

No. 885,499.

PATENTED APR. 21, 1908.

C. E. MANOR.
GRAIN SCRUBBER.

APPLICATION FILED AUG. 15, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

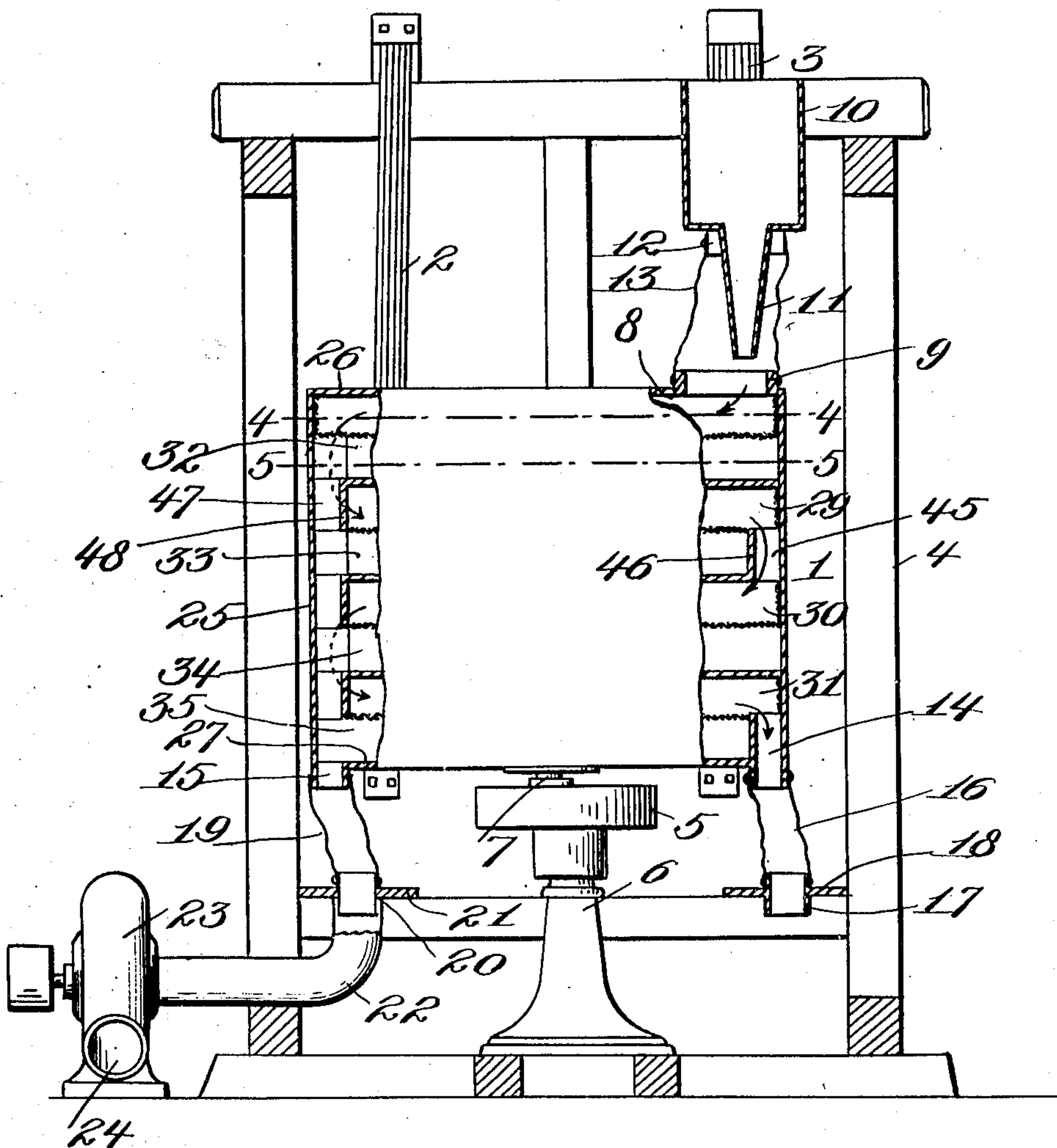
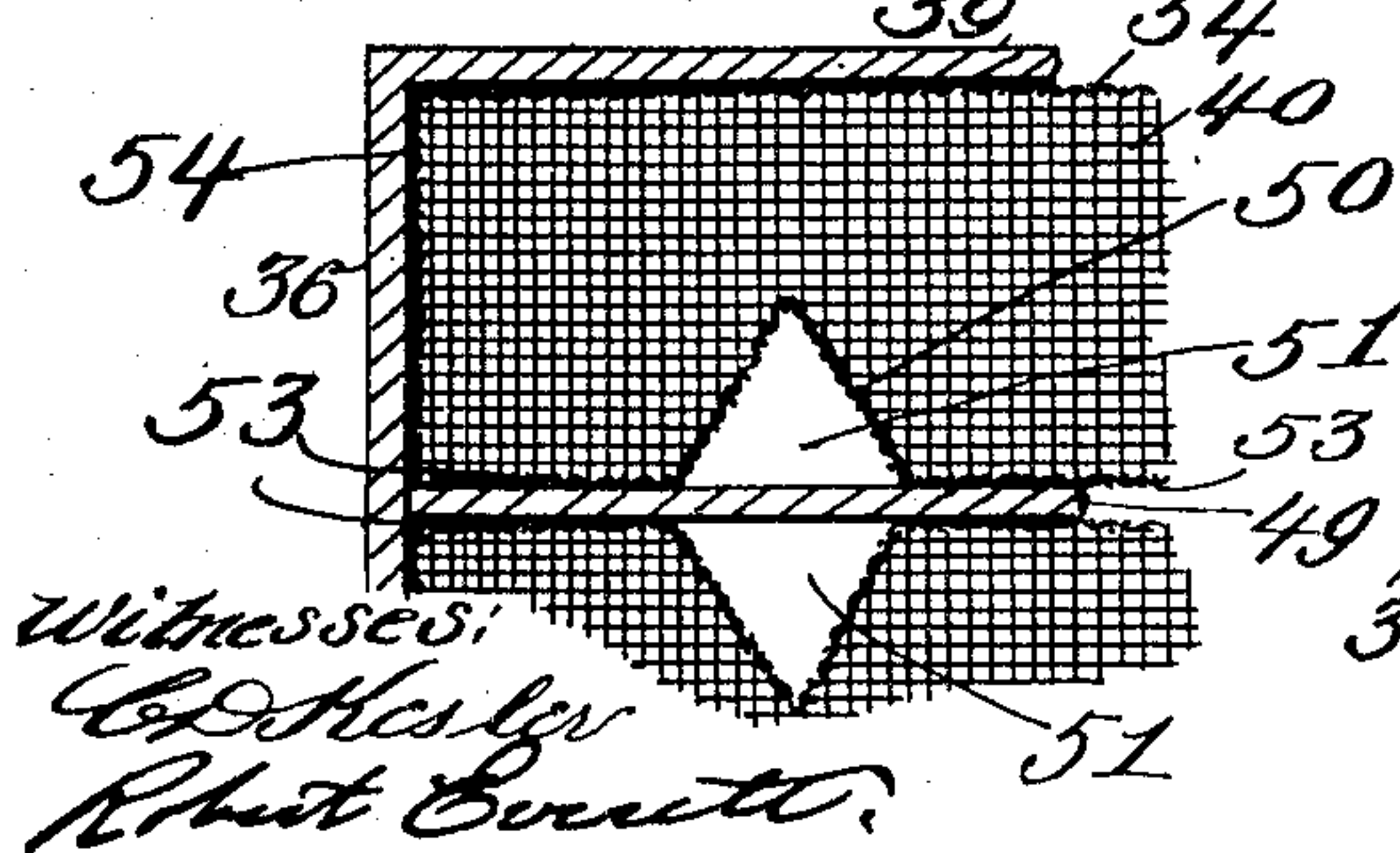
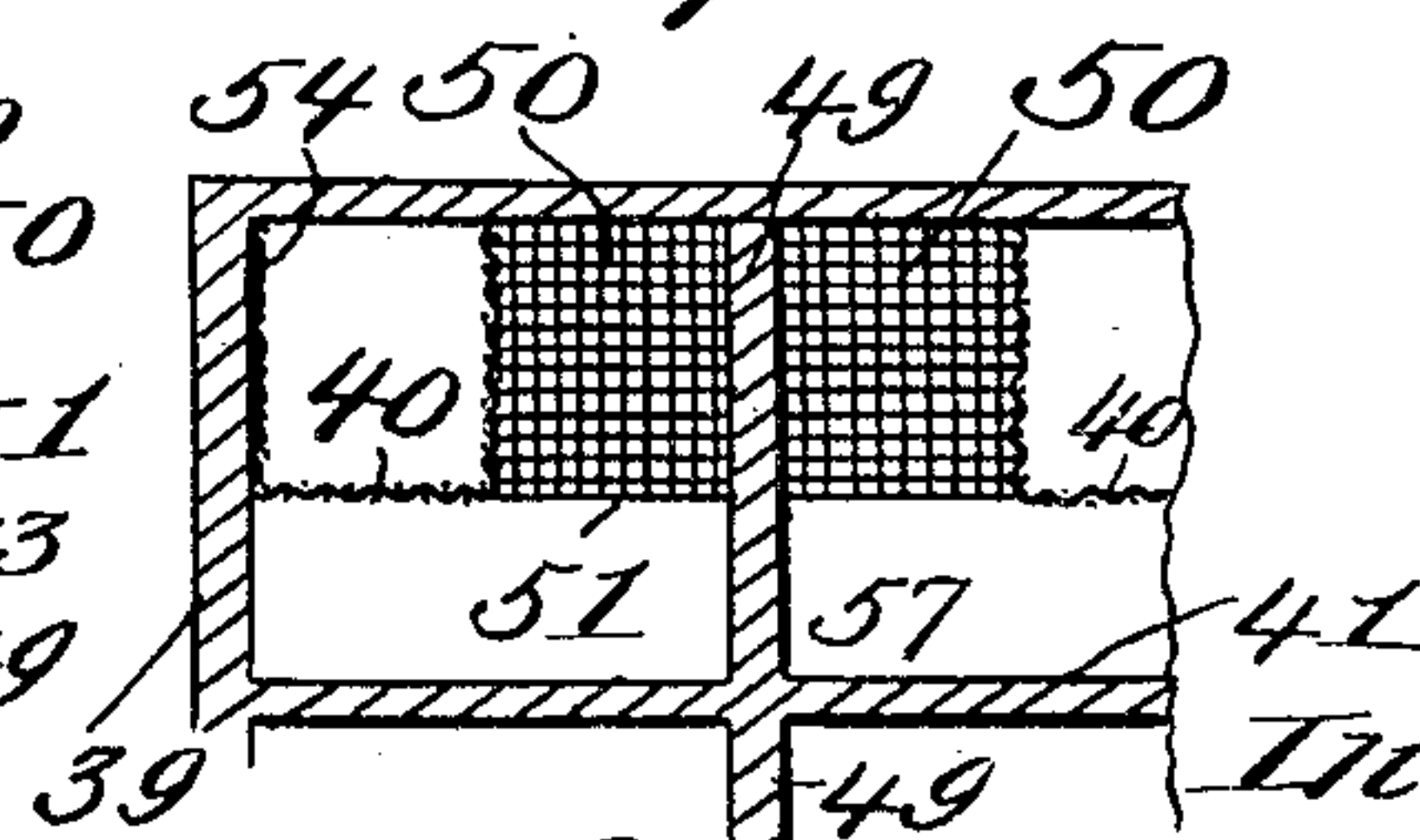


