No. 735,983. PATENTED AUG. 11, 1903.

E. A. JOHNSTON.

HEADER.

APPLICATION FILED SEPT. 20, 1901.

NO MODEL. 6 SHEETS—SHEET 1.

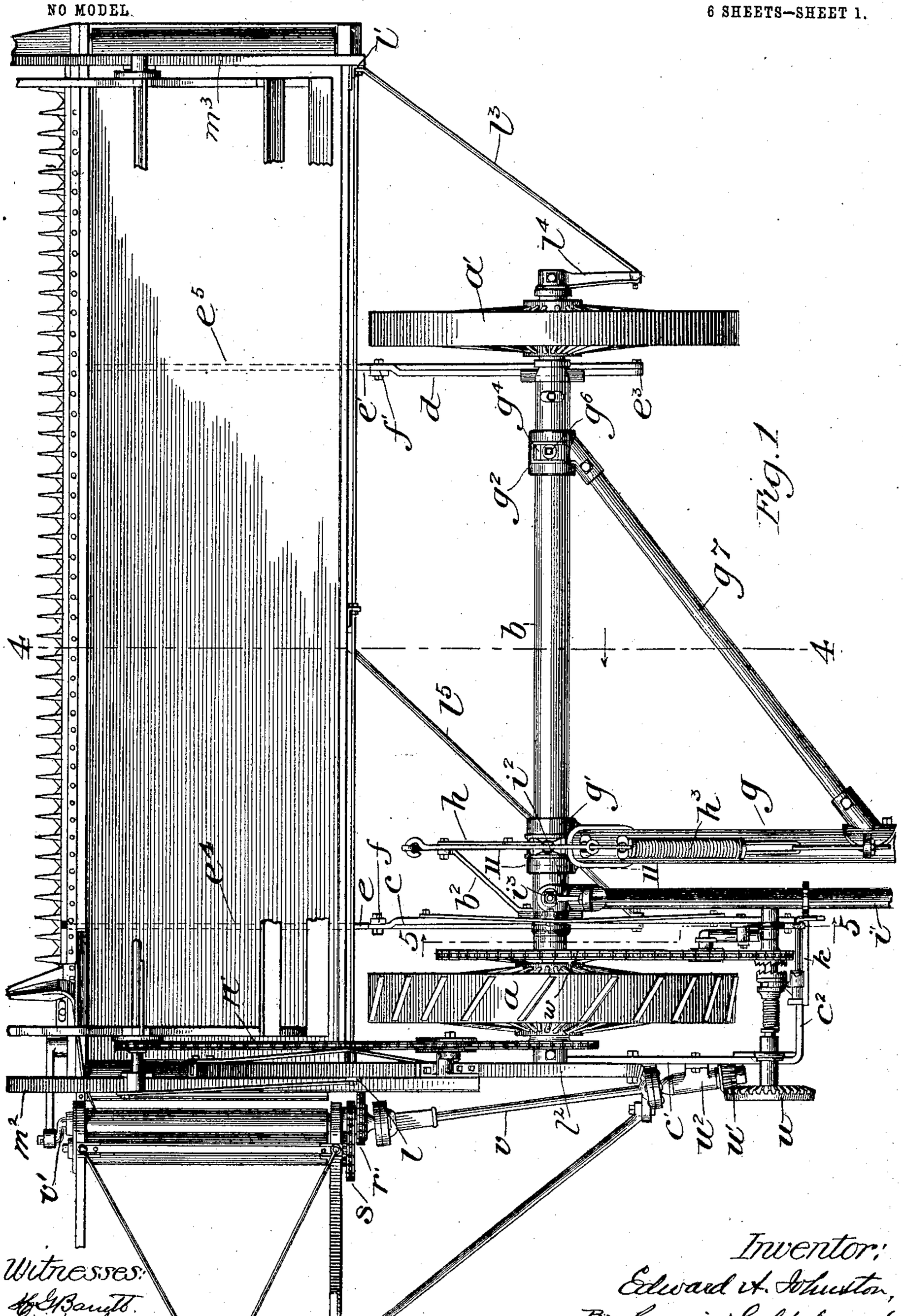

Fig. 1.

Witnesses:
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J. E. Hutchinson Jr.

Inventor:
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By Lennie Goldsborough,
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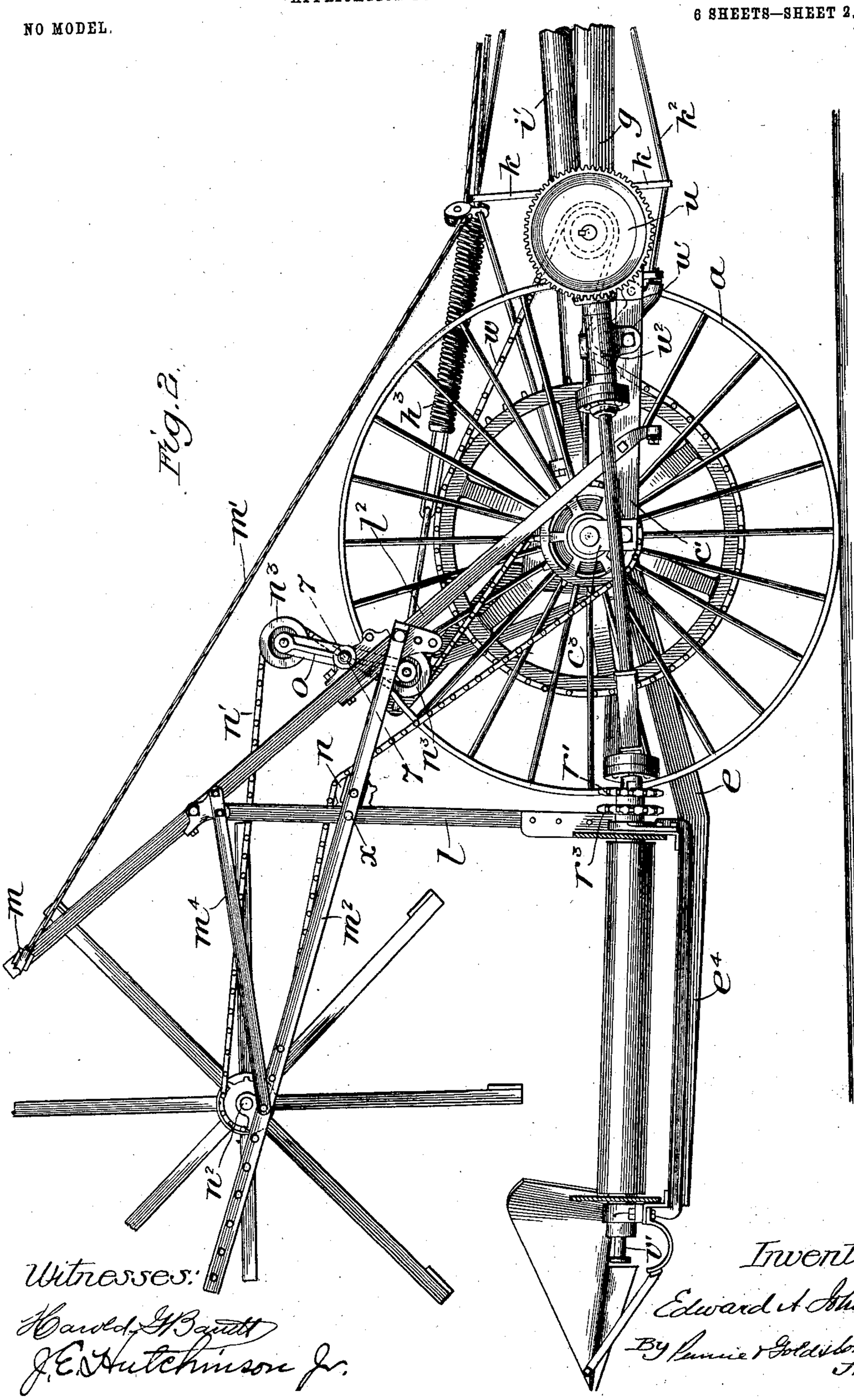
NO MODEL. 6 SHEETS—SHEET 2.

