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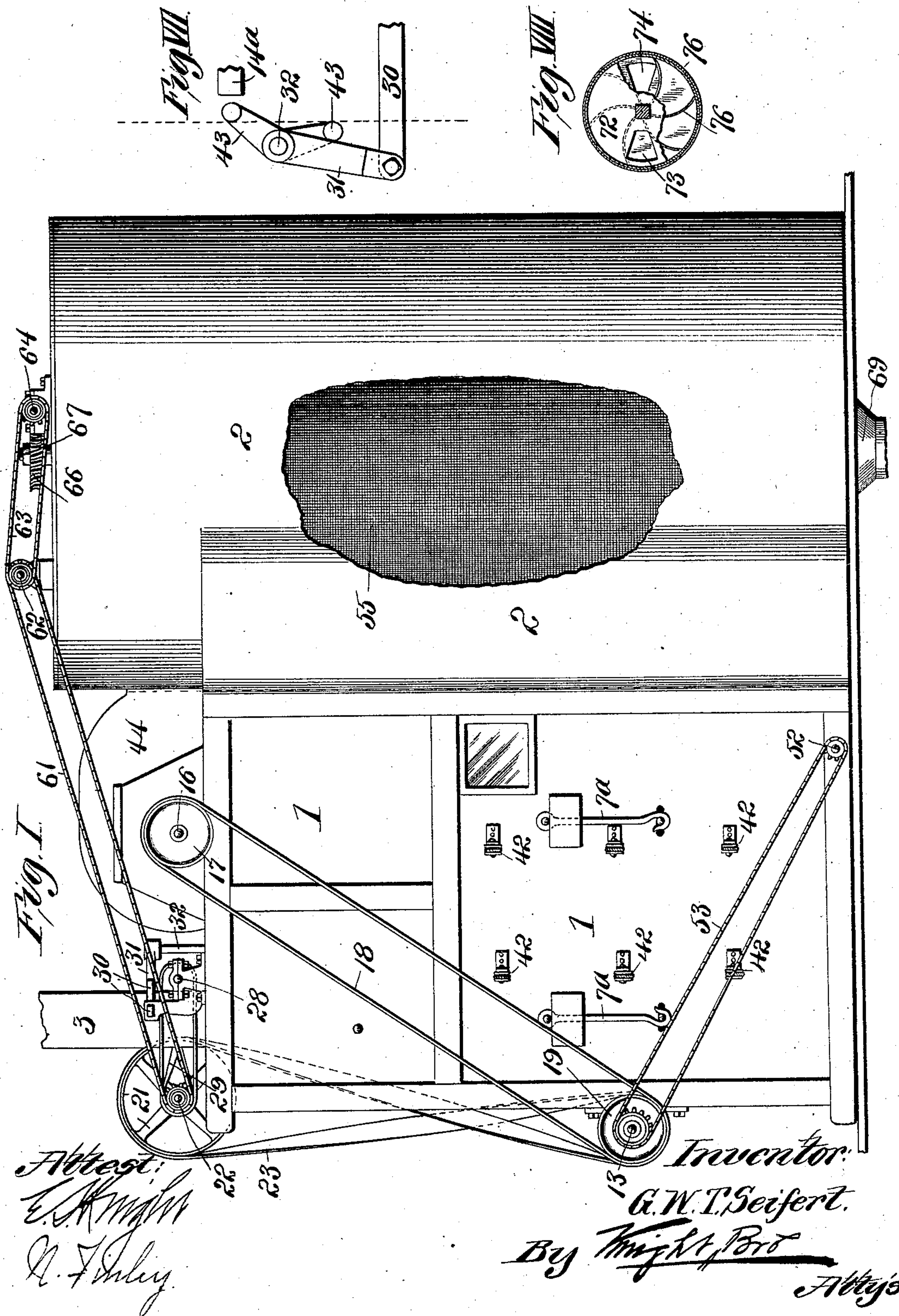
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G. W. T. SEIFERT.

