

No. 626,108.

Patented May 30, 1899.

F. C. STUCKEL.

CROSS CONVEYER FOR THRESHING MACHINES.

(Application filed Mar. 28, 1899.)

(No Model.)

3 Sheets—Sheet 1.

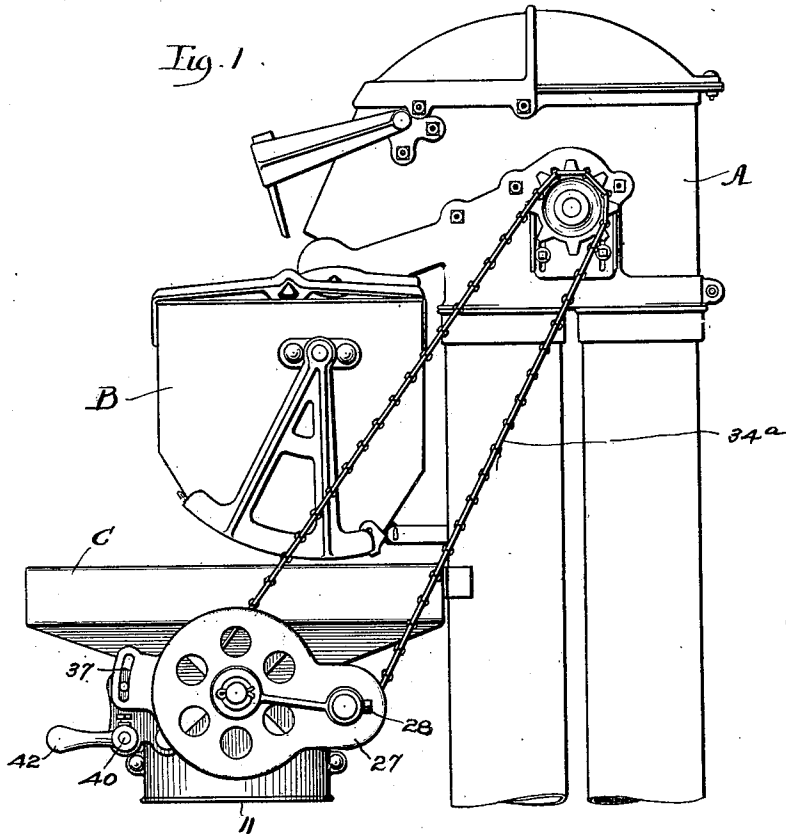
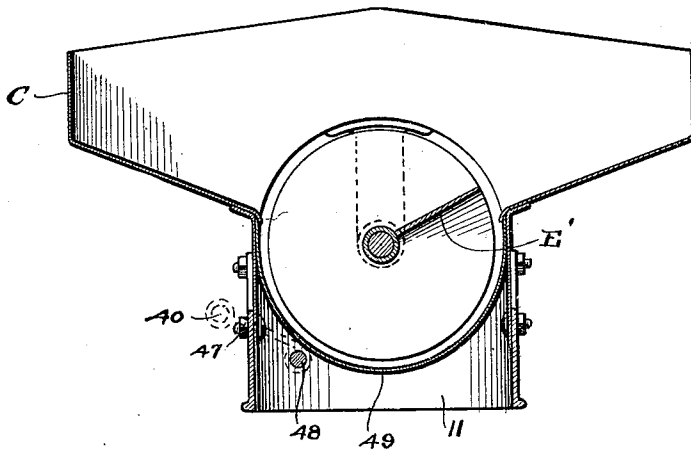


Fig. 1a.



Witnesses:

Fred Gulack
David Q. Davis

Inventor:

