

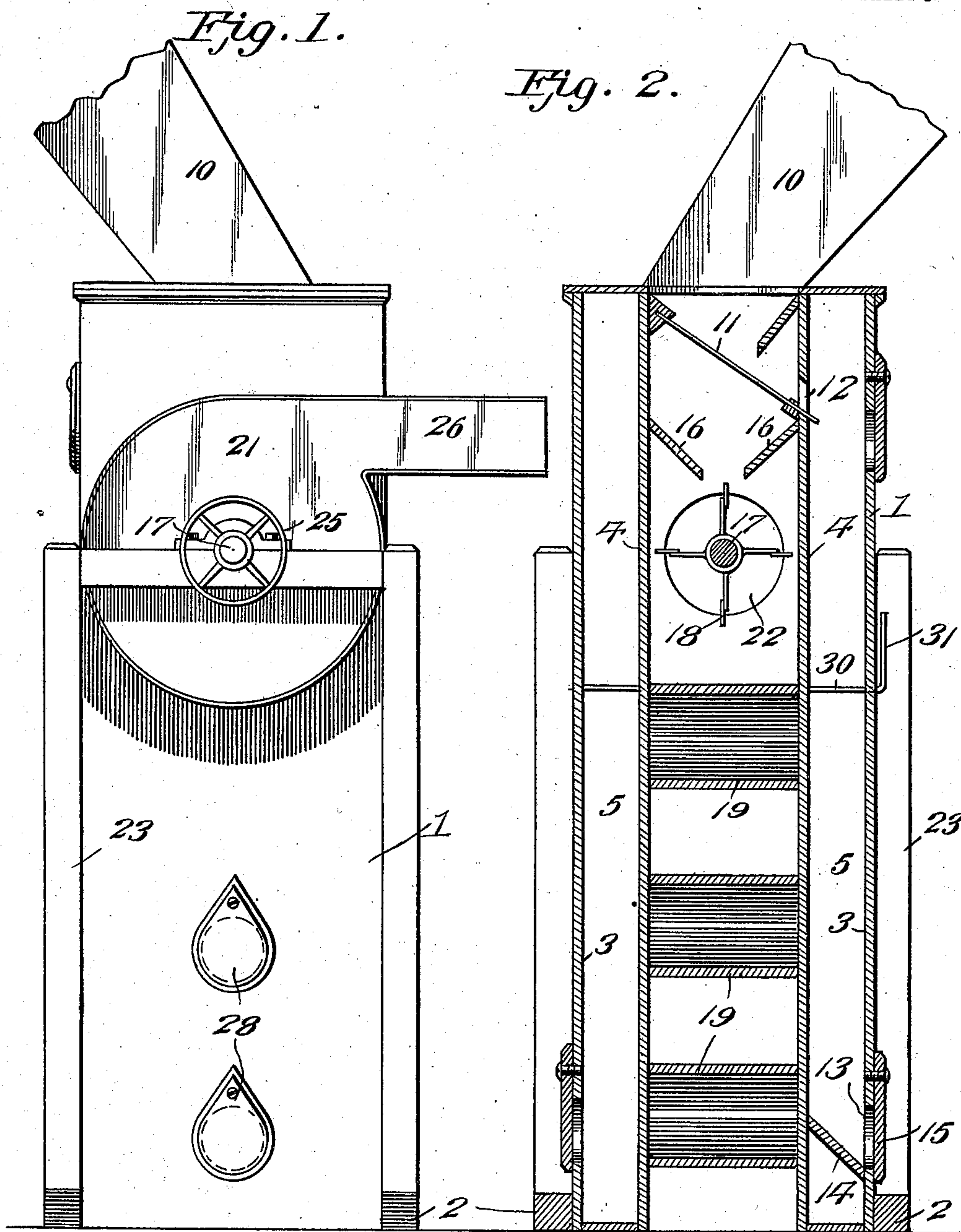
No. 867,880.

PATENTED OCT. 8, 1907.