Fig. 2.



Witnesses:

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 6 SHEETS—SHEET 3.

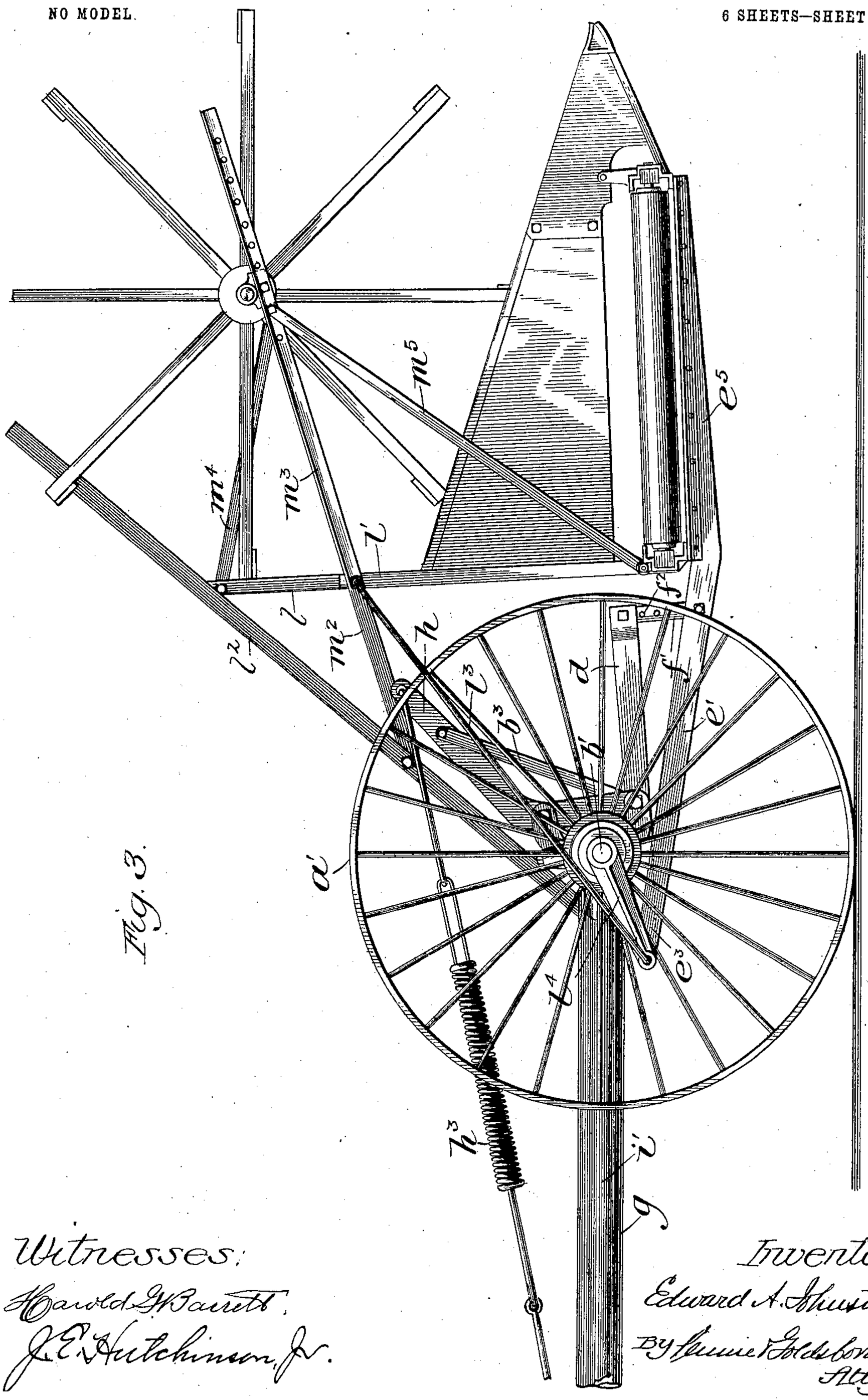

Fig. 3.

Witnesses:
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HEADER.

APPLICATION FILED SEPT. 20, 1901.

NO MODEL. 6 SHEETS—SHEET 4.

Fig. 4.