Frank C. Stuckel

By *Deane Fisher*
his Attorneys

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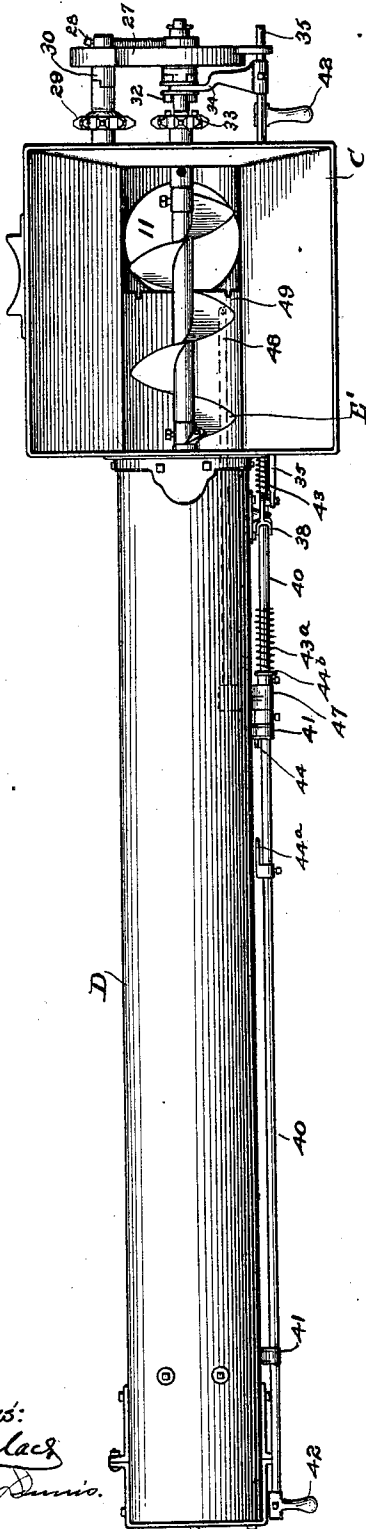
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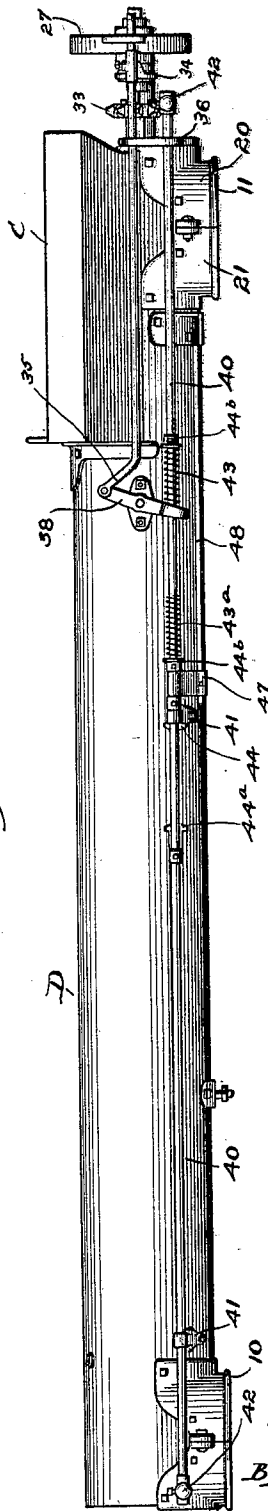
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Fig. 2.



Witnesses:
Fred C. Stuckel
John R. Dennis.

Fig. 2a.



Inventor:
Frank C. Stuckel
By Prince Fisher
his Attorney.

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3 Sheets—Sheet 3.

Fig. 3.

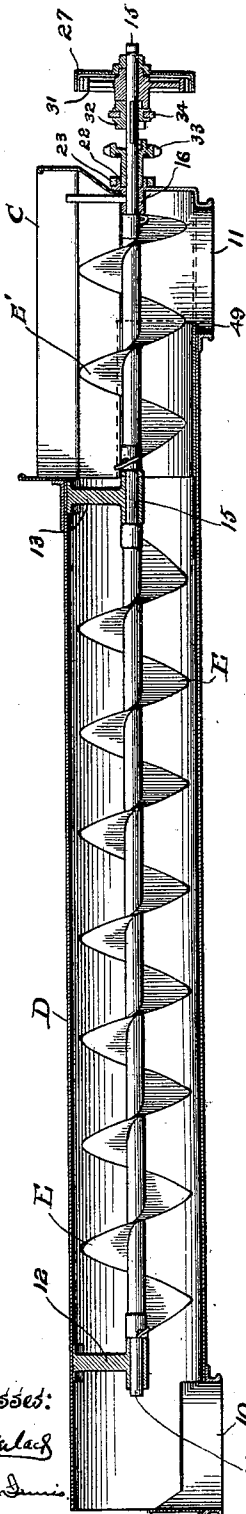


Fig. 3a.

