

(Model.)

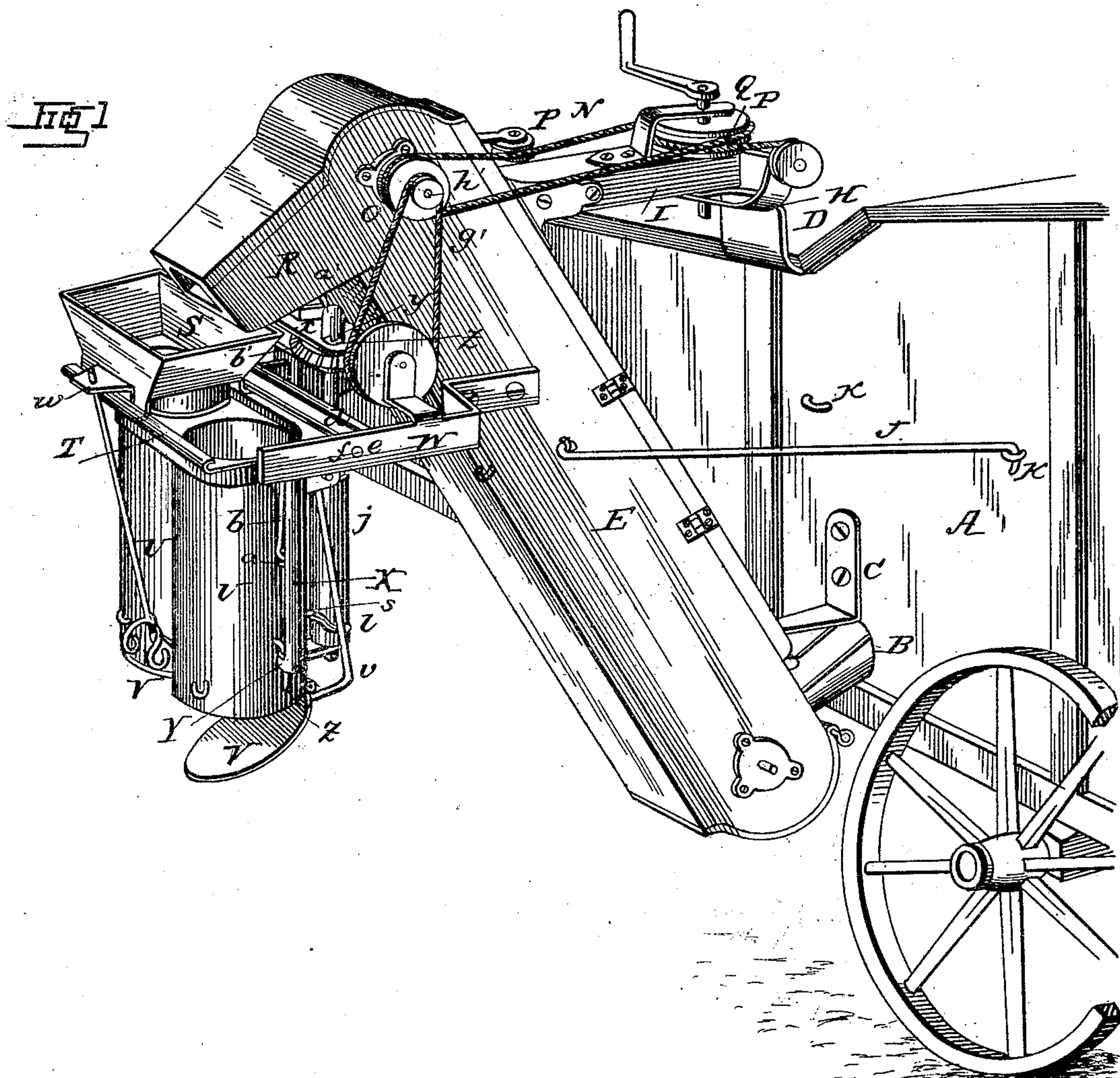
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E. M. THORPE.

AUTOMATIC GRAIN METER.

No. 281,164.

Patented July 10, 1883.



WITNESSES:  
*Fred. G. Dieterich*  
*Wm. Lecher*

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• INVENTOR.  
By *Louis Bagger & Co.*  
ATTORNEYS.



