

No. 763,875.

PATENTED JUNE 28, 1904.

S. A. FURMAN.  
GRAIN SEPARATOR.

APPLICATION FILED JAN. 15, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 1.

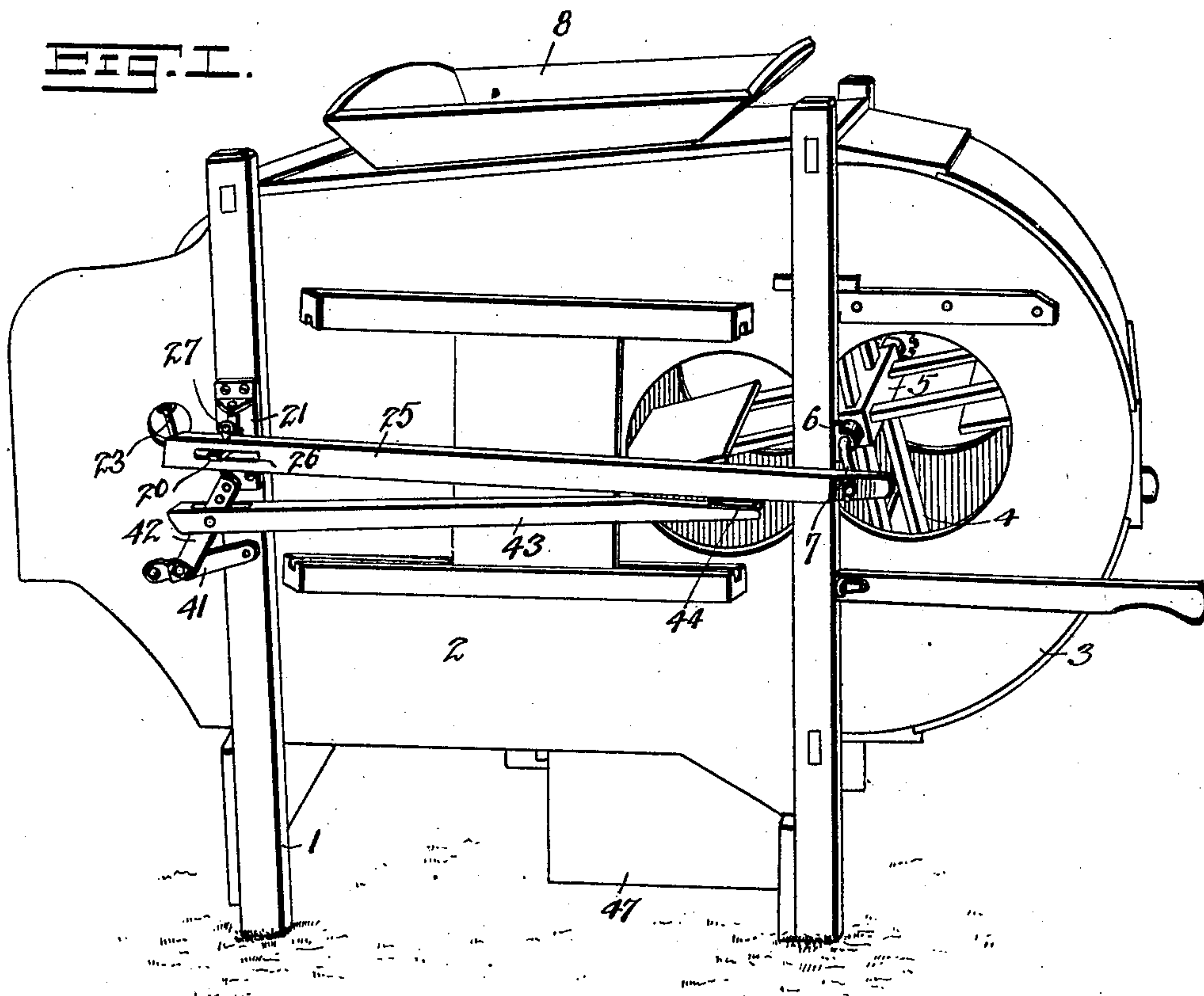


FIG. 2.

