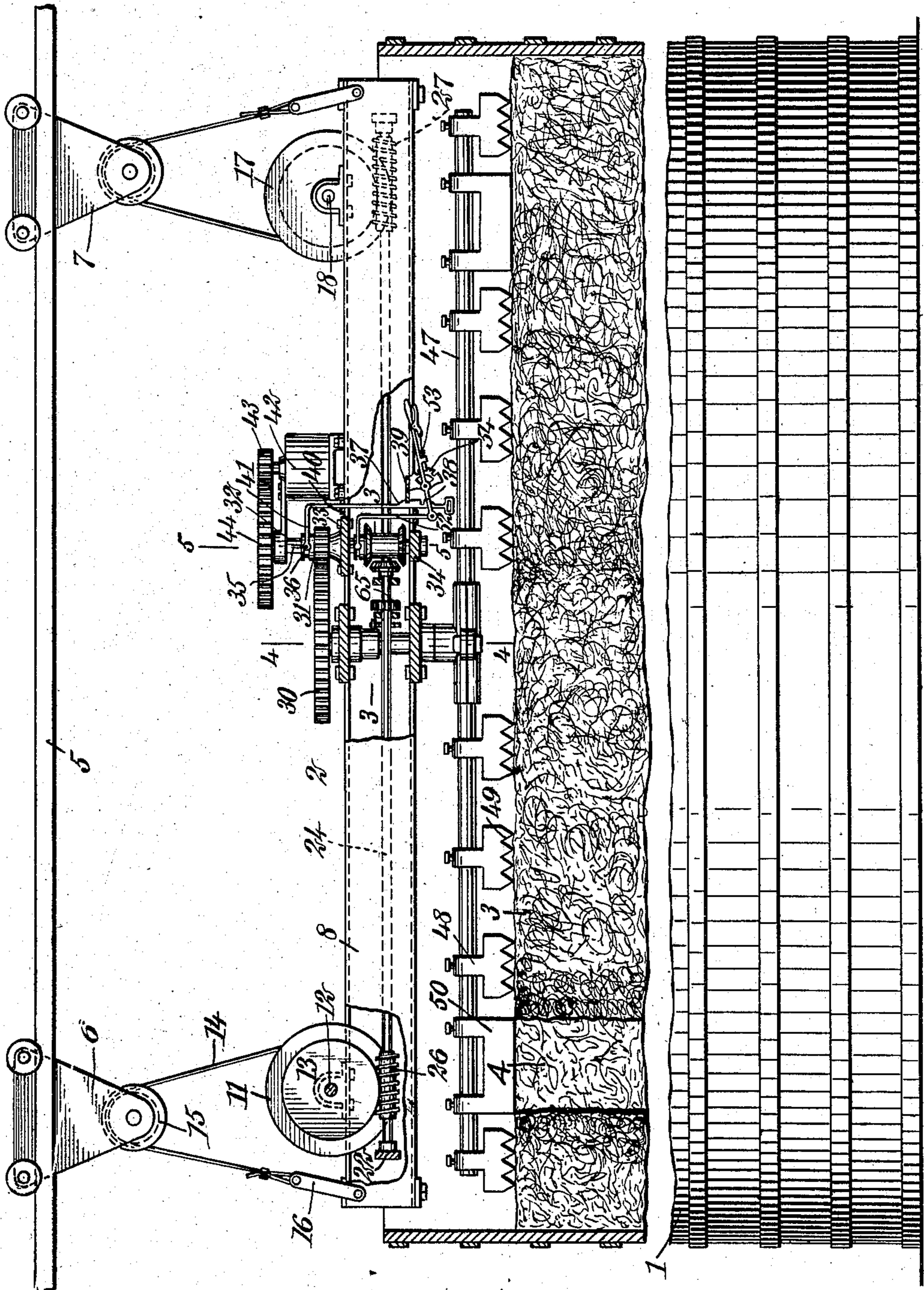


No. 894,618.

PATENTED JULY 28, 1908.

