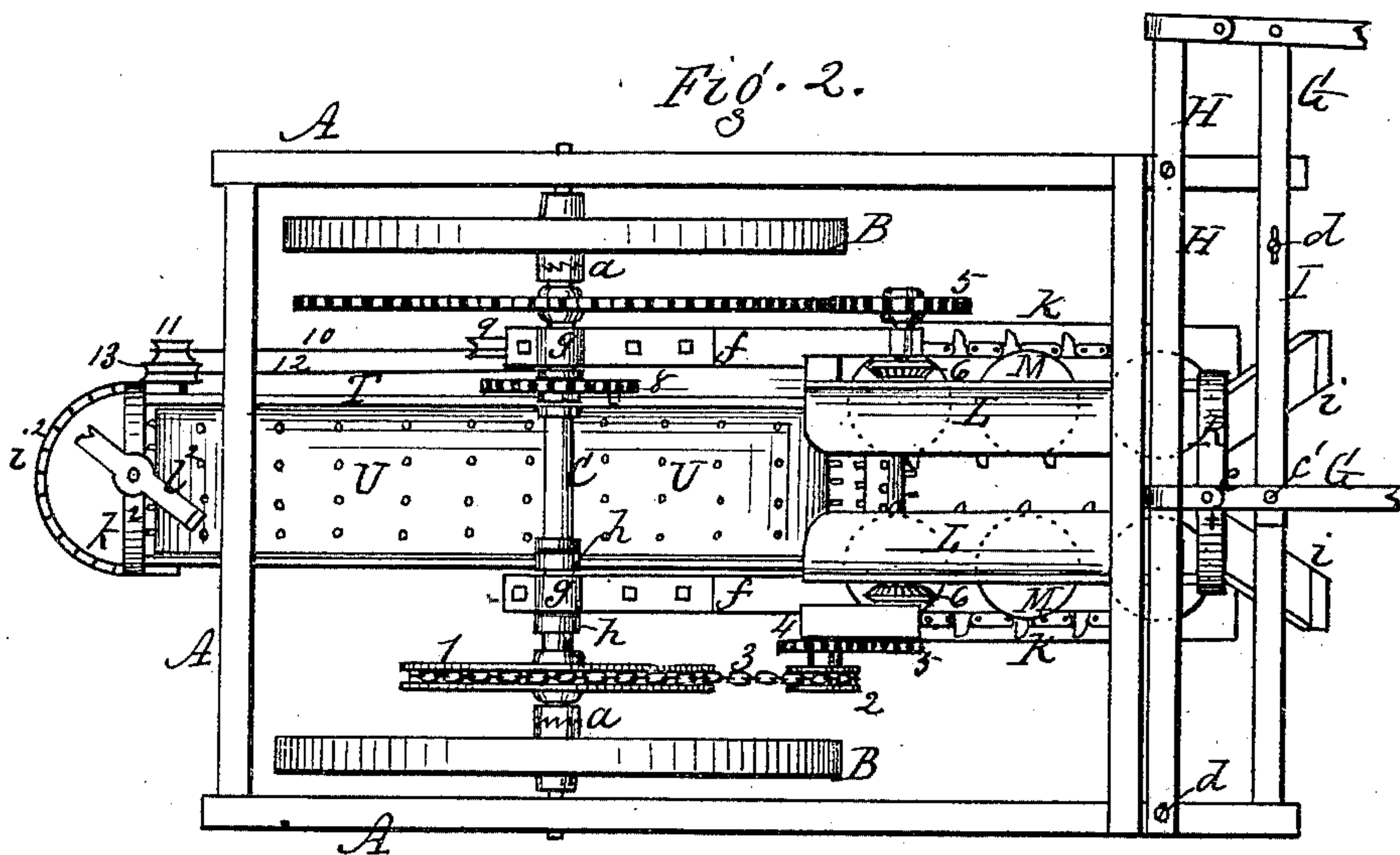