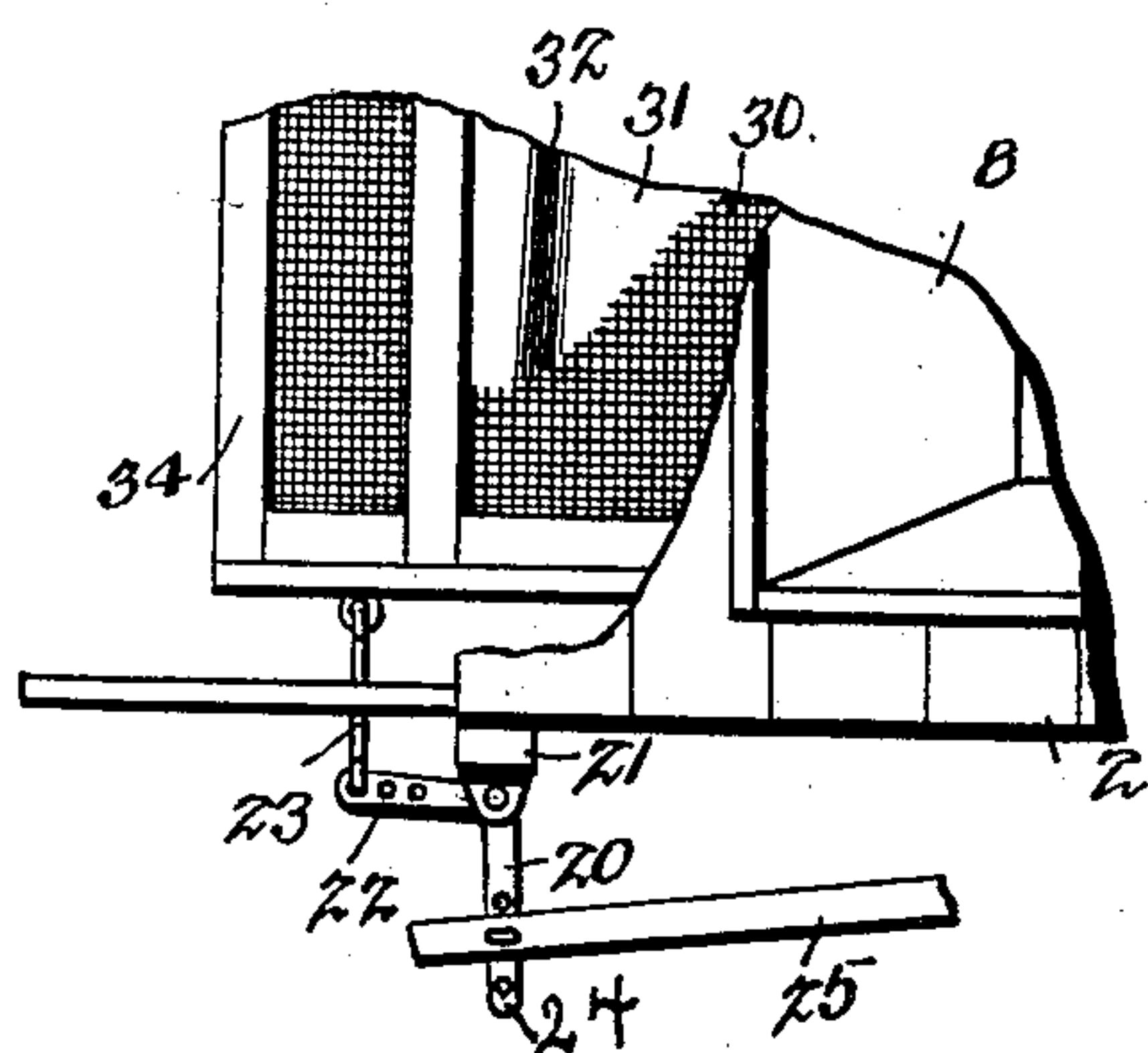
