

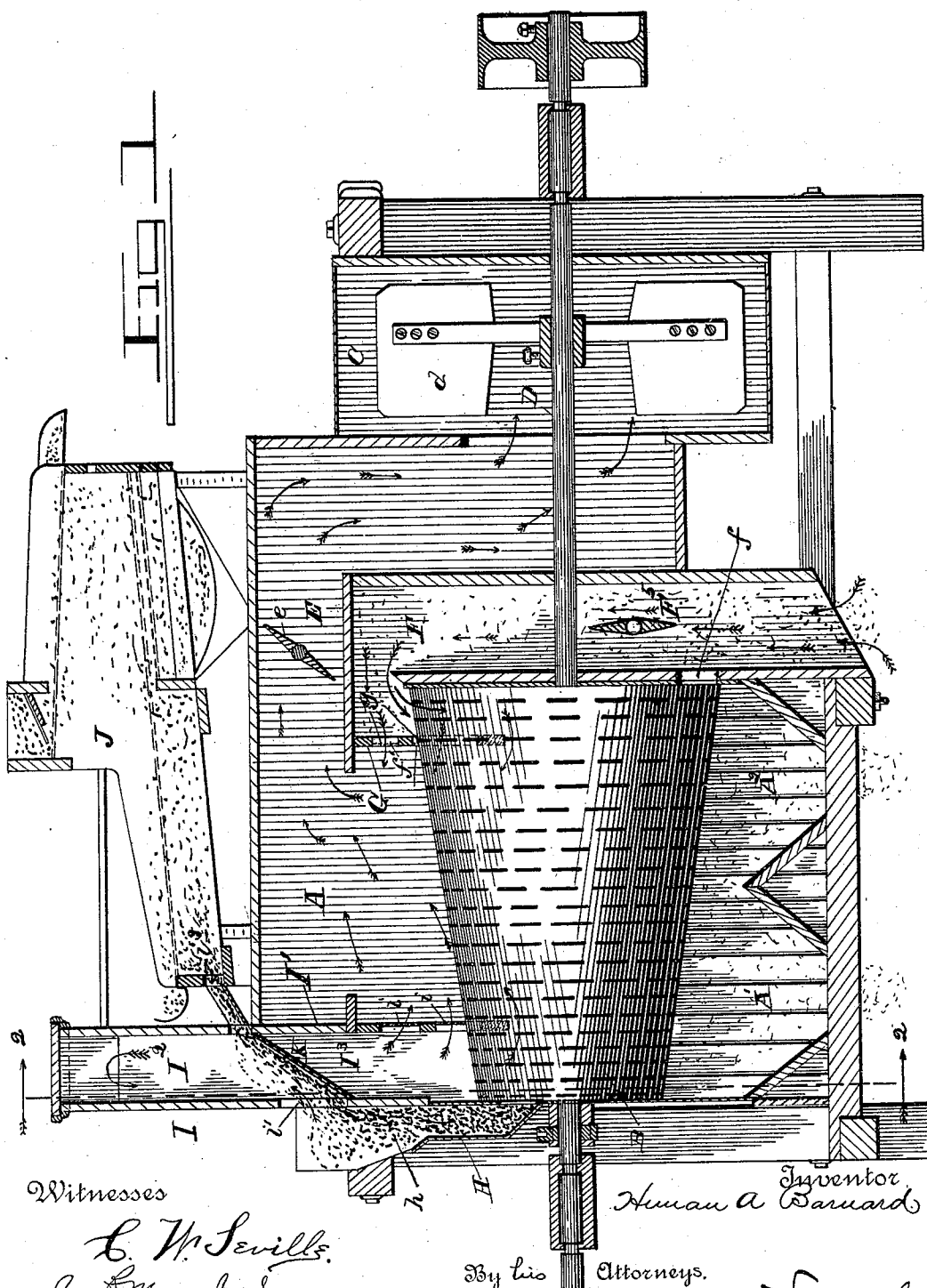
(No Model.)

3 Sheets—Sheet 1.

H. A. BARNARD.
GRAIN SCOURER.

No. 485,525.

Patented Nov. 1, 1892.



