(No Model.)

4 Sheets—Sheet 1.

G. ANDERSON.

PNEUMATIC STACKER.

No. 534,489. Patented Feb. 19, 1895.

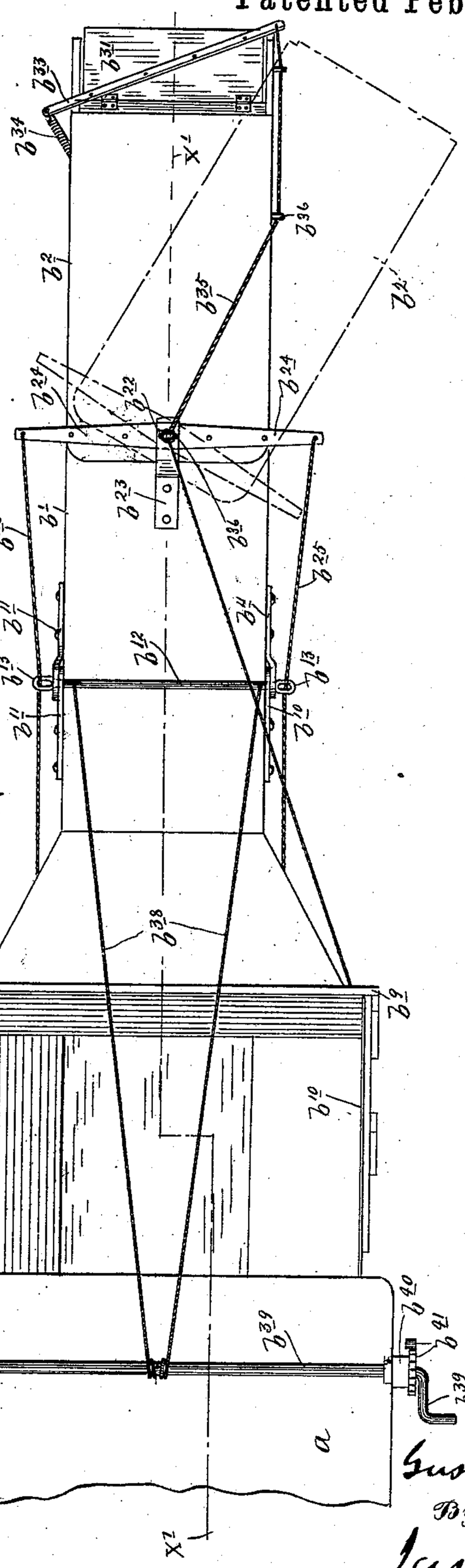

Fig. 1.

Witnesses.
a. H. Opsahl.
Frank D. Merchant.

Inventor.
Gustav Anderson
By his attorney.
Lee F. Williamson

(No Model.)

4 Sheets—Sheet 2.

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PNEUMATIC STACKER.

No. 534,489. Patented Feb. 19, 1895.

