

No. 715,072.

Patented Dec. 2, 1902.

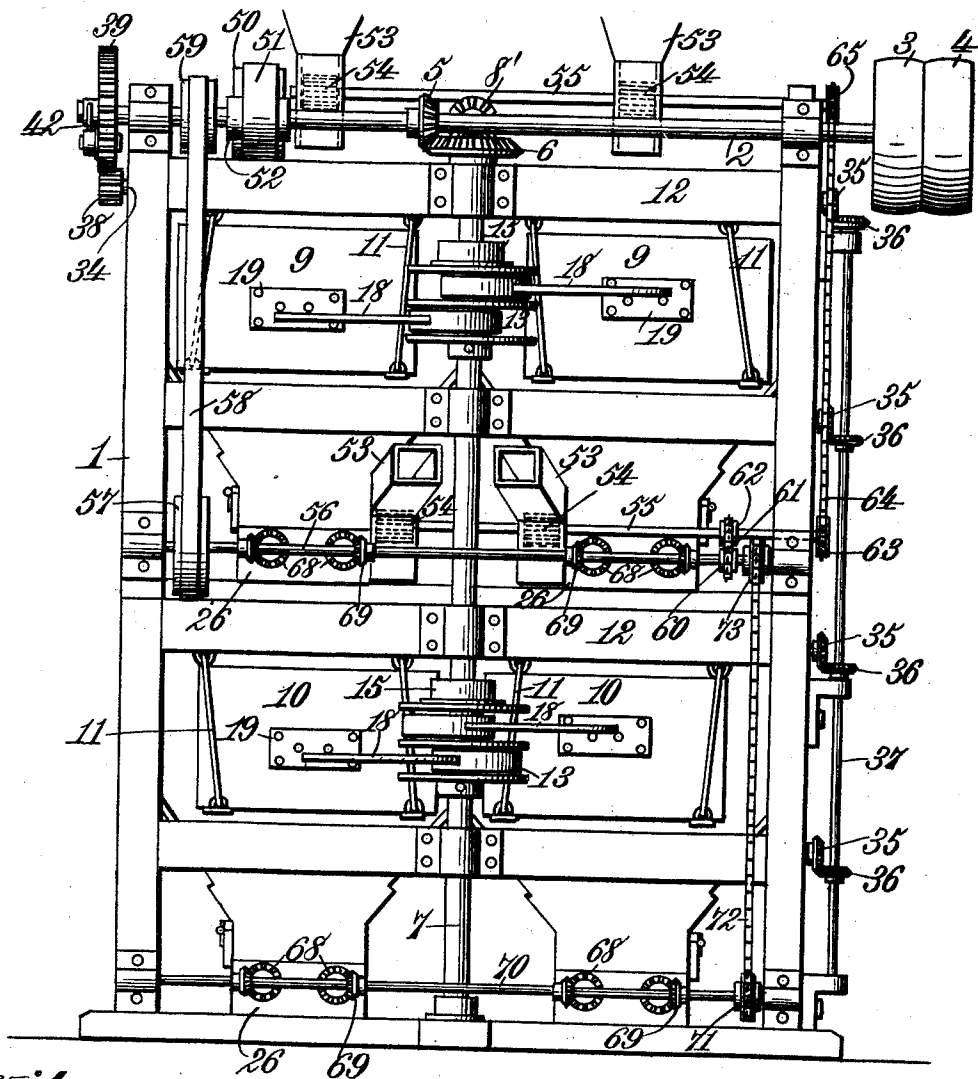
C. W. HOLLENDER.
BOLTING MACHINE.

(Application filed Oct. 16, 1901.)

(No Model.)

6 Sheets—Sheet 1.

Fig. 1.