PURIFIER, GRADER, AND DUST COLLECTOR FOR FLOUR MILLS.

No. 575,993.

Patented Jan. 26, 1897.



Attest:  
E. A. Smith  
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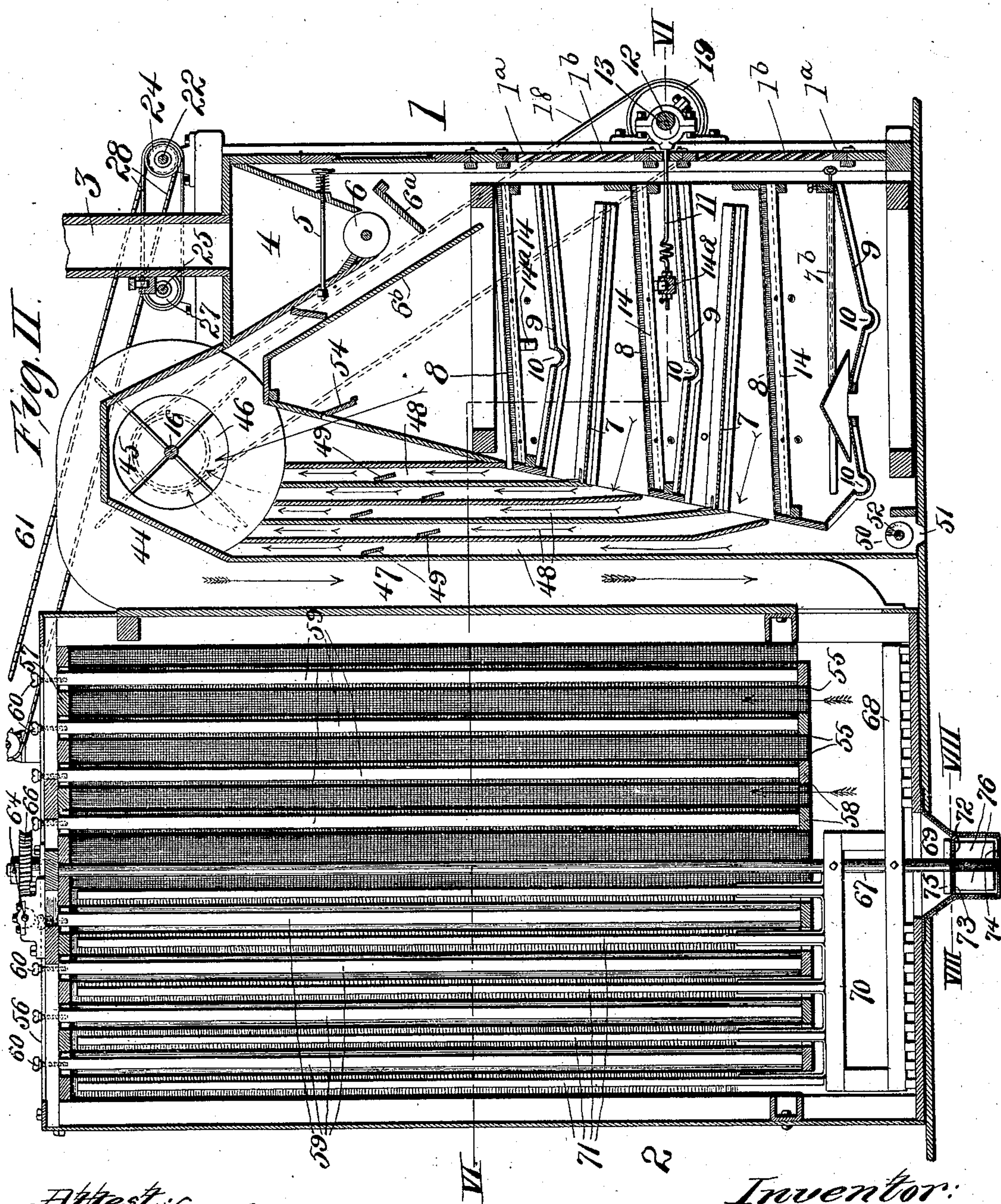
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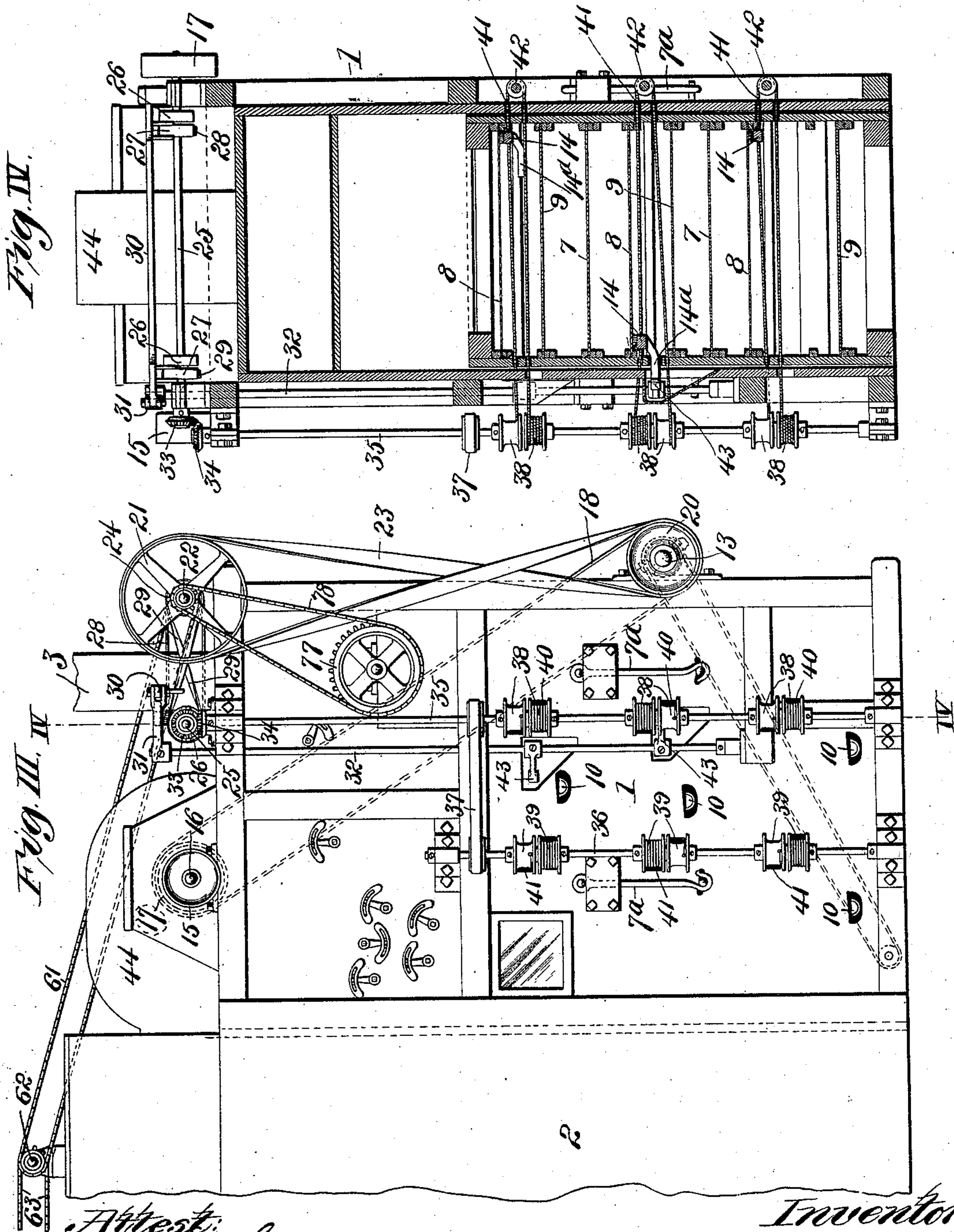