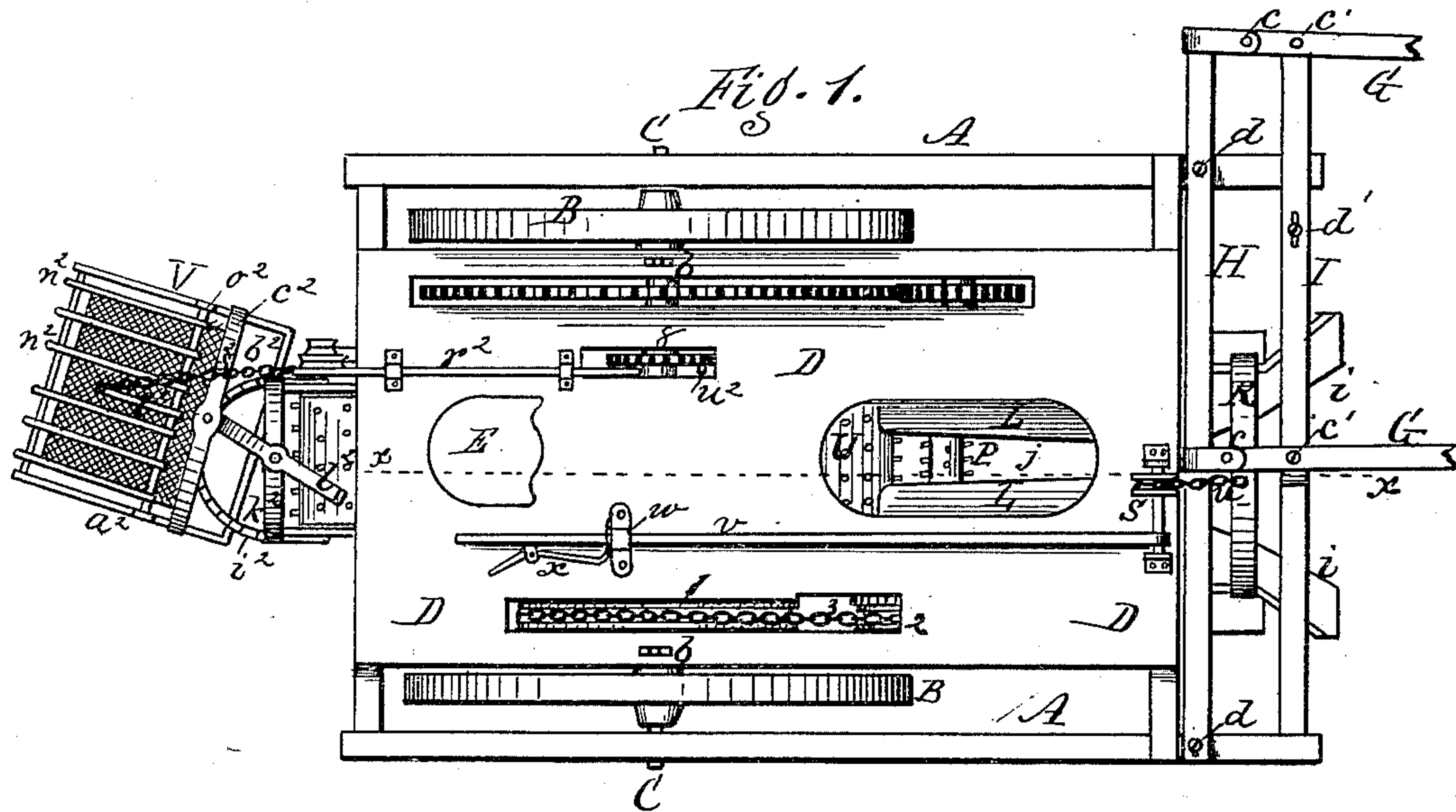