Fig. 2.



Witnesses:
C. E. Manor
Robert E. Smith

Fig. 3.



Inventor
Charles E. Manor
By James L. Norris

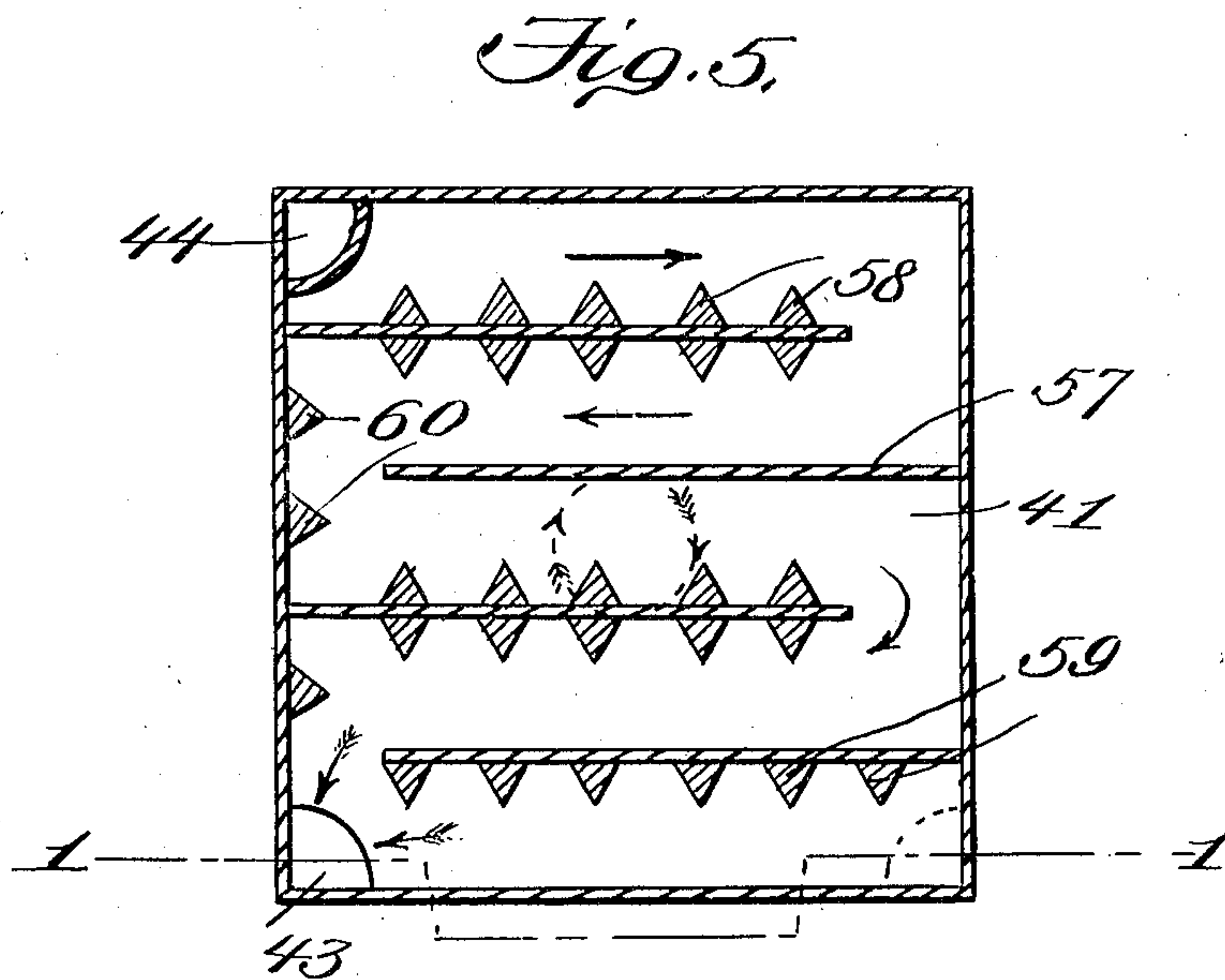
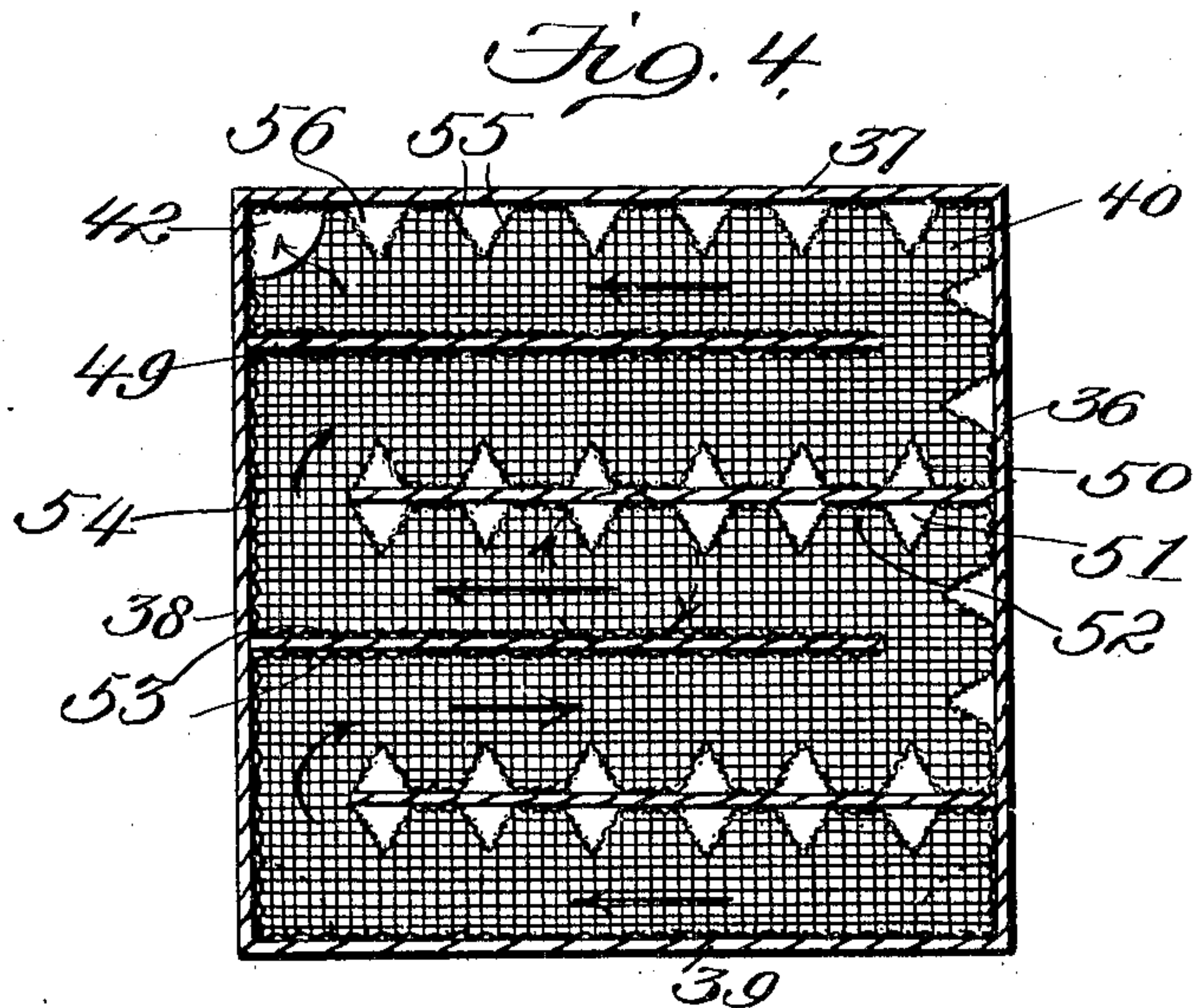
No. 885,499.

PATENTED APR. 21, 1908.

C. E. MANOR.
GRAIN SCRUBBER.

APPLICATION FILED AUG. 15, 1907.

2 SHEETS—SHEET 2.



Witnesses
C. D. Mesler
Robert Everett.

Inventor
Charles E. Manor
By James L. Norris
Att'y.

UNITED STATES PATENT OFFICE.

CHARLES E. MANOR, OF STANLEYTON, VIRGINIA, ASSIGNOR OF ONE-HALF TO JAMES D. MANOR, OF NEWMARKET, VIRGINIA.

GRAIN-SCRUBBER.

No. 885,499.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed August 15, 1907. Serial No. 388,685.

