July 15, 1924. 1,501,379

L. D. TETER

STONE GATHERER

Filed Nov. 25, 1922 5 Sheets-Sheet 1

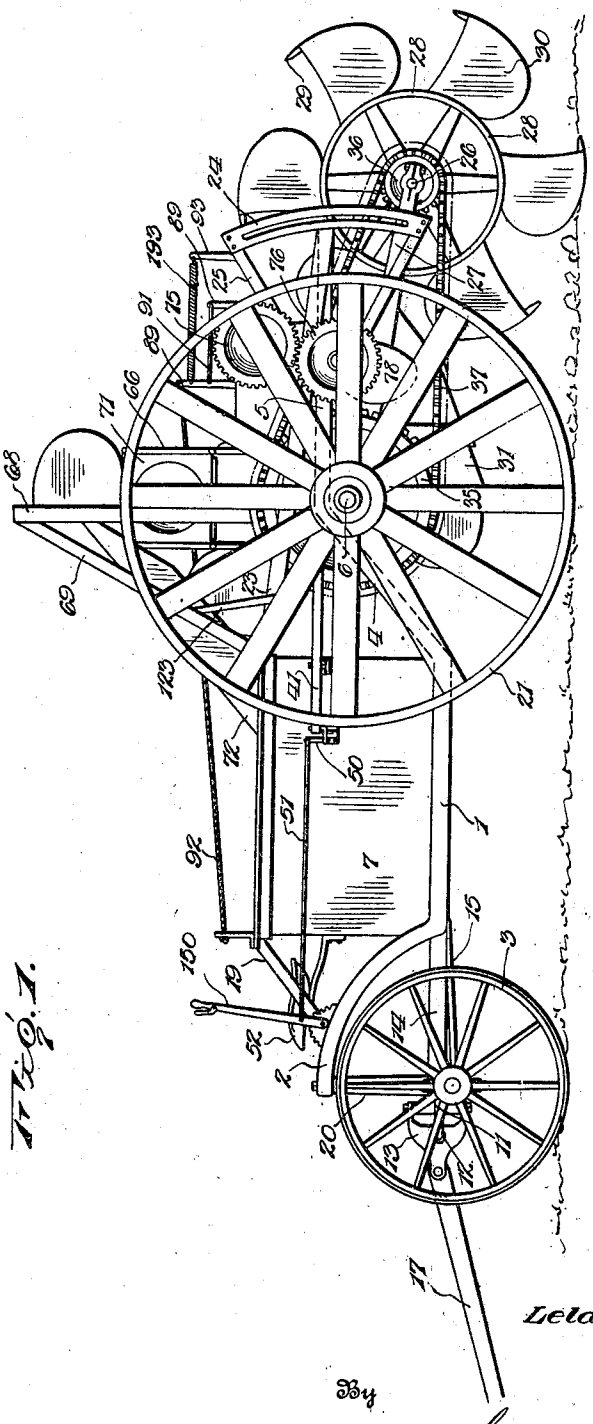


Fig. 1.

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Fig. 2.