H. B. MORRISON.  
Bean-Puller.

No. 223,003.

Patented Dec. 30, 1879.



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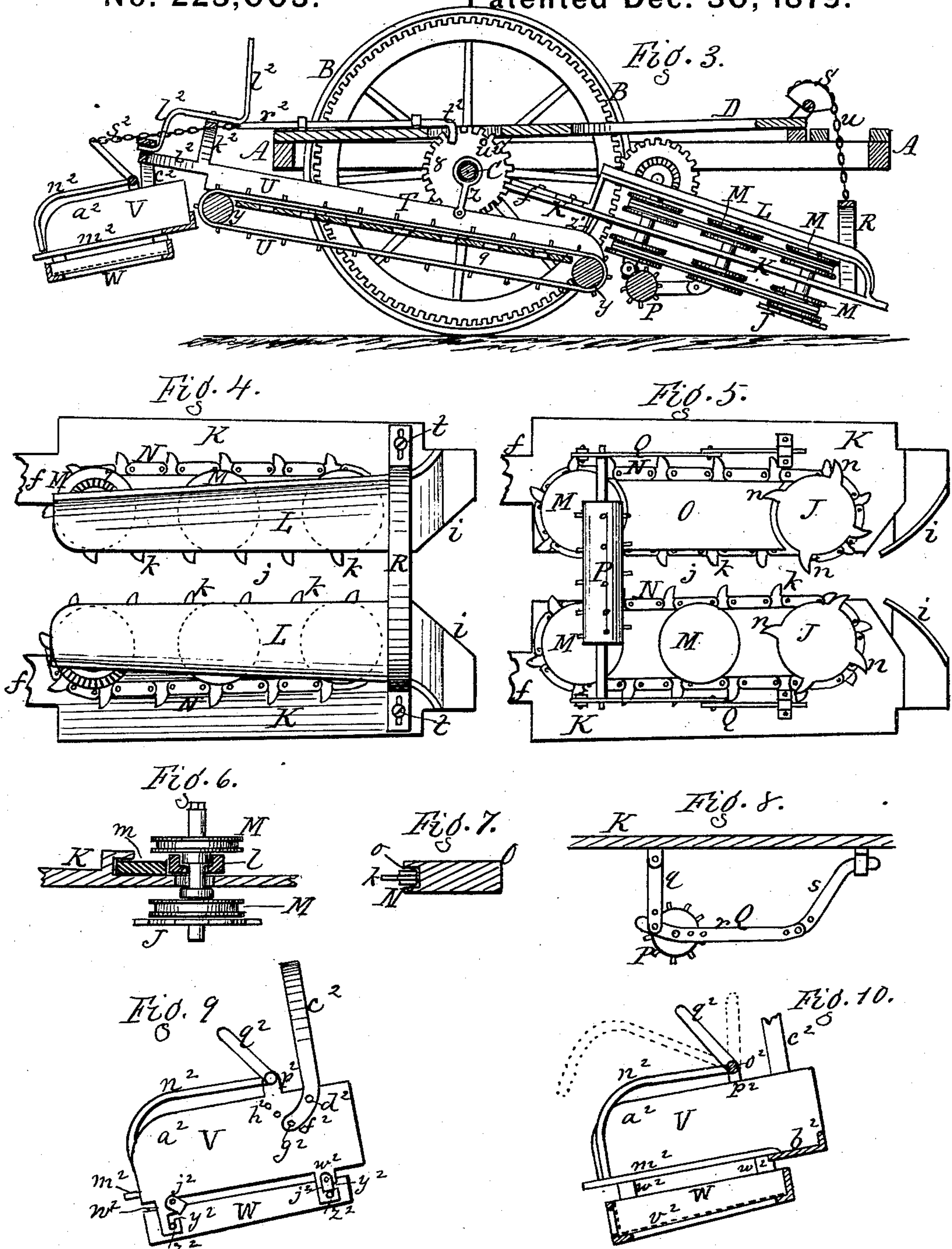
Inventor.

Hiram B. Morrison  
per R. F. Osgood,  
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# UNITED STATES PATENT OFFICE.

HIRAM B. MORRISON, OF LE ROY, ASSIGNOR, BY MESNE ASSIGNMENT, TO  
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## IMPROVEMENT IN BEAN-PULLERS.

Specification forming part of Letters Patent No. **223,003**, dated December 30, 1879; application filed  
May 31, 1878.

*To all whom it may concern:*

Be it known that I, HIRAM B. MORRISON, of Le Roy, in the county of Genesee and State of New York, have invented certain new and useful Improvements in Bean-Pullers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of the machine. Fig. 2 is a similar view, but with the platform removed. Fig. 3 is a longitudinal vertical section in line *x x* of Fig. 1. Figs. 4, 5, 6, 7, 8, 9, and 10 are detail views.

My improvement relates to machines for harvesting or pulling beans; and the invention consists in the construction and arrangement of parts hereinafter more fully described and definitely claimed.

In the drawings, A represents a rectangular frame, constituting the main frame.

B B are the supporting and driving wheels. C is the axle.

