

W. DALTON & J. H. CLEMENTS, JR.

DITCH FILLING MECHANISM.

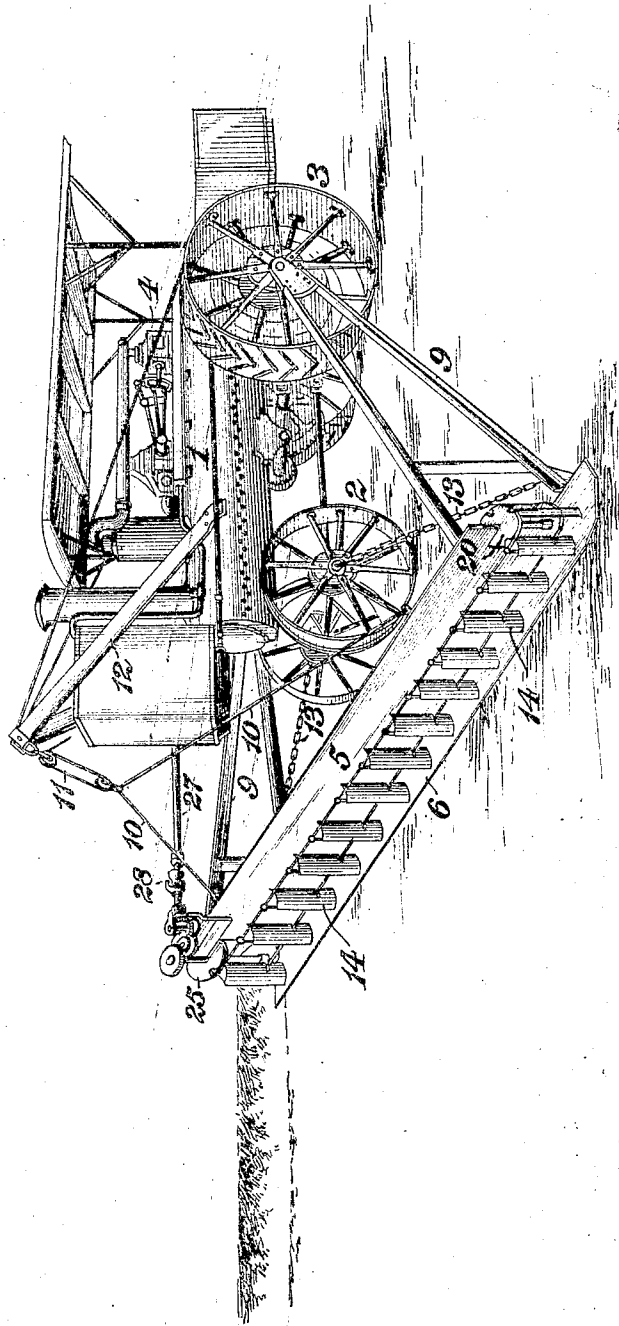
APPLICATION FILED NOV. 18, 1908.

918,016.

Patented Apr. 13, 1909.

5 SHEETS—SHEET 1.

FIG. 1.