W. FERGUSON.
LEACH CLEARING DEVICE.
APPLICATION FILED MAY 17, 1907.

2 SHEETS—SHEET 1.



WITNESSES
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Fig. 1

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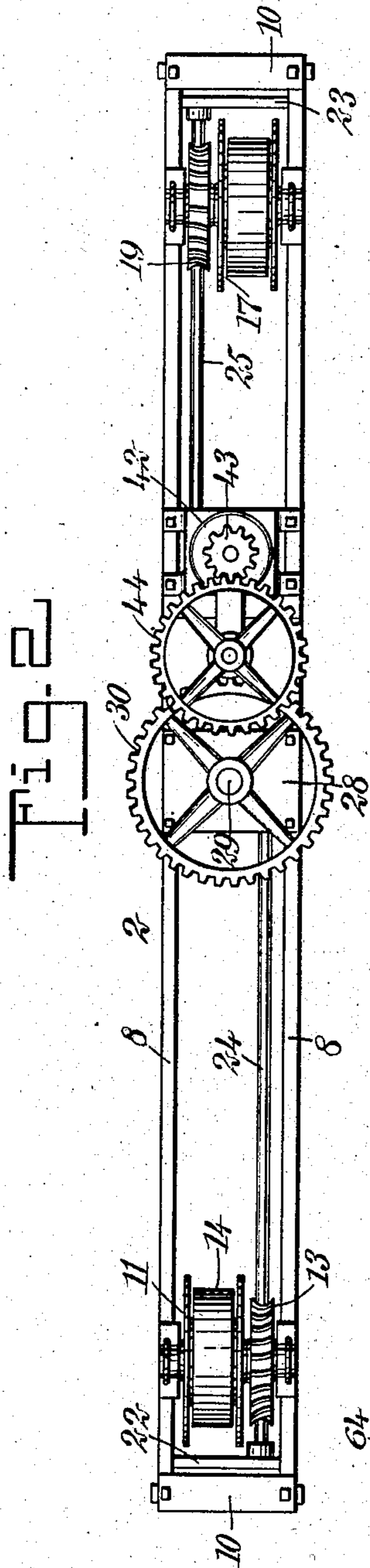


