W. A. PATTERSON.

COTTON SEPARATOR.

APPLICATION FILED JAN. 15, 1908.

951,218.

Patented Mar. 8, 1910.

3 SHEETS—SHEET 1.

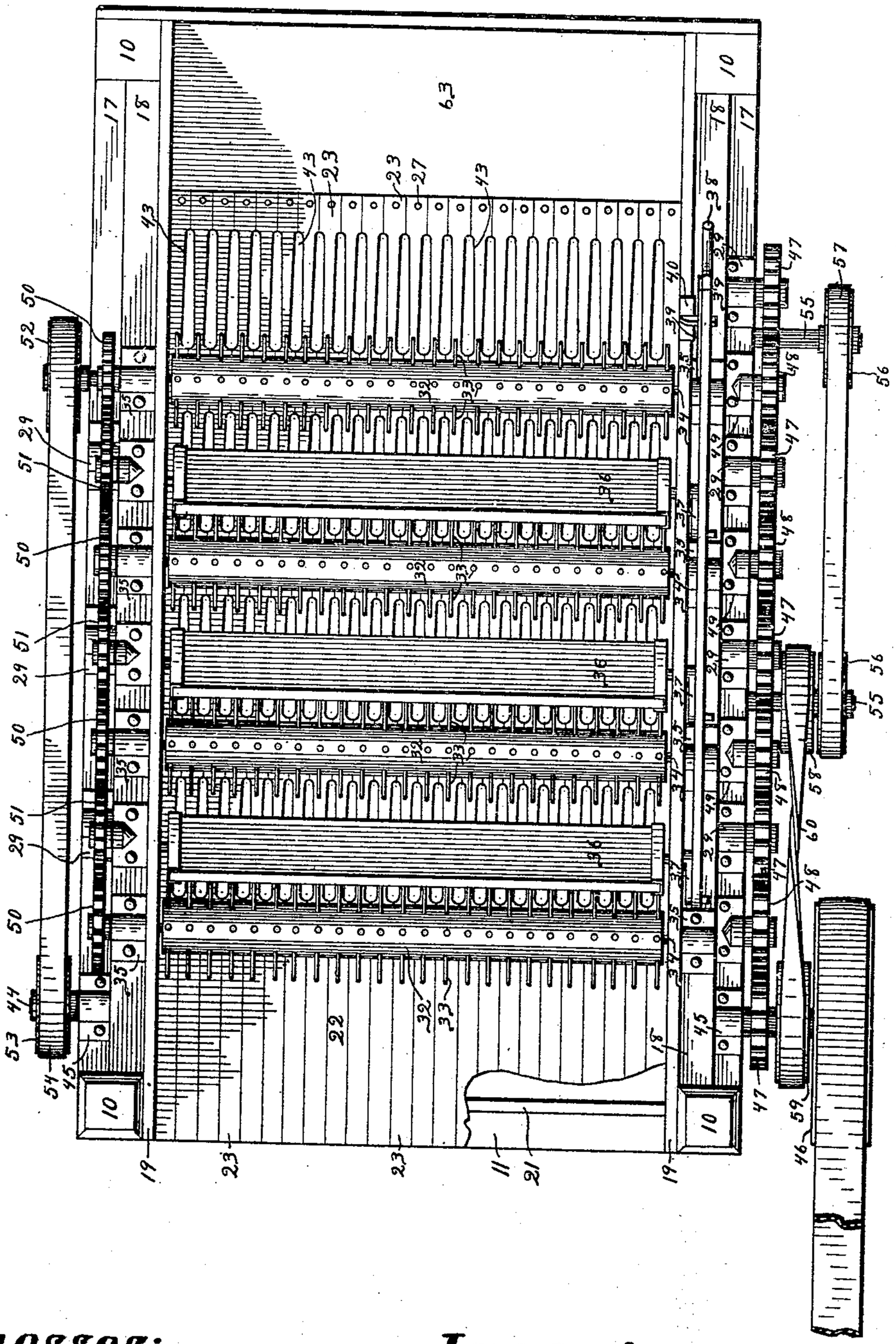

Fig. 1.

