

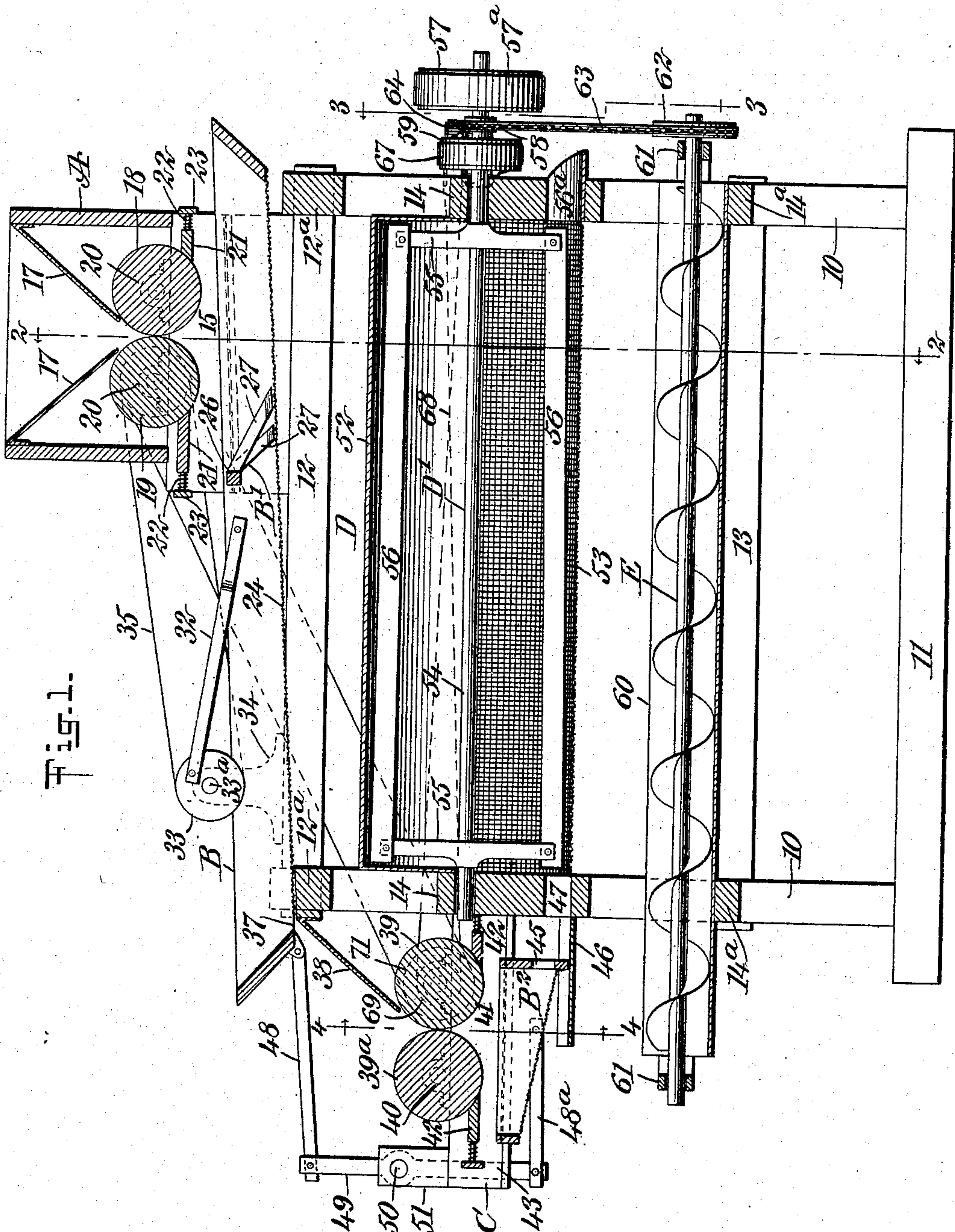
No. 840,296.

PATENTED JAN. 1, 1907.

W. CALDWELL.
MACHINE FOR HULLING GREEN CORN.

APPLICATION FILED APR. 2, 1906.

2 SHEETS—SHEET 1.



WITNESSES

John H. ...
Wm. H. ...