Witnesses.
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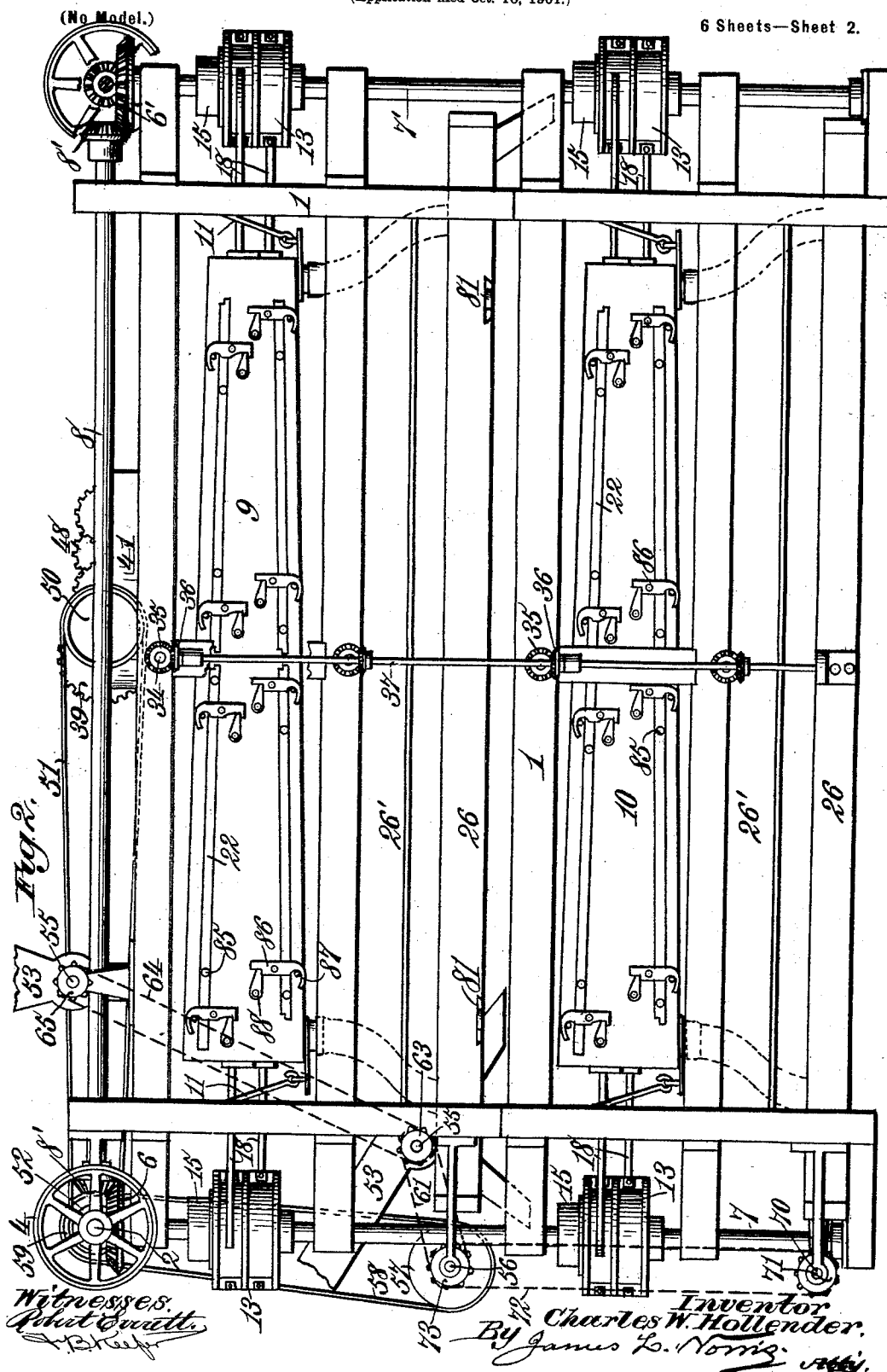
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C. W. HOLLENDER.

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6 Sheets—Sheet 2.



