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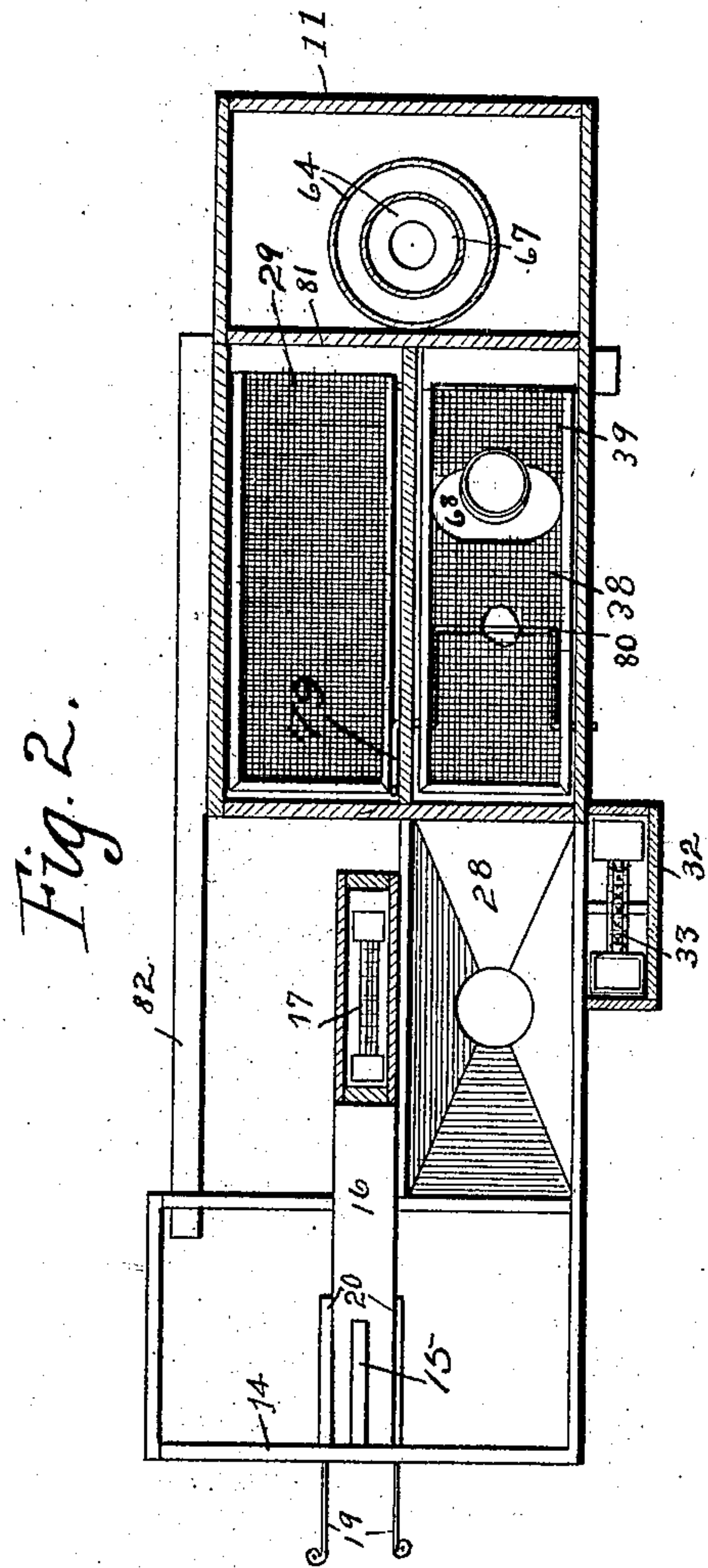
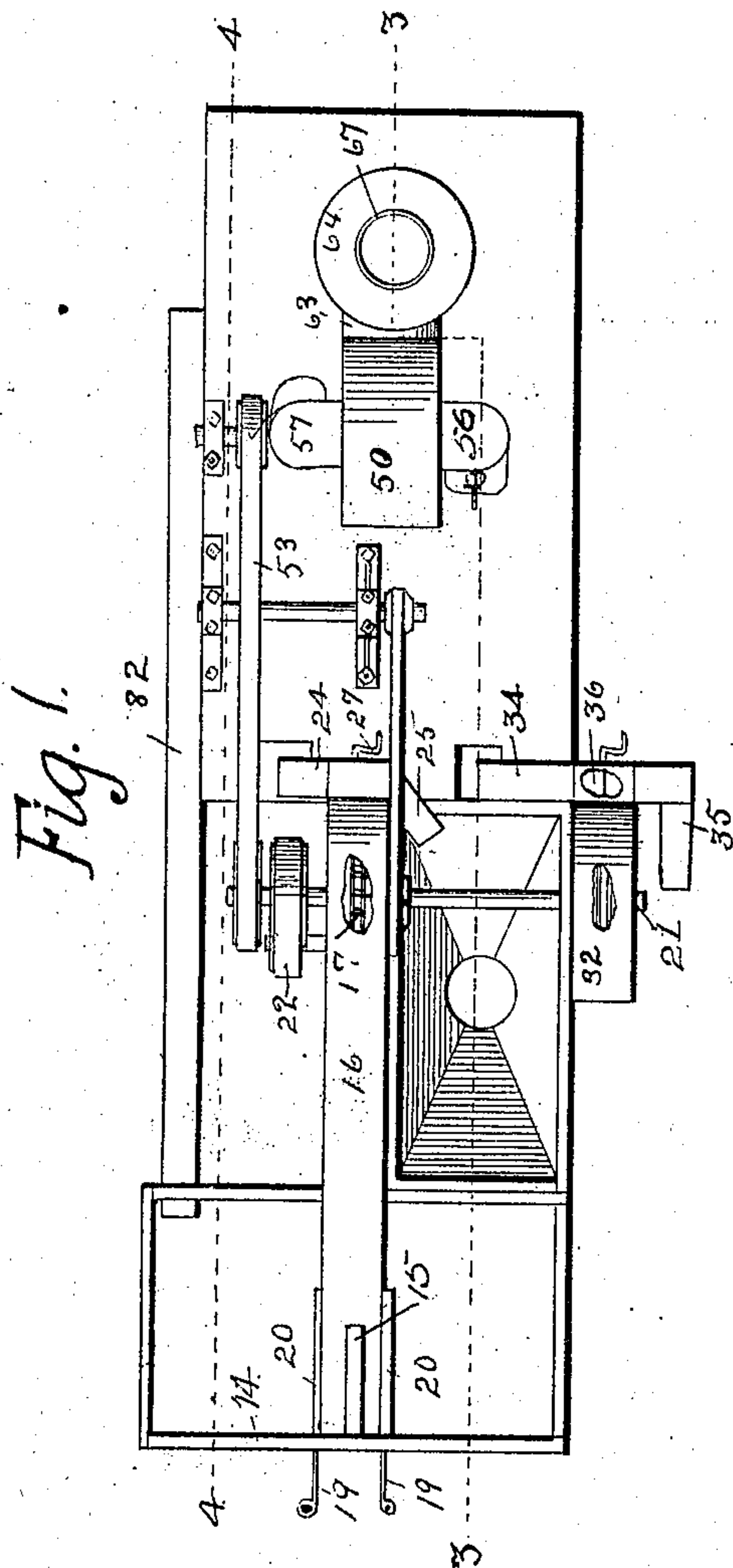
PATENTED MAR. 27, 1906.

