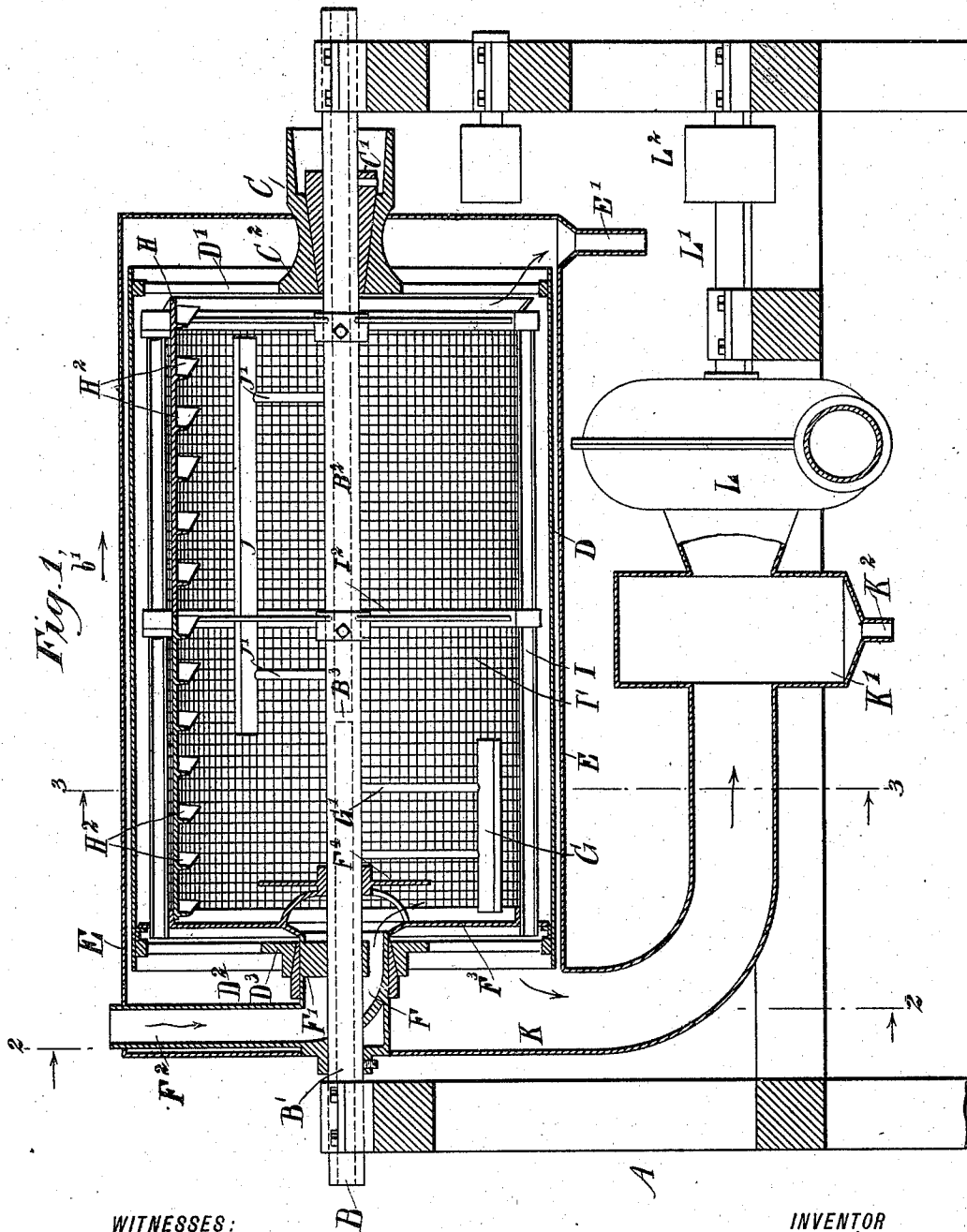


M. T. GIBBS.

WASHING, SCOURING, AND DRYING GRAIN.

No. 576,401.

Patented Feb. 2, 1897.



WITNESSES:

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Rev. G. H. H. H.

