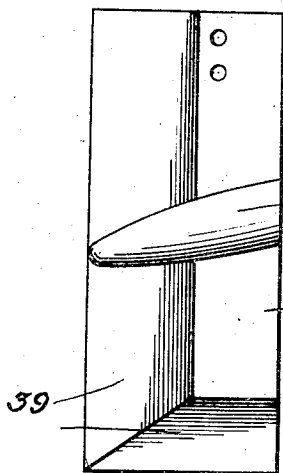
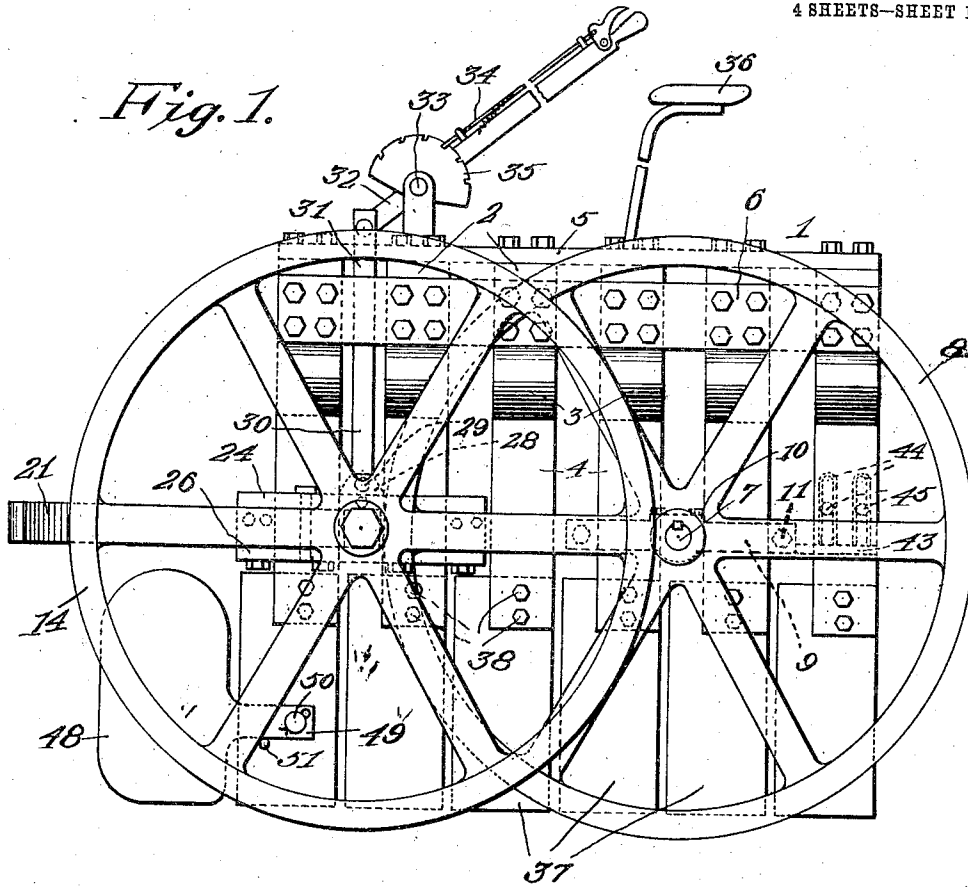


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BEET HARVESTER.
APPLICATION FILED MAR. 17, 1909.

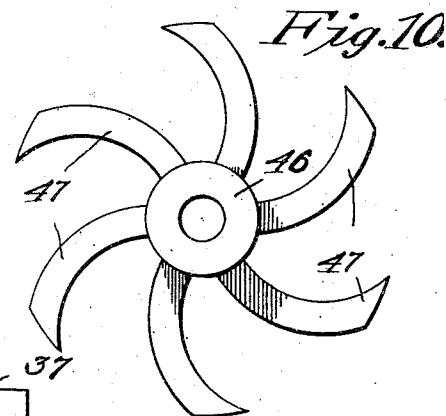
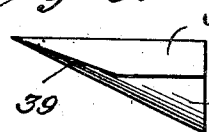
945,073.