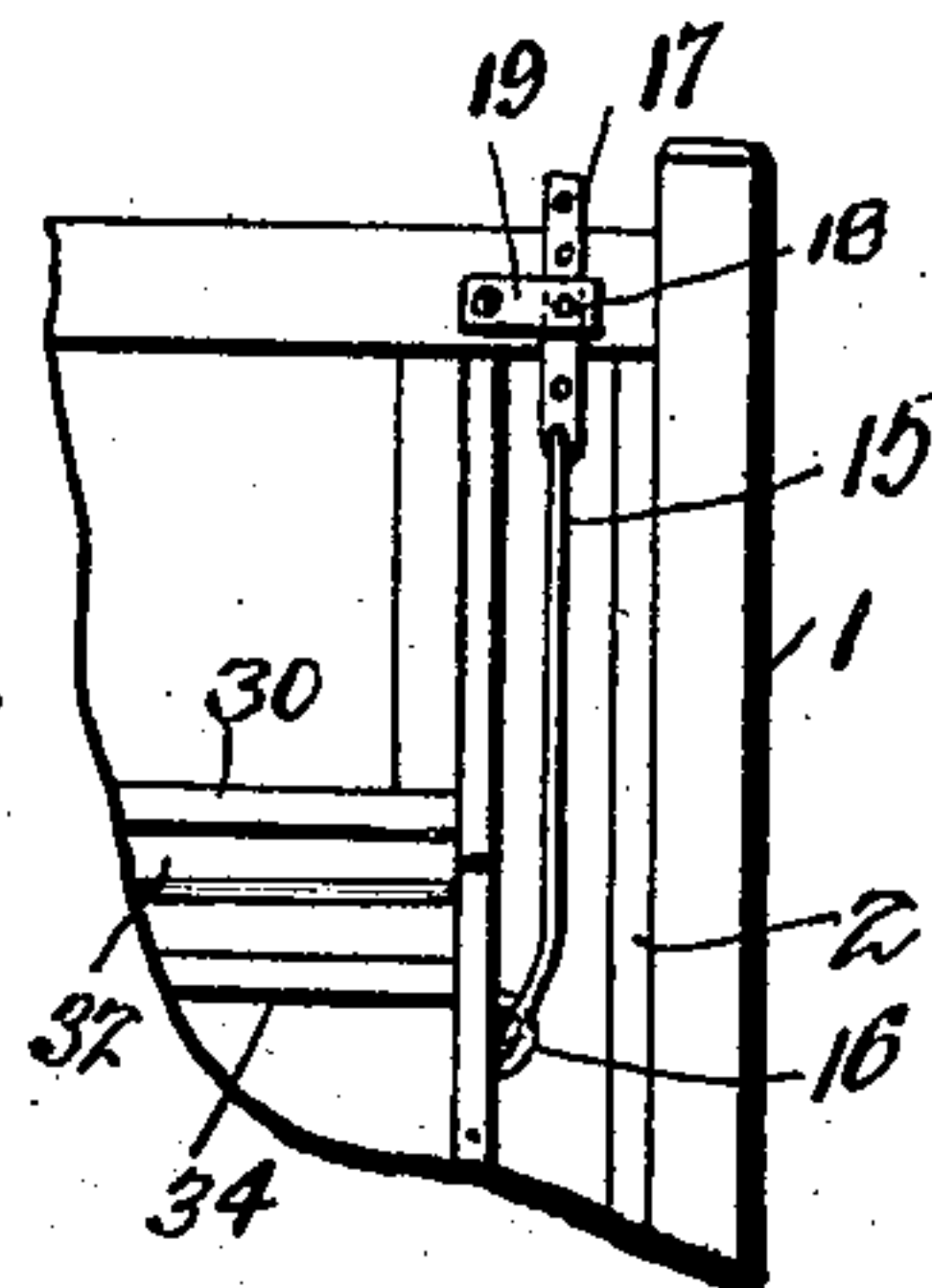


