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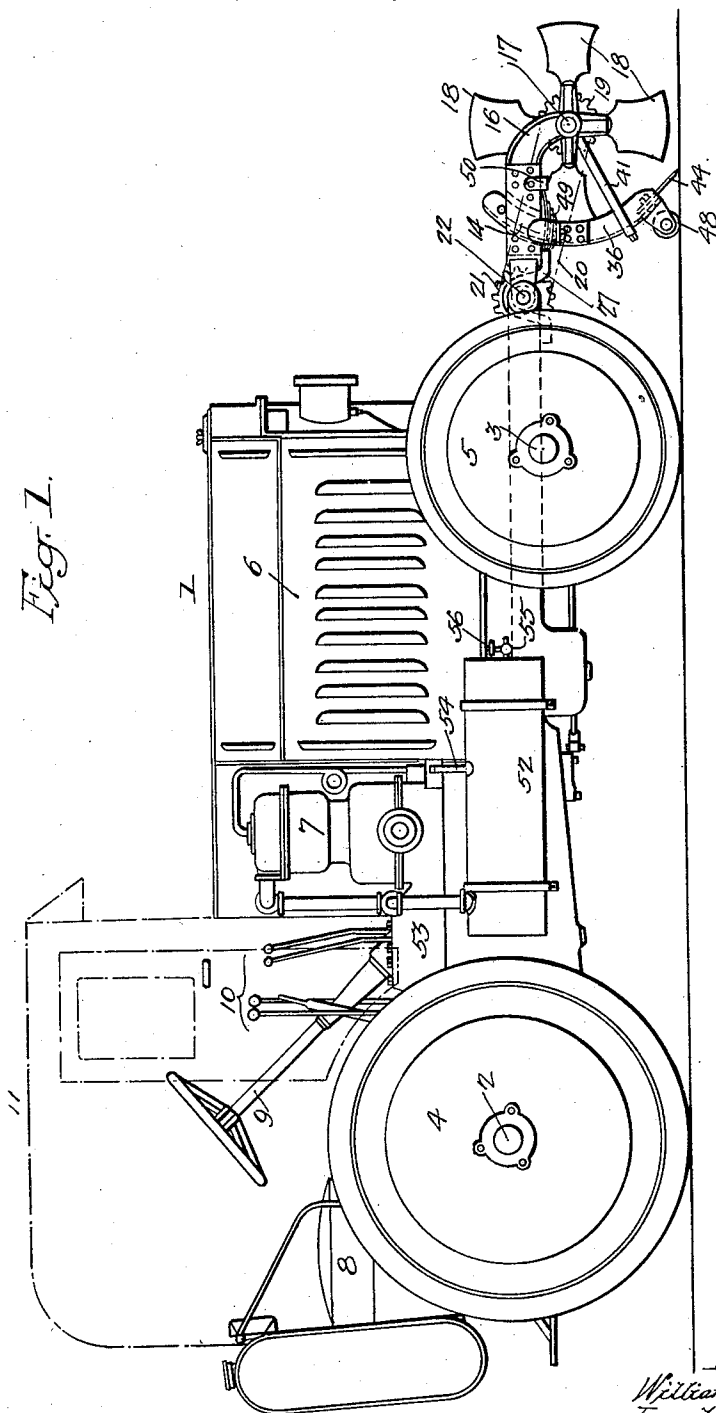
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DITCH FILLING MACHINE