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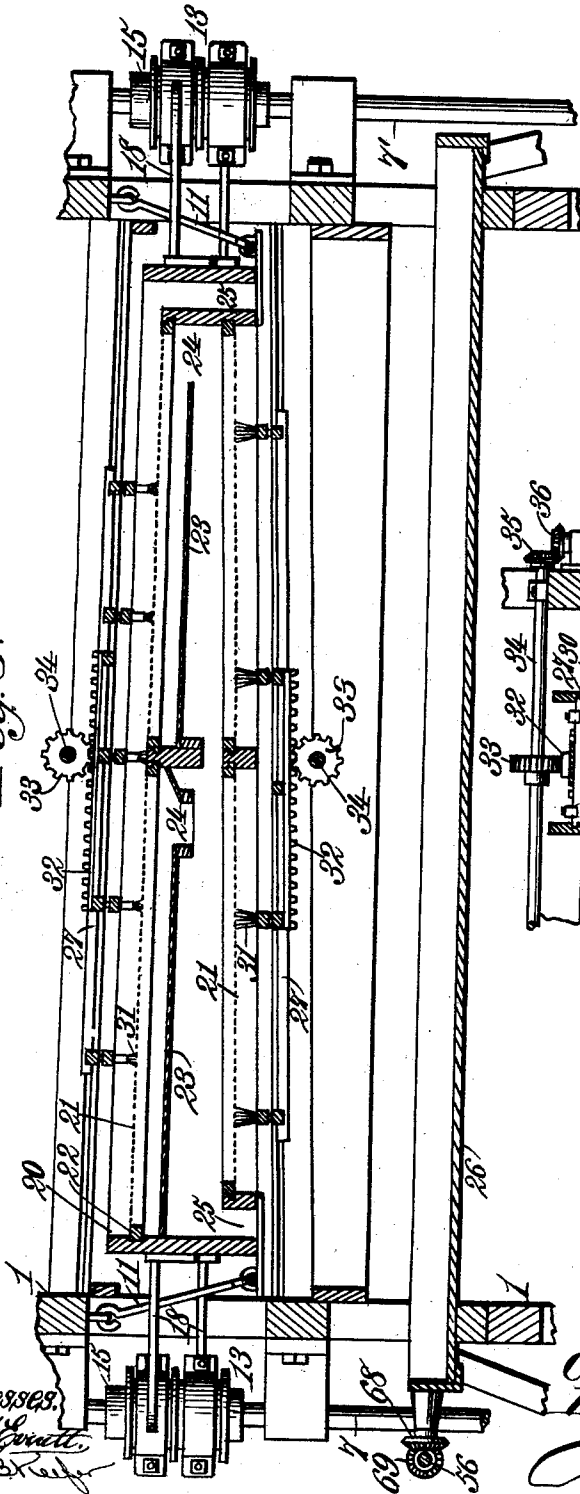
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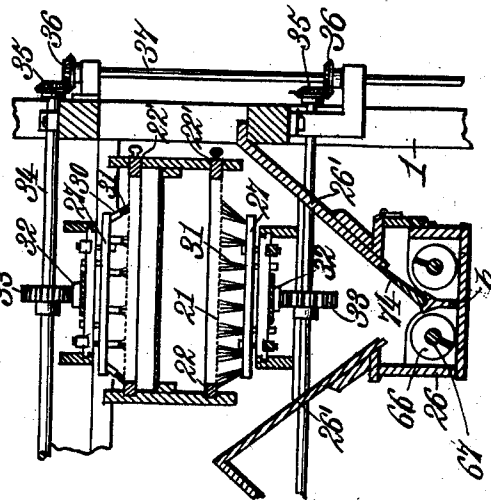
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Fig. 3.



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Fig. 4.



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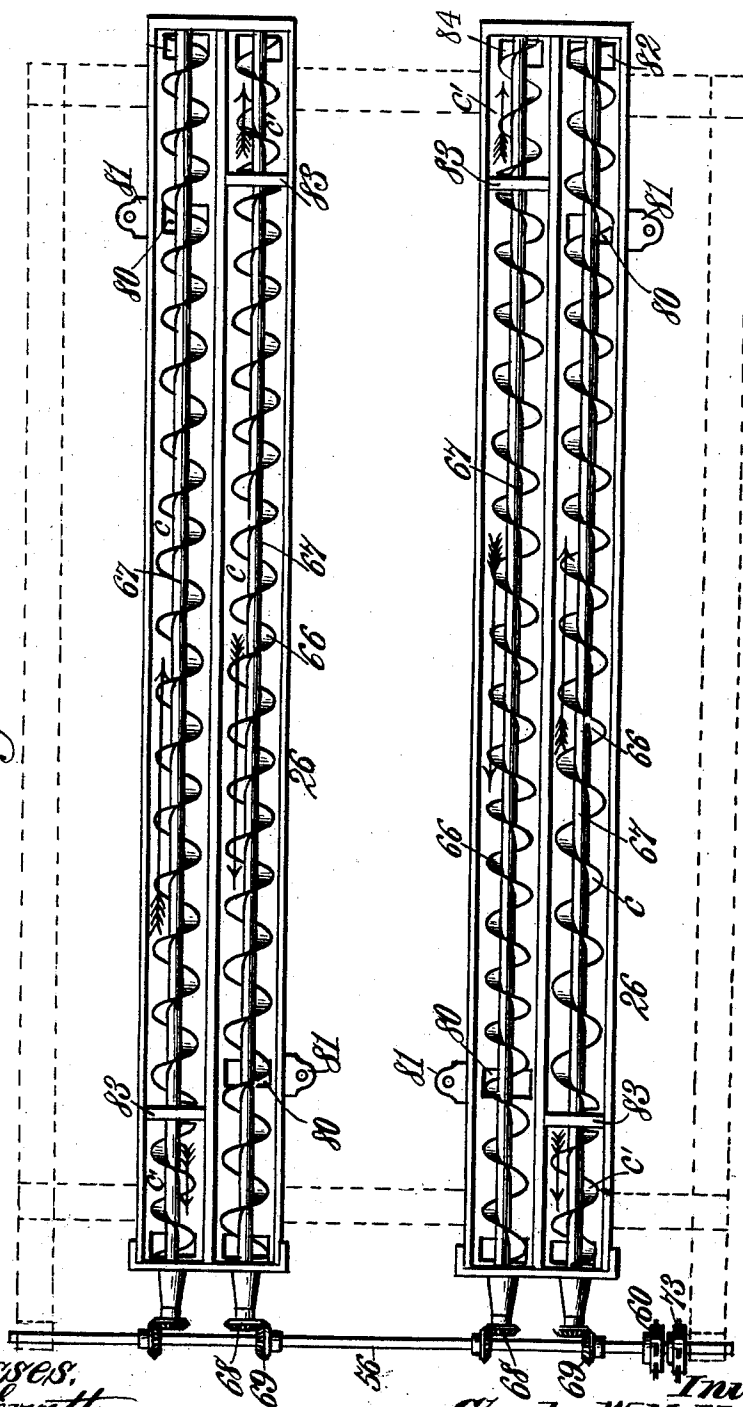
C. W. HOLLENDER.
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(Application filed Oct. 16, 1901.)

