

Dec. 20, 1927.

M. DAVIS

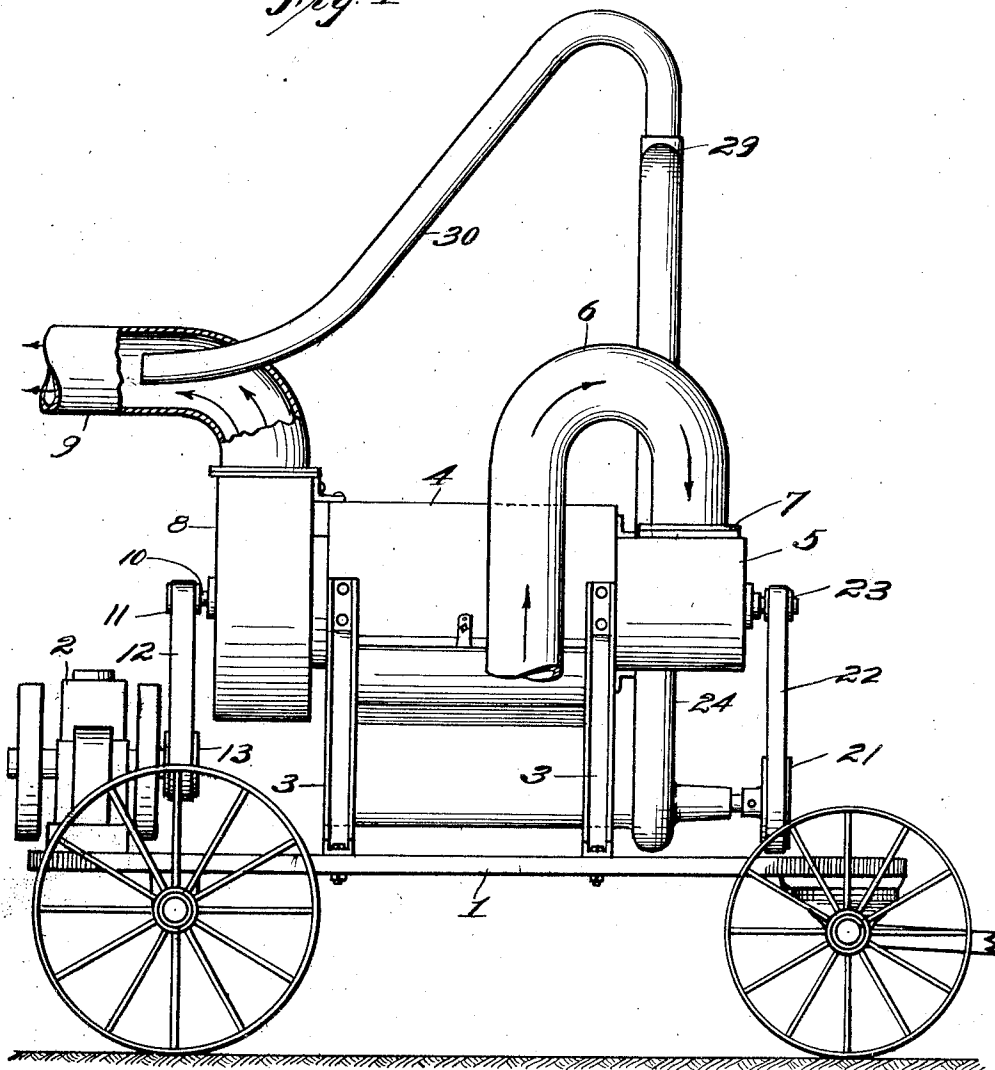
1,653,153

COMBINED GRAIN THRASHER AND CLEANER

Filed Sept. 9, 1926

3 Sheets-Sheet 1

Fig 1



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Dec. 20, 1927.