J. S. LORD.

PORTABLE GRIST MILL.

APPLICATION FILED FEB. 20, 1905.

3 SHEETS—SHEET 1.



Witnesses

A. E. Heagur
S. F. Christy

Inventor *J. S. Lord*

By *Quig & Lane attys*

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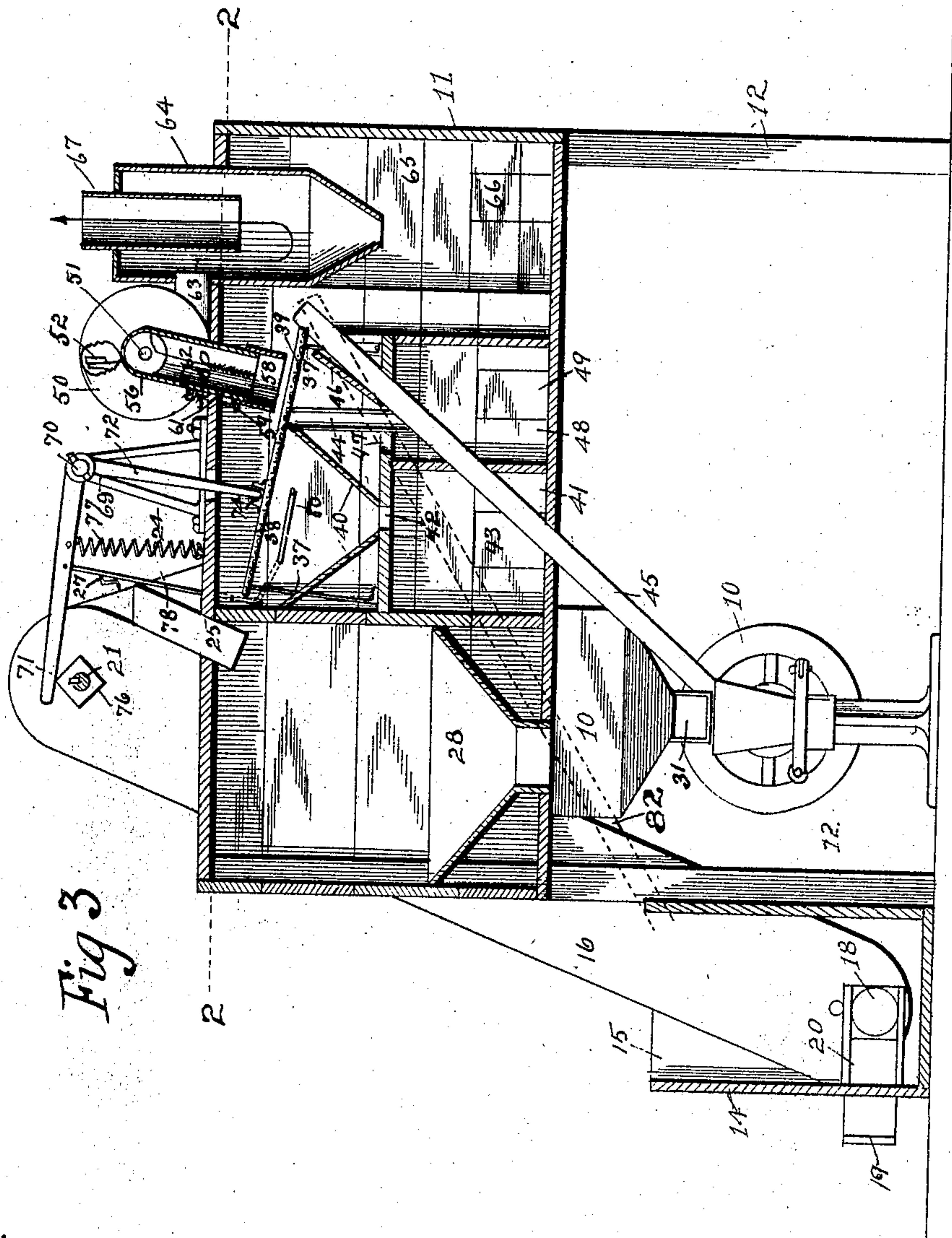
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3 SHEETS—SHEET 2.



