No. 674,101. Patented May 14, 1901.

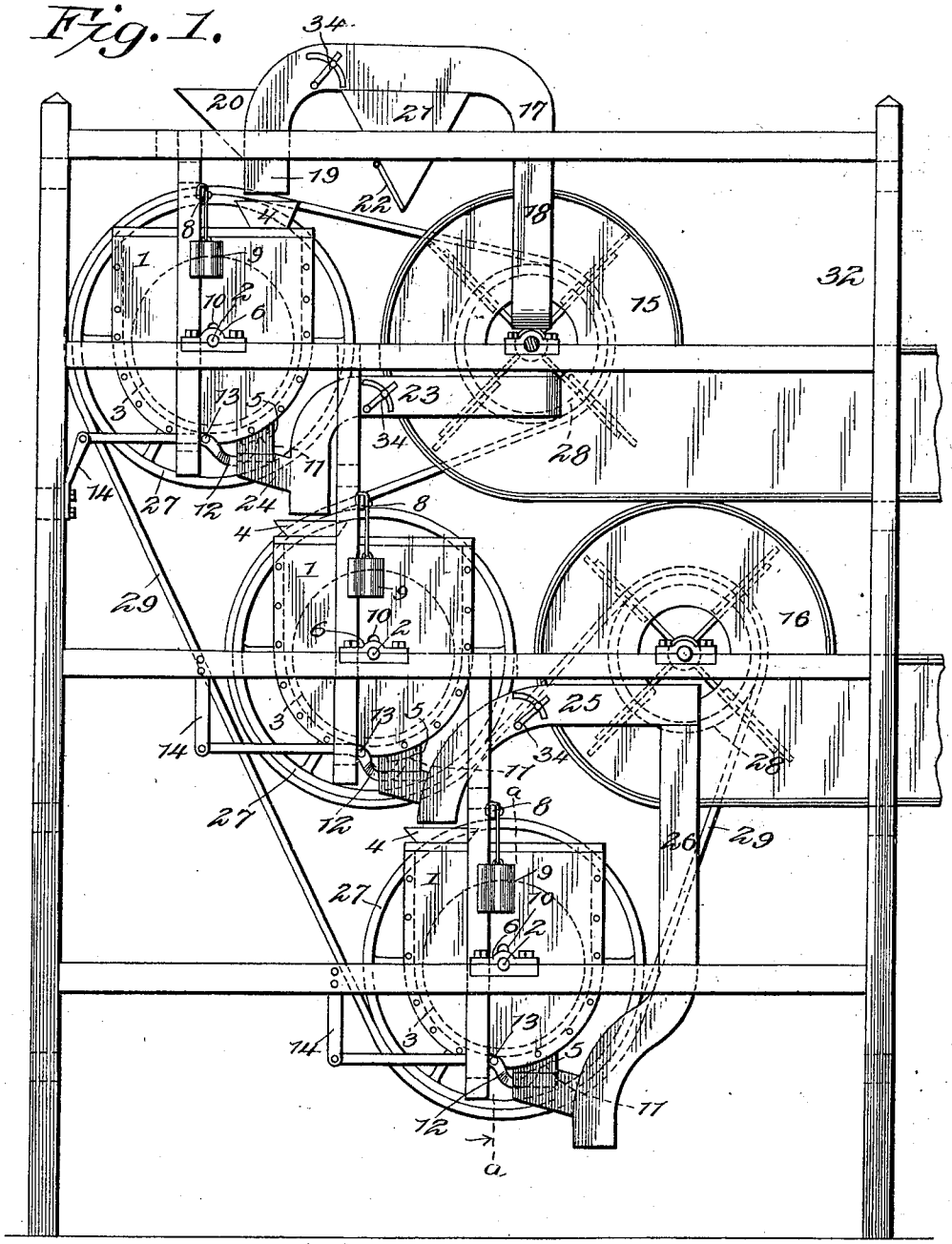
C. STONE.

GRAIN SCOURER AND CLEANER.