W. C. HARMON.
GRAIN CLEANER AND SEPARATOR.

APPLICATION FILED JUNE 28, 1906.

2 SHEETS—SHEET 1.



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Fig. 3.

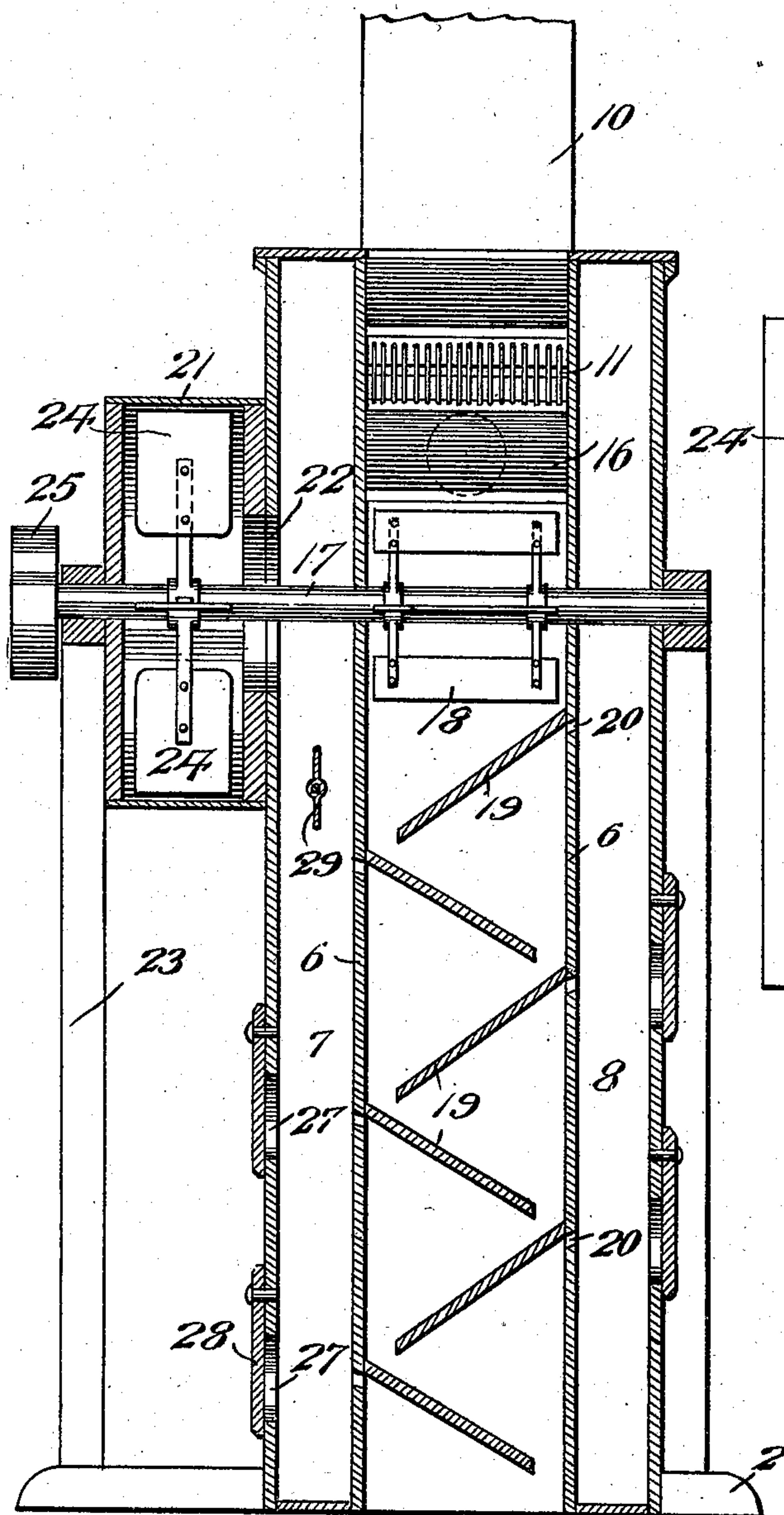
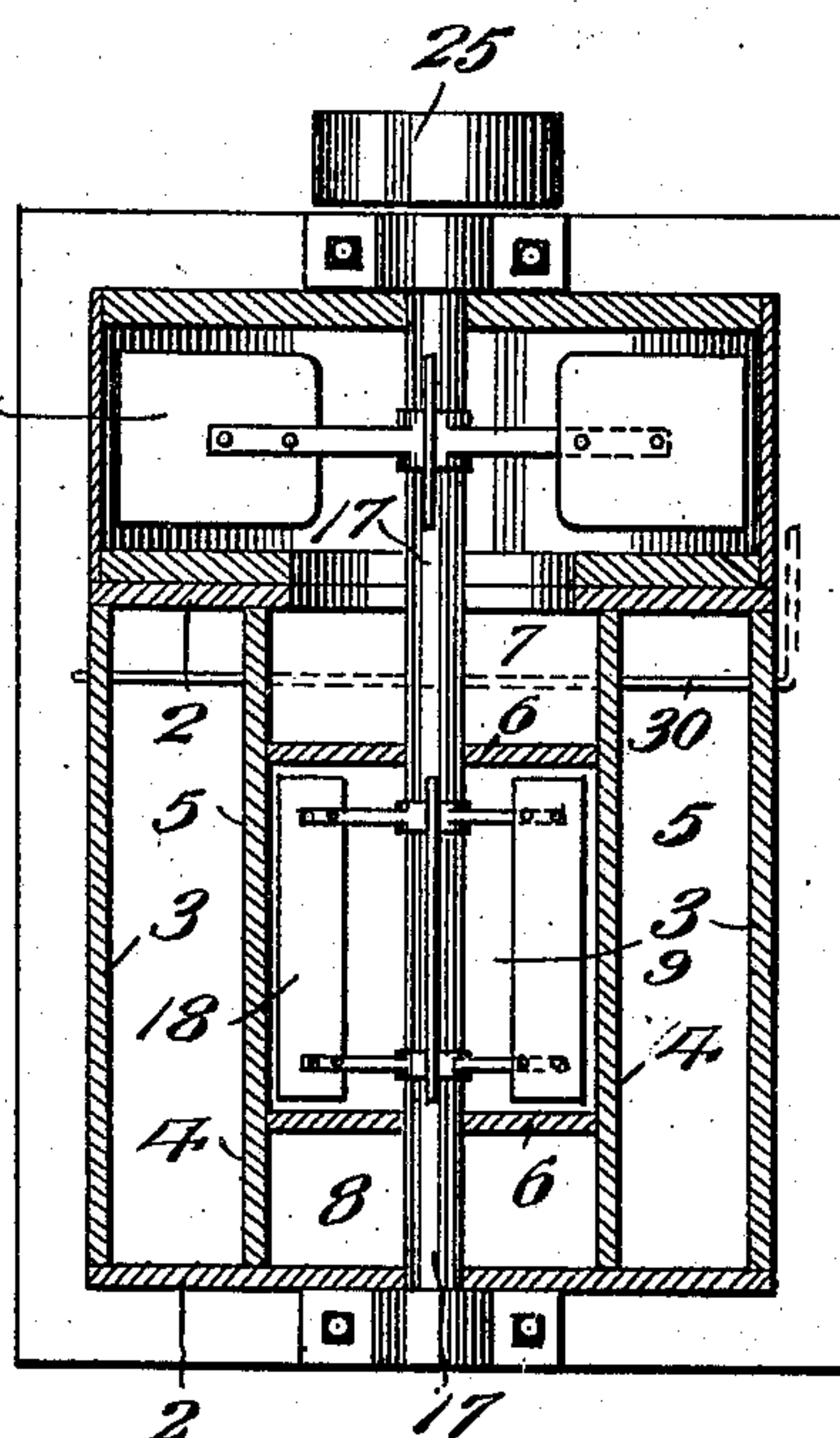


Fig. 4.