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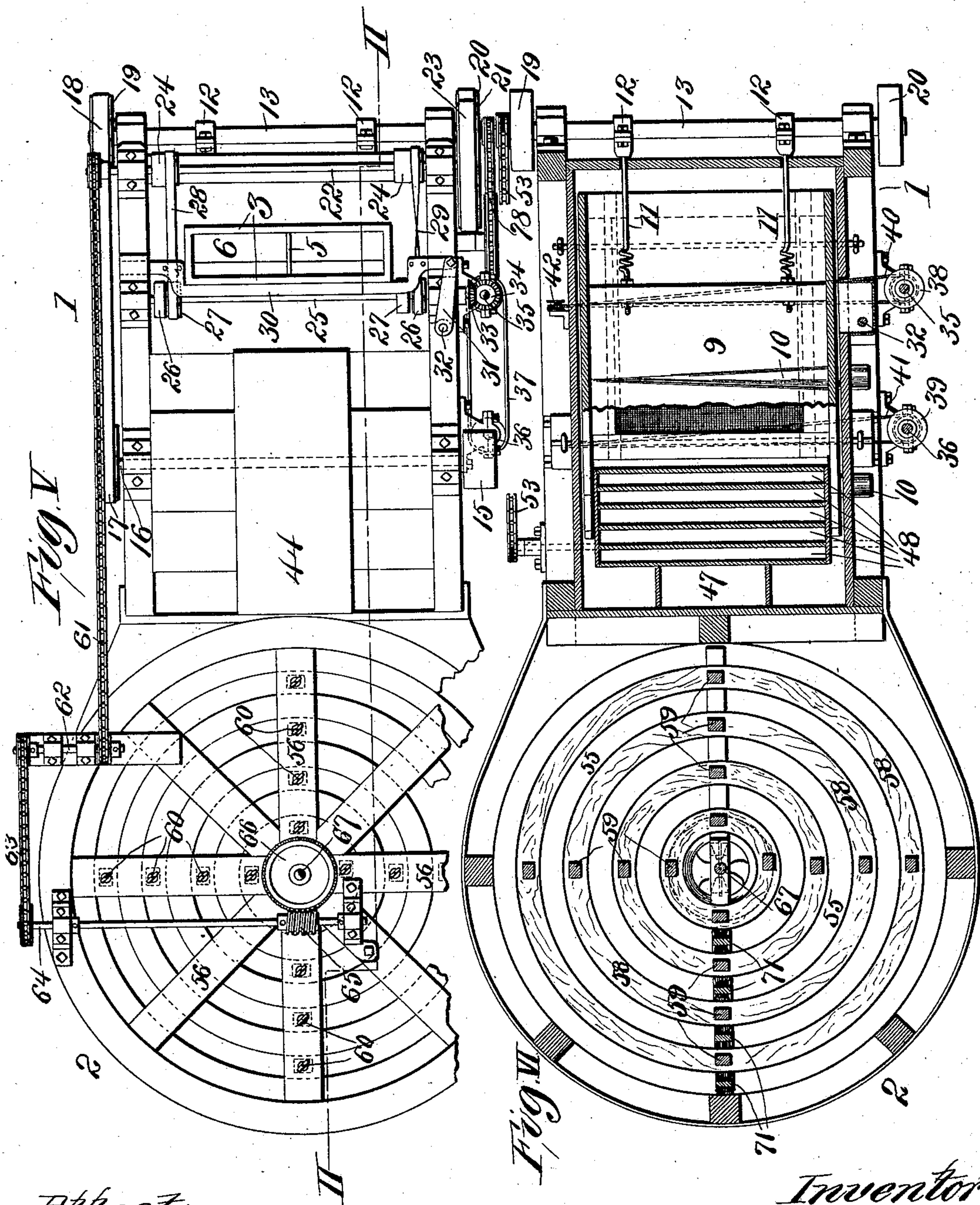
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# UNITED STATES PATENT OFFICE.

