

E. P. MOLNAU

CLEANER FOR SUGAR BEETS AND THE LIKE

FIG. 1

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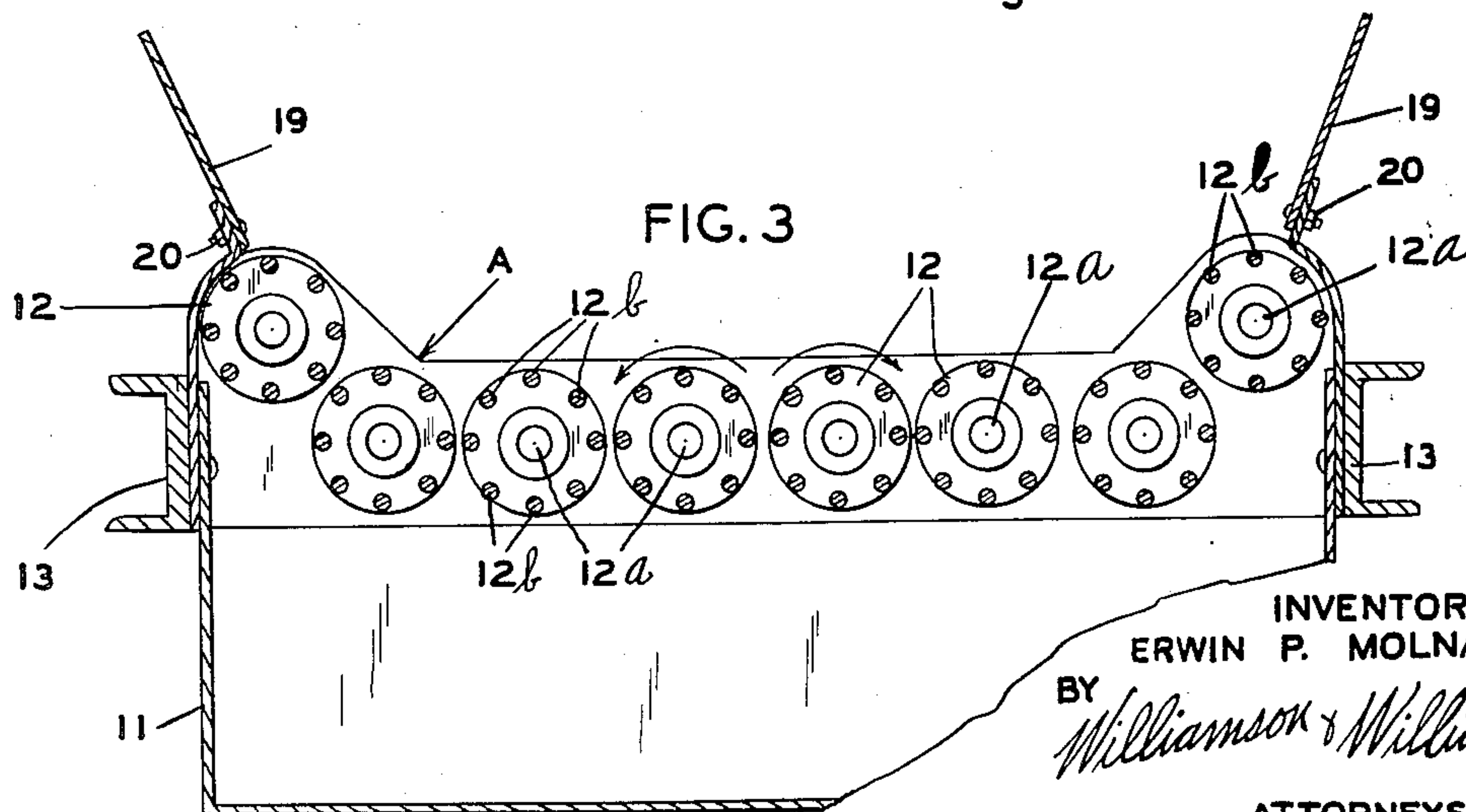
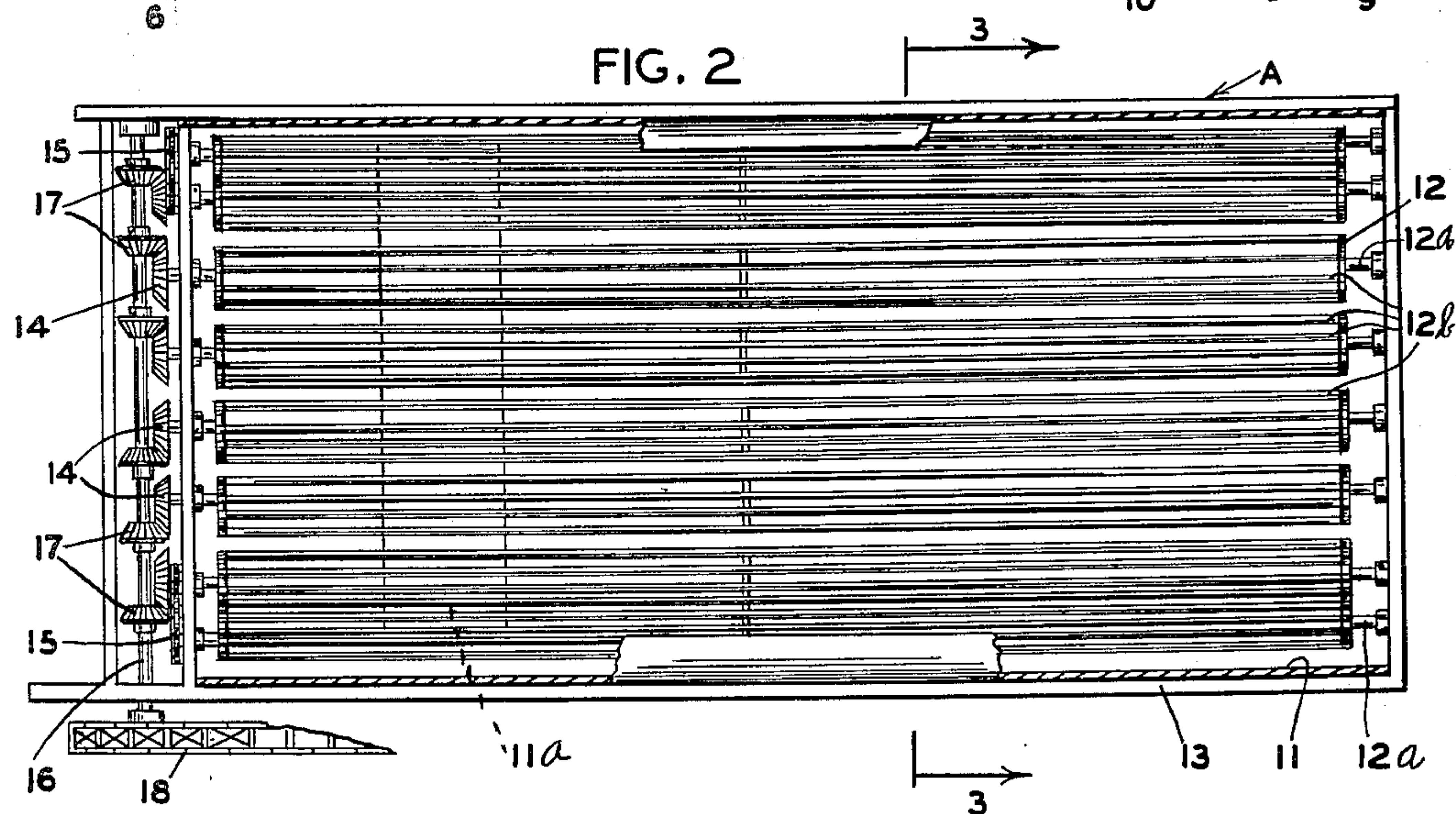
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UNITED STATES PATENT OFFICE

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CLEANER FOR SUGAR BEETS AND THE LIKE

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1 Claim. (Cl. 209—107)

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This invention relates particularly to a sugar beet cleaner.