To all whom it may concern:

Be it known that I, CHARLES E. MANOR, a citizen of the United States, residing at Stanleyton, in the county of Page and State of Virginia, have invented new and useful Improvements in Grain-Scrubbers, of which the following is a specification.

This invention relates to a gyratory grain scrubber, particularly adapted for use in cleaning grain and also for other purposes wherein it is found applicable; and the object thereof is to provide a grain scrubber with means, in a manner as hereinafter set forth, whereby the scrubbing of the grain will be had in a quick and efficient manner, the travel of the grain vastly facilitated and the dirt or other substance removed from the grain, quickly separated therefrom and discharged from the machine.

Further objects of the invention are to provide a gyratory grain scrubber which shall be simple in its construction and arrangement, strong, durable, efficient in its use, conveniently operated, readily set up and comparatively inexpensive to manufacture.

With the foregoing and other objects in view the invention consists in the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings wherein like characters denote corresponding parts throughout the several views and in which—

Figure 1 is a vertical sectional view of a gyratory grain scrubber in accordance with this invention; Fig. 2 is a detail in sectional plan of one of the scrubbing compartments; Fig. 3 is a detail in longitudinal section of one of the scrubbing compartments, also showing the dirt or dust-receiving compartment; Fig. 4 is a sectional plan of the scrubbing compartment taken on line 4—4 of Fig. 1; and, Fig. 5 is a sectional plan of the dirt-receiving compartment taken on line 5—5 of Fig. 1.

Referring to the drawings by reference characters, 1 denotes a combined scrubber and dust separator element, suspended by

the pivoted hangers 2, 3 in a frame 4. The element 1 is adapted to have a gyratory movement imparted thereto and for such purpose a rotatable table 5 is provided, connected to a suitable prime mover and mounted upon an upright 6. The rotatable table 5 carries a coupling pin 7 which is secured to the upper face of said table and arranged eccentrically with respect to the axle of the table. The pin 7 is connected approximately centrally to the bottom of the element 1. From such arrangement it is evident that when the table 5 rotates a gyratory motion will be imparted to the element 1. The table 5 not only constitutes a means for imparting a gyratory motion to the element 1, but also acts as a support therefor and in connection with the hangers 2, 3 constitutes means for retaining the element 1 within the frame. The manner of supporting the element 1 is shown by way of example, as other suitable means can be employed. The top of the element 1 is provided with an opening 8 in which is mounted a short sleeve 9 opening into the element 1. The sleeve 9 constitutes an inlet for the grain to be scrubbed. A reservoir for the grain is indicated by the reference character 10 and which is formed with a discharge spout 11 arranged directly over the sleeve 9. The reservoir 10 is formed with a depending collar 12 which surrounds the spout 11 and has connected thereto the upper end of a flexible tubing 13, the lower end of said tubing being attached to the sleeve 9. The element 1 at its bottom is formed with an outlet 14 for the cleaned grain and an outlet 15 for the dirt, dust or matter scrubbed from the grain. The outlet 14 is connected by a flexible pipe 16 to a sleeve 17 which is adapted to open into suitable means (not shown) for the reception of the scrubbed grain. The sleeve 17 is attached to a support 18 carried by one of the bars of the frame 4. The outlet 15 is connected by a flexible pipe 19 to a sleeve 20 mounted upon a support 21 carried by one of the bars of the frame 4. Communicating with the sleeve 20 is the suction pipe 22 of a suction fan 23, the function of the latter being to facilitate the discharge of the dirt removed from the grain during the cleaning operation. The outlet for the fan 23 is indicated by the reference character 24.

The combined scrubber and separator element consists of a shell 25 having a head 26

for closing the upper end thereof and a closed bottom 27. Within the shell 25 is arranged a plurality of combined grain-scrubbing and separator compartments and a plurality of receiving compartments for the matter scrubbed and separated from the grain.

The combined scrubbing and separating compartments are indicated by the reference characters 28, 29, 30, and 31 and the receiving compartments are indicated by the reference characters 32, 33, 34, and 35. The disposition of the compartments is such that there will be a receiving compartment arranged below a combined scrubbing and separating compartment. Each of the combined scrubbing and separating compartments is formed from a portion of the walls 36, 37, 38 and 39 of the shell 25 and a bottom 40 of foraminous material secured to the inner faces of the walls of the shell. Each of the receiving compartments is formed from a portion of the walls of the shell and an imperforate bottom 41 secured to the inner faces of the walls of the shell. The bottom 40 of each of the scrubbing and separator compartments is cut away as at 42 to form an outlet. The outlets, however, of the scrubbing and separator compartments are alternately disposed with respect to each other. Each of the bottoms 41 of the receiving compartments is cut away at one corner as at 43 to constitute an outlet for the compartment. These outlets 43 are arranged in vertical alinement and also in alinement with the outlet 15. The bottoms 41 of the compartments 32, 33 and 34 are each formed with an opening 44, constituting inlets for the compartments 29, 30 and 31. Arranged to communicate with each of the openings 44 is a conduit 45 having an imperforate wall 46. The conduits 45 also communicate with the outlets 42 and the function of the conduits 45 is to allow of the grain passing from one scrubbing and separating compartment into another without entering a receiving compartment. The conduit 45 which communicates with the outlet 42 of the compartment 31 opens into the outlet 14 so as to discharge the cleaned grain from the element 1.