GEORGE W. T. SEIFERT, OF DUQUOIN, ILLINOIS, ASSIGNOR OF ONE-HALF  
TO JOSEPH C. EADE, OF SAME PLACE.

## PURIFIER, GRADER, AND DUST-COLLECTOR FOR FLOUR-MILLS.

SPECIFICATION forming part of Letters Patent No. 575,993, dated January 26, 1897.

Application filed May 25, 1896. Serial No. 593,029. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. T. SEIFERT, a citizen of the United States, and a resident of Duquoin, Perry county, State of Illinois, have invented a certain new and useful Improvement in Purifiers, Graders, and Dust-Collectors for Flour-Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a combined machine for purifying, grading, and separating flour and middlings and removing and collecting the dust from the flour and delivering the different parts through the separate exits from the machine.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure I illustrates a side elevation of my improved machine, a portion of the casing of the dust-collector being shown broken out to afford a view of the outer collector-tube within the casing. Fig. II is a vertical longitudinal section taken on line II II, Fig. V. Fig. III is a side elevation of the purifier end of the machine, the side shown being that opposite the side shown in Fig. I. Fig. IV illustrates a vertical cross-section taken on line IV IV, Fig. III. Fig. V is a top view. Fig. VI illustrates a horizontal section taken on line VI VI, Fig. II. Fig. VII is an enlarged detail diagram of the belt-shifting trip-lever through the medium of which the belt is shifted to change the motion of the screen-cleaning brushes in the grader. Fig. VIII illustrates a section taken on line VIII VIII, Fig. II, through the exit-valve by which the flour escapes from the dust-collector.

In the drawings, 1 designates the frame or casing of the purifier, and 2 the casing of the dust-collector.

3 designates the feed-chute through which the flour is fed to the hopper 4, provided with a feed-regulator 5 and a feed-roll 6. From the hopper the flour falls upon a deflecting-board 6<sup>a</sup>, then upon the side of the hood 6<sup>b</sup>, and then upon the shaker, suspended on rocker-rods 7<sup>a</sup>. The shaker is composed, as usual, of any desired number of grading-

screens 8, located one above another. Beneath each screen is a sheet-metal hopper 9, at the lowest points of which are discharge-spouts 10, through which the material that is passed through the screen directly above has exit to the exterior of the machine. Beneath the hoppers are return-boards 7, on which the stock is carried from the tail of a screen to the head of the next screen below. Between the lowest screen and the lowest hopper is a cut-off 7<sup>b</sup>.

1<sup>a</sup> are slatted frames having oblique air-inlets 1<sup>b</sup>, through which the incoming air-currents are directed upwardly toward the screens.

The shaker is agitated through the medium of the shaker-rod 11, operated by an eccentric 12 on a shaft 13.

The screens 8 are cleaned by brushes 14, actuated in the manner to be presently described.

Power is applied to the machine through a drive-pulley 15 on a shaft 16, provided with connection with any suitable motor. On the opposite end of the shaft 16 is a pulley 17, from which a belt 18 leads to a pulley 19 on the shaft 13. On the opposite end of the shaft 13 is a pulley 20. It is upon this shaft 13, as before stated, that the eccentrics 12, through the medium of which the shaker 7 is operated, are mounted.

At the upper end of the purifier-frame is a pulley 21, mounted on the shaft 22, and connecting the pulleys 20 and 21 is a belt 23. Upon the shaft 22 are tight pulleys 24, there being two of such pulleys 24, and both being mounted within the bearings of the shaft 22.

25 designates a shaft upon which are tight pulleys 26 and loose pulleys 27. The pulleys 24 and 26 27 at one end of the shafts 22 25 carry a straight belt 28, and at the opposite end carry a cross-belt 29, thereby providing for a reverse motion being imparted to the shaft 25 when the belts 28 29 are shifted.

