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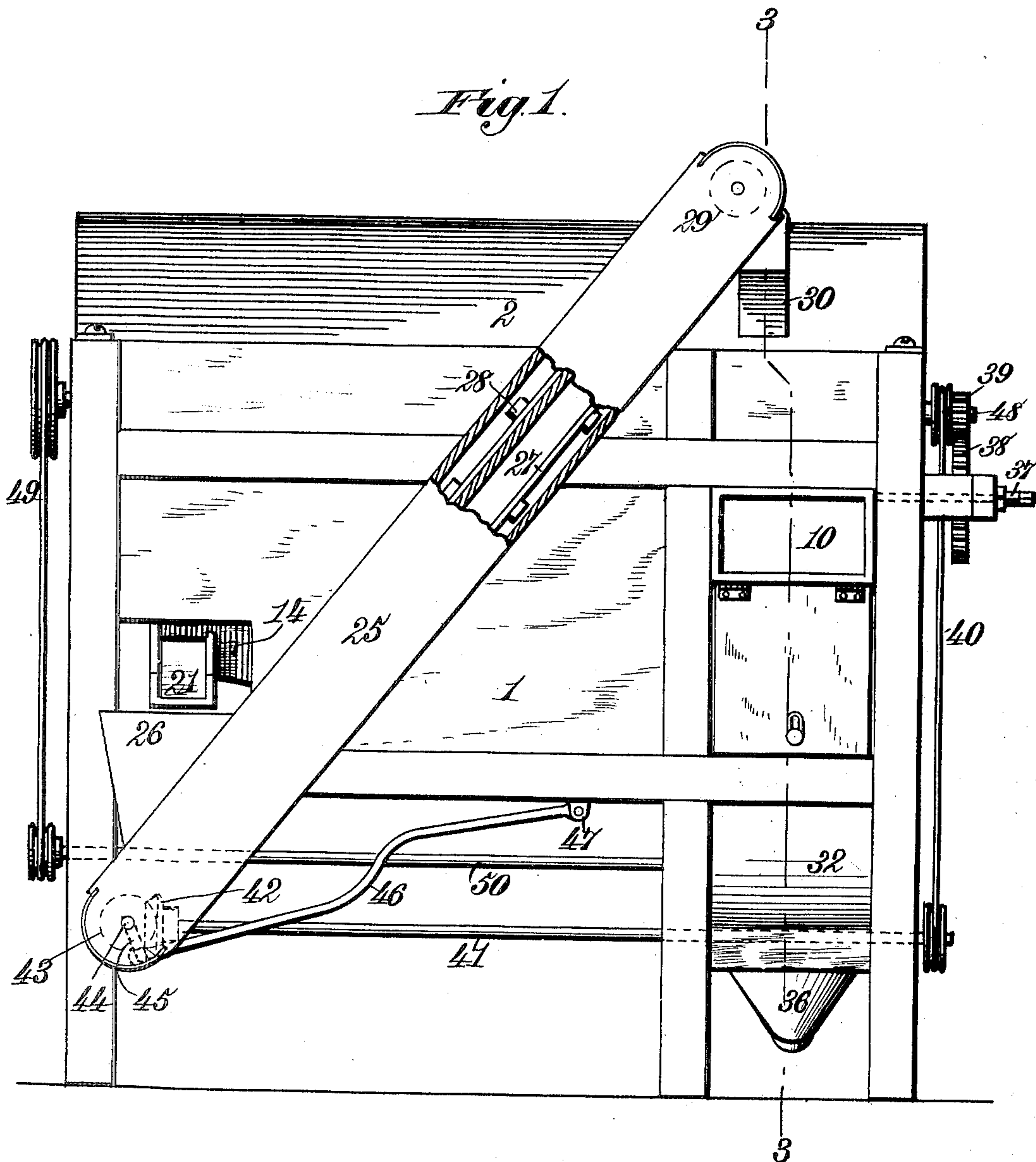
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MECHANISM FOR THRESHING, SEPARATING, AND CLEANING PEAS, BEANS, &c.