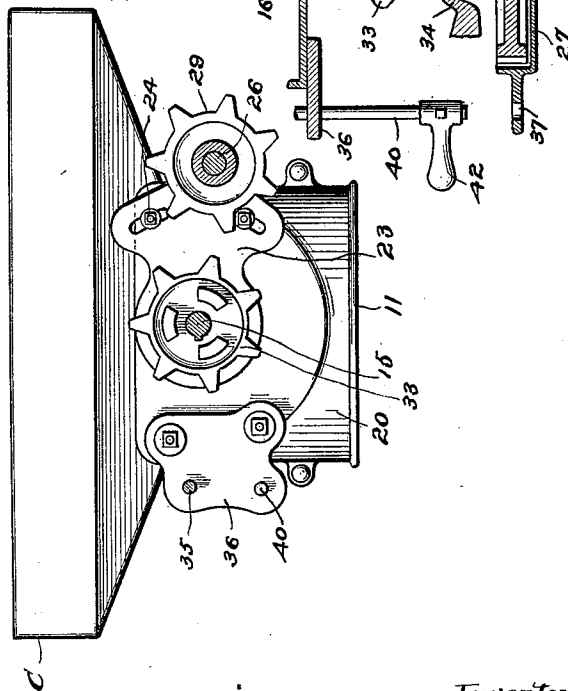


Fig. 3c.

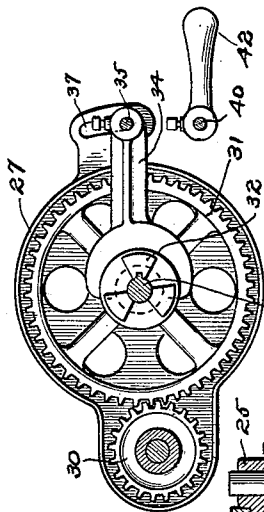


Fig. 3d.

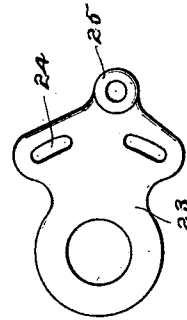
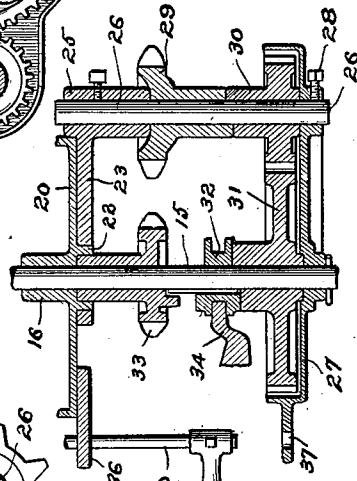


Fig. 3e.



Witnesses:
Frederick
Chas. Q. Smith

Inventor:
 Frank C. Stuckel
 By *Peira Fisher*
 his Attorney.

UNITED STATES PATENT OFFICE.

FRANK C. STUCKEL, OF RACINE, WISCONSIN, ASSIGNOR TO THE J. I. CASE
THRESHING MACHINE COMPANY, OF SAME PLACE.

CROSS-CONVEYER FOR THRESHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 626,108, dated May 30, 1899.

Application filed March 28, 1899. Serial No. 710,765. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. STUCKEL, a resident of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Cross-Conveyers for Threshing-Machines, of which the following is a full, clear, and exact description.

The invention relates to conveyers such as may be mounted upon the roof of a threshing-machine or in like situation, the design being to deliver grain or other material alternately at each end of the apparatus, discharging it into any suitable receptacle at one side and then upon reversal discharging it into another at the opposite side. Devices of this sort are now in common use.

The nature of the present improvements will appear in detail from the following description and be thereafter distinctly pointed out by claims at the conclusion.

On the drawings like parts bear like designation throughout.

Figure 1 is a side view at the head of the elevator, displaying the automatic weigher and the hopper end of the cross-conveyer located beneath the weigher; Fig. 1^a, a cross-sectional view at the hopper of said conveyer; Fig. 2, a plan, and Fig. 2^a, a side elevation of the cross-conveyer; Fig. 3, a view of said conveyer in longitudinal section; Fig. 3^a, an end view, parts in section, showing the drive-sprockets next the hopper mounted in position; Fig. 3^b, a detail view of the drive mechanism in longitudinal section; Fig. 3^c, a cross-sectional elevation at the inner face of the differential gear and clutch; Fig. 3^d, a detail of the radius plate for the sprockets.

