

No. 646,487.

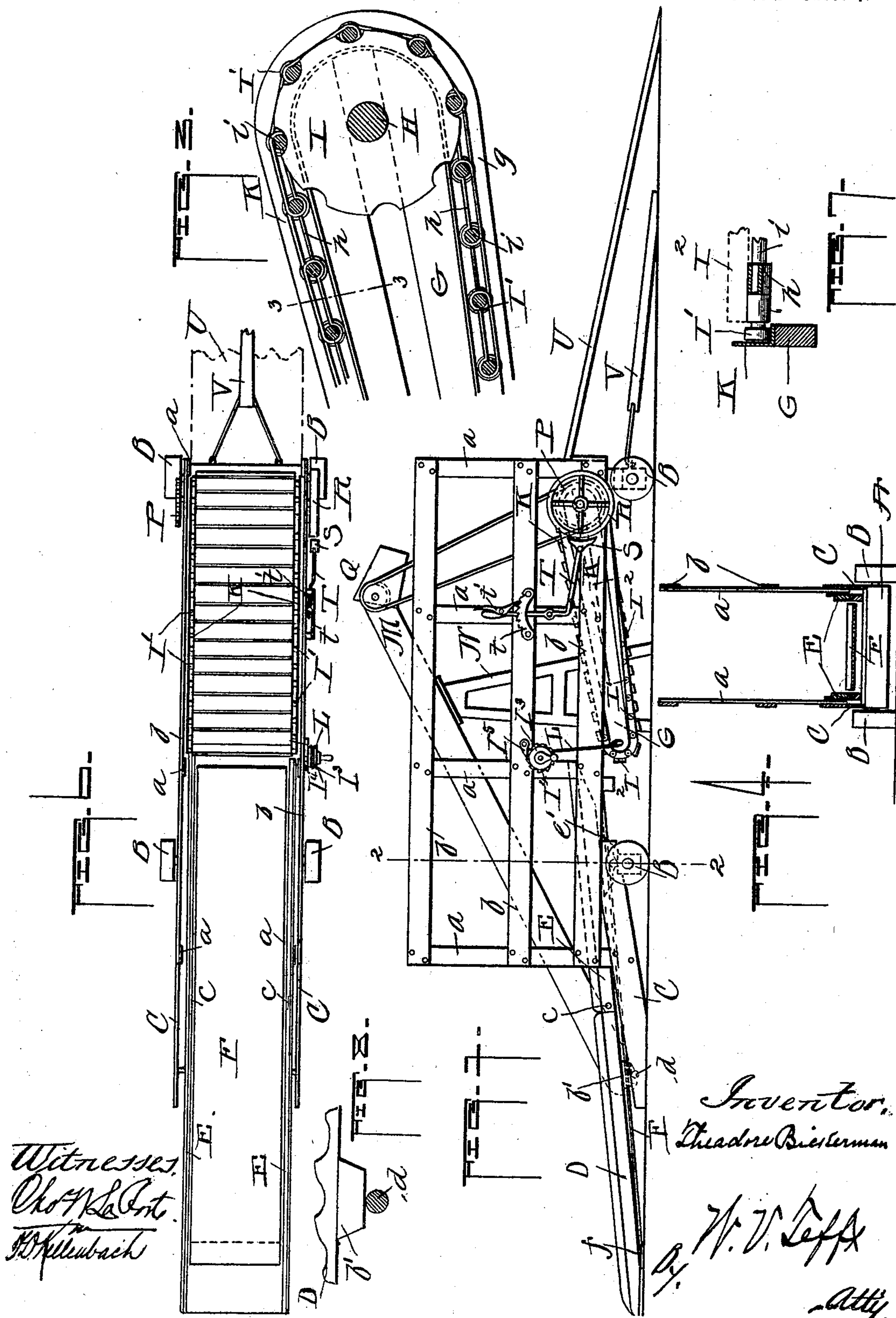
Patented Apr. 3, 1900.

T. BICKERMAN.
DUMPING AND ELEVATING MACHINE.

(No Model.)