Witnesses

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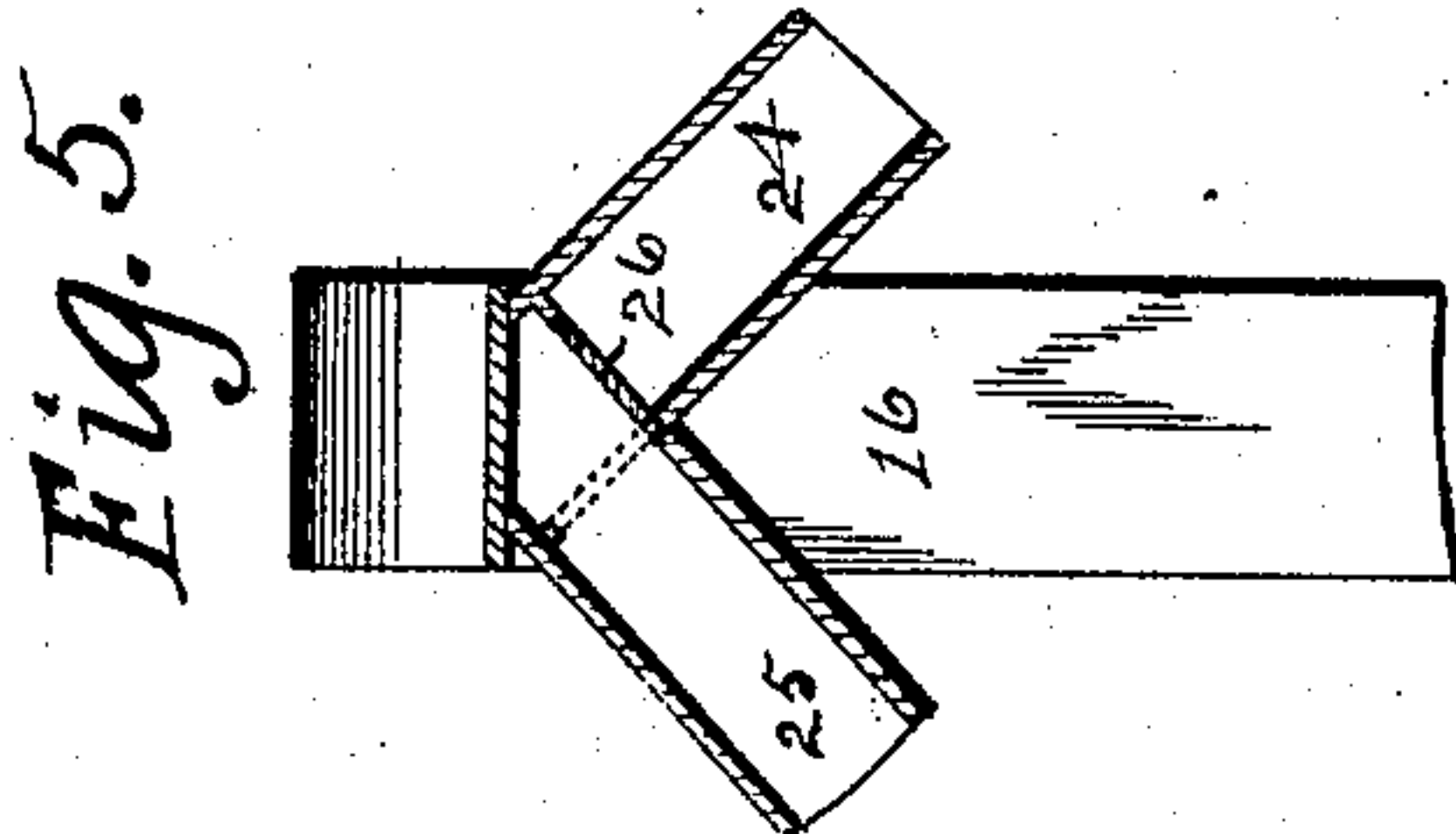
