

No. 765,701.

PATENTED JULY 26, 1904.

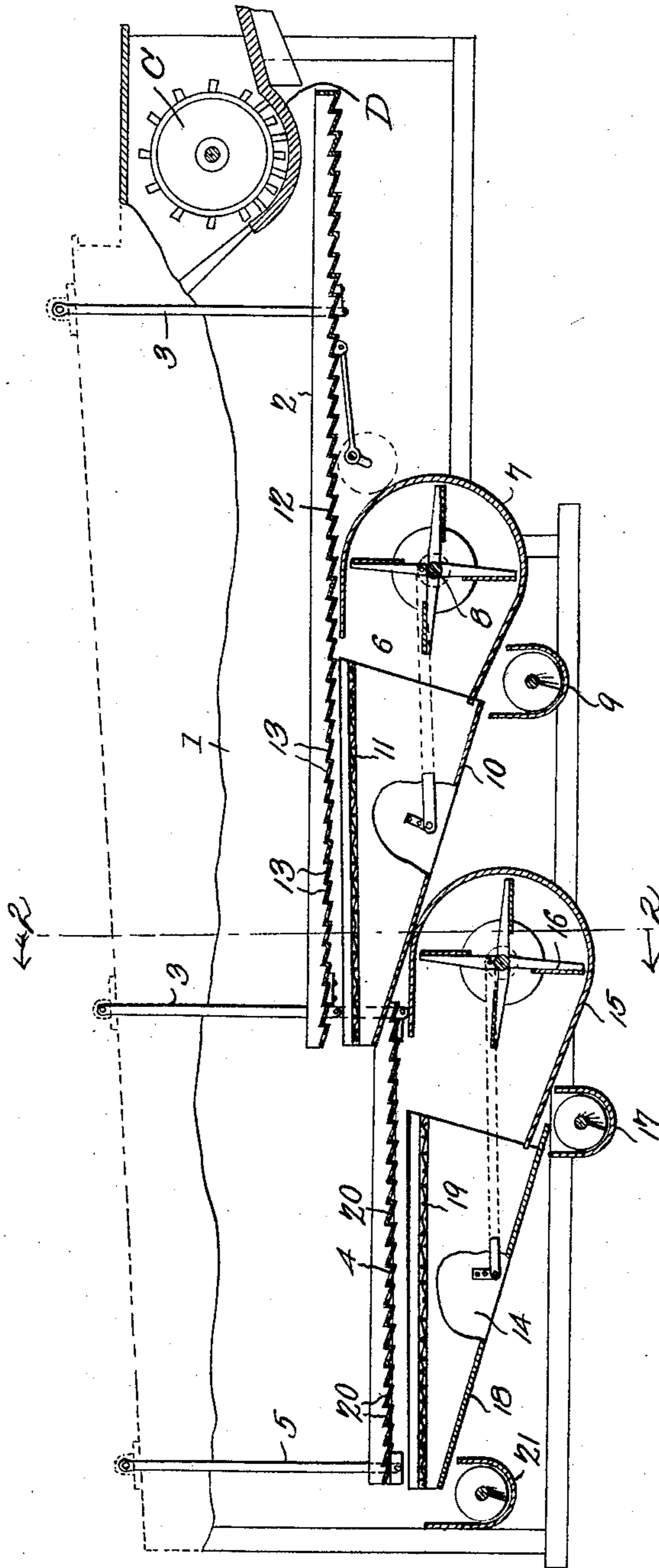
I. M. COOPER.
GRAIN SEPARATOR AND CLEANER.