Filed March 6, 1930

4 Sheets-Sheet 1



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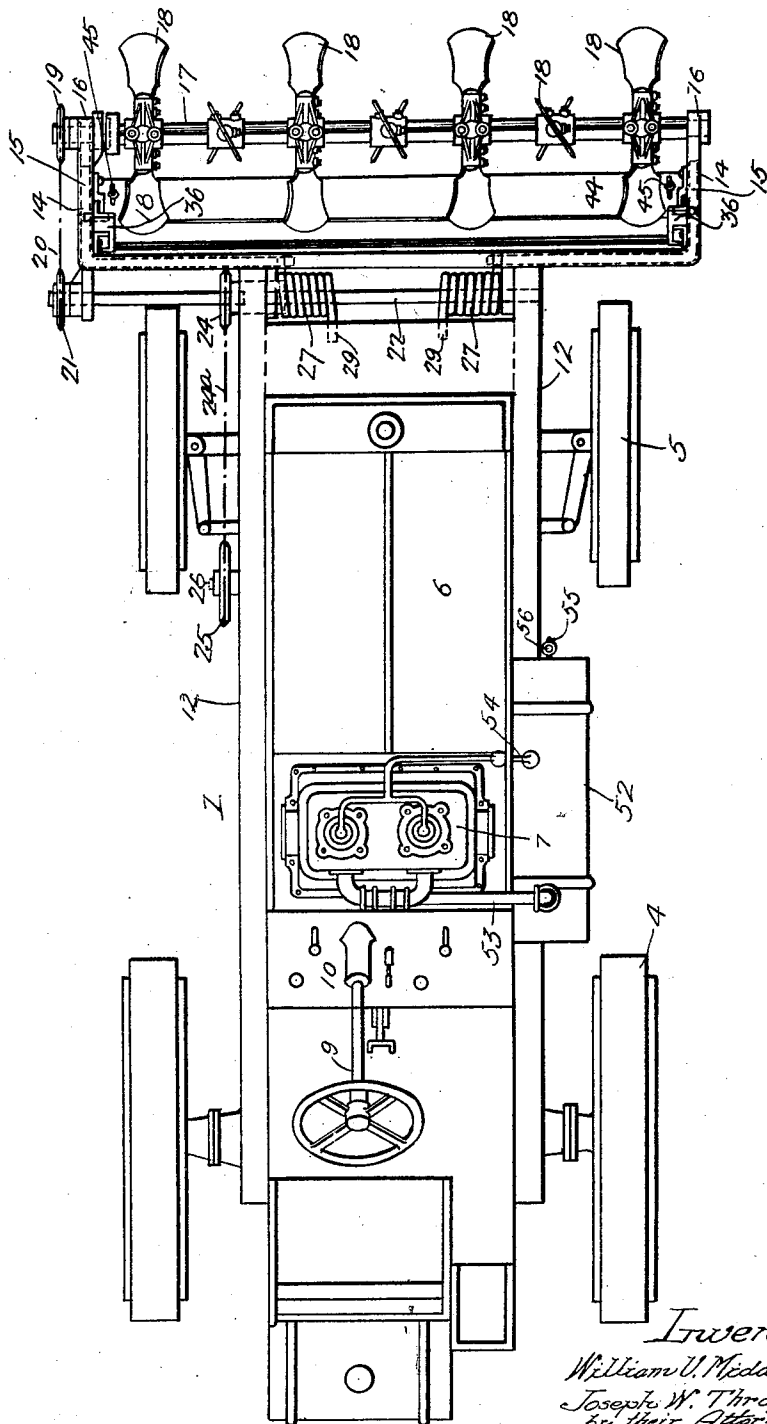
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Fig. 2.