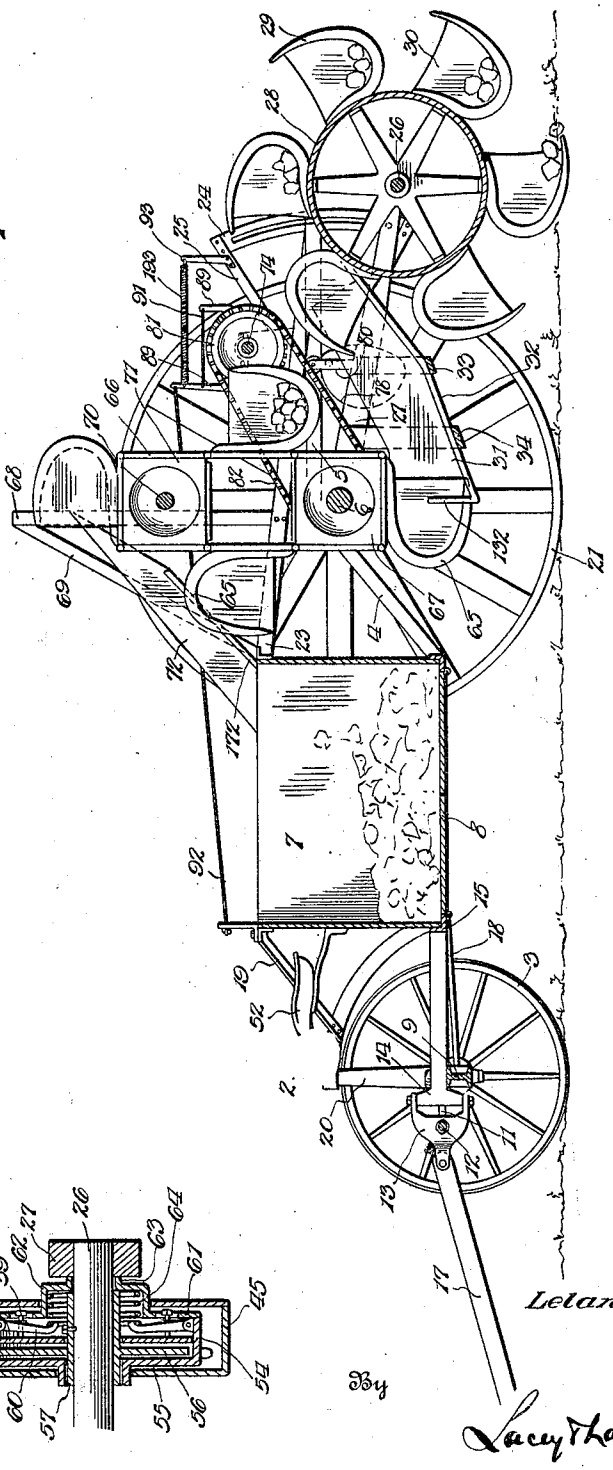


Fig. 9.

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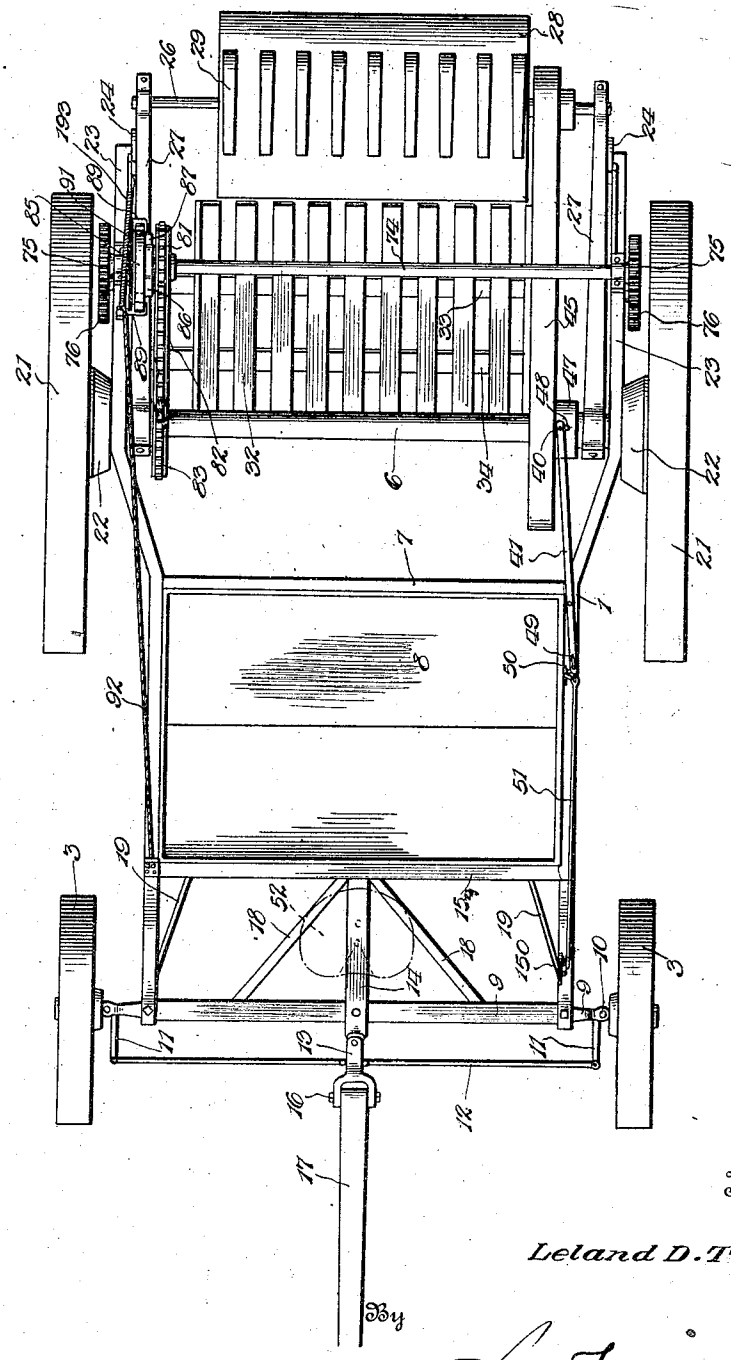


Fig. 3.