APPLICATION FILED MAR. 28, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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Wm. Bagger

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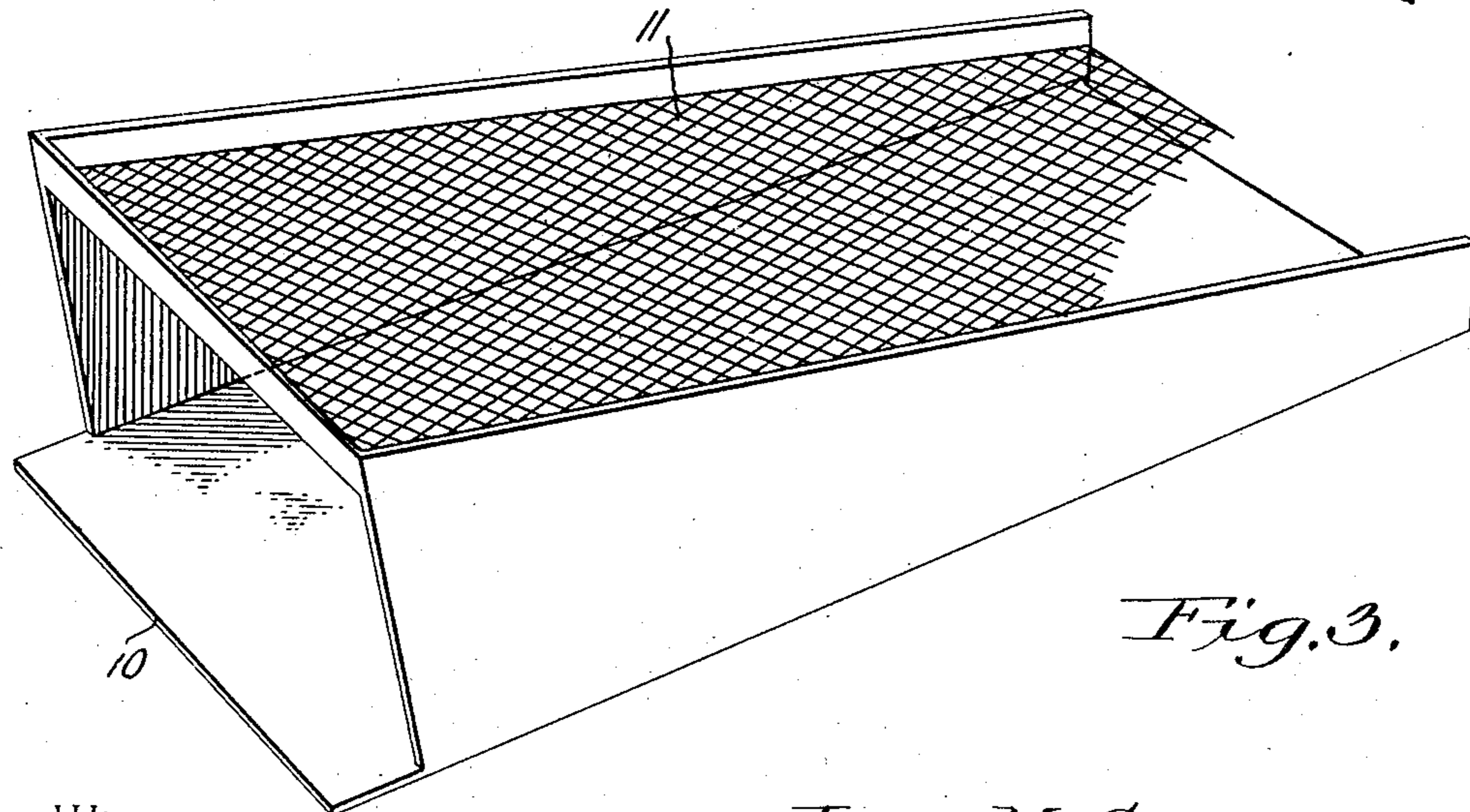
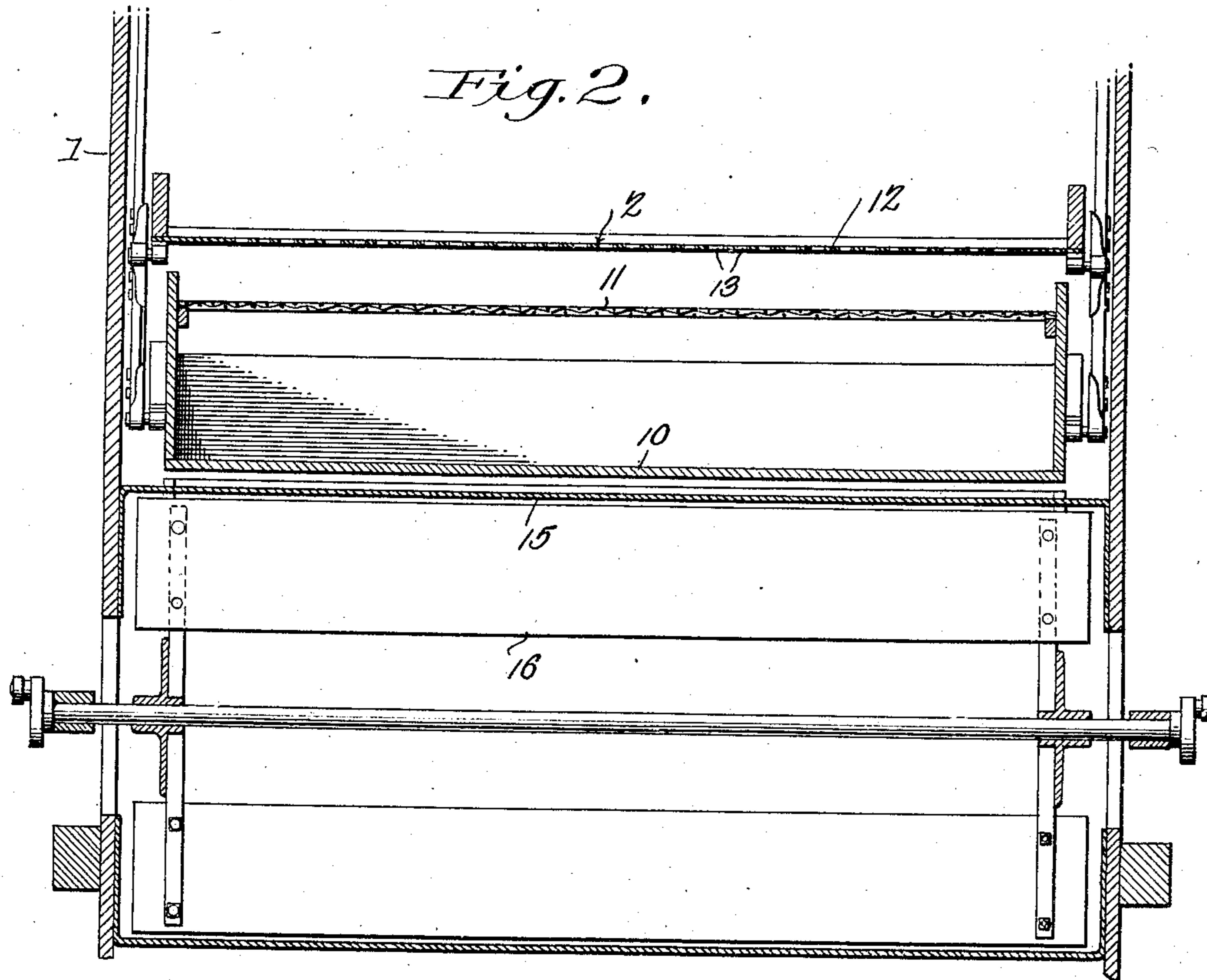
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NO MODEL.