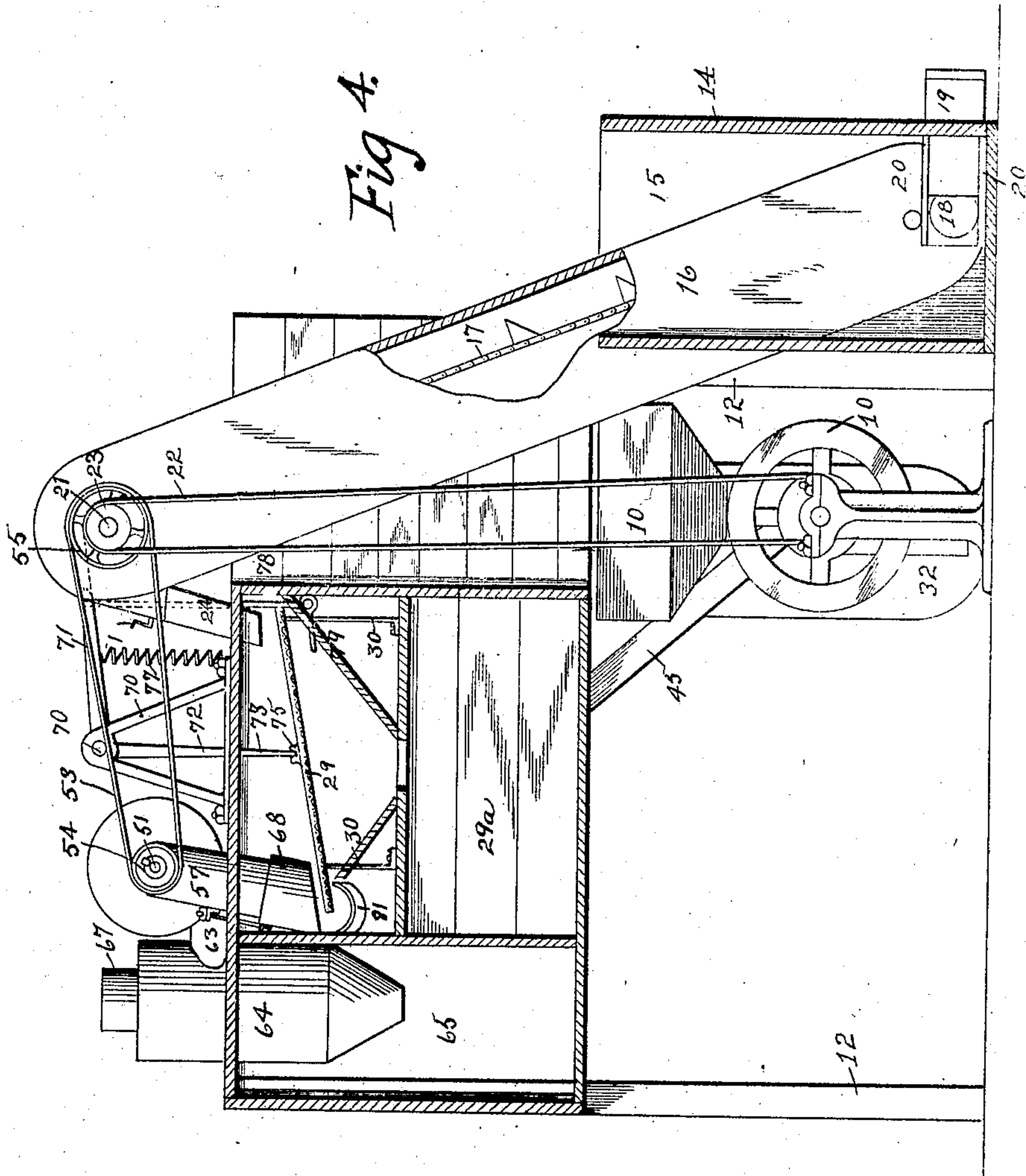
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN S. LORD, OF OGDEN, IOWA.