(No Model.)

(Application filed Aug. 13, 1900.)

3 Sheets—Sheet 1.



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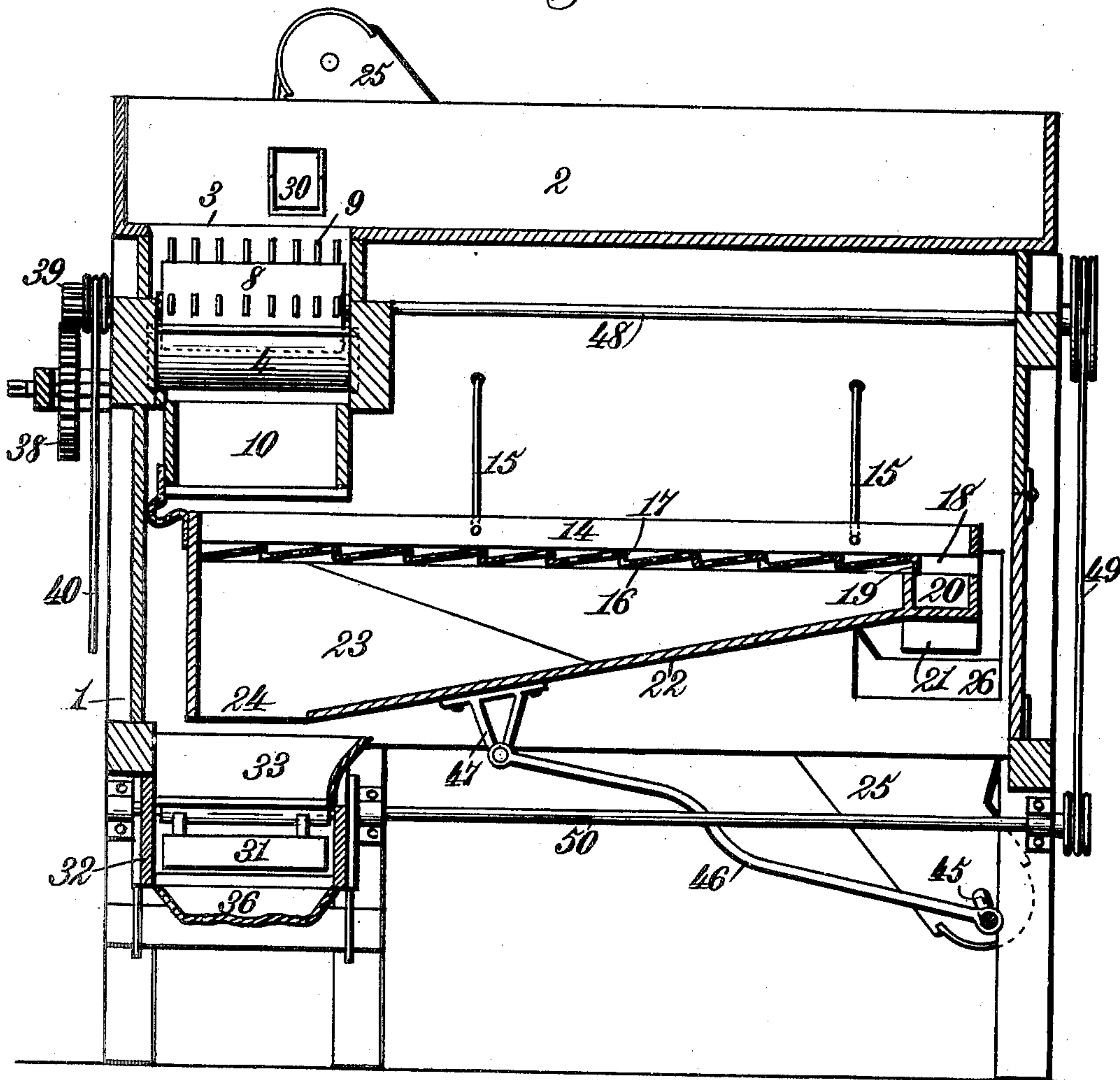
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Fig. 2.