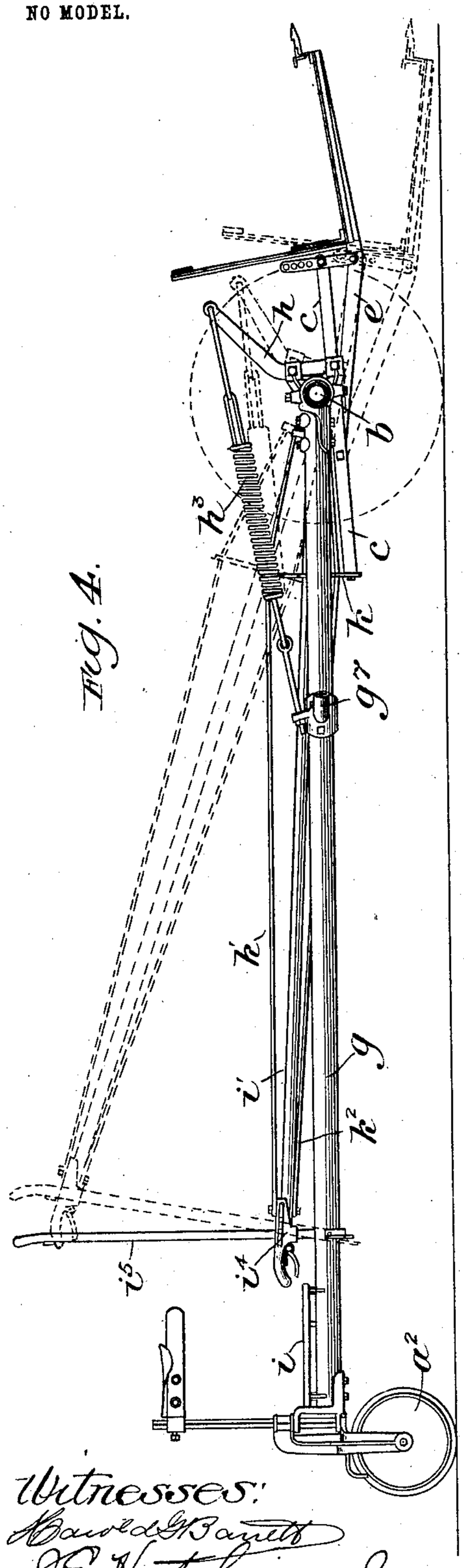


Fig. 7.

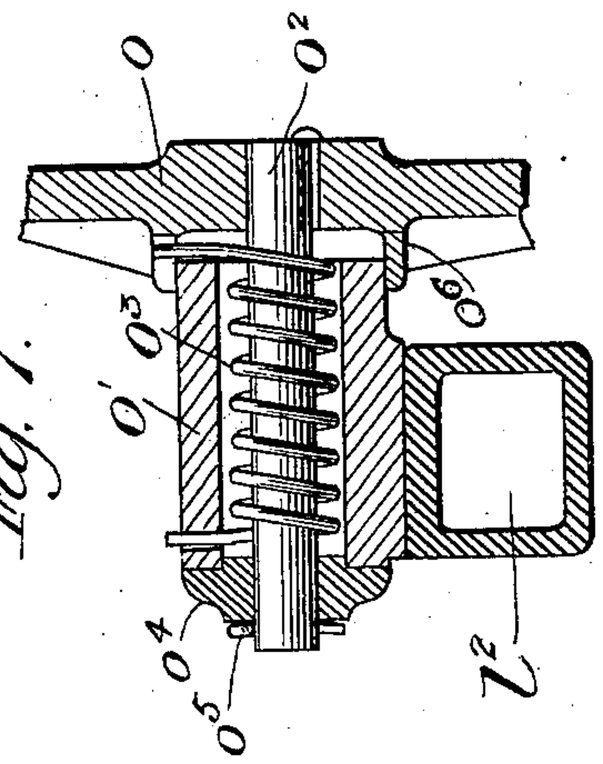
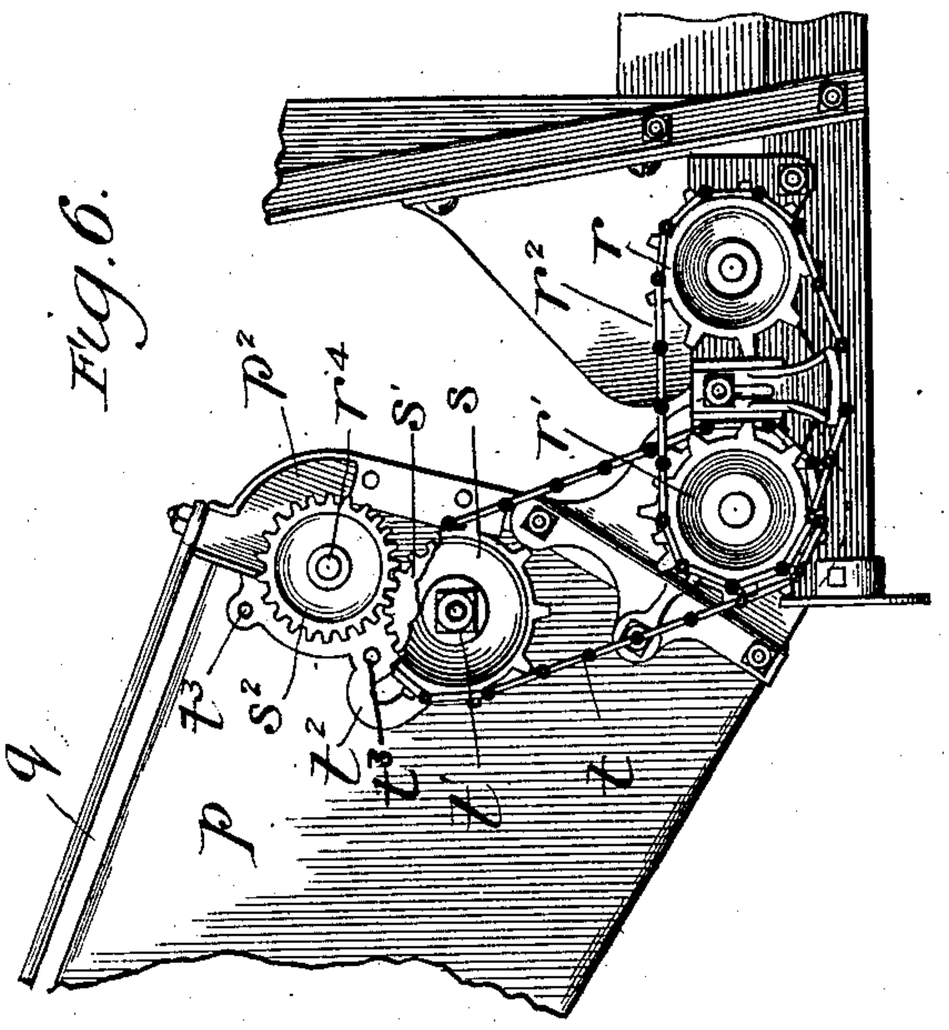


Fig. 6.