PORTABLE GRIST-MILL.

No. 816,108.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed February 20, 1905. Serial No. 247,043.

To all whom it may concern:

Be it known that I, JOHN S. LORD, a citizen of the United States, residing at Ogden, in the county of Boone and State of Iowa, have
5 invented certain new and useful Improvements in a Combined Flour-Mill and Grain-Cleaner, of which the following is a specification.

The objects of my invention are to provide
10 a machine of simple, durable, and inexpensive construction and of light weight designed to be used in the nature of an attachment to be connected with a grinding-mill of the ordinary kind for the purpose of cleaning and separating the flour from the carrier product and
15 also to provide in the same machine means for cleaning grain and also means for mixing two kinds of grain to be fed to the grinding-mill.

My invention consists in the construction, arrangement, and combination with a grinding-mill of the flour and grain cleaning and handling mechanism, as hereinafter more fully set forth, pointed out in the claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a top or plan view of the complete machine. Fig. 2 shows a horizontal sectional view on the line 2 2 of Fig. 3. Fig.
30 3 shows a vertical longitudinal sectional view on the line 3 3 of Fig. 1. Fig. 4 shows a vertical longitudinal sectional view on the line 4 4 of Fig. 1; and Fig. 5 shows a detail view, partly in section, illustrating the spouts for discharging grain into either the grinder or the cleaning device.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the grinding-mill. This mill is of ordinary construction, and hence is not shown or described in detail herein. My improved machine comprises a rectangular frame 11, supported on legs 12. At one end of the frame is a hopper 14, attached to the adjacent
45 legs 12 and provided with a central vertical partition 15, forming two compartments in the hopper. Fitted into said hopper is the lower end of an elevator-leg 16, having therein a chain-and-bucket elevator 17 of the ordinary construction. In both sides of the elevator-leg, near its lower end, I have provided openings 18 to admit the grain in the compartments of the hopper 14 to the bottom of the elevator-leg. These openings may be
55 covered by the slides 19, which slides move

independently of each other in the tracks or guides 20, so that either one or both may be closed or opened. The chain-and-bucket elevator 17 is driven from a shaft 21 at the top of the elevator-leg, and the said shaft is rotated
60 by the belt 22, running over the pulley 23 on the shaft 21, and said belt is driven by the grinding-mill, as shown in Fig. 4. At the upper end of the conveyer-leg 16 where the chain-and-bucket elevator discharges, I have
65 provided two spouts 24 and 25, inclined downwardly and outwardly from each other. At the point where these spouts come together I have provided a pivoted damper 26, operated by the handle 27. In one position this damper cuts off the spout 24, as shown in Fig. 5,
70 and in its other position it cuts off the spout 25, as shown by dotted lines in Fig. 5, so that by manipulating the handle 27 the discharge from the chain-and-bucket elevator
75 17 may be directed into either one of said spouts. The spout 25 is arranged to discharge into a hopper 28 in the frame 11, which hopper discharges directly into the grinding-mill 10. The other spout 24 discharges directly upon a sieve 29, which sieve
80 is supported in an inclined position on the supports 30 and is constantly vibrated during the operation of the machine as will hereinafter appear. Beneath the sieve 29 is a
85 compartment 29^a in the frame.

The ground grain after passing through the mill 10 is discharged through the spout 31 into the elevator-leg 32. In this elevator-leg 32 is a chain-and-bucket elevator 33 of ordinary construction, driven from the shaft 23 at its top. At the top of the elevator-leg are two spouts 34 and 35, and I have provided a damper 36, similar to the damper 26, by which the ground grain may be directed to
95 either one of the spouts 34 and 35. If it is desired to use the ground grain without separating the hulls from the flour, it is discharged through the spout 35. If it is desired to separate and purify the ground grain,
100 it is discharged through the spout 34 and falls upon a sieve-frame 36. This sieve-frame is supported in an inclined position upon the supports 37. The upper portion of the sieve is covered with a fabric 38 of relatively fine
105 mesh, and the lower end of the sieve is covered with a fabric 39 of relatively coarse mesh. Beneath the sieve 38 are the inclined deflectors 40, directing the flour which passes through the sieve 38 into a compartment
110

through an opening 42 therein. The flour may be taken from this compartment through the opening covered by the door 43. That portion of the ground grain that does
 5 not pass through the sieve 38 moves downwardly to the coarse sieve 39, and at the bottom of this coarse sieve is a spout 44 to receive the particles that pass through the top of the coarse sieve and to convey them to a
 10 second spout 45, which discharges into the grinding-mill. The tailings from the sieve 39 also discharge into the upper end of the spout 45, and the particles that pass through the sieve 39 are carried by the deflector 46
 15 through the opening 47 into the compartment 48, from which they may be moved through the opening covered by the door 49.