INVENTOR

Wayne Caldwell

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ATTORNEYS

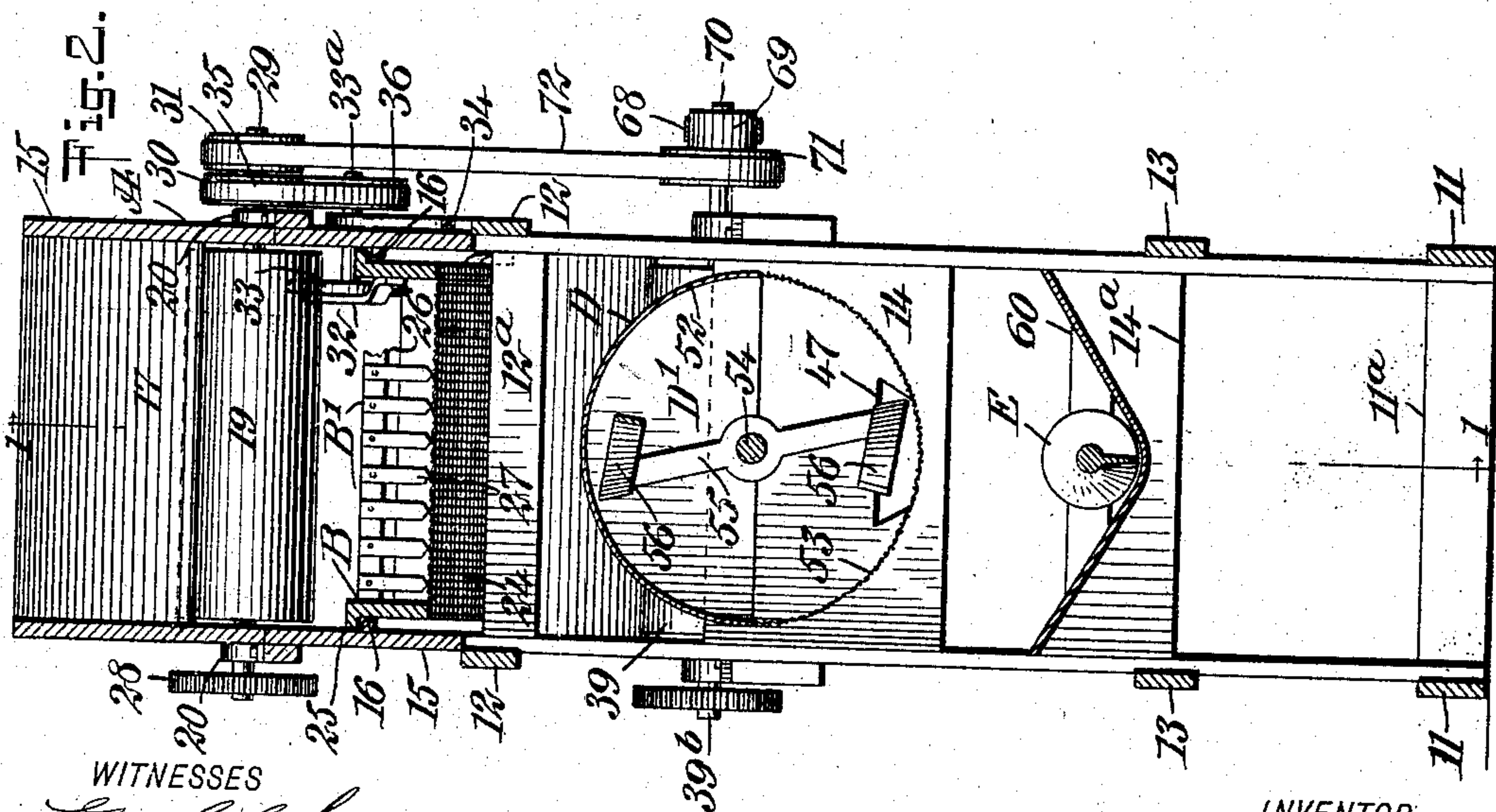
