G. SEEDS.

EXCAVATING MACHINE.

APPLICATION FILED MAR. 31, 1915.

1,295,615.

Patented Feb. 25, 1919.

3 SHEETS—SHEET 1.

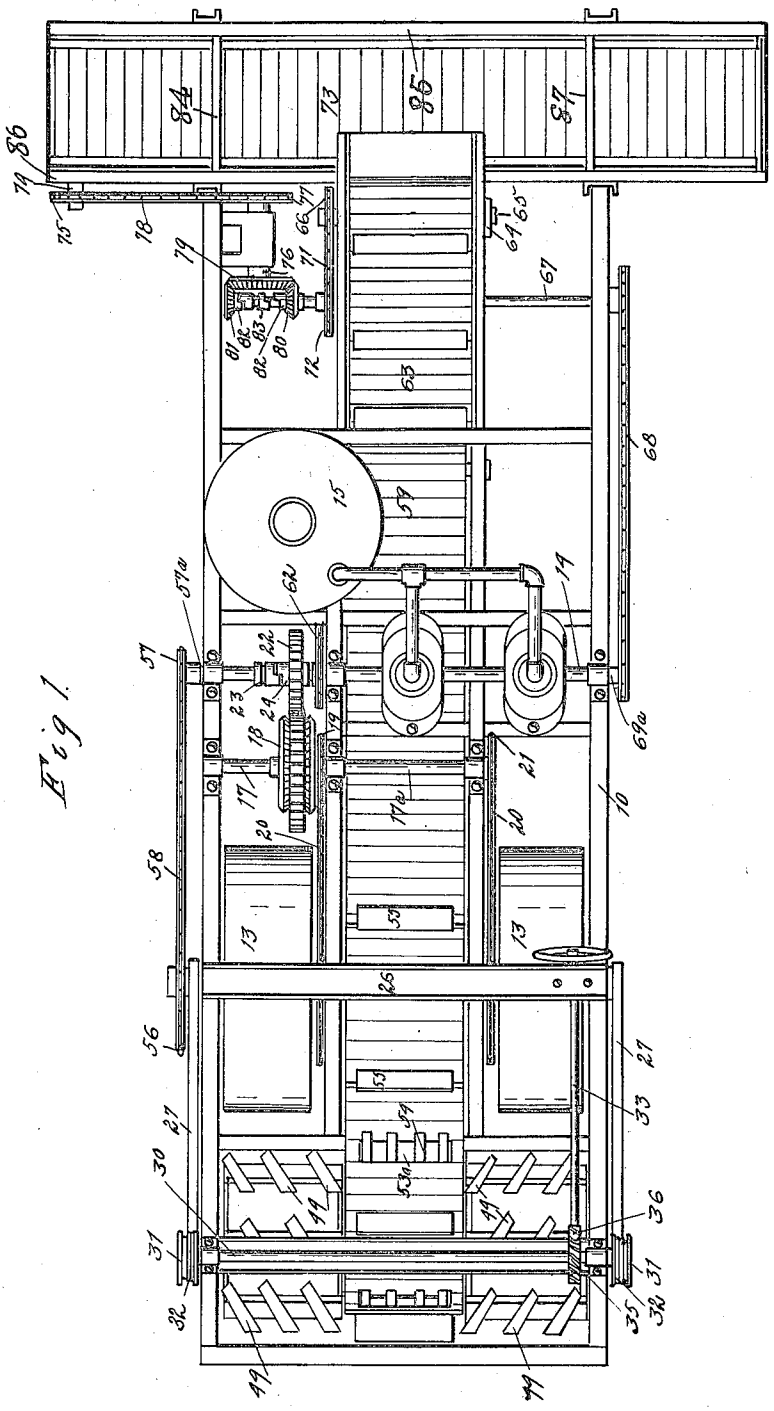


Fig. 1.

Witnesses.
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3 SHEETS—SHEET 2.