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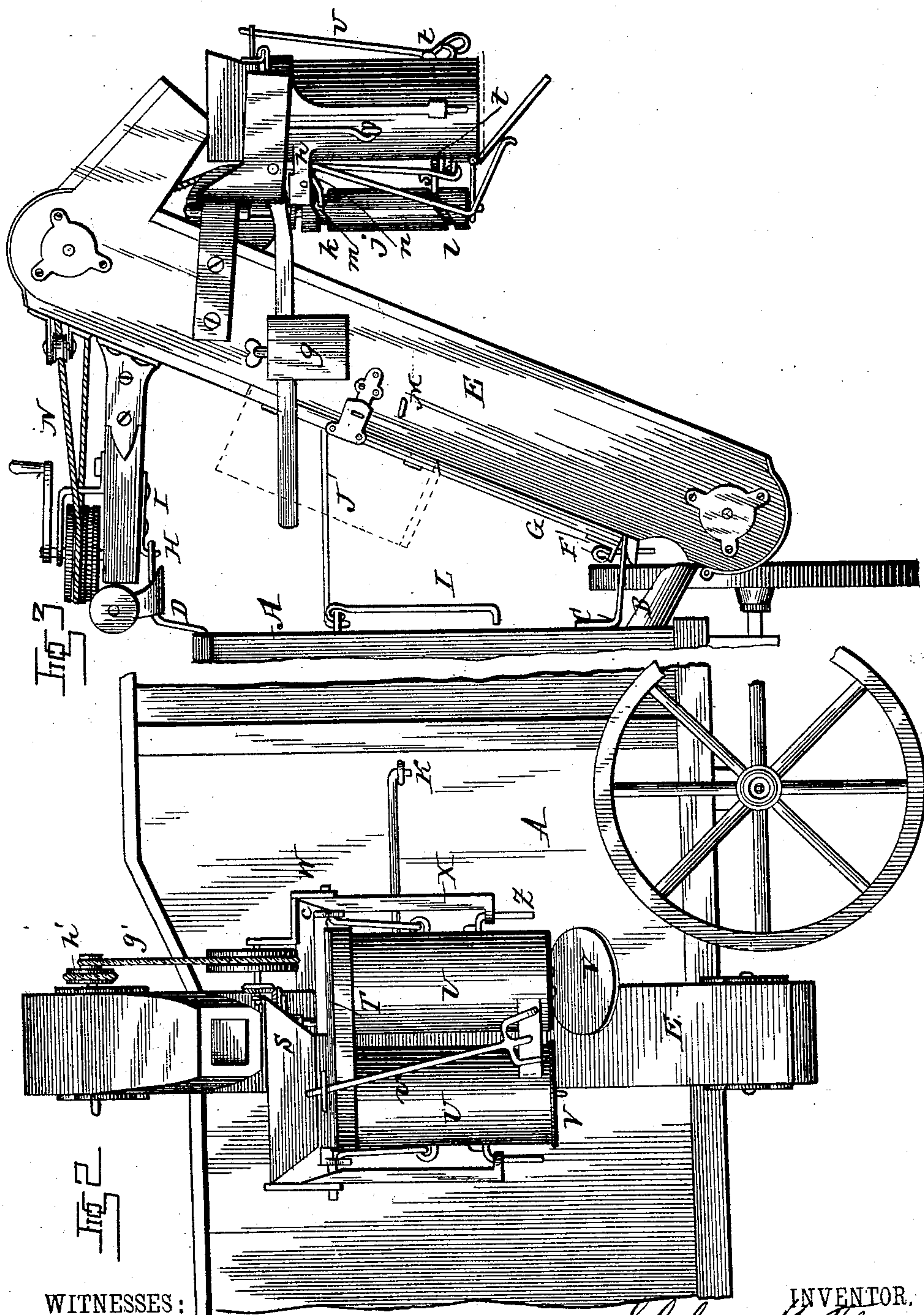
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