*a a* are clutches sliding on the axle, and engaging with the hubs of the wheels, and operated by levers *b b*, by which means the wheels may be thrown into and out of gear with the axle.

D is a platform, which rests on top of the main frame and supports the driver's seat E.

G G are thills, to which the horse is attached. Instead of this, a pole or tongue may be used, if desired, for a pair of horses.

K K are two bed-plates, to which the pulling and gathering devices are applied. At the front they are of considerable width, but at the rear they are preferably narrowed, as shown at *f f*, and are attached to the axle by suitable boxes *g g*, which allow the axle to turn therein. The ends of the plates forming the boxes are retained against lateral movement by collars *h h*, which rest on each side thereof.

L L are elevating-plates, attached to and forming a fixture with the bed-plates, but at some distance from them. At the front end the elevating-plates are bent down and attached to the ends of the bed-plates, thereby forming curves, and at the extremities the

ends are bent outward horizontally, or slightly inclined upward, forming the points for passing under the beans.

The inner edges of the bed-plates and the elevating-plates are made angular, opening outward, as shown at *i i*, Figs. 4 and 5, for the purpose of gathering and concentrating the stalks of the beans, and these two sets of plates are set at a distance apart to leave a passage, *j*, between them for the beans to pass through as they are pulled and carried back to the endless apron.

The top surfaces of the elevating-plates L L are made of considerable width, presenting a flat surface from bottom to top, and at their outer edges they have vertical flanges, for a purpose presently to be described.

Fig. 4 shows a top view of the said plates, and Fig. 5 a bottom view on an enlarged scale.

M M M are chain wheels or pulleys, arranged above and below the bed-plate K, on each side of the machine, around which pass endless chains N N. The wheels are preferably flanged to receive and hold the chains. The chains are made in links, and at suitable distances apart have spurs *k k*. These spurs are rounded on one side and square on the other, and as the spurs come round in line with the inner edges of the plates to draw up the beans the rounded sides are presented in the direction of motion, as shown in Fig. 4, to prevent cutting of the stalks, and also to freely discharge the stalks as the points leave them at the top. The spurs project inward across the space *j* sufficiently to hold the stalks, and as the chains are moved the beans are carried up through the passage *j* upon the inclined plates, and finally discharged upon the endless apron.

The construction of the elevating-plates L L with the flat surface on top, and with the vertical flanges at the outer edges, is essential to prevent loss of such beans as are shattered out. They fall upon the top of the plates, and are carried up by the tops of the beans, which sweep over the plates, and are prevented from falling off by the flanges, and finally drop over at the rear upon the endless apron. The width of the elevating-plates is such as to rest under



the whole body of the bean-tops, thereby catching all the beans that drop out.

It will also be noticed that the elevating-plates are separated so far as not to press hard upon the stalks; but the latter are carried up by the projecting spurs, which interlock with them, without producing undue agitation, and the rounding of these spurs on the upper side prevents the cutting of the stalks, and also allows them to be discharged properly onto the apron.

The journals of the lowest wheels, M, next the point rest in boxes *l l*, which, in turn, rest against rubber or other springs *m m*, Fig. 6, on the upper side, which have the effect of pressing said wheels downward and producing tension on the chains, and so keeping them taut.

J J, Figs. 3 and 5, are gathering-wheels on the same shafts as the lower chain-wheels, M M, and on the under side, next the ground. They also are provided with curved spurs *n n*, which may be longer than the spurs *k k*, but curve in the same direction. These wheels serve to gather or draw the bean-stalks together in line with the passage through the plates, and to present them in proper position to the chains, the curves of the spurs preventing clogging as they clear themselves from the stalks.

O O are guide-plates secured on the under side of the bed-plate K, and provided on their inner edges with a groove, *o*, Fig. 7, in which the chain runs. It serves to cover and shield the chain and hold the same out in position, so that its spurs can hold the stalks as they pass upward. These guide-plates or casings may be made to extend around all the chain-wheels.

P is a clearing-roller, hung beneath the bed-plates near the upper end. It is armed with teeth, and serves the purpose of clearing the roots of the beans from dirt. As the beans are carried up between the plates in the passage, the roots come in contact with this roller, and as they draw through the teeth the dirt is shaken off without materially agitating the beans.