Witnesses

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Heman A. Barnard Inventor

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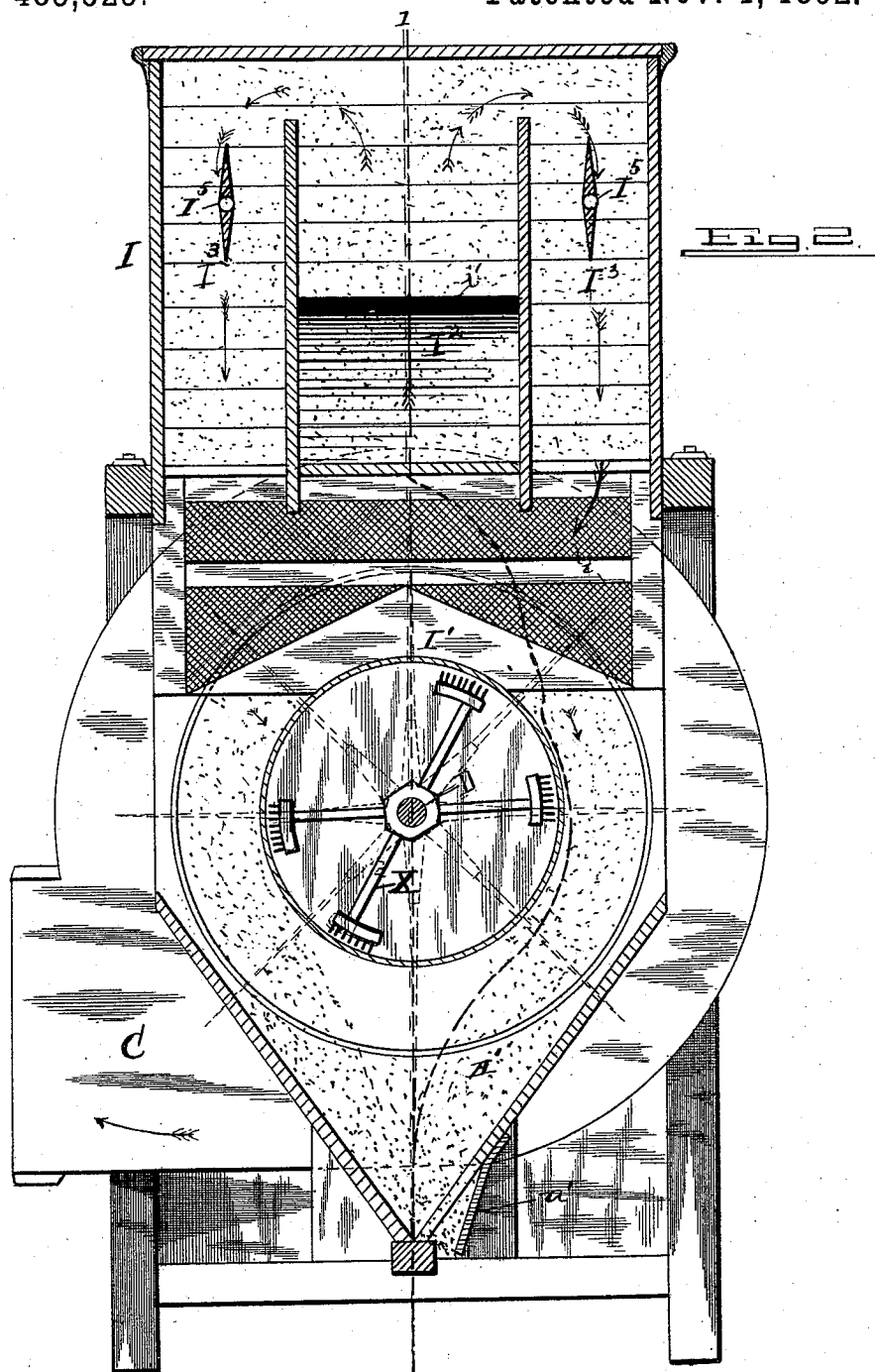
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WITNESSES
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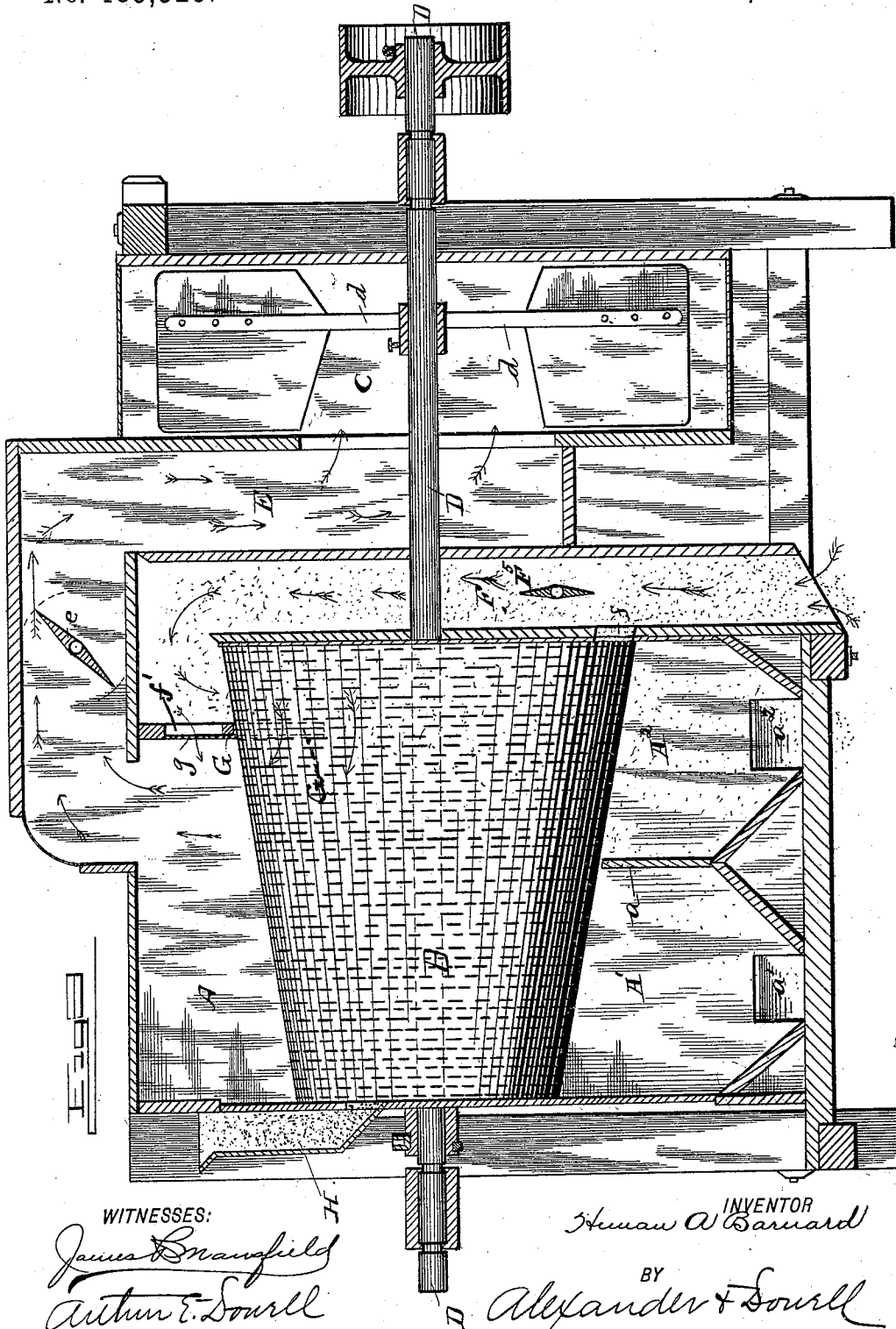
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WITNESSES:

James Brangfield
Arthur E. Sourell

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UNITED STATES PATENT OFFICE.

HEMAN A. BARNARD, OF MOLINE, ILLINOIS, ASSIGNOR TO THE BARNARD & LEAS MANUFACTURING COMPANY, OF SAME PLACE.

GRAIN-SCOURER.

SPECIFICATION forming part of Letters Patent No. 485,525, dated November 1, 1892.

Application filed July 2, 1892. Serial No. 438,742. (No model.)

To all whom it may concern:

Be it known that I, HEMAN A. BARNARD, of Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Grain-Scourers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The present invention is an improvement in grain-scouring machines; and its objects are to utilize the chamber wherein the scouring is effected for separating the dust and screenings and for depositing and collecting the latter, and to so construct the machine that it can, if desired, be made so as to subject the material being screened to the action of two separating air-currents—one before and one after scouring—or to one only of such currents, and the resulting screenings be separated from the dust and collected and discharged from the machine separately or together, while the scoured material and dust are discharged separately, also.

The invention consists in the novel construction and arrangement of the scouring-chamber, air-passages, separating-trunks, and devices and fan, whereby said chamber forms a part of the air-passage, a double or single screen-box, and a dust-chamber. The material is scoured in said chamber and discharged, the dust, screenings, and scourings from both separating-trunks and scouring-case drawn into it, but the dust withdrawn therefrom by the outflowing air-current, and the screenings deposited in it, but discharged therefrom by automatic valves.

Referring to the drawings by letters of reference marked thereon, Figure 1 is a central vertical longitudinal section through my improved grain-scouring machine having two separating-trunks, on line 1 1, Fig. 2. Fig. 2 is a vertical transverse section of the same on line 2 2, Fig. 1. Fig. 3 is a vertical longitudinal central sectional view through a machine having but one separating-trunk.