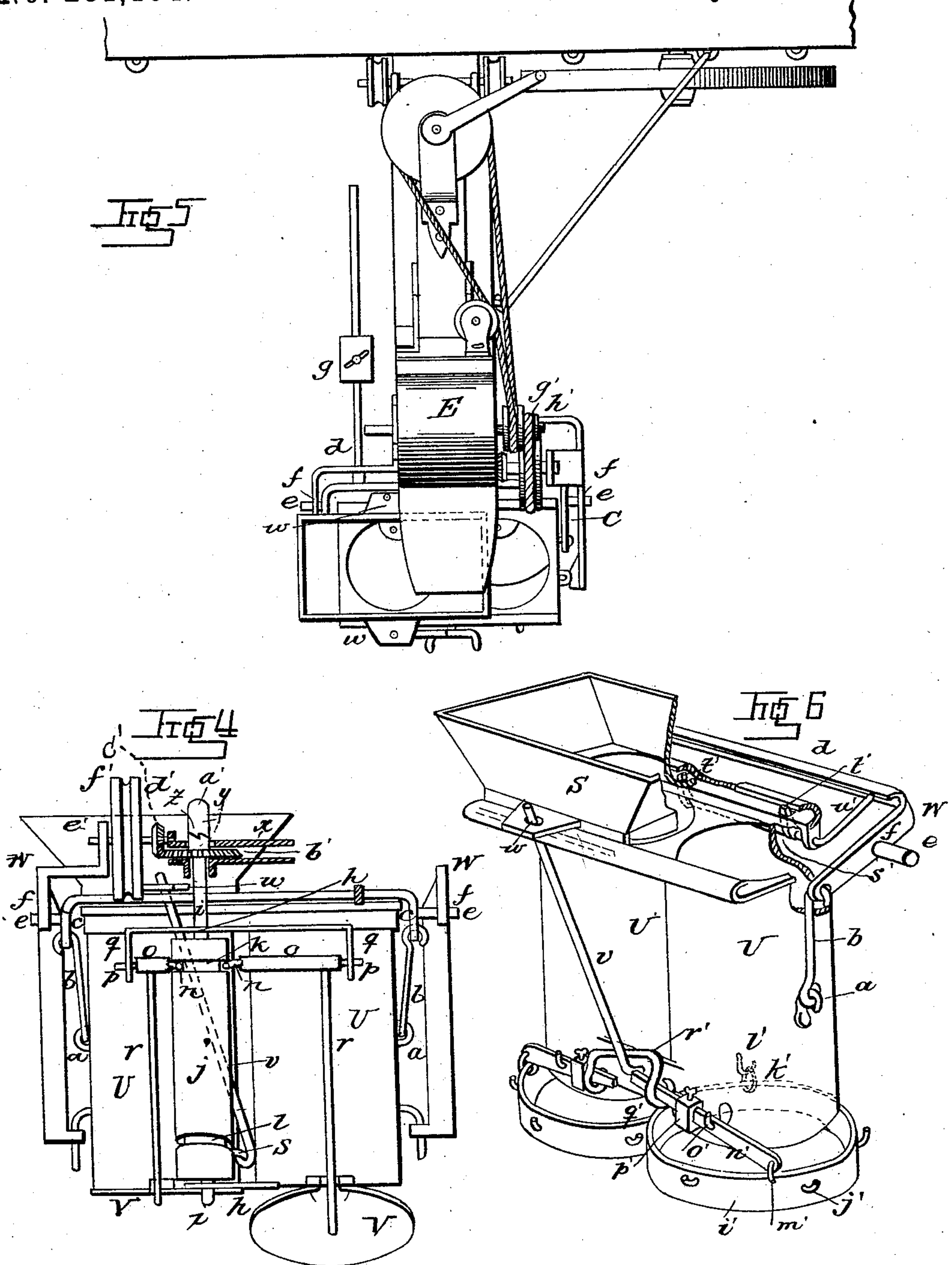
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# UNITED STATES PATENT OFFICE.