Witnesses:
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No. 735,983. PATENTED AUG. 11, 1903.

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HEADER.

APPLICATION FILED SEPT. 20, 1901.

NO MODEL. 6 SHEETS—SHEET 5.

Fig. 5.

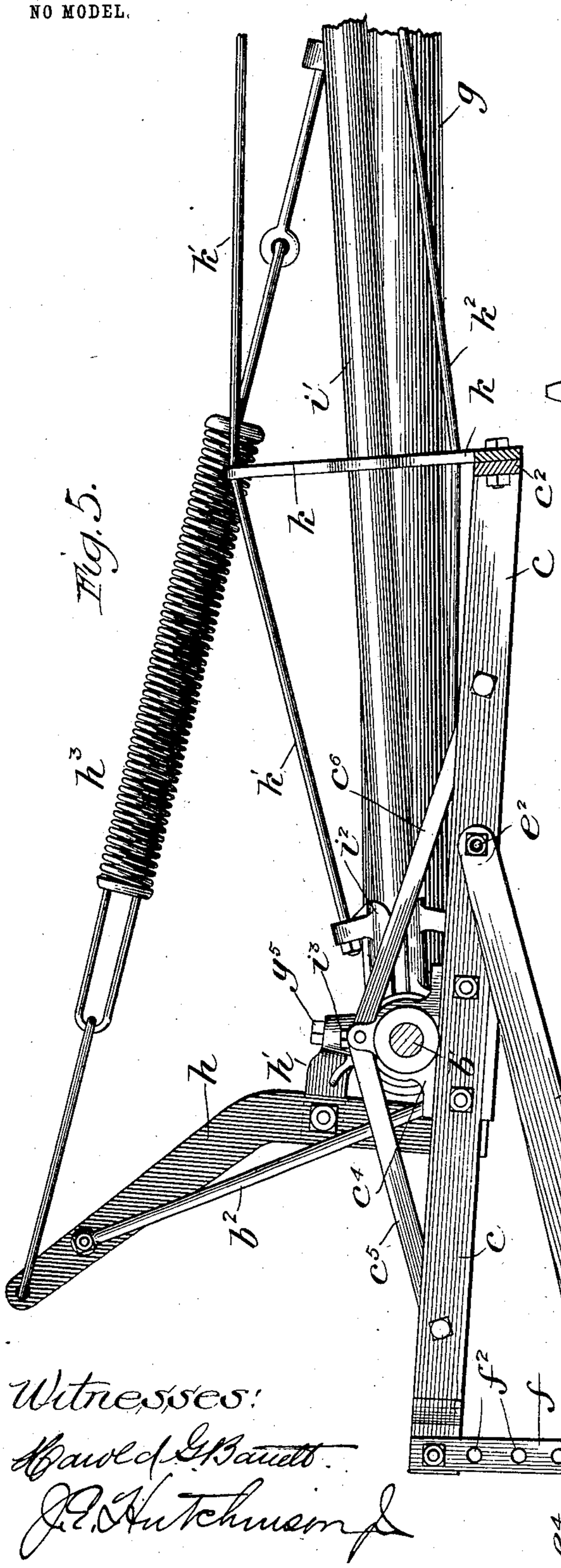


Fig. 12.

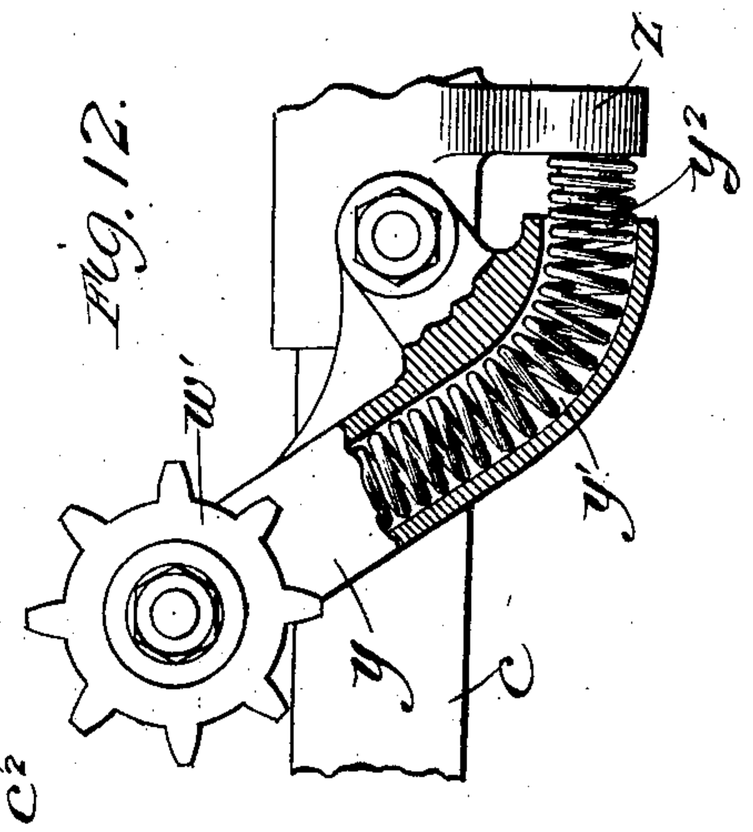
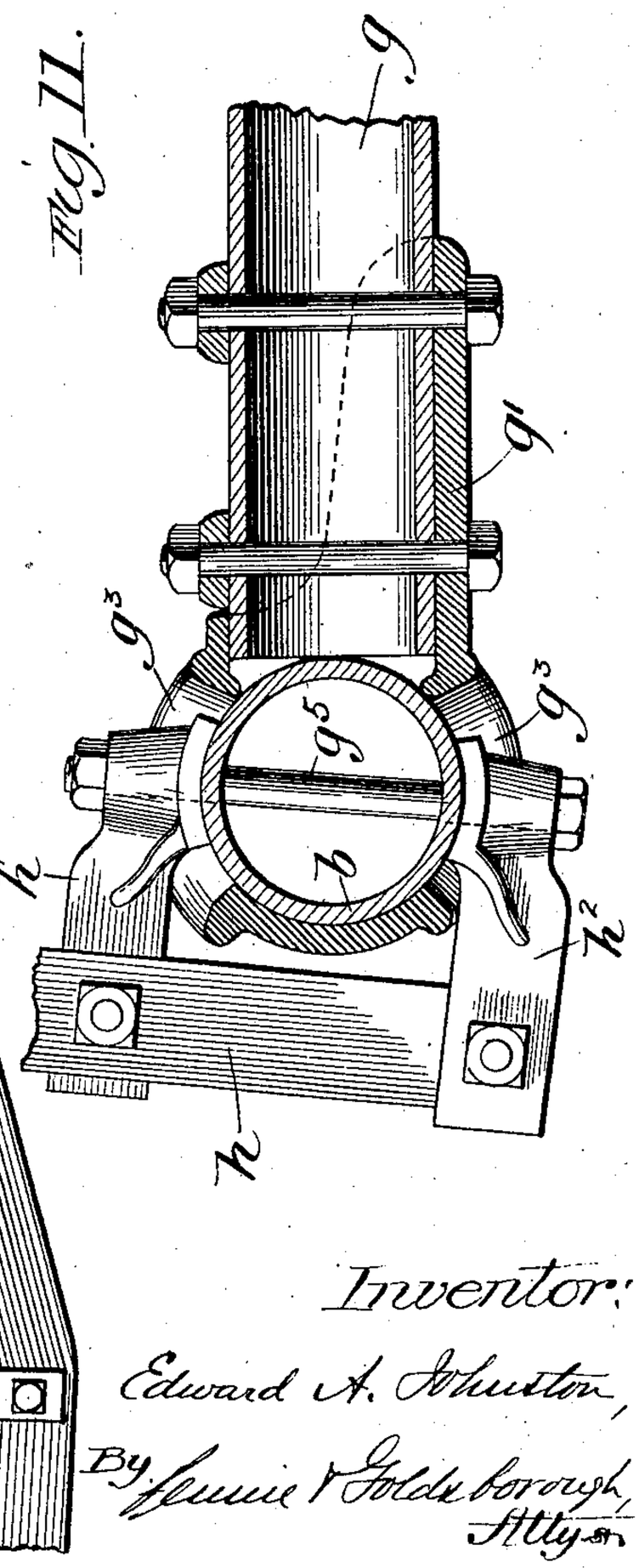