(No Model.)

6 Sheets—Sheet 4.

Fig. 5.



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C. W. HOLLENDER.
BOLTING MACHINE.

(Application filed Oct. 18, 1901.)

(No Model.)

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Fig. 6.

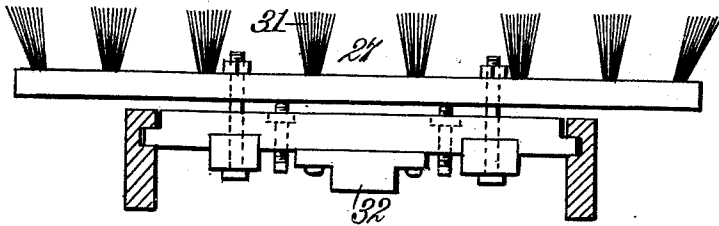


Fig. 7.

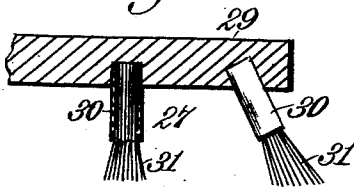


Fig. 8.

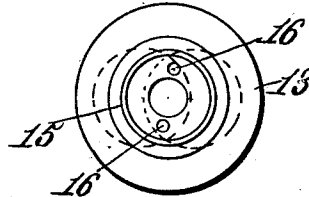


Fig. 9.

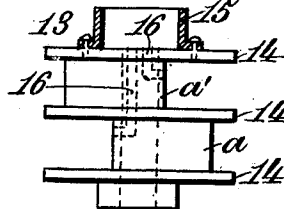


Fig. 10.

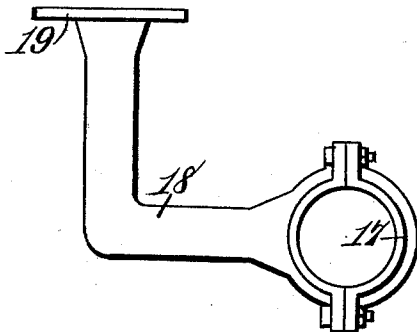
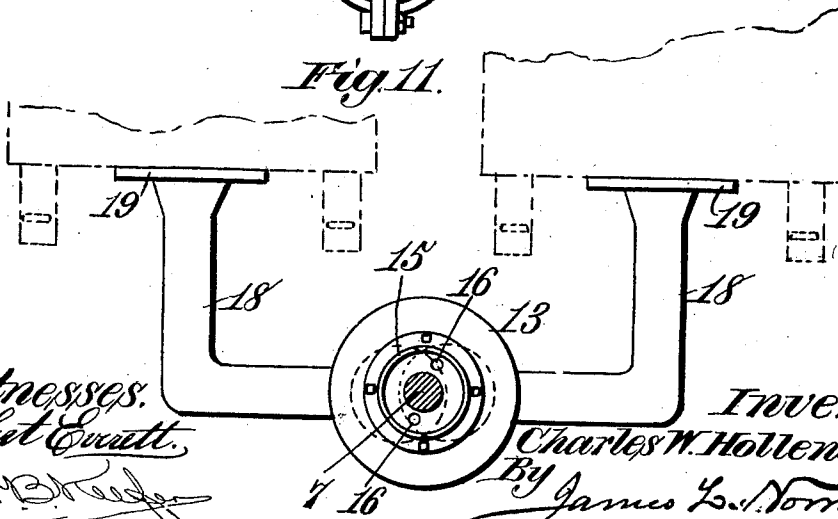


Fig. 11.



