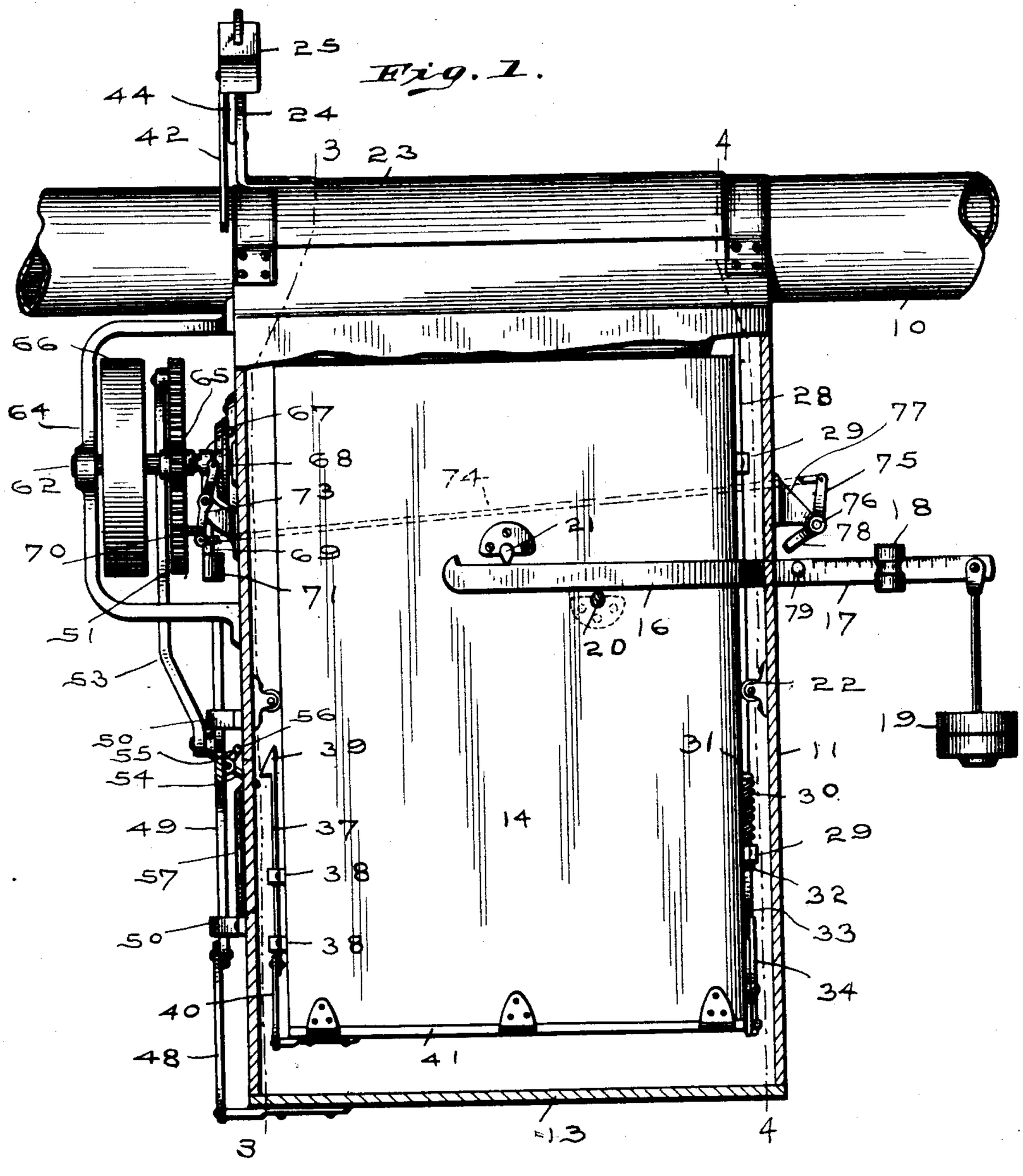
(No Model.) 3 Sheets—Sheet 1.

A. SCHULZE.

AUTOMATIC COTTON WEIGHING SCALE.

No. 542,285. Patented July 9. 1895.

Fig. 1.



Witnesses
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(No Model.) 3 Sheets—Sheet 2.

A. SCHULZE.

AUTOMATIC COTTON WEIGHING SCALE.

No. 542,285. Patented July 9, 1895.

Fig. 2.

