(No Model.) 2 Sheets—Sheet 1.

A. HEINE.

COMBINED GRAIN SCOURER AND DUST COLLECTOR.

No. 499,385. Patented June 13, 1893.

Fig. 2.

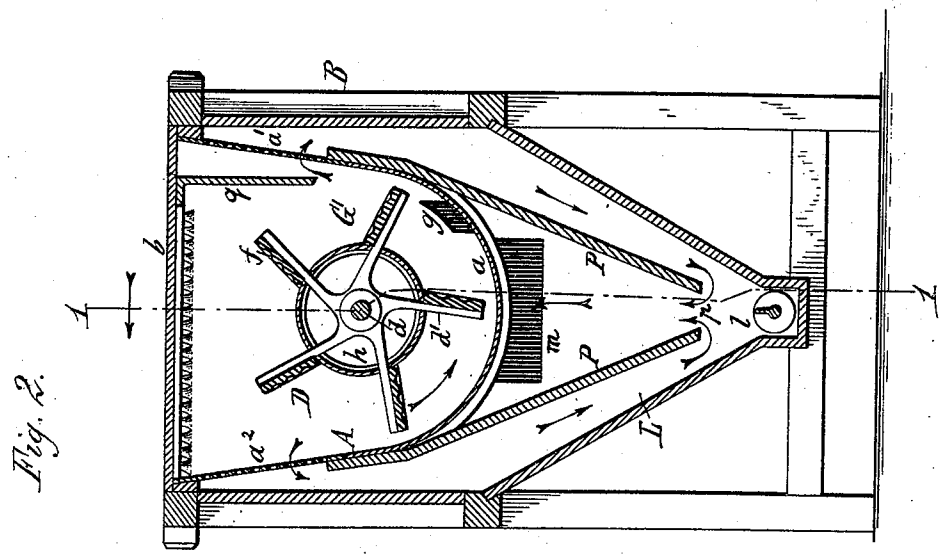
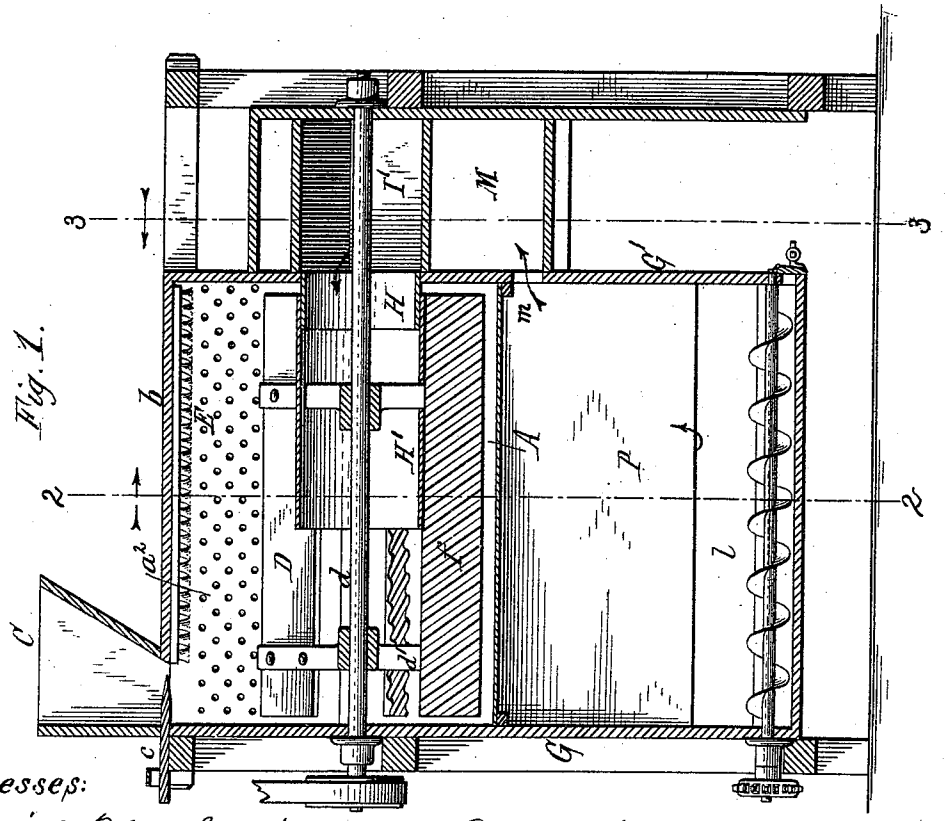


Fig. 1.



Witnesses:
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(No Model.) 2 Sheets—Sheet 2.