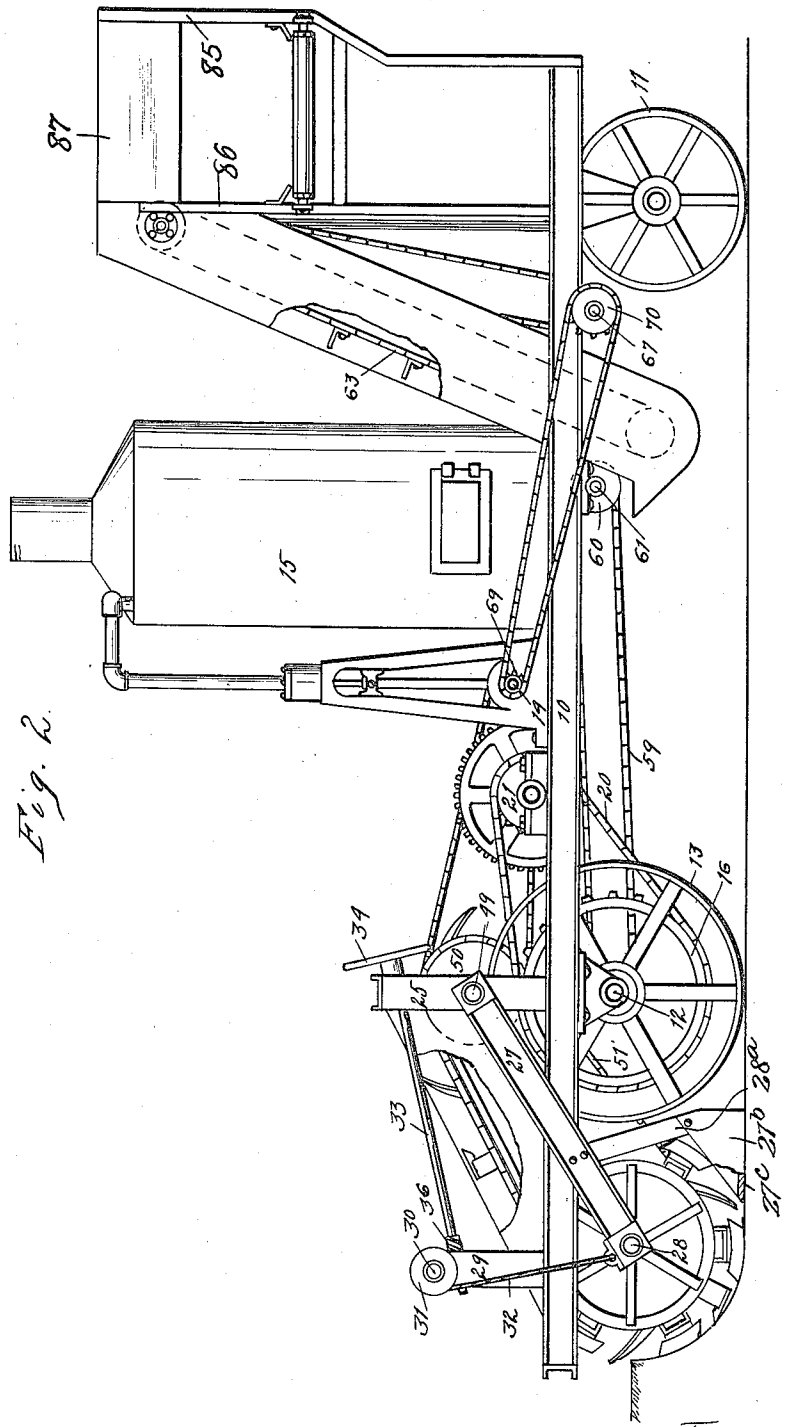


Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 3.