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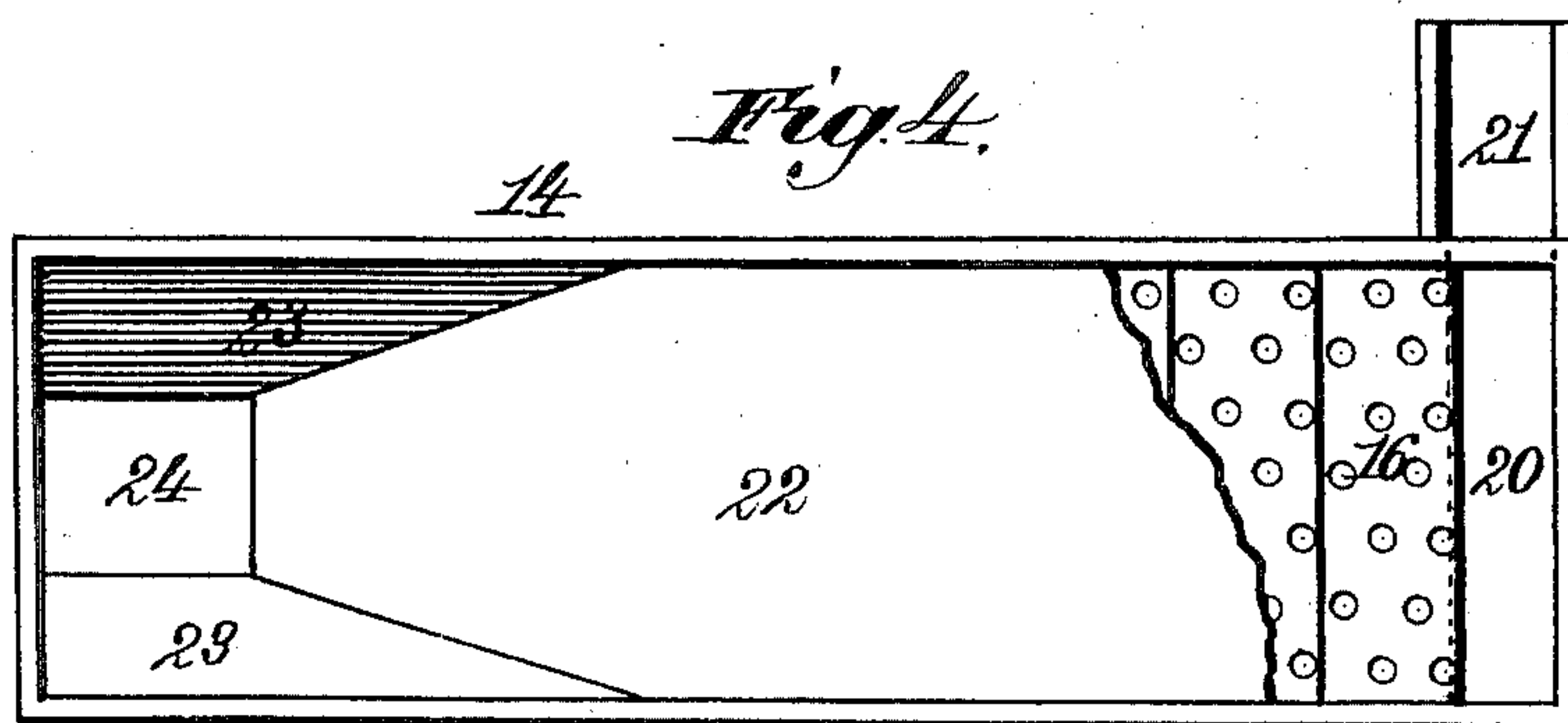
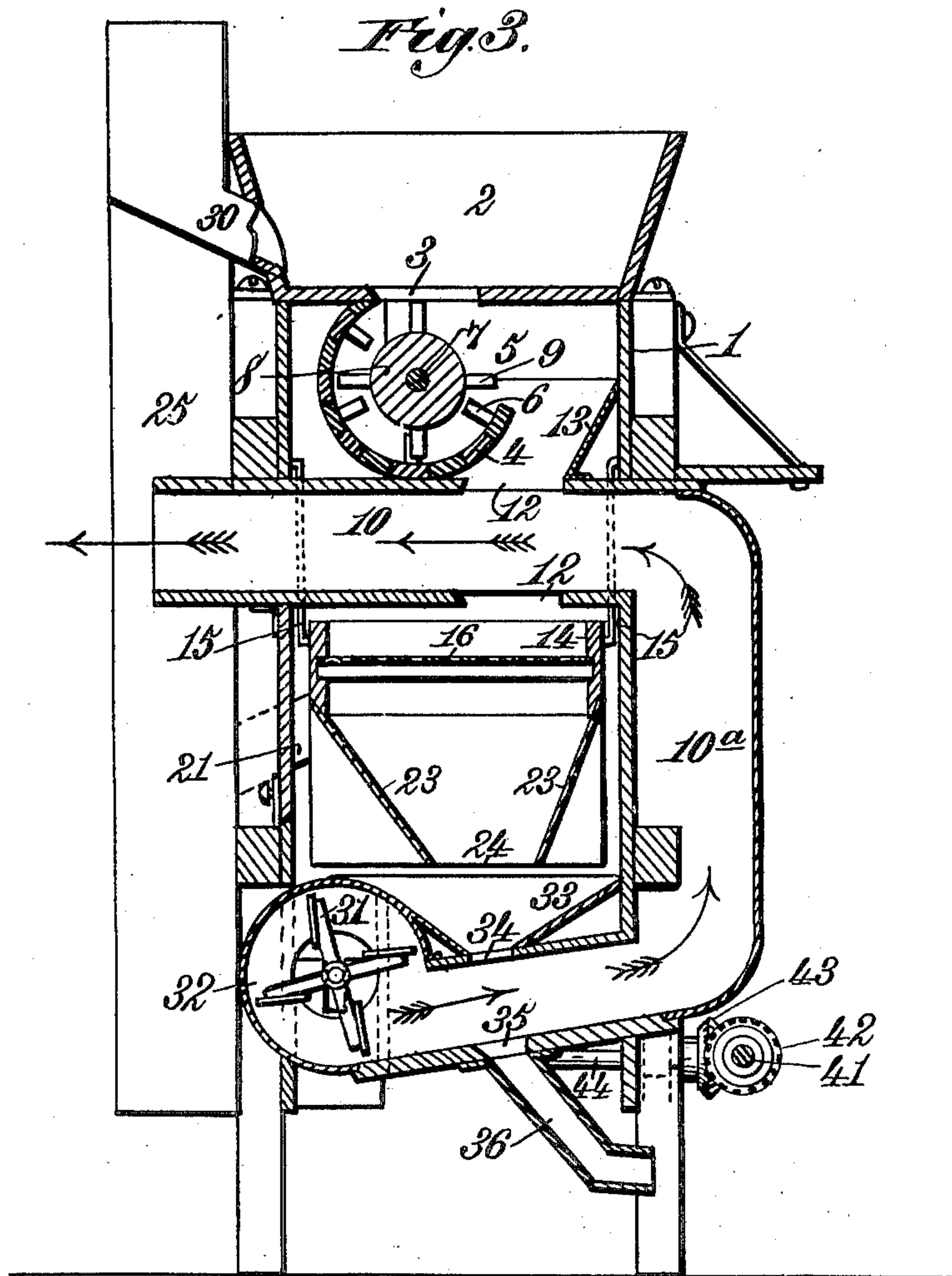
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(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