WITNESSES

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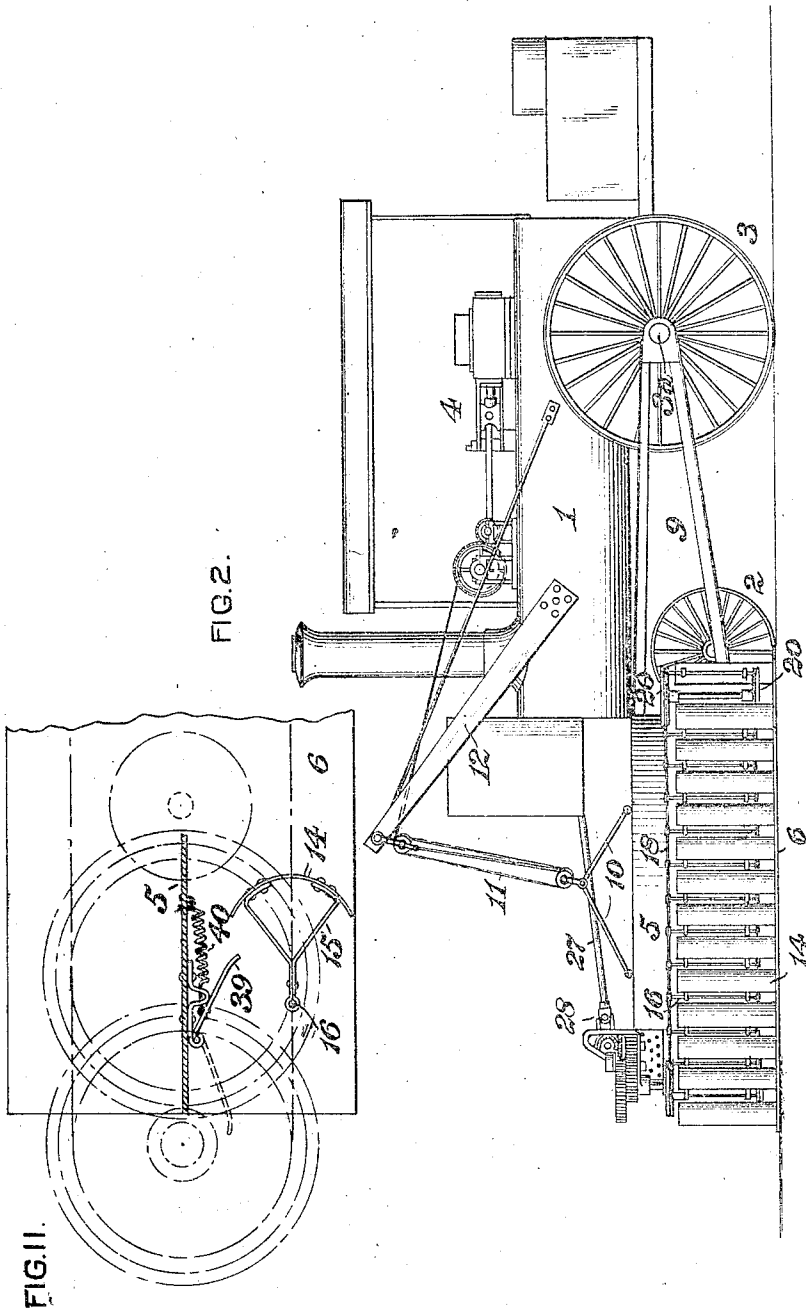


FIG. 11.

FIG. 2.

WITNESSES

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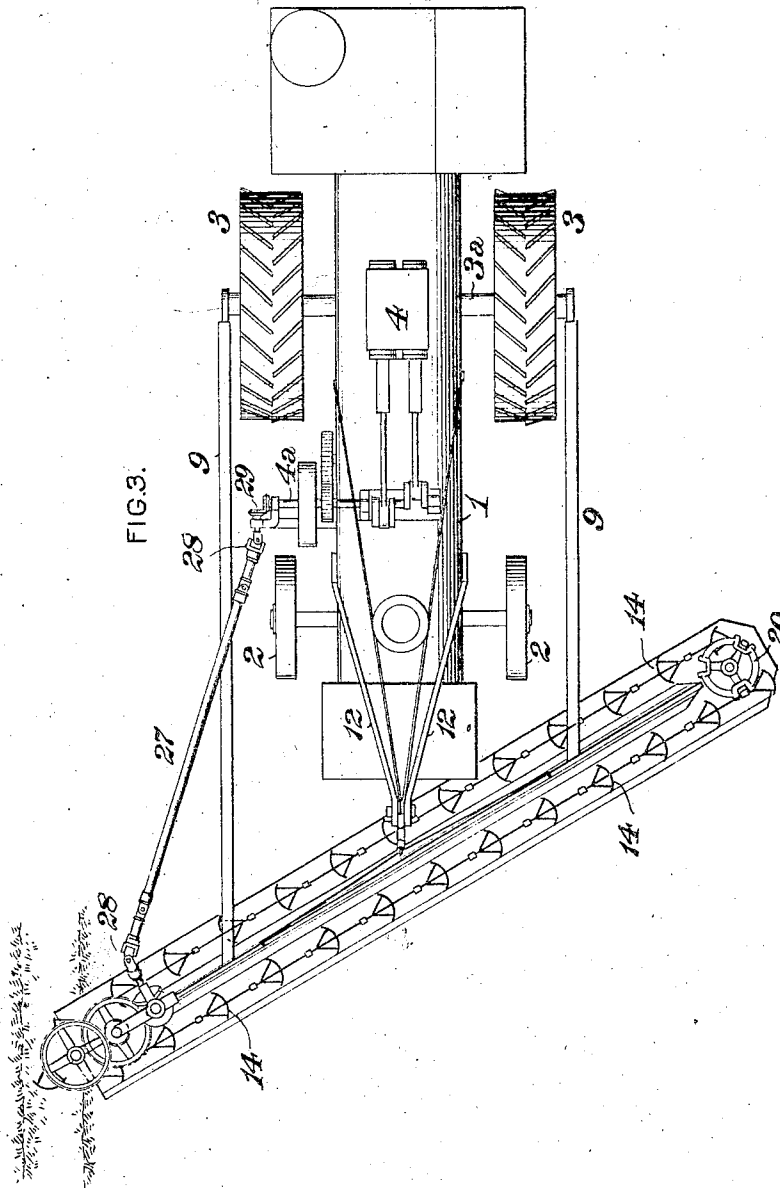
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5 SHEETS—SHEET 3.