Patented Jan. 4, 1910.
4 SHEETS—SHEET 1.



Witnesses

Fig. 9.



Inventor

William Atwood

James F. Crown
E. M. Ricketts

By

Watson E. Coleman
Attorney

W. ATWOOD.
BEET HARVESTER.
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4 SHEETS—SHEET 2.

Fig. 2.

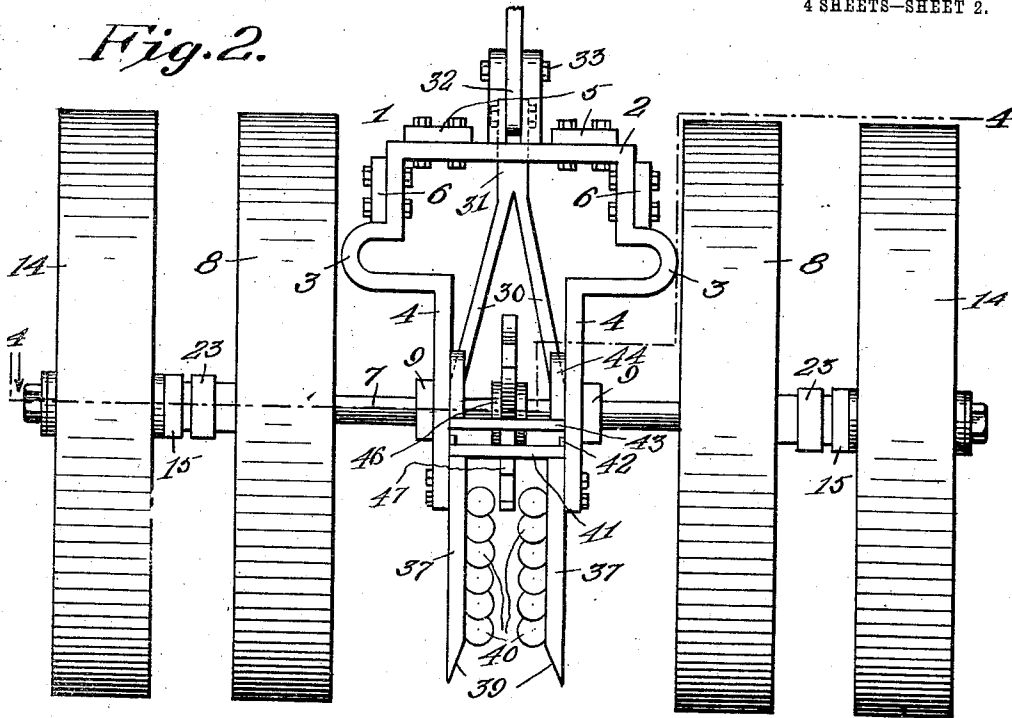


Fig. 5.

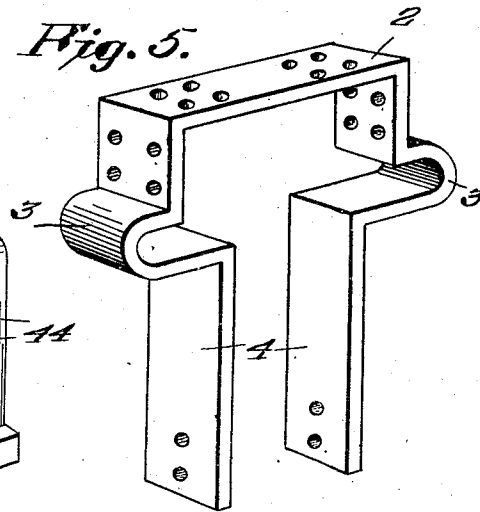
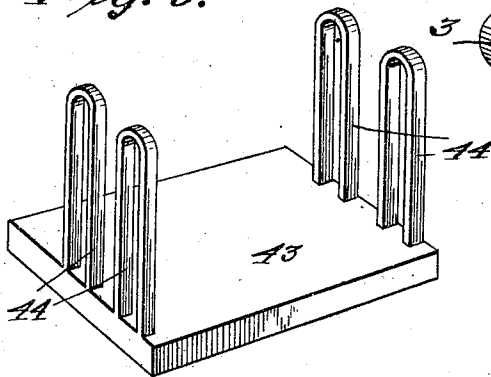


Fig. 6.