CIRUS F. SLONE, OF MEDINA, TENNESSEE.

MECHANISM FOR THRESHING, SEPARATING, AND CLEANING PEAS, BEANS, &c.

SPECIFICATION forming part of Letters Patent No. 668,023, dated February 12, 1901.

Application filed August 13, 1900. Serial No. 26,800. (No model.)

*To all whom it may concern:*

Be it known that I, CIRUS F. SLONE, a citizen of the United States, residing at Medina, in the county of Gibson and State of Tennessee, have invented new and useful Improvements in Mechanism for Threshing, Separating, and Cleansing Peas, Beans, and other Products, of which the following is a specification.

My invention relates to mechanism for threshing, separating, and cleansing peas, beans, and other products.

It is my object to provide a mechanism of this type which shall be simplified in construction by reducing the number of mechanical parts, but which shall be capable of rapid, efficient, and economical operation.

It is my purpose also to provide a mechanism of the type named in which the material operated upon shall be subjected at two different points to the action of a continuous air-blast from a single fan, the force of said blast being greater at one point than at the other, whereby the marketable product is more thoroughly cleansed and separated from foreign substances without increasing the number of operative parts of the mechanism.

It is another purpose of my said invention to provide a simple and inexpensive construction and combination of parts whereby the machine can be used for threshing and separating other material besides peas or beans, such as sunflower-seed, sorghum-seed, turnip and mustard seed, and the like.

I aim also to produce a mechanism for threshing peas, beans, and the like which shall have a very light draft, be capable of a large daily output, and possess other novel and useful improvements, all of which will be fully described in the following specification and then particularly pointed out and defined in the claims at the end thereof.

To enable others to clearly understand and practice my said invention, I will now explain the same in detail, reference being had for this purpose to the accompanying drawings, in which—

Figure 1 is a side elevation showing the casing inclosing the complete mechanism, part of the boxing of the elevator being broken away. Fig. 2 is a vertical longitudinal section taken nearly in the central line of the

machine. Fig. 3 is a vertical section taken upon the line 3 3 in Fig. 1. Fig. 4 is a plan view showing the separator, a part of the screen being broken away.

The reference-numeral 1 in said drawings indicates the casing of the machine, which is represented as being supported by legs, but may be made portable by mounting it upon any of the well-known forms of truck used for such purposes. Mounted on the same is a species of hopper 2, extending the full length of the casing, in which the material to be operated upon is placed. At or near one end of this hopper an opening 3 is formed in the bottom, through which the peas, beans, or other material to be operated upon pass to the threshing and separating mechanism below.

The threshing or hulling devices by which the pods or hulls are broken up and torn apart consists of a concave 4, having somewhat less than half its circular wall removed, thereby forming an opening 5, one edge of which coincides with an edge of the opening 3, while the other lies at some distance below and beyond the other edge of said opening, as shown in Fig. 3. Within the concave 4 are pins or studs 6, projecting from the inner face toward the center or axis of the concave. Coinciding with this axis is the shaft 7 of a cylinder 8, from the cylindrical face of which project pins 9, so arranged as to pass the pins or studs 6 without contact, but suitably close to the same, the ends of the pins 9 revolving just clear of the inner face of the concave-section 4.

The threshing devices described are arranged in a compartment by themselves directly beneath the opening 3. The bottom of said compartment is formed by the upper wall of a blast-trunk 10, which passes horizontally and transversely through the casing 1, as shown in Figs. 2 and 3. In the upper and lower walls of the blast-trunk are openings 12, through which the material acted upon by the threshing devices drops by its own gravity, passing directly across the continuously-flowing current of air, which traverses the blast-trunk in the direction indicated by the arrows in Fig. 3. The material operated upon by the thresher is drawn by the revolution of the cylinder 8 between said cylinder and the concave-section 4 and thrown by the



pins 9 over upon an inclined plate 13, which guides it to the upper opening 12. The concave-section 4 projects partly over this opening and inclines in the same direction as the plate 13, the passage between lying at a more or less acute angle with the line of direction of the air-current. To escape from the blast-trunk through this passage, it would be necessary for the air to make a backward movement and follow a tortuous course in order to pass out of the opening 3, its direct path to the exit end of the blast-trunk offering much less obstruction.