The head A of the elevator, attached, as usual, upon the side of the threshing-machine, carries the familiar automatic weigher B, which discharges its load at intervals into the mouth of hopper C for cross-conveyer D. The conveyer consists of a transverse tube, generally of sheet metal, secured upon the roof of the machine and furnished with opposite exits 10 11, through which the grain falls alternately into a wagon-body or other convenient receptacle. An auger E extends lengthwise of conveyer-tube D and is journaled at its ends in hangers 12 13, dependent

within from the conveyer-tube. At hanger 12 the stub-axle 14, socketed in the tubular shaft of the auger and fastened by set-bolt, serves as the auger-journal, while at hanger 13 the long axle 15, secured in like fashion within the auger-shaft, constitutes the companion journal. Axle 15 passes across hopper C, being sustained by elongated bearing 16 at the outer face of said hopper, and carries a short auger E', located within the hopper between hanger 13 and bearing 16. The auger-shaft is hollow to allow for ready insertion of axle 15, which may thereupon be fastened by set-bolt or like expedient.

Augers E E' are properly made of like pitch and sweep. They rotate in unison under action of axle 15, common to both; but it is seen that the screw-flanges of the two augers are not continuous at confronting ends. A space occurs for a brief distance, (denoted by hanger 13,) forming a sort of safety-pocket between abutting terminals of the auger-screws. This provision tends to relieve main auger E from overcrowding and by so much lessens the risk of strain or breakage due to the jamming of the grain in passage. A sudden excess delivered to hopper C has a chance to "heave" in the open mouth of such hopper for the full length of auger E', and this, in conjunction with the safety-pocket, markedly diminishes the danger of imposing an overburden upon main auger E. The grain cannot be crowded into tight frictional contact between the screw and the tube-wall of conveyer D.

Upon the outer end face of hopper C is carried the drive mechanism to actuate the augers. For this purpose conveyer-exit 11 may conveniently consist of cast-metal thimble-sections 20 21, bolted together and stoutly riveted to the adjacent walls of the hopper-outlet. Thimble-section 20 carries internally the elongated bearing 16 for drive-shaft 15, and upon its external face is provided with a hub-like boss 22, concentric with the shaft and affording a pivotal mount for radius-plate 23. By slot-and-bolt connections 24, Figs. 3^a and 3^d, the radius-plate can be suitably adjusted, turning upon hub 22 as a center. At its free end radius-plate 23 affords an extended seat for counter-shaft 26, said shaft being secured therein in relation parallel with drive-

shaft 15. A cover or cap 27, sustained upon the outer terminals of said shafts, is held in desired position by set-screw 28. Sprocket-wheel 29 runs loosely upon counter-shaft 26, but interlocks with pinion 30 to move with it in unison. Pinion 30 meshes into gear-wheel 31, free to turn upon shaft 15, but engaging at intervals with clutch 32, secured by spline or like joint to the shaft. Sprocket-wheel 33, suitably recessed to engage at intervals with shifting clutch 32, is loosely mounted upon shaft 15 within the recess at boss 22. Drive-chain 34 extends about both sprockets 29 33 and transmits the power from any convenient source, as from the upper cross-axle of the main elevator, Fig. 1.

The two sprockets 29 33 are alternately made to drive conveyer-shaft 15. With clutch 32 in the position shown sprocket 33 is an idler, the power from chain 34 being transmitted by sprocket 29, gear 30 31, and clutch 32 to shaft 15. At such relation the speed of rotation for said shaft is markedly reduced because of the differential gear 30 31, while the direction of movement is necessarily the reverse of that described by the shaft when clutch 32 shifts to opposite position, releasing wheel 31 and engaging directly with sprocket 33. Companion sprocket 29 then becomes the idler, shaft 15 being compelled to revolve at a higher rate, properly suited for easy delivery of the grain to the remote exit 10 at opposite terminal of the conveyer-tube.

The reversal of clutch 32 can be accomplished by the operator from either side of the machine. Fork 34, seated, as usual, in the groove of clutch-collar 32, is secured to rod-shifter 35, which may be conveniently sustained by bracket 36 beneath the hopper. The outer terminal of shifter 35 encounters a slot 37 in cover 27 to better brace the shifter against end thrust of fork 34 when clutch 32 is in the act of interlocking. At its other terminal shifter 35 pivots to lever 38, having below its fulcrum an elongated eye, through which passes the trip-rod 40. The tripper is seen to extend the full length of the conveyer-tube, being properly mounted by brackets 36 41, so that it may either slide or turn, as desired. Handles 42, near the ends of the tripper 40, enable it to be readily managed. Coil-springs 43 43^a, mounted by collars 44^b on trip-rod 40 at each side of lever 38, encounter the lever alternately just before the rod finishes its traverse and afford a cushion-like thrust to aid shifter 35 and fork 34 in smoothly landing clutch 32 into its new engagement. To hold the rod 40 in place despite the compression of the spring 43 or 43^a at the close of the traverse, said rod carries a pair of catches 44 44^a, which alternately pass beyond bracket 41, projected from the conveyer-tube, and on axial quarter-turn of the rod are made to hook behind said bracket, thus keeping the rod fixed in place at either extreme.