Fig. 2

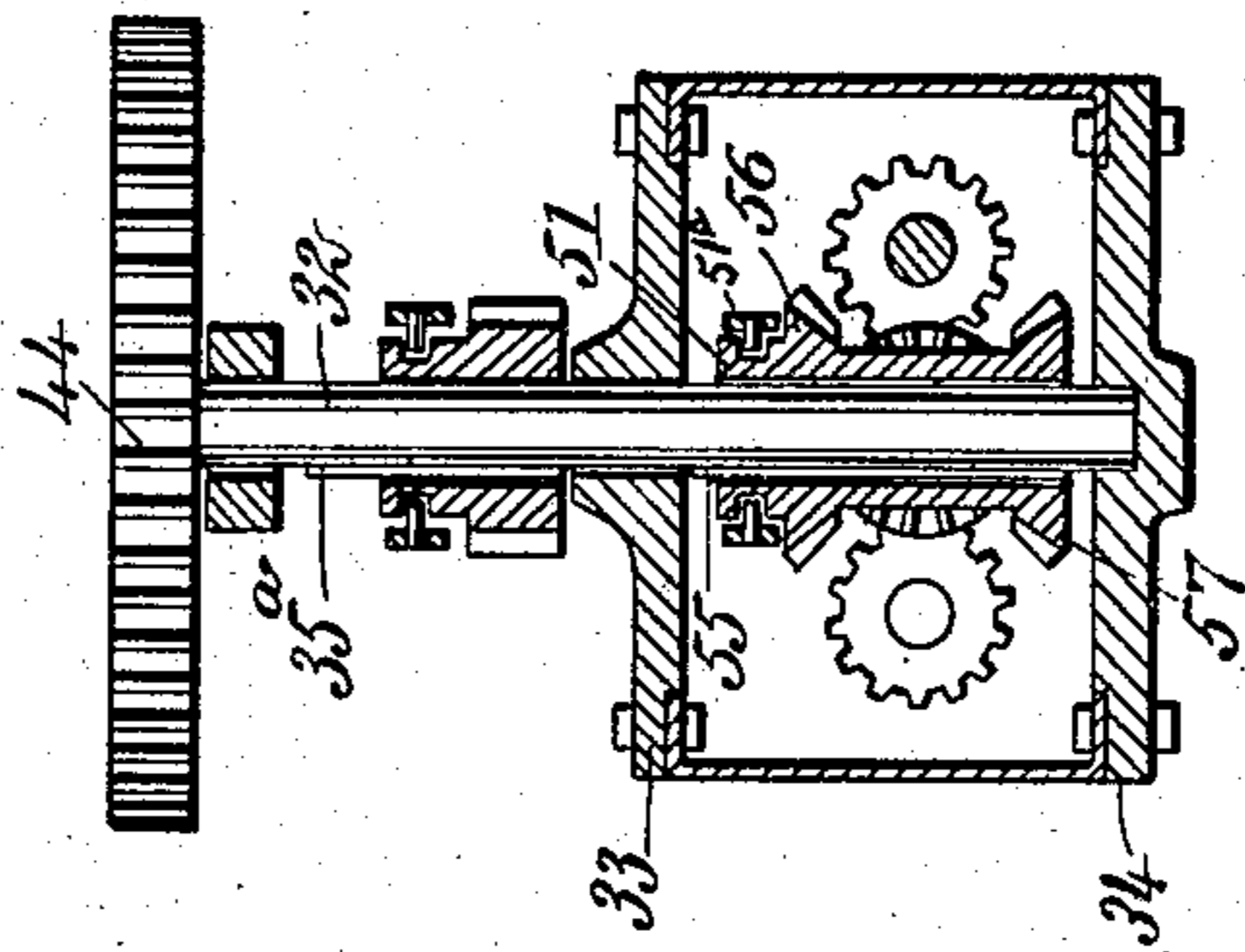


Fig. 3

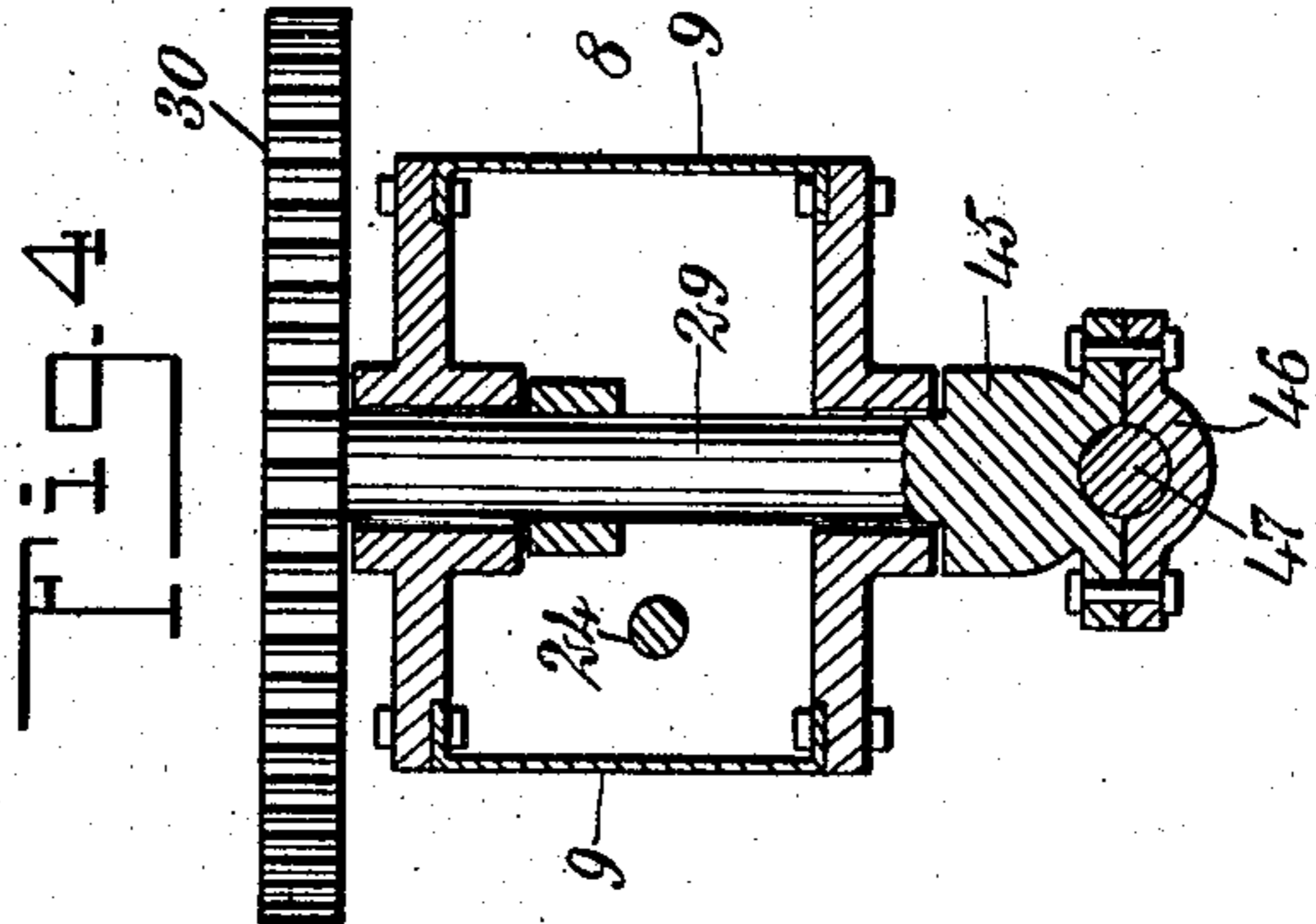


Fig. 4

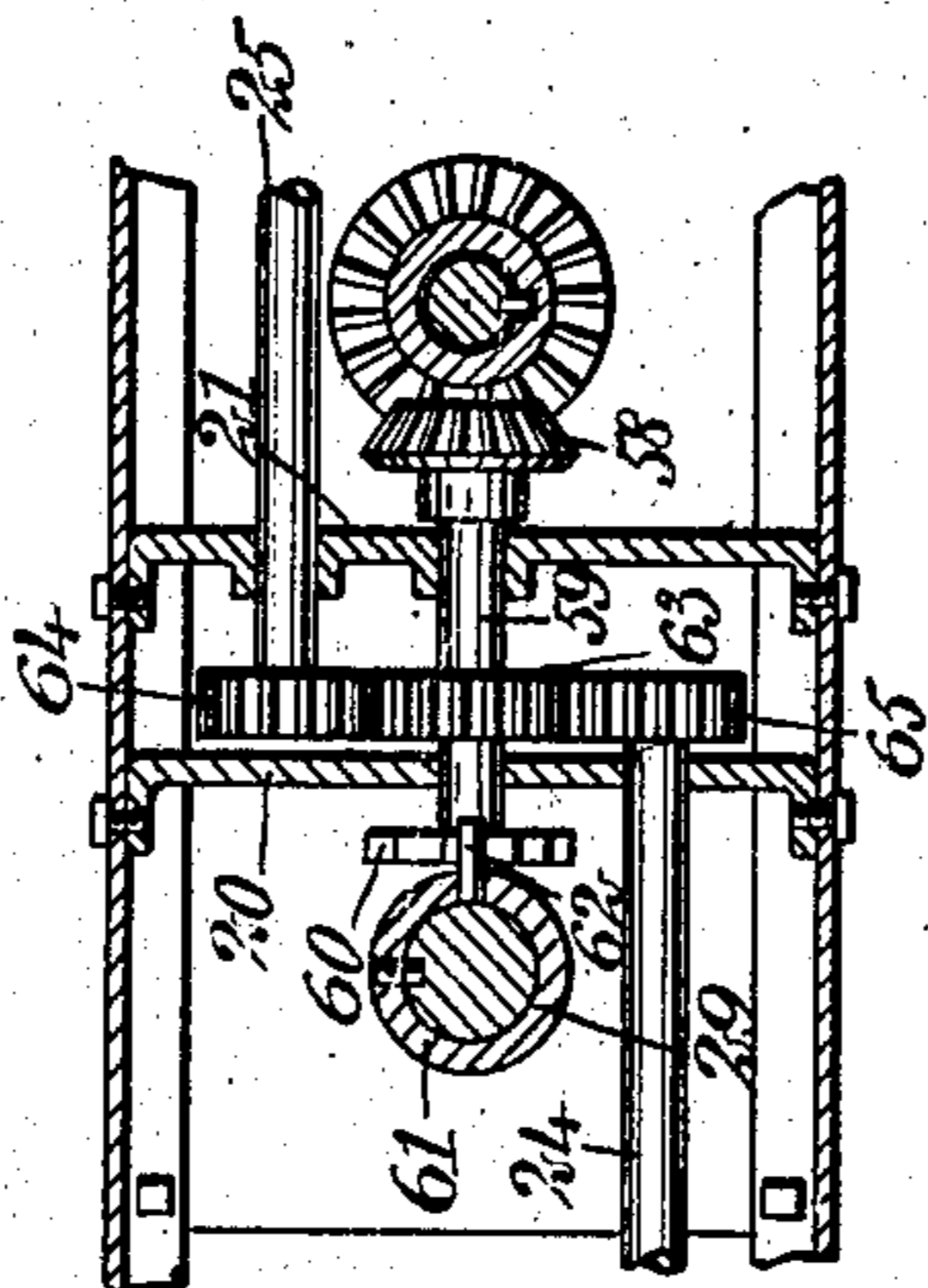


Fig. 5

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UNITED STATES PATENT OFFICE.

WILLIS FERGUSON, OF BREVARD, NORTH CAROLINA.

LEACH-CLEARING DEVICE.

No. 894,618.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed May 17, 1907. Serial No. 374,146.

To all whom it may concern:

Be it known that I, WILLIS FERGUSON, a citizen of the United States, and a resident of Brevard, in the county of Transylvania and State of North Carolina, have invented a new and Improved Leach-Clearing Device, of which the following is a full, clear, and exact description.

This invention relates to leach-clearing or leach-casting devices such as used for the purpose of removing the leach from leaching vats.

The object of the invention is to produce a device of this kind which will operate automatically to feed itself or advance downwardly into the leacher as the spent tan bark is ejected by it.