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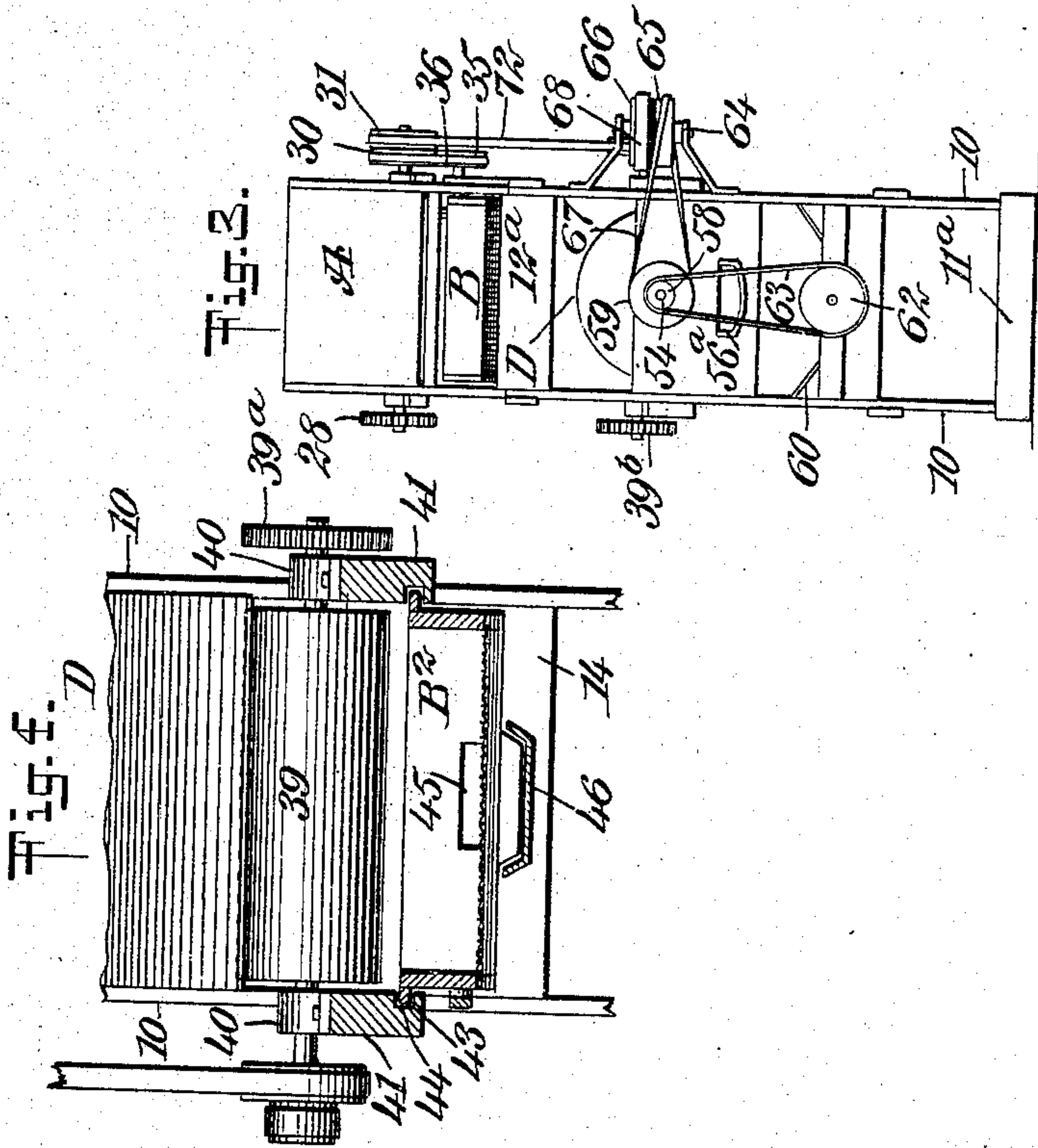