Witnesses

James F. Brown
E. M. Ricketts

Inventor

William Atwood

By

Watson E. Coleman

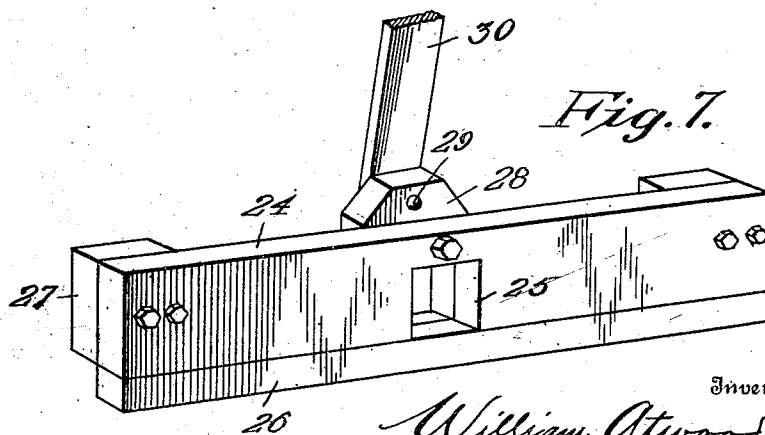
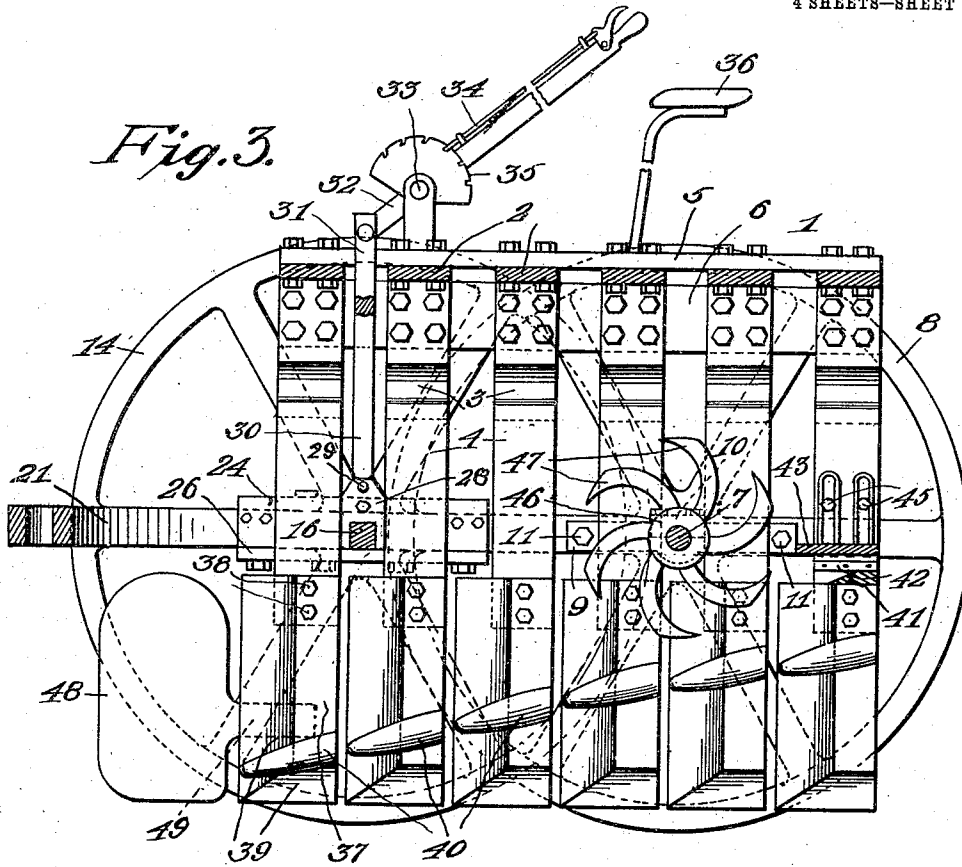
Attorney