Witnesses:—

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Bess Wills.

Inventor:—

Warren A. Patterson.

By Frank P. Shepard, Atty.

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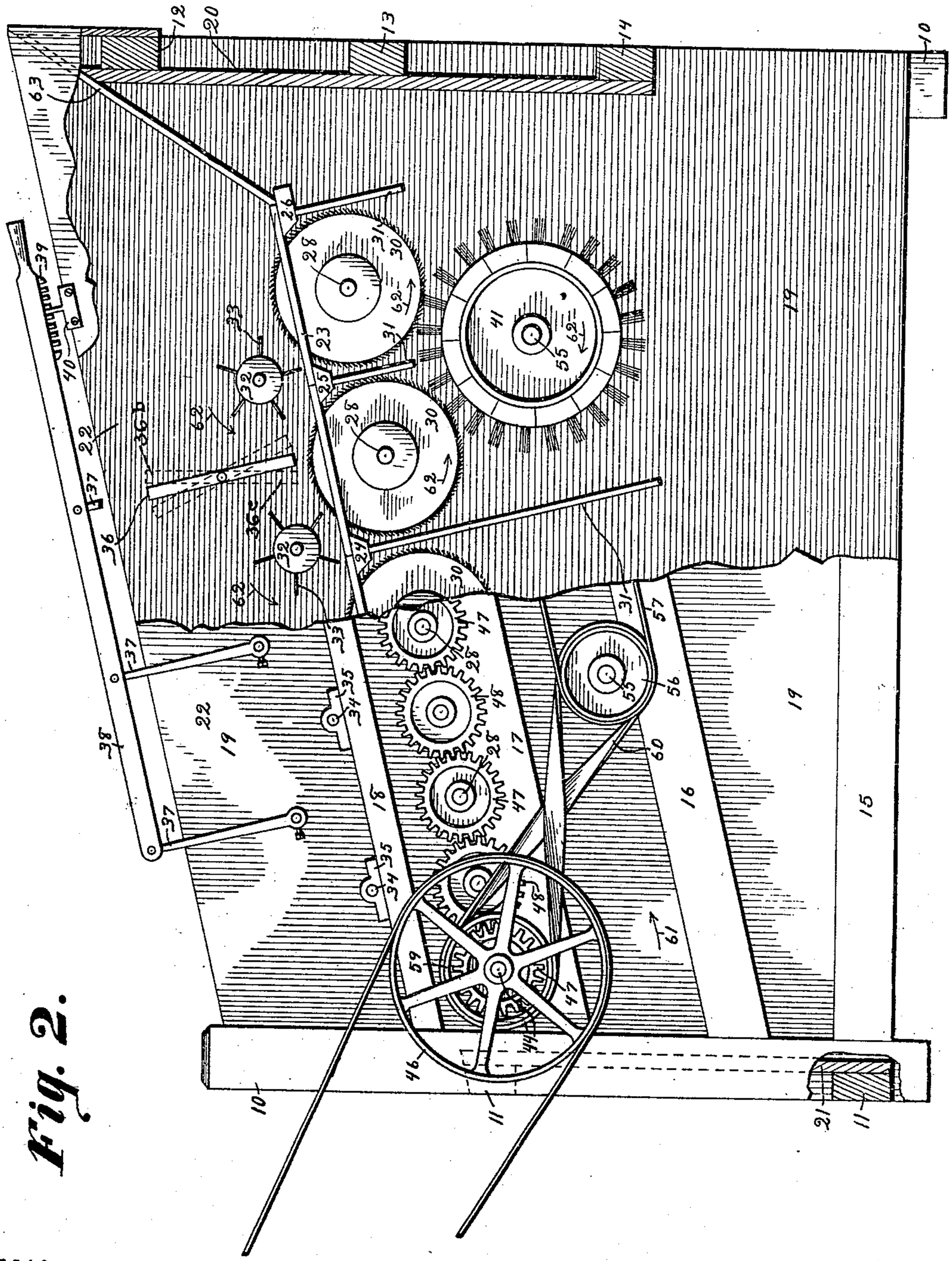

Fig. 2.