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GRAIN CLEANER AND SEPARATOR.

No. 867,880.

Specification of Letters Patent.

Patented Oct. 8, 1907.

Application filed June 28, 1906. Serial No. 323,761.

To all whom it may concern:

Be it known that I, WILLIAM C. HARMON, a citizen of the United States, residing at Seneca, in the county of Newton and State of Missouri, have invented new and useful Improvements in Grain Cleaners and Separators, of which the following is a specification.

The invention relates to an improvement in grain cleaners and separators, comprehending specifically a machine wherein is combined the cleaning and separating operation whereby the grain is separated from all refuse matter and thoroughly screened.

The main object of the present invention is the provision of a machine of this type in which the grain is continually subjected, during its passage through the machine, to a separating operation and to a current of air designed to draw from the material the refuse and light matter, the separating operation rendering the mass more readily influenced by the air currents while at the same time tending to clean or scour the grain.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a view in elevation of a separator constructed in accordance with my invention, Fig. 2 is a vertical section of the same, Fig. 3 is a similar view taken at right angles to the section of Fig. 2, Fig. 4 is a transverse section on the line 4—4 of Fig. 3.

Referring to the drawings, wherein like parts are indicated by similar reference numerals throughout the several views my improved cleaner and separator comprises a box-like casing 1 of the desired length, supported at the lower end in a base plate 2 and closed at the upper end.

The casing is preferably square in cross section including side walls 2 and end walls 3, which are secured together in any substantial manner. The casing is interiorly divided by vertically disposed spaced partitions 4, extending in parallel relation to the end walls 3 thereof. The partitions 4 are so arranged relative to the end walls of the casing as to provide refuse receiving spaces or chambers 5 between said partitions and the end walls. The partitions 4 are connected by transversely disposed partitions 6, extending throughout the length of the casing and arranged in parallel relation to the respective side walls of the casing. The partitions 6 are spaced from the side walls of the casing to provide intermediate air spaces 7 and 8, and are so disposed relative to each other as to include a separating chamber 9 bounded by the partitions 6 and the included sections of the partitions 4, as clearly shown in Fig. 4. The separating chamber 9 is in open communication at the upper end with a grain spout 10, designed to deliver the material to said chamber, and within the chamber immediately below the mouth of the spout is arranged a screen or riddle 11, preferably composed of parallel bars spaced apart to permit the

passage of the grain between them but to receive and support the larger refuse. The riddle 11 is inclined transverse the width of the separating chamber and at the lower end projects through an opening 12 formed in one of the partitions 4, the lower or discharge end of the riddle extending within the refuse chamber 5, so as to direct the refuse supported by the riddle into said chamber. The lower portion of the chamber is provided with an outlet 13 by forming an opening in the approximate wall of the casing, the refuse chamber adjacent the outlet having an inclined bottom 14 to direct the refuse through the opening. A closure 15 is provided whereby the escape of the refuse may be controlled as desired.

Below the riddle the partitions 4 are provided with oppositely arranged downwardly and inclining deflector plates 16, spaced apart at their inner or free ends to direct the grain passing through the riddle toward the center of the separating chamber.

A shaft 17 projects through the casing, being supported in a suitable framework projecting from the base plate 2, and constituting the operating shaft of the separator. The shaft extends through the partitions 6 and centrally through the separating chamber, being within the plane of said chamber provided with blades 18 supported at the ends of spider arms fixed to the shaft, the blades being approximately of the full width of the chamber. The shaft is disposed immediately below the deflector plates 16, so that the grain passing over said plates will be engaged and spread by the revolving blades 18. Below the separating blades the partitions 6 of the separating chamber are provided with guide plates 19 alternately connected to the opposing partitions and extending in reversely inclined directions therefrom, the free edge of one plate being spaced from the proximate partition and disposed above the upper or supported end of the next succeeding plate. As the plates 19 are of the full width of the separating chamber, the construction described provides a tortuous passage for the grain below the separating blades, as will be evident. Each partition 6 immediately below the connection thereto of each plate 19 is formed with a transversely arranged opening 20, providing for communication between the separating chamber and the air chambers 7 and 8, as will be apparent from Fig. 3 of the drawings. The separating chamber is preferably open at bottom to provide for the escape of the grain, and is designed to be arranged for coöperation with any suitable form of conveyer, whereby the grain after treatment may be conveyed to a place of deposit.