A represents the main chamber, which is closed on all sides, except as hereinafter mentioned.

B is a conical scouring-case of ordinary construction lying horizontally, longitudinally, and about centrally of said chamber.

C is a fan-chamber located at the end of chamber A adjoining the larger or discharge end of case B, and D is the main shaft, extending centrally through the fan-chamber and case B, carrying a fan *d* in chamber C and beaters X X in the case. Said shaft is journaled in bearings on the main frame, as indicated in the drawings.

E is an air-passage leading from the top and center of chamber A down to the fan-chamber, and *e* is a valve in the upper end of said passage by which the current of air may be regulated.

F is a vertical air-trunk between passage E and end of chamber A, into which the scoured material is discharged from a case B through an opening *f* in the end of wall of chamber A, as shown. The upper end of trunk F communicates with the interior of chamber A through a lateral opening *f'*; but the air-current passing therethrough is deflected downward upon and beside the case B by means of a vertical shallow partition G, having openings in it, which are partially closed by fine screens *g* of any suitable material, the object of which is to weaken the air-current from trunk F at this point by permitting part of the air to escape through the screens into chamber A and thence almost directly into passage E, while another part of such current is obliged to descend more or less into said chamber, as indicated by the arrows in Figs. 1 and 3. It will be obvious from the drawings that the fan will suck a current of air through trunk F into chamber A and thence through passage E into the fan-chamber, the volume of the current being regulated by valve *e*.

H is a feed-spout for conducting material into case B.

I, Fig. 1, indicates an air-trunk at the front end of chamber A and above the case. The said trunk is closed at top; but its bottom is open and extends into chamber A somewhat below the top of the case, the lower end of its inner wall I' fitting thereover, as shown in Fig. 2, and also having transverse openings, which are partly closed by fine screens *i* for

the purpose of weakening the air-currents descending through said trunk as they enter chamber A, as indicated by the arrows, Fig. 1. This trunk, as shown, is divided into three vertical flues—a large central flue I² and two smaller side flues I³. In the front wall of the trunk is an opening *i'*, through which air enters and rises through flue I² and passes thence down through flues I³ into chamber A. J designates a shoe of any suitable construction, mounted on the frame above chamber A and in rear of trunk I. This shoe discharges into flue I² through an opening *i*³ in the rear wall of trunk I, and the material falls through said flue onto a chute K therein, by which it is directed through opening *i'* into the mouth of a hopper *h*, from whence it is conducted into the case through spout H. The suction of fan *d* creates an air-current up through flue I², down through flues I³ into chamber A, and thence into the fan-chamber through passage E, as above described. The lower portion of chamber A has converging walls, so as to collect matters deposited therein. As shown, it is formed with two bins A' A², respectively adapted to catch screenings drawn into chamber A through trunks F and I, respectively. Any collected matters in said bins may be automatically discharged through flap-valves *a'* *a*² in the sides of said bins.

The operation is as follows, viz: The grain or other material is discharged from the vibrating shoe J through opening *i*³ into the flue I² of the first separating-trunk I, where the light screenings are drawn up said flue, while the grain passes through said flue into the small hopper *h* and thence through spout H into the screening-case B, where it is scoured by the action of the beaters, (not shown in drawings,) and then discharged at the opposite end of case B through the opening *f* into the second trunk F, where it is again subjected to the action of the uprising air-current in said trunk, and finally discharged from said trunk clean and in condition for grinding. The screenings drawn up flue I² are carried into and down flues I³ into chamber A and, striking on top of case B, pass down each side thereof into the hopper A', while the screenings drawn through trunk F are similarly discharged into chamber A and collected in hopper A'. The screenings are prevented from being drawn into passage E by the weakening of the air-currents through screens *i g*, by which the currents of air escaping directly or freely into chamber A are so weakened that the screenings, which are heavier than the dust, are deposited in the chamber; but the dust and lighter impurities are drawn out through passage E. The air-currents of course weaken as they expand in chamber A, and the screens *i g* by allowing part of the incoming currents to take more direct course to flue E cause the air in chamber A to be broken into numerous small eddies, which assist in causing the deposit of

screenings. The scourings are drawn out through passage E by the weakened currents entering chamber A through the trunks. The action of the screenings on the outside of the scouring-case, in combination with the inflowing and surrounding currents of air, prevents clogging of the openings in the case by deposit of dust and scourings thereon. When but one separation is desired, trunk I and the shoe may be dispensed with, as indicated in Fig. 3, the grain entering the case directly through spout H. If desired, flues I³ and trunk F may be provided with valves I⁵ and F⁵, respectively, for independently regulating the relative volume of velocity of the air-currents therethrough, so that with the machine shown in Fig. 1 either of said trunks may be cut out of operation. If desired, a transverse partition *a* may be put in chamber A, so as to certainly prevent commingling of the screenings drawn therein from trunks I E, as shown in Fig. 1, though this is not actually necessary.