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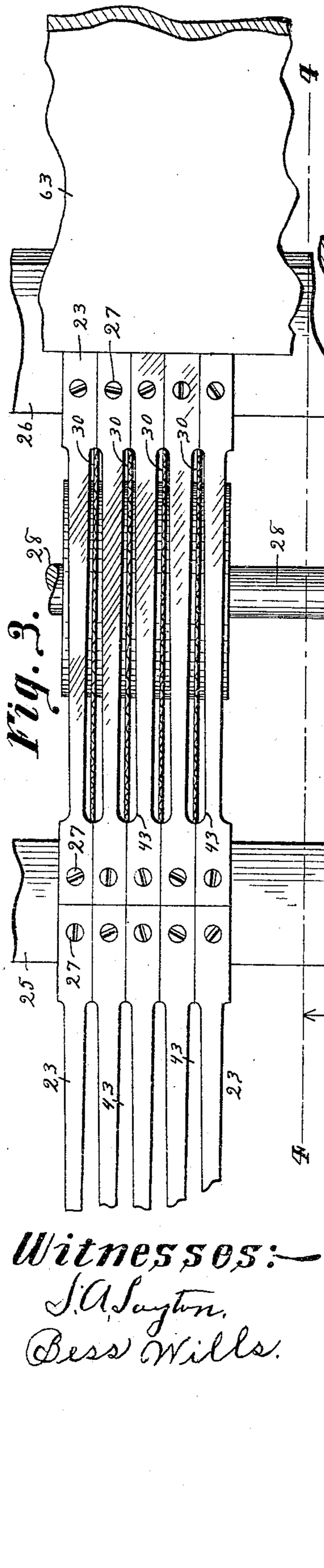

Fig. 3.

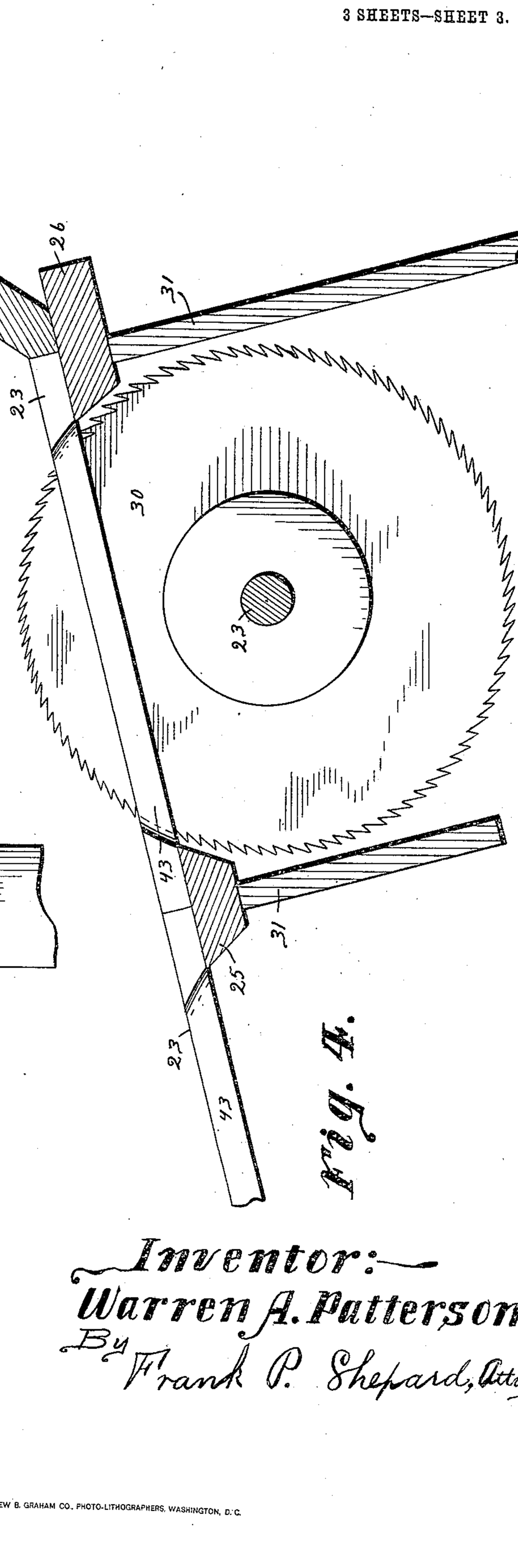

Fig. 4.