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C. W. HOLLENDER.
BOLTING MACHINE.

(Application filed Oct. 16, 1901.)

Patented Dec. 2, 1902.

(No Model.)

6 Sheets—Sheet 6.

Fig. 12.

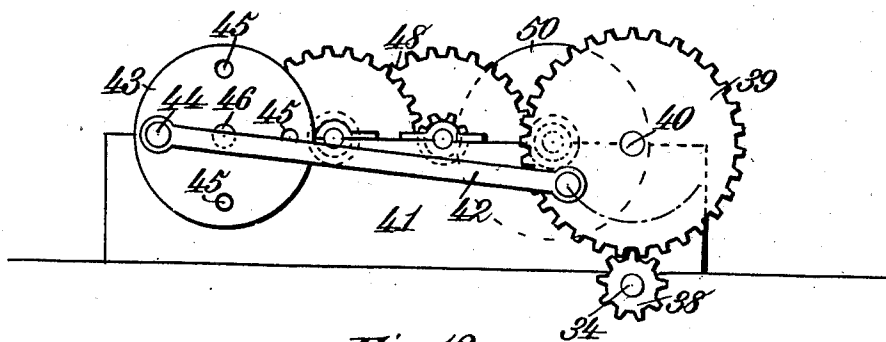
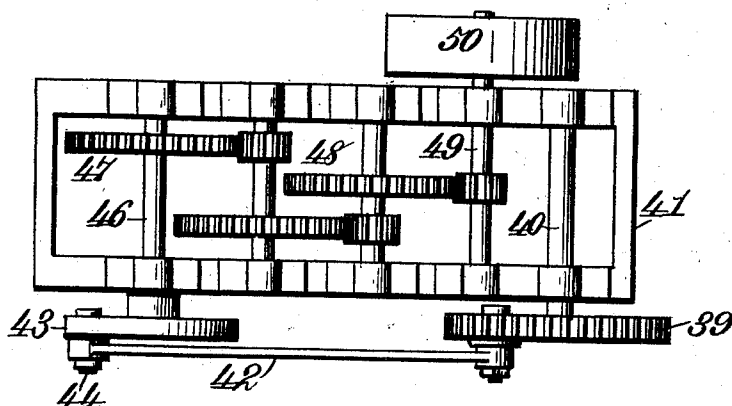


Fig. 13.



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UNITED STATES PATENT OFFICE.

CHARLES W. HOLLENDER, OF PARIS, TEXAS, ASSIGNOR OF ONE-HALF TO
EMIL SPRINGMANN, OF LIVERPOOL, ENGLAND.

BOLTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 715,072, dated December 2, 1902.

Application filed October 16, 1901. Serial No. 78,894. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. HOLLENDER, a citizen of the United States, residing at Paris, in the county of Lamar and State of Texas, have invented new and useful Improvements in Bolting-Machines, of which the following is a specification.

This invention relates to a bolting-machine; and the objects and advantages thereof will appear in the following description, while the novelty of the invention will constitute the basis of the claims at the end of said description.

The invention is shown in one simple and convenient embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a front elevation of a bolting-machine including my invention. Fig. 2 is a side elevation of said machine as seen from the right in Fig. 1. Fig. 3 is a longitudinal sectional elevation of a shaker and its driving mechanism together with the brushes for said shaker. Fig. 4 is a transverse sectional elevation of the same, showing also the conveyers for the finished product and a valve for controlling the latter. Fig. 5 is a sectional plan view of certain of the conveyers, the framework being shown by dotted lines. Fig. 6 is a detail view of a brush and its support. Fig. 7 is a detail view of a portion of a brush. Fig. 8 is a plan view of a double eccentric. Fig. 9 is a sectional elevation of the same. Fig. 10 is a detail view of an eccentric-strap. Fig. 11 is a plan view of a double eccentric and the coacting straps, one end of a pair of shakers being shown by dotted lines. Fig. 12 is a side elevation of the means for actuating the brushes, and Fig. 13 is a plan view of the same.

Like characters refer to like parts in all the figures of the drawings.