I have provided means for removing the bran and particles of relatively light weight
 20 as follows: Mounted on top of the machine-frame 11 is a fan-casing 50, having a shaft 51 running through it and a fan 52 fixed to said shaft. This shaft is driven by a belt 53, running over the pulley 54 on the shaft 51 and
 25 also over a pulley 55 on the shaft 21. Two tubes 56 and 57 communicate with the eye of the fan-casing, and one of them extends downwardly to a point adjacent to the sieve 39. Mounted on the lower end of the tube
 30 56 is an adjustable sleeve 58, provided with a lug 59. A lug 60 is fixed to the tube 56, and a screw-threaded rod 61 is passed through these lugs and provided with a thumb-nut 62, so that the said sleeve 58 may be adjusted
 35 relative to the sieve 39. When this sleeve is close to the sieve and the fan is being operated, the suction upwardly through the tube 56 will be relatively great, and when the sleeve is elevated it will be relatively less.
 40 The numeral 63 indicates a discharge-tube connected with the fan-casing 50 and discharging into a cylinder 64, closed at its top and opened at its bottom, its lower end discharging into a compartment 65, to which
 45 access is had through the opening covered by the door 66. The numeral 67 indicates an open-ended tube passing through the top of the cylinder 64. In use the bran and light particles of grain that are drawn upwardly
 50 through the tube 56 are discharged into the cylinder 64, and in this cylinder they are separated, the heavier particles falling downwardly into the compartments 65 and the lighter ones carried by the current of air upwardly through the tube 67, through which
 55 they are discharged. The tube 57 has its lower end directly over the lower end of the sieve 29. It is provided with an adjustable sleeve (indicated by the numeral 68) and is
 60 made adjustable in the same manner as the sleeve 58. This tube 57 discharges into the eye of the fan-casing.

I have provided means for vibrating both of the sieve-frames 29 and 36 as follows: On

top of the frame 11 is a standard 69, in which
 65 a rock-shaft 70 is mounted. Fixed to the rock-shaft 70 is an arm 71, and fixed to the same rock-shaft are two arms 72 and 73. The arm 72 extends downwardly and enters a
 70 bracket 74 on the sieve-frame 36, and the arm 73 enters a bracket 75 on the sieve 29. Mounted upon the shaft 21 is an angular block 76, rotated with the shaft 72, and a contractile coil-spring 77 is fixed to the arm
 75 71 and to the top of the machine-frame, normally holding the outer end of the arm 71 in engagement with the angular block 76. When the shaft 21 is rotated, both of the arms 72 and 73 will be vibrated and both of
 80 the sieve-frames will be vibrated upon their supports. I have also provided means for striking upon the under surface of the sieve fabric 38 for the purpose of releasing particles that have become wedged in said fabric
 85 as follows: The numeral 78 indicates a rod pivoted to the arm 71 and passed through the top of the machine-frame. This rod is pivoted to a crank-arm 79, mounted in the machine-frame and having a crank-arm 80
 90 connected therewith and standing under the sieve 38, so that an up-and-down movement of the rod 78 will cause the crank-arm 80 to strike against the under surface of the fabric 38. I have provided means for carrying
 95 clean grain from the discharge end of the sieve 29 into the hopper 14, as follows: The numeral 81 indicates a spout receiving the discharge from the sieve 29 and carrying it to a second spout 82, which latter spout discharges in to the hopper 14.

In practical use and assuming that it is desired to mix two kinds of grain and grind them I place the grain in the opposite compartments of the hopper 14 and open both of
 100 the slides 19. In this connection if it is desired to mix the two kinds of grain in different proportions one of the slides may be left only partly open. The grain from both parts of hopper 14 will enter the elevator-leg and be carried upwardly by means of the chain-
 105 and-bucket conveyer. The damper 26 is set to discharge the grain through the spout 25 and from thence to the grinding-mill. If the grain has passed through the grinding-mill, it enters the elevator-leg 32 and is carried
 110 thereby by means of the chain-and-bucket elevator 33 and, if it is desired, may be discharged from the elevator-leg 32 through the spout 35 without separating the hulls from the flour. If it is desired to clean the flour,
 115 the damper 36 is set to discharge the ground grain through the spout 34 and upon the upper end of the sieve 38. This sieve is being constantly vibrated and the rod 80 is constantly striking upon its under surface.
 120 Hence the grain moves downwardly over the face of the sieve and the flour passes through the sieve into the compartment 41. That