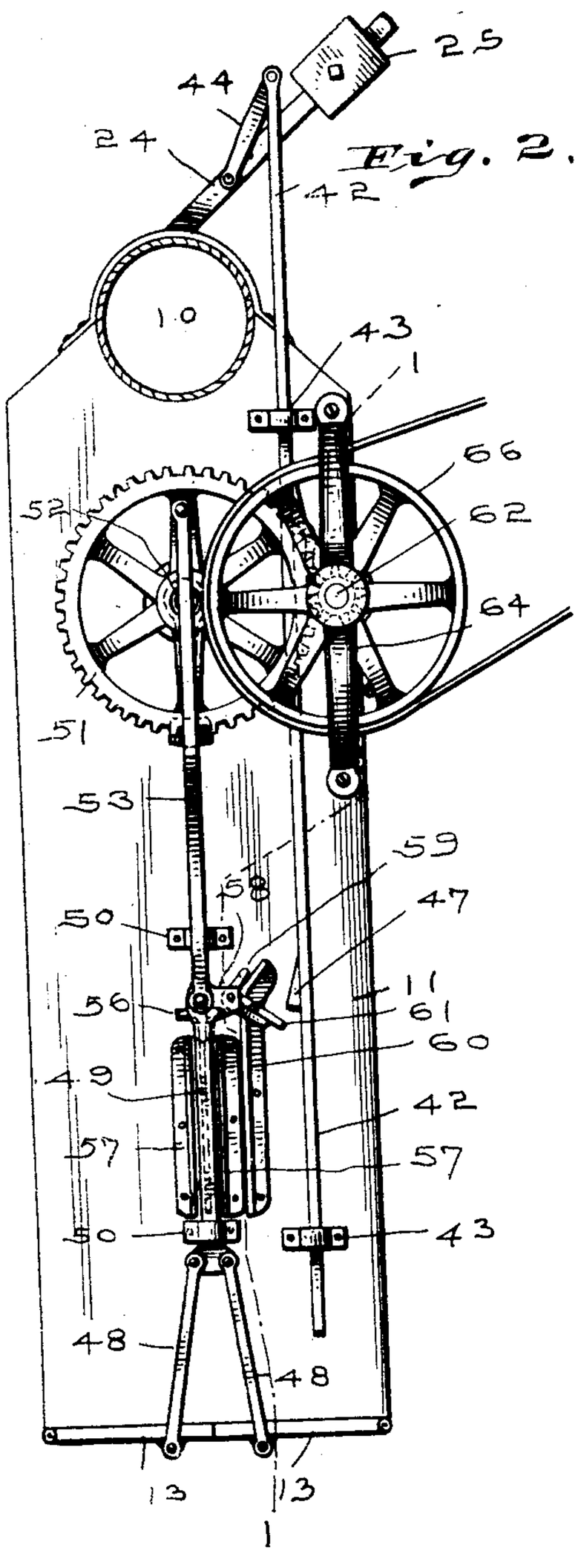
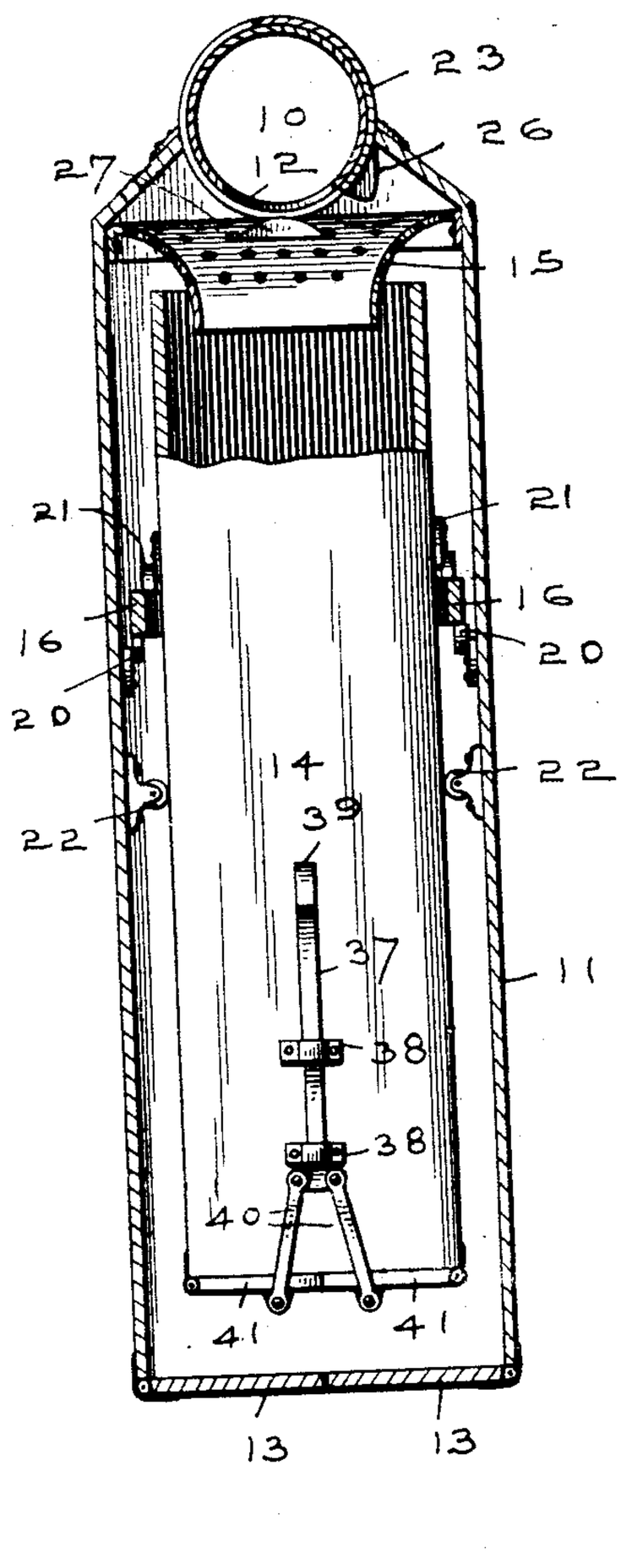