(Application filed Oct. 26, 1899.)

2 Sheets—Sheet 1.



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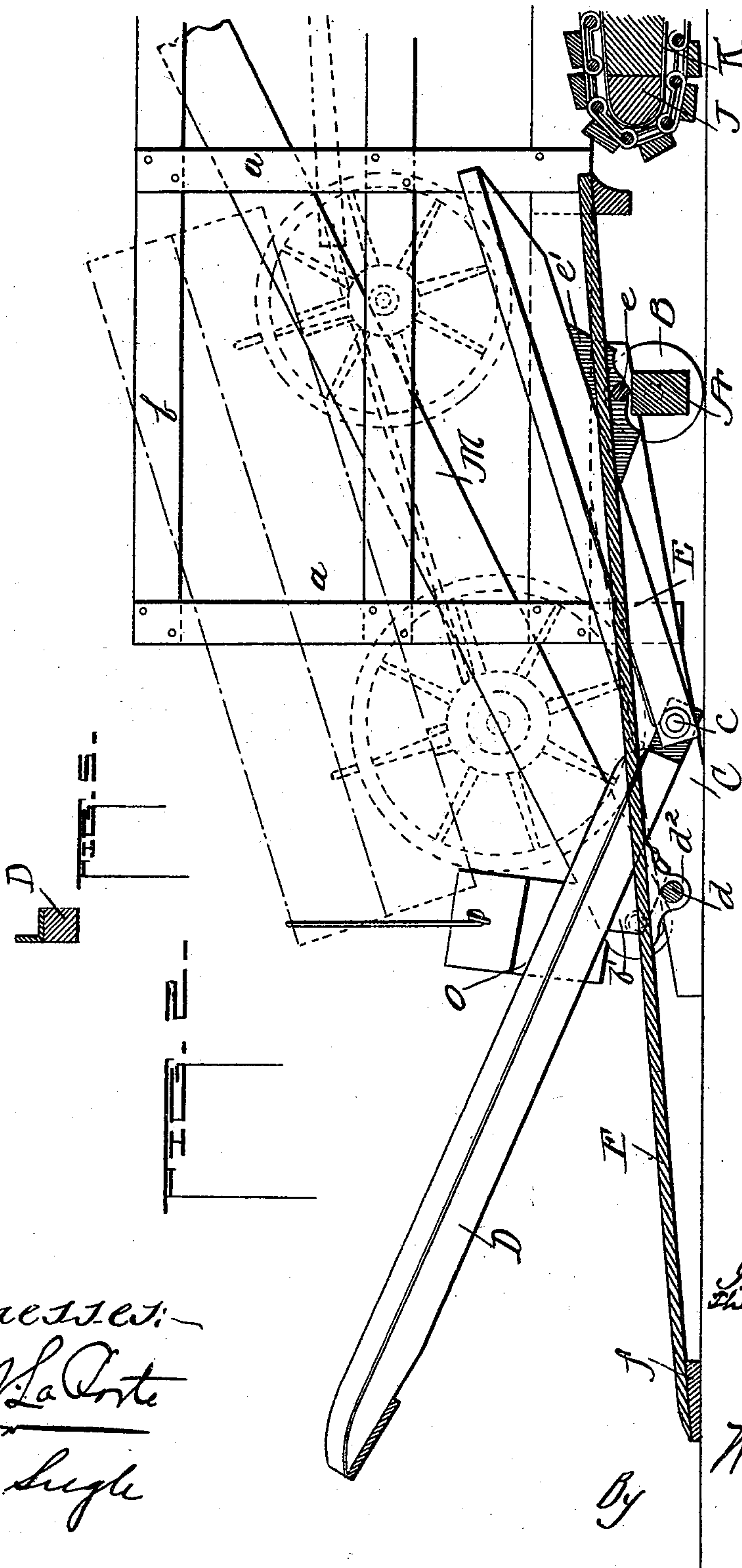
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(No Model.)

2 Sheets—Sheet 2



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UNITED STATES PATENT OFFICE.

THEODORE BICKERMAN, OF HENRY, ILLINOIS.