Fig. 11.



Witnesses:

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No. 735,983. PATENTED AUG. 11, 1903.

E. A. JOHNSTON.

HEADER.

APPLICATION FILED SEPT. 20, 1901.

NO MODEL. 6 SHEETS—SHEET 6.

Fig. 8.

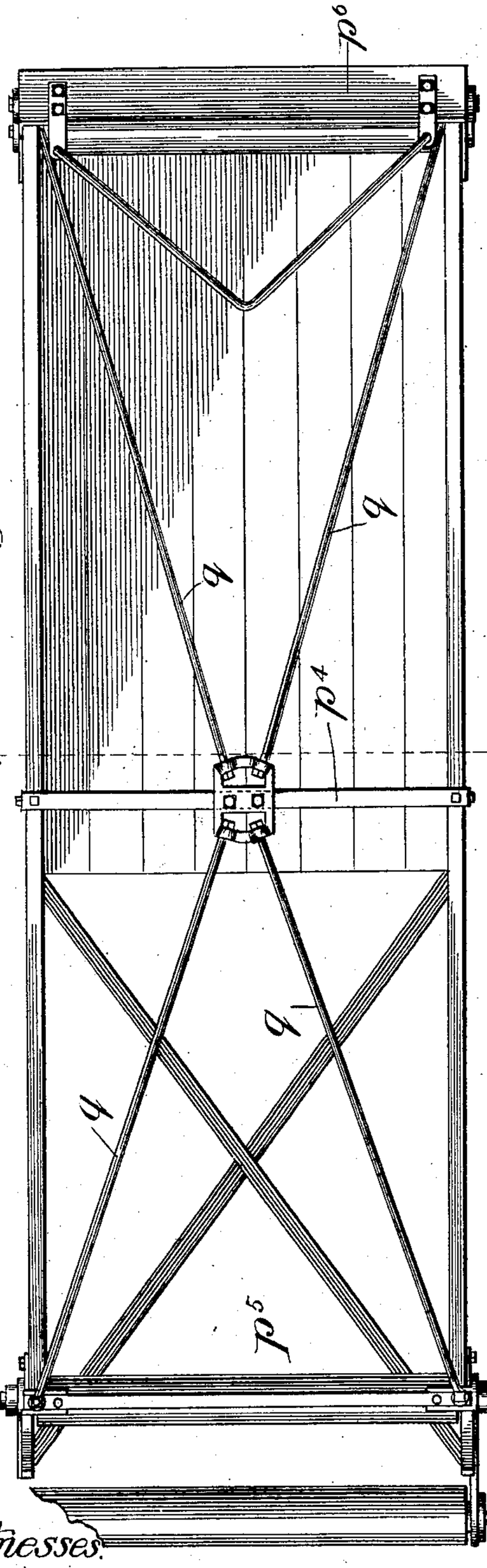


Fig. 9.