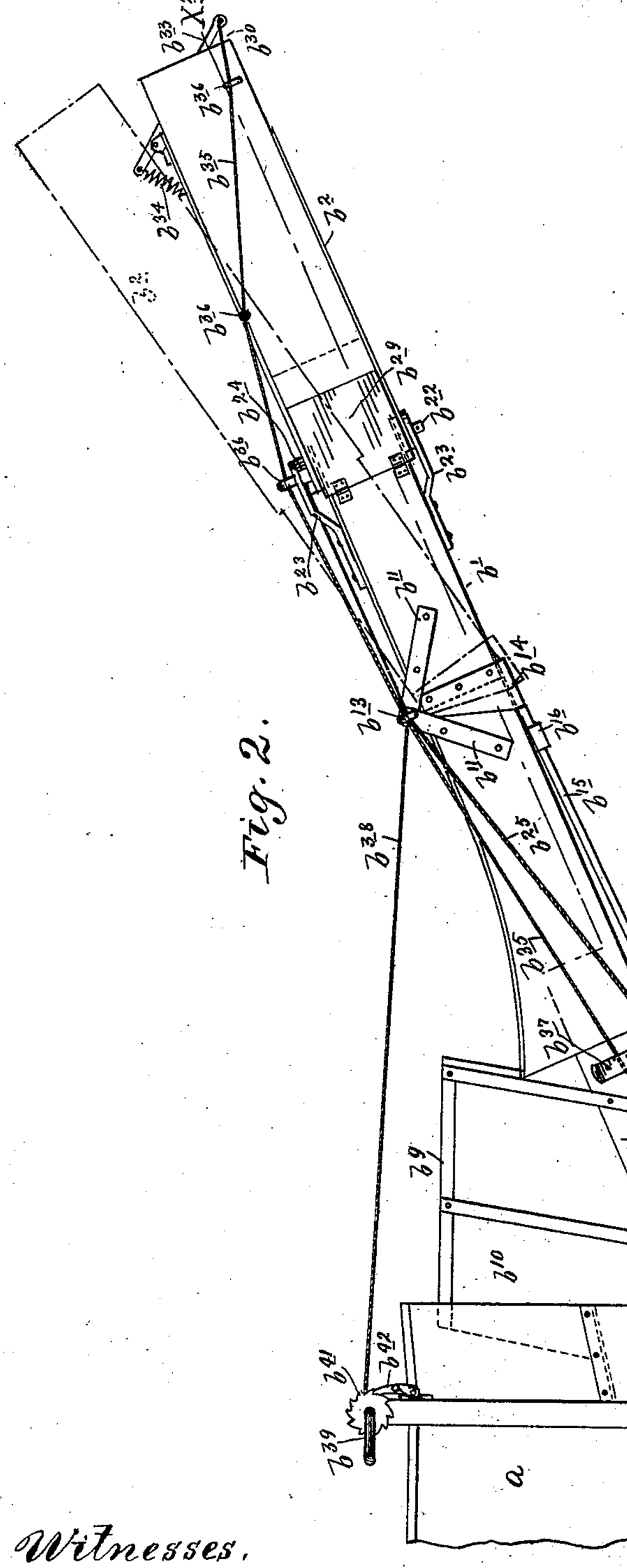

Fig. 2.

Witnesses.
A. H. Opsahl.
Frank D. Merchant.

Inventor.
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Jas. F. Williamson

(No Model.) 4 Sheets—Sheet 3.

G. ANDERSON.

PNEUMATIC STACKER.

No. 534,489. Patented Feb. 19, 1895.