A. HEINE.

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Fig. 3.

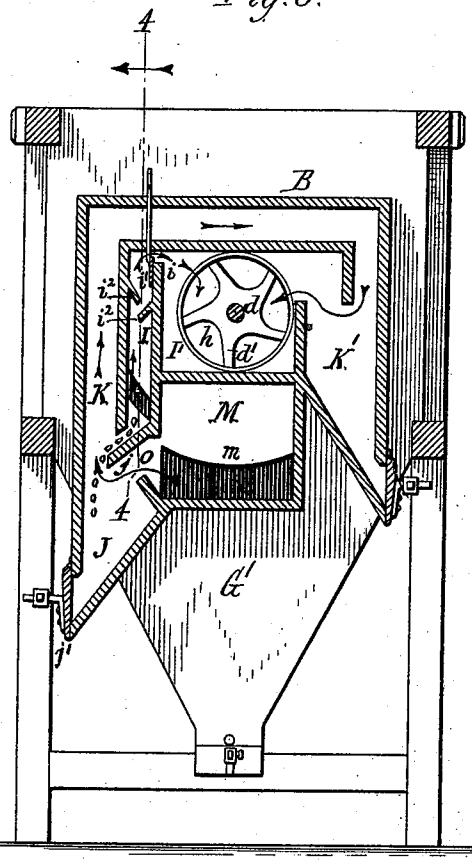


Fig. 5.

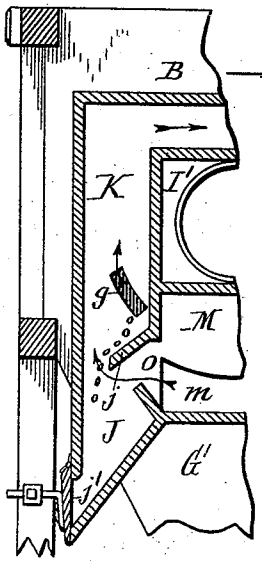
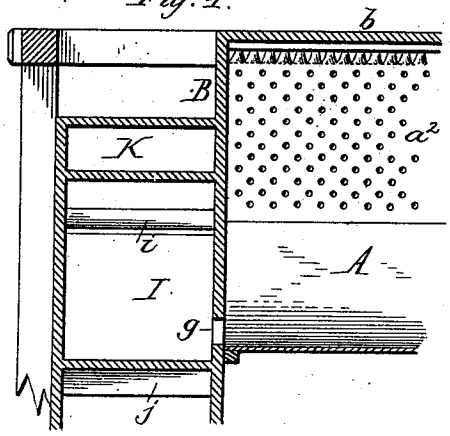


Fig. 4.



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UNITED STATES PATENT OFFICE.

AUGUST HEINE, OF SILVER CREEK, NEW YORK.

COMBINED GRAIN-SCOURER AND DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 499,385, dated June 13, 1893.

Application filed March 9, 1893. Serial No. 465,234. (No model.)

To all whom it may concern:

Be it known that I, AUGUST HEINE, a citizen of the United States, residing at Silver Creek, in the county of Chautauqua and State of New York, have invented new and useful Improvements in a Combined Grain-Scourer and Dust-Collector, of which the following is a specification.

This invention relates to improvements in that class of combined grain scouring machines and dust collectors which are so constructed that the air currents are confined within the machine, so that a circulation of air is maintained in the machine and practically no air is drawn into the machine and none discharged therefrom.

The objects of this invention are to increase the efficiency of this class of machines and to simplify the construction thereof.

In the accompanying drawings consisting of two sheets:—Figure 1 is a longitudinal sectional elevation of my improved machine, the plane of section being indicated by line 1—1, Fig. 2, and the view being taken in the direction of the arrow crossing said line above that figure. Fig. 2 is a vertical cross section of the machine in line 2—2, Fig. 1, the view being taken in the direction of the arrow crossing the line 2—2, above that figure. Fig. 3 is a vertical cross section of the machine in line 3—3, Fig. 1, the view being taken in the direction of the arrow crossing the line 3—3, above that figure. Fig. 4 is a fragmentary longitudinal section of the rear portion of the machine in line 4—4, Fig. 3, the view being taken in the direction of the arrow crossing the line 4—4, above that figure. Fig. 5 is a fragmentary cross section, similar to Fig. 3, showing the machine provided with a single air leg, instead of the two air legs shown in Fig. 3.

Like letters of reference refer to like parts in the several figures.