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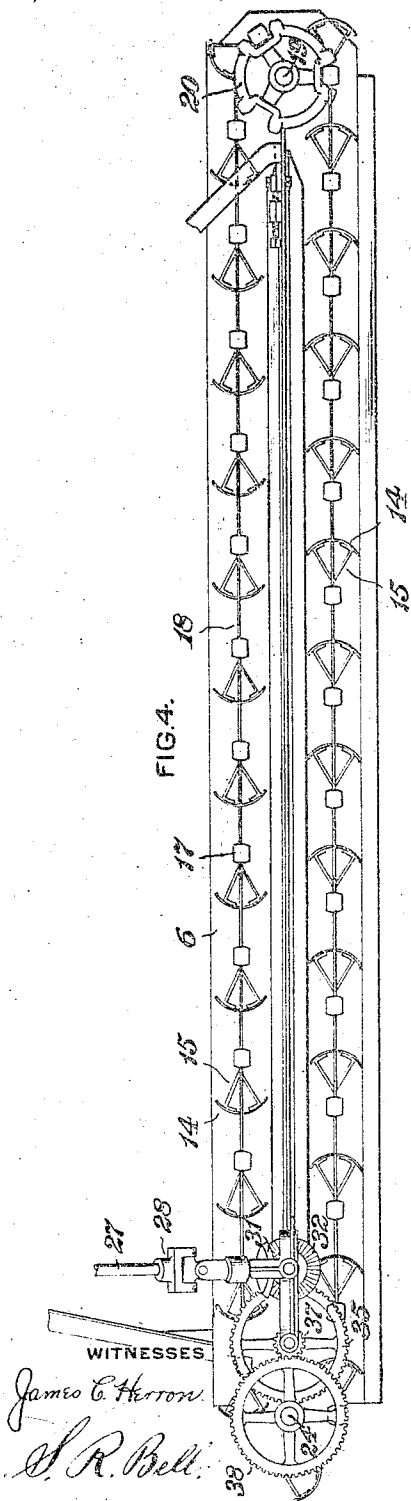
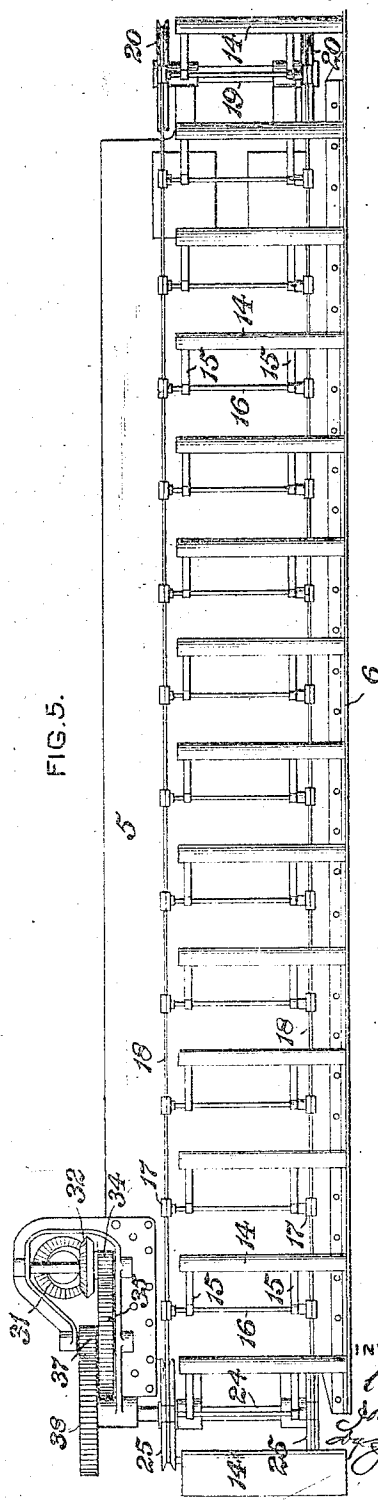
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5 SHEETS—SHEET 4.