DUMPING AND ELEVATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 646,487, dated April 3, 1900.

Application filed October 26, 1899. Serial No. 734,895. (No model.)

To all whom it may concern:

Be it known that I, THEODORE BICKERMAN, a citizen of the United States, residing at Henry, in the county of Marshall and State of Illinois, have invented certain new and useful Improvements in Dumping and Elevating 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.

My invention relates to certain new and useful improvements in portable dumps and elevators, by means of which I provide a very efficient, durable, and conveniently-handled mechanism adapted to work under all circumstances and conditions of locations.

The object of my invention is to provide a mechanism combining an automatic dump, an elevator, and power mechanism, all supported and carried upon the same framework and adapted to be moved together from one place to another without taking it apart and fitted to operate in close and narrow places—as, for instance, between rows of corn-cribs.

My invention consists of two dump-sections supported in a portable structure and suitably pivoted together at their meeting ends, and each independent section supported on rock-shafts at either side of the pivoting-point between the two sections, the framework of the dump-sections forming an inclined passage-way for the wheels of the wagon, and the sections are so arranged and supported that the weight of the wagon when thrown upon the pivoting-point between the sections will cause the same to be depressed and the wagon to be dumped.

My invention further consists of an inclined stationary driveway-platform carried between the frame-pieces of the dump-sections; also, of a tread-power mechanism suitably mounted in the portable framework and a suitable chute and elevating mechanism.

My invention further consists of the detailed construction of the several parts and the combination thereof to produce the complete working device.

That my invention may be more fully understood, reference is had to the accompanying drawings, in which—

Figure 1 is a side elevation of the complete

device, showing the adjustment of the several parts in position to operate. Fig. 2 is a vertical section through the rear portion of the device, showing a wagon on the dump and the position of dump-sections during the dumping process, and also various details in the construction and arrangement of parts. Fig. 3 is a detail view showing a section through a portion of the tread-power mechanism. Fig. 4 is a vertical section through the line 2 2 of Fig. 1 and shows the general framework of the device. Fig. 5 is a detail view. Fig. 6 is a plan view of my machine. Fig. 7 is a sectional view through the line 3 3 of Fig. 3. Fig. 8 is a detail view showing the manner of supporting one of the sections of the dump.

In the drawings similar letters indicate similar parts throughout the views.

In the above brief statement of the objects of my invention I have in a general way referred to various parts of the device; but for the purposes of more general information as to the uses of the complete device I desire to make the following statement: I am aware that devices for dumping grain are old, in fact, and also that elevating devices are old, and that recently devices have been constructed combining the dumping and elevating features and mounting same upon a portable truck or frame, and power has been applied to operate the elevator, so I do not claim, broadly, the combination of a portable dump and elevator; but I have constructed an automatic dump and combined therewith a tread-power mechanism that greatly simplifies the work of dumping and elevating. When my device is in position for operation, the load is drawn upon the dump by a team of horses, and as the wagon reaches the proper position thereon the weight of the loaded wagon depresses the dump and the load is discharged through a proper conveyer to the elevator, and as the wagon is drawn upon the dump the horses are driven upon a tread-power device which is operated by the horses and furnishes the power to operate the elevator to convey the grain so dumped to a proper receptacle.

Referring to the drawings, A A are cross-pieces or axles, which form the truck which supports the superstructure, and are mounted

upon wheels, as B B. The forward part of the frame structure is mounted directly upon the forward axle and may be pivoted thereto by the use of the ordinary king-bolt or in any other suitable manner. The rear portion is supported upon the inclined frame-pieces C C, (there being provided one piece on each side,) the forward end of which bears upon the rear axle A and the rear ends upon the ground or upon any suitable support that will cause them to bear close to the ground, and they may be so connected with the truck as to adapt them to be raised and lowered, and means may be provided for raising and lowering same; but in such case the frame parts supported thereby should be supported directly upon axle A.