The framework which incloses or houses all the operative parts of the machine is designated in a general way by 1 and may be made of the material usually employed in this class of apparatus. The framework supports at or near its top in suitable bearings a main shaft, as 2, horizontally disposed, carrying at one end the fast and loose pulleys 3 and 4, respectively, adapted to receive a belt connected

with a suitable driving-pulley. (Not shown.)

When said belt is on the fast pulley 3, the machine will be operated and can be stopped by shifting said belt onto the loose pulley. It will of course be understood that other means may be employed for driving said main shaft. Said main shaft is provided with a bevel-pinion 5, meshing with the bevel-gear 6 at the upper end of the upright or vertical shaft 7, supported by suitable bearings at the front of the machine, a similar shaft, as 7', being located at the rear of the machine. The mechanism for operating the vibrating shakers receives its motion from devices connected with these parallel shafts 7 and 7'. The shaft 7' carries at its upper end a bevel-gear 6', the function of which will hereinafter appear. A horizontal shaft, as 8, extends along the top of the frame and is provided at its ends with bevel-gears, as 8', meshing with the gears 6 and 6', respectively, the shaft 8 and intermeshing bevel-gearing forming a simple means for driving the two upright shafts 7 and 7' in unison, though it is not intended to limit the invention in this respect.

The machine includes superposed vibratory shakers arranged in pairs, each pair being adapted to operate upon a mass of material independently of the other. The shakers are adapted to be simultaneously vibrated or reciprocated in corresponding directions, and each of them is of box-like form and contains a plurality of sieves hereinafter described. The upper shakers are designated by 9 and the lower ones by 10, and each is suspended by links, as 11, arranged at the corners and hung from beams or cross-pieces, as 12, forming part of the framework of the machine. The upright shafts 7 and 7', it will be remembered, carry the means for vibrating the shakers or sieves, and these means include eccentrics, as 13, each eccentric being of duplex form. It will therefore be understood that there are four double eccentrics, each of the shafts 7 and 7' carrying two. The eccentrics are shown in detail in Figs. 8 and 9, and each consists of two sections or parts, as a and a' , one above the other and suitably flanged, as at 14, to prevent side motion of their straps, the sections a and a' and their flanges being integral. The uppermost sec-

tion a' in each case is provided with an annular receptacle, as 15, suitably bolted or otherwise fastened thereto and serving to receive a lubricant which passes from thence and enters the ducts or bores 16, formed in parallelism in the eccentric. The ducts have their lower ends turned outward, so as to supply the lubricating fluid to the peripheries of the sections a and a' of the duplex eccentrics. The bore or duct 15 at the left, Fig. 9, is longer than the other one, as it has to supply the lower section a with the lubricant. The straps 17, which embrace the eccentrics, have elbow or right-angular arms or extensions, as 18, terminating at their inner ends in plates, as 19, suitably fastened to the opposite ends of the shakers 9. On reference to Figs. 1 and 3 it will be seen that an eccentric is connected to each pair of shakers, it being also seen, on reference to Fig. 1, that the arms 18 are located in different horizontal planes, the lower arm in each case being connected to the shakers on the left, while the other arms are connected to the shakers on the right. The eccentrics are therefore located at the ends of each pair of coacting shakers, and by their presence all jarring is taken off from the framework, and the shakers being made light the jar is much reduced.

Referring to Fig. 3, wherein one of the shakers 9 is illustrated in detail, I will now describe the same, corresponding characters being used to designate similar parts in the other shakers. Said shaker 9 includes a box-like body, as 20, made of some light material and which incloses the several sieves or cloths of different degrees of fineness. The cloths are four in number, and each is denoted by 21, they having rectangular frames, as 22, slidable in place in suitable guides or grooves in the body 20, the outer side of the latter being slotted, as at 22', to receive said slidable frames or to substitute others of a different mesh or to inspect the work. There are two upper cloths and two lower ones, the sifted material from the upper cloths falling onto the inclined boards 23, arranged under the respective upper cloths or sieves, and the boards have outlets 24, through which the material can pass to drop onto the lower cloths to be further sifted thereby. In connection with the horizontally-disposed sieves or cloths I provide brushes, hereinafter described, which have vibratory or reciprocatory motions independent of but in the same direction with the shakers, and hence of said cloths, and which operate against the outer faces of the cloths to facilitate their action upon the material. The coarse material leaves the upper and lower cloths through the superposed outlets 25 at the opposite ends of the shakers, while the fine material or flour is sifted through said lower sieves or cloths and gravitates into one of the feed-troughs 26, Fig. 4, such flour striking in its fall the inclined boards 26', which converge toward