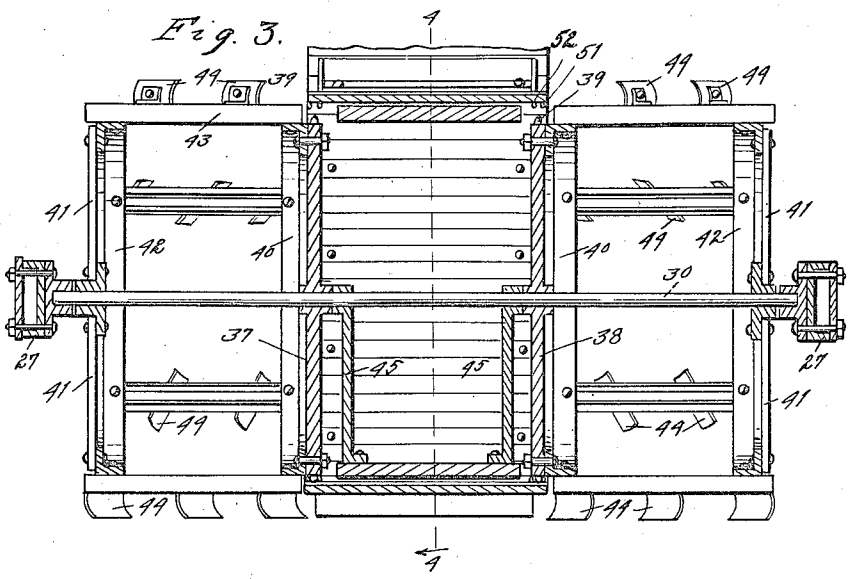


Fig. 5

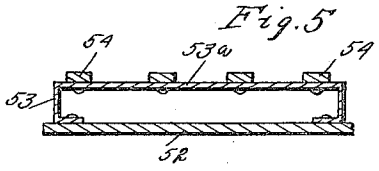
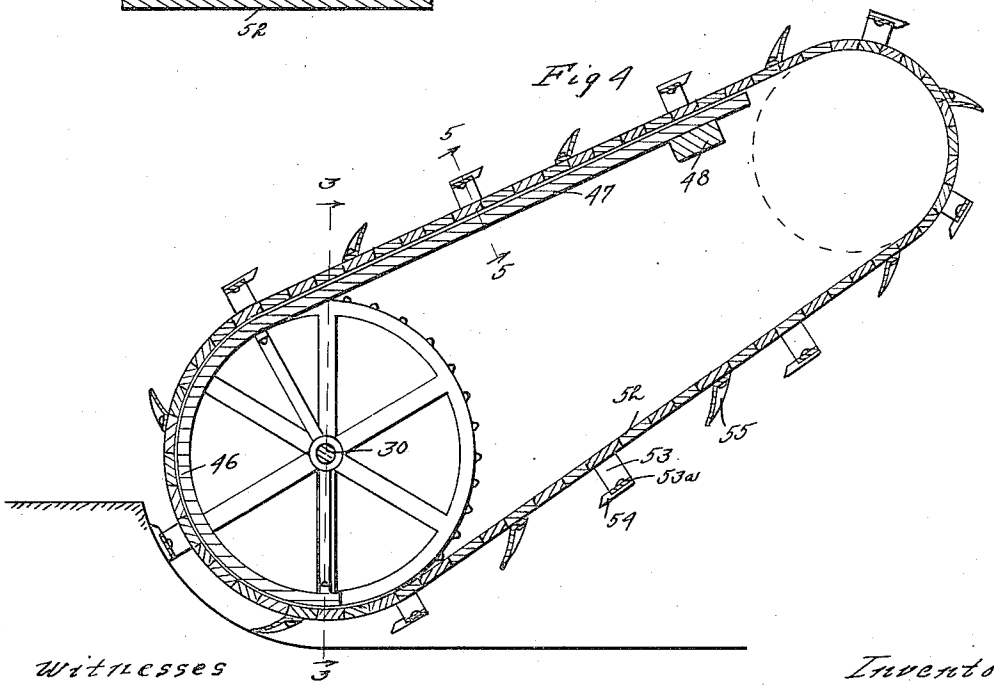


Fig 4



Witnesses

G. F. Juecker.

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UNITED STATES PATENT OFFICE.