A frame structure or rack is adapted to be built upon the trucks, consisting of upright frame-pieces *a a a a*, connected by cross-pieces *b b b*, and a corresponding set on the opposite side connected lengthwise by similar frame-pieces, and the two side frames thus constructed and connected by suitable cross-pieces form the complete rack, this rack or frame serving the double purpose of a supporting-frame for various working parts and as a driveway-guard.

The automatic dump mechanism consists of the two sections D and E, hinged together, as at *c*, the section D being provided with the blocks *b'*, provided with smooth bearing-surfaces at their lower edges, and is supported upon the shaft *d*. The section E is provided with the blocks *e'*, which are provided with circularly-formed depressions in their lower faces, which are adapted to rest upon shaft *e*, upon which the said sections are adapted to rock. The support of the said sections upon the said shafts at points removed from a straight line through the said sections running through the pivoting-point of the two sections allows the sections to be depressed between such supporting-points, and the blocks *b'* are provided with flat bearing-surfaces, adapting them to move upon shaft *d* so as not to interfere in any way with the sections being so depressed. The shafts *d* and *e* are supported in the frame-pieces C C, as shown. The combined sections D and E, supported in the manner just above described or in any suitable manner, form the dump proper. The sections as I now desire to construct them consist merely of the side frame-pieces, as shown in Fig. 5, provided with a tracking edge and a flange on the outside, upon which the wheels of the vehicle may travel. The sections may be connected, tied, and secured together and braced in any suitable manner, and it is desirable in forming section D that at the end which is designed normally to bear upon the ground deflectors may be placed thereon leading up to the tracking-faces adapted to direct the wheels upon the bearing-faces of the section. It is designed that normally the sections shall lie in a position to form a gradual inclined plane leading

from the ground upward to the desired height to facilitate in dumping. They may be placed at any angle desired, and the sections may be differently formed and constructed without altering the principle involved in my invention.

F is a plank or inclined driveway, which is supported at its middle portion by means of blocks *d'*, secured to the driveway-plank and journaled upon shaft *b'*, as shown in Fig. 2, and supported at its lower end upon the block *f* or in any other suitable manner and bears upwardly upon the gradual incline the full length of the dump and remains permanently in this position. It fills the space between the side frame-pieces that form the dump-sections, and, if desirable, it may be divided by partitions centrally located thereon and running the length thereof, adapted to form a path or way for each horse to travel upon as it ascends the driveway or plank.

The above description of the dump covers and includes substantially all of the points in the drawings, or, as previously stated, the detail construction and the manner of mounting may be modified without altering the principle involved in my invention so long as the hinged sections are adhered to and the pivoting of the same at their side hinged points.

In carrying out my invention it is necessary in order to utilize the horses to furnish the power to elevate the grain without unhitching and using some outside auxiliary power mechanism to employ tread-power mechanism. I propose to support the tread-power mechanism upon the same portable frame that supports the dump and in such proximity and relation to the dump that as the horses are driven up the inclined driveway F they will be driven from off said driveway to and upon the upper surface of the tread-power. Fig. 1 shows substantially the relation of the parts just above referred to.

The tread-power mechanism consists substantially of the side frame-pieces G, the shaft H, journaled upon the lower longitudinal frame-pieces of the rack, and may be supported in suitable boxings thereon and with suitable collars and other necessary mechanical parts that may be necessary to hold the shaft in proper position in its journals in the framework, and at points just inside of each outside frame-piece G, I provide sprocket-wheels, as I, as shown in Fig. 3. The rear ends of the frame-pieces G are connected by means of the frame-piece J, which is rounded on its outside face. Upon the entire face or surface of the side pieces G is provided a band or track K, which is formed of angle-iron, as shown, a portion of the way around and a flat metal strip the balance of the way. The rear ends of the tread-power frame are adjustably supported in connection with the framework of the machine by means of the chain L, connected therewith and with the take-up reel I⁴, having the ratchet-wheel I³ fixed thereto, and the pawl I⁵ adjusted to engage the