said feed-troughs and which direct the flour into one or the other of said troughs along which it is fed by spiral conveyers hereinafter described. The brushes, each of which is denoted by 27, operate against the outer faces of the cloths, and each includes a frame, as 29, of suitable size and material, to the cross-bars of which are affixed in some convenient manner the tubes 30, adapted to receive bunches of bristles, as 31. (See Figs. 6 and 7.) The brushes, as before stated, operate independently of and in the direction of, the lengths of the shakers. The upper brushes have secured upon their upper sides rack-bars 32, extending longitudinally thereof, while the lower brushes have corresponding rack-bars 32 upon their under sides, and pinions, as 33, are adapted to mesh with the teeth of these rack-bars, the pinions being carried by horizontal shafts, as 34, provided with bevel-gears, as 35, at their outer ends adapted to mesh with similar bevel-gears 36 on the vertical shaft 37, Fig. 1, whereby the brushes can be operated in unison. The upper shaft 34 extends entirely across the machine and is provided at the end thereof opposite that carrying the bevel-gear 35 with a pinion 38, Figs. 12 and 13, meshing with a gear 39, the shaft 40 of which is carried by the auxiliary frame 41, mounted on the top of the main frame. This gear 39 has pivoted to its outer face a connecting rod or pitman 42, the opposite end of which is likewise connected to a disk or wheel 43. The pivot 44, which unites the connecting-rod and disk, is adjustably mounted and may consist of a bolt, which may be placed in any one of the series of perforations or holes 45, formed in the outer face of the disk and located at different distances from the center of motion of the disk. By changing the position of the pivot 44 the stroke of the brushes can be varied at the will of the operator. The shaft 46 carries a gear 47, connected by a train of speed-reducing gears, as 48, with the shaft 49, which carries the pulley 50, connected by the belt 51 with the pulley 52 on the main shaft 2. When the main shaft 2 is in motion, the shaft 46, and hence the disk 43, will be rotated through the intermediate connections, and as the disk rotates it serves to oscillate the gear 39, the distance being approximately the third part of a circle. The ratio of the gears 39 and 38 is a three-to-one one, so that on each stroke of the gear 39 the gear 38 is given a complete rotation, the rotations being alternately in opposite directions, whereby the brushes through the intervening connections will be moved back and forth.

The ground material from a mill (not shown) passes into the hoppers 53, the spouts of which contain suitable force feed devices, the operation of which prevents the material from choking up in said hoppers. The upper two hoppers deliver material into the upper pair of shakers, while the lower two hoppers per-

form a like function with respect to the lower shakers, and each pair of shakers is operable independently of the other, the machine being in this respect a gang one. The spouts or discharge ends of the hoppers 53 contain peripherally-grooved rolls 54, carried by the horizontal shafts 55, and which said rolls as they are rotated feed the mass downward into the respective shakers, there being one roll for each shaker.

A horizontal shaft is shown at 56, it having at one end (shown as the left) a pulley 57, adapted to receive the belt 58, also passed around the pulley 59 on the main shaft 2. The shaft 56 is also provided with a sprocket-wheel 60, connected by the sprocket-chain 61 with the sprocket-wheel 62 on the lower shaft 55. Said lower shaft 55 carries a sprocket-wheel 63 at its right end, connected by the sprocket-chain 64 with the sprocket-wheel 65 on the upper feed-roll shaft 55, such mechanism providing a suitable means whereby the several feed-rolls can be simultaneously rotated.

The flour from the lower cloths, as previously stated, enters the feed-troughs 26, there being two for each shaker, and it is forced along the same by the sections *c* of spiral conveyers, as 66, the shafts of which are denoted by 67. The shafts 67 of the series of conveyers are provided at their forward ends with bevel-gears 68, meshing with similar gears 69 on the shafts 56 and 70, respectively. The shaft 70 carries a sprocket-wheel, as 71, connected by the sprocket-chain 72 with the sprocket-wheel 73 on the shaft 56, whereby the several spiral conveyers can be actuated in unison. On reference to Fig. 4 it will be seen that the feed-screws 66 are arranged in pairs, and the delivery of the fine or sifted material to these screws is governed by a valve, as 74, adapted to be swung by an attendant so as to deliver the material to either one of the screws, and this operation can be effected while the machine is running. The valve 74 is pivoted to the upper side of the wall or partition *b*, that divides the trough 26 into two parts, and it is swung into a position in line with one or the other of the inclined walls 26'.

The superposed vibratory shakers 9 and 10 may be operated independently of each other, or the material sifted by the upper pair of shakers can be delivered to the lower pair through outlets, as 80, having hand valves or slides, as 81, which can be manipulated to either cause the delivery of the flour to the lower shakers or cut off the supply flowing to the same.