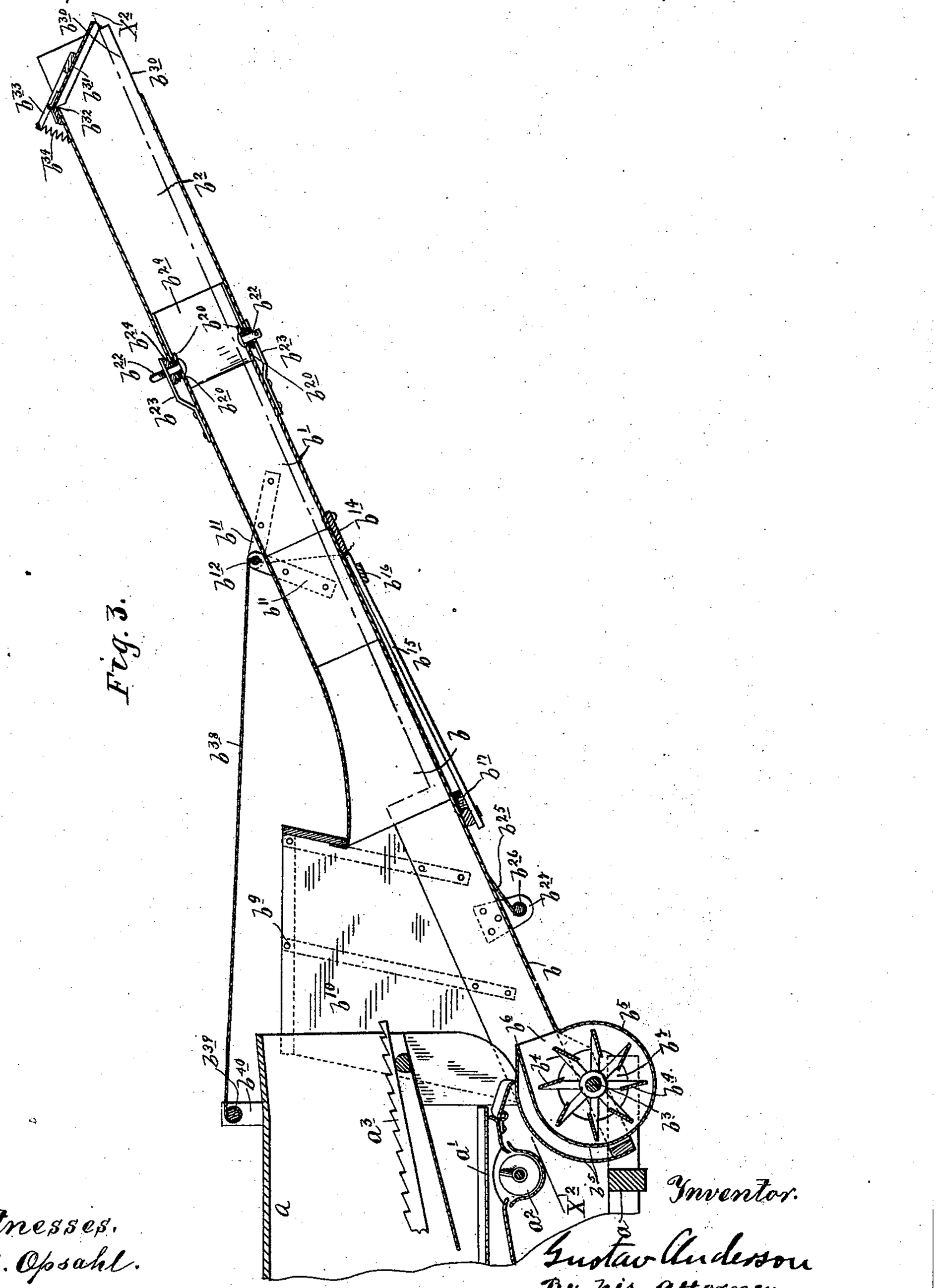

Fig. 3.

Witnesses.
A. H. Opsahl.
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(No Model.) 4 Sheets—Sheet 4.

G. ANDERSON.

PNEUMATIC STACKER.

No. 534,489. Patented Feb. 19, 1895.