The reference character 47 denotes a conduit having an imperforate wall 48. In one corner of each of the compartments 29, 30 and 31 is arranged a conduit 47 and the function thereof is to allow the matter removed from the grain to pass to the outlet 15 without passing through a scrubbing and separating compartment to commingle with the grain therein.

Each of the combined scrubbing and separator compartments is provided with a plurality of transversely extending partitions 49 arranged in staggered relation with respect to each other and the function thereof is to cause, during the gyratory motion of the ele-

ment 1, the travel of the grain in a sinuous manner through each of said compartments. The partitions 49 within the compartment 28 are alternately disposed with respect to the partitions in the compartment 29 and a like arrangement of partitions is carried throughout the combined scrubbing and separator compartments—that is to say the partitions 49 in one compartment are alternately disposed with respect to the partitions in an adjacent compartment. Secured to a pair of partitions 49 and projecting from each face thereof are V-shaped guides 50 intended to push the material over the foraminous bottoms 40, the latter constituting a sifting surface. The guides 50 are formed of foraminous material open at their tops, of a height equal to the height of the compartment and communicating at their bottoms with the openings 51 formed in the bottom 40. The inclined sides of the guides 50 form means whereby the grain when shifted is not only deflected but also scrubbed, the matter removed from the grain passing through the guides and down through the opening 51 into the receiving compartment.

Owing to the shape of the guides 50 wedge-shaped pockets 52 are formed which facilitate the shifting of the grain owing to the fact that when the element moves the inclined surface will facilitate the grain being shifted from the guides, consequently overcoming the lodging of the grain between guides having straight surfaces.

Each of the deflectors 49 has both of its faces covered with foraminous material as at 53, consequently providing a roughened surface against which the grain is to contact and it is evident that such surfaces will tend to facilitate the cleaning or scrubbing operation. The walls of the compartment are also roughened for the same purpose as the roughened partitions and such provision is had by securing to the inner faces of the walls of the shell 25 foraminous material, as indicated by the reference character 54. Certain of the walls of the compartments are provided with guides 55 of the same structure and for the same purpose as the guides 50. The guides 55 communicate with the receiving compartment through the openings 56. Although but a pair of the walls of the compartment are shown as provided with guides, yet it is evident that all the walls may have the guides disposed thereon.

Each of the receiving compartments is provided with a plurality of partitions 57 arranged in staggered relation with respect to each other. The partitions 57 of one compartment are arranged in the same manner as the partitions 57 in another compartment. Certain of the partitions 57 have projecting from each face laterally-extending solid V-shaped guides 58 to push the material over the bottom 41 of the compartment. An-

other of the partitions 57 is formed with solid guides 59 which are substantially V-shaped, but project from one face thereof. The function of the guides 59 is the same as the guides 58. One of the walls of the receiving compartment is shown provided with solid V-shaped guides 60 for the same purpose as the guides 58, but it is evident that the other walls of the compartment can have the guides disposed thereon. The arrows upon Fig. 1 indicate the travel of the grain.

Owing to the manner in which the partitions and outlets of the scrubbing and separator compartments are disposed the grain is caused to travel in a sinuous manner in an alternate direction through the compartments—that is to say the grain will travel in one direction in a sinuous manner in one compartment, but in the compartment below, although the grain will travel in a sinuous manner, the direction will be opposite to that in the upper compartment and in connection with the roughened surfaces against which the grain impacts, and, owing to the gyratory motion imparted to the element 1, it is evident that the grain will be thoroughly and quickly scrubbed. Owing to the manner in which the outlets for the receiving compartments are arranged the dirt or other matter removed from the grain will be quickly discharged from the element 1, the guides as well as the partitions within the receiving compartments facilitating the discharge of the dirt from the compartments and the dirt from an upper receiving compartment will not enter a lower compartment.

It is evident from the foregoing construction and arrangement of parts that a machine is set up provided with a plurality of compartments which will not only scrub the grain so as to clean it, but also act as a means to separate the matter removed from the grain and furthermore such matter after being removed does not again come in contact with the grain during the travel of the latter as such matter is rapidly discharged from the machine, out of receiving compartments independent of the combined scrubbing and separating compartments.

What I claim is—

1. A grain scrubber comprising a combined scrubbing and separating compartment having imperforate side walls with the inner faces thereof roughened, said compartment further having a foraminous bottom formed with an outlet, and a closed top for said compartment having an inlet adapted to communicate with a source of supply.

2. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having imperforate side walls with the inner faces thereof roughened, said compartment further comprising a foraminous bottom, and V-shaped guides disposed in said

compartment of a height equal to the height of said compartment, suitably spaced apart and arranged in such relation with respect to each other as to provide substantially wedge-shaped pockets.

3. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, said bottom provided with a plurality of enlarged openings and hollow perforated V-shaped guides spaced from each other disposed in said compartment and communicating with the openings in said bottom.