GEORGE SEEDS, OF NEWTON, IOWA.

EXCAVATING-MACHINE.

1,295,615. Specification of Letters Patent. Patented Feb. 25, 1919.

Application filed March 31, 1915. Serial No. 18,386.

To all whom it may concern:

Be it known that I, GEORGE SEEDS, a citizen of the United States, and resident of Newton, in the county of Jasper and State of Iowa, have invented a certain new and useful Excavating-Machine, of which the following is a specification.

The object of my invention is to provide a traction excavator of the type which travels along the ground under its own power, and travels in the path which it excavates.

A further object is to provide such a machine having means whereby a comparatively wide, shallow ditch is cut, and whereby the dirt is transferred rearwardly through the machine.

A further object is to provide in such a machine means for delivering the dirt on either side of the ditch.

Still a further object is to provide in such a machine an excavating device of new, simple, and inexpensive construction.

Still a further object is to provide in such a machine an excavating device whereby a wide, shallow path is cut and the dirt is thrown from the sides toward the center, and whereby the central portion of the path is excavated and all the loose earth is elevated to a discharge carrier.

A further object of my invention is to provide an excavator having a storage chamber wherein the soil may remain temporarily while the excavator is proceeding so that the machine may continue to work although there is no receptacle along side to receive the dirt discharged.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a top or plan view of an excavator embodying my invention.

Fig. 2 shows a side elevation of the same.

Fig. 3 shows a transverse, vertical, sectional view through the excavating mechanism, taken on the line 3—3 of Fig. 4.

Fig. 4 shows a longitudinal, detail, sectional view through the excavating mechanism and the dirt elevator, taken on the line 4—4 of Fig. 3, and

Fig. 5 shows a detail, sectional view, taken on the line 5—5 of Fig. 4.

In the form of my invention illustrated in the drawings accompanying this application, I have employed the reference numeral 10 to indicate generally the frame of my improved excavating machine, the heavier parts of which are preferably composed of I-beams. The rear portion of the machine is preferably mounted on suitable supporting wheels 11. The excavating mechanism, which will be more fully described hereinafter, is mounted at the front of the machine. Near the front of the machine, but rearwardly therein with reference to the excavating mechanism, is a transverse shaft 12, upon which are mounted wide tread traction wheels 13. Suitably mounted on the frame, preferably near the central portion of the machine, is a crank shaft 14 which is operatively connected with a steam engine 15, or any suitable source of motive power. It will be understood that the traction wheels 13 may be driven in any suitable way. In the drawings I have shown on the traction wheels the master gears 16.

Mounted on the frame is a two-part shaft 17, on which is a differential 18. On one member of the differential is a gear 19 in line with one of the master gears. On the gear 19 and the master gear 16, in line therewith, is a sprocket chain 20. The gear 19 and the portion of the differential fixed thereto, travels loosely on the part 17^a of the shaft 17. The part 17^a of the shaft 17 is operatively connected with the other portion of the differential. On the shaft portion 17^a is a sprocket gear 21 in line with the other master gear. On the gear 21 and the master gear in line therewith is a similar sprocket chain 20. On the crank shaft 14 is loosely mounted a gear 22 in mesh with the proper gearing part of the differential.

Slidably but non-rotatably mounted on the shaft 14 is a clutch member 23, which may be controlled in any suitable way, and which is adapted to coact with the clutch member 24 formed on the gear 22. The gearing mechanism shown for operating the traction wheel is simply illustrative, and any suitable gearing mechanism might be employed.