FIG. 3.



Witnesses  
*E. C. Stewart*  
*J. W. Garner*

S. A. Furman, Inventor.  
by *C. A. Snow & Co.*  
Attorneys

No. 763,875.

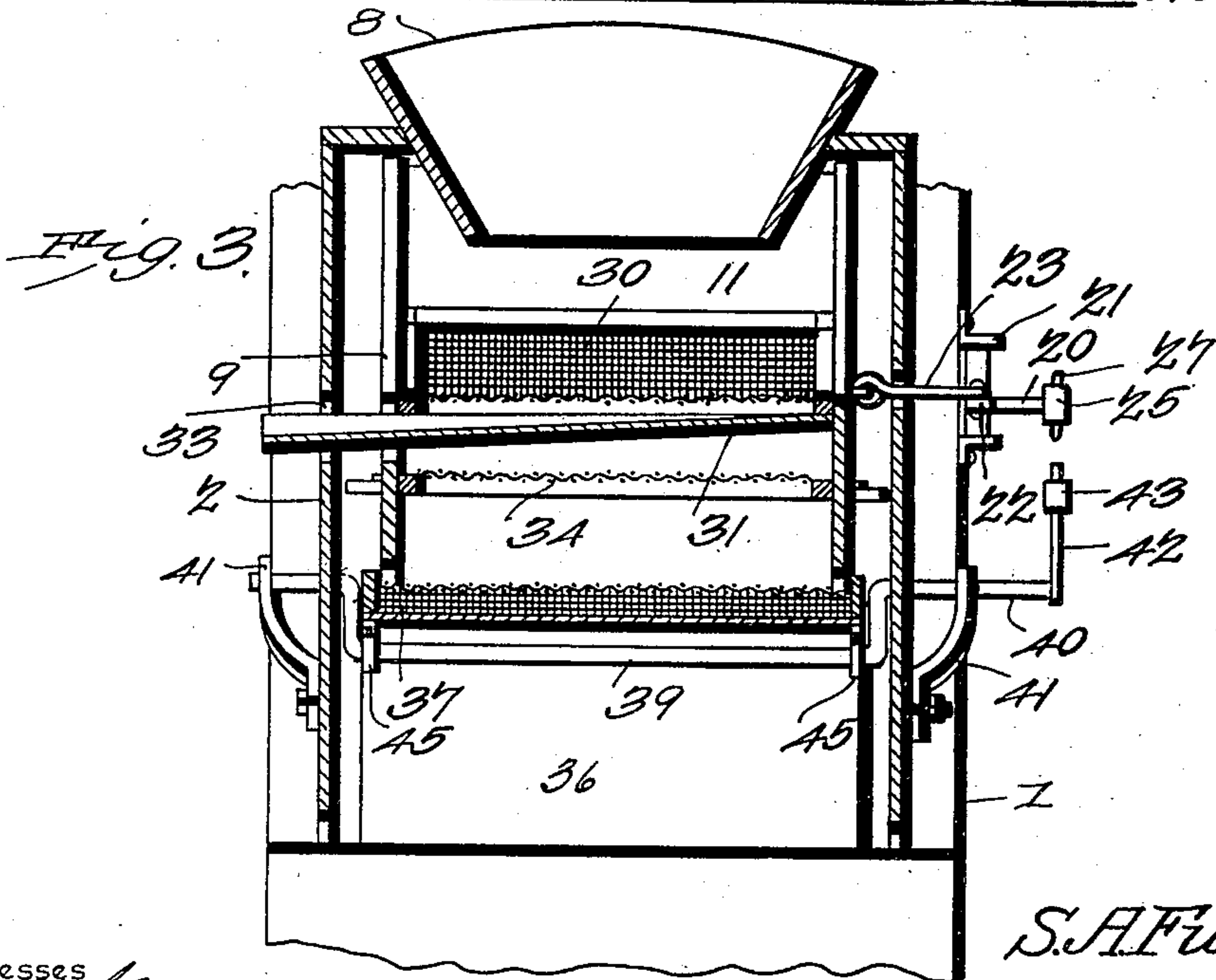
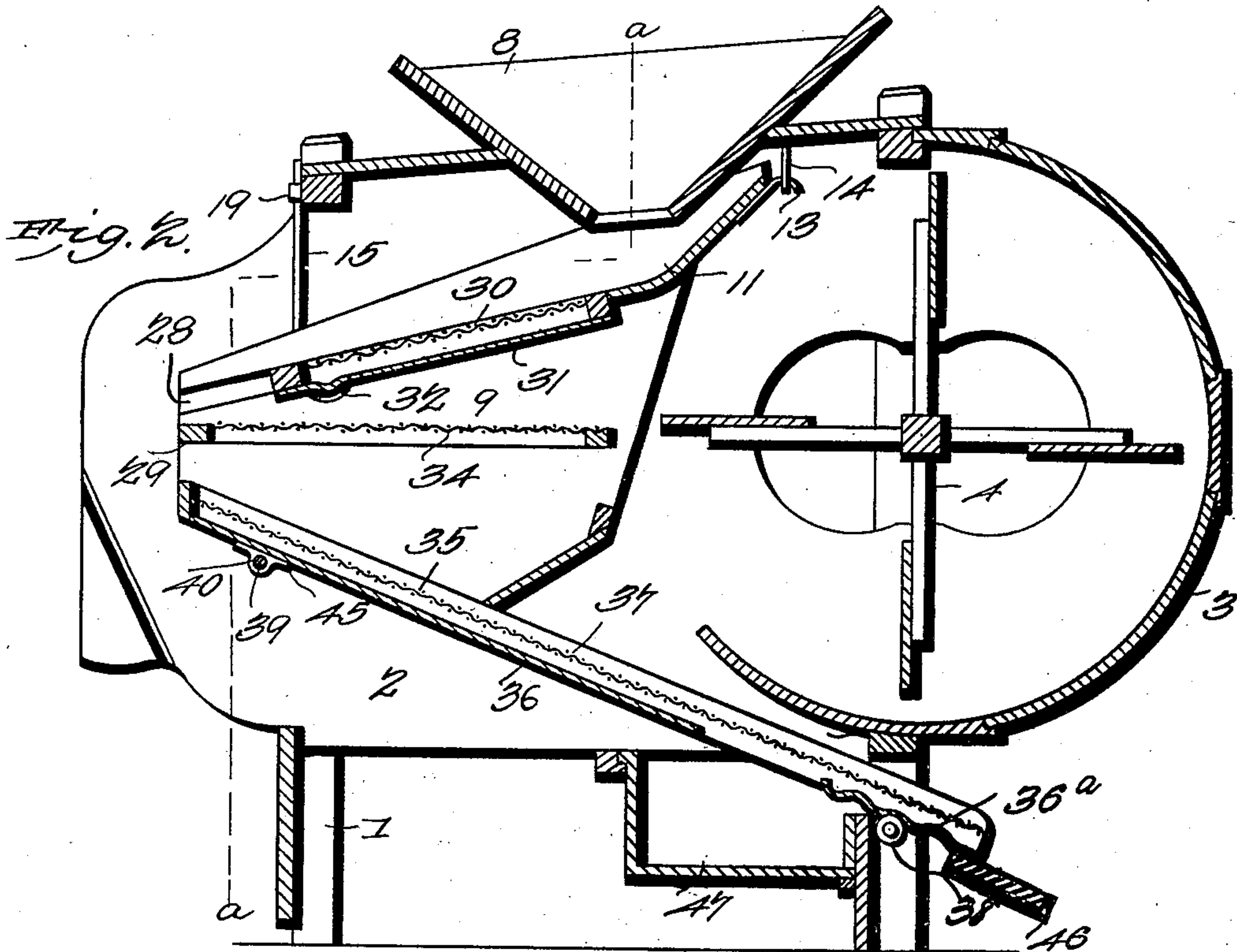
PATENTED JUNE 28, 1904.