portion of the ground grain that does not pass through the sieve 38 must be discharged to one or the other of the following places: First it may pass through the spouts 44 and 45, and in this event it will be carried directly into the grinder and be again elevated and discharged on top of the sieve 38, or it will pass through the sieve 39 into the compartment 48; where the light particles will be elevated by the air-current created by the fan and discharged thereby either into the compartment 65 or out through the top of the tube 67. In this way all of the valuable portions of the grain are ultimately reduced to flour of the proper degree of fineness, and the bran and waste products are received into the compartment 65. If it is desired to clean grain without grinding it, the damper 26 is set to discharge the grain through the spout 24 on top of the sieve 29. This sieve is constantly vibrated during the operation of the machine, and the grain that passes through the sieve is delivered into the compartment 29^a. The grain that passes over the sieve is returned to the hopper 14, and the particles of lighter weight are elevated by the air-current and passed into the compartment 65. In this way the grain is thoroughly cleaned, and all grains that do not pass through the sieve 29 or are not elevated through the tube 57 are returned to the hopper 14, so that a thorough cleaning and separation of the grain may be had. All of the working parts of the machine are driven from the shaft of the grinding-mill, and the machine may be readily changed for the various uses for which it is adapted simply by opening and closing the several dampers.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. The combination with a grinding-mill, of a machine-frame, a sieve in the machine-frame, a hopper having two compartments, an elevator-leg in the hopper communicating with both compartments, an elevator in the elevator-leg, two discharge-spouts at the top of the elevator-leg, one discharging upon the sieve and the other discharging to the grinding-machine and a single valve controlling the discharge from the elevator-leg into said spouts.

2. The combination with a grinding-mill, of a machine-frame, a hopper having two compartments, an elevator-leg in the hopper communicating with both compartments thereof, two slide-valves controlling the communication between the compartments and the elevator-leg, an elevator in the elevator-leg, two discharge-spouts at the top of the elevator-leg, one of said spouts discharging into the grinding-machine, a sieve receiving the discharge from the other spout, and a single valve for controlling said discharge-spouts.

3. The combination with a grinding-mill, of a machine-frame, a hopper having two compartments, an elevator-leg in the hopper communicating with both compartments thereof, two slide-valves controlling the communication between the compartments and the elevator-leg, an elevator in the elevator-leg, two discharge-spouts at the top of the elevator-leg, one of said spouts discharging into the grinding-machine, a sieve receiving the discharge from the other spout, a single valve for controlling said discharge-spouts, and means for returning grain that passes over said sieve into the said hopper.

4. The combination with a grinding-machine, of a frame, a hopper, an elevator-leg communicating with the hopper, an elevator in the elevator-leg, a spout at the top of the elevator-leg discharging into the grinding-machine, an elevator-leg receiving the discharge from the grinding-machine, an elevator in said elevator-leg, two spouts at the top of said elevator-leg, a single valve for controlling said spouts, a sieve receiving the discharge from one of said spouts and means for conveying substances that pass over said sieve back to the grinding-machine and means for conveying the substance passed through the other spout back to the hopper.

5. The combination with a grinding-machine, of a frame, a hopper, an elevator-leg communicating with the hopper, a shaft at the top of the elevator-leg, a chain-and-bucket elevator in the elevator-leg driven by said shaft, a spout at the top of said elevator-leg discharging into the grinding-machine, an elevator-leg receiving the discharge from the grinding-machine, said elevator-leg having the said shaft passed through it, a chain-and-bucket conveyer in the latter elevator-leg driven from said shaft, a discharge-spout at the top of the latter elevator-leg, a sieve receiving the discharge from said spout and means for conveying substances passing over said sieve back to the grinding-machine.

6. The combination with a grinding-machine, of a machine-frame, a hopper having two compartments, an elevator-leg communicating with both of said compartments, a shaft at the top of the elevator-leg, a chain-and-bucket conveyer in the elevator-leg driven from said shaft, a grain-sieve and a flour-sieve in the machine-frame, two spouts at the top of the elevator-leg, one discharging into the grinding-machine and the other discharging on top of the grain-sieve, a single valve controlling said spouts, a second elevator-leg receiving the discharge from the grinding-mill, a chain-and-bucket conveyer in the second elevator-leg driven from the same shaft as the first elevator, two discharge-spouts at the top of the second elevator-leg, one of said spouts discharging upon the flour-sieve, a single valve controlling said dis-

charge-spouts, a fan-casing on top of the machine-frame, a fan therein, means for driving said fan from the shaft of the elevators, tubes communicating with the eye of the fan-casing and extended to points adjacent to said sieves and a discharge-tube connected with the fan-casing.