The roller is turned by the frictional contact. The roller is suspended in an adjustable framework, Q, Figs. 5 and 8, on opposite sides, consisting of arms *q r s*, having adjusting-holes, and so arranged that the roller can be adjusted both vertically and forward and back. Any number of these rollers may be used.

R is a curved bail or bow, attached to the bed-plates K K on opposite sides, near the front end, by means of bolts *t t*, which pass through slots in the ends of the bail, thereby allowing the lateral adjustment of the bed-plates to increase or lessen the width of the passage *j*, before described. This bail rises to sufficient height to allow the beans to pass under it.

S is a segment pivoted on top of the main frame, and *u* is a chain or other connection, connecting the top of the bail with the segment. As the segment is turned one way or the

other the bed-plates will be correspondingly raised or lowered.

*v* is a lever attached to the shaft of the segment S, and extending back within reach of the operator, where it passes through a guide-loop, *w*, and has a locking or engaging device, *x*, of any ordinary form, by which it may be engaged with the notched loop and held at any adjustment.

By this means the operator, seizing the lever *v*, can regulate the height of the bed-plates in passing under the beans, or can guide the same higher or lower as the machine passes along.

T is the frame or trough of the endless apron, and U is the apron, which passes through the same.

The frame has side pieces forming the trough, and the apron passes around pulleys *y y* at the opposite ends of the trough.

The apron is provided, preferably, with short spurs on its surface to hold the beans. The lower end of the apron rests under the upper end of the bed-plates, and receives the beans as they are dropped therefrom by the chains. The rear end of the apron extends some distance back of the main frame, being elevated at that end.

The apron-frame is suspended and held by pendent loops *z z* on the axle and arms *z' z'* on the bed-plates.

V is a dumper for receiving the beans from the rear end of the endless apron and dumping them in bunches or piles upon the ground. It is constructed as follows: It has sides *a<sup>2</sup> a<sup>2</sup>* and a horizontal back piece, *b<sup>2</sup>*, the latter coming under the end of the apron. To the side pieces is attached a bail, *c<sup>2</sup>*, pivoted at *d<sup>2</sup>*, and having projecting ends *f<sup>2</sup>*, through which pass pins *g<sup>2</sup>*, entering any of a series of concentric holes, *h<sup>2</sup>*. This is shown in Fig. 9. By this means the dumper may be adjusted to any desired angle vertically to properly dump the beans. *i<sup>2</sup>*, Figs. 1 and 2, is a fixed bearing in the form of a bow, which is attached to the rear end of the endless-apron frame, or may be attached to the main frame. The top of this bearing is notched or corrugated over nearly or quite its whole extent. *k<sup>2</sup>* is a vertical curved bearing forming a fulcrum for the lever *l<sup>2</sup>*, and is attached to the endless-apron frame in rear of the fastening-point of the bearing *i<sup>2</sup>*. *l<sup>2</sup>* is a curved lever pivoted to the top of the fulcrum *k<sup>2</sup>*, and pivoted at its lower outer end to the bail *c<sup>2</sup>*, which rises from the dumper. These parts are not attached to the bearing *i<sup>2</sup>*, but rest loosely thereon, and are supported by said bearing. By drawing or pressing on the lever *l<sup>2</sup>* the bail *c<sup>2</sup>* will be raised from the bearing *i<sup>2</sup>*, and the whole dumper can then be swung to the right or left at any angle desired, so as to throw off the beans to either side of the machine. When the bail is dropped the notches in the top of the bearing *i<sup>2</sup>* hold the dumper in place.

*m<sup>2</sup> m<sup>2</sup>*, Figs. 3 and 10, are rods forming a grated bottom to the dumper. The beans slide



off from these rods in dumping.  $n^2$   $n^2$  are corresponding curved arms, forming a gate that rests over these rods. At the rear these arms have a shaft,  $o^2$ , whose journals rest in lugs  $p^2$   $p^2$  on the sides of the dumper. This gate is kept closed till the dumper is filled with the beans, and is then opened to dump them.  $q^2$  is an arm attached to the shaft  $o^2$ .  $r^2$  is a sliding bar resting in suitable bearings on top the platform, and projecting out over the rear of the main frame, as shown in Figs. 1 and 3. The arm  $q^2$  is connected with the sliding bar  $r^2$  by a chain or other connection,  $s^2$ . When the bar  $r^2$  is drawn forward the gate  $n^2$  will be raised.  $t^2$  is a downwardly-projecting hook on the inner or forward end of the bar  $r^2$ , and  $u^2$  is a pin projecting horizontally from the face of a wheel, 8, fixed upon the axle and revolving with it. At every revolution of the wheel the pin strikes the hook and draws the sliding bar forward, and then releases it as the pin passes downward, thus making the action automatic. If desired, other means may be used for operating the gate.