Witnesses:—
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UNITED STATES PATENT OFFICE.

WARREN A. PATTERSON, OF ST. LOUIS, MISSOURI.

COTTON-SEPARATOR.

951,218. Specification of Letters Patent. Patented Mar. 8, 1910.

Application filed January 15, 1908. Serial No. 410,973.

To all whom it may concern:

Be it known that I, WARREN A. PATTERSON, a citizen of the United States, residing at No. 4176 Castleman avenue, in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Cotton-Separators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention pertains to machines for removing cotton from bolls after the bolls have been gathered from the field, and the object is to produce a machine which shall be cheap and simple in construction, and which will perfectly and completely remove the cotton from the bolls.

Other objects and advantages of the invention will be set forth in the ensuing description.

Referring to the drawings: Figure 1 is a plan view of the machine the gin saws being not shown. Fig. 2 is a right-hand side elevation of the machine, with portions broken away to expose construction and operation of interior parts. Fig. 3 is a fragmental plan view, on larger scale, of certain ribs and saws used in the machine. Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Referring to the several figures, in all of which like characters of reference designate like parts, the machine body comprises an inclosing and supporting frame-work in which the essential parts are contained, said frame-work consisting of the upright corner-posts 10; the front end cross-beams 11; the rear end cross-beams 12, 13, and 14; and the four side-beams 15, 16, 17, and 18 on each side; the beams 16, 17, and 18 being inclined downward from the front end to the rear, while all beams are mortised into the corner-posts.

To complete the frame-work into a suitable inclosure, it is entirely walled up, as at 19, to form the upper portion into a hopper or receptacle to receive the bolls containing the cotton, hold them while being acted upon by the parts, and to form the lower portion into a compartment to receive the cotton separated from the bolls. The front and rear ends of the frame-work are also walled, as at 20 and 21, respectively, the extension of the rear wall 21 being limited at its upper end to allow the bolls, hulls, and other matter resulting from the separation to pass from the machine, while the extension of the front wall 20 is limited at its lower end to allow the cotton to be removed from the machine.

In arranging the separating mechanism, a grated bed constituting a bottom for the upper or hopper compartment 22 is formed by ribs 23, of which there are in this instance four sets, having functions similar to the ribs of the common cotton-gin. These ribs 23 are straight, those of one set meeting and alining with those of the next, and said ribs are supported at their ends by cross-bars 24, 25, and 26 to which they are secured by screws 27, the ends of said cross-bars being secured to the inner surface of the side walls 19. The ribbed bed thus formed is arranged at a suitable incline—say fifteen degrees from horizontal position, to cause the cotton, bolls, and hulls to slide or work rearward from the front end of the compartment 22 to the delivery end of the machine, while being worked upon by the separating mechanism.

Journaled laterally of the machine beneath each set of ribs 23 is a shaft 28 resting in journal bearings 29 on the side beams 17, and each shaft carries a series of circular saws 30 whose edges project upward between and above the ribs similar to the saws of the common cotton-gin. The shafts of saws thus journaled are separated from each other beneath the ribs 23 by partitions 31 which closely join the rib-supporting bars 24, 25, and 26 and are secured at their ends to the side walls 19.

Journaled laterally of the machine above the ribs 23 are four rollers 32 having each a plurality of longitudinal rows of agitating-spikes 33, the shafts 34 of said rollers resting in journal bearings 35 on the side-beams 18. The first agitating-roller 32 is mounted to co-act with the first shaft of saws 30, the second roller 32 with the second shaft of saws 30, and so on; each roller 32 being journaled forwardly of its respective shaft of saws where its spikes will just clear the saw teeth and the ribs 23.