ELIHU M. THORPE, OF WAPELLA, ILLINOIS.

## AUTOMATIC GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 281,164, dated July 10, 1883.

Application filed May 21, 1883. (Model.)

*To all whom it may concern:*

Be it known that I, ELIHU M. THORPE, of Wapella, in the county of De Witt and State of Illinois, have invented certain new and useful Improvements in Automatic Grain-Measuring Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my improved grain-measuring machine attached to the side of a thrashing-machine. Fig. 2 is a front view of the weighing mechanism detached. Fig. 3 is a side view. Fig. 4 is a rear view. Fig. 5 is a top view of the same, and Fig. 6 is a detail view of a modification of the device used when discharging into bags.

Similar letters of reference indicate corresponding parts in all the figures.

My invention has relation to automatic grain-measuring machines; and it consists in the improved construction and combination of parts of a measuring-machine attached to the upper end of an elevator, which may be attached to and swing adjustably upon the side of a thrashing-machine, as hereinafter more fully described and claimed.

In the accompanying drawings, the letter A indicates the side of a thrashing-machine, and B the discharge-spout of the same.

A bracket, C, extends above the discharge-spout, and a bracket, D, is fastened to the upper edge of the machine, and the elevator E is hinged, with its upper end inclined outward, upon these brackets by means of a bolt, F, passing through two perforated lips, G, upon the lower end of the back of the elevator-casing, and through a perforation in the outer end of bracket C, and by a vertical bolt, H, projecting downward from the inner end of a horizontal brace-arm or bracket, I, projecting from the upper end of the back of the elevator-casing. The elevator swings horizontally upon these bolts, and may be adjusted to discharge into different wagons, which may be backed up to the side of the thrasher by means of a hooked arm, J, hinged to the side of the elevator-casing and engaging a series of

staples, K, upon the side of the thrasher, while when the latter is moved from one place to another the elevator may be held up against the side of the machine by means of a hooked arm, L, hinged upon the side of the same, and engaging a staple, M, upon the casing. The discharge-spout opens into the lower end of the elevator-casing, and the endless carrier-belt of the elevator is driven by a belt, N, passing over a pulley, O, upon the outer end of the shaft upon which the upper pulley, over which the carrier-belt runs, is fastened, over a horizontal guide-pulley, P, journaled in brackets upon the upper end of the elevator-casing, and over a double horizontal pulley, Q, journaled upon the upper side of the inner end of the bracket I, which receives its motion by suitable connection with the operating-shafts of the thrashing-machine.

A downward-turned spout, R, discharges the grain carried up by the elevator into a hopper, S, which slides in a frame, T, upon the top of two cylindrical vessels, U, having hinged bottoms V, and suspended beside each other, connected by frame T.

Two arms or brackets, W, project forward from the sides of the elevator-casing, and are provided at their outer ends with two downward-pending bars, X, which are provided at their lower ends with two inward-extending eyes, Y, in which two vertical rods, Z, fastened at their upper inward-bent ends to the sides of the vessels U, slide, guiding the lower ends of the said vessels.

Two eyes, a, project from the outer sides of the two vessels U, and are engaged by the lower eyed ends of two bars, b, which are suspended from the ends of the short arms c of a bifurcated scale-beam, d, the bifurcated arms of which pass on both sides of the vessels, and are pivoted upon two laterally-extending trunnions, e, rocking in suitable bearings, f, in the brackets W, while its long arm extends rearward, and is provided with a sliding weight, g, which may be adjusted so as to counterbalance the weight of the vessels and those portions of the mechanism which are attached to the same, and the weight of the quantity of grain desired to be contained in each of the vessels before it is discharged therefrom.

The upper and lower ends of the vessels U



are connected by two rearwardly-extending brackets, *h*, which form bearings for the upper and lower ends of a shaft, *i*, upon which a cylinder, *j*, is fastened, having two cam-grooves, *k* and *l*, one at each end. The upper of these grooves, *k*, passes circularly around the cylinder, excepting at one point, where it forms a short upward-pointing bend, *m*, and the ends of two short arms, *n*, projecting from two sleeves, *o*, turning upon a horizontal shaft, *p*, fastened between two rearwardly-projecting lugs, *q*, upon the upper portions of the vessels *U*, project into this groove, and are raised each once for every revolution of the cylinder *j*.