It will be seen that the spiral conveyers 66 are in two sections, as *c* and *c'*, of opposite pitches, the sections *c* being much longer than the sections *c'* and serving to force the flour toward the spouts 82, connected with the troughs or runways 26, the spouts in turn being arranged to deliver the finished product at any suitable or desired places. The troughs

26 are separated transversely by the walls 83, which form the compartments in which the conveyer-sections *c* and *c'* are located. The tailings from the respective shakers gravitate into the short compartments of the troughs 26, in which the conveyer-sections *c'* are situated, so that the latter will force the tailings in a direction opposite that taken by the flour, the tailings passing into suitable spouts, as 84, connected with the troughs 26 and arranged to deliver said tailings at suitable points. The presence of the transverse walls 83 in the respective troughs divides the same into compartments for receiving the flour and tailings, respectively, which effectually divides the fine and the coarse material.

The slots 22' in the sides of the shakers 9 and 10 in practice are preferably lined with cloth, so that the dust cannot get out of said shakers.

The cloth-frames 22 have knobs 85 upon their outer edges by which they can be readily slid into and out of place and are held against withdrawal by pivoted detents, as 86, carried by the respective shaker-bodies, which detents cross the outer edges of the frames and have hooked ends adapted to engage pins on said shaker bodies or frames. The detents are held in their normal or effective positions by pawls engaging the same and carried by the shaker bodies or frames 20. By disengaging the pawls 88 from the detents 86 said detents will be released and can be disengaged from the pins 87, so as to swing them out of the path of the cloth-frames 22, whereby the latter can be removed.

The invention may be variously modified within the scope of the appended claims.

Having described the invention, I claim—

1. In a machine of the class described, a shaker, means for actuating said shaker, a brush for said shaker, a wheel for operating said brush, an oscillatory member for actuating said wheel, a disk having a rod pivoted thereto and also connected with said oscillatory member, and means for rotating said disk.

2. In a machine of the class described, a shaker, means for actuating said shaker, a brush for the latter, a rack connected with the brush, a pinion meshing with the rack, a gear meshing with said pinion, and means for oscillating said gear.

3. In a machine of the class described, a shaker, means for actuating said shaker, a brush for the shaker, a pinion, operative connections between the pinion and brush, a gear meshing with said pinion, a disk, a rod connected respectively with said disk and gear, and means for rotating the disk.

4. In a machine of the class described, a shaker, means for actuating said shaker, a brush for the shaker, a rack connected with the brush, a pinion meshing with said rack, an oscillatory gear meshing with said pinion, a rod adjustably connected with the disk and

connected with said gear, and means for rotating said disk.

5. In a machine of the class described, a shaker, means for actuating said shaker, a brush for the shaker, a rack connected with said brush, a pinion meshing with said rack, an oscillatory gear meshing with the pinion, a disk having a series of holes located at different distances from its center, a connecting-rod pivoted to the gear, a pin on said rod adapted to enter one of said holes, and means for operating said disk.

6. In a machine of the class described, a shaker, means for actuating said shaker, a brush for the shaker, a pinion, operative connections between the pinion and brush, a gear meshing with said pinion, a disk operatively connected with said gear and serving to oscillate the latter, a shaft carrying said disk, a second shaft, a train of intermeshing gears connected respectively with said shafts and means for rotating said second shaft.

7. In a machine of the class described, a plurality of shakers, means for actuating the respective shakers, brushes for said shakers, pinions operatively connected with each other, operative connections between the pinions and the respective brushes, a gear meshing with one of the pinions, and means for oscillating said gear.

8. In a machine of the class described, a

shaker including a body and a plurality of cloths the frames of said cloths being slidably held in the body, pivoted detents upon the body adapted to cross the ends of said sliding cloth-frames, pins carried by said body and adapted to be engaged by the detents and pawls also carried by the body and adapted to engage the detents to normally hold the same in their effective positions.

9. In a machine of the class described, a shaker, means for operating said shaker, a pair of troughs arranged side by side below the shaker, conveyers arranged in the respective troughs and each consisting of oppositely-pitched sections, one section serving to feed the screenings and the other section to feed the tailings, and one tailings-screw section being at one end of its trough, while the other tailings-screw section is at the opposite end of its trough, transverse partitions dividing the troughs into compartments in which the respective sections of the conveyers are mounted, and means for rotating the conveyers in opposite directions.

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

CHARLES W. HOLLENDER.

Witnesses:

G. L. GODFREY,
J. S. PATRICK.