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

A. SCHULZE.

AUTOMATIC COTTON WEIGHING SCALE.

No. 542,285. Patented July 9, 1895.

Fig. 4.

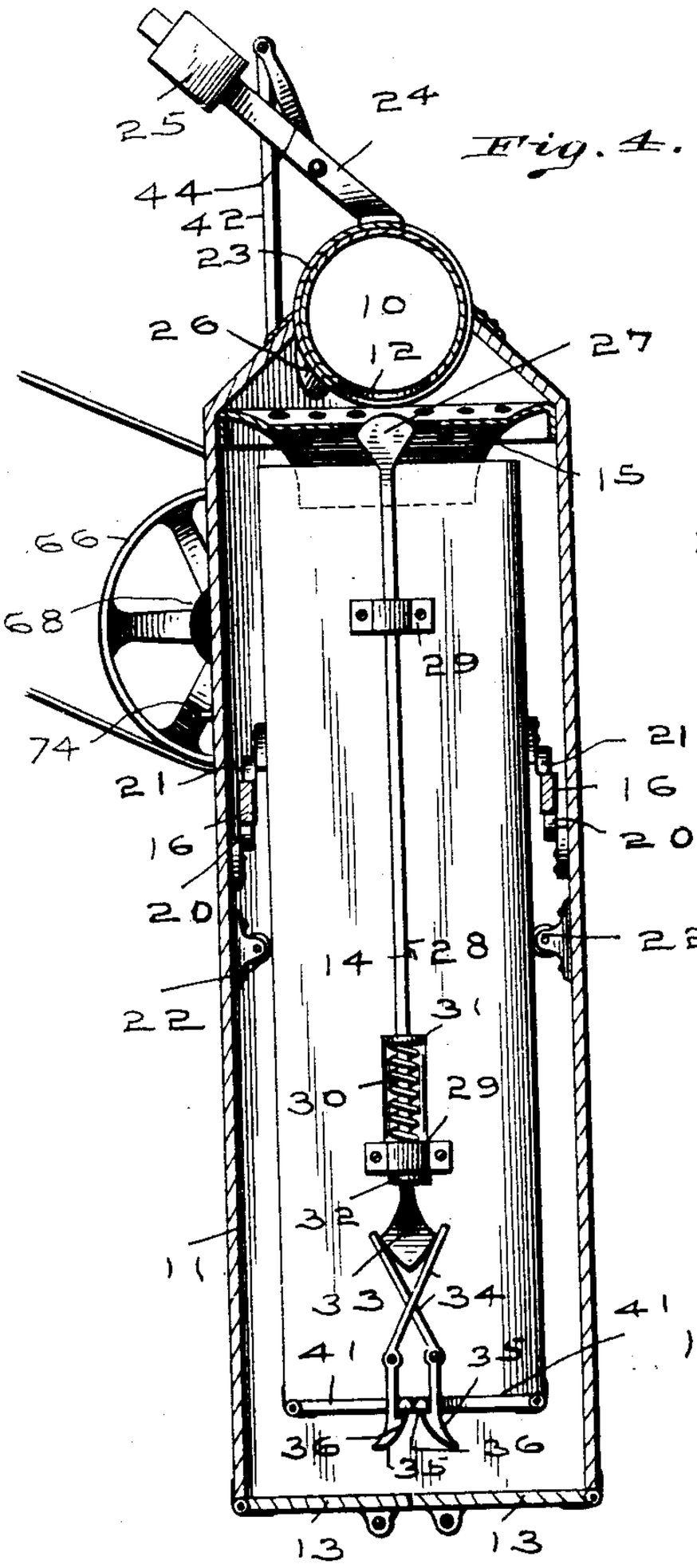


Fig. 5

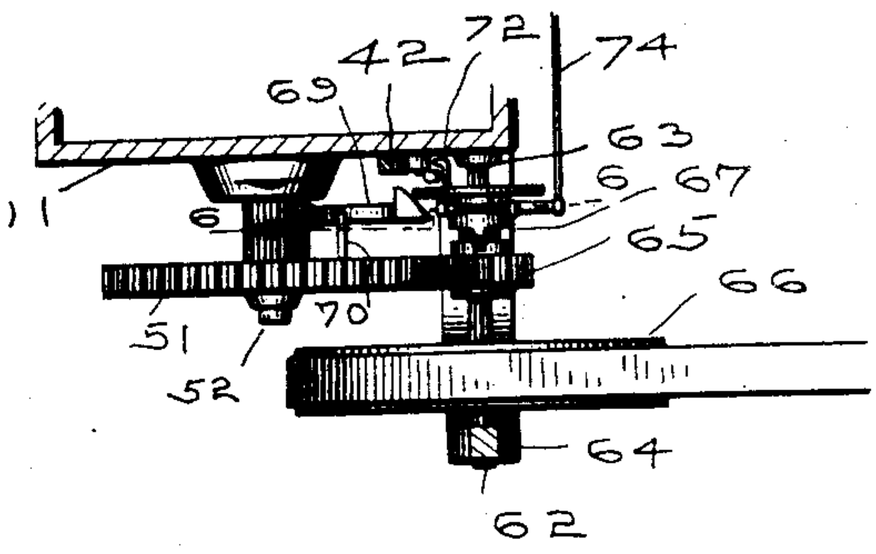


Fig. 6.

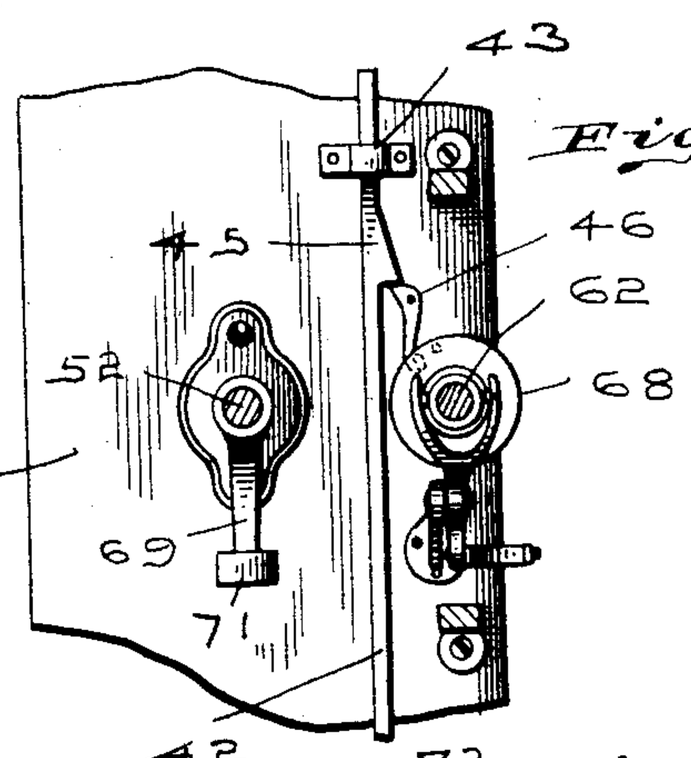
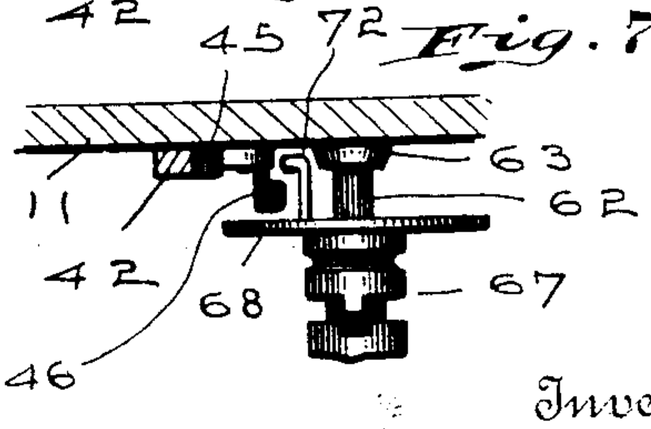