Fig 4

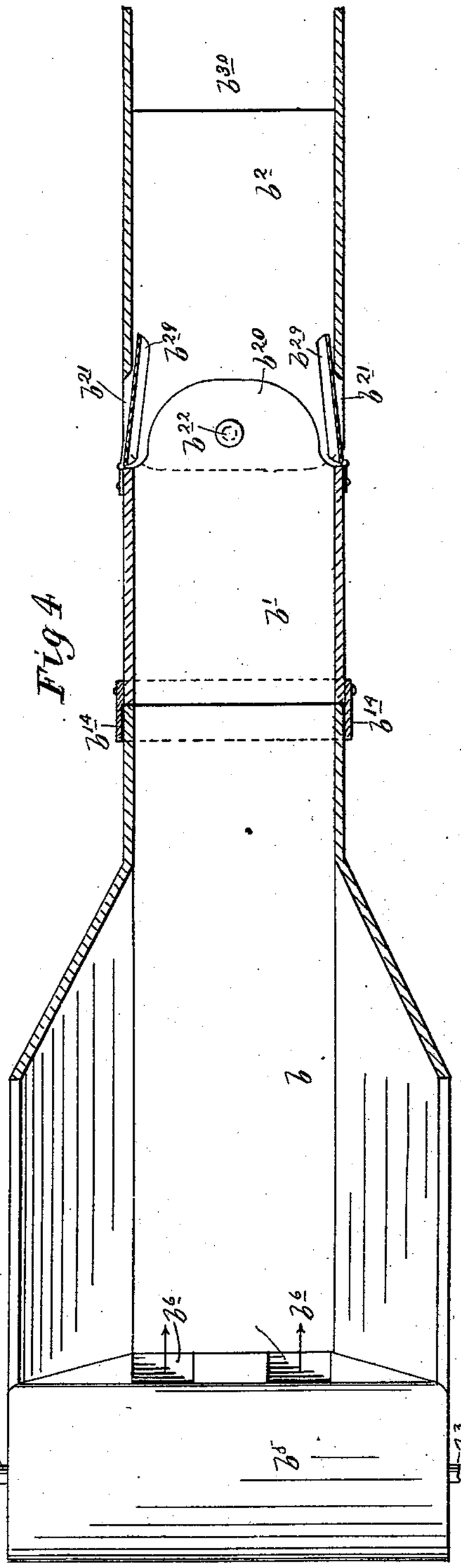
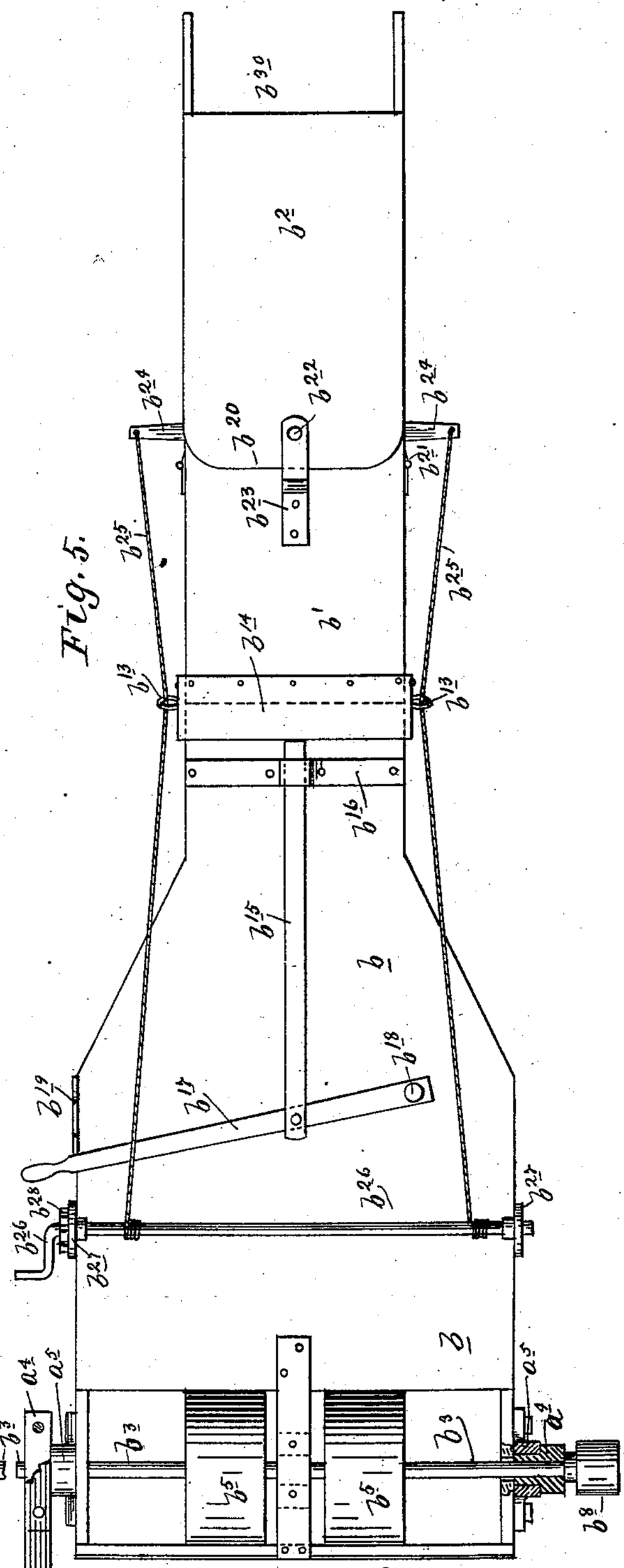


Fig. 5.



Witnesses
A. H. Opsahl.
Frank D Merchant

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Gustav Anderson
By his attorney Jas. F. Williams.

UNITED STATES PATENT OFFICE.

GUSTAV ANDERSON, OF WELLS, MINNESOTA, ASSIGNOR TO THE MINNEAPOLIS THRESHING MACHINE COMPANY, OF MINNESOTA.

PNEUMATIC STACKER.