The drawings show the parts in the relation assumed when sprocket 29 drives the auger-

shaft, all grain delivered to the hopper being allowed to promptly escape by exit 11 just beneath. If the grain is to escape instead at remote exit 10, the operator gives tripper 40 a quarter-turn, which suffices to throw catch 44 clear from the path of bracket 41, and then by an endwise thrust of the tripper-spring 43^a eventually contacts with lever 38 to shift the clutch into union with sprocket 33. At the close of its traverse catch 44^a, by quarter-turn of the rod, hooks behind bracket 41 on the opposite face and keeps the parts in set relation.

Between the collars for spring 43^a and catch 44 the tripper 40 loosely sustains an arm 47, the inner end of which fastens to the long handle 48, extended beneath the conveyer-tube and secured in turn to the sliding valve 49. The valve is a metal plate curved to conform to the hopper-floor and serves to close the exit 11 when the grain delivered to the hopper is to be carried across the conveyer to exit 10. The reverse movement imparted to the auger dispenses with the need of any valve for exit 10, since the grain will not travel to such exit unless the motion of the auger is in single direction of rotation (according to the pitch of the screw-flange) proper to convey the grain to such exit. The reverse rotation moves all grain away from outlet 10, forcing it constantly toward the companion outlet 11.

If an endless belt instead of an auger be employed within the conveyer-tube, a fractional part of the load often fails to escape at exit 11 even when brought there. The speed of the belt carries grain past the outlet. The minor portion of grain is delivered instead at opposite exit 10. Such exit must be temporarily closed by valve to prevent wastage. The use of the auger avoids the presence of the extra valve. Besides, it is plain that any grain delivered to outlet 11 by auger E' must stay there, beyond chance of return, until it finds escape.

Obviously the details of structure can be varied according to the mechanic's skill without departure from the essentials of the invention.

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

1. In cross-conveyers, the combination with the main tube having an end outlet, of the feed-hopper located at the end opposite and furnished with a valved exit therein, the rotating auger extended along said tube and hopper, the reversing drive-gear mechanism to actuate the auger-shaft and a tripper to shift said drive mechanism, substantially as described.

2. In cross-conveyers, the combination with the main tube having an outlet at one end, of the feed-hopper located at the end opposite and having a valved exit therein, the rotating auger extended along said tube and hopper, drive mechanism to actuate the auger

and a trip-rod controlled from opposite terminals to simultaneously shift both the drive mechanism and the hopper-valve, substantially as described.

5 3. In cross-conveyers, the combination with the main tube having an outlet at one end, of the feed-hopper located at the end opposite and having a valved exit therein, the rotating auger extended in separate parts (*i. e.*,
10 with space intervening) along said tube and hopper respectively, drive mechanism to actuate the auger and a trip-rod controlled from opposite terminals to simultaneously shift
15 both the drive mechanism and the hopper-valve, substantially as described.

4. In cross-conveyers, the combination with the main tube and feed-hopper of the rotating auger extended through the same, the drive mechanism to actuate the auger comprising dual sprockets loosely mounted upon
20 the auger-shaft and parallel counter-shaft respectively, the gear-pinion carried by the counter-shaft in interlock with the sprocket thereon, the meshing gear-wheel on the auger-
25 axle, the shifting clutch interposed at said axle between the sprocket and gear wheels

and suitable means for alternately throwing said clutch into or out of engagement therewith, substantially as described.

5. The combination with the conveyer 30 mechanism and its inclosing tube having an outlet-valve therein, of the drive-gear with its control-clutch to reversely operate said conveyer mechanism and suitable means to actuate both the outlet-valve and the control- 35 clutch simultaneously, the same comprising a shifter-rod for the clutch, a tripper-rod sustained by the conveyer-tube, movable longitudinally thereon and axially about to interlock with such tube at the finish of its travel; said tripper-rod being pivotally joined
40 to the cross-arm extended from the outlet-valve and having dual coil-springs thereon to oppositely encounter the free end of a tilt-lever fulcrumed upon the conveyer-tube and
45 secured to the shifter-rod for the clutch, substantially as described.

FRANK C. STUCKEL.

Witnesses:

ALBERT WRIGHT GUILBERT,
RICHARD TAYLOR ROBINSON.