A represents the scouring case arranged horizontally in the upper portion of the machine below the deck or top plate *b* of the inclosing frame B of the machine. The lower portion *a* of the scouring case is semi-cylindrical in form and imperforate, while its side portions a' a^2 which extend upwardly to the top plate *b* are perforated.

C represents the feed hopper which delivers the grain to be scoured into the scouring case at one end thereof and which is provided with a slide *c*, or some other suitable feed device, by which the delivery of the grain into the scouring case is regulated.

d represents a horizontal shaft which extends through the scouring case, and D represents beaters which are arranged lengthwise in the scouring case and secured to the shaft by spiders d'. The beater shaft is arranged axially, or nearly so, with reference to the lower semi-cylindrical portion of the scouring case, so that the beaters rotate in proximity to the lower portion of the case while they are farther removed from the upper portions of the case and from the top plate of the machine which forms also the top of the scouring case. This plate may be provided on its under side with brushes E, as shown, or with some other suitable scouring device, for instance, corrugated plates. The beaters are obliquely corrugated or ribbed on their faces, as shown at *f*, in the proper direction to propel the grain from the inlet end of the scouring case toward the opposite end thereof. These corrugations or ribs may be rectangular, rounded or otherwise shaped in cross section, as may be preferred.

G represents the upright head wall or board of the machine which closes the head end of the scouring case and extends to a considerable distance below the same. G′ represents a similar vertical wall which closes the rear end of the scouring case. This rear wall is provided adjacent to the lower portion of the scouring case with an opening *g* through which the scoured grain is discharged from the latter. The rear wall is also provided with an opening *h* arranged concentrically with the beater shaft and made of such diameter that the beaters are arranged farther from the axis of rotation than the edge of this opening, so that the rotation of the beaters propels the air contained in the scouring case outwardly and draws the air into the scouring case through this opening or eye *h*. The latter is provided with a short tube or collar H which is secured therein and projects into the scouring case, and the beaters are provided on the inner sides of their tail portions with a tube H′ which surrounds at its tail end the collar H. The latter prevents the escape of grain

through the eye h and also conducts the inflowing air into the tube H′, which latter in turn delivers the air near the middle of the length of the scouring case and so serves to distribute the air lengthwise through the same.

I represents an ascending air leg which is arranged in rear of the grain discharge opening g of the scouring case and into the lower portion of which the grain is discharged from said opening. This air leg communicates at its upper end by a narrow opening i with an air chamber I′ arranged in rear of the eye h of the scouring case, so that a slight ascending air current can pass upwardly through the leg I and into said eye. The opening i is controlled by an adjustable valve i' and the leg is preferably provided below said valve with oblique partitions i^2 which intercept any heavy material which may be lifted by the air current flowing upwardly through said leg. The latter is provided at its lower end with an inclined shelf j upon which the grain falls and from which it drops into a receiving hopper J which is provided with an automatic valve j' by which the grain is discharged.

K represents an ascending air leg which is arranged on the outer side of the air leg I and which communicates at its lower end with the air leg I and the hopper J, and which extends horizontally over the top of the air leg I and the air chamber I′ to the opposite side of the machine, where it descends to a chess hopper K′ and then takes an upward turn and opens into the air chamber I′.

L represents the dust separating chamber arranged below the scouring case and extending upwardly on the outer sides of the upper perforated portions of the scouring case to the top of the machine. The lower walls of this dust separating chamber preferably converge downwardly to a conveyer l, or other device by which the separated dust is removed.

m represents the air escape opening of the dust separating chamber, formed in the rear wall G′ thereof, below the rear portion of the scouring case, and opening into an air chamber M which is located below the air chamber I′ and which communicates by an opening O with the grain receiving hopper J.

P represents deflecting boards which extend from the lower portions of the scouring case downwardly into the dust separating chamber and which are fitted with their front and rear ends to the front and rear walls G G′ thereof and separated at their lower ends by an opening p. The upper portions of these deflecting boards are arranged outside of the air escape opening m of the dust separating chamber.

q is a deflecting board or curtain arranged at a short distance inwardly from the perforated wall a' on that side of the scouring case on which the beaters have an upward movement. This curtain prevents the beaters from drawing in air on that side of the scouring case through the perforated wall a', which might take place in the absence of the curtain by reason of the trend of the air current in the upper portion of the scouring case toward the opposite wall a^2 thereof.

