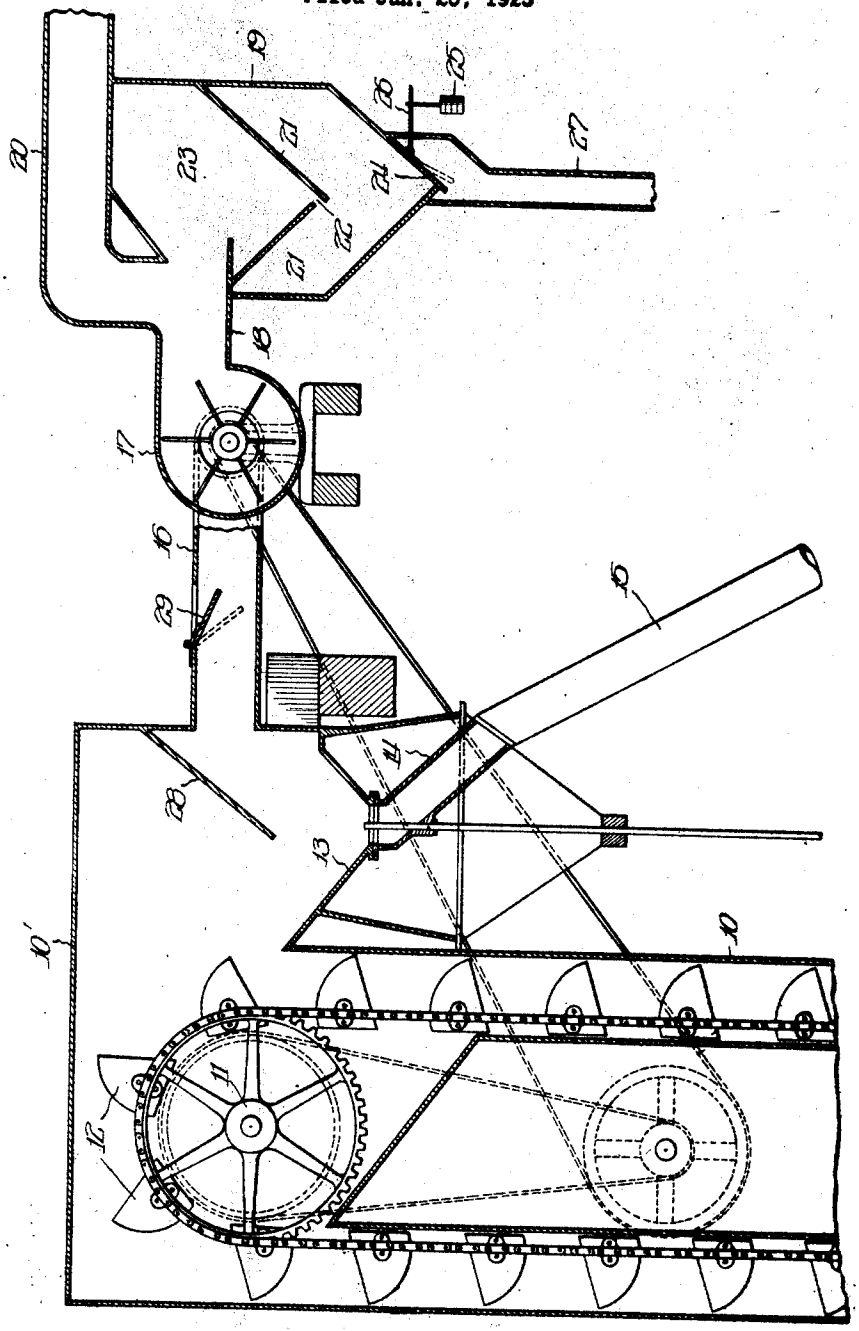
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R. L. DOWDALL

GRAIN CLEANER AND DUST SEPARATOR FOR ELEVATORS

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GRAIN CLEANER AND DUST SEPARATOR FOR ELEVATORS.

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To all whom it may concern:

Be it known that I, ROY L. DOWDALL, a citizen of the United States, residing at Oberlin, in the county of Decatur and State of Kansas, have invented certain new and useful Improvements in Grain Cleaners and Dust Separators for Elevators, of which the following is a specification.

This invention relates to the general art of grain elevators, and has reference more particularly to devices for cleaning and freeing the grain from dust, chaff, and broken and light particles of grain. The main objects of the invention are, to provide an improved cleaner and dust separator which may readily be attached to or embodied in the elevator head and which will serve, through the instrumentality of a fan and suitable air ducts and grain directing and chaff collecting devices, to not only clean the grain by freeing it from dust, chaff, and light and broken particles, but will also keep the elevator clean, prevent explosion and fire, and thereby reduce the insurance risks and rates.

Other objects are to provide a device of the character described which will also keep the pit and bearings clean, prevent hot boxes and dust explosions, and abstract the dust from the elevator leg. A still further object is to provide a device of the character described which will not only abstract dust, chaff, and light and broken particles of grain, but will also separate the dust from the chaff and light and broken grain and collect and separately deliver the latter.