Fig. 3.

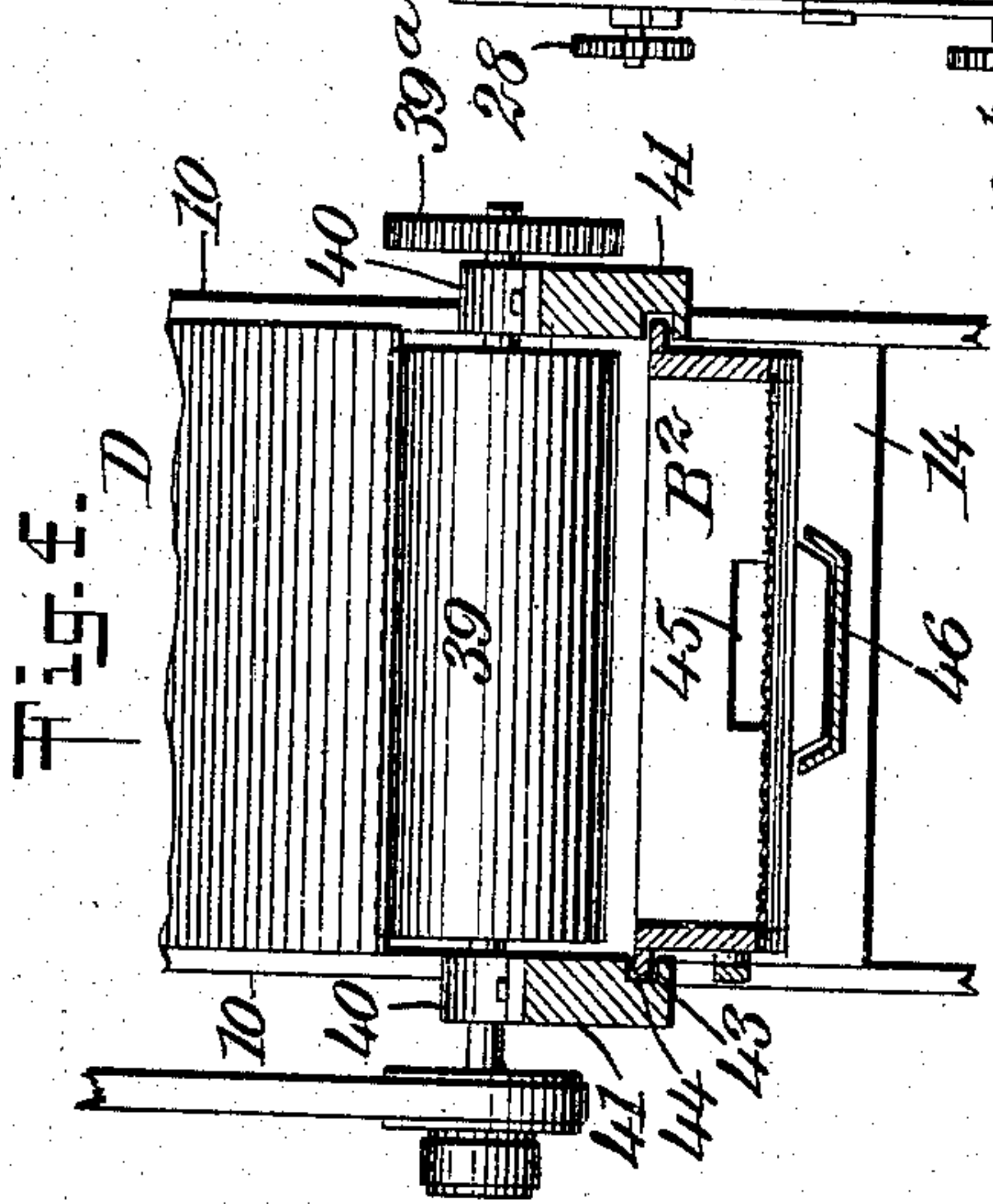


Fig. 4.

UNITED STATES PATENT OFFICE.

WAYNE CALDWELL, OF CIRCLEVILLE, OHIO.

MACHINE FOR HULLING GREEN CORN.

No. 840,296.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed April 2, 1906. Serial No. 309,355.

To all whom it may concern:

Be it known that I, WAYNE CALDWELL, a citizen of the United States, and a resident of Circleville, in the county of Pickaway and State of Ohio, have invented a new and Improved Machine for Hulling Green Corn, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a simple, economic, and effective machine especially adapted for removing the hulls or skins from green corn after the corn has been cut from the cobs, whereby to provide a more superior quality of food product than the ordinary canned, evaporated, or dried corn.