Extending laterally of the machine just in the rear of each of the first three agitating-rollers 32 is a wooden stop-board 36 which is mounted tiltably on a horizontal axis for adjustment of its angular relation to the ribs 23, one pintle of each stop-board

extending out through the wall 19 and having a crank 37 for controlling it. A rod 38 engages all the crank-arms 37 for tilting the stop-boards 36, and the front or handle end of this rod is provided with a notched rack 39 adapted to engage a locking-stud 40 on the machine for locking the stop-boards 36 in adjusted position.

Journaled below the shafts of saws 30 are two revolving brushes 41 adapted to remove the cotton from the saws 30, each brush being positioned to contact the teeth of two shafts of saws, and being arranged to remove the cotton therefrom in the same manner as in the common cotton-gin. The shafts of these brushes 41 are journaled in bearings 42 on the side beams 16.

The saw space 43 between the ribs 23, shown best by Figs. 3 and 4, is just wide enough at the front end, or at the point where the saw teeth pass up between them, to perfectly clear said teeth, while the rear end of said space is made wide enough to allow the cotton and the seed that may adhere thereto or in other words is caught by said teeth to be drawn down between said ribs.

A drive-shaft 44 is journaled across the rear end of the machine, in bearings 45 on the side-beams 17, and carries a belt-pulley 46 adapted to be driven from any suitable source of power. This shaft 44 has a gear-wheel 47, as has also each of the saw shafts 28, and said wheels 47 are operatively connected together into a train of saw-driving gearing by interposed gear-wheels 48, which are mounted upon supporting brackets 49 bolted to the side-beams 17. The shafts 34 of the agitating-rollers 32 are provided with gear-wheels 50, having gear-wheels 51 interposed between them to form a train of roller-driving gearing, and one of said shafts 34 has a belt pulley 52 which takes motion from a like belt-pulley 53 on the drive-shaft 44 through a belt 54. The shafts 55 of the brushes 41 are provided with belt pulleys 56 operatively connected by a belt 57, and the front one of these shafts 55 has a belt-pulley 58 which takes its motion from a pulley 59 on the drive-shaft 44 through belt 60.

In running the machine, the main drive-shaft 44 runs in the direction indicated by arrow 61, and the different belts are so run therefrom as to drive the saws 30, the rollers 32, and the brushes 41 in the direction of their indicating arrows 62.

In the use of the machine, it is found to work well with the parts running at the following speeds: the saws 30 running at 375 revolutions per minute; the agitating-rollers 32 at 350 revolutions per minute; and the brushes 41 at 400 revolutions per minute.

In using the machine, the cotton bolls containing the cotton as gathered from the field are fed evenly onto the feed-board or inclined approach 63 of the upper or hopper compartment 22 by any suitable means, preferably by one of the cotton-feeding machines in common use. The bolls and portions of bolls dropping into contact with the first shaft of saws 30 are caught by the teeth of said saws and thrown forcibly against the first agitating-roller 32, or against the lower spikes 33 of said roller, the saw teeth at the same time stripping said bolls and hulls of the cotton that protrudes therefrom, and carrying said cotton down through between the ribs 23 to where it is removed from the saw teeth by the first or front brush 41. In being thrown against the spikes 33 some of the small bolls or portions of bolls pass between said spikes and on rearward to the next shaft of saws 30, there to be caught by the teeth of said saws and thrown forcibly on rearward against the spikes 33 of the second roller 32. The bolls and parts of bolls that are larger and that do not pass between the spikes 33 of the first roller 32 are thrown or carried upward and rearward over said roller by said spikes, the rearward movement of said bolls and hulls above said roller being limited by the first stop-board 36 which causes said bolls and hulls to drop down onto the front or rising portions of the saws of the second shaft, where they are caught by said saws in the same manner in which they were caught by the first shaft of saws and drawn rearward under said stop-board and thrown forcibly against the spikes 33 of the second roller 32 along with the bolls and hulls which passed between the spikes of the first roller 32. In being thus thrown against the spikes of the second roller 32 by the second shaft of saws, the bolls and hulls are further stripped of their attached or protruding cotton by the saw teeth and are further broken open, some of the smaller bolls, and also part of the hulls resulting from the breaking of bolls, passing between the lower spikes of said second roller and on rearward to where they are caught by the teeth of the third shaft of saws. The bolls and hulls that do not pass between the spikes of the second roller by the action of the second shaft of saws 30 are thrown or carried upward and rearward over said roller by said spikes, the rearward movement of said bolls and hulls above said roller being limited by the second stop-board 36 which causes said bolls and hulls to drop down onto the front or rising portion of the third shaft of saws 30 where they are caught by the saw teeth in the same manner as they were caught by the second shaft of saws, and drawn rearward under said stop-board and thrown forcibly against the spikes 33 of the third roller 32 along with the bolls and hulls which passed between the spikes of the second roller. Each succeeding shaft of saws,