On the frame, preferably near the traction wheels, are mounted upwardly extending frame members 25, clearly illustrated in Fig. 2. The members 25 are connected by a transverse frame member 26. Pivoted to the members 25 are downwardly and forwardly extending frame members 27. Ro-

tatably mounted in the lower, forward ends of the frame members 27 is a transverse shaft 28, on which are mounted the digging devices. For raising and lowering the shaft 28, and thereby raising and lowering the digging devices, the following mechanism may be employed:

Near the front part of the machine are upwardly extending frame members 29, on the upper ends of which is mounted a transverse shaft 30, on which are sheaves 31. Secured to the forward ends of the frame members 27 are flexible devices 32 which are wound around the respective sheaves 31.

Suitably mounted is a shaft 33, on one end of which is a hand wheel 34. On the other end of the shaft 33 is a worm gear 36 in mesh with the worm wheel 35 on the shaft 30. It will be seen that by rotating the hand wheel 34 the shaft 30 may be rotated for winding the flexible devices on the sheaves 31 for thereby raising or lowering the shaft 28 and the digging devices mounted thereon.

My improved digging devices are comprised of two outer portions and a central portion, which will now be described:

The outer portions remove the dirt at the sides of the ditch to be excavated and throw it toward the center. The inner portion removes the central part of the ditch and also assists in elevating all of the dirt. The inner portion of the excavator comprises two spaced, heavy sprocket wheels 37 and 38, having the sprocket teeth 39. On the rims of the sprocket wheels 37 and 38 are laterally extending annular flanges 40. Spaced from the respective wheels 37 and 38 on opposite sides of the machine, are wheels 41 having rims 42. Each flange 40 is connected with the adjacent rim 42 by a plurality of transverse frame members 43. On the frame members 43 are detachably mounted a plurality of cutting teeth 44, so arranged as to throw the dirt which they excavate toward the center of the machine. The construction just described makes it easy to quickly remove the cutting teeth 44 for sharpening or replacing them.

Supported on the shaft 30 between the wheels 37 and 38 are two downwardly extending arms 45, which support a platform 46 which is curved to form substantially a half cylinder in front of the axle or shaft 30, and is then extended upwardly and inwardly at 47 in the machine, and is supported at its upper end by a transverse frame member 48. Extended through the upright members 25 is a transverse shaft 49, on which are sprocket wheels 50 spaced from each other and in line with the respective wheels 37 and 38. Sprocket chains 51, illustrated in Fig. 2, travel on the sprocket wheels 50 and on the wheels 37 and 38, and support an endless platform comprised of members 52, clearly illustrated in Fig. 4. Mounted on the platform comprised of the members 52, preferably at regular intervals, are digging devices comprising the members 53 extending away from the platform, connected at their upper ends by the transverse members 53^a on which are detachably mounted the cutting blades 54. Detachably mounted on the members 52 comprising the endless platform, at regular intervals and preferably alternating with the members 53, are cutting blades or shovels 55 adapted to pick up and carry the dirt. Secured to the arms 27 are arms 28^a on the lower ends of which outside the outlines of the machine are cutter members having blade portions 27^b and 27^c.

On one end of the shaft 49 is a sprocket gear 56 in line with a sprocket 57 on the shaft 14. The chain 58 travels on the gears 56 and 57.

Suitably mounted in the machine is an endless apron 59, the forward end of which is below the upper end of the apron formed by the members 52. The rear end of the apron 59 travels over a roller 60 on the shaft 61. A chain 62 travels on suitably alined sprocket gears on the shafts 14 and 61 for transmitting power from the engine for imparting movement to the endless apron 59.

Suitably mounted near the rear of the machine is an endless conveyer elevator 63 adapted to receive material discharged from the apron 59 and to elevate it in the rear part of the machine. The endless elevator 63 travels at its upper end over a roller 64 on a shaft 65, on which is a sprocket gear 66.

In the rear part of the machine is a transverse shaft 67, which is rotated by means of a chain 68 traveling on alined sprocket gears 69 and 70 on the shafts 14 and 67.

At the rear end of the machine an endless conveyer 73 is mounted transversely in the machine, and projects laterally from the machine in both directions. One end of the conveyer 73 travels over a shaft 74, on which is a sprocket gear 75.