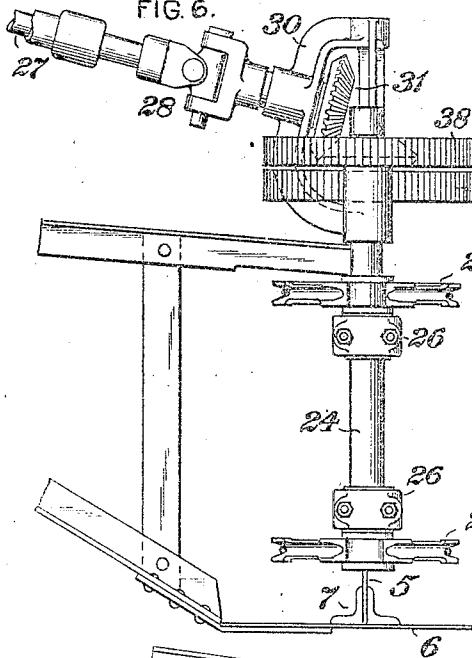
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FIG. 6.



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5 SHEETS—SHEET 5.

FIG. 7.

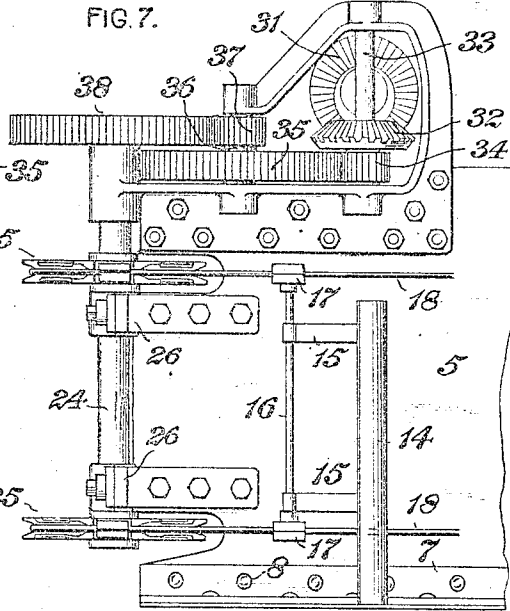


FIG. 8.

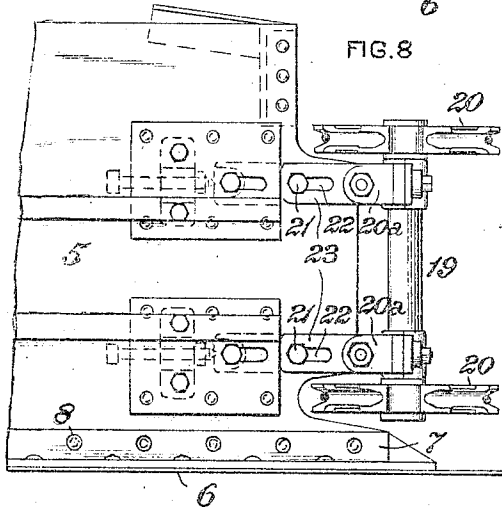


FIG. 9.