(Application filed Sept. 19, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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GRAIN SCOURER AND CLEANER.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

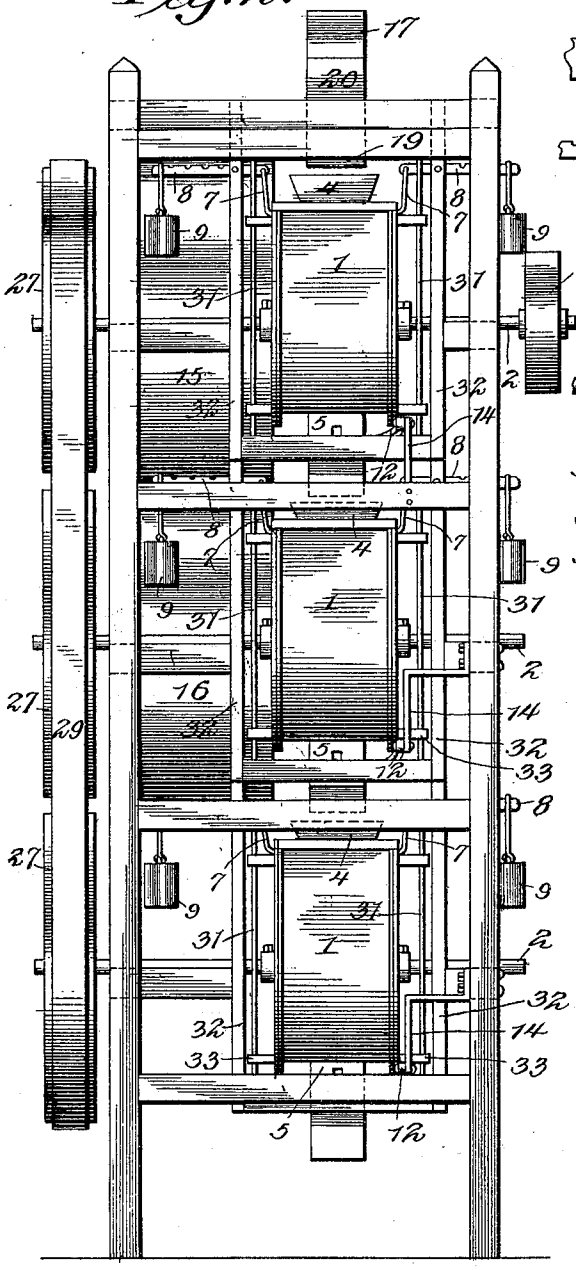


Fig. 3.

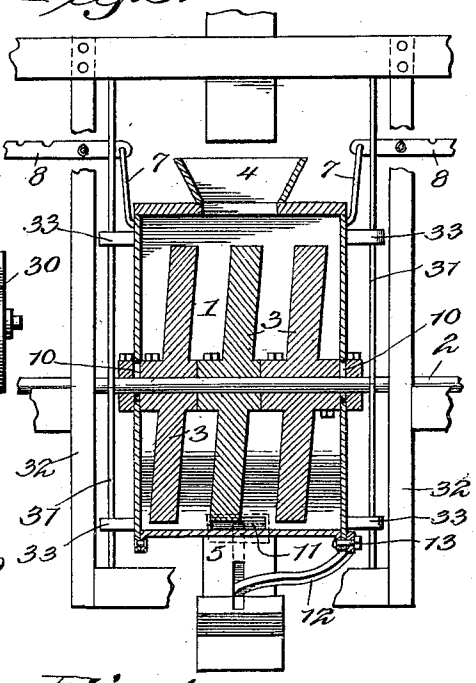
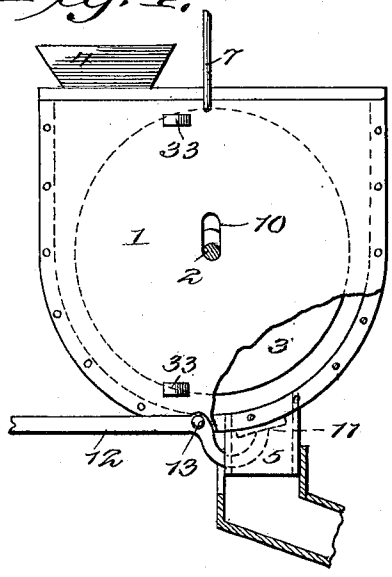


Fig. 4.



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UNITED STATES PATENT OFFICE.

COLUMBUS STONE, OF MANCHESTER, TENNESSEE, ASSIGNOR OF ONE-HALF TO ELZA O. GRISSOM, OF BOWLING GREEN, KENTUCKY.

GRAIN SCOURER AND CLEANER.

SPECIFICATION forming part of Letters Patent No. 674,101, dated May 14, 1901.

Application filed September 19, 1900. Serial No. 30,479. (No model.)