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

ANDREW SCHULZE, OF LOTT, TEXAS, ASSIGNOR TO THE KINGSLAND & DOUGLAS MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI.

AUTOMATIC COTTON-WEIGHING SCALE.

SPECIFICATION forming part of Letters Patent No. 542,285, dated July 9, 1895.

Application filed October 15, 1894. Serial No. 526,009. (No model.)

To all whom it may concern:

Be it known that I, ANDREW SCHULZE, a citizen of the United States, residing at Lott, county of Falls, and State of Texas, have invented a certain new and useful Automatic Cotton-Weighing Scale, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention consists, broadly, in an automatic scale or weighing-machine adapted to be used in connection with pneumatic conveyers, and it is of such construction that it will automatically weigh any amount that its scale may be set at, cut off the supply from the conveyer, empty itself, and immediately reset itself, the resetting of the machine opening the supply-valve from the conveyer, so that the weighing operation can be repeated.

In the drawings, where there is shown one form of machine which I have found efficient, Figure 1 is a longitudinal section through the outer casing on the line 1 1 of Fig. 2, showing the casing connected to a pneumatic conveyer-pipe. Fig. 2 is an end view of the entire scale or weighing-machine. Fig. 3 is a cross-sectional view taken through the outer casing on the line 3 3 of Fig. 1, the weighing-receptacle being partly in elevation and partly in section. Fig. 4 is a cross-sectional view taken through the outer casing on the line 4 4 of Fig. 1, the weighing-receptacle being shown in elevation. Fig. 5 is a top view of the mechanism connected with the outer casing of the scale for automatically resetting the same after it has been operated. Fig 6 is a cross-sectional view of the same on the line 6 6 of Fig. 5. Fig. 7 is an enlarged detail top view of the clutch and conveyer-valve trip.

In all the drawings, where like marks of reference refer to similar parts in all the views, 10 represents a pneumatic conveyer-pipe, through which air is passed either by a suction or blow fan for conveying cotton, grain, or other products—say from a delivering-room to a baling-press, gin, or other desired point.

11 is a closed shell or casing, which is connected to the pipe 10 in any suitable manner, the pipe having an opening 12 therein, which opens into the casing 11, the casing having hinged doors 13 in its bottom, whose operation will be hereinafter described.

14 is the weighing box or receptacle, which is centrally supported within the casing 11 and beneath the opening 12 in the pneumatic pipe, a hopper or funnel 15 being connected to the walls of the casing 11 and opening into the open top of the weighing-receptacle 14.

The weighing-receptacle has hinged doors in its bottom, which are opened and closed as hereinafter described, and the box itself is supported centrally within the casing 11 on the arms or bifurcated ends 16 of a scale-beam 17, which extends through a slot in one end of the casing to the outside of the same, where it carries the balancing-weight 18 and on its end the ordinary set-weights 19.

Knife-edges 20 are formed on brackets secured to the inner walls of the casing 11, and upon these the arms 16 of the scale-beam are supported, knife-edges 21 being formed on brackets secured to the sides of the weighing-receptacle. These knife-edges rest on the upper side of the arms 16 of the scale-beam.

22 are rollers mounted in brackets secured to the walls of the casing 11, and these make contact with the weighing-receptacle, preventing it from tilting and hold it centrally within the casing.