ratchet, substantially as shown in Figs. 1 and 6 of the drawings, there being provided a similar chain and take-up reel on the opposite side. The framework of the tread-power being supported on shaft H in the manner shown, by winding up the chain L it may be drawn to any position or angle desirable in the operation thereof. The tread-surface may be constructed in any suitable manner; but I prefer to construct it in the manner shown in the figures of the drawings, in which it is shown consisting of the pair of link chains formed of the links *h*, connected by rods *i*, said rods extending across the width of the tread-power connecting corresponding sets of links on the opposite side, and on each end of the said rods are journaled the rollers *I'*, which are adapted to travel on the track K. Upon the chains thus formed are placed the tread-bars *I''*, which are formed with a proper surface angle or taper to furnish a proper footing for the horses as they travel thereon. I do not confine myself to this particular detail construction of chains and tread-power mechanisms, but any suitable tread-power may be employed that is fitted for the purpose designed.

In connection with the automatic-dump tread-power I purpose to employ an elevator and other auxiliary mechanism usually employed for the elevation of grain. I have shown in the drawings elevator mechanism which consists of the main elevator-spout M, adapted to be secured at its lower end to the framework, which may be in a pivoted manner and be free at its upper end to facilitate it being raised or lowered to any point to which it may be desired the grain shall be delivered. It may be lodged at different points by support upon the rack; but I have preferred to use the supporting-frame N, which may or may not be used, as desired. In Fig. 2, O is a chute adapted to be hung to the wagon-box substantially in the manner shown and bear across the lower edge thereof while the grain is being dumped therefrom and to lead to and connect with the elevator M, to which the grain is delivered and within which there is purposed to be operated the usual grain-elevator mechanism. On the side of the machine where the elevator is placed and on the end of shaft H the belt-wheel P is secured and is connected with a belt-wheel Q on the upper end of the elevator by means of a belt, so that when the tread-power is being operated, causing shaft H to be turned, power will be conveyed to belt-wheels P and Q and the connecting-belt, causing the grain to be properly conveyed or elevated.

It is necessary before the horses are driven upon the tread-power that the movable surface shall be fixed and stationary until the dump shall have been depressed and until the grain from the wagon is in readiness to be elevated. Therefore I have shown a locking device which consists of the clutch-wheel R, fixed to shaft H, and the clutch-shoe S, hinged

to the pivoting-bar T. By moving the upper end of bar T rearwardly the clutch-block S will be caused to bear against the surface of clutch-wheel R, and by means of the ratchet-frame and catch (shown in Fig. 1) the bar T may be locked effectually to prevent the movement of the surface of the tread-power mechanism. I have merely shown the above locking mechanism as a means, not the means that necessarily must be used. In fact, any suitable locking mechanism may be employed, and probably much better and simpler means may be found for accomplishing this result.

In the operation of elevating differences in the amount of power required to accomplish the elevating may be found, owing to the different kinds of materials, as grain or vegetables, that are to be elevated. I regulate this very readily by raising or lowering the tread-power mechanism to varying angles, as will readily be understood without further detailed explanation. After the grain from the wagon has been dumped and elevated it is purposed that the horses be driven and the wagon drawn off in front of the machine, and I provide a driveway or plank U for the purpose, which is supported at its upper end upon the framework and leads up to or near the upper end or face of the tread-power and down gradually until it bears upon the ground or other suitable support, which enables the horses and wagon to be drawn from off the machine. I also provide the tongue V, which may be connected with the portable frame in any suitable manner.

The machine as a whole may be driven from one place to another readily. It is adapted to operate between rows of cribs or other grain-receptacles and to work in very narrow close places. As the drive is continuous onto and across the machine, there being no necessity for going around it or backing off from it, the horses without being unhitched furnish the power and the dump acts automatically, so that there remains nothing to be done except to drive on the machine until the wagon by its own weight operates the dump and remains thereon while the horses operate the tread-power until the grain shall have been elevated and then to drive off again, thus accomplishing a great amount of work in a very simple, quick, and easy manner.