INVENTOR

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BY

ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

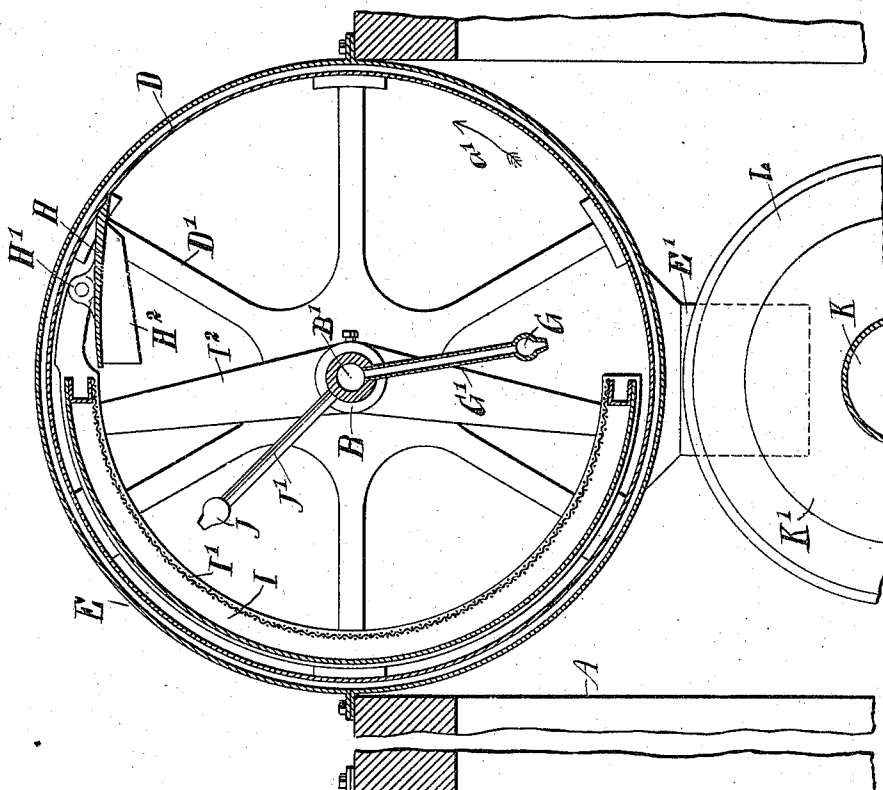
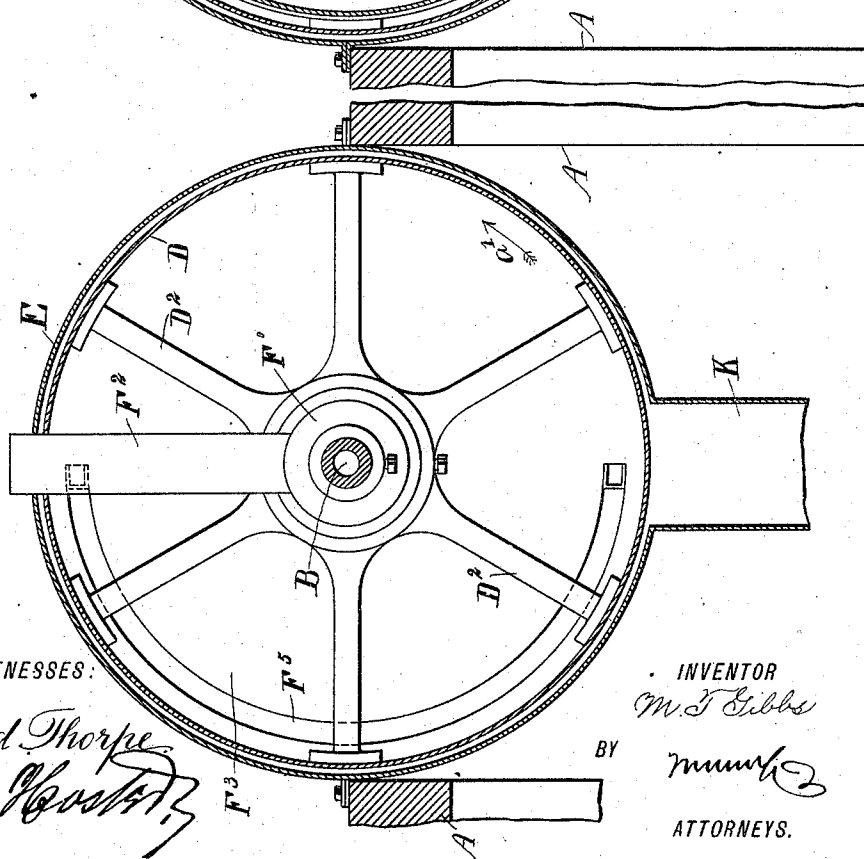


Fig. 2.



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MILTON T. GIBBS, OF MAYVILLE, NORTH DAKOTA.

WASHING, SCOURING, AND DRYING GRAIN.

SPECIFICATION forming part of Letters Patent No. 576,401, dated February 2, 1897.

Application filed March 31, 1896. Serial No. 585,563. (No model.)