7. The combination with a grinding-machine, of a machine-frame, a hopper having two compartments, an elevator-leg communicating with both of said compartments, a shaft at the top of the elevator-leg, a chain-and-bucket conveyer in the elevator-leg driven from said shaft, a grain-sieve and a flour-sieve in the machine-frame, two spouts at the top of the elevator-leg, one discharging into the grinding-machine and the other discharging on top of the grain-sieve, a single valve controlling said spouts, a second elevator-leg receiving the discharge from the grinding-mill, a chain-and-bucket conveyer in the second elevator-leg driven from the same shaft as the first elevator, two discharge-spouts at the top of the second elevator-leg, one of said spouts discharging upon the flour-sieve, a single valve controlling said discharge-spouts, a fan-casing on top of the machine-frame, a fan therein, means for driving said fan from the shaft of the elevators, tubes communicating with the eye of the fan-casing and extended to points adjacent to said sieves, a discharge-tube connected with the fan-casing, a cylinder receiving the discharge from the fan-casing, closed at its top and opened at its bottom, and an open-ended tube in the top of the cylinder with its lower end some distance beneath said top.

8. The combination with a grinding-machine, of a machine-frame, a hopper, an elevator-leg communicating with the hopper, an elevator in the elevator-leg, a discharge-spout at the top of the elevator-leg discharging into the grinding-machine, a second elevator-leg receiving the discharge from the grinding-machine, an elevator in the second elevator-leg, a discharge-spout for the second elevator-leg, a sieve-frame receiving the discharge from said spout, means for slidingly supporting the said frame in an inclined position, a sieve of relatively fine mesh at the upper end of the sieve-frame and a sieve of relatively coarse mesh at the lower end of the sieve-frame, said machine-frame formed with a compartment for receiving the discharge through the fine sieve, said frame also provided with a compartment receiving the discharge through the coarse sieve, and means for returning the tailings from both the fine and the coarse sieve into the grinding-machine.

9. The combination with a grinding-machine, of a machine-frame, a hopper, an elevator-leg communicating with the hopper, an elevator in the elevator-leg, a discharge-

spout at the top of the elevator-leg discharging into the grinding-machine, a second elevator-leg receiving the discharge from the grinding-machine, an elevator in the second elevator-leg, a discharge-spout for the second elevator-leg, a sieve-frame receiving the discharge from said spout, means for slidingly supporting the said frame in an inclined position, a sieve of relatively fine mesh at the upper end of the sieve-frame and a sieve of relatively coarse mesh at the lower end of the sieve-frame, said machine-frame formed with a compartment for receiving the discharge through the fine sieve, said frame also provided with a compartment receiving the discharge through the coarse sieve, and means for returning the tailings from both the fine and the coarse sieve into the grinding-machine, means for vibrating the sieve-frame, and means for striking the under surface of the fine sieve.

10. In a machine of the class described, a grain-sieve and a flour-sieve, means for slidingly supporting both of said sieves in an inclined position, a rotatable shaft, an angular block on said shaft, an arm yieldingly held against the angular block, two arms fixed to the said rock-shaft and attached to the said sieve-frames, a knocker beneath the flour-sieve, and a rod attached to the arm that engages the angular block, said rod connected with said knocker.

11. In a machine of the class described, a machine-frame, a hopper having two compartments connected to the machine-frame, an elevator-leg communicating with both compartments, slides for controlling the communication between said compartments and the elevator-leg, a shaft at the top of the elevator-leg, an elevator in the elevator-leg driven from said shaft, two discharge-spouts at the top of said elevator-leg, a single valve controlling them, a sieve receiving the discharge from one of said spouts, a grinding-machine receiving the discharge from the other spout, said frame formed with a compartment receiving the discharge through the grain-sieve, means for returning the tailings from the grain-sieve to the hopper, an elevator-leg receiving the discharge from the grinding-machine, an elevator in said elevator-leg driven from said shaft, an angular block on said shaft, a spout at the top of the second elevator-leg, a grain-sieve receiving the discharge from said spout, said frame formed with a compartment receiving the discharge through the flour-sieve, means for returning the tailings from the flour-sieve to the grinding-machine, a spring-actuated arm engaging the angular block, means for vibrating both of said sieves by said arm, a knocker for the flour-sieve actuated by said arm, a fan-casing, a fan therein, two tubes communicating with the eye of the fan-casing and having their lower ends above the said sieves, adjustable

sleeves on the said tubes, a discharge-tube for the fan-casing, a receptacle closed at its top and open at its bottom, receiving the discharge from the fan, said frame formed with
5 a compartment to receive the discharge from the bottom of the said receptacle, and an open-ended tube in the top of the said recep-

tacle with its lower end below the top of the receptacle.

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Witnesses:

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