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5 Sheets-Sheet 4

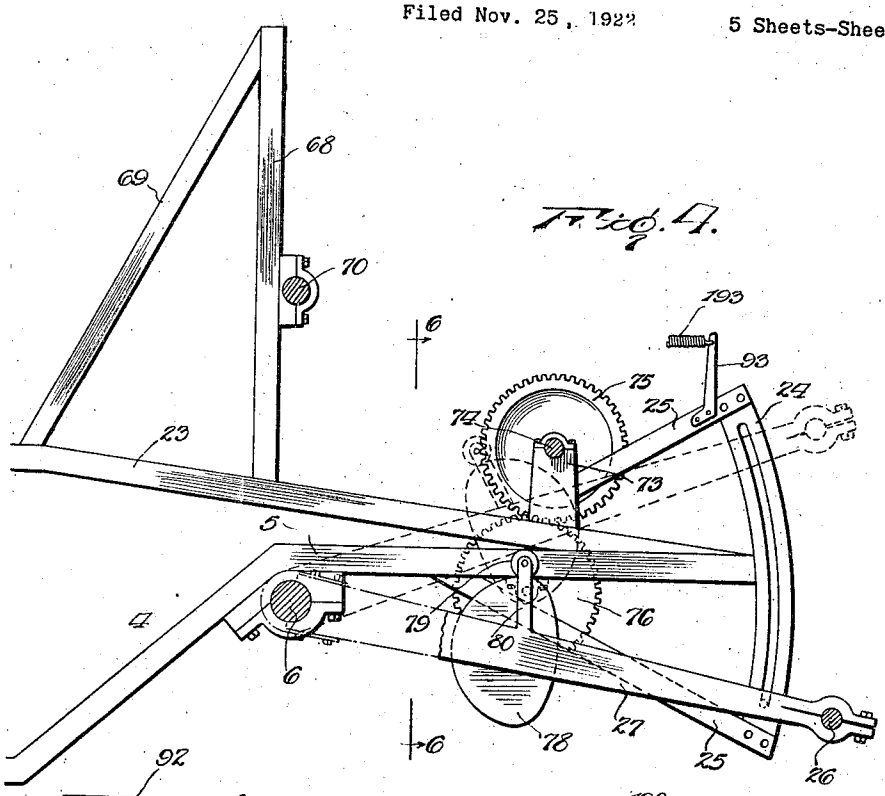


Fig. 4.

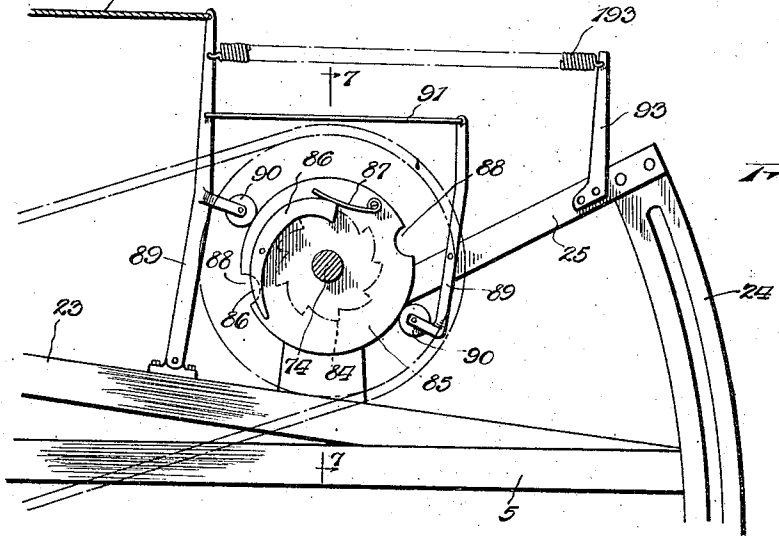


Fig. 5.

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Fig. 6.