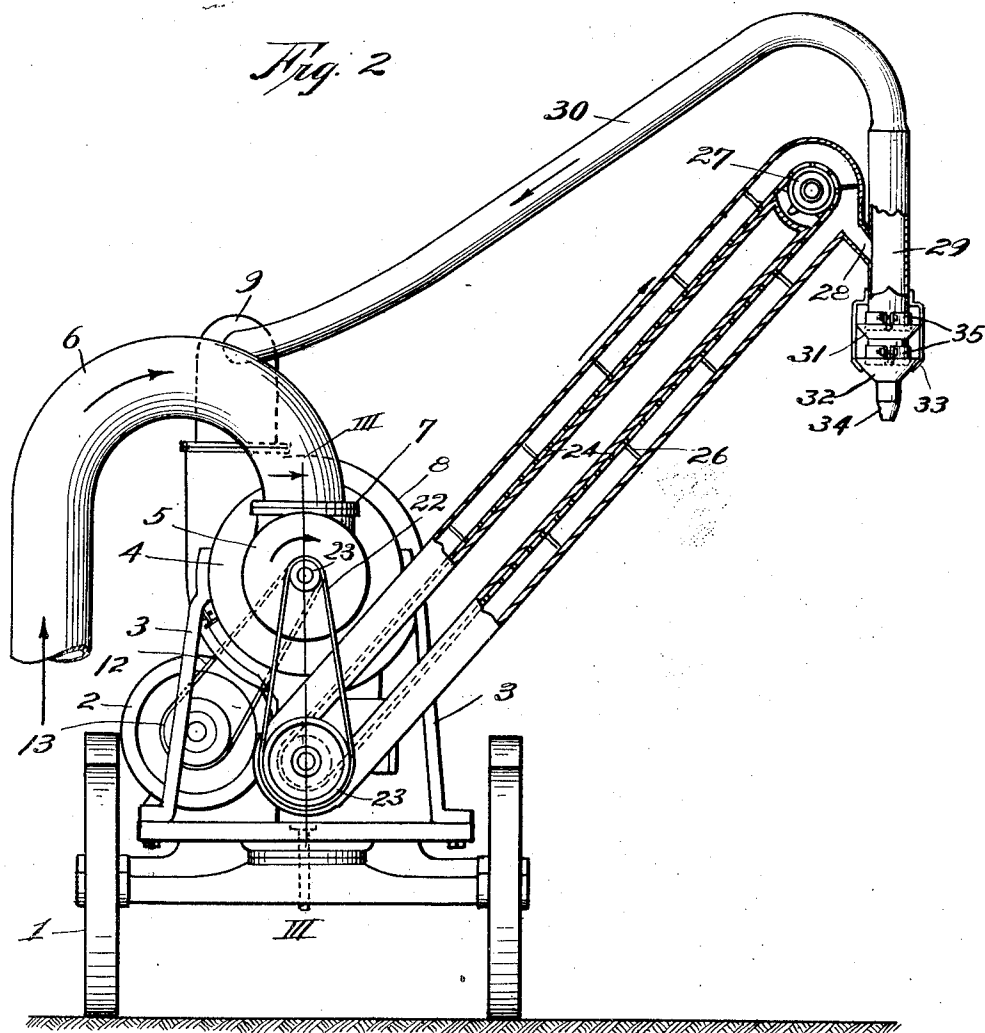
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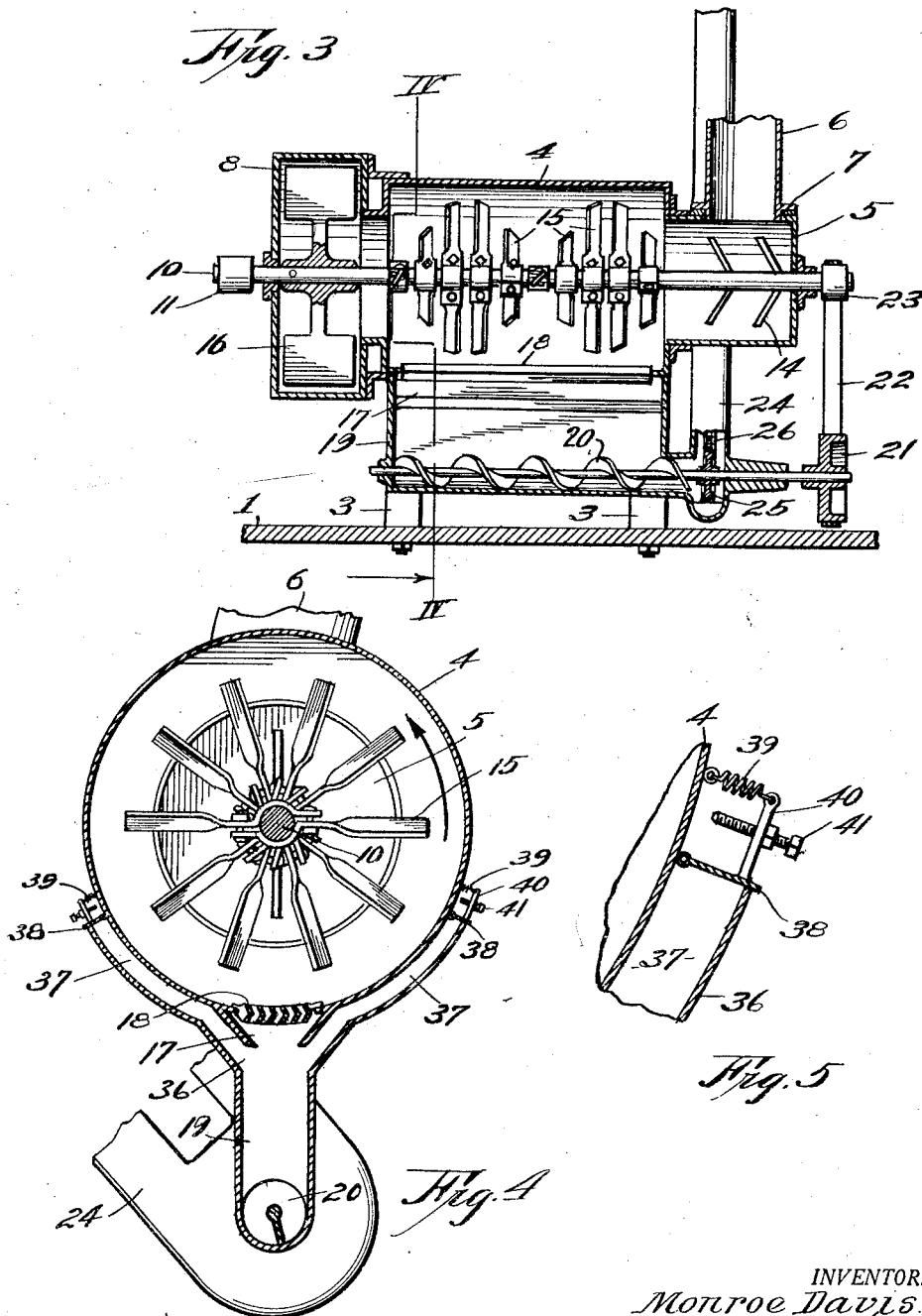
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COMBINED GRAIN THRASHER AND CLEANER