W is a box forming a bin hung beneath the dumper. It serves simply for catching the shelled beans and sifting out the dirt therefrom. To this end it has a screen-bottom,  $v^2$ , and, if desired, the outer inclined end may also have a screen. It is connected to the dumper, so as to be removable, as follows:  $w^2$   $w^2$  are pendent arms on the bottom of the dumper, provided with bayonet-slots  $y^2$   $y^2$ , Fig. 9. Into these slots pass pins  $z^2$   $z^2$  on the sides of the box, and when in place they are secured by turning buttons  $j^2$   $j^2$ .

The operating parts may be actuated by any suitable gearing or belting. In the drawings the axle has a wheel, 1, which gives motion to a smaller pulley, 2, by means of a chain, 3. Instead of this a similar cog-gear may give motion to a pinion, as shown at the top in Figs. 1 and 2. On the shaft of 2 is a spur-pinion, 4, which gives motion to a smaller pinion, 5. On the shaft of 5 is a bevel-gear, 6, which meshes into a similar bevel-pinion, 7, Fig. 4, on the shaft of the upper chain-wheel, M. By this arrangement motion is given to the endless chains. On the main axle is also a spur-gear, 8, which meshes into a pinion below it, and on the shaft of the pinion is a pulley, 9, having a band, 10, which runs on a small pulley, 11, by which means motion is given to the endless-apron roller. Another band, 12, on pulley 13, and running to a pulley on the other roller, gives motion to the latter.

Various modifications may be made without changing the nature of the invention. The bed-plates, if desired, may have small wheels rolling upon the ground. The bed-plates may be made stationary, and the chain-wheels and chains may be adjustable laterally. The ele-

vating-plates may be carried higher and farther back, a greater number of the chain-wheels may be used, and the beans may be discharged over the axle. The bed-plates may be made horizontal, or nearly so, and the elevating-plates inclined upward, and they may be braced by posts between them, the passage between the angular parts extending all the way up, while that in the bed-plates may extend but part-way back, the rear portion being closed. The bed-pieces may have flanges or stays on the under side to strengthen them. The endless apron may run down to the point of the bed-plates. The chain-wheels may all be used above or all below the bed-plates, and those on opposite sides may be made to alternate in position vertically—that is, the wheel on one side may come opposite the space between two wheels on the other, so that the stalks will be bent in zigzag form. This is effective for pulling large stalks, such as cotton or cane. Instead of making the gathering-wheels with curved spurs, sharp points may be used, like the knives in a reaping-machine, for cutting the stalks, the points of the wheels on opposite sides interlocking. The teeth or spurs on the endless chains may be made of similar form. The dumper and screen-box beneath it may be so arranged that when the gate is raised to dump the load the box will be lowered, and vice versa.

This machine may be applied to pulling other materials than beans, such as cotton, corn, and other stalks. The machine may be arranged for pulling one or more rows at once.

Having thus described my invention, I claim—

1. The combination, with the plates K L, chain-wheels M M, and chains N N, provided with the rounded spurs  $k$   $k$ , of the clearing-roller P, hung in the adjustable frame Q beneath the plates, as herein shown and described.

2. In combination with the endless apron U and dumper V, the notched bow  $i^2$ , bail  $e^2$ , and pivoted lever  $l^2$ , turning upon the fulcrum  $k^2$ , the whole arranged as described, so that the dumper may be turned to different positions to dump the load, as specified.

3. The combination, with the dumper V, of the grated bottom  $m^2$ , the turning gate  $n^2$ , the arm  $q^2$ , chain  $s^2$ , and bar  $r^2$ , provided with the hook  $t^2$ , engaging automatically with pin  $u^2$  of wheel 8, as shown and described, and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HIRAM B. MORRISON.

Witnesses:

R. F. OSGOOD,  
I. H. GRAVES.