SPECIFICATION forming part of Letters Patent No. 534,489, dated February 19, 1895.

Application filed February 26, 1894. Serial No. 501,491. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV ANDERSON, a citizen of the United States, residing at Wells, in the county of Faribault and State of Minnesota, have invented certain new and useful Improvements in Pneumatic Stackers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to pneumatic stackers, for co-operation with thrashing-machines; and has for its object to provide a pneumatic stacker, which shall be efficient for the purposes had in view, which shall be comparatively simple in construction and comparatively light in weight.

To these ends, my invention consists in the novel features hereinafter fully described and defined in the claims.

The accompanying drawings illustrate my invention, in which like letters referring to like parts,—Figure 1 is a plan view and Fig. 2 a right side elevation showing my improved stacker, as applied to an ordinary thrashing machine separator, with some parts broken away. Fig. 3 is a longitudinal vertical section, on the line X′ X′ of Fig. 1. Fig. 4 is a horizontal section, on the line X^2 X^2 of Figs. 2 and 3, with some parts removed; and Fig. 5 is a bottom plan or an underneath view of the stacker.

a represents a part of the thrashing machine separator frame; *a′*, one of the riddles; a^2, the tailings conveyer, and a^3 the straw-rack or delivery section of the straw-carrier, of an ordinary thrashing machine separator. In other words, the parts *a* *a′* a^2 a^3 are intended to represent the delivery end of any thrashing-machine.

b *b′* b^2 represent the trunk sections of the stacker; of which parts *b* is the lowermost or receiving section; *b′*, the central section, and b^2 the outermost or delivery section. The lower trunk section *b* is provided with a fan-shaft b^3, the ends of which are extended outward, and are journaled in trunnion bearings a^4, on the separator frame *a* which extend into bearings a^5 on the stacker section *b*. The said shaft b^3 and bearings a^4 form a pivotal center for the angular adjustment of the entire stacker, in the vertical plane. To the said shaft b^3 are fixed a pair of fans b^4, which revolve within suitable fan cases b^5, fixed to the trunk section *b*, with their discharge outlets b^6, on opposite sides of the transverse center of the said shaft and directly in line with the stacker-trunk. The fan-cases have their air inlets b^7 on the exterior of the stacker-trunk, so that the air is drawn from the external atmosphere and not from the interior of the thrashing machine. The shaft b^3 is provided with a suitable pulley b^8, for the application of power from some moving part of the thrashing machine.

In virtue of the fact, that the fan-shaft b^3, fans b^4 and cases b^5, are all carried by the receiving trunk-section *b*, it is obvious that the fan-cases will follow all the adjustments of the stacker. In other words, the discharge outlets b^6 of the fans, may be located, once for all, in the proper positions to produce the most effective line of blast, and this line will be preserved, as a constant quantity, in all the angular adjustments of the stacker. This is an important improvement in this class of stackers. Hitherto, as far as I am aware, the stacker-fan has been located in the separator, apart from the stacker; and hence, under the necessary adjustments of the stacker, the blast from the fan would strike the stacker trunk at different angles and have correspondingly different effects on the straw. The use of two fans, spaced apart from each other on opposite sides of the center of the stacker-trunk, is also an important improvement; in virtue of the fact, that the blast from the two fan-case outlets b^6 may be discharged on the lines of the greatest resistance to the straw; or, in other words, the blast may be made to travel close to the side walls of the trunk, thereby more effectively overcoming the friction from said side walls and tending to throw the straw toward the center line of the trunk. This can not be done with a single fan; as a single fan would require to be centrally located, with respect to the trunk, and the tendency of the blast therefrom would be to spread the straw sidewise against the side walls of the trunk, thereby increasing the friction, and the tendency to lodge the straw in the angles or corners of the trunk. In other words, the pair

of fans tend to produce the best clearance and carrying power of the blast; while a single fan, as demonstrated by experience, is liable to permit the trunk to become choked to a greater or less extent.

The fact that the supply of air for the fans is drawn from the exterior instead of from the interior of the machine, is also an advantage, in that all interference with the separator-fans from the stacker-fans, is thereby avoided.