Fixed to the side wall 2 of the casing forming a wall of the air chamber 7 is a fan case 21, so arranged as to be in open communication with the air chamber 7 through the medium of openings 22 formed in the proximate side wall of the casing and in the contacting wall

of the fan casing. The shaft 17 is of a length to extend through the fan case, being revolvably supported therebeyond in a standard 23 projecting from the base plate. Within the fan case the shaft 17 is provided with a series of vanes 24 forming a suction fan, and the end of the shaft 17 beyond the fan case is provided with a suitable belt wheel, as 25, for connection with a source of power. The fan case 21 is provided with a walled outlet or chute 26 preferably extending from the upper edge of the case and in alinement with the plane of operation of the fan. The wall 2 of the casing forming the outer wall of the air chamber 7 is formed with a series of openings 27, to provide for the admission of air to the chamber, said openings being normally closed by any desired form of valve 28, whereby to regulate the quantity of air admitted through the openings 27. A cutoff valve 29 is pivotally supported in the air chamber 7 being of a size to completely fill the chamber when arranged in cutoff position, the valve is preferably in the form of a rectangular plate centrally supported upon a rod 30 extending through the end walls 3 of the partition and provided beyond one of said end walls with a handle 31 whereby to operate the cutoff as desired.

In operation the grain admitted through the chute 10 is directed onto the riddle 11, passing therethrough together with the smaller particles of refuse. The main portion of the refuse, however, is separated from the grain and directed into the refuse chamber 5. The grain with the smaller particles of refuse is directed by the deflector 16 onto the revolving separator blades 18, and effectively spread by the action of said blades. The material passes from the separator blades onto the guide plates 19, and travels down said blades in succession throughout the length of the separating chamber. The fan 24 creating a suction in the air chamber 7, will, through the openings 20 draw the lighter portions of the refuse through said openings, into the chamber 7, into the fan case and out through the conductor or chute 26. As the descending mass of grain is thus subjected to the action of the air current many times

during its progress through the separating chamber it is obvious that the grain will be thoroughly cleansed of all refuse and will be delivered to the conveyer in a clean condition.

The action of the separator blades 18 as well as frictional contact of the grain with the guiding plates will tend to thoroughly clean or scour the kernels of grain, the material thus removed being withdrawn by the air current as is the other refuse.

The machine as a whole is readily adapted for handling various classes of grain, as the air inlets 27 and the cut-off 29 may be manipulated to control the force of the air current to the desired extent.

It is to be particularly noted in connection with the construction described that the cleaning and separating operation is entirely automatic and that the machine once in operation requires no further attention, as all material once introduced is compelled to follow the same course and is continuously and successively subjected to a cleaning and separating operation in its passage through the machine.

Having thus described the invention what is claimed as new, is:—

A grain separator comprising an inclosed separating chamber, refuse chambers extending throughout the length of the sides of the separating chambers and beyond the end walls thereof, a screen supported in the upper end of the separating chamber and inclining toward and terminating within one of the refuse chambers, a revolving spreader mounted in the separating chamber below the screen, a series of alternately and reversely inclined guide plates arranged within the separating chamber, air chambers arranged at the ends of the separating chamber and between the projecting ends of the refuse chambers, said air chambers being in communication with the separating chamber through openings formed in the walls of the latter adjacent the connected ends of the guide plates, and means for creating a suction in the air chambers.

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

WILLIAM C. HARMON.

Witnesses:

L. B. BRINSON,
W. E. ROGERS.