23 is a valve secured around the pneumatic pipe 10 in any suitable manner, its object being to close at certain times the opening 12 in such pipe, the valve having secured to it an operating-lever 24, which carries an adjustable weight 25 on its end.

26 is a projection formed on the valve 23, and as the valve closes this projection is adapted to contact with the rounded head 27 of a vertical rod 28, which works in brackets or bearings 29, secured to one end of the weighing-receptacle 14. A spring 30 is coiled around the rod 28 between its lower bracket and a collar or stop 31 above, 32 being a collar or stop below the bracket which limits the upward movement of the rod. A flaring or tapering head 33 is formed on the lower end of the rod 27 and lies between the upper ends of the crossed arms 34, these being pivoted to the end of the weighing-receptacle and having

hooks 35 on their lower ends, which are adapted to engage with projections 36 on the doors and thereby hold them closed. On the opposite end of the weighing-receptacle is a vertical spring-rod 37, which works in brackets 38, secured to the receptacle, the upper end of the rod 37 having a hook 39 thereon and having pivoted to its lower end the links 40, one of these being in turn pivoted to each of the swinging doors 41 in the bottom of the receptacle.

42 is a vertical moving bar, which works in brackets or bearings 43 on one end of the casing 11, and its upper end is connected by a link 44 with the valve-operating lever, the moving bar having a tooth or projection 45 formed on it at a suitable point and adapted to engage with a pivoted dog 46 on the casing 11, which holds the rod 42 normally in a raised position.

47 is a tooth or projection on the moving bar 42 below, through which the bar is lifted or raised.

48 are links pivoted to the doors 13 in the bottom of the outer casing 11, the upper ends of such links being pivoted to the lower end of a vertical slide 49, which is adapted to be moved in brackets 50, secured to the end of the casing 11.

51 is a gear-wheel mounted on the end of a stub-axle 52, which is secured to the casing 11 near its top and in a vertical line with the slide 49, such slide being connected to the gear-wheel 51 by a crank 53, which gives the slide 49 a reciprocating movement when the gear revolves.

On the back of the slide 49 is pivoted a pawl or finger 54, which works through a slot in the outer casing 11, the finger having a right-angular part 55 with projections 56 thereon, which are adapted to make contact with the vertical guide-plates 57, secured to the outside of the casing 11, whereby when the projections 56 make contact with the guides the pawl or finger 54 will be held at right angles to the guides and will be in line to engage with the hook 39 of the spring-bar 37 on the weighing-receptacle.

On one side of the slide 49 is formed a bracket 58, to which is pivoted an L-shaped arm 59, one end of which is adapted to work against a vertical guide 60, which holds the pivoted finger 61 of the bracket at right angles to the guide and in a vertical line of engagement with the tooth of the sliding bar, as hereinafter described.

62 is a shaft, one end of which is mounted in a bearing 63, secured to the end of the casing 11, and its other in a boxing or bearing 64, supported from the end of such casing, this shaft being parallel with the stub-axle 52 and has loosely mounted on it a pinion 65, which meshes with the gear 51 on the stub-axle. The shaft 62 is driven through the pulley 66, connected by a belt with any suitable power.

67 is a clutch which is loosely secured to the shaft 62 by a key or spline, so as to move laterally thereon, the clutch being adapted to be thrown into engagement with the hub of the pinion 65 and so turn the same through the shaft 62.

68 is a circular plate secured to the inner face of the clutch 67, and when the clutch is in engagement with the pinion 65 it is adapted to be thrown out of engagement at a proper time through a swinging arm 69, mounted loosely on the stub-axle 52, this arm adapted to be turned partly around by a projecting pin 70 on the gear-wheel 51 and then swings down through gravity, a beveled weight 71 on its end striking the circular plate 68 and moving it inward, and with it the clutch 76, and thus disengaging such clutch from engagement with the pinion 65.

72 is a pin or projection on the inner face of the plate 68, which at the proper time is adapted to engage with the end of the dog 46 and move the same to release it from engagement with the tooth 45 on the sliding rod 42 and allow such rod to drop.

The clutch 67 is adapted to be thrown into engagement with the pinion 65 by the lever 73, pivoted to the bracket 72, the bifurcated ends of such lever having projections thereon, which work loosely in an annular groove around the clutch.