It will be seen by referring to Fig. V that the tight pulleys 26 are the outer pulleys on the shaft 25, and the loose pulleys 27 are the inner pulleys, and that the belts 28 29 are so arranged that while one belt 28 or 29 is running upon one of the tight pulleys 26 the other belt is running upon the loose pulley



27 at its end, and is consequently inoperative with regard to the shaft 25. The belts 28 29 are shifted by means of a shifting bar 30, to one end of which a crank-arm 31 on a vertical shaft 32 is connected. The shaft 25 is provided with a bevel gear-wheel 33, that meshes with a bevel gear-wheel 34 on a vertical shaft 35. It is through the medium of this shaft 35 that the screen-cleaning brushes 14 are actuated. Parallel with the shaft 35 is a shaft 36, which shaft 36 has driving connection with the shaft 35 through means of a belt 37. Upon shafts 35 and 36 are, respectively, spools 38 and 39, the spools on each shaft being arranged in pairs. Connected to each spool of each pair is a cord 40 and 41, which is arranged to be alternately wound onto one spool and then upon the other, the cord running to the opposite side of the machine and passing around sheaves 42. The cords have connection with the cleaning-brushes 14, and in their movement draw the brushes backward and forward across the machine. As the brushes reach the side of the machine at which the shaft 35 and spools 38 39 are located they trip the belt-shifting mechanism, as I will proceed to explain.

Each of the brushes carries a finger 14<sup>a</sup>, which fingers, as the brush reaches the spool side of the machine, are protruded through the side of the machine and strike rocking arms 43 on the shaft 32, by which the belt-shifter is actuated. This part of the device is shown in detail in Fig. VII. As a rocking arm 43 is thrown in a reverse position to that previously occupied on its being struck by one of the fingers 14<sup>a</sup> the belt-shifter 30 carries the belt that was previously in engagement with the tight pulley 26 onto the loose pulley, and the reverse action takes place at the opposite end of the shaft 25 and the motion of the shaft 35 is reversed, thereby causing the cord 40 41 to be wound upon the spool from which it was previously unwound and the brush to be carried to the opposite side of the machine.

It will be observed by referring to Fig. IV that the brushes 14 are alternately arranged, so that when one brush is at one side of the machine the others are at the opposite side. This arrangement is necessary in order that whenever a brush has traversed the width of the screen another brush will be at the opposite side to trip the belt-shifting mechanism.

44 designates a fan-housing, within which is located a fan 45, mounted upon the shaft 16. The sides of the fan-housing have eyes 46, that open into a chute 47. Leading from the shaker 7 to the fan-housing is a series of flues 48, the passages through which are controlled by valves 49. These flues are so located that communication is provided into a flue both through and over the tail of the screen with which it communicates in order that the suction of the fan 45 may exert its influence to withdraw the dust through the

screen and over the tail thereof, as the material passes from the shaker, thereby affording a double suction action, one action taking place through the screen and the other during the travel of the heavier particles to and upon the intermediate apron while moving to the next screen beneath. As the heaviest particles from the original product fed to the machine reach the lower screen and are shaken therefrom they fall into a box 50, from which they are discharged through an exit-opening 51 by means of a conveyer 52, driven by a sprocket-chain 53, driven by the shaft 13.

54 designates a valve controlling an opening through the boxing over the upper end of the shaker, through which opening the dust may also be drawn to the eyes 46 of the fan in its passage to the collector.

The chute 47 leads to the interior of the dust-collector, the construction of which I will now describe.

55 designates the dust-collector tubes, which are preferably of cloth and are open alternately at one end and then the other, one tube being arranged within another. Each of the tubes is supported by cross-bars 56 at the upper end of the dust-collector, and the cloth of the tubes is connected to rings 57 at the upper end and rings 58 at the lower end.

For the purpose of keeping the cloth taut I provide stretcher-bars 59, provided at the upper ends with screws 60, by means of which the stretcher-bars the cloth may be kept as taut as may be desired and prove best for the efficient action of the collector.