Beneath the blast-trunk 10 is the separator, consisting of a frame 14, suspended within the casing by pivoted hangers 15 and extending nearly from end to end of the interior. This frame supports a horizontal or nearly horizontal screen or sieve 16, having numerous openings of a size and form suited to the peas or other material to be separated. The screen is also formed with a series of transverse steps 17, integral with the metal of which the screen is formed and at equal distances apart. The transverse steps 17 are substantially at right angles to the plane of the frame 14, and the screen has a rising inclination between them from the bottom of one step to the top of the next. The screen lies in a groove 18, formed in the inner face of the frame 14, from which it may be withdrawn and another screen substituted having a similar step formation, but provided with openings of different size, whereby the machine can be used to thresh and separate seed of a different kind. One end of the screen 16 lies directly under the blast-trunk 10 in a position to receive whatever material drops through the opening 12. The other end of the screen is provided with a lip 19, which overlaps the inner wall of a shoe 20, which extends across the end of the frame 14 and has at one side of said frame an extension 21, which projects through an opening in the casing 1, its inclination being such that any material passing over the end of the screen 16 and dropping into the shoe will pass down therein and out through the extension 21. Beneath the screen 16 is a chute formed of a wall 22, which abuts against the lower edge of the inner wall of the shoe 20, from which point it extends toward the other end of the frame 14 with a downward inclination, as shown in Fig. 2. The chute is provided with inclined side walls 23, which converge to an opening 24 under that end of the screen 16 which lies under the blast-trunk 10.

The end of the outwardly-projected extension 21 of the shoe overhangs the lower part of an inclined elevator-casing 25, having a hopper 26, which receives whatever comes from the shoe. Within the casing 25 is the elevator-belt 27, with cross-slats or buckets 28 of suitable form. The elevator-belt runs over drums 29 at the ends of the casing 25, and the elevator discharges at its upper end

into a chute 30, which enters the side of the hopper 2 close to the feed-opening 3.

The blast-trunk is supplied with a continuous current of air by a rotary fan 31, arranged in a fan-casing 32, placed in the lower part of the casing 1, at the same end at which the threshing mechanism is arranged. As shown most clearly in Fig. 3 of the drawings, the blast-trunk is approximately U-shaped and comprises two substantially horizontal portions and a vertical intermediate portion 10<sup>a</sup>, connecting the two horizontal portions. The lower transverse portion of the blast-trunk preferably has a moderate upward inclination and may be of somewhat less internal area than the upper transverse portion. It passes directly under the opening 24, through which the peas that pass through the screen 16 are discharged, and has a hopper 33 mounted on it, leading to an opening 34 in its upper wall and not far from the fan-casing. An opening 35 in the lower wall leads to a discharge spout or chute 36, which is inclined laterally and downward, as shown in Fig. 3.

The threshing-cylinder 8 is driven from a power-shaft 37, having a spur or other gear 38 meshed with a pinion 39 on the cylinder-shaft. The latter shaft is geared by a belt or sprocket-chain 40 to a shaft 41, which extends longitudinally beneath the casing 1 to the lower end of the elevator-casing, its end carrying a bevel-gear 42, which operates a like gear 43 on a shaft 44, that extends across the machine and carries the drum 29 in the lower end of the elevator-casing. A crank 45 on the shaft 44 also operates a pitman 46, connected to a bracket 47, hanging from the wall 22, whereby the necessary reciprocating movement is given to the screen or sieve 16. The shaft 48 of the threshing-cylinder is extended to the other end of the machine, as shown in Fig. 2, and is geared by a belt or sprocket-chain 49 to a shaft 50, which carries the fan.