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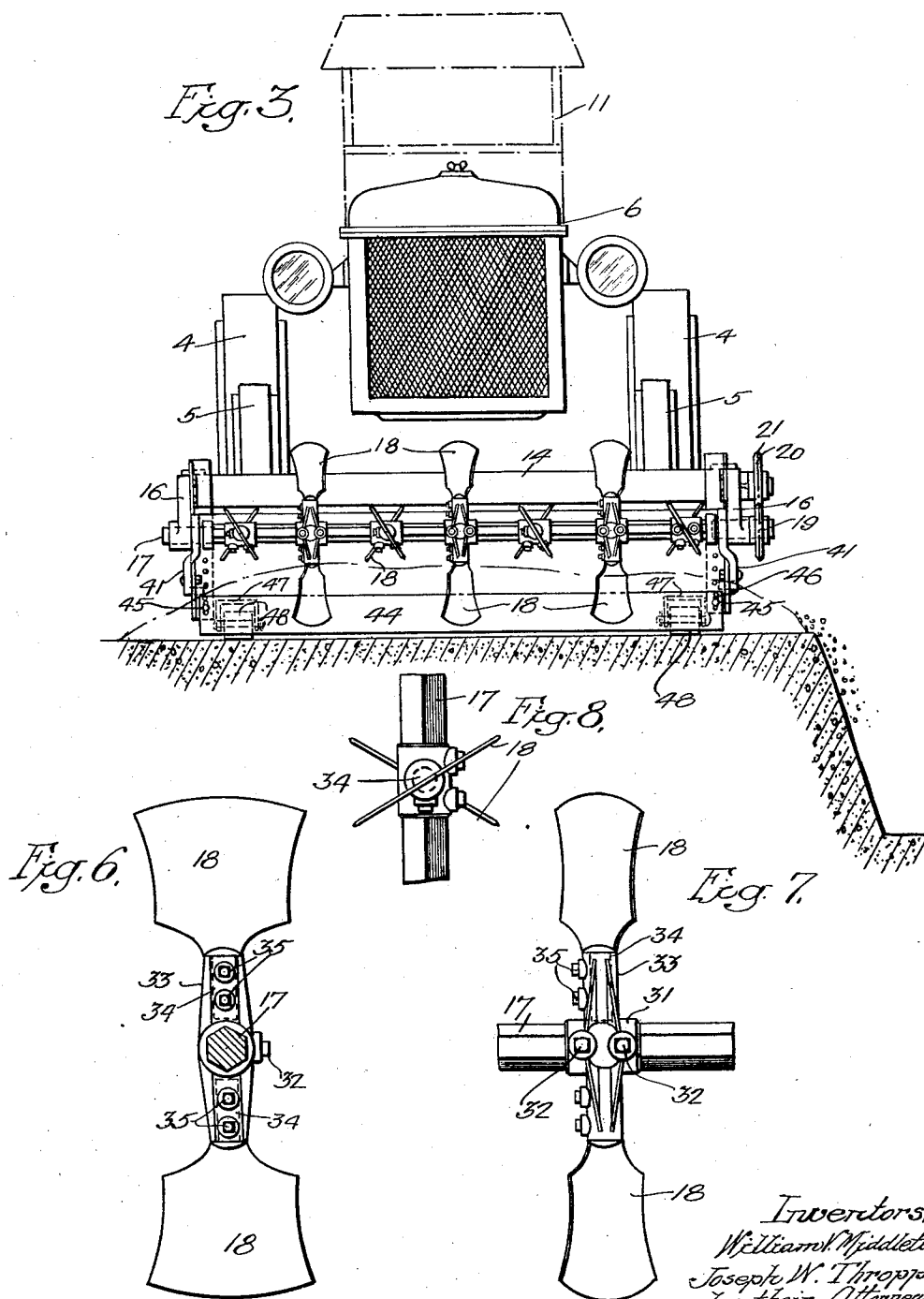
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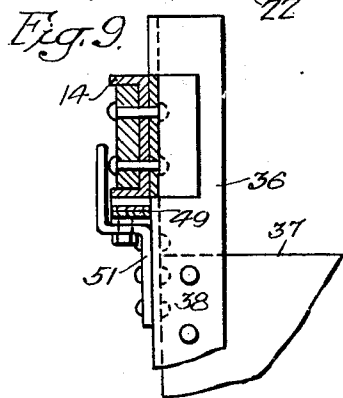
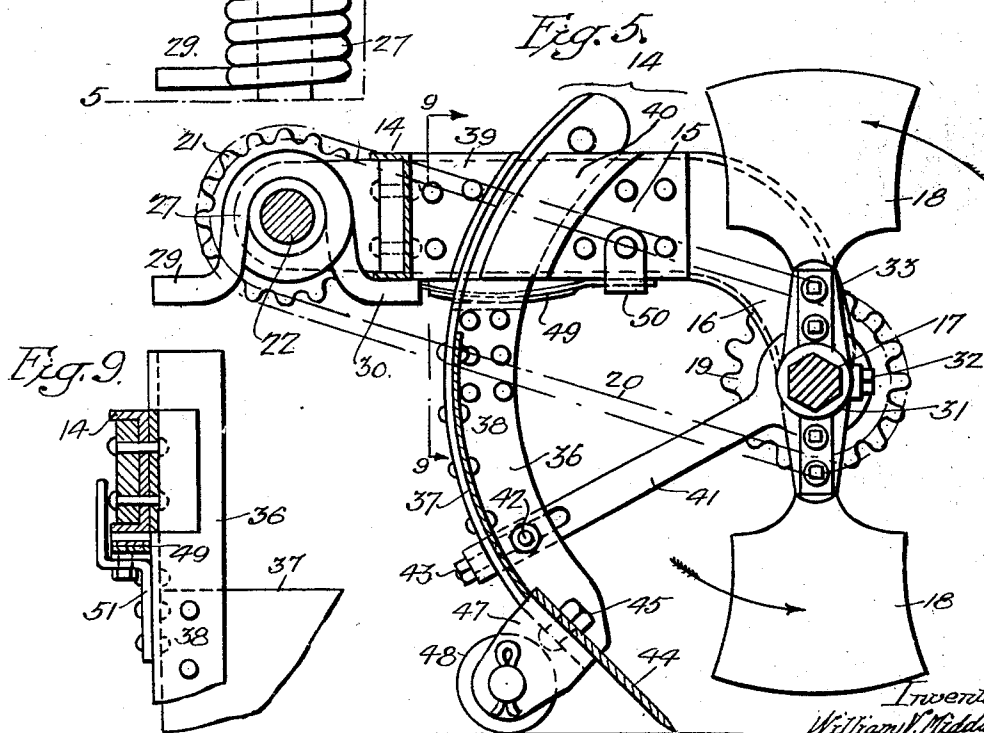
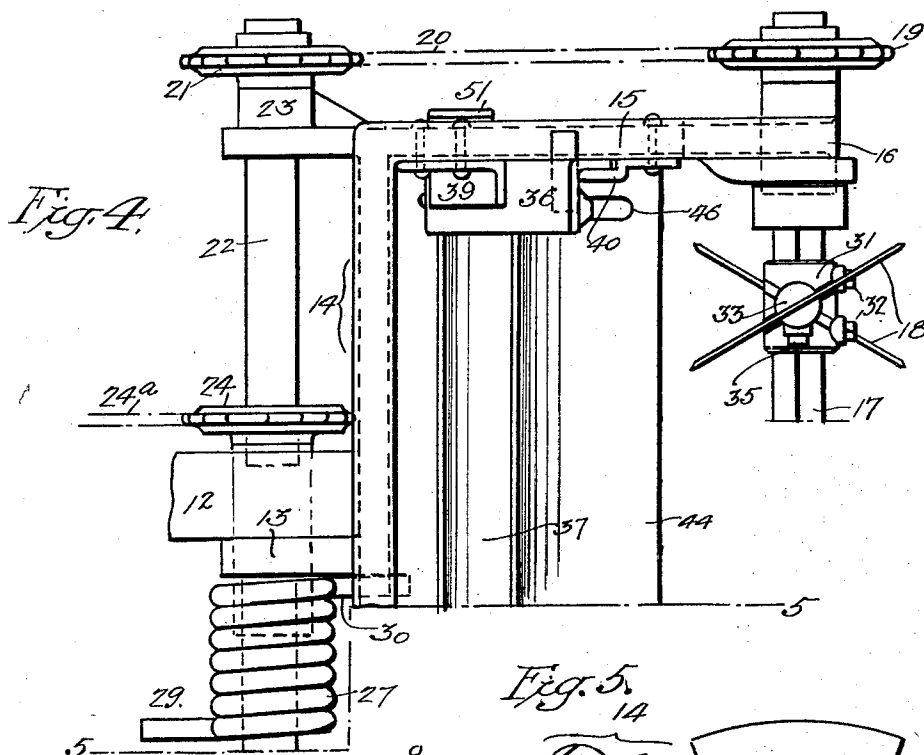
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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DITCH-FILLING MACHINE