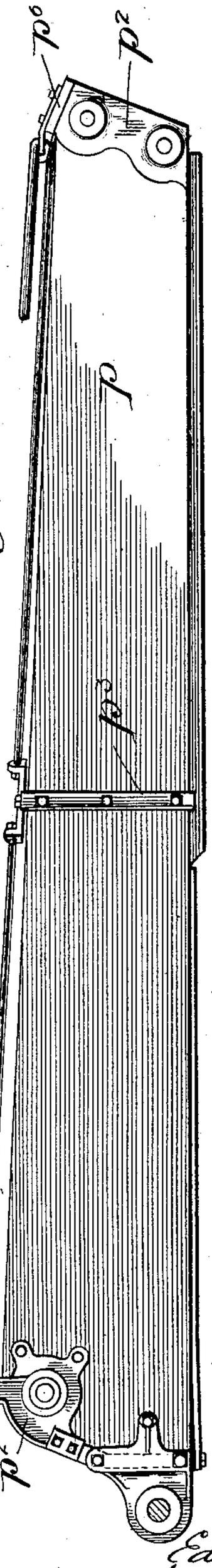
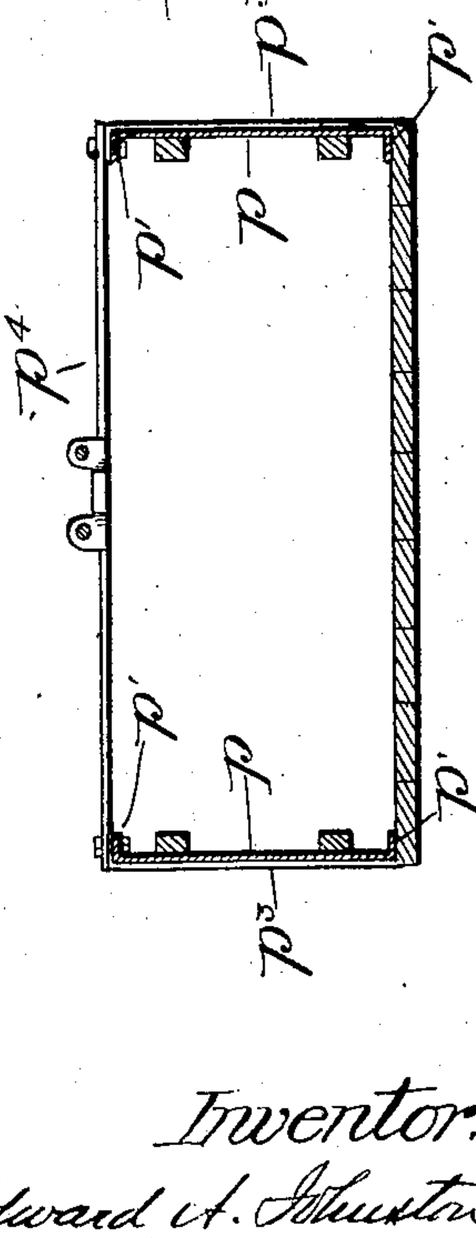


Fig. 10.



Witnesses:
Harold G. Bamford.
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Attys.

No. 735,983. Patented August 11, 1903.

UNITED STATES PATENT OFFICE.

EDWARD A. JOHNSTON, OF CHICAGO, ILLINOIS, ASSIGNOR TO McCORMICK HARVESTING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

HEADER.

SPECIFICATION forming part of Letters Patent No. 735,983, dated August 11, 1903.

Application filed September 20, 1901. Serial No. 75,683. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. JOHNSTON, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Headers; 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.

The invention relates more particularly to a type of machine known as "headers," where the cutting apparatus is set high up above the ground, so as to sever the straws only a short distance below the heads, and the machine is pushed forward through the standing grain by the team being hitched to a tongue projecting rearward from the axle of the wheels on which the machine is supported.

The invention consists in particular improvements in various parts of the machine, the object aimed at being to lighten the weight of the structure without impairing its rigidity and strength and generally to improve the construction, so as to enhance the ease and efficiency of operation, as well as to produce a machine of comparatively light draft and that may be easily handled and adjusted by the driver.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of the entire machine except parts of the tongue and elevator. Fig. 2 is a side elevation taken from the stubble end of the platform. Fig. 3 is a similar view from the grain-wheel side. Fig. 4 is a verticle fore-and-aft section on the line 4 4, Fig. 1, looking in the direction of the arrow. Fig. 5 is a similar section on the line 5 5, Fig. 1, looking in the opposite direction. Fig. 6 is a detail of the gearing for driving the elevator-aprons. Fig. 7 is a sectional detail of the tightener for the reel-chain, taken on the line 7 7, Fig. 2. Figs. 8 and 9 are plan and side views of the elevator; and Fig. 10 is a cross-section of the same on the line 10 10, Fig. 8, looking in the direction of the arrow. Fig. 11 is a sectional detail of the tongue-tube on the line 11 11, Fig. 1, showing the manner of connecting it to the axle of the supporting-wheels; and Fig. 12 is a similar detail of the take-up arm for the main drive-chain.

The general organization of the manhine is similar to many that are now well known, and no more particular description of the machine will therefore be required than is necessary to set out the construction and operation of the parts to which the invention more especially relates.

The supporting-wheels a a' are mounted at opposite extremities of a tubular through-axle b, having solid ends where the wheels are journaled, as indicated at b' in Figs. 3 and 5. Of these wheels a is the drive-wheel and a' the grain-wheel. The former is inclosed in a rectangular frame consisting of fore-and-aft side bars c c', that are connected together by a cross-bar c^2 at the rear, making a sort of U-shaped frame, that is closed at the rear and open at the front. Both these side bars are rigidly connected to the axle by brackets c^3 c^4 or otherwise. The outer one, c', does not extend forward beyond the axle; but the inner one, c, is continued under and in front of the axle, as indicated in Figs. 1 and 5, and is braced by struts c^5 c^6 to the top of the axle. The grain-wheel has no inclosing frame; but on its inner side there is rigidly secured to and underlying the axle a bar d, which extends from a point in rear of the axle to a point in front of the same on a line with the front end of the inner side bar c of the drive-wheel frame. From these two bars c d the entire framework of the harvester is supported through the intermediacy of supporting-bars e e', that are bolted to the bars c d, respectively, at e^2 and e^3 and extend downward slightly, so as to bring the platform a little below the level of the axle and then extend forward horizontally under the platform, as shown in full lines at e^4 e^5, Figs. 2 and 3, and in dotted lines in Fig. 1. At the front ends of the bars c d down-hangers f f' are provided to support the bars e e' at points intermediate of their length, and these hangers are advisedly provided with holes f^2 to permit of the vertical adjustment of the bars that support the platform, so as to set the latter higher or lower with respect to the bars c d.

The framework of the machine being sup-

ported as above described, it will be understood that in order to tilt the machine the axle must be rocked in the hubs of the supporting-wheels. To permit this, the tongue is connected to the axle in a peculiar manner, which will now be described.