To all whom it may concern:

Be it known that I, MILTON T. GIBBS, of Mayville, in the county of Traill and State of North Dakota, have invented certain new and useful Improvements in Washing, Scouring, and Drying Grain, of which the following is a full, clear, and exact description.

The object of the invention is to provide certain new and useful improvements in washing, scouring, and drying grain whereby the grain is washed and rinsed the desired number of times in such rapid succession that the kernels are prevented from becoming soaked before they undergo the drying process, thus rendering this process simply one of removing the water from the surface of the kernel and providing a rapid process of removing this water by force, in contradistinction to the process of evaporation.

The invention consists principally in a method whereby the grain while in motion is first subjected to the action of jets of water to loosen the impurities on the outside of the kernels and then immediately subjected to a compressed-air blast to remove the water and loosened impurities.

The invention further consists in an apparatus of especial construction, as hereinafter more fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1, and Fig. 3 is a similar view of the same on the line 3 3 of Fig. 1.

The improved washing, scouring, and drying machine is provided with a suitably-constructed frame A, on which is held a fixed shaft B, having hollow portions B' B² and carrying on one end a conical bearing C' for a pulley C to revolve on, said pulley being connected by belt with suitable machinery for imparting a rotary motion to the pulley. On the inwardly-extending hub C² of this pulley C are secured spokes D' of a drum D, revolving within a stationary closed casing E, sup-

ported on the main frame A. (See Figs. 2 and 3.)

The end of the drum F opposite to that on which the spokes D' are located is provided with radial spokes D², projecting from a hub D³, mounted to turn on a fixed bearing F', secured on the outside of the curved grain-inlet F, provided with an upwardly-extending spout F², connected with a suitable source of grain-supply. The grain passing down this spout F² into the inlet F is discharged by the latter into the drum D in front of a head F³, closing this end of the casing and the parts contained therein, the grain being deflected downwardly by a deflector F⁴, secured to the stationary shaft B. The grain flowing downward upon the bottom of the drum D is subjected to the action of jets of water issuing through a longitudinally-extending spout G, supported on hollow arms G', secured to the shaft B at the left hollow portion B' thereof, this portion being connected at its outer end with a suitable source of water-supply, so that water passing through this portion and the hollow arms G' can pass into the longitudinal spout G, from which the water passes outward and downward in small jets upon the grain. The grain in passing into the drum D is taken up by the latter as the drum revolves in the direction of the arrow a', the grain being finally scraped off the inner face of the drum by a scraper H, pivoted at H' to a projecting arm of a casing I, held within the drum D on arms I², attached to the shaft B, said casing being made segmental in cross-section, as plainly illustrated in Fig. 3.

On the under side of the scraper H are spiral blades H² for causing the grain passing under the scraper to be moved longitudinally in the direction of the arrow b', the rear end of said scraper discharging upon the inner face of the casing I, which inner face is made in the form of a screen I', as indicated in Figs. 1 and 3.

Now it will be seen that by the arrangement described the grain entering at the drum D by the inlet F is subjected to the jets of water issuing through the spout G and is carried up by the drum, removed therefrom, and moved longitudinally forward by the spiral blades H², to finally be discharged forcibly

against the screen I, thus allowing the water charged with the loosened impurities to pass through the meshes of the said screen, while the grain rolls down the same back upon the drum, but a distance forward in the direction of the arrow b' , to be again subjected to the action of the water, carried up by the drum and again scraped off by the scraper H. This operation is repeated again and again in rapid succession on the kernels until the grain has moved sufficiently forward to be out of reach of the water issuing through the right-hand end of the spout G, the grain now being taken up by the drum D and delivered by the scraper H upon the screen I' of the casing I and subjected to the action of a compressed-air blast issuing through a spout J, extending longitudinally in the casing and delivering the air in the direction of the upper end of the screen I', as will be understood by reference to Figs. 1 and 2. The grain rolling down the screen I' is subjected to the air-blast again and again in rapid succession, while the water and any loosened impurities not carried off by the suction-current of the air and the forcible projection of the grain against the screen are now forcibly removed from the surface of the kernels and driven through the screen I' into the casing I. It is understood that the air serves as the principal agent to dry the grain.

The spout J is connected by hollow arms J' with the hollow portion B² of the stationary shaft B, which hollow portion B² is separated from the other hollow portion, B', by a transverse partition B³, as indicated in dotted lines in Fig. 1. The outer end of the hollow portion B² is connected with a suitable source of compressed-air supply, the air passing through the hollow arms J' into the spout J and through the openings thereof outward and downward toward the grain rolling down the screen I'.