W. ATWOOD.
BEET HARVESTER.
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4 SHEETS—SHEET 3.



Inventor

William Atwood

Witnesses

James F. Crown
E. M. Ricketts

By

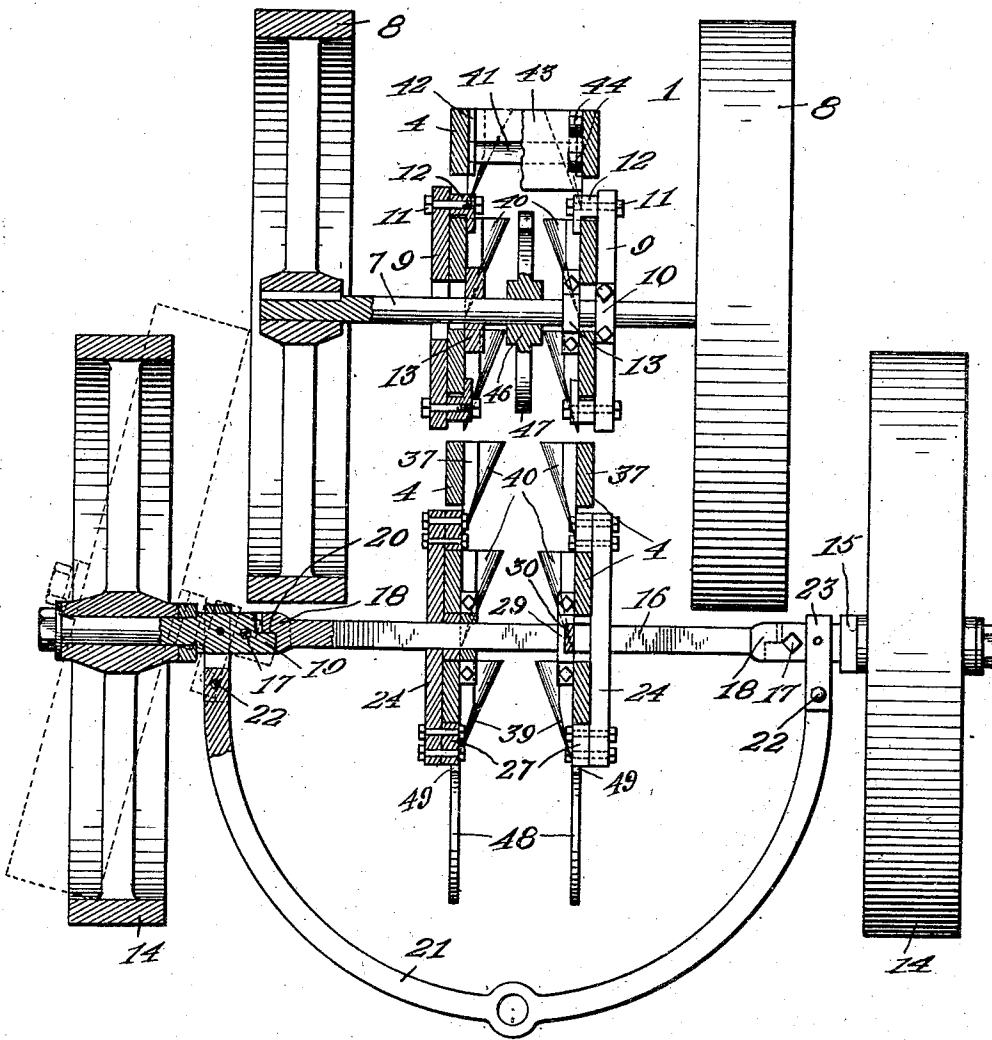
Watson E. Coleman
Attorney

945,073.

Patented Jan. 4, 1910.

4 SHEETS—SHEET 4.

Fig. 4.



Witnesses

James F. Brown
C. M. Ricketts

Inventor
William Atwood

By Watson E. Coleman
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM ATWOOD, OF LONGMONT, COLORADO.

BEET-HARVESTER.

945,073.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed March 17, 1909. Serial No. 483,968.