S. A. FURMAN.  
GRAIN SEPARATOR.

APPLICATION FILED JAN. 15, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses  
*B. C. Stewart*  
*J. W. Garner*

by

*C. A. Snow & Co.*  
Attorneys

*S. A. Furman,*  
Inventor.



# UNITED STATES PATENT OFFICE.

SAMUEL A. FURMAN, OF POTTER, NEW YORK.

## GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 763,875, dated June 28, 1904.

Application filed January 15, 1902. Serial No. 89,903. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL A. FURMAN, a citizen of the United States, residing at Potter, in the county of Yates and State of New York, have invented a new and useful Grain-Separator, of which the following is a specification.

My invention is an improved grain-separator; and it consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a grain-separator constructed in accordance with my invention. Fig. 2 is a vertical longitudinal sectional view of the same. Fig. 3 is a vertical transverse sectional view of the same, taken on a plane indicated by the line *a a* of Fig. 2. Fig. 4 is a detail view showing the bell-crank lever and its connections to the upper shoe and crank-shaft, respectively. Fig. 5 is a detail rear elevation showing one of the hangers which suspend and support the rear end of the upper shoe.

The frame 1 is preferably of the form here shown, but may be of any suitable construction, and the same supports an inclosing casing 2, at one end of which is formed a drum 3, in which is disposed a blower-fan 4. The shaft 5 of the said fan is journaled in suitable bearings 6, that are secured to the frame 1, and the said shaft is provided at one end with a crank 7. Any suitable means, (not here shown,) such as a hand-crank or a belt-pulley, may be provided and attached to the opposite end of the fan-shaft to operate the fan.

In the upper side of the casing 2 is a hopper 8. An upper shoe 9, which comprises the sides 10 and suitable connections between them, is disposed below the hopper 8. At the front upper side of the shoe 9 is a transversely-inclined feed-board 11, which is so disposed as to receive the material discharged from the hopper 8. The front end of the upper shoe is suspended from the upper side of the casing by any suitable means which will admit of the lateral movement of the rear end of the upper shoe. I here show a hook 13 and a staple 14 to thus support and suspend the front end of the upper shoe. The rear portion of

the same is supported by a pair of hangers 15, the lower ends of which are flexibly connected to the sides of the shoe, as at 16, and the upper portions of which are provided each with a series of adjusting-openings 17, adapted to engage studs 18, which project from the upper side of the frame and casing. Lock-buttons 19 are pivoted to the rear side of the upper portion of the frame and are adapted to engage the rear sides of the upper portions of the hangers 15 to secure the latter on the studs 18. It will be understood that the studs 18 and adjusting-openings 17 adapt the rear end of the upper shoe to be adjusted vertically, as may be required, and that such adjustment may be easily and conveniently effected at one side of the shoe independently of the other side, for the reason that only a single centrally-disposed supporting means, comprising the hook 13 and staple 14, is used. The lock-buttons 19, as will be seen by reference to Fig. 5 of the drawings, are perforated so as to engage the studs 18, thus confining the adjustable hangers 19 securely in any position to which they may be adjusted. These studs 18 obviously form the axis upon which the hangers swing when the shoe is laterally vibrated, as will be hereinafter set forth.

A horizontally-disposed bell-crank lever 20 is fulcrumed in a bearing-bracket 21, which is bolted or secured by screws to one side of the frame 1 near the rear side of the casing. The rearwardly-extending arm 22 of said bell-crank lever is connected by a link 23 to one side of the upper shoe 9, near the rear end of the latter. Said link is flexibly connected to the arm 22 and to the shoe. The outwardly-extending arm 24 of the bell-crank lever is connected to the rear end of a pitman 25, the front end of which is connected to the wrist of the crank 7. As here shown the rear portion of the pitman 25 has a transverse slot 26, through which the outer end of the arm 24 extends and in which the same is pivoted, as by a pin 27. It will be understood from the foregoing that when the fan is rotated the crank 7, pitman 25, bell-crank lever 20, and link 23 will communicate transverse reciprocating motion to the rear end of the upper shoe 9 and that the hook 13 and staple 14 will



serve as a pivot on which the front side or end of the said shoe turns.