When sugar beets are harvested, a large quantity of dirt clings to the outside thereof and materially increases the weight and displacement of the beets. Sugar beet processors are at the present time paying for beets by weight and, of course, are paying beet prices for this dirt clinging to the beets.

It is an object of my invention to provide an extremely simple, yet highly efficient, sugar beet cleaner which will remove substantially all of the dirt from the surface of the beets and separate this dirt from the beets while delivering the cleaned beets to a collection location.

It is another object to provide an inclined beet receiving foraminous bed structure formed from a plurality of closely spaced substantially parallel elongated rotating rollers provided with roughened outer surfaces whereby the beets, as they travel down the foraminous bed, are cleaned and the removed dirt separated from the beets.

It is a further object to provide a beet cleaner having an inclined foraminous bed structure formed from two sets of closely spaced substantially parallel rollers provided with roughened outer surfaces and having mechanism for rotating said sets in opposite directions to carry the beets laterally on the bed as they travel longitudinally down the incline thereof.

More specifically, it is an object to provide two sets of coplanar closely spaced substantially parallel elongated rollers, each formed from a plurality of spaced parallel rod members and having means for rotating the rollers of said sets in opposite directions to split the flow of beets as they travel down the bed and carry the beets laterally outwardly to the sides of the bed where they are spiraled downwardly and delivered to a suitable collection location.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same, or similar parts throughout the several views and in which:

Fig. 1 is an elevational diagrammatic view showing a typical conveyor arrangement with my beet cleaner mounted in the line of travel therein for unloading a truck and carrying the beets upwardly to permit discharge thereof into a suitable collection location, such as a railroad car.

Fig. 2 is a top plan view of my cleaner mechanism with portions thereof broken away; and

Fig. 3 is a transverse substantially vertical sec-

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tional view taken substantially along the line 3—3 of Fig. 2.

As illustrated in the accompanying drawings, I provide a beet cleaner adapted to be mounted in the line of flow of a beet unloader and loader conveyor mechanism to clean the beets before final discharge thereof.

Fig. 1 shows a typical producer's truck 5 in position to be dumped into a collection hopper 6 having a conveyor apron in the bottom thereof. This conveyor apron carries the beets a slight distance upwardly and delivers said beets to the inclined conveyor 7 which carries the same to the top of the supporting structure and delivers said beets on to the inclined bed of my beet cleaner, designated as an entirety by the letter A. Any suitable supporting structure may be used, such as the frame structure, designated as an entirety by the numeral 8. The beet cleaner A is disposed a sufficient distance above the ground level to permit a railroad car, such as the gondola 9, or a truck, to be positioned under the discharge end thereof to receive the flow of cleaned beets from the cleaner. The truck 10 is positioned under a dirt collecting hopper 11, which is provided in underlying relation to the cleaning bed of the cleaner A and is collecting the dirt removed from the beets to prevent accumulation thereof at the loading station.

The cleaning bed of my beet cleaner, in the form illustrated, is formed from two sets of substantially parallel elongated roller structures, each roller structure being designated as an entirety by the numeral 12. A suitable rigid supporting structure, such as the frame 13, is provided and the rollers 12, in the form illustrated, have a longitudinally disposed central shaft 12a fixed therein and this shaft is journaled at its end portions in suitable bearings mounted in the ends of frame 13. Each of the intermediate shafts 12a has a bevel gear 14 fixed thereto and the extreme lateral shafts 12a are respectively driven by suitable chain and sprocket driving connections 15. A transversely disposed drive shaft 16 is journaled in the end portions of opposed sides of frame 13. A plurality of bevel gears 17 are fixed to shaft 16 in spaced relation thereon and respectively mesh with bevel gears 14 respectively fixed on roller shafts 12a, the bevel gears 17 on opposite sides of the longitudinal center line of the bed being disposed on opposite sides of the respective bevel gears 14 to divide the rollers 12 into two sets to be rotated in opposite directions. The shaft 16 is driven from any conventional source of power by a suitable