Mounted longitudinally in the machine adjacent to the shaft 67 is a shaft 76, on one end of which is a sprocket 77 in line with the sprocket 75. A chain 78 travels on the sprockets 77 and 75. On the opposite end of the shaft 76 is a beveled gear 79. Loosely mounted on the shaft 67 are two spaced, beveled gears 80 and 81, arranged in mesh with the beveled gear 79. Formed on each of the beveled gears 80 and 81 is a clutch member 82. Slidably but nonrotatably mounted on the shaft 67 is a double clutch member 83, adapted to coact with the clutch members on either of the gears 80 or 81. The double clutch member 83 is controlled in any suitable way for rotating either of the gears 80 or 81 from the shaft 67 and thereby

operating the conveyer 73 in either direction desired.

The upright partition members 85 and 86 are disposed transversely of the machine and extend from conveyer 73 upwardly to form the trough of which the conveyer is the bottom. Partition members 84 and 87 extend between members 85 and 86 on each side of the discharging end of conveyer 63. It will be seen that the members 85 and 86 together with members 84 and 87 form a container which will prevent the soil dumped into conveyer 73 from falling off if the conveyer 73 is not operated to carry away said soil while the balance of the machine is in operation. The fact that the members 84 and 87 are spaced apart somewhat from the conveyer 73 allows free passage of dirt carried by the conveyer beneath them when such conveyer is being operated.

In the practical operation of my improved excavator, the machine is taken to the place where it is desired to commence operations, under its own power. Suitable steering mechanism not here shown and not forming any part of my invention, may be employed. It will be understood that in traveling over the road the excavating members are raised. When the place for commencing operations has been reached, the hand wheel 34 is operated to lower the excavating devices, and the operation of the machine is commenced.

The gears 57 and 69 are loosely mounted, and are provided with clutch members adapted to coact with clutch members 57^a and 69^a, slidably but nonrotatably mounted on the shaft 14. When the digging mechanism has been operatively connected with the engine by shifting the clutch members 57^a, the side members will excavate the dirt and throw it toward the center, whereupon the central excavating part will finish the excavating of the middle part of the ditch, and pick up and elevate all of the dirt. The dirt carried up by the platform members 52 and the shovels 55 thereon, is dropped upon the endless conveyer 59 and thereby carried to the elevator 63 by which it is elevated and discharged upon the lateral conveyer 73.

The conveyer 73 is provided with retaining members surrounding it adjacent to the discharging end of the conveyer 63, so that if it is desirable for any reason not to discharge the dirt from conveyer 73 as fast as it is received, the dirt will be retained within such retaining members and stored until conveyer 73 is again operated to carry away such dirt.

It will be understood that some changes may be made in the arrangement and construction of the parts of my excavating machine without departing from its essential features and purposes, and it is my intention to cover by this application any such changes which may be included within the scope of my claims.

I claim as my invention:

1. In an excavating machine, a frame mounted on wheels, a digging device at the forward end of said frame including a pair of members pivoted at their forward ends outside the outline of the frame, and extending downwardly and forwardly, a shaft mounted in the forward ends of said pivoted members, a digging device on said shaft, arms extending downwardly from said pivoted members, cutter members on the lower end of said last described arms arranged outside the outline of the frame of the machine, means for raising and lowering said shaft, a motive power device on said frame, and means for operatively connecting said motive power device with said digging device.

2. In an excavating machine, a frame mounted on wheels, a digging device at the forward end of said frame including a pair of members pivoted at their forward ends outside the outline of the frame, and extending downwardly and forwardly, a shaft mounted in the forward ends of said pivoted members, a digging device on said shaft, arms extending downwardly from said pivoted members, cutter members on the lower end of said last described arms arranged outside of and just rearwardly of said digging device, means for raising and lowering said shaft, a motive power device on said frame, and means for operatively connecting said motive power device with said digging device.

Des Moines, Iowa, March 19, 1915.

GEORGE SEEDS.

Witnesses:
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A. SHERMAN.