The lower end of the lever 73 is connected by a rod 74 at the side of the casing with an arm 75 on the end of a transverse rock-shaft 76, this working in bearings or brackets 77 on the end of the casing 11. To one side of the scale-beam and above the same there is secured to the rock-shaft an arm 78, which is adapted to be engaged with and lifted by a pin 79 on such scale-beam, as hereinafter described.

Having mentioned in detail the several parts of the automatic scale, I will describe its operation; but before doing so attention is called to the fact that it must be taken into consideration that a given amount of extra weight is required in the weighing-receptacle to throw the clutch mechanism into gear to empty such receptacle, and we will suppose, for instance, that this extra weight is five pounds. Therefore, if, for instance, two hundred pounds were to be weighed at a time and an ordinary scale-beam was used in connection with my machine the balancing-weight would be set at one hundred and ninety-five pounds, so that while the scale-beam would partly tip at one hundred and ninety-five pounds, yet the mechanism for closing the valve in the pneumatic pipe would not be closed nor the doors of the weighing-receptacle be opened until there were two hundred pounds in such receptacle. If the scale-beam were made for the purpose, the 195-pound point would really represent two hundred pounds, as there would be five pounds extra weight required in the weighing-receptacle

before the scale would tip, and the 195-pound point would therefore be marked 200, and all the other points of the scale to correspond.

Supposing the parts to be in the position shown in the drawings, which is their normal one, the valve in the pneumatic pipe being open, and the doors in the bottom of the weighing-receptacle and casing closed, we will suppose the scale-beam to be one made especially for it, and it to be set at two hundred pounds. As the cotton, grain, or other product is conveyed through the pipe, either by a suction or blow-fan, the cotton would drop into the weighing-receptacle until there were one hundred and ninety-five pounds therein, when the scale-beam would partly tip; but the cotton would still be fed into the weighing-receptacle, as the pin 79 on the scale-beam had only to this time made contact with the arm 78 of the clutch-operating mechanism. As the cotton continued to be fed in the weighing-receptacle, the scale-beam would gradually rise until the two hundred pounds had been reached, when the weight would be sufficient to turn the rock-shaft 76 and its arm 75, through the rod 74, would move the arm 73 on its pivotal point and shift the clutch 67 on the shaft 62, so that it would engage with the pinion 65. The first effect of the shifting of the clutch 67 would be to bring its pin or projection 72 in line with the end of the dog 46, which pin, striking the dog, would throw it out of engagement with the tooth 45 on the sliding rod 42 and allow such rod to drop, thus closing the valve 23 of the pneumatic pipe and cutting off any further supply of cotton to the weighing-receptacles By the closing of the valve 23 the projection 26 thereon, coming into contact with the rounded head 27 of the rod 28, such rod would be depressed, the head on its lower end spreading apart the arms 34 and withdrawing the hooks 35 from engagement with the pins 36 on the doors 41 of the weighing-box, so that such doors could open freely. Simultaneously with the opening of the valve 23 the gear-wheel 51 would be caused to revolve through its meshing with the pinion 65, which is now revolving with the shaft 62. The crank 53 would operate through its connections with the gear-wheel 51 and slide 49 to move such slide downward, which would thus open the doors of the casing 11. Both the doors to the weighing-receptacle and outer casing now being open the cotton or other product would fall out into a bin, press, gin, or wherever it was desired to deliver it. The slide 49 in its downward movement carries with it the finger 54 and angle-arm 59, and as they move downward the transverse projections 56 on the first would contact with the guides 57 and so bring the finger 54 in a horizontal position, while the pivoted finger 61 on the arm 59 would make contact with the guide 60 and bring its finger 61 also into a horizontal position. In the farther downward movement of the slide 49 the finger 61 would make contact with the tooth 47 on the sliding rod 42; but the finger, being pivoted to its arm, would slip over the tooth and drop below it. The same thing would happen with the finger 54 within the outer casing, except that it strikes against the hook on the spring-bar 37, which bar has enough spring in it to allow the finger to pass the hook 39 and get below it. When the slide 49 has reached its lowest limit and starts to rise, the two fingers 54 and 61 will engage with the tooth 47 and hook 39 and carry the sliding and spring-bars up with it, thus closing the doors of both the weighing-box and casing and opening the valve of the pneumatic pipe last. The fingers 54 and 61 are carried high enough in their upward movement to allow the doors of the weighing-receptacle to be caught by their locking-hooks 35 and the tooth 45 on the sliding-rod by the dog 46. At the same time the movement of the slide 49 continues further, so as to allow the fingers to be disengaged from the tooth 47 and hook 39, through the projections on such fingers sliding over the ends of their guides 57 and 60, and the parts would again be in their normal positions, as shown. As the gear 51 revolves to lift the sliding-bar in the second half of its revolution, the pin 70 on the gear would engage with the swinging arm 69, which is loosely mounted on the stub-axle 52, and when the gear has completed its full revolution the weighted arm would fall over or swing on the stub-axle, and in so doing its beveled end or head 71 would strike the edge of the circular plate 68, secured to the clutch 57 and throw such clutch inward and out of engagement with the pinion 65, so that the operating mechanism would be entirely thrown out of gear until the weighing-receptacle is again filled with the proper weight and the scale again tipped, when the operating mechanism would again be thrown into gear and the operation just described be repeated.