The invention concerns itself especially with improvements in the means for driving the feeding mechanism, and for raising and lowering the mechanism to its operating position.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 represents a leacher or leaching vat, and shows the construction and manner of operating the invention; parts of the casting device are broken away and shown in section; the upper portion of the leacher is shown in cross section, while the lower part is broken away and shown in elevation; Fig. 2 is a plan of the leach casting device; Fig. 3 is a section through the leach casting device, upon an enlarged scale, and taken on the line 3—3 of Fig. 1; Fig. 4 is a vertical section through the leach casting device, taken on the line 4—4 of Fig. 1; and Fig. 5 is a vertical section through the device, taken on the line 5—5 of Fig. 1.

Referring more particularly to the parts, 1 represents the leacher or vat in which the casting device 2 operates. The interior of the leacher is supposed to be filled with the spent tan bark 3, which is to be ejected through the usual opening in the bottom which is closed by a plug which extends up through the mass of tan bark, leaving an opening 4 through which the tan bark is ejected by the device. In practice, a number of these vats or leachers are usually

placed in a row, and above them a continuous rail 5 extends, which enables the same device to be used in connection with any of the vats. For this purpose, upon the rail 5, trolleys 6 and 7 run upon wheels, as shown, and these support the casting device in a manner which will be described more fully hereinafter.

The casting device consists of a horizontal beam 8 which is formed of two vertically disposed channel bars 9, the flanges of which are disposed inwardly. At the ends, these channel bars 9 are connected by stout cross bars 10 so as to form a rigid beam structure. At the left end of the beam a drum 11 is supported in a horizontal position, and the shaft 12 of this drum carries rigidly a worm wheel 13. On the drum 11 a band 14 of rubber belting or similar material, is mounted as shown, and from the drum this belt extends upwardly and passes around a sheave 15 carried in the trolley 6. The end of the belt is attached to a shackle 16 on the left end of the beam.