4. A grain scrubber comprising a combined scrubbing and separating compartment adapted to have a gyratory motion imparted thereto and provided with an inlet and an outlet, said compartment having roughened walls and a foraminous bottom, partitions arranged in said compartment and disposed in staggered relation with respect to each other, and V-shaped guides projecting at an angle with respect to said partitions, suitably spaced apart and arranged in such relation with respect to each other as to form substantially wedge-shaped pockets.

5. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, and a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet and of the same area as the separating compartment, said compartments adapted to have a gyratory motion imparted thereto in unison.

6. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, V-shaped guides disposed in said compartment, said guides suitably spaced apart and of a height equal to the height of the compartment, and a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet and of an area equal to the area of the separating compartment.

7. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, said bottom provided with a plurality of enlarged openings and vertically-extending hollow perforated V-shaped guides disposed in said compartment said guides of a height equal to the height of the compart-

ment and suitably spaced apart thereby forming pockets for the material and communicating with the openings in said bottom, and a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet.

8. A grain scrubber comprising a combined scrubbing and separating compartment adapted to have a gyratory motion imparted thereto and provided with an inlet and an outlet, said compartment having roughened walls and a foraminous bottom, partitions arranged in said compartment and disposed in staggered relation with respect to each other, vertically-extending V-shaped guides within said compartment, certain of said guides projecting at an angle with respect to certain of the walls of said compartment and the other of said guides extending at an angle with respect to the partitions, said guides suitably spaced apart to provide pockets, and a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet and of an area equal to the area of said separating compartment.

9. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet and of an area equal to the area of the separating compartment, and a suction device communicating with the outlet of the receiving compartment.

10. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet of an area equal to the area of the separating compartment, partitions arranged within said receiving compartment and disposed in staggered relation with respect to each other, and V-shaped guides within said receiving compartment and arranged at an angle with respect to said partitions, said guides suitably spaced apart to form pockets.

11. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, V-shaped guides disposed in said

compartment and of a height equal to the height of said compartment, said guides suitably spaced apart to form pockets, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet and of an area equal to the area of the separating compartment, partitions arranged within said receiving compartment and disposed in staggered relation with respect to each other, and V-shaped guides within said receiving compartment and extending at an angle with respect to the partitions within said receiving compartment.

12. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, said bottom provided with a plurality of enlarged openings and hollow perforated V-shaped guides disposed in said compartment and communicating with the openings in said bottom, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet, partitions arranged within said receiving compartment and disposed in staggered relation with respect to each other, and V-shaped guides within said receiving compartment.

13. A grain scrubber comprising a combined scrubbing and separating compartment adapted to have a gyratory motion imparted thereto and provided with an inlet and an outlet, said compartment having roughened walls and a foraminous bottom, partitions arranged in said compartment and disposed in staggered relation with respect to each other, V-shaped guides within said compartment and of a height substantially equal to the height of said compartment, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet and of an area equal to the area of the separating compartment, partitions arranged within said receiving compartment and disposed in staggered relation with respect to each other, and V-shaped guides within said receiving compartment and extending at an angle with respect to the partitions in the receiving compartment.

14. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain through

said bottom, said receiving compartment having an outlet and of an area equal to the area of the receiving compartment, partitions arranged within said receiving compartment and disposed in staggered relation with respect to each other, V-shaped guides within said receiving compartment, and a suction device communicating with the outlet of the receiving compartment.

15. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, V-shaped guides disposed in said compartment, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain through said bottom, said receiving compartment having an outlet and of an area equal to the area of the separating compartment, partitions arranged within said receiving compartment and disposed in staggered relation with respect to each other, V-shaped guides within said receiving compartment said guides of a height equal to the height of their respective compartments, and a suction device communicating with the outlet of the receiving compartment.

16. A grain scrubber comprising a combined scrubbing and separating compartment having an inlet and an outlet and further having roughened walls and a foraminous bottom, said bottom provided with a plurality of enlarged openings and hollow perforated V-shaped guides disposed in said compartment and communicating with the openings in said bottom, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain, said receiving compartment having an outlet, partitions arranged within said receiving compartment and disposed in staggered relation with respect to each other, V-shaped guides within said receiving compartment, and a suction device communicating with the outlet of the receiving compartment.

17. A grain scrubber comprising a combined scrubbing and separating compartment adapted to have a gyratory motion imparted thereto and provided with an inlet and an outlet, said compartment having roughened walls and a foraminous bottom, partitions arranged in said compartment and disposed in staggered relation with respect to each other, V-shaped guides within said compartment, and suitably spaced apart thereby forming pockets, a compartment connected with and arranged below said combined scrubbing and separating compartment for receiving the matter separated from the grain through said bottom, said receiving compartment having an outlet and

of an area equal to the area of said receiving compartment, partitions arranged within said receiving compartment and disposed in staggered relation with respect to each other, V-shaped guides within said receiving compartment and suitably spaced apart thereby forming pockets, and a suction device communicating with the outlet of the receiving compartment.

18. A grain separator comprising a combined scrubbing and separating compartment provided with an inlet and an outlet and adapted to have a gyratory movement imparted thereto, said compartment having roughened walls and a foraminous bottom formed with a plurality of enlarged openings, and hollow perforated guides arranged within said compartment and communicating with the openings in the bottom.