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

1. The combination of an air separating device, a settling-chamber having openings for the admission of air-currents containing screenings or other impurities derived from said separating device and separate openings for the escape of the said current and deposited screenings with a scouring device located in said chamber, means for separating the screenings from said current within said chamber, and a fan for creating said current, substantially as described.

2. In a grain-scourer, the combination of an air separating device, a settling-chamber having openings for the admission of an air-current containing screenings and other impurities derived from said separating device, and separate escape-openings for the deposited screenings and air-current with a scouring device in said chamber into which the grain from the air separator is passed for scouring such grain and discharging the scouring-dust in said chamber and means for separating the screenings from the air-current while passing through said chamber, substantially as and for the purpose set forth.

3. In a combined grain separator and scourer, the combination of an air-trunk and a fan for separating the heavy impurities or screenings by a current of air with a chamber having openings for the admission of the air-current from said trunk and for the exit of the screenings and air-current separately and a scouring device in said chamber receiving the grain passed through said trunk, substantially as described.

4. In a grain-scourer, the combination of an air-current separating device, a settling-chamber into which the air-current from said separating device is discharged, and a grain-scourer in said chamber receiving the grain from said device, substantially as described.

5. In a grain-scourer, the combination of an air-current separating device, a settling-chamber into which the air-current from said separating device is discharged, and a grain-scourer in said chamber receiving the grain from said device, and means for causing the deposit of screenings from said current in said chamber and for withdrawing the same separately therefrom, substantially as specified.

6. In a combined grain separator and scourer, the combination of an air-trunk, a settling-chamber communicating therewith, and a fan with a scouring device in said chamber and a device in said chamber for separating the heavy from the light impurities drawn out of the grain in the air-trunk, whereby the grain and heavy and light impurities are separately discharged and the dust, &c., are drawn into the fan and discharged therefrom, substantially as described.

7. In a grain-scouring machine, the combination of a settling-chamber, a scouring-case therein, a fan-chamber communicating therewith, and an air separating-trunk communicating with said settling-chamber and adapted to discharge screenings downwardly in said chamber with means, substantially as described, whereby a portion of the air-current entering through the trunk is permitted to escape into the chamber above the main discharge from the trunk thereinto, substantially as set forth.

8. In a grain-scouring machine, the combination of a settling-chamber, a scouring-case therein, a vertical air-trunk receiving the discharge from said case and communicating with said chamber, a fan-chamber, an air-passage connecting said fan-chamber and settling-chamber, and a partition provided with openings interposed between the trunk and air-passage, so as to prevent the free passage of the entire air-current from the trunk to the passage, substantially as described.

9. The combination of a settling-chamber, the scouring-case therein, the air-trunk above the same, having ascending and descending flues, means, substantially as described, for passing grain through the ascending flue and into the scouring-case, and a fan for producing an air-current through the flues of the

trunk into and through the chamber, substantially as and for the purpose described.

10. The combination of the settling-chamber, the scourer therein, and air separating-trunks communicating with said chamber, through which the grain is passed, respectively, before and after scouring, and a fan communicating with said chamber adapted to produce air-currents through said trunks into said chamber, substantially as and for the purpose described.

11. The combination of the scouring-case, the air-trunk above the same, having ascending and descending flues, means, substantially as described, for passing grain through the ascending flue and into the scouring-case, and a fan for producing an air-current through the flues of the trunk, and a settling-chamber surrounding said case and interposed between the fan and trunk and forming part of the air-passage, substantially as described.

12. The combination of the settling-chamber, the scourer therein, an air separating-trunk located at one end of the chamber above the scourer and having lateral openings near its lower end for the partial escape of air into the chamber, and a fan for creating air-currents through said trunk and into and through said chamber, substantially as described.

13. The combination of the settling-chamber, the scourer therein, and air separating-trunks communicating with said chamber, through which the grain is passed, respectively, before and after scouring, and a fan communicating with said chamber adapted to produce air-currents through said trunks into said chamber, and means, substantially as described, whereby the air-currents in said trunks are weakened before they fully enter the chamber, and the screenings thereby more effectively deposited, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HEMAN A. BARNARD.

Witnesses:

J. S. LEAS,

W. D. BENNETT.