61 designates a drive-chain driven by the shaft 22 and imparting motion to the shaft 62. The motion imparted to the shaft 62 is conveyed by a drive-chain 63 to a shaft 64. On the shaft 64 is a worm 65, that meshes with a worm-wheel 66 on a vertical shaft 67, that passes centrally through the dust-collector. Secured to the lower end of the shaft 67 is a sweep 68, that carries the flour to a centrally-located valve-box 69. On the sweep 68 is a frame 70, that carries a series of vertically-arranged brushes 71, located between the tubes 55, by means of which the particles of dust that adhere to the cloth of the tubes are removed on the rotation of the sweep 68. The dust therefore falls to the bottom of the collector and is carried to the valve-box 69 by the sweep 68, while the blast of air blows through the cloth tubes.

The valve-box 69 is provided with a horizontal partition 72, in which is an opening 73, and in the bottom of the box is a discharge-opening 74, the opening 74 being located in an offset position from that of the opening 73. On the shaft 67 is a drag 75, that carries the dust to the opening 73. Within the valve-box on the shaft 67 and beneath the partition 72 are a number of radial wings 76, that carry the dust as it falls through the opening 73 in the partition 72 to the discharge-opening 74 in the bottom of the valve-box. These wings



serve the purpose of preventing the dust from being blown out through the valve-box and act as a valve to control the exit through the valve-box.

5 78 designates a drive-chain leading from a toothed wheel on the shaft 22 to a toothed wheel 77 on the shaft of the feed-roll 6, through the medium of which the feed-roll is driven.

I claim as my invention—

10 1. The combination of a suitable casing, a shaker provided with a series of screens, a series of hoppers beneath the screens, and a series of return-boards beneath the hoppers, a series of independent flues leading from  
15 above the tail of each screen and above each return-board, a fan, a housing for the fan, with which the series of flues connect, a chute extending from the fan-housing, and a shaker-operating mechanism; substantially as de-  
20 scribed.

2. The combination of a suitable casing, a shaker provided with a series of screens, a series of hoppers beneath the screens, a series of return-boards beneath the hoppers, a se-  
25 ries of independent flues leading from above the tail of each screen, and above each return-board the slatted front frames having upwardly-inclined inlets through which currents of air are directed obliquely against the  
30 screens, a fan, a housing for the fan with which a series of flues connect, and a chute extending from the fan-housing, and a shaker-operating mechanism; substantially as described.

3. The combination of a suitable casing, a  
35 shaker provided with a series of screens, a series of hoppers beneath the screens, a series of return-boards beneath the hoppers, and a cut-off above the lowest hopper, a series of

independent flues leading from above the tail of each screen, and above each return-board, 40 a fan, a housing for the fan with which the series of flues connect, a chute extending from the housing and a shaker-operating mechanism; substantially as described.

4. The combination of the vertical dust- 45 collector tubes located one within the other, the rings located at the top and bottom of the tubes by which the tubes are alternately closed at the top and bottom, the central ver- 50 tical shaft, the sweep secured to the lower end of the shaft, the frame located on the sweep, and the vertical brushes located on the frame and traveling between the tubes; substan- tially as described.

5. In a purifier, grader and dust-collector, 55 the combination of a housing, a dust-collector composed of a series of tubes arranged one within another and having their ends al- ternately open and closed, and adjustable 60 stretcher-bars on the outside of each tube adapted for employment to distend said tubes; substantially as described.

6. In a purifier, grader and dust-collector, the combination of a dust-collector composed of a series of tubes arranged one within an- 65 other, and having their ends alternately open and closed, a sweep located in the lower end of said dust-collector, a driving-shaft by which said sweep is carried and brushes carried by said shaft, said brushes being arranged to 70 travel in and to clean said tubes, substantially as described.

G. W. T. SEIFERT.

In presence of—  
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N. FINLEY.