As the horses are driven onto the machine and the wagon is drawn upon the dump the length of the sections and the points of pivoting are so determined with reference to the wagon and the horses drawing the same that the dump will remain in a fixed and positive position until the hind wheels of the wagon have passed the pivoting-point *d* of section D and until the horses shall have reached and shall be standing upon the surface of the tread-power mechanism, at which time the weight of the wagon will cause the sections to be depressed at their hinged points and when depressed to the maximum point will

occupy the relative positions shown in Fig. 3, the wagon box and truck being shown in dotted lines thereon and is again drawn from off the dump. The weight thereof as it passes beyond the pivoting-point of section E will serve to adjust the sections to other normal positions. However, the dump itself is so balanced as to cause this adjustment without the aid of the wagon.

As previously stated, I do not desire to limit myself to the exact construction detailed in the drawings. I do not claim any invention in connection with the elevator itself, but only claim to have invented the automatic dump formed of the two sections, the application of the tread-power in combination with the elevating device, and the complete combination of the parts going to make up the complete device.

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

1. In a dumping and elevating machine, the combination of two sections pivoted together, each independently supported in such a manner as to adapt them to be tipped and to be depressed at the point of pivoting between the two sections, a driveway-platform supported between the outside frame-pieces of the dump-section and stationary with relation thereto, all substantially as described and shown.

2. In a dumping and elevating machine, the combination of two sections pivoted together and each independently supported upon a rock-shaft adapting them to tip under pressure at or near the pivoting-points between the two sections, a driveway located between the outside frame parts of said sections and stationary with relation thereto, all substantially as described and shown.

3. In a dumping and elevating machine, the automatic dump consisting of two sections pivoted together and each independently supported upon a rock-shaft adapting them to tip under pressure applied between the points of support and each section provided with a tracking-surface and suitable guard continuing the whole length of the two sections that form the dump, a driveway, bearing between the tracking-faces on the sections and stationary with relation to the dump, forming an incline corresponding with a normal incline of the dump-sections, all substantially as described and shown.

4. In a dumping and elevating machine, sections D, and E, pivoted together as at c, and each section provided with an intervening block as b' and e', each supported upon rock-shafts as d and e, and each section provided upon the upper surface of the outside frame-pieces with a flanged bearing-face, said sections adapted to tip under pressure or weight of a wagon and to be depressed between their supporting-points, the driveway F, bearing between the outside frame-pieces of the sec-

tions and stationary with relation thereto and suitably supported to form a gradual incline, all substantially as described and shown.

5. In a dumping and elevating machine, the combination of the two dump-sections D, and E, pivoted together as at c, and supported upon independent rock-shafts d, and e, at some distance from the body of each section by means of intervening blocks as b' and e', and each section constructed with two side frame-pieces provided with flanged bearing-faces upon their upper edges leaving an open space between said frame parts; the inclined driveway F, bearing between said frame parts and stationary with relation thereto, one end of which is supported upon or adjacent to the ground and the other end in a somewhat-elevated position upon the framework of the machine, forming a driveway for the horses, all substantially as described and shown.

6. In a dumping and elevating machine, the combination of two sections pivoted together, and each independently supported upon a rock-shaft adapting them to tip under pressure at or near the pivoting-point between the two sections, a driveway located between the outside frame parts of said sections and stationary with relation thereto and suitable elevating mechanism and a receiving-chute adapted to receive and elevate grain, all substantially as described and shown.

7. In a dumping and elevating machine, the automatic dump, consisting of two sections pivoted together, and each independently supported upon a rock-shaft, adapting them to tip under pressure applied between the points of support, and each section provided with a tracking-surface and suitable guard continuing the whole length of the two sections that form the dump, a driveway, bearing between the tracking-faces on the sections and stationary with relation to the dump, forming an incline corresponding with the normal incline of the dump-sections, suitable elevating mechanism and a chute adapted to receive and elevate grain, all substantially as described and shown.

8. In a dumping and elevating machine, the automatic dump consisting of two sections pivoted together, and each independently supported upon a rock-shaft adapting them to tip under pressure applied between the points of support, and each section provided with a tracking-surface and suitable guard continuing the whole length of the two sections that form the dump, a driveway, bearing between the tracking-faces on the sections and stationary with relation to the dump, having an incline corresponding with the normal incline of the dump-sections, a suitable elevating mechanism and a receiving-chute adapted to receive and elevate grain, and suitable power mechanism mounted in the machine adapted to be operated by the horses attached to the wagon, all substantially as described and shown.