2 SHEETS—SHEET 2.



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Wm. Baggett
at

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UNITED STATES PATENT OFFICE.

ISAAC M. COOPER, OF GLENELDER, KANSAS.

GRAIN SEPARATOR AND CLEANER.

SPECIFICATION forming part of Letters Patent No. 765,701, dated July 26, 1904.

Application filed March 28, 1903. Serial No. 150,030. (No model.)

To all whom it may concern:

Be it known that I, ISAAC M. COOPER, a citizen of the United States, residing at Glenelder, in the county of Mitchell and State of Kansas, have invented a new and useful Grain Separator and Cleaner, of which the following is a specification.

This invention relates to devices for separating and cleaning grain and which usually constitute parts of threshing-machines.

The object of my present invention is primarily to assist in the thorough separation of all the grain, avoiding any waste.

A further object of my invention is to effect as far as may be possible the thorough cleaning of the grain; and a further object of my invention relates to the recleaning of the tailings, the tailings being subjected to a primary cleaning before passing into the tailings-spout, thereby avoiding the overcrowding of the latter, which frequently results in serious waste of grain.

With these and other objects in view my invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of a grain separating and cleaning device constructed in accordance with the principles of my invention. Fig. 2 is a transverse sectional view taken on the line 2 2 in Fig. 1. Fig. 3 is a perspective detail view of one of the shoes.

Corresponding parts in the several figures are indicated by similar numerals of reference.

In carrying out my invention I avail myself of a plurality of shoes, each shoe comprising a fan-casing, a fan contained within the same, a grain-board, a screen or riddle, and a receiving spout or trough. In connection with each shoe I employ a corrugated conveyer, pivotally suspended within the casing of the machine and having a vibratory movement whereby the uncleaned grain, straw, chaff, and the like is carried in a rearward direction from the threshing-cylinder toward the tail end of the machine.

Referring to the drawings, 1 designates the casing of an ordinary threshing-machine, of

which latter only as much is shown as is necessary to assist in properly locating the parts constituting my invention. In the example of my invention illustrated in the accompanying drawings I have shown two shoes, two grain-conveyers, and two fans; but it will be understood that a larger number may be used when desired.

2 designates the first conveyer, which is suspended by links 3 3^a within the casing.

4 designates the second conveyer, which is suspended by means of links 3^a 5, the second conveyer 4 being disposed in rear of and from eight to twelve inches below the first conveyer in order that the uncleaned grain passing from the latter to the conveyer 4 will have a drop, during which it is subjected to a cleaning-blast, as will be presently described.

It will be specially noted that the conveyer 4 is not merely disposed in rear of and also below the first conveyer 2, but that it is also pivotally connected with the lower end of the link 3^a, which latter also serves to support the rear end of the conveyer 2, the distance between the points of connection being, as above stated, from eight to twelve inches. It follows that the lower or rear conveyer 4 being pivotally connected with the link 3^a at a greater distance from the pivotal supporting-point of the latter than the upper or front conveyer 2 the said rear conveyer will have a stroke of a greater length or that it will in a given time traverse a greater distance than the distance traversed by the upper or front conveyer. This is an important feature of my invention, for the reason that the straw and other waste material passing over the said lower or rear conveyer will thus be quickly and effectively disposed of and danger of choking will become lessened or entirely obviated.

Below the first conveyer 2 is disposed the first shoe, which comprises a casing 6, a receiving-trough 9, disposed under the discharge of a fan-case 7, within which operates a rotary fan 8, a grain-board 10, discharging downwardly and forwardly into said trough, and a sieve 11, which is disposed between the conveyer 2 and the grain-board 10. The conveyer 2 has a corrugated bottom 12, the rear

portion of which, or as much of the rear portion as is disposed above the sieve 11, is perforated, as shown at 13, thus permitting the grain to pass through said perforations to the sieve or screen 11 and through the latter onto the grain-board.

The second shoe comprises a casing 14, a receiving-trough 17, disposed transversely to the outlet of a fan-casing 15, within which operates a rotary fan 16, a grain-board 18, discharging forwardly and downwardly into said receiving-spout, and a sieve or screen 19, which is disposed between the grain-board 18 and the conveyer 4, the corrugated bottom of which is also provided with perforations 20, through which the grain may sift onto the sieve or screen 19, passing from thence onto the grain-board 18, whereby it is discharged into the trough 17.

The tailings-spout 21 is disposed transversely under the upper rear end of the grain-board 18 in such a position as to receive the tailings passing over the screen 19 and the second conveyer 4.

It is obvious that suitable means are to be provided for driving the fans and for imparting to the conveyers a vibratory movement.