A further purpose of the invention is to provide a machine particularly adapted for use in canning establishments so constructed that it will not occupy much space and so that it is automatic in its action, acting not only to separate the hulls from the kernels of corn, but also to reduce the hulled corn to particles of desired size and to discharge the hulls and the finished product from different portions of the machine.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal vertical section through the complete machine, taken practically on the line 1 1 of Fig. 2. Fig. 2 is a transverse section taken substantially on the line 2 2 of Fig. 1. Fig. 3 is a sectional front elevation of the machine, drawn upon a small scale, the section being taken substantially on the line 3 3 of Fig. 1; and Fig. 4 is a vertical section taken practically on the line 4 4 of Fig. 1.

The frame of the machine may be of any desired type. As shown, it is rectangular, of greater length than width, and consists of corner-posts 10, bottom side sills 11, and end sills 11^a, top side sills 12, and end upper sills 12^a, and lower intermediate side pieces 13, together with upper front and rear end blocks 14 and lower end blocks 14^a, the upper end blocks 14 being of greater thickness than the

lower blocks 14^a. Side boards or cheek-pieces 15 are secured to the upper portion of the frame at its forward edge, which side boards extend substantially to the central portion of the frame at each of its sides, and upon the inner faces of said side boards 15, as shown in Fig. 2, horizontal ribs 16 are formed, located about centrally between the top and the bottom of said side boards. A hopper A is supported on the upper portions of the side boards 15, which hopper is adapted to receive the corn to be hulled, and said hopper is provided with interior front and rear partitions 17, which converge over a space between rolls 18 and 19, which rolls act as hulling and reducing rolls. These rolls 18 and 19 are mounted in bearings 20, which are preferably adjustable, so that the distance between the rolls may be increased or decreased according to the extent to which the material is to be crushed.

Scrapers 21 are mounted to slide in the cheek-pieces 15, the inner ends of which scrapers engage with the under outer faces of the rolls 18 and 19, as is best shown in Fig. 1, and these scrapers are held up to their work by springs 22, which have bearing against the scrapers and against bars 23, extending from one cheek 15 to the other.

Below the hulling and reducing rolls 18 and 19 a sieve B is mounted for reciprocating movement. The ends of the sieve are preferably inclined downward and inward, and the wire fabric 24, which constitutes the bottom of the sieve, may be of any desired mesh.

The sieve B is of sufficient length to extend beyond the front and the rear of the frame, as is shown in Fig. 1, and has movement between the cheek-pieces 15. The said sieve is provided at the upper portion of its sides with outwardly-extending flanges 25, as shown in Fig. 2, which by engagement with the ribs 16 of the cheek-pieces of side boards 15 limit the downward movement of the sieve and likewise serve to guide the sieve in its reciprocating movements. A comb B' is located in the said sieve, preferably between its center and that portion which in the movement of the sieve is brought directly beneath the space between the rolls 18 and 19. This comb consists of a body-bar 26, extending from one side of the sieve to the other, and teeth 27, which incline downward

and in direction of the receiving end of the sieve, alternate teeth being of greater length and having more of an inclination than the others, as is clearly shown in Fig. 1.

5 The shaft of each roll 18 and 19 at one side of the machine is provided with a gear 28, and these gears mesh so that one roll imparts movement to the other. The shaft 29 of one roll, as shown best in Fig. 2, is provided with an inner pulley 30 and an outer pulley 31, and motion is imparted to the sieve B through the medium of a link 32, secured to a side of the sieve, which link extends rearward and has pivotal connection with a crank-disk 33, mounted upon a shaft 33^a, which extends out through a side board 15 at the side of the machine opposite that at which the gears 28 are located. The said shaft 33^a is mounted in a bearing 34, secured to the upper edge of a cheek-piece or side board 15, and a belt 35 connects the pulley 30 on the roll-shaft 29 with a pulley 36 at the outer end of the shaft 33^a, as is also shown in Fig. 2.

25 A space 37 is provided in the bottom of the screen B at its rear or delivery end, and this space 37 is over a lead-board 38, which extends down from the upper rear portion of the machine with an outward inclination to direct the material delivered thereto from the sieve to a space between a second set of hulling and reducing rolls 39 and 39^a, which are mounted in adjustable bearings 40, supported upon the side pieces 41 of a horizontal extension-frame C from the rear portion of the main frame, as is clearly shown in Fig. 1. In this extension-frame C scrapers 42 are located—one for each roll 39 and 39^a—which scrapers are of the same construction as the scrapers above referred to and designated 21.