19. A grain separator comprising a combined scrubbing and separating compartment provided with an inlet and an outlet and adapted to have a gyratory movement imparted thereto, said compartment having roughened walls and a foraminous bottom formed with a plurality of enlarged openings, partitions within said compartment disposed in staggered relation with respect to each other, said partitions having perforated guides carried by certain of said partitions and connected to certain of the walls of said compartment, said guides communicating with the openings in said bottom.

20. A grain separator comprising a combined scrubbing and separating compartment provided with an inlet and an outlet and adapted to have a gyratory movement imparted thereto, said compartment having roughened walls and a foraminous bottom formed with a plurality of enlarged openings, partitions within said compartment disposed in staggered relation with respect to each other, said partitions having roughened faces, hollow perforated guides carried by certain of said partitions and connected to certain of the walls of said compartment, said guides communicating with the openings in said bottom, and a compartment arranged below the combined scrubbing and separating compartment adapted to receive the matter separated from the grain, said receiving compartment having an outlet and moving in unison with said combined scrubbing and separating compartment.

21. A grain separator comprising a combined scrubbing and separating compartment provided with an inlet and an outlet and adapted to have a gyratory movement imparted thereto, said compartment having roughened walls and a foraminous bottom formed with a plurality of enlarged openings, partitions within said compartment disposed in staggered relation with respect to each other, said partitions having roughened faces, hollow perforated guides carried by

certain of said partitions and connected to certain of the walls of said compartment, said guides communicating with the openings in said bottom, a compartment arranged 5 below the combined scrubbing and separating compartment adapted to receive the matter separated from the grain, said receiving compartment having an outlet and moving in unison with said combined 10 scrubbing and separating compartment, and a suction device communicating with the outlet of the receiving compartment.

22. A grain scrubber comprising a plurality of combined scrubbing and separating 15 compartments each provided with a foraminous bottom constituting a sieve, a receiving compartment arranged below each of the combined scrubbing and separating compartments and adapted to receive the 20 matter separated from the grain, means for establishing communication between the combined scrubbing and separating compartments, a common conducting means for the separated material from the receiving 25 compartments, means within the combined scrubbing and separating compartments for causing the grain to travel in a sinuous manner, and perforated guides arranged in each of the combined scrubbing and separating 30 compartments and communicating with the receiving compartment, said guides of a height equal to the height of their respective compartments.

23. A grain separator comprising a combined scrubbing and separating compartment 35 having a foraminous bottom and provided with enlarged openings, and hollow V-shaped apertured guides arranged within said compartments and communicating with 40 the enlarged openings in said bottom said guides of a height equal to the height of said compartment.

24. A gyratory grain scrubber comprising combined scrubbing and separating compartments 45 each provided with an inlet and an outlet, and further having a foraminous bottom, a receiving compartment arranged below each of said combined scrubbing and separating compartments, a common conducting means communicating with the receiving 50 compartments for carrying off the separated material, hollow apertured V-shaped guides arranged in each of the combined scrubbing and separating compartments and communicating through the 55 bottoms of said compartments with the receiving compartments, and solid guides arranged within each of the receiving compartments, said guides of a height equal to the height of their respective compartments. 60

25. A gyratory grain scrubber comprising a combined scrubbing and separating compartment provided with hollow apertured V-shaped guides opening through the bottom 65 of said compartment, said guides of a

height equal to the height of said compartment.

26. A gyratory grain scrubber comprising a combined scrubbing and separating compartment having a foraminous bottom and 70 roughened walls, V-shaped guides disposed within said compartment, said compartment further provided with an inlet and an outlet, a receiving compartment arranged below the combined scrubbing and separating compartment 75 and adapted to receive the matter separated from the grain through said bottom, said receiving compartment having an outlet, and a suction device communicating with the outlet of the receiving compartment. 80

27. A gyratory grain scrubber comprising a combined scrubbing and separating compartment having a foraminous bottom and closed top formed with an inlet, said bottom 85 having an outlet at one corner, hollow perforated V-shaped guides disposed within said compartment and of a height substantially equal to the height of the compartment, a receiving compartment arranged below the combined scrubbing and separating compartment 90 and adapted to receive the matter separated from the grain through said bottom, said receiving compartment having an outlet at one corner, and partitions extending transversely of each of said compartments 95 and of less width than the width of their respective compartments, said receiving compartment of an area equal to the area of the separating compartment. 100

28. A gyratory grain scrubber comprising a combined scrubbing and separating compartment having imperforate side walls with a lining of foraminous material, said compartment further having a foraminous bottom, 105 partitions arranged within said compartment and having attached to each side thereof foraminous material, said separating compartment having a closed top provided with an inlet communicating with a source of 110 supply and said foraminous bottom cut away at one corner to provide an outlet for said compartment, a receiving compartment arranged below the combined scrubbing and separating compartment and adapted to receive 115 the matter separated from the grain through said bottom, said receiving compartment having an outlet at one corner, partitions arranged in said receiving compartment, and a suction device communicating 120 with the outlet of the receiving compartment.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHAS. E. MANOR.

Witnesses:

GEO. W. KENNEDY,
Jos. F. Tusing.