In the operation of this machine, the beaters operate at the same time as part of the scouring mechanism and as fan blades by which the air current is set in motion which circulates in the machine. The grain, which is delivered into the scouring case at one end thereof, is scoured in its passage through the scouring case, and the liberated dust is driven through the perforated portions of the scouring case, together with the air set in motion by the beaters, into the upper portions of the dust separating chamber on the outer sides of the perforated portions of the scouring case. The dust and the air descend in the dust separating chamber and the air is compelled by the deflecting boards P to travel nearly to the lower portion of the dust separating chamber, where the air takes an upward turn and passes upwardly through the opening p between the lower ends of the deflecting boards and ascends through the space between said boards to the air outlet opening m, through which it passes into the air chamber M. From the latter it passes through the opening O, which is located underneath the inclined shelf j, into the upper portion of the grain receiving hopper J, where it passes upwardly around the lower edge of the inclined shelf j over which the grain escapes downwardly. The air now takes an ascending course and carries off the dust and other light material which is commingled with the escaping grain and then flows upwardly through the air leg K to the eye h of the scouring case, depositing on its way the heavier grade of the material in the chess hopper K. A slight air current is drawn upwardly through the inner air leg I and passes through the opening i thereof to the eye of the scouring case. This air current carries with it the light dust which it has separated from the grain escaping through the discharge opening of the scouring case. The relative force of the volume of the air currents passing upwardly through the outer air leg K and inner air leg I can be regulated by the valve i' of the inner air leg. If desired, the inner air leg I may be omitted, and the grain may be discharged from the opening g directly into the air leg K, as represented in Fig. 5.

It is obvious that the grain can be moved lengthwise through the scouring case in a well known manner by oblique ribs secured to the interior of the scouring case.

I claim as my invention—

1. The combination with a scouring case having an eye for the admission of an air current and exits for the escape of the dust and air, of revolving beaters which operate upon the grain in the scouring case and draw the air current into the scouring case through said eye and expel the air and dust through

said exits, and a dust separating chamber receiving the dust and air from said exits, and having an air outlet which is connected with the eye of the scouring case and whereby the air is returned to the scouring case through said eye, substantially as set forth.

2. The combination with a scouring case having exits for the escape of the dust and air, a grain inlet at one end, a grain outlet at the other end, and an eye for the admission of an air current at the same end at which the grain outlet is located, of revolving beaters arranged within the scouring case, and a dust separating chamber which receives the dust and air from said exits and which has its air outlet connected with the eye of the scouring case, substantially as set forth.

3. The combination with a scouring case having exits for the escape of the dust and air, a grain inlet and a grain outlet, and an eye for the admission of an air current, of revolving beaters arranged within the scouring case, a dust separating chamber which receives the air and dust from said exits, and an air leg which receives the grain from the scouring case and which communicates at its lower end with the air outlet of the dust separating chamber and at its upper end with the eye of the scouring case, substantially as set forth.

4. The combination with a scouring case having exits for the escape of the dust and air, a grain inlet and a grain outlet, and an eye for the admission of an air current, of revolving beaters arranged within the scouring case, a dust separating chamber which receives the air and dust from said exits, an inner air leg receiving the grain from the scouring case and connected at its upper end with the eye thereof, and an outer air leg which receives the grain from the inner air leg and communicates at its lower end with the air outlet of the dust separating chamber and at its upper end with the eye of the scouring case, substantially as set forth.

5. The combination with the scouring case having exits for the escape of the dust and air, a grain inlet and a grain outlet, and an eye provided with a collar projecting into scouring case, of revolving beaters arranged within the scouring case, a tube rotating with said beaters and communicating with said collar, and a dust separating chamber, substantially as set forth.

6. The combination with the scouring case having perforated side walls, a grain inlet a grain outlet and an eye for the admission of an air current, of revolving beaters arranged within the scouring case, and a dust separating chamber inclosing the perforated walls of the scouring case and having its air outlet connected with the eye of the scouring case, substantially as set forth.

7. The combination with the scouring case having an imperforate lower portion, perforated side walls, a grain inlet, a grain outlet, and an eye for the admission of an air current, of revolving beaters arranged within the scouring case, a dust separating chamber inclosing the perforated walls of the scouring case, deflecting boards depending from the imperforate portion of the scouring case into the dust separating chamber, and air passages leading from the lower portion of the dust separating chamber into the space between the deflecting boards and from the upper portion of said space to the eye of the scouring case, substantially as set forth.

8. The combination with the scouring case having perforated side walls, an eye for the admission of an air current, and beaters revolving in said case, of a curtain arranged in said case near the inner side of the perforated wall near which the beaters have an upward movement, and a dust separating chamber inclosing the perforated walls of the scouring case, substantially as set forth.

Witness my hand this 6th day of March, 1893.

AUGUST HEINE.

Witnesses:
S. U. NEWTON,
JOE NAGLE.