Each side board 41 of the extension-frame C is provided with a horizontal groove 43 in its inner face, and these grooves receive outwardly-extending flanges 44 at the upper end of a second sieve B². The bottom of the sieve B², which may be of any degree of thickness, is inclined downward and forward, and in the front member of the frame of said sieve B² an opening 45 is made for the escape of material from said sieve onto a board 46, which extends rearward from the rear portion of the frame and is located at the bottom portion of an opening 47, made in the lower portion of the rear block 14 of the frame, as shown in Fig. 1. In the operation of the sieve B² its forward end portion has sliding movement on the said board 46.

60 Motion is imparted to the sieve B² from the upper sieve B in any suitable or approved manner—as, for example, a link 48 is pivotally attached to the rear end of the upper sieve B and to the upper end portion of a lever 49 and pivoted between its ends, as shown at 50 in Fig. 1, to a standard 51 from

the extension-frame C. A second link 48^a is pivoted to the lower end of the lever 49 and to a side of the sieve B².

A cylinder D is stationarily located in the main frame, extending from front to rear at the brace-blocks 14 of said main frame, as is also best shown in Fig. 1. This cylinder consists of an upper half 52 of a non-perforate material, such as sheet metal, and a lower half or section 53, constructed of a perforated or reticulated material of any degree of thickness. Closed ends are preferably provided for the upper section 52 of the cylinder D; but the lower or perforated section 53 is open at its ends, and the position of the cylinder is such that material discharged from the sieve B² onto the feed-board 46 will be fed by the forward movement of the sieve B² through the opening 47 in the rear block 14 into the lower or reticulated section 53 of said cylinder.

85 A reel D' is mounted to revolve in the cylinder D. This reel consists of a shaft 54, the ends whereof are journaled in the brace-blocks 14 of the main frame, as shown in Fig. 1, and within said cylinder at its end portions spider-arms 55 are secured to the shaft 54, and the said arms support spiral blades 56, so that as the reel is revolved its blades force or grind the material against the perforated or reticulated section of the cylinder, and thereby tend to remove any hulls which may possibly remain attached to the kernels and to force the kernels in particles through the lower section of the cylinder. The waste material passes out of the cylinder D to an outlet-chute 56^a, fitted in the lower portion of the forward frame-block 14.

At the forward end of the reel-shaft 54 a driving-pulley 57 is attached, connected by a belt 57^a with any suitable source of power, and a sprocket-pinion 58 is also secured to the same end of the reel-shaft, together with a smaller pulley 59.

A trough 60, V-shaped in cross-section, as is shown in Fig. 2, is supported adjacent to its ends by the lower intermediate bars 14^a at the ends of the main frame, and this trough 60 extends from the front of the machine beyond the rear of its frame a sufficient distance to receive material discharged from the lower sieve B²; or any material from said sieve that is not caught by the said trough will be caught by the receptacle into which the material is emptied from the trough. The material is carried out from the trough 60 through the medium of a screw conveyer E, the ends of the shaft whereof are journaled in brackets 61 at the end portions of the trough 60, and said trough 60 extends from side to side of the machine, as is shown in Fig. 2, and the conveyer occupies a lower central position therein, as is shown in the same figure.

The forward end of the shaft of the screw conveyer E is provided with a sprocket-wheel 62, connected by a chain belt 63 with the sprocket-pinion 58 of the reel-shaft 54, since all driving is done from the reel-shaft 54, it being the main drive-shaft.

A bracket 64 is erected at that side of the machine at which the driving-pulleys heretofore referred to are located, as is shown in Fig. 3, and the said bracket is provided with two pulleys 65 and 66. A belt 67 is carried over the pulley 65 and over the pulley 59 on the reel-shaft 54, and a belt 68 is carried from the upper pulley 66 and is carried over a smaller pulley 69 on the shaft 70 of one of the lower rolls 39 and 39^a—the roll 39, for example—whereby to drive said roll, and as each roll 39 and 39^a is provided with a gear 39^b and as said gears mesh one of the said lower rolls will turn the other.