A similar arrangement is adopted at the opposite side of the beam for supporting it from the trolley 7, comprising a drum 17, the shaft 18 whereof is provided with a worm wheel 19. The arrangement on the two ends of the beam is of an opposite character, however, as indicated, so that while the worm wheel 13 is located on the forward face of the drum 11, the worm wheel 19 is located adjacent to the rear face. As indicated most clearly in Fig. 3, near the middle part of the beam, cross bars 20 and 21 are placed, and at the ends of the beam similar cross bars 22 and 23 are placed respectively. These bars afford means for supporting horizontal worm shafts 24 and 25, the former of which is rotatably mounted in the cross bars 20 and 22, while the latter is located at the right and rotatably mounted in the cross bars 21 and 23. The worm shaft 24 is provided with a worm 26, which meshes with the worm wheel 13 aforesaid. The worm shaft 25 is similarly provided with a worm 27, which meshes with the worm wheel 19. The pitch of these worms 26 and 27 is of opposite character, for a purpose which will appear more fully hereinafter.

At or near the middle of the beam, frame plates 28 are provided, which form a bearing for a vertical main shaft 29. The upper extremity of this shaft is provided with a rigid gear wheel 30 which may be continuously

driven from a pinion 31 meshing therewith. This pinion 31 is slidably mounted upon a feed shaft 32 which is mounted in a vertical position, passing through frame plates 33 and 34 attached to the upper and lower sides of the beam. The pinion 31 is connected with the shaft through the medium of a feather 35^a running in a key-seat or groove 35, and is provided with a collar 36 to which a rod 37 is attached which enables the pinion to be raised out of mesh with the gear 30.

In order to enable the pinion to be held in either of the positions suggested, the lower part of the rod 37 is flattened and formed with notches 38. Either of these notches may be brought into engagement with a cross slat 39 disposed across the under side of the beam as shown. The upper portion of the rod 37 is slidably mounted through a cross slat 40, and above the cross slat the rod has a lateral extension 41 which engages the collar 36 in a well-known manner. The feed shaft 32 is adapted to be driven continuously by means of a motor 42 which is set up upon the beam. The shaft of this motor is provided with a pinion 43 which drives a large gear wheel 44 rigidly carried by the feed shaft 32. The main shaft 29 extends downwardly through the beam, as indicated in Fig. 4, and its lower extremity is formed with a driving head 45. This driving head is formed with a clamp 46 for holding a hoe bar 47 which extends in a horizontal plane across the vat beneath the beam. At suitable points the hoe bar 47 is provided with rigidly attached hoes 48 which have teeth 49 on their lower edges adapted to scrape the upper surface of the tan bark as the device operates. At suitable points in line with the opening 4, scrapers 50 are provided on the hoe bar, which scrape the tan bark which is loosened by the hoes, into the opening 4.

Slidably mounted on the feed shaft 32 between the cross bars 33 and 34, I provide a sleeve 51. The upper part of this sleeve is formed with a collar 51^a, which is engaged by a bent link 52. The lower part of this link is attached to a suitable lever 53 which enables the sleeve to be slid up or down upon the shaft, as will be readily understood. This lever 53 is suitably mounted upon a quadrant 54 attached to the under side of the beam as shown in Fig. 1. The sleeve 51 is connected with the shaft 32 by means of a feather 55 from which arrangement when the shaft rotates, the sleeve rotates also. The upper portion of the sleeve 51 is formed with a bevel gear wheel 56, and a similar bevel gear wheel 57 is formed at its lower end. Between these bevel gear wheels 56 and 57 a pinion 58 is located, said pinion being carried upon a horizontal stub shaft 59 which is rotatably mounted in the two cross bars 20 and 21, as indicated most clearly in Fig. 3. The opposite end of the stub shaft

59 is provided with a star wheel 60 which lies adjacent to the main shaft 29. Upon this shaft 29 a collar 61 is rigidly attached, and this collar is provided with a radially projecting pin 62. As the main shaft 29 rotates, the pin 62 is adapted to engage with the teeth of the star wheel 60 so as to give the stub shaft 59 a partial rotation. With the continuous rotation of the shaft 29, it will be apparent that a step-by-step movement will be imparted to the shaft 59.