The receiving trunk-section b underlies the delivery or tail-end of the separator, and at its lower or receiving portion is open at its top and provided with upwardly extending sidings, composed, as shown, of skeleton-frames b^9 and canvas curtains b^{10}, adapted to overlap the sidings of the separator frame. The open top, at the receiving portion of the trunk-section b, is an advantage, in that an outlet is thereby afforded, for the blast from the separator-fans directly into the open air, without passing through the stacker-trunk. The blast from the separator-fans is comparatively light, as compared with the blast from the stacker-fans, and, where the receiving trunk-section is entirely closed, may not be able to force its way through the trunk; and as a result thereof, the separator-fans would fail to produce their proper cleaning effect on the riddles. The opening at the top of the receiving trunk-section does not interfere with the proper action of the stacker-fans, as the blast is so strong, it will be carried, at once, into the closed part of the trunk. This effect is further insured by setting the fan outlets b^6 in such position that the blast therefrom will, under the action of the fans b^4, be thrown into the trunk at a slight downward dip or angle.

The central trunk-section b' is pivotally connected to the top of the receiving section b by angularly placed strap-irons b^{11} secured to the sides of said section and a transverse hinge-rod b^{12}, connecting the said straps at their angular junctions. To the sides and bottom of the trunk-section b' is secured a joint box b^{14}, which telescopes with the bottom and sides of the trunk section b, and serves to maintain a sufficiently close (though not air-tight) joint between the said sections b and b', under the angular adjustment of the section b' in the vertical plane, within the limited range required in working positions of the stacker. The section b' and the delivery section b^2, carried thereby, is angularly adjusted for working positions, by a push-bar b^{15}, which bears against the lower edge of the joint-box b^{14}, as shown in Fig. 5. The upper end of the push-bar b^{15} is held and guided by a keeper b^{16} and the lower end of the same is attached to a hand-lever b^{17}, pivoted as shown at b^{18} and securable in any set position by a lock-plate b^{19}. It is obvious that by manipulating the hand-lever b^{17}, the trunk-sections b' and b^2 may be adjusted as desired, with respect to the section b in the vertical plane.

The uppermost or delivery trunk-section b^2 is so connected to the section b', that it is capable of sidewise or lateral angular motion thereon, while at the same time, it is rigid with the section b', in respect to angular adjustment in the vertical plane. For these purposes, the bottom and top walls of the said sections b' and b^2 over and underlap with each other, as shown at b^{20}, in Figs. 2 and 3; are cut away at their sides, as shown at b^{21}, in Figs. 4 and 5; and are connected by vertical pivot bolts b^{22}, extending through the said overlapping parts of the top and bottom walls and reinforcing strap-irons b^{23}, fixed to the section b'. The upper pivot bolt b^{22} also extends through a transverse lever b^{24}, rigidly secured to the top of the section b^2. The ends of said lever b^{24} extend outward beyond the sides of the trunk and are connected by ropes or other flexible connections b^{25}, with a windlass b^{26}, secured to the bottom of the lower trunk-section b, in bearings b^{27} fixed thereto. The said ropes b^{25} pass through the eyes b^{13} in the hinge-rod b^{12} and are so attached to the windlass b^{26} that they wind up or unwind in opposite direction. In other words, one of the said ropes b^{25} will be wound up and the other unwound by turning the windlass b^{26}; and hence, it is obvious that the trunk-section b^2 may be swung laterally in either direction on the trunk-section b', by turning the said windlass b^{26} in one or the other direction. The windlass b^{26} carries a square notched lock-disk b^{28}, with which engages a gravity pawl $b^{28\frac{1}{2}}$ to hold the same and the trunk-section b^2 wherever set. The fact that the side walls of the section b^2 are cut away, as shown at b^{21}, permits the angular lateral adjustment of the said section b^2 on the section b'; and the joints between the sides of the two sections are sufficiently closed by joint plates b^{29}, pivoted to the side walls of the section b', and projecting with their upper or free ends inside of the section b^2. Under the action of the blast from the stacker-fan, these joint-plates b^{29} will be thrown outward, so as to close the openings b^{21} and maintain the joint sufficiently tight, at the sides, for all practical purposes. This joint, however, between the sections b' and b^2 is not air-tight. The joints at the top and bottom are maintained sufficiently tight, by the over and underlapping parts of the top and bottom walls of said sections, shown at b^{20}.