On the same end of the shaft 70 carrying the pulley 69, over which the driving-belt 68 is passed, a second pulley 71 is secured, and this second pulley is connected by a belt 72 with the outer pulley 31 on the shaft 29 of one of the upper rolls 18 or 19. In this manner all driving is done, as stated, from the reel-shaft 54.

In the operation of the machine the green corn to be hulled is first removed from the cobs and is then fed in proper quantities through the medium of the hopper A to the upper combined hulling and reducing rolls 18 and 19, which rolls acting upon the kernels passing between them squeeze the hulls from the kernels and reduce the kernels to particles of greater or less size. The material from the rolls 18 and 19 is received in the upper sieve B, and as the said sieve is reciprocated the material is spread out by the comb B', which also acts in a measure to force the material passing beneath its teeth upon the bottom of the sieve, and the crushed particles of corn which pass through the bottom of the sieve B will fall around the cylinder D and will be received in the trough 60. The skins or hulls of the corn cannot pass through the meshes of either of the sieves or through the meshes in the cylinder D. As the crushed and partially hulled product passes out from the sieve B through the rear opening 37 therein it is conducted by the lead-board 38 to the lower combined hulling and reducing rolls 39 and 39^a, where the material is further hulled and further reduced and is dropped upon the lower sieve B², and the particles of corn passing through the bottom of the sieve B² are likewise received by the trough 60. Those particles of corn which cannot pass through the bottom of the sieve B², together with the skins or hulls, pass out from the said sieve through its forward opening 45 and find their way through the opening 47 into the cylinder D, where by the rotation

of the reel D' the corn is further reduced, so that during its passage through the cylinder it will have been forced through the meshes of its lower section into the trough 60, while the skins or hulls will pass out from the cylinder at its forward end to the offtake spout or chute 56^a, and the conveyer E, being constantly in motion, will carry the material either from the back to the front of the machine or from the front to the back, as may be desired. Usually, however, the conveyer discharges the material carried thereby at the rear end of the said trough.

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

1. In corn-hulling machines, the combination with a frame, a hopper supported by the frame, combined hulling and reducing rolls mounted to revolve in the frame below the outlet for the hopper, scrapers for said rolls, an inclined sieve mounted for movement in the frame below the rolls, a crank-disk, a shank therefor, a link connected with the sieve and the crank-disk, and a spreading device located in said sieve, of a second inclined and lower sieve receiving material from the upper sieve, a cylinder secured within said frame below the upper sieve, which cylinder is provided with a reticulated body portion and a plain upper portion, means for delivering material from the lower or second sieve into the reticulated portion of the said cylinder, said cylinder being provided at said reticulated portion with an inlet and an outlet, a reel mounted to revolve in the said cylinder, having spiral blades, a trough located below the cylinder, a screw conveyer in said trough, and driving devices for the conveyer and reels, the rolls and the said crank-shaft.

2. In corn-hulling machines, the combination with a frame, a hopper supported thereby, combined hulling and reducing rolls mounted to turn in close relation to each other below the outlet of said hopper, a screen mounted in the frame below the said rolls, having an outlet at its rear ends, means for imparting reciprocating motion to the said sieve, a cylinder secured in the said frame below the said sieve, the cylinder being provided with a lower perforated or reticulated section having end inlets and outlets, and a reel mounted to revolve in the said cylinder, the blades of which reel are spiral, of a second set of combined hulling and reducing rolls located between the sieve and the cylinder, guide devices for conducting the material from the end outlet of the sieve to the second set of rolls, a second inclined reciprocating sieve located beneath the second pair of rolls, a driving connection between the two sieves, the second sieve having guided horizontal movement, the said second sieve being likewise provided with an outlet-opening oppo-

site the inlet-opening for the cylinder, a guide
for the lower portion of the sieve, extending
out from a wall-section of the inlet-opening
for the cylinder, a trough supported by the
5 frame and extending beneath the cylinder
and the said second sieve, a conveyer located
within the said trough, and driving devices
for the conveyer, the reel and the rolls.

In testimony whereof I have signed my
name to this specification in the presence of 10
two subscribing witnesses.

WAYNE CALDWELL.

Witnesses:

MILT MORRIS,
H. B. WEAVER.