To all whom it may concern:

Be it known that I, COLUMBUS STONE, a citizen of the United States, residing at Manchester, in the county of Coffee and State of Tennessee, have invented a new and useful Grain Scourer and Cleaner, of which the following is a specification.

My invention is an improved grain scourer and cleaner for the removal of fuzz, smut, and other impurities from the external surfaces of grain, as wheat and the like, by abrasion and for separating the said impurities from the grain and cleaning the latter.

One object of my invention is to effect an improvement in the construction and combination of the devices for scouring the grain and removing the fuzz, smut, and other impurities therefrom by abrasion.

A further object of my invention is to provide means for automatically discharging the grain, after the same has been scoured, from the scouring-boxes and to render the machine self feeding and regulating, so that the same will require little or no attention when in operation.

A further object of my invention is to provide improved means for winnowing the grain and carrying off the fuzz, smut, and other impurities detached therefrom by the abrading action of the scouring mechanism.

A further object of my invention is to provide means for recovering such grain as may be carried off by the winnowing exhaust-air blast and automatically discharging such recovered grain as the same accumulates.

With these and other objects in view my invention consists in the peculiar construction and combination of devices hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a grain scouring and cleaning machine constructed in accordance with my invention. Fig. 2 is an end elevation of the same. Fig. 3 is a sectional view of the same, taken on the line *a a* of Fig. 1. Fig. 4 is partly a detail elevation and partly a sectional view on a plane at right angles to Fig. 3.

My improved scouring mechanism comprises a scouring-box 1, the lower side of which is semicylindrical in shape, a revoluble shaft 2, and scouring-disks 3, which are secured on said shaft and operate in the said scouring-box, the said disks being made of emery or other suitable material and being disposed obliquely on the said shaft, as shown in Fig. 3, whereby their lower sides as the shaft rotates move back and forth above the bottom of the scouring-box, as will be understood.

The scouring-box has a feed-hopper 4 on its upper side and a discharge-spout 5 on its lower side. The shaft is journaled in bearings, as at 6, in a suitable supporting-frame, and the scouring-box, which is vertically movable with relation to the shaft, is suspended by links 7 from the inner end of levers 8, which levers are provided with adjustable counterbalancing-weights 9. The ends or heads of the box through which the shaft 2 passes are provided with vertical slots 10 to clear the said shaft and permit the vertical movement of the box with relation thereto. In the discharge-spout 5 is an automatically-operated valve 11, which regulates the discharge of the grain from the box after the grain has been scoured by being subjected to the abrading action of the cylindrical lower side of the box and the obliquely-disposed revoluble emery abrading-disks. The said valve is operated by a lever 12, which is pivotally connected to the scouring-box, as at 13, and has its outer end pivotally connected to an immovable support, as at 14. The weights are so set on the counterbalancing-levers 8 as to adapt the scouring-box to contain a certain predetermined quantity of grain before the scouring-box descends under the weight of the grain and opens the valve 11 automatically to permit of the discharge of the scoured grain from the box. In operation the grain is fed to the scouring-box continuously through the hopper or intake 4, and the scouring-box being initially elevated by the counterweighted levers the grain is subjected to the scouring and abrading action of the cylindrical lower side of the scouring-box and the obliquely-disposed emery disks. The valve 11 being closed while the scouring-box is thus disposed in its initial normal elevated position, the grain is subjected to the efficient scouring action of the box and disks and accumulates in the scouring-box while being scoured.

When the predetermined quantity of grain which is being thus scoured has accumulated in the scouring-box, the latter under the weight of the grain descends, as before stated, thereby causing the valve 11 to be automatically opened and the grain in the lower side of the scouring-box to be discharged through the spout 5. Owing to the oblique disposition of the scouring-disks on their revoluble shaft said disks are not only efficient in scouring the grain and working the same back and forth in the lower side of the scouring-box, but also are efficient in moving the grain to the discharge-spout to facilitate the discharge thereof when sufficiently scoured from the scouring-box.

In practice I employ a suitable number of the scouring mechanisms in a single machine, as shown in Fig. 1 and 2, the said scouring mechanisms being disposed one above another, so that the grain is discharged from an upper scouring mechanism to the next lower scouring mechanism in series and is hence repeatedly scoured during its passage through the scouring mechanisms.