Filed Sept. 9. 1926

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UNITED STATES PATENT OFFICE.

MONROE DAVIS, OF ENID, OKLAHOMA.

COMBINED GRAIN THRASHER AND CLEANER.

Application filed September 9, 1926. Serial No. 134,456.

This invention relates to grain thrashing and cleaning machines, and has for its primary object to provide an inexpensive and efficient machine which will function economically, and which is of light weight and portable character for convenience in moving it to and from the field of operations.

With this general object in view the invention consists in certain novel and useful features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawings, in which:

Figure 1 is a side elevation, partly broken away, of a machine embodying the invention.

Figure 2 is an end view, partly broken away of the machine.

Figure 3 is a vertical section taken on the line III—III of Figure 2.

Figure 4 is an enlarged section taken on the line IV—IV of Figure 3.

Figure 5 is a fragmentary section, showing, on a larger scale, part of the construction as illustrated in Figure 4.

Referring now to the drawings in detail, 1 indicates a wheeled truck or frame of any suitable character, and 2 is a motor such as an internal combustion engine, mounted on the truck. The features of the machine which combined impart novelty to the machine as a whole, are as follows:

3 indicates a set of standards mounted upon and secured to the bed of the truck, and 4 is a cylinder extending longitudinally of the truck and bolted to and between opposite standards. The cylinder has openings in its ends, that at the receiving end communicating with the discharge end of an extension cylinder 5 which is closed at its opposite or outer end, and said extension cylinder is adapted to receive mixed straw and grain from a charging tube 6, which is preferably swivelled as at 7, for convenience in taking straw and grain from a grain header or other means of supply, not shown.