To all whom it may concern:

Be it known that I, WILLIAM ATWOOD, a citizen of the United States, residing at Longmont, Colorado, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Beet-Harvesters, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in beet harvesting machines.

The objects of the invention are to provide a simple and practical machine of this character which will effectively lift or pull the beets from the ground and then top them, to provide improved beet lifting devices, to provide improved means for cutting the tops off of the beets uniformly and to provide an improved frame construction for a machine of this character.

With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the improved beet harvester; Fig. 2 is a rear end elevation; Fig. 3 is a vertical longitudinal section; Fig. 4 is a horizontal section taken on the line 4—4 in Fig. 2; Fig. 5 is a perspective view of one of the frame members; Fig. 6 is a perspective view of the gage board; Fig. 7 is a detail perspective of one of the slidable supports for the front axle; Figs. 8 and 9 are side and top views of one of the blades having beet lifting ribs; and Fig. 10 is a detail view of the wheel for feeding or forcing the beet tops against the topping knife.

The invention comprises a body or frame 1 consisting, preferably, of a plurality of transverse members 2 of substantially inverted U-shaped, as shown more clearly in Fig. 5. The depending arms of the frame members 1, 2 have bent portions 3 intermediate their ends which offset their lower extremities 4. Top and side longitudinal bars 5, 6 are bolted to the upper portions of the frame members or bars 2 and fasten the same together in spaced relation, as shown in Fig. 1. Said frame is hung for vertical swinging movement from a rear axle 7 which extends between certain of the members or bars 2 and has supporting and drive wheels 8 keyed upon its ends. Said axle rotates in

bearing recesses formed in bearing bars 9 and it is retained in said bearing recesses by cap plates 10, as shown in Fig. 4. The bearing plates or bars 9 are secured to certain of the frame members and are preferably vertically adjustable thereon, whereby the rear portion of the frame may be raised or lowered with respect to the axle. This adjustment of the bearings 9 is preferably effected by securing to their ends, by means of bolts 11, clamp plates 12 which engage the depending ends 4 of certain of the members 2, as clearly shown in Fig. 4. The rear axle is prevented from shifting longitudinally in its bearings by arranging sectional stop collars 13 upon it within the frame.

The front portion of the frame 1 is supported by supporting and steering wheels 14 rotatable upon end sections 15 of a three-part sectional front axle 16. The spindle or end sections 15 of this front axle are mounted upon vertical pivot bolts 17 carried by the enlarged forked ends 18 of the intermediate section 16 of said axle. The inner pivoted ends of the axle sections 15 are recessed to provide stop projections 19 which engage stop shoulders 20 formed by recessing the forked portions 18 of the central or intermediate axle section, as clearly shown in Fig. 4 of the drawings, whereby the two end axle sections may have a limited rearward swinging movement which will permit the front wheels to be turned slightly at an angle to facilitate turning the machine around and also the steering of the machine. A curved draft bar or yoke 21 has its ends connected to the end sections of the axle and to its front central portion may be connected the team of draft animals. Said ends of the bar 21 are pivoted by vertical bolts 22 in U-shaped clips 23 arranged on the axle sections 15, as shown. The intermediate axle section 16 of the front axle is arranged in supporting plates 24 slidably mounted on the two foremost frame members or bars 2.

As clearly illustrated in Fig. 7, each of the axle supporting slides 24 is in the form of a metal plate having a central opening 25 to receive the axle section 16, which latter is square in cross section and is retained in the opening 25 by a separate strip 26 bolted or otherwise secured to the bottom edge of the plate or bar 24. Bolted to the ends of the plates 24 are stop blocks 27 which engage the edges of the two foremost members 2 to guide the axle carrying slides 24 and prevent

them from shifting laterally, as clearly shown in Fig. 4 of the drawings. Bolted to the central portions of the slides or plates 24 are blocks 28 to which latter are pivoted at 29 the arms 30 of a forked lower end of a vertically extending link 31. The upper end of the latter projects above the top of the frame and is pivoted to a hand lever 32. Said lever is fulcrumed intermediate its ends in a bracket 33 on the top of the frame 1 and carries a spring projected and hand retracted locking pawl 34 to engage a stationary segmental rack 35. The hand lever 32 projects within convenient reach of the operator who sits upon a seat 36 on the top of the frame and when it is shifted forwardly and rearwardly causes the front end of the frame to be lowered into or raised out of the ground, for a purpose presently explained.