Application filed March 6, 1930. Serial No. 433,652.

Our invention relates to certain improvements in machines for filling ditches after the ditch has been dug and pipes or conduits have been located therein. Machines of this type travel along the one edge of the ditch and cut into the bank of earth and carry the earth transversely and discharge the earth into the ditch. The ditch is then tamped by hand or independent power mechanism.

One object of our invention is to provide a ditch-filling machine with an air compressor, so that as the ditch is being filled with earth, the air-driven tamping machines can follow and tamp the earth to the desired extent.

Another object of the invention is to provide the scraper with rollers which travel on the surface of the earth and prevent the scraper cutting into the surface of the earth, the scraper yielding when the rollers pass over uneven ground.

A further object of the invention is to provide a movable conveyer extending parallel with the scraper.

A still further object is to provide the conveyer with adjustable blades, the angular pitch of which can be altered with respect to the longitudinal axis of the rotatable shaft.

And a still further object of the invention is to counterbalance the scraping and conveying mechanism and to arrange the countershaft, through which the conveyer is driven, parallel with the center line of the axis of the pivots of the frame which carry the conveyer, so that the conveyer can be raised and lowered without disturbing the driving mechanism.

In the accompanying drawings:

Fig. 1 is a side view of our improved ditch-filling machine;

Fig. 2 is a plan view;

Fig. 3 is a front view;

Fig. 4 is an enlarged plan view of one end of the machine, illustrating the frame carrying the conveyer and the scraper;

Fig. 5 is a sectional view on the line 5—5, Fig. 4;

Figs. 6, 7 and 8 are detail views of the ad-

justable blades of the conveyer; and Fig. 9 is a sectional view on the line 9—9, Fig. 5.