The scale herein described, only one form of which is shown, is adapted to word in connection with any pneumatic conveyer and where the air is moved either by an exhaust or a blow-fan.

It will be understood that the construction of the scale shown and described, while being the preferable one at this time, is not the only successful form, and I do not wish to limit myself to it, as many changes and modifications can be made therein without departing from the principle of my invention.

I am also aware that the mechanism herein shown and described may be simplified and still be within the spirit of my invention.

In my appplication, Serial No. 525,209, I have shown an automatic weighing-scale for cotton adapted for occasional or continuous weighing in connection with a pneumatic conveyer, in which weighing-scale so shown the parts are reset by hand and the weight of the product discharged from the weighing-receptacle opens the doors of the in-

closing casing. In the present application the apparatus illustrated is more particularly adapted for continuous weighing, although not confined thereto. The parts herein shown are reset automatically and the doors of the casing opened by mechanism provided for such purpose. So, too, in the apparatus herein illustrated the actuating mechanism revolves, but is brought into requisition only by the tipping of the scale, whereas in my application, Serial No. 525,209, the weight of the product in the weighing-receptacle unlatches the parts which are actuated by gravity.

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

1. In combination with a pneumatic conveyer, a scale suitably supported within a closed casing, connected with the conveyer, a weighing receptacle carried by the scale adapted to receive cotton or other products from the conveyer, means connected with the scale for cutting off the supply and opening the weighing receptacle and casing when such scale is tipped, and devices for then closing said receptacle and casing and turning on the supply.

2. In combination with a pneumatic conveyer, a scale supported within a closed casing connected with the conveyer, the weighing receptacle of such scale adapted to receive cotton or other staples through a gate or valve in the conveyer, doors in the weighing receptacle and casing, means for opening such doors and closing the conveyer valve on the tipping of the scale beam, and devices for closing such doors and opening such valve on the emptying of the weighing receptacle.

3. In combination with a pneumatic conveyer, a closed casing connected to the conveyer, a scale beam pivoted within such casing, a weighing receptacle carried by such scale beam and adapted to receive cotton or other products through a valve in said conveyer, doors in said receptacle and the casing, mechanism connected with the scale beam for automatically opening such doors on the tipping of the scale beam and closing the conveyer valve and then closing such doors with the opening of said valve.

4. In combination with a pneumatic conveyer, a closed casing connected to such conveyer, a scale within such casing, its weighing receptacle adapted to receive cotton or other products through a valve in said conveyer, doors in the bottom of such weighing receptacle and casing, means connected with the conveyer valve for opening the doors of the weighing receptacle as such valve is closed, mechanism connected with the scale for opening the doors of the casing and closing the conveyer valve when the scale is tipped, and then closing the doors of both the casing and weighing receptacle and opening the conveyer valve.

5. In combination with a pneumatic conveyer, a closed casing connected to the conveyer, a scale within such casing, its weighing receptacle adapted to receive cotton or other products through a valve in said conveyer, doors in the bottom of such weighing receptacle and casing, means connected with the conveyer valve for opening the doors of the weighing receptacle, mechanism connected with the scale for opening the doors of the casing and closing the conveyer valve, then closing the doors of both the casing and weighing receptacle and opening the conveyer valve, and means for operating said mechanism put into connection therewith by the tipping of the scale.

In testimony whereof I have hereunto set my hand and affixed my seal, this 3d day of October, 1894, in the presence of the two subscribing witnesses.

ANDREW SCHULZE. [L. S.]

Witnesses:

JOHN F. GREEN,

E. E. VERNELL.