As illustrated in the drawings, especially in Fig. 11, this tongue is a stout metal tube g. It is supported at its rear end on the truck of a steering-caster a^2 and at its forward end is rigidly secured to a socket-casting g', which is sleeved upon and around the axle near the drive-wheel, so that the axle may have a limited rocking movement in the socket. At a point near the grain-wheel there is a socket-casting g^2, similar in all respects to the one just described, and rearward from this casting g^2 a tubular tongue-brace g^7 extends diagonally and is united to the tongue at a point sufficiently in rear of the machine to insure the requisite bracing effect. The socket-castings g' g^2 are short sections of tubing that are large enough to turn freely on the axle, and they are provided with slots g^3 g^4, extending diametrically through them, into which slots pass through-bolts g^5 g^6, that go clear through the axle and hold the sockets against longitudinal movement thereon. By means of these sleeve-like sockets the tongue and its brace are securely connected at their front ends to the axle, so as to permit the machine to be easily driven and guided, and so, also, as to allow the same to be tilted for the purpose of altering the height of cut.

The platform and elevator are of course very heavy, and it is desirable to provide means to assist the driver in tilting them. I therefore bolt a gooseneck or standard h to the axle by means of forwardly-extending clips h' h^2, that are rigidly secured, respectively, to the upper and lower sides of the axle by the through-bolt g^5, which holds the sleeve-casting g' against lateral movement. This standard projects slightly forward and extends sufficiently above the axle to secure the necessary leverage thereon, and to its upper end is secured a stout spring h^3, that extends downwardly and back along the tongue to a point about where the diagonal brace g^7 joins it, where it is adjustably made fast in any suitable manner. The tension of this spring constantly pulling between the upper end of the standard h and the tongue counterbalances the weight of the main frame and other parts in front of the axle and greatly assists the driver in raising and lowering the cutters. As there is considerable strain on the standard h, I brace it laterally by braces b^2 b^3.

The driver stands or rides on a platform i at the rear end of the tongue and controls the machine by means of a long tubular hand-lever i', which is rigidly connected at its forward end to a joint-casting i^2, that is bolted to the axle by the through-bolt i^3, so that as the lever is raised and lowered by the driver the axle is rocked in the hubs of the wheels. At its rear end the hand-lever is provided with a thumb-latch i^4, that is adapted to take into notches on a locking-bar i^5, so that the lever may be set at any desired adjustment. The forward end of the hand-lever is also connected to the rear end of the U-shaped frame that surrounds the main drive-wheel in order to secure the necessary leverage on the platform-frame and the parts to be tilted. This connection is preferably made by a standard or brace k, that is bolted to the cross-bar c^2 of the drive-wheel frame and extends upwardly, as best shown in Fig. 5. The hand-lever passes through this standard about midway of its length, and for the purpose of bracing the lever, and thereby allowing the use of a smaller lighter tube, I provide struts or straining-rods k' k^2, which extend along the lever on its upper and lower sides from the joint-casting i^2 at its front end to the extreme rear end, passing through holes in the upper and lower ends of the standard k, so as to spraddle the rods apart sufficiently to give the lever the necessary rigidity.

The construction of the grain-platform of itself forms no part of the present invention; but the manner of bracing it is believed to be novel. Rising from the rear corners of this platform are posts or light standards l l', the former being at the elevator end of the platform and the latter at the grain end. These posts or standards are braced by means of upwardly and forwardly extending braces l^2 l^3, the latter rising diagonally from an arm l^4, projecting rearward from the grain end of the main axle. The brace l^2 is bolted at its lower end to the stubbleward side bar c' of the drive-wheel frame, and at a point on the opposite side bar of the same frame, in line with the points of connection of the other braces, is a third diagonal brace l^5, that extends horizontally grainward and is connected to the platform-frame about midway of its length. The brace l^2 carries at its upper end the sheave or roller m, over which runs the rope m', that supports and adjusts the elevator. It is to be noted of this construction that the points of connection of the braces, and particularly the one that braces the elevator, are all in line with the points e^2 e^3 of connection of the bars that support the platform. This allows the whole machine to be tilted without twisting or straining any of the parts and without throwing the elevator out of line. It also dispenses with the necessity of adjustments for the purpose of lining up the braces and other parts.

The reel is supported by arms m^2 m^3, that are pivoted to the posts l l', respectively, and are upheld at their outer ends by struts or braces m^4 m^5, the latter rising from the rear outer corner of the grain-platform and the former extending downward from the point where the brace l^2 joins the post l. The arm m^2, which carries the inner end of the reel, is pivoted to the post l at the point x and carries in rear of this point, and of course eccentric thereto, an idler n, over which runs the

chain n', by means of which the reel is driven. The arm m^2 is also extended rearward from this point and made fast to the diagonal brace l^2. It will be understood that all these arms and braces that uphold and support the reel are adjustable for the purpose of raising and lowering the reel and also to compensate for sagging. These adjustments require corresponding variations in the length of the reel-drive chain, and it is well understood that the tilting of the frame necessitates some provision for keeping the chain taut as the relation of the parts changes. The reel-chain n' is driven by a sprocket on the stubbleward end of the hub of the drive-wheel. On its way to the sprocket on the reel-shaft n^2 it passes over a tightener of novel construction, consisting of a pair of idle pulleys n^3 n^3, journaled at opposite ends of an arm o, that is pivoted midway of its length in a bearing-box o', that is bolted to the brace l^2, as best shown in Figs. 2 and 7. The arm o has a stud or pin o^2 projecting from its hub, which passes into the box, and a spring o^3 is coiled around the pin and is connected at one end to the box and at the other to the hub of the arm carrying the idlers. The spring reacting between the arm and its bearing tends constantly to take up slack in the chain n'.

The construction of the elevator forms one of the features of my invention. As shown in Figs. 8 to 10, the sides are made of thin sheet-steel p, having flanged or turned-over edges p'. At opposite ends there are castings p^2, in which are the bearings for the elevator-rollers. Midway of its length the elevator sides are strengthened by straps p^3, and a brace p^4 extends over at this point to keep the sides from spreading. At the foot of the elevator there is a similar cross-piece p^5, and at the upper end there is a board p^6, which ties the bearings for the rollers together at this point. Extending diagonally to the four corners of the elevator from the cross-piece p^4 are four braces or tie-rods q, that are adjustable for the purpose of squaring up the sides and ends of the structure.