Straw from the cylinder 4 is adapted to pass through the other or discharge opening at its opposite end, into a suitably supported fan casing 8, provided with a communicating tube 9, for stacking the straw or discharging it into any suitable receptacle.

A shaft 10 extends longitudinally through the cylinder, cylinder extension 5 and the fan casing, and is suitably journaled in the

closed or outer ends of said extension and fan casing, and equipped at one end with a pulley 11 connected by a belt 12 to the drive pulley 13 of the motor or engine 2. The shaft is provided within extension 5 with arms or beaters 14 inclined toward cylinder 4 for the purpose of preliminarily thrashing and co-operating with a suction fan hereinafter identified, in discharging straw and grain into the cylinder 4, and mounted on the shaft within cylinder 4 are thrashing arms 15 for completing the thrashing of the grain from the heads of the straw. The shaft also carries a fan 16 within the fan casing, the function of said fan being to create a suction for drawing the straw from the header or other point of supply, (not shown) through the tube 6, and successively through the cylinder extension and cylinder and into the fan casing, and for creating a blast which discharges the straw through the stacking tube 9. The suction created by the fan is gauged to handle the straw as explained, but is not intended to be powerful enough to withdraw from the cylinder the relatively heavy grain after it is separated from the heads of straw.

Vertically below the shaft 10 the cylinder 4 is provided with a depending discharge spout 17, and located in the upper end of the spout and bridging said opening is a grid or screen 18 through which the grain thrashed from the straw is adapted to pass down into a chamber 19, equipped at its lower end with grain-feeding means, preferably in the form of a spiral conveyor 20. The conveyor is provided at one end with a pulley 21 connected by a belt 22, with a pulley 23, on the corresponding end of shaft 10, so that power shall be transmitted from said shaft to operate the conveyor. At the end toward which the conveyor is adapted to feed the grain, chamber 19 communicates with the lower end of an elevator conveyor casing 24, and journaled on the shaft of the conveyor 20 at the lower end of said casing 24, is a sprocket wheel 25 for driving a conveyor 26 operating within the inclined conveyor casing 24. Forming the support and guide for the upper end of the inclined conveyor is a sprocket wheel 27, and adjacent thereto said casing is provided with a discharge spout 28 for delivering the grain carried up by the inclined conveyor, to an upright tube 29. The tube 29 is equipped at its upper end with a smaller extension tube 30

communicating at its opposite end with the stacker tube 9, the arrangement being such that the blast produced by the fan within the stacker tube exerts a suction in tube 29 and its extension 30 sufficient to carry up any grain husks, chaff and other light matter delivered to tube 29 by the spout 28, this suction being insufficient to affect or raise the grain itself delivered to tube 29 by such spout.

The lower end of tube 29 which is open, overlies a funnel 31 so spaced from said tube as to admit air under the suction produced in tube 9, into the lower end of said tube so that the husks and chaff which may enter tube 29, may, as above explained, pass up through said tube around and therefore without interfering with the discharge of the grain from the lower end of the latter. To make this operation more effective, a second funnel 32 underlies and is spaced from the first to admit additional air, and both funnels are supported by hangers 33 depending from tube 29, the stem of the lower funnel forming a spout 34 for the discharge of the cleaned grain into a sack, wagon, or the like. The lower end of tube 29 and the stem of the uppermost funnel are equipped with adjustable collars 35, so that the air inlet spaces for tube 29 provided between the latter and the uppermost funnel and between the two funnels, may be varied to suit the condition or character of the grain being cleaned. In this connection it is desired to state that an application now pending, filed July 12, 1926, and serially numbered 121,865, is based on the grain cleaning mechanism above described as provided at the lowermost end of tube 29, and no claim is therefore made to the specific construction thereof, in this application.