Two downward-pending arms, *r*, the ends of which are bent forward at right angles to their upper portions, projecting in under and supporting the hinged bottoms of the vessels *U*, are fastened to the sleeves *o*, and it will be seen that when one of the short arms *n* is raised by the bend in the cam-groove its arm *r* will be drawn out from under the hinged bottom of the measuring-vessel, allowing it to drop, discharging the contents of the vessel. The lower cam-groove, *l*, consists of a lower and an upper portion, both of equal length, the upper portion connecting with the lower portion by two diametrically-opposite steep inclines of the groove, so that an arm, *s*, projecting with its end into the groove, will be raised and lowered once in each revolution of the cylinder, remaining the same length of time in each position. This arm projects at a right angle from the inner end of a rock-shaft, *t*, rocking in bearings between the two cylinders *U*, and the end *u* of the arm which projects into the cam-groove is bent at a right angle to the arm, parallel to the direction of the rock-shaft, so that the said shaft will be rocked as the cam-cylinder revolves.

Two arms, *v*, project upward from the inner and outer ends of the rock-shaft, and pass with their upper ends through two perforated lugs, *w*, projecting inward and outward from the lower part of the sliding hopper, so that as the shaft is rocked the arms will slide the said hopper in its frame from its position over one of the measuring-vessels into position over the other, and vice versa, sliding it once forward and back for each revolution of the cam-cylinder.

A bracket, *x*, projects from the front side of the elevator-casing, a little above the level of the brackets *W*, and forms a bearing for a sleeve, *y*, turning outside the upper portion of the shaft *i*, the upper edge of which sleeve forms a half-clutch, *z*, which engages a half-clutch, *a'*, upon the upper end of shaft *i* when the latter is depressed, together with the measuring-vessels, by the weight of the grain contained in the said vessels, while a horizontal crown-wheel or beveled wheel or pinion, *b'*, is fastened upon the said sleeve. This wheel or pinion is engaged by a vertical pinion, *c'*, upon a shaft, *d'*, turning in bearings *c'* upon one of

the brackets *W*, and upon the side of the bracket *x*, and a pulley, *f'*, is fastened upon the said shaft, and connected by a belt, *g'*, to a pulley, *h'*, upon the end of the upper elevator-shaft, outside pulley *O*, turning the pulley and the shaft and pinion.

The operation of my device will easily be understood by reference to the foregoing description, taken in connection with the accompanying drawings. As the thrashing-machine is set in motion the elevator starts with it, carrying the grain up to its top, where it passes out through the inclined spout into the sliding hopper. The sliding weight has, prior to the starting of the apparatus, been set upon the scale-beam, so as to tip when the weight of grain desired to be measured at the time is in the measuring-vessel, and consequently when the desired quantity of grain has passed into the one measuring-vessel the weight of the same tips the outer scale-arms, with the vessels and their attached mechanism, down, which throws the two half-clutches upon the cam-cylinder shaft and the sleeve, which continually rotates, into engagement, rotating the cam-cylinder. The lower cam-groove will operate first, shifting the sliding hopper over the empty measuring-vessel, whereupon the upper cam-groove will operate on the arms, opening the bottom of the filled vessel, allowing it to drop, discharging its contents, and closing it again, whereupon, the weight of the grain being removed, the vessels, &c., are raised by the sliding weight, throwing the clutches out of engagement, until the weight of the grain in the vessel now filling tips the scale-arm, and the same operation is performed with that vessel, and so forth. It follows that a registering mechanism may be attached to the measuring or weighing mechanism, registering the number of times the vessels are emptied. The sliding hopper will also serve to remove the surplus grain from the top of the measuring-vessels when sliding from one vessel to the other, thus giving the exact measure of grain, the vessels being of a certain known capacity, as one-half or one bushel, or any other desired capacity.

In Fig. 6 of the drawings is shown a slight modification of the device, which may be used when the grain is emptied through the measuring-vessels into bags, and which does away with the cam-cylinder and bottoms. This device consists of two rings, *i'*, provided with hooks *j'* upon their outer sides, upon which the upper edges of the bags may be secured. These rings are provided upon one side with a laterally-projecting eye, *k'*, which may be hooked upon a hook, *l'*, upon the inner side of the measuring-vessel, and diametrically opposite to the eye *k'*, with a hook, *m'*, which is hooked into the end of a scale-lever, *n'*, having its fulcrum upon a hook, *o'*, upon the side of the measuring-vessel, and provided with a sliding weight, *p'*, and projecting with its free end through one of two eyes, *q'*, upon the ends of a cross-bar, *r'*, fastened upon the