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driving means, such as the chain and sprocket drive 18 and is driven in such a direction so that the top of each set of rollers will be traveling toward the respective sides of the bed to divide the beets at the center and carry the same outwardly toward the sides as said beets travel down said inclined bed. The shafts 12 disposed at the lateral extremities of the bed are elevated a slight distance above the line of coplanar shafts journaled in the bottom of the bed, as best shown in Fig. 3, and are respectively driven by the chain and sprocket drives 15.

A pair of upstanding retaining plates 19 which, in the form shown, are disposed in slightly diverging relation one to the other are respectively mounted along the sides of the bed and extend upwardly to prevent the beets from rolling outwardly over said sides. Each plate 19 is mounted to permit vertical adjustment thereof, as by being provided with elongated slots to receive the clamping bolts 20 therethrough. The dirt collecting hopper 11 completely underlies the foraminous bed of the cleaner to collect the dirt removed from the beets and permit the discharge thereof through the hopper opening 11a, shown by the dotted lines in Fig. 2.

Each of the rollers 12 is provided with a roughened outer surface and, in the form shown, is made from a plurality of spaced parallel rod members 12b which are respectively fixed around the shafts 12a in peripherally spaced relation and serve to intermittently engage the beets as they travel down the incline of the bed, and the impact of this intermittent engagement serves to clean substantially all of the dirt from the beets. During the operation of my cleaner, the beets are discharged onto the top portion of the inclined bed and the two sets of rollers travel in opposite directions toward the respective sides of the bed, splitting the flow of beets at the center of the bed and carrying said beets outwardly toward said sides. As the beets collect along the sides in their travel downwardly longitudinally of the bed, they are spiraled one over the other and the force of impact of the rods 12b against the beets combines with the force of impact of the beets, one against the other, in the removal of the dirt. The cleaned beets are discharged from the lower end of the bed and the dirt is discharged through the opening 11a in the bottom of the hopper 11.

It will be seen that I have provided an extremely simple beet cleaner particularly adapted for efficient cleaning of sugar beets to remove the dirt therefrom, which cleaner embodies the combination of a plurality of elongated rollers having roughened outer surfaces and divided into two oppositely rotating sets to carry the beets outwardly to the sides of the bed during their longitudinal travel down the bed. My cleaning

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device is particularly adapted to be interposed into a conveyor mechanism to receive the beets at one end thereof and longitudinally carry the beets in the line of conveyor travel to discharge the same at the other end thereof. By collecting the beets at the sides of the bed, the impact of the beets one against the other is combined with the impact of the beets against the rods of the rollers to provide a highly efficient cleaning operation.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention.

What I claim is:

Cleaning apparatus for removing dirt and other material from the outside of sugar beets and the like, said apparatus having in combination a supporting structure, an inclined cleaning bed mounted on said structure and adapted to receive articles to be cleaned at the upper end thereof and to discharge the cleaned articles at the lower end thereof, said cleaning bed comprising a plurality of parallel cleaning rollers spaced apart the same distance at the top as at the bottom and each roller including a plurality of spaced parallel rod-like members mounted around the periphery thereof, driving mechanism connected with each roller for rotating the rollers on one side of the longitudinal center line of the bed in one direction and the rollers on the other side of said bed in the other direction to divide said bed into two sets of rollers, the direction of rotation of said sets being such that the upper portions of the rollers travel away from said center line to carry the articles outwardly toward the side edges of the bed, all of said rollers being of equal outside diameter and the extreme side rollers revolving on axes disposed above the axes of the other rollers, the axes of the remaining rollers all lying in the same inclined plane.

ERWIN P. MOLNAU.

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