Referring now to Fig. 6, r denotes a sprocket-wheel on the rear end of the platform-roller at the elevator side of the machine, and r' is a similar sprocket on the rear end of the lowermost roller of the elevator that is connected to the sprocket r by means of a chain r^2. Inside of the sprocket r' there is another similar sprocket r^3 on the shaft of the elevator-roller, and from this sprocket the roller r^4 of the upper canvas of the elevator is driven. It is necessary, however, to change the motion of these rollers, and in order to effect this I interpose an intermediate sprocket s, that has on its inner side a spur-gear s', which meshes with the gear s^2 on the roller-shaft r^4. The sprocket s is driven by a chain t from the sprocket r^3 on the lowermost roller of the elevator and is journaled on a stud t', which projects from a plate or casting t^2, that is pivoted on the axis of the roller r^4. The chain may therefore be tightened when desired by adjusting the plate t^2 and sprocket s around the roller r^4, the adjustment being made by turning the plate so as to change the bolt-holes t^3 to other positions where they may have bolts or screws passed through them and into new holes or places in the sides p of the elevator.

The power to drive all the operative parts of the machine is taken, as usual, from the drive-wheel. In Figs. 1 and 2, u denotes a bevel-gear on the counter-shaft, and u' a miter-pinion engaging therewith. This pinion is on the rear end of a short shaft journaled in a box u^2, that is secured to the outer bar c' of the drive-wheel frame with a slight inclination stubbleward. A tumbling-shaft v is connected at its rear end to this short shaft, and its forward end connects to the shaft of the roller r' of the elevator, the elevator, therefore, being driven entirely and solely by this single shaft. At its forward end the shaft of the roller r' is provided with a crank v', and the pitman which drives the cutter is connected to this crank. Thus the cutter-bar and the canvas are driven from the lower roller of the elevator, and all the power is transmitted from the counter-shaft by a single tumbling-shaft.

The counter-shaft itself is driven from the main wheel by means of the chain w, as usual. I provide a tightener for the under ply of this chain, consisting of an idle sprocket w', mounted on a stud in the end of an arm y. This arm is pivoted to the inner side bar c of the drive-wheel frame and is cored out or otherwise provided with an open-ended recess y', in which is housed a coiled spring y^2. The arm y is pivoted near a lug z on the side bar c, and a teat on the lug enters the open end of the spring, as shown in Fig. 12, and keeps the sprocket w' constantly pressed upward against the chain w, thereby keeping it taut.

Having thus described my invention, what I claim is—

1. The combination of the supporting-wheels, the axle, the steering-wheel, the main frame secured to the axle, the tongue having a pivotal connection with the axle at its front end and supported at its rear end by the steering-wheel, and a tilting-lever rigidly connected to the axle and extending rearward along the tongue, whereby the frame may be tilted by rocking the axle in the supporting-wheels.

2. The combination of the supporting-wheels, the axle, the steering-wheel, the main frame secured to the axle, the tongue having a pivotal connection with the axle at its front end, and supported at its rear end by the steering-wheel, a tilting-lever rigidly connected to the axle and extending rearward along the tongue, and a spring for counterbalancing the weight of the main frame.

3. The combination of the supporting-wheels, the axle, the steering-wheel, the main frame secured to the axle, the tongue having

a pivotal connection with the axle at its front end, and supported at its rear end by the steering-wheel, a brace extending forward and outward from the tongue and also having a pivotal connection with the axle, and a tilting-lever rigidly connected to the axle on the opposite side of the tongue from the brace and extending rearward along the tongue.

4. The combination of the supporting-wheels, the axle, free to rock therein, brackets c^3, c^4, rigidly secured to the axle, fore and aft bars c, d, secured to the brackets and extending in front and rear of the axle on the under side, frame-supporting bars secured at their rear ends to the fore and aft bars behind the axle, and extending forward under the supporting and main frame, and struts c^5, c^6, connecting the fore and aft bars to the brackets above the axle.

5. The combination of the supporting-wheels, the axle free to rock therein, fore and aft bars c, d, rigidly secured to the axle and extending in front and rear thereof, frame-supporting bars e, e', secured to the fore and aft bars behind the axle and extending forward of the same under the main frame, and hangers connecting the bars e, e' with the fore and aft bars in front of the axle, said hangers being adjustable to vary the tilt of the frame-supporting bars.

6. The combination of the supporting-wheels, the axle free to rock therein, fore and aft bars c, d, rigidly secured to the axle and extending in front and rear thereof, frame-supporting bars e, e', secured to the fore and aft bars in front and rear of the axle, the main frame, the bar c' on the outer side of the drive-wheel, the arm l^4 on the axle outside the grain-wheel, and the braces l^2, l^3, extending upwardly from the bar c' and arm l^4, respectively, to the upper part of the main frame.

7. The combination of the supporting-wheels, the axle free to rock therein, the drive-wheel frame consisting of the bars c, c', c^2, the tongue pivotally connected to the axle, the tilting-lever, and the standard k rising from the rear end of the drive-wheel frame and connected to the lever, said tilting-lever being rigidly connected to the axle at its front end and extending rearward along the tongue.

8. The combination of the supporting-wheels, the axle free to rock therein, the drive-wheel frame consisting of the bars c, c', c^2, the tilting-lever rigidly connected at the front end to the axle, a standard rising from the rear bar of the wheel-frame through which the lever passes, and tie-rods k', k^2 connected to the lever near opposite ends and passing through the standard above and below the lever.

9. The combination of the supporting-wheels, the axle free to rock therein, the sleeve-like coupling g' encircling the axle and having the slots g^3, the bolt g^5, passing through the coupling and axle, and the tongue rigidly secured to the coupling.

10. The combination of the supporting-wheels, the axle free to rock therein, the tongue pivotally connected to the axle, the horizontal arms h', h^2, bolted to the axle, the standard h secured to the arms and extending above the axle, and the spring h^3 connected to the upper end of the standard and to a point on the tongue in rear of the axle.

11. The combination of the lower roller of the elevator, the corresponding roller of the upper elevator-canvas, the sprocket-wheel on the former, a gear-wheel on the latter, an adjustable plate carrying a stud, a gear journaled on the stud intermediate of the sprocket-wheel and roller-gear and meshing with said roller-gear, and a chain for driving the intermediate gear from the lower roller of the elevator.

12. The combination of the inner rollers of the lower elevator and platform canvases, of the sprocket-wheels r, r' r^3 the chain r^2 around the wheels r, r', the gear s^2 on the inner roller of the upper elevator-canvas, the gear s' meshing with the gear s^2, the adjustable plate t^2 on which the gear s' is journaled, the sprocket-wheel s, rigidly connected with the gear s', and the chain t around the sprocket-wheels r^3, s.

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

EDWARD A. JOHNSTON.

Witnesses:

WM. H. FERGUSON,

CHAS. W. ALLEN.