The operation of the mechanism is as follows: The material to be operated upon is placed in the hopper 2, from which it passes through the feed-opening 3 into the threshing-concave 4. As the vines or plants are carried around in the concave by the revolving cylinder the teeth 6 and 9 operate to strip the pods, hulls, or parts containing the seed from the vines or plants and break up and shred the same, thus liberating the seed in a well-known manner. The mass of material coming from the thresher drops in a continuous stream through the openings 12 in the upper transverse portion of the blast-trunk, being subjected as it passes to the action of the air-current, which is only strong enough at this point to drive off the dust and lighter impurities, but not so strong as to carry any of the passing material with it. After passing through the upper transverse portion of the blast-trunk it is received on the end of the stepped screen 16, to which a suitably-



rapid reciprocation is given by the pitman 46, by which the material is kept in constant movement upon the screen, while at the same time it is caused by the step formation to travel toward the other end of the screen, where all these parts too large to pass through the openings therein will fall into the shoe 20, by which they will be again delivered to the thresher and the operation repeated. The peas passing the screen fall into the chute beneath it and pass down the inclined wall 22 to the opening 24. Through the latter they fall into the hopper 33 and thence go through the openings 34 and 35 in the lower transverse portion of the blast-trunk to the spout 36. In passing from the opening 34 to the opening 35 they are again subjected to the air-blast; but at this point the current of air is of greater force by reason of being so much closer to the fan and because of the relatively smaller area of the blast-trunk. The lower transverse portion of the latter is therefore inclined somewhat, so that the peas forced out of the direct line of descent shall upon reaching the bottom wall of the blast-trunk be able to roll down its incline, and thereby reach the discharge-spout 36. By these means I subject the hulled peas at two different points to the direct action of a continuous air-current produced by a single fan, the current being of relatively greater force at one point than at the other.

By means of the interchangeable screen I am able to use the same mechanism in threshing sunflower-seed, sorghum-seed, mustard and turnip seed, and others, the only variation required being in the size of the openings in the screen.

It will be observed that the entire mechanism comprises a much less number of mechanical parts than are usually seen in machines of this type, whereby it is of very light draft, can be manufactured at a low cost, and is not at all liable to become disordered.

What I claim is—

1. The combination with a threshing mechanism and a vibrating screen beneath said mechanism, of an air-forcing mechanism having a blast-trunk substantially U-shaped and comprising two transverse portions united at one end by a single and undivided intermediate vertical portion, and a fan-blower connected with the end of the lower transverse portion, whereby the entire volume of the air-blast is delivered first through the lower and finally through the upper transverse portion

of the blast-trunk, the lower transverse portion having a smaller internal area than the upper, one of said transverse portions being arranged beneath the threshing mechanism and the other beneath the screen and each provided with registering openings in their upper and lower walls to permit the threshed product to pass transversely therethrough, substantially as described.

2. The combination with a threshing mechanism and a vibrating screen beneath said mechanism, of an air-forcing mechanism having a blast-trunk substantially U-shaped and comprising two transverse portions united at one end by a single and undivided intermediate vertical portion, and a fan-blower connected with the end of the lower transverse portion, whereby the entire volume of the air-blast is delivered first through the lower and finally through the upper transverse portion of the blast-trunk, the lower transverse portion being inclined upwardly and having a smaller internal area than the upper, one of said transverse portions being arranged beneath the threshing mechanism and the other beneath the screen and each provided with registering openings in their upper and lower walls to permit the threshed product to pass transversely therethrough, substantially as described.

3. The combination with a threshing mechanism and a vibrating screen beneath said mechanism, of an air-forcing mechanism having a blast-trunk substantially U-shaped and comprising two transverse portions united at one end by a single and undivided intermediate vertical portion, and a fan-blower connected with the end of the lower transverse portion, whereby the entire volume of the air-blast is delivered first through the lower and finally through the upper transverse portion of the blast-trunk, one of the said transverse portions being arranged beneath the threshing mechanism and the other beneath the screen and each provided with registering openings in their upper and lower walls to permit the threshed product to pass transversely therethrough, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CIRUS F. SLONE.

Witnesses:

D. T. ANDREWS,  
J. M. SANDERS.