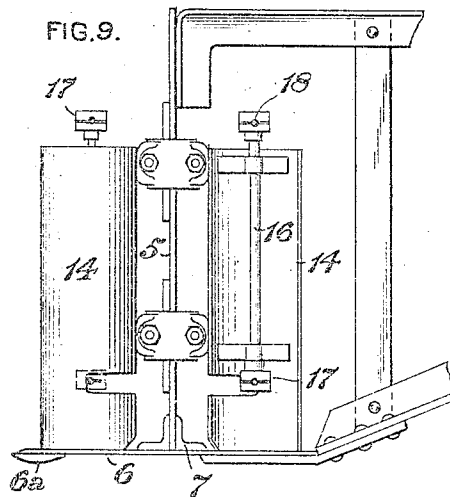
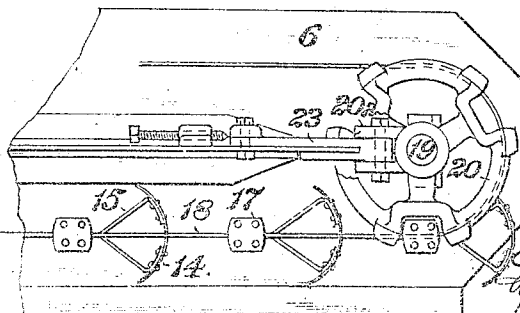


FIG. 10.



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UNITED STATES PATENT OFFICE.

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DITCH-FILLING MECHANISM.

No. 918,016.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed November 18, 1908. Serial No. 463,153.

To all whom it may concern:

Be it known that we, WILLIAM DALTON and JOSEPH H. CLEMENTS, JR., both of Schenectady, in the county of Schenectady and State of New York, have jointly invented a certain new and useful Improvement in Ditch-Filling Mechanism, of which improvement the following is a specification.

The object of our invention is to provide simple and effective mechanical means whereby the earth which has been excavated from ditches or trenches may be expeditiously replaced therein when required, thereby reducing the time and expense involved in performing the operation by hand labor in the manner ordinarily heretofore practiced.

The improvement claimed is hereinafter fully set forth.

Contractors engaged in digging trenches for water or gas pipes or other conductors, and ditches which require to be subsequently refilled, are now extensively using excavating machines for this purpose, which effect a substantial economy as compared with hand labor. These machines deposit the excavated earth alongside of the trench, in a pile which extends for the full length thereof, and which may be ten feet wide or thereabout at its base. After the pipe has been laid in the trench, the latter must be refilled with earth from this pile, and, so far as our knowledge and information extend, this operation has heretofore been performed by hand labor; no mechanical device having been proposed or found available for this purpose.

Our invention, generally stated, consists in a ditch filling mechanism comprising a motor vehicle, as an ordinary traction engine, and a scraper located in advance thereof and supported adjustably thereon; also, a motor vehicle, a scraper and conveyer located in advance thereof, connections supporting the scraper and conveyer on the motor vehicle, and mechanism actuated by the motor of the vehicle for operating the conveyer.

In the accompanying drawings: Figure 1 is a view, in perspective, of an apparatus for filling ditches or trenches, illustrating an application of our invention: Fig. 2, a side view, in elevation, of the same: Fig. 3, a plan or top view: Fig. 4, a similar view, on an enlarged scale, of the scraping and conveying mechanism detached: Fig. 5, a front view of the same: Fig. 6, an end view, on a further

enlarged scale, of the same, looking toward the right hand side of the apparatus: Fig. 7, a front view of the right hand end portion of the same: Fig. 8, a similar view of the left hand end portion of the same: Fig. 9, an end view of the same, looking toward the left hand side of the apparatus: Fig. 10, a plan or top view of the left hand end portion of the same: and; Fig. 11, a plan view of a jarring device for clearing material from the conveyer blades.

In the practice of our invention, we provide a suitable motor vehicle, which is herein illustrated as in the form of an ordinary traction engine, having a boiler, 1, mounted on a pair of front supporting wheels, 2, and a pair of rear driving wheels, 3, which latter are fixed upon an axle, 3^a, rotated by a double cylinder engine, 4, set upon the top of the boiler, through proper connections, in any suitable known manner. As the specific construction of the motor vehicle does not, in and of itself, form part of our present invention, and as various forms of motor vehicles adapted to use therein are familiar to those skilled in the art, this apparatus need not be herein fully and at length set forth.