Now it will be seen that as the grain runs down the screen I' after being subjected to the air-blast it leaves the screen at the lower end to fall on the revolving drum D, which in turn takes up the grain on its inner surface by centrifugal force, the grain being finally removed by the scraper H and again delivered to the screen I', on which the grain rolls down to be subjected again to the action of the air-blast, and this operation is repeated until the grain has moved forward in the direction of the arrow b' , by the action of the blades H², until the grain leaves the right-hand open end of the drum D to pass into a spout E', formed in the bottom of the casing E. This spout E' delivers the grain at the outside of the machine into suitable bins, receptacles, or the like.

The left-hand end of the casing I opens into a pipe K, connected with a suction-fan L of any approved construction and having its shaft L' journaled in the frame A, and a pulley L² on the shaft is connected by a belt with the pulley C. Thus when the drum D

is rotated the suction-fan L is set in motion, so that the water, impurities, and other matter are drawn by the suction-fan into the pipe K, which contains a discharge-receptacle K', formed in its bottom, with an outlet-spout K² for carrying off the impurities.

It is understood that the head F³ previously mentioned is formed with a segmental slot F³ for the passage of the left-hand end of the casing I, so that the latter opens into the pipe K, connected with the suction-fan L. By this arrangement the impurities travel to the left while the grain is moved forward to the right, so that the grain is completely dried at the time it reaches the spout E'. It will further be seen that a thorough scouring and polishing of the grain takes place, as the grain is permitted to roll down the screen I' after it is subjected to the air-blast.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The herein-described method of scouring and drying grain, consisting in first subjecting the grain while in motion to the action of jets of water to loosen the impurities on the kernels, then moving the grain upward and delivering it by centrifugal force against a sieve, then subjecting the grain while on the sieve to the action of an air-blast, forcing the water charged with the impurities of the grain through the sieve to be disposed of, the grain rolling down on the sieve for further scouring, all as set forth.

2. An apparatus of the class described, comprising a revoluble drum, a stationary screen or sieve inclosed in said drum, and a scraper adapted to remove the grain from the inner surface of said drum, and to guide the grain to the sieve, all substantially as shown and described.

3. An apparatus of the class described, comprising a revoluble drum adapted to receive the grain at one end, a scraper in engagement with the inner surface of said drum, to remove the grain from the inner surface of the drum, said scraper being provided with spirally-arranged blades, and a stationary casing within said drum and formed with an inner face of netting upon which discharges said scraper, substantially as shown and described.

4. An apparatus of the class described, comprising a revoluble drum, a water-spout extending within said drum and connected with a water-supply to subject the grain passing into the drum to jets of water and an air-pipe arranged within said drum to subject the previously-wetted grain to the action of an air-blast, substantially as shown and described.

5. An apparatus of the class described, comprising a revoluble drum, a water-spout extending longitudinally within said drum and connected with a water-supply, to subject the grain passing into the drum to jets

of water, and a compressed-air spout arranged longitudinally within said drum, to subject the previously-wetted grain to the action of a compressed-air blast, substantially as shown and described.

5 6. An apparatus of the class described, comprising a revoluble drum provided at one end with a grain-inlet, a scraper arranged within the drum and in contact at one end
10 with the inner surface of the drum to remove the grain therefrom, said scraper being provided with spirally-arranged blades, a fixed segmental casing within said drum and having its inner face formed of wire-netting, the
15 rear end of the scraper discharging the grain on the upper end of said netting, a longitudinal water-spout within said drum near one end thereof, and a longitudinal compressed-air spout within said drum and extending toward the other end of the drum and pointing toward said netting, substantially as shown and described.

7. An apparatus of the class described, comprising a revoluble drum provided at one
25 end with a grain-inlet, a scraper arranged within the drum and in contact at one end with the inner surface of the drum, to remove the grain therefrom, said scraper being provided with spirally-arranged blades, a fixed
30 segmental casing within said drum and hav-

ing its inner face formed of wire-netting, the rear end of the scraper discharging the grain on the upper end of said netting, a longitudinal water-spout within said drum near one end thereof, a longitudinal compressed-air
35 spout within said drum and extending toward the other end of the drum and pointing toward said netting, and a suction-fan connected with one end of said casing, to remove the impurities therefrom, substantially as
40 shown and described.

8. An apparatus of the class described, provided with a fixed casing, a revoluble drum inclosed in said casing with an air-space between said drum and casing, a receptacle
45 connected with said space by a flue or pipe, and extending below said flue and a suction-fan connected with said receptacle, and flue substantially as shown and described.

9. An apparatus of the class described, 50 provided with a stationary casing within a revoluble drum, said casing being provided with an inner face of wire-netting and with one end open to connect with a suction-fan, substantially as shown and described.

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Witnesses:

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