1 illustrates one type of an automotive device, such as a tractor, to which our invention can be applied. This tractor has axles 2 and 3, on which are mounted wheels 4 and 5, respectively. The engine of the tractor is located within the casing 6 and back of this casing is an air compressor 7 of any suitable type. 8 is the operator's seat and 9 is the steering wheel. 10 are the operating levers which are within reach of the operator, and which control the several mechanisms of the tractor. The operator's seat, as well as the steering wheel and operating levers, may be located within a cab 11, shown by dotted lines in Fig. 1.

Pivoted to the front end of the frame 12 of the tractor is a frame 14 having side arms 15, provided with bearings 16 for the shaft 17, on which are mounted the blades 18 of the conveyer. 19 is a sprocket-wheel, around which passes a drive-chain 20 from a sprocket-wheel 21 on a counter-shaft 22, which is on a line with the pivots 13 for the frame 14. This countershaft 22 is adapted to bearing 23 at the rear of the frame 14, and on this counter-shaft 22 is a sprocket-wheel 24, around which passes a drive-chain 24a from a sprocket-wheel 25. Geared to the mechanism of the engine of the tractor, and between the shaft 26, carrying sprocket-wheel 25, and the engine mechanism, is a reduction unit of any suitable form. This reduction is not shown in the present instance.

In order to counterbalance to a certain extent the overhanging frame 14 carrying the conveyer and the scraper, two coil-springs 27 are mounted on the pivot-shaft 22, which extends from one bearing 13 to the other. One end 29 of each spring extends under the frame 12 of the tractor, while the other end 30 of the spring extends under the frame 14 carrying the conveyer and scraper.

In some instances in place of the two springs shown, a single spring may be used, but we prefer the two-spring construction illustrated. The conveyer-shaft 17 in the present instance is hexagonal in cross-section, and mounted on the shaft are hubs 31 which

carry the blades 18. These hubs can be adjusted longitudinally of the shaft 17 and secured to the position in which they are adjusted by set-screws 32. On the hubs are arms 33 having sockets for the shanks 34 of the blades 18, and these blades can be adjusted in the arms to any angle desired and held in the adjusted position by set screws 35 (see Figs. 6, 7 and 8). By this construction the angular pitch of the blades of the conveyer can be altered in respect to the longitudinal axis of the shaft and the blades can be spaced on the shaft at any distance apart desired. The propeller shaft is driven in the direction indicated by the arrows in Fig. 5, so that stones and other coarse material will be carried away from the blade of the scraper. By this method of driving, the stones in the earth are not wedged in between the blades of the conveyer and scraper, as the tendency is to churn the stones in the soft excavated material. By making the blades adjustable, they can be turned so as to feed material either to the right or to the left of the machine, without changing the direction of the rotation of the shaft.

36 is a scraper located directly back of the conveyer and this scraper consists of a curved blade 37 and two curved angle bars 38, the blade being riveted to the one flange of each angle bar as shown. The angle bars extend beyond the upper edge of the curved blade 37 and slide in ways on the side arms 15 of the frame. The curve of the side arms and the blade 37 is on a radius taken from the center of the shaft 17 as a pivot, and the guide-ways formed by two angle-blades 39 and 40 are secured to the side arms 15 of the frame 14. The flange of the angle bar 39 rests against the guide angle of the bars 38, while the blade 40 overlaps the flat portion of the angle bars 38, firmly holding the scraper and yet allowing it to yield when necessary. In order to support the lower portion of the scraper and keep it in line with the curved ways, rods 41 are mounted on the shaft 17 or on the hubs on the shaft if desired, and the outer ends of the rods are adjustably secured to the curved angle bars 38 of the scraper by bolts 42. In each rod is a slot adapted to receive the bolt and at the end of the rod is an adjusting screw 43, so that by adjusting this screw the lower end of the scraper can be brought into alignment with the guideways.

At the extreme lower end of the scraper is a detachable plate 44, which is held to the scraper by bolts 45. This plate is preferably sharpened at its lower edge and is the removable section of the scraper. The plate 44 is preferably made adjustable and is slotted at 46 for the passage of the bolts 45. On the back of the plate 44 are bearings 47 for rollers 48. These rollers travel on the ground and support the overhanging frame and its parts, including the scraper and the conveyer.

In order to allow the scraper to yield independently of the frame 14 in the present instance, we provide a plate spring 49 at each end of the scraper, which is secured by a clip 50 to each arm 15, and on each angle bar 38 of the scraper is an angular piece 51 which extends under the spring 49 and on one side of the arm 15 of the frame 14. This piece not only acts as an abutment for the spring but also retains the spring in position. The spring takes up the shocks due to the scraper traveling over rough ground.