Near the middle of the stub shaft 59 and between the cross bars 20 and 21, this shaft is provided with a rigid gear wheel 63. This gear wheel meshes on one side with a gear wheel 64 which is rigidly carried by the end of the shaft 25, and on the other side meshes with a similar gear wheel 65 carried rigidly by the shaft 24.

The parts are normally in the relation shown in Fig. 1; that is, the sleeve 51 is normally in a mid position so that the bevel gear wheel 58 does not mesh with either of the bevel gear wheels 56 or 57.

The mode of operation of the device will now be described: With the parts in the relation shown in Fig. 1, it will be understood that the motor 42 operates through the pinion 31 to drive the gear wheel 30 and the shaft 29 continuously. In this way the hoe bar is rotated on the central axis of the vat, and the scrapers and hoes are dragged across the surface of the tan bark. At each rotation of the shaft 29, the star wheel is advanced one tooth, and a slight rotation is given to the shaft 59. This rotates the gear wheels 64 and 65 and the worm shafts 24 and 25; these shafts rotate in opposite directions, and the direction of rotation is such that the drums 11 and 17 are rotated in opposite directions. They both rotate in a direction which will uncoil the bands which are wrapped upon them. In this way as the rotation of the hoes continues, the beam is fed slightly downwardly into the interior of the vat. It should be understood that this feeding movement is very slow. When it is desired to raise or lower the beam quickly so as to bring it into working position or to raise it out of the vat, it is only necessary to disconnect the pinion 31 from the gear wheel 30 by means of the rod 37. The lever 53 will then be operated so as to bring either the bevel gear wheel 56 or the bevel gear wheel 57 into mesh with the pinion 58. When either of these bevel gear wheels is in engagement with the pinion, the feed motion becomes imparted directly from the feed shaft 32, and will take place at a high speed. If one of the bevel gear wheels is in mesh, the beam will be raised, and if the other is in mesh, the beam will be lowered.

It should be understood that the pinion 31 constitutes a clutch for connecting or disconnecting the feed shaft from the main shaft.

Likewise, the sliding sleeve 51 may be considered as a two-way clutch which is normally open, but which affords means for driving the stub shaft in either direction.

5 Attention is called to the fact that when the automatic feed is in operation, the downward advancing movement of the beam will be faster when the beam is in the upper portion of the vat, and it will be slower as the
10 beam approaches the bottom of the vat. This follows, of course, from the fact that the supporting bands at the drums are coiled upon themselves.

15 Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a device of the class described, in combination, a beam, a horizontal stub shaft mounted therein, a vertical main shaft
20 adapted to drive the same, a shaft mounted upon said beam having a gear wheel disposed near said stub shaft and extending toward one end of said beam, a second shaft having a gear wheel opposite said first gear wheel and
25 extending toward the opposite end of said beam, a pinion on said stub shaft meshing with both of said gear wheels and driving the same, a motor for rotating said main driving shaft, a clutch between said motor and
30 said main driving shaft for disconnecting said motor therewith, a feed shaft also for driving said stub shaft, means for driving said stu-

shaft in either direction from said feed shaft, raising and lowering devices at the end of said beam and actuated by said shafts, and a
35 hoe bar carrying hoes driven by said main shaft.

2. In a device of the class described, in combination, a beam, a horizontal stub shaft, a vertical main shaft for driving the same, a
40 worm shaft having one end near said main shaft and extending toward one end of said beam, a second shaft having one end near said main shaft and extending toward the opposite end of said beam, means for driving
45 said worm shafts from said stub shaft, a motor, a clutch connecting the same with said main shaft, a feed shaft also driven from said motor, a sliding sleeve having bevel gears formed thereon, a bevel gear carried by said
50 stub shaft and adapted to mesh with either of said bevel gears of said sleeve, a hoe bar having hoes and driven by said main shaft, and drums actuated by said worm shafts and carrying
55 cables for raising and lowering said beam.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIS FERGUSON.

Witnesses:

T. E. PATTON,
DANIEL L. ENGLISH.