A scraper or plow, composed of a vertical plate, 5, of stout metal, and a horizontal plate, 6, of metal, secured to the vertical plate by angles, 7, and rivets, 8, and having a knife edged stiffening piece, 6^a, fixed to its forward side, is located in front of, and at an angle to the longitudinal central plane of the motor vehicle, as most clearly indicated in Figs. 1 and 3, and is supported thereon by frames, 9, which are rigidly secured, at their forward ends, to the plates of the scraper, and are journaled at their rear ends, on bearings located in line axially on the motor vehicle, said bearings being, in this instance, shown as formed on the ends of the driving axle, 3^a, thereof. The scraper is likewise supported, and its height above the ground level adjusted as desired, by means of rods, 10, the lower ends of which are connected to the vertical plate, 5, of the scraper, toward the extremities thereof, and the upper ends of which are connected, through a pulley block and tackle hoist mechanism, 11, to arms or brackets, 12, fixed upon the motor vehicle. Through the connections above described, the scraper may be raised and lowered, to vary its height as desired, either manually or by the actuation of the hoist mechanism, 11, by the engine of the motor vehicle. In order to afford additional

support to the scraper, it may also be connected by chains, 13, to the fixed axle of the front supporting wheels, 2, of the motor vehicle. By reason of the inclination of the scraper or plow, relatively to the line of traverse of the motor vehicle, it will be seen that it will displace the earth from the pile in advance of it, and move the same, in the manner of a plow, toward its right hand end, which is that nearer the ditch or trench, as the motor vehicle is moved forward.

To promote and expedite the action of the scraper, as a plow, upon the pile of earth to be moved, we preferably provide it with a suitable transfer mechanism which is herein shown as a "flight" conveyer, comprising a plurality of vertical sheet metal blades or buckets, 14, of segmental section, connected to form an endless chain, traversing on opposite sides of the vertical plate, 5, of the scraper, with the concave sides of the buckets turned in the direction of, and moving toward, the right hand end of the plate, on the front side thereof. The buckets, 14, are connected, near their upper and lower ends, by metal arms, 15, to vertical rods, 16, having blocks 17, made in two sections, fixed to their upper and lower ends, and the blocks of the several rods are flexibly connected one to another, as by wire ropes, 18, so as to form an endless chain conveyer. A guide shaft, 19, having sprocket wheels, 20, fixed upon it in line horizontally with the upper and lower blocks, 17, of the rods, 16, is journaled in bearings, 20^a, connected to the left hand end of the vertical plate, 5, of the scraper, and in order to admit of taking up slack in the chain conveyer, said bearings are secured adjustably to the plate, 5, by means of bolts, 21, passing through longitudinal slots, 22, in plates, 23, fixed to the bearings. A driving shaft, 24, on which are secured sprocket wheels, 25, located in the same horizontal planes as the sprocket wheels, 20, is journaled in bearings 26, at the right hand end of the vertical plate, 5. The upper and lower blocks, 17, of the rods, 16, engage the recesses of the correspondingly located sprocket wheels, 20 and 25, around which the conveyer traverses from left to right on the forward side of the plate, 5, and in the reverse direction on the rear side thereof.

Rotation is imparted to the conveyer driving shaft, 24, in direction proper to effect the traverse of the chain conveyer as above stated, by the engine, 4, of the motor vehicle, through a flexible shaft, 27, provided with a universal joint, 28, near each of its ends, and rotated through a pair of bevel gears, 29, by the crank shaft 4^a, of the engine. The end of the flexible shaft, 27, adjacent to the conveyer, is journaled in a bearing, 30, fixed to the vertical plate, 5, and carries a bevel gear, 31, by which the driving shaft, 24, is rotated,

through intermediate gearing provided for the purpose of reducing the speed of the shaft, 24, relatively to that of the engine. In the instance shown, said intermediate gearing comprises a bevel gear, 32, fixed upon a vertical shaft, 27; a spur pinion, 34, also fixed upon the shaft, 33, and engaging a similar gear, 35, on another vertical shaft, 36, also journaled on the plate, 5; and a spur pinion, 37, fixed on the shaft, 36, and engaging a similar gear, 38, on the upper end of the conveyer driving shaft, 24. The double reduction of speed effected by the intermediate gearing, enables the conveyer to be moved to the proper rate of speed for moving the material along the scraper, while the engine is operated at the normal comparatively high speed for which it is designed.