The improved beet pulling or lifting device consists of a plurality of rectangular blades 37, bolted, as shown at 38, to the inner faces of the depending ends 4 of the frame members or bars 2 and depending therefrom, as shown. Each of the blades 37 has its front and bottom edge inwardly beveled, as shown at 39, and upon its inner face is formed an upwardly and inwardly inclined rib 40. These ribs on the several blades 37 are arranged at different distances from the bottom edges of said blades, the rib on the foremost blade being lowest and the one on the rearmost blade being the highest, whereby the several ribs will form an incline up which the beets will travel as they pass from one blade to the other. The arrangement of the lifting ribs 40 will be readily understood upon reference to Figs. 2, 3 and 4 of the drawings and it will be seen that each pair of opposing ribs will lift the beet slightly higher than the preceding pair, as the machine moves forwardly and the beet will thereby be lifted out of the ground and to the cutting or topping mechanism at the rear of the frame 1. The adjustment of the front end of the frame 1 by means of the lever 32 permits the lifting ribs to be properly positioned to effectively raise or pull the beets.

The beets are topped by a horizontally disposed cutting blade or knife 41 arranged across the tops of the two rearmost blades 37 and held thereon by cleats 42, as shown in Fig. 3 of the drawings. The front edge of said topping knife is beveled so that the beets will be effectively topped and, in order to regulate the amount cut, a suitable gage 43 is provided. Said gage, as shown in Fig. 6, is in the form of a board having slotted uprights 44 rising from its side edges to receive clamping bolts 45 which extend through the depending ends 4 of the rearmost member 2 of the frame. It will be seen, upon reference to Fig. 3, that said gage board 43 is disposed horizontally above the

topping knife and that by reason of said construction it may be adjusted vertically to regulate the degree of cut made by the topping knife. Since said gage board is stationary when adjusted, the topping of the beets will be uniform.

For the purpose of maintaining the beets in upright position and forcing or feeding them to the topping knife, I fix to the rotating rear axle 7, a feed wheel 46 consisting of a hub and a plurality of curved radially projecting arms 47 which engage the foliage or leaves of the beet and force the same rearwardly against the topping knife.

For the purpose of directing the foliage of the beets between the foremost blades 37, I provide upon the latter forwardly projecting foliage deflecting plates 48. The latter are pivotally mounted so that they can swing upwardly when they strike an obstruction and their front lower corners are rounded to facilitate the same, as will be seen upon reference to Fig. 1. Said mounting of the deflecting plates 48 is effected by providing their rear edges with arms 49 arranged upon pivot studs 50 on the foremost plates 37. The arms 49 are adapted to engage stop pins 51 which limit the downward movement of the deflecting plates 48.

In operation, as the machine is drawn forwardly by draft animals, the lowermost plates 37 which enter the ground will loosen the earth on opposite sides of the beet so that the ribs 40 on said plates will engage and lift the beet. As the machine advances, the beet will pass rearwardly between the succeeding plates 37 and will be lifted by the ribs thereon until its foliage is caught by the arms 47 of the feed wheel 46, which arms force it rearwardly beneath the gage board 43 and against the topping knife 41, which latter tops the beets uniformly.

While I have shown and described in detail the preferred embodiment of the invention, it will be understood that I do not wish to be limited to the precise construction set forth, since various changes in the form, proportion, arrangement of parts and details of construction may be resorted to without departing from the spirit and scope of the invention.

Having thus described the invention what is claimed is:

1. The combination of a wheel supported frame, and rows of blades depending from the side portions of the frame and formed on their opposing faces with inwardly extending and upwardly inclined beet lifting ribs, the ribs on each succeeding pair of oppositely disposed blades being slightly higher than those on the preceding pair, whereby a beet will be lifted out of the ground as it travels rearwardly over said ribs.