The operation and advantages of this invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. The threshed grain coming from the cylinder and concave passes to the conveyer 2 either directly or from the straw-carrier, which latter, however, does not form a part of my present invention. When the grain reaches the perforated portion of the conveyer 2, it will sift through the openings 13, which should be of ample size to permit of the passage of the grain, chaff, small particles of straw, &c., which will drop upon the sieve or screen 11. The grain will sift through the latter onto the grain-board 10 and pass from the latter to the receiving-trough 9, while the blast of the fan 8 will carry the chaff and trash in a rearward direction off the screen 11 and onto the imperforate portion of the conveyer 4. The material dropping from the conveyer 2 onto the conveyer 4 also receives the benefit of the blast from the fan 8, which, as is obvious, will carry the lighter particles over the entire length of the conveyer 4 and to the exit of the machine, while only the heavier particles containing the grain will drop upon said second conveyer 4. It is obvious that all the material passing from the first into the second conveyer, including the straw, receives the impact of the blast from the fan 8, which will tend to carry a large proportion not only of the chaff, but also of the straw itself, directly through the exit at the tail end of the machine, so that the second conveyer will be burdened with a comparatively small portion of worthless material only, the process of separation of the remain-

ing values being effected with corresponding ease, efficiency, and slight expenditure of power. On reaching the perforated portion 20 of said secondary conveyer the material will be subjected to a recleaning operation by the fan 16, the grain dropping through the perforations 20 onto and through the sieve 19 to the grain-board 10, whereby it is conveyed to the receiving-trough 17, while the chaff and worthless particles are blown in a rearward direction over the tailings-spout, which latter only receives the heavier particles to which grain still adheres.

It is evident that by my invention the grain is not merely subjected to a recleaning operation caused by merely duplicating the shoes and the fans, but the lighter particles are thoroughly separated from the heavier particles during an early stage of the separation, and said lighter particles are effectually disposed of, while only the heavier particles to which grain still adheres are permitted to reach the tailings-spout, from which it is disposed of in the usual manner. It is obvious that by the construction and combination of parts set forth overcrowding of the tailings-spout is absolutely avoided and also that a thorough separation of the grain is effected with a minimum expenditure of power.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be perfectly understood. I desire to state that while I have herein described a simple and preferred form of my invention I do not limit myself with regards to the structural details of the same, but reserve the right to any changes, alterations, and modifications within the scope of my invention which may be resorted to without departing from the spirit or sacrificing the utility of the same.

Having thus described my invention, I claim—

1. A grain separating and cleaning device comprising a plurality of corrugated vibratory conveyers, one of which extends beneath the cylinder and concave of a threshing-machine and another of which extends over the tailings-trough of a threshing-machine, said conveyers being so related that the front one will be disposed above and overlapping the one in rear, and said conveyers being provided with perforated and imperforate portions, the perforated portions being at their rear ends, a shoe beneath each conveyer having a screen and a grain-board, disposed below the perforated portion of said conveyer, and means for deflecting rearward currents of air against the under sides of the screens and the rear ends of the conveyers.

2. A grain separating and cleaning device comprising a plurality of corrugated vibratory conveyers, one of which extends beneath the cylinder and concave of a threshing-machine and another of which extends over the tail-

ings-trough of a threshing-machine, said conveyers being so related that the front one shall be disposed above and overlapping the one in rear, supporting-links for said conveyers, the rear conveyer being connected pivotally at its front end with the links supporting the rear end of the front conveyer, whereby the arc of movement of the rear conveyer shall be in excess of that of the front conveyer, said conveyers being provided with perforated and imperforate portions, the perforated portions being at their rear ends, a shoe beneath each conveyer having a screen and a grain-board, disposed below the perforated portion of such conveyer, and means for deflecting rearward currents of air against the under sides of the screens and the rear ends of the conveyers.

3. A grain separating and cleaning device comprising a plurality of corrugated vibratory conveyers, one of which extends beneath the cylinder and concave of a threshing-machine and another of which extends over the tailings-trough of a threshing-machine, said conveyers being so related that the front one shall

be disposed above and overlapping the one in rear, suspending and connecting means for said conveyers, whereby the arc of movement of the rear conveyer shall be in excess of that of the front conveyer, a shoe beneath each conveyer having a screen and a grain-board disposed below a perforated portion at the rear end of each conveyer and a grain-trough receiving the discharge of the grain-board, and a blower disposed to direct a rearward blast against the under side of the screen and the rear end of the conveyer, said blast being also effectively directed against material dropping from one conveyer to the next one in rear thereof and from the rear conveyer over the tailings-trough.

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

ISAAC M. COOPER.

Witnesses:

JOHN FARBAUGH,
DANIEL MEGLI.