In order to detach from the buckets or blades of the conveyer any material which may adhere to them, we provide, near the right hand or delivery end of the conveyer, a jarring or clearing appliance of any suitable and preferred construction, one form of which is shown in Fig. 11, and consists of an arm, 39, pivoted at one end to the vertical plate, 5, of the scraper, and projecting therefrom into the path of the buckets, 14, each of which strikes it in its traverse and swings it upon its pivot sufficiently far to permit the bucket to pass it, after which it is returned by a spring, 40, to its original position, in readiness to be struck by the next succeeding bucket. The jarring of the bucket caused by its contact with the arm, 39, will cause any clayey or other adhesive matter which may attach itself to the buckets to be detached and drop therefrom.

We do not limit ourselves to the specific construction of conveyer herein exemplified, as it will be obvious to those skilled in the art, that other suitable known forms, as for example, a screw conveyer, would be the mechanical equivalents thereof, and could be substituted therefor, without departure from the spirit of our invention.

We claim as our invention and desire to secure by Letters Patent:

1. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof, frames secured at their forward ends to the scraper and journaled at their rear ends on the motor vehicle, and means for raising and lowering the scraper.

2. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof, frames secured at their forward ends to the scraper and journaled at their rear ends on the motor vehicle, and a hoist mechanism connected to the scraper and operable by the motor of the vehicle.

3. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and comprising a horizontal plate and a vertical plate rigidly con-

nected thereto, and means for supporting said scraper adjustably on the motor vehicle.

4. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and comprising a horizontal plate and a vertical plate rigidly connected thereto, frames secured at their forward ends to said plates and journaled at their rear ends on the motor vehicle, and means for raising and lowering the scraper.

5. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and supported adjustably thereon, a conveyer mounted on the scraper, and means for actuating the conveyer by the motor of the vehicle.

6. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and supported adjustably thereon, a conveyer mounted on the scraper, a shaft provided with universal joints and rotated by the motor of the vehicle, and gearing connecting said shaft with the conveyer.

7. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and supported adjustably thereon, a conveyer mounted on the scraper, a shaft provided with universal joints and rotated by the motor of the vehicle, and gearing through which the conveyer is actuated by said shaft at a reduced rate of speed relatively to that of the motor of the vehicle.

8. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and comprising a horizontal plate and a vertical plate rigidly connected thereto, a conveyer comprising an endless chain of blades or buckets fitted to traverse longitudinally on opposite sides of the vertical plate of the scraper, and means for actuating the conveyer by the motor of the vehicle.

9. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and comprising a horizontal plate and a vertical plate rigidly connected thereto, a driving shaft and a guide shaft journaled in bearings on the vertical plate of the scraper adjacent to the opposite ends thereof respectively, sprocket wheels

fixed on said shafts, a conveyer comprising an endless chain of blades or buckets passing around said sprocket wheels, and means for rotating the driving shaft by the motor of the vehicle.

10. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and comprising a horizontal plate and a vertical plate rigidly connected thereto, a driving shaft and a guide shaft journaled in bearings on the vertical plate of the scraper adjacent to the opposite ends thereof respectively, sprocket wheels fixed on said shafts, a conveyer comprising an endless chain of blades or buckets passing around said sprocket wheels, and means for adjusting the bearings of the guide shaft longitudinally on the vertical plate of the scraper.

11. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and comprising a horizontal plate and a vertical plate rigidly connected thereto, a conveyer comprising an endless chain of blades or buckets fitted to traverse longitudinally on opposite sides of the vertical plate of the scraper, means for actuating the conveyer by the motor of the vehicle, and a jarring device for dislodging material from the conveyer blades in their traverse toward the delivery end of the conveyer.

12. In a ditch filling mechanism, the combination of a motor vehicle, a scraper located in advance thereof and comprising a horizontal plate and a vertical plate rigidly connected thereto, a driving shaft and a guide shaft journaled in bearings on the vertical plate of the scraper adjacent to the opposite ends thereof respectively, sprocket wheels fixed on said shafts, a conveyer comprising an endless chain of blades or buckets passing around said sprocket wheels, a shaft provided with universal joints and rotated by the motor of the vehicle, and gearing connecting said shaft with the driving shaft on the vertical plate.

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Witnesses:

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