together with the agitating-roller and stop-board co-acting therewith, acts in the same manner as the preceding ones, with the effect that the bolls and hulls are completely broken up and their cotton entirely removed, the hulls and other matter resulting from the separation being finally delivered out the rear or open end of the upper or hopper compartment 22.

The angular position given the stop-boards 36 determines the amount of cotton and bolls that may be separated by the machine in a given time, and determines also what part of the full amount of cotton contained in or mingled with the bolls will be separated therefrom. When the lower portions of the stop-boards 36 are tilted forward, as indicated by the dotted representations 36[b] in Fig. 2, the bolls, hulls, and cotton thrown against said boards by the rollers 32 will be delivered by said boards at points on the ribs 23 closer to said rollers and farther from the next shaft of saws, thus allowing the saws to catch the protruding or mingling cotton with less tendency to draw the bolls and hulls rearward under said board, and increasing the tendency of the bolls and hulls to be again caught by the spikes 33 of the roller 32 and again carried around said roller. When the lower edges of the stop-boards 36 are tilted rearward, as shown by the dotted representations 36[c], the bolls and cotton thrown against said boards by the rollers 32 will be delivered by said boards onto nearer the full surface of the saws, thus increasing the tendency of the saw teeth to draw said bolls forward in removing their cotton, and lessening the tendency of said bolls to be caught by the spikes of the rollers 32.

Changes in the proportion and minor details of the invention are allowable within the meaning and intent thereof.

The foregoing being a full, clear, and exact description of the invention, what I claim and desire to secure by Letters Patent is:—

1. In a cotton separator, a bed composed of ribs, a plurality of shafts of circular saws, journaled beneath the bed in such position that the saws project above the surface of the bed between the bed ribs, agitating-rollers journaled above the bed with axes parallel to the axes of the saws, partitions mounted above and clearing the bed between the agitating-rollers.

2. In a cotton separator, an inclined ribbed bed, a plurality of circular saws journaled below said bed and projecting above the surface thereof between the bed ribs, said saws being adapted to be driven so that their projecting portions move in the direction of descent of the bed, an agitating-roller mounted above the bed for each set of saws, said rollers having spikes and being adapted to be moved so that the spikes adjacent the bed move in the direction of ascent of said bed, partitions mounted above and clearing the bed between said agitating rollers, and means for adjusting the angular relation of said partitions and bed.

3. In a cotton separator, an inclined bed, a plurality of sets of circular saws mounted beneath the bed and projecting above said bed through slots therein, said saws being adapted to be driven so that their projecting edges move in the direction of descent of the bed, a plurality of agitating rollers mounted above the bed, each agitating-roller being adapted to co-act with its respective set of saws and being placed away from said set of saws in the direction of descent of the bed, said agitating rollers being each provided with agitating spikes and being adapted to revolve so that the lower spikes move in the direction of ascent of the bed, stop-boards mounted above the bed between said agitating rollers, each stop-board being mounted adjacent an agitating-roller on the descent side thereof, and means for adjusting the angular relation between said stop-boards and the bed.

4. In a cotton separator, a ribbed bed, a plurality of sets of saws mounted to rotate between the ribs of the bed, a plurality of cotton agitators located one between each pair of such sets of saws, a plurality of tiltable stop-boards positioned one between each pair of said agitators, and means whereby the said stop-boards may be simultaneously tilted.

Witness my hand this 11th day of December 1907.

WARREN A. PATTERSON.

Witnesses:

LEILA MOSSMAN,

BESS WILL.