outer one of the rocking arms *v*, at right angles to the same. A horizontal rock-shaft, *s'*, is journaled, upon the under side of frame T, to the rear of the measuring-vessels, and is provided with two upwardly-inclined projections or lugs, *t' t'*, extending through slots in the frame T, and engaging a slot or notch in the bottom of the hopper, while a rearwardly-projecting arm, *u'*, is engaged by a notch upon the transverse portion of one of the bifurcated scale-lever arms, so that when the scale-lever is tilted by the sliding weight arm *u'* will be depressed, raising the lugs, while when the weight of the grain tilts the outer arms of the lever down, the lugs will be depressed, disengaging the sliding hopper and allowing it to be shifted to the other vessel. When the device is in operation, the bags are fastened to the rings, and the weights upon the small scale-levers are adjusted so as to counter-balance the weight of the bags and the rings. As now the grain is directed through one of the vessels into the suspended bag, the weight of the grain in the bag will draw the ring down, raising the free end of the small scale-lever, which presses against the cross-piece on the rocking arm, exerting the force on the sliding hopper. This is held in its position by the catch or trigger, one of the arms of which extends into the notch in the hopper until the large scale-lever is tilted, when the catch is caused to release the hopper, which is then slid over the other measuring-vessel by means of the weight of the grain in the bag acting on ring *i'*, and through it upon the small scale-lever and the rocking arm, whereupon the catch engages in the notch in the hopper, holding it over the vessel until that bag is filled, and so forth.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a grain-measuring machine, the combination of the continually-rotating sleeve *y*, having half-clutch *z*, shaft *i*, turning in bearings upon the measuring-vessels, and having half-clutch *a'* at its upper end, and cylinder *j*, provided with cam-grooves *k m*, measuring-vessels U, having swinging bottoms V, and sleeves *o*, having arms *n*, projecting into groove *k m*, and pending bent arms *r*, supporting the hinged bottoms, as and for the purpose shown and set forth.

2. In a grain-measuring machine, the combination of the continually-rotating sleeve *y*,

having half-clutch *z*, shaft *i*, turning in bearings upon the measuring-vessels, and having clutch *a'*, and cylinder *j*, having cam-groove *l*, rock-shaft *t*, having bent arm *s u*, projecting into the said cam-groove, and upright arms *v*, and hopper S, having laterally-projecting perforated lugs *w*, through which the ends of arms *v* pass and slide, and sliding in frame T upon the top of the measuring-vessels, as and for the purpose shown and set forth.

3. In a grain-measuring device, the combination of the measuring-vessels U, suspended from the short bifurcated arms of a scale-beam having swinging bottoms V, and forming vertical bearings *h* and horizontal bearings *q*, hopper S, having laterally-projecting perforated lugs *w*, and sliding in frame T over the tops of the measuring-vessels, continually-rotating sleeve *y*, having half-clutch *z*, vertical shaft *i*, turning in bearings *h*, and having half-clutch *a'* at its upper end, and cylinder *j*, provided with cam-grooves *k* and *l* at its upper and lower ends, sleeves *o*, rocking upon shaft *p*, fastened in bearings *q*, and pending bent arms *r*, supporting the swinging bottoms V, and rock-shaft *t*, having bent arms *s u*, projecting into groove *l*, and upright arms *v*, projecting through and sliding in the perforated lugs *w*, as and for the purpose shown and set forth.

4. In a grain-measuring device, the combination of the supporting frame or brackets W, having downward-pending bars X, provided with eyes Y at their lower ends, measuring-vessels U, having sliding hopper S, swinging bottoms V, and cam-shaft *i j*, operating the said bottoms and hopper, as specified, and provided with half-clutch *a'* at its upper end, and provided with vertical guide-rods Z upon their sides, and eyes or staples *a*, bifurcated scale-beam *d*, pivoted in bearings in brackets W, having eyed bars *b* pending from its outer bifurcated ends, *c*, and sliding weight *g*, and the continually-rotating sleeve *y*, having half-clutch *z*, adapted to engage the half-clutch *a'* when the measuring-vessels are tipped down, as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

ELIHU M. THORPE.

Witnesses:

JOHN D. METZ,  
JOHN C. MILLS.