2. The combination of a wheel supported frame, rows of blades depending from the

side portions of the frame and formed on their opposing faces with inwardly extending and upwardly inclined beet lifting ribs, the ribs on each succeeding pair of oppositely disposed blades being slightly higher than those on the preceding pair, whereby a beet will be lifted out of the ground as it travels rearwardly over said ribs, and means whereby the front end of the frame may be raised or lowered.

3. The combination of a wheel supported frame, rows of blades depending from the side portions of the frame and formed on their opposing faces with inwardly extending and upwardly inclined beet lifting ribs, the ribs on each succeeding pair of oppositely disposed blades being slightly higher than those on the preceding pair, whereby a beet will be lifted out of the ground as it travels rearwardly over said ribs, and a beet topping means at the rear portion of the frame.

4. The combination of a wheel supported frame, rows of blades depending from the side portions of the frame and formed on their opposing faces with inwardly extending and upwardly inclined beet lifting ribs, the ribs on each succeeding pair of oppositely disposed blades being slightly higher than those on the preceding pair, whereby a beet will be lifted out of the ground as it travels rearwardly over said ribs, a horizontally arranged beet topping knife at the rear of the frame, a vertically adjustable gage board above said knife, a rotary feed wheel in the frame in advance of said knife, said feed wheel being actuated from the wheels of the frame and means for raising and lowering the front end of the frame.

5. The combination of a frame consisting of a plurality of inverted substantially U-shaped members united by top and side longitudinally extending bars, beet elevating means connected to the depending ends of said members, beet topping mechanism at the rear of the frame and supporting wheels for said frame.

6. In a machine of the character described, the combination with a support, of beet elevating means consisting of opposing longitudinal rows of upwardly and rearwardly extending inclines, said inclines being arranged in pairs and each succeeding pair being disposed in a plane slightly higher than those of the preceding pair, whereby a beet will be lifted out of the ground as it travels rearwardly over said inclines.

7. In a machine of the character described, the combination with a support, of beet elevating means consisting of opposing longitudinal rows of upwardly and rearwardly extending inclines, said inclines being arranged in pairs and each succeeding pair being disposed in a plane slightly higher than those of the preceding pair, whereby

a beet will be lifted out of the ground as it travels rearwardly over said inclines and means for adjusting the front end of the support vertically.

8. In a machine of the character described, the combination with a support, of beet elevating means consisting of opposing longitudinal rows of upwardly and rearwardly extending inclines, said inclines being arranged in pairs and each succeeding pair being disposed in a plane slightly higher than those of the preceding pair, whereby a beet will be lifted out of the ground as it travels rearwardly over said inclines and beet topping mechanism at the rear portion of the support.

9. The combination of a support, rows of blades carried thereby and arranged in pairs, and oppositely disposed ribs provided on the opposing faces of said blades and inclined upwardly and rearwardly, the ribs on each succeeding pair of oppositely disposed blades being slightly higher than those on the preceding pair, whereby the beet will be lifted out of the ground as it travels rearwardly over said ribs.

10. The combination of a support, rows of blades carried thereby and arranged in pairs and oppositely disposed ribs arranged on the opposing faces of said blades and inclined upwardly and rearwardly and inwardly, the ribs on each succeeding pair of oppositely disposed blades being slightly higher than those on the preceding pair, whereby a beet will be lifted out of the ground as it travels rearwardly over said ribs.

11. The combination of a wheel supported frame, beet elevating mechanism arranged thereon and including oppositely disposed inclines, a horizontally disposed stationary topping knife arranged across and above the uppermost portions of said inclines, a horizontally disposed and relatively stationary gage board arranged above said knife, a transverse shaft arranged horizontally in advance of said gage board, a rotary feed wheel upon said shaft and having a plurality of arms to engage the beets and means for rotating said shaft from the wheels of the main frame.

12. The combination of a frame consisting of a plurality of inverted substantially U-shaped members united by top and side longitudinally extending bars, beet elevating means connected to the depending ends of said members and means for supporting the frame for movement over a row of beets.

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

WILLIAM ATWOOD.

Witnesses:

C. S. MILLEN,
PEARL YOKUM.