set-screws in said hub for tramming the spider to a true horizontal level, substantially as described.

8. The combination, with the stationary case, of the vertical shaft therein, the screen-supporting spiders mounted thereon, having downturned flanges on their extremities and provided with annular rims, the annular shelves secured to the inside of the case and forming a close joint with said rims, and the hoppers below the screens secured to said shelves, and having their upper edges extended into the angle formed by the downturned flanges and rim of the spiders, substantially as described.

RUDOLPH W. O. REHMENKLAU.

In presence of—

JAS. F. WILLIAMSON,

EMMA F. ELMORE.