Other objects and attendant advantages of the invention will be apparent to persons skilled in the art as the same becomes better understood by reference to the accompanying drawing, in which I have illustrated a practical embodiment of the invention which has been found in practice to satisfactorily effectuate the stated purposes and objects thereof; and referring thereto—

The figure is a vertical section of the upper portion or head of a grain elevator leg, showing my improvements applied thereto.

Referring to the drawing, 10 designates an elevator leg, and 10′ a specially constructed head thereof, in which is mounted the usual top pulley 11 over which passes the endless bucket elevator 12, by which the grain is elevated from the bottom of the leg to the head.

Within the head 10′ and on the delivery side of the bucket elevator 12 is located the usual funnel 13, the lower end of which communicates with an inclined delivery spout 14 which may be revolved on the axis of the funnel 13 so as to communicate with any one of a plurality of distributor spouts 15.

On and communicating with the delivery side of the head 10′ is a pipe 16 which at its outer end communicates with the suction side of a rotary high speed fan 17, this latter having a tangential discharge 18 which communicates with a trap 19 and also, on its upper side, with an exhaust spout 20. The trap 19 is preferably formed with a pair of internal shelves 21 so disposed as to form at their lower ends a narrow flow passage 22 into the lower portion of the trap; the space above the shelves constituting a settling chamber 23. The lower portion of the trap, below the shelves 21, constitutes a container or holder for the light grain and chaff and is equipped at its lower end with a pivoted door or valve 24 normally held closed by a counterweight 25 suspended from an arm 26 on the door. When the weight of the chaff and light grain in the container exceeds the pressure of the counterweight, the door will open and permit the grain and chaff to fall into a discharge pipe 27. By thus retaining a certain volume of the material in the lower portion of the trap 19, air circulation through the settling chamber 23 is prevented.

On the inner side of the vertical wall of the head 10′ to which the air pipe 16 is connected, and opposite the inner end of said pipe and above the funnel 13 is an inclined board 28 which constitutes a grain spreader for the grain as it is thrown down by the buckets of the elevator. This spreads the grain directly across the path of the air current, so that the latter readily draws the dust, chaff and light and defective particles of grain out of the falling body of grain, carrying the same through the fan and discharging it through the delivery spout 18. Since there is no air circulation through the air chamber 23, the air current reflexed from the chamber 23 is forced upwardly and outwardly through the spout 20, taking with it the finest and lightest particles consisting mostly of dust, while the light grain and chaff enter the chamber

23 settling therein and flowing through the narrow discharge throat 22 into the lower portion of the trap, and filling the latter up to a point at which the weight suffices to open the door 24 and thus allow the light grain and chaff to flow through the spout 27 to a sack or bin.

The strength of the suction current is regulated by means of a hinged door valve 29 formed in the wall of the suction pipe 16. By partly opening the said door valve the strength of the suction is reduced; and by completely closing the same, the entire suction is through the elevator leg and head. The air current induced by the fan 17 has its inlet at the boot or bottom of the leg, thus keeping the pit clean and taking the dust out of the leg. It also keeps the bearings clean and prevents hot boxes and dust explosions. The air current passes through and across the grain between the bottom of the spreader 28 and the funnel 13, and also draws with it the dust and chaff floating in the head 10′ and in the leg 10.

It will thus be seen that the device performs a number of advantageous functions in connection with the elevation and distribution of grain in an elevator. It thoroughly cleans the grain of dirt and dust, discharging the latter to the outside. It also separates out from the grain the chaff and light and defective particles of grain and delivers the same to a separate bin or sack for chicken and stock feed or other purposes. It also keeps the elevator leg and head clean and free from dust accumulations, prevents danger of dust explosion and fire, thus cutting down the insurance rate. Furthermore, by the use of the suction fan any damp and smutty grain that is run over the leg will be dried and conditioned, thus eliminating danger of heating.

Manifestly the specific form and details of structure may be variously modified without departing from the principle of the invention or sacrificing any of the advantages inherent therein; and hence I reserve all such variations and modifications as fall within the spirit and purview of the appended claims.

I claim—

1. In a grain cleaner of the character described, the combination with a grain elevator leg and head, of a fan connected on its suction side to said head, a discharge pipe for said fan, a grain receptacle directly communicating with the delivery end of said discharge pipe, and a dust discharge pipe communicating with said fan discharge pipe laterally of the latter and extending thence at a higher level than the top of said grain receptacle.

2. In an apparatus of the character described, the combination with a grain elevator leg and head, of an endless bucket elevating conveyor mounted therein, an inclined plate mounted in said box across the path of the grain thrown off by the conveyor buckets and acting to spread the grain impinging thereon, a rotary fan, and a pipe connecting the suction side of said fan with a wall of said head behind said spreader plate.

3. In a grain cleaner of the character described, the combination with a grain elevator leg and head, of a fan connected on its suction side to said head, a discharge pipe for said fan, a grain receptacle directly communicating with the delivery end of said discharge pipe, and a dust discharge pipe overlying said grain receptacle and communicating with the upper side of said fan discharge pipe behind the delivery end of the latter.

ROY L. DOWDALL.