In combination with my improved scouring mechanism I employ exhaust-air-blast fans 15 16. In the form of my invention here shown I combine with the exhaust-air-blast fan 15 a wind-trunk 17, which has the depending legs 18 19, the former leading to the casing of the fan and the latter being disposed over the intake 4 of the upper scouring mechanism. The said leg 19 has a hopper 20, through which grain is fed to the box of the upper scouring mechanism, and it will be understood that the exhaust-air blast created by the fan through the wind-trunk 17 will winnow the grain as the same descends from the hopper 20 through the leg 19, the descending grain on its passage to the scouring mechanism being subjected to the action of an ascending exhaust-air blast, and thereby efficiently winnowed, the chaff and other light impurities and foreign substances being discharged through the wind-trunk 17 into the fan-casing and from the latter, as will be readily understood. In order to recover such of the grain as may be carried upward through the leg 19 by the exhaust-air blast, I provide the wind-trunk 17 on its lower side at a point between the legs 18 19 with a depending chamber 21, which has an inclined discharge gate or valve 22 at its lower side. The eddies set up in the chamber 21 cause the grain and other heavier particles to drop in the said chamber. The partial vacuum therein keeps the valve or gate 22 closed until a sufficient quantity of grain has accumulated in the said chamber to overcome the pressure of the atmosphere on the said gate or valve, when the latter will be opened by the weight of the grain, the same discharged, and the valve or gate immediately thereafter closed by the suction of the air in the chamber 21.

A wind-trunk 23 leads from a point above the intake 4 of the second scouring mechanism to the casing of the exhaust-air-blast fan 15. An inclined trough 24, which communicates with the said wind-trunk 23, is disposed below the discharge-spout 5 of the first scouring mechanism. It will be understood from the foregoing and by reference to the drawings that as the scoured grain is discharged from the first scouring mechanism the same will be subjected to the action of the exhaust-air blast through the lower portion of the wind-trunk 23 as the scoured grain passes from the first scouring mechanism to the second scouring mechanism, the said exhaust-air blast serving to carry off the smut, fuzz, and other impurities removed from the grain by the first scouring mechanism.

The exhaust-air-blast fan 16 has wind-trunks 25 26, which are similar to the wind-trunk 23 and are similarly disposed with relation to the discharge-trough of the second and third scouring mechanisms, and it will be understood that as the grain is discharged from each of the second and third scouring mechanisms the same is subjected to the winnowing action of the exhaust-air blasts which lead to the casing of fan 16. When the grain has been finally discharged from the machine, it has been thoroughly scoured and cleaned. In the drawings I show three of the scouring mechanisms and two exhaust-air-blast fans arranged in operative combination; but it will be understood that I may vary the number of such scouring mechanisms and air-blast fans employed.

Any suitable means may be employed for rotating the shafts 2 in the scouring-boxes and the fans in the fan-casing. In the drawings I show each shaft 2 provided at one end with a pulley 27 of suitable diameter and each fan-shaft provided with a pulley 28 of less diameter and an endless belt 29, which connects said pulleys 27 28 and applies power to the respective shafts. The shaft 2 of one of the scouring mechanisms is provided with a power-pulley 30.

I also show vertically-disposed guides 31 supported by the frame 32 and engaged by ears or lugs 33, which extend from the heads of the scouring-boxes. The said guides and ears or lugs coact to prevent the scouring-boxes from swaying laterally.

Each of the wind-trunks is provided with a valve, (indicated at 34,) by means of which the strength of the air-blast passing through the said wind-trunks may be regulated.

Having thus described my invention, I claim—

1. In a grain-scourer, the combination of a vertically-movable horizontally-disposed counterweighted scouring box or casing having a discharge-opening in its lower side, a discharge-valve automatically opened by the descent of said box or casing and closed by the ascent thereof, a horizontally-disposed revoluble shaft journaled in fixed bearings and having scouring elements, said scouring elements and box or casing coacting to scour

the grain while said box or casing is in its elevated position, and said scouring elements feeding the scoured grain to the discharge-opening, when said box or casing descends and said valve opens, substantially as described.

2. In a grain-scourer, the combination of a vertically-movable counterweighted scouring box or casing having a discharge-opening in its lower side, a discharge-valve automatically opened by said counterweighted vertically-movable scouring-box, when the latter descends, a revoluble shaft in fixed bearings, and a series of obliquely-disposed scouring-disks on said shaft, in said box or casing, the lower sides of said disks moving back and forward on the bottom of said box or casing, and feeding the grain to the discharge-opening thereof when the said box or casing is lowered and the valve open, substantially as described.

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

COLUMBUS STONE.

Witnesses:
J. W. GARNER,
MAY C. GLADMOND.