The air compressor 7 is located preferably back of the engine of the tractor. This air compressor is connected to a compressed air tank 52 through pipes 53 and 54, and at the end of the compressor is a pipe 55 provided with a coupling for an air hose, which may be adapted thereto, and to one or more tamping tools which can be used to tamp the earth in the ditch after the conveyor has filled or partially filled the ditch. In the pipe 55 is a suitable cut-off valve 56.

While the conveyer shaft is rotated in one direction while in action, it may be reversed if desired if the conveyer becomes clogged with the material.

We claim:

1. The combination in an automotive device having a take-off, of a conveyer frame pivotally mounted on the end of the frame of the automotive device; counter-balance springs for the said conveyer frame; a conveyer shaft mounted on the frame; conveyer blades mounted on the shaft; means for driving the conveyer shaft; a scraper mounted on the frame back of the conveyer; and a support for the frame arranged to travel on the ground.

2. The combination in an automotive device, of a conveyer frame pivotally mounted on the end of the said device; a conveyer shaft; means for driving the shaft; conveyer blades on the shaft; a curved scraper located back of the conveyer shaft and arranged to slide in guides on the frame; and rollers supporting the lower end of the said scraper.

3. The combination in an automotive device, of a conveyer frame pivotally mounted on the end of the said device; a conveyer shaft; means for driving the shaft; conveyer blades on the shaft; a curved scraper located back of the conveyer shaft and arranged to slide in guides on the frame; rollers supporting the lower end of the said scraper; and rods connecting the lower end of the scraper with the conveyer shaft.

4. The combination in an automotive device, of a conveyer frame pivotally mounted on the end of the said device; a conveyer shaft; means for driving the shaft; conveyer blades on the shaft; a curved scraper located back of the conveyer shaft and arranged to slide in guides on the frame; rollers supporting the lower end of the said scraper; and

springs between the frame and the scraper, allowing the scraper to yield independently of the frame.

5 5. The combination in an automotive device, of a frame pivotally mounted on the automotive device and having side arms; bearings at the ends of the arms; a conveyer shaft mounted in the bearings; means for driving the said conveyer shaft; a scraper
10 consisting of side members in the form of angle bars; a connecting curved blade secured to the angle bars, said bars being curved on a radius taken from the center of the conveyer shaft; guides on each arm of the frame,
15 through which the angle bars extend; and means for supporting the lower end of the scraper on the ground.

6. The combination in an automotive device, of a conveyer frame pivotally mounted on the said device; said frame having side
20 arms; bearings at the outer ends of said arms; a conveyer shaft mounted in the bearings; conveyer blades on the shaft; a counter-shaft through which the conveyer shaft is driven, said shaft being on the line of the pivot of
25 the said frame; and two coil-springs mounted at the pivot of the frame, one end of each spring being attached to the frame of the tractor and the other end of each spring being
30 attached to the pivoted frame.

7. The combination in an automotive device having a take-off, of a transversely arranged frame pivoted to one end of the automotive device; a transversely arranged conveyer shaft mounted on the frame; means
35 for driving said shaft from the take-off of the automotive device; a series of reversible blades on the shaft; and means for securing the blades in either of two positions so that the machine can be set to fill a ditch at either
40 side thereof.

8. The combination in a ditch-filling machine, of a tractor; a frame mounted at one end of the tractor, said frame being of
45 greater width than the tractor; a transverse shaft mounted on the frame; means for driving said shaft in one direction from the motor of the tractor; and a series of blades on the shaft spaced apart and forming the conveyer
50 for moving the material transversely to the direction of the tractor, each of said blades being independently mounted on the shaft and being adjustable so that they can feed the material to either the right or left hand
55 side of the tractor, in order that the tractor may travel on either side of the ditch and convey material transversely to the movement of the tractor to fill the ditch.

9. The combination in a ditch-filling machine, of a tractor; a transverse frame pivotally mounted at one end of the tractor and being of greater width than the tractor; a
60 transverse shaft mounted on the frame; means for driving the shaft in one direction
65 from the power mechanism of the tractor; a

series of reversible blades mounted on the shaft; a scraper carried by the frame and located back of the conveyer, said shaft being geared to the motor so that it will turn in a direction away from the scraper; and
70 rollers carried by the scraper and arranged to travel on the ground, the arrangement being such that the tractor can travel on either side of the ditch and discharge material into the ditch.

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