The bottom of the uppermost or delivery trunk-section is cut away, as shown at b^{30} and between the side-walls of said section, near its upper end, directly over the opening b^{30} is mounted a gate b^{31} pivoted to the top wall of said section, as shown at b^{32}. To this gate b^{31} is attached a diagonal lever b^{33}, the ends of which project at each end beyond the gate. This lever b^{33} is subject, at its upper end, to a spring b^{34}, or equivalent device, tend-

ing to throw the gate into its uppermost or open position; and, at its lower end, has attached thereto a rope b^{35} or other flexible connection, which passes through suitable guiding eyes b^{36} on the trunk-section b^2, and thence to a spring-clamp b^{37} on the trunk-section b. Under the co-operation of the spring b^{34} and the rope b^{35}, the gate b^{31} may be set and held in any desired position for co-operation with the opening b^{30}, to afford a discharge outlet of the desired size from the upper end of the trunk-section b^2. The fact that this tate b^{31} is set on an angle causes the same to deflect the straw downward as delivered from the stacker. The fact that it is pivoted between the side-walls of the trunk-section, enables the gate to be made light and affords a continuation of the trunk-section when raised into its more open position. This arrangement of the delivery gate is much better in every way, than to employ a box-gate, as has hitherto been done.

From the hinge-rod b^{12} extend stay-ropes b^{38}, or other flexible connections, to a windlass b^{39}, journaled in suitable bearings b^{40}, on the top of the separator-frame a. This windlass is provided with a ratchet lock-disk b^{41}, engaged by a pawl b^{42}, for holding the same wherever set. As the delivery section b^2 is rigid with the central section b', in respect to vertical adjustment, and as the central section b' is hinged at its top to the lowermost or receiving section b, it is obvious that with the windlass b^{39} and ropes b^{38}, the stacker as an entirety may be raised or lowered on its pivotal bearings a^4 b^3 to any desired angular adjustment in the vertical plane, with respect to the separator.

When out of use or when moving from place to place on the road, the stacker will be raised to its highest position by the windlass b^{39} and the trunk-section b' b^2 be turned inward on the hinge-bolt b^{12}, so as to fold back on the trunk-section b and the top of the separator.

All the parts of my improved stacker, have now been specified; and the operation is probably clear from the detailed description of the parts. The straw and chaff delivered from the separator are received at the open part of the trunk-section b, and, under the action of the blast from the stacker-fans b^4, will be carried out through the stacker-trunk and be delivered, in any direction or elevation desired, from the upper end of the same. The stacker as an entirety will be adjusted from time to time, and the sections b' and b^2 on the section b in the vertical plane, when necessary or desirable to bring the upper end of the stacker trunk to the proper level; and the delivery section b^2 will be adjusted sidewise on the section b', more frequently, in order to spread the straw as may be desired on the stack.

From the description given, it is obvious that all the parts of my pneumatic stacker may be of a simple and cheap construction, as no attempt is made to maintain air-tight joints. The stacker trunk is preferably made with side walls of wood veneers and top and bottom walls of tin or other thin sheet metal. It is therefore, comparatively light; and in virtue of the way in which it is applied and supported from the separator, the tilting strain on the separator from the weight of the stacker is reduced to the minimum.

The points of advantage in respect to efficiency in work, have been already noted in the detailed description.

By actual usage, during the past season, I have demonstrated the practicable and serviceable character of this form of pneumatic stacker.

It will be understood that changes might be made, in the details of the construction, without departing from the principle of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a pneumatic stacker, the combination with the trunk section b of the trunk section b' pivoted to the section b, for angular adjustment in the vertical plane, the joint-box b^{14} and the push-bar b^{15}, lever b^{17} and a locking device b^{19}, for adjusting said section b', substantially as described.

2. The combination with the trunk section b^2 having the bottom opening b^{30}, of the outlet gate b^{31} pivoted to the top and working between the side walls thereof, the lever b^{33} and the spring b^{34}, the flexible connection b^{35}, all operating substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GUSTAV ANDERSON.

Witnesses:
EMMA F. ELMORE,
JAS. F. WILLIAMSON.