9. In a dumping and elevating machine, the automatic dump, consisting of two sections pivoted together, and each independently supported upon a rock-shaft, adapting them to tip under pressure applied between the points of support and each section provided with a tracking-surface and suitable guard continuing the whole length of the two sections that form the dump, a driveway bearing between the tracking-faces on the sections and stationary with relation to the dump, having an incline corresponding with the normal incline of the dump-section, a suitable elevating mechanism and a receiving-chute adapted to receive and elevate the grain, and suitable power mechanism mounted in the machine, adapted to be operated by the horses attached to the wagon, consisting of the traveling inclined surface suitably supported to adapt it to move under the weight of the horses and suitable power-conveying shaft, wheels and belt connected with the elevating mechanism adapted to convey the power, all substantially as described and shown.

10. In a dumping and elevating machine, the combination with a portable frame of an automatic dump, constructed in two sections pivoted together and each independently supported in such a manner as to adapt them to tip under pressure between the supporting-points and suitable elevating mechanism and a receiving-chute adapted to receive and elevate grain, and a tread-power mechanism supported upon the said framework, adapted to be operated by the horses attached to the wagon and connected with the elevator by suitable mechanical means, whereby a loaded wagon driven upon the dump-sections will be automatically dumped and the horses by their weight and movement will operate the tread-power to cause the grain to be elevated, all substantially as described and shown.

11. In a dumping and elevating machine, the combination with a portable frame of an automatic dump constructed in two sections pivoted together, and each independently supported in such a manner as to adapt them to tip under pressure between the supporting-points and suitable elevating mechanism and a receiving-chute adapted to receive and elevate the grain and a tread-power mechanism pivotally supported at one end and adapted to be supported by suitable mechanism at the other end to adapt it to be raised or lowered so as to be adjusted at different angles as desired and suitably connected by proper mechanical parts with the elevator, whereby a loaded wagon driven upon the dump-sections will be automatically dumped and the horses by their weight and movement will operate the tread-power to cause the grain to be ele-

vated, all substantially as described and shown.

12. In a dumping and elevating machine the combination therewith, of an automatic dump consisting of two sections pivoted together and each independently supported in a pivoted manner, whereby they may be tipped under pressure or weight between the pivoting-points, and a driveway-plank bearing between the frame parts of the dumping-sections and being stationary with relation thereto and forming an incline corresponding with the normal inclined position of the combined sections, of a suitable elevator and chute and a tread-power mechanism pivotally supported at one end upon the framework of the machine and the other end thereof adjustable up or down by suitable mechanism provided for the purpose and connected by suitable mechanical parts with the elevator whereby when the wagon is driven upon the dump and the same has been automatically dumped thereon, the grain therefrom will be delivered to the elevator and the horses traveling upon the moving surface of the tread-power will furnish the power necessary to elevate the grain, all substantially as described and shown.

13. The combination with a portable frame structure, of an automatic dump consisting of two sections hinged together and each section independently supported upon a rock-shaft adapting them to tip under pressure at points between their supports, and each section provided, upon its upper edge, with tracking-faces having upwardly-projecting flanges, and a driveway-board bearing between outside frame parts of the dump-sections and stationary with relation thereto, one end thereof supported upon or adjacent to the ground and the other end supported upon the frame structure; a suitable elevating mechanism supported in connection with the frame structure, and a chute adapted to be attached to the wagon and bearing underneath the edge of the rear end of the wagon-box and leading to the elevator, and a tread-power mechanism pivotally supported at its forward end upon the frame structure and the rear end thereof adjustable up and down by means of suitable mechanism employed for the purpose, said tread-power suitably connected with the elevator and adapted to furnish the power for operating the same, all substantially as described and shown.

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

THEODORE BICKERMAN.

Witnesses:

T. F. CLOVER,
HENRY YAEGER.