In the sides of the shoe 9 are upwardly-inclined forwardly - extending supporting-grooves 28 and grooves 29, which are below the grooves 28. An inclined cockle-screen 30 has its frame secured in the grooves 28, the cockle-screen being so disposed with reference to the feed-board 11 that the grain discharged from the hopper onto the said feed-board will be by the latter deflected onto the cockle-screen. The frame of the cockle-screen has an imperforate bottom 31, disposed at a suitable distance below the cockle-screen and inclining laterally and downwardly and formed at its lower rear corner with a spout 32, which projects laterally through and operates in an opening 33 made in one side of the casing 2. It will be understood that as the grain passes over the cockle-screen the cockle will pass through said screen, become separated from the grain, fall onto the imperforate bottom 31, and be discharged from the latter at one side of the machine through the spout 32.

A chaffing-screen 34 has its sides secured in the grooves 29. It will be understood by reference to Fig. 2 of the drawings that the grain discharged over the lower side of the cockle-screen will fall onto the chaffing-screen, where it will be subjected to the action of the blast from the fan and thoroughly winnowed thereby, the chaff and other impurities being blown outwardly by the air-blast from the rear end of the machine.

A longitudinally-reciprocating lower shoe 35 has its rear portion disposed below the laterally-reciprocating upper shoe. Said lower shoe 35 has an imperforate bottom 36, and at the lower portion of the shoe, on the under side thereof, is a metal sheet 36<sup>a</sup>, the corrugations of which are transverse of the shoe and which terminates at the front end of the shoe 35. A screen 37 is carried by the said longitudinally-reciprocating lower shoe, the said screen being disposed at some distance above the imperforate bottom 36 and projecting forwardly beyond the same to the extreme front end of the shoe. The sides of the lower shoe 35, at their front ends, bear and are supported upon rollers 38, which engage the corrugated metal sheet 36<sup>a</sup>. The rear portion of the said lower shoe 35 is supported by the depending cranked portion 39 of a rock-shaft 40. The latter is journaled in bearings 41, which are secured to the frame 1, and the said rock-shaft is provided at one end with a rock-arm 42. Said rock-arm is connected to the rear end of a pitman 43. The front end of said pitman is flexibly connected, as by a hinge 44, to the pitman 25 and receives its motion therefrom. The rear portion of the lower longitudinally-reciprocating shoe is provided on its under side with bearings 45 for the crank portion

39 of rock-shaft 40. It will be understood from the foregoing that when the machine is in operation the upper shoe will be vibrated or reciprocated transversely and that the lower shoe will be simultaneously reciprocated in a longitudinal direction and vibrated vertically by the joint action of the crank-shaft and pitman and the corrugated sheet on the rollers 38.

The grain which falls through the chaffing-screen falls upon the upper portion of the separating-screen 37 and is discharged from the lower front end of the latter onto a laterally-inclined discharge-board 46, which is disposed transversely of the machine, at the front end thereof, and serves to discharge the grain onto the floor in advance of the machine. The screenings which pass through the screen 37 are discharged by the shortened imperforate bottom 36 into a receptacle 47, (which is here shown as a drawer,) with which the frame is provided and which is located under the board 46 and the front lower portion of the lower shoe 35.

By pivotally suspending the front end of the upper shoe the lateral motion of the rear portion thereof is greatly facilitated and a material economy of power is effected. By vertically adjusting the rear portion of said upper shoe the cockle-screen and chaffing-screen may be disposed at any angle required to secure the best results.

The cranked rock-shaft which supports the rear portion of the lower shoe imparts a jumping motion to the rear end of said shoe, which greatly enhances the efficiency of the separating-screen carried thereby and causes the grain to travel and jump thereon toward the front end of the machine.

Having thus described my invention, I claim—

In a device of the class described, the combination of a casing having a hopper, a centrally-disposed staple depending from the top of the casing in front of the hopper, a shoe having a hook engaging said staple, hangers connected flexibly with the sides of said shoe near the rear end thereof and each provided at its upper end with a vertical row of perforations, studs projecting forwardly from a beam of the frame and adapted to be engaged by said perforations, and lock-buttons mounted pivotally adjacent to the studs and having perforations engaging the outer ends of the latter.

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

SAMUEL A. FURMAN.

Witnesses:

LUCY A. BORDWELL,  
EMMET RICHIE.