To guard against any possibility of grain and straw accumulating upon and materially clogging the grid, the upper end of the chamber 19 is provided with a flaring mouth 36 into which depends the lower portion of cylinder 4 and its spout 17, the cylinder and its spout being spaced from the flaring mouth of chamber 19 so as to provide air-inlet passages 37 normally closed at their upper or intake ends by valves 38, under the suctional power of the fan, that is when the grid is open to the gravitative passage or fall of grain from the cylinder 4 to chamber 19. When the grid is clogged however, no appreciable suctional action is exerted by the fan on said valves and as a result springs 39 connected at their opposite ends to cylinder 4 and to arms 40 projecting from the valves, act to open the latter to re-establish the suctional action and thereby effect the dislodgment of the clogging matter, and as this is accomplished the suction produced in the air passages immediately recloses the valves. The opening movement is limited by adjust-

ing screws 41 carried by arms 40, coming in contact with the cylinder, and the screws can be adjusted to so limit the opening movement of valves as to accommodate the particular condition or kind of grain being cleaned. In actual service to which the machine has been put, an occasional flutter or movement of the valves can be observed, due to momentary cloggings and the immediately following clearances of the grid.

In the operation of the thrashing arms 15, the heavy material, particularly grain, is thrown outward by centrifugal force as it is separated from the straw and chaff into the relatively quiet zone established within cylinder 4 by providing receiving and discharging openings therefore of smaller diameter than the cylinder. This facilitates the flow or fall of the grain upon the grid without material or appreciable interference on the part of the straw and other light particles, and also facilitates the escape of the straw and light particles under the pull of the fan, into the fan casing, practically denuded of grain. The result is that nothing but grain has much opportunity to accumulate on the grid and only at relatively wide intervals is there any interference to the continuous passage of grain to the conveyor chamber 19, which occasional interruptions are made but momentary through the automatic opening of the valves 38 by the respective springs, as hereinbefore explained.

It is believed no other or further recapitulation of the operation is necessary as the particular function of each operative element has been explained in connection with the description thereof, and while the drawings illustrate the preferred embodiment of the invention, it will be apparent that the construction may be changed within the spirit and scope of the appended claims, in various particulars.

I claim:

1. In a grain thrashing and cleaning machine, a cylinder having different discharge openings for straw and grain respectively, a chamber for the reception of grain passing from the respective discharge opening, and having a passage connecting the atmosphere with the discharge side of the grain discharge opening of the cylinder, a valve for such passage, and means for producing a suction tending to evacuate straw from the cylinder through the respective discharge opening and through said air passage and grain discharge opening into the cylinder for effecting closing movement of said valve.

2. In a grain thrashing and cleaning machine, a cylinder having different discharge openings for straw and grain respectively, a chamber for the reception of grain passing from the respective discharge opening, and having a passage connecting the atmosphere with the discharge side of the grain

discharge opening of the cylinder, a valve for such passage, means for producing a suction tending to evacuate straw from the cylinder through the respective discharge opening and through said air passage and grain discharge opening into the cylinder for effecting closing movement of said valve, and yielding means for opening said valve in the event the grain discharge opening of the cylinder becomes clogged to the passage of grain therethrough.

3. In a grain thrashing and cleaning machine, a cylinder having different discharge openings for straw and grain respectively, a chamber for the reception of grain passing from the respective discharge opening, and having a passage connecting the atmosphere with the discharge side of the grain discharge opening of the cylinder, a valve for such passage, means for producing a suction tending to evacuate straw from the cylinder through the respective opening and through said air passage and grain discharge opening into the cylinder for effecting closing move-

ment of said valve, yielding means for opening said valve in the event the grain discharge opening of the cylinder becomes clogged to the passage of grain therethrough, and adjustable means for abutment against a fixed part of the machine for limiting opening movement of the valve.

4. In a grain thrashing and cleaning machine, the combination of a cylinder having different discharge passages for straw and grain, air-current producing means for passing unthrashed grain into and straw out of the cylinder, means for thrashing the unthrashed grain within the cylinder, and a yieldingly-opened valve for closing the grain-discharge opening of the cylinder to the entrance of air into the cylinder, under the power of the air current, when the said grain-discharge opening is open to the passage of grain from the cylinder.

In witness whereof I hereunto affix my signature.

MONROE DAVIS.