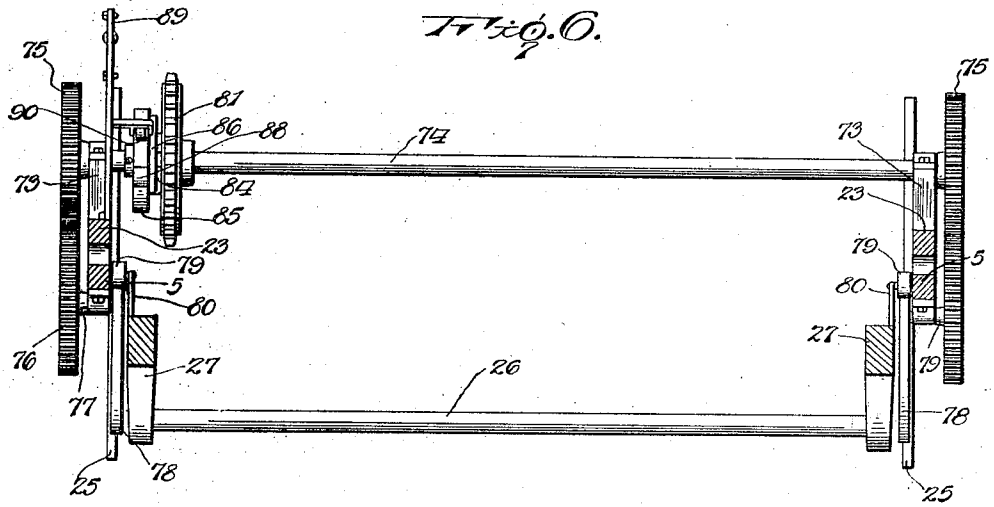


Fig. 7.

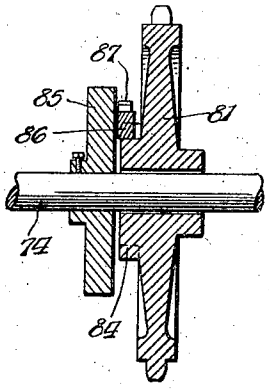
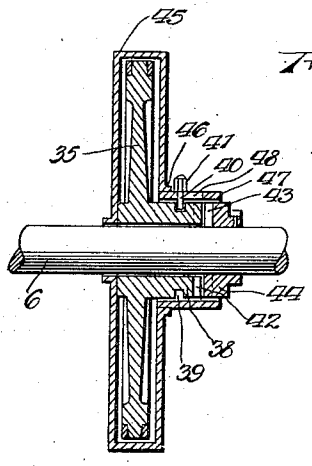


Fig. 8.



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UNITED STATES PATENT OFFICE.

LELAND D. TETER, OF LIVINGSTONVILLE, NEW YORK.

STONE GATHERER.

Application filed November 25, 1922. Serial No. 603,200.

To all whom it may concern:

Be it known that I, LELAND D. TETER, a citizen of the United States, residing at Livingstonville, in the county of Schoharie and State of New York, have invented certain new and useful Improvements in Stone Gatherers, of which the following is a specification.

This invention has for its object the provision of a machine of strong and durable construction which may be readily drawn over a field and in which will be embodied means whereby, during the travel of the machine, stones will be taken from the ground and delivered into a receptacle upon the machine. The invention also has for its object the provision of means in such a machine for raising the stone-gathering members when the machine is to be moved to a place of deposit, and also seeks to provide means whereby, if a large rock should be encountered, the stone-gathering members may yield to the impact and be momentarily arrested but resume operation after the large rock or other obstruction has been passed. Other incidental objects of the invention will appear in the course of the following description, and the invention resides in certain novel features which will be particularly pointed out in the appended claims.

In the accompanying drawings:—

Figure 1 is a side elevation of a machine embodying my invention, the dust guard or gear case being removed;

Fig. 2 is a longitudinal vertical section of the machine;

Fig. 3 is a plan view of the same;

Fig. 4 is an enlarged sectional elevation of a portion of the mechanism for raising and lowering the gatherers;

Fig. 5 is a similar view of another portion of the same mechanism;

Fig. 6 is a transverse section on the line 6—6 of Fig. 4;

Fig. 7 is an enlarged transverse section on the line 7—7 of Fig. 5;

Fig. 8 is an enlarged transverse section through the main driving sprocket, and

Fig. 9 is a similar view through the driving sprocket on the beater or gatherer shaft.

In carrying out the invention, I employ a frame consisting of truss-like side bars or sills 1 having their front ends upturned, as shown at 2, whereby to provide clearance for the steering wheels 3 and having their rear ends turned upwardly, as shown at 4, and then extended rearwardly, as shown at 5, to be carried by the rear axle 6 and furnish a support for the operating mechanism, as will be hereinafter fully set forth. Supported by and between the sills 1, between the upwardly extended forward portions 2 and the rearwardly and upwardly extended portions 4, is a box or receptacle 7 which may be of any preferred form and is illustrated as having an open top and being equipped with dumping doors 8 in its bottom. The steering wheels 3 are mounted at the ends of the front axle 9 so as to turn about vertical pivots 10 in steering, and spindle arms 11 project forwardly from the said pivots and are connected by a tie rod 12 in a well-known manner. At its center, the tie rod is connected with a coupling plate or head 13 so as to move therewith, and this coupling head is pivotally attached to the front end of a drawbar 14 which is rigidly secured upon the front axle and also secured to a cross bar 15 which constitutes a part of the support for the receptacle 7. The coupling head 13 may move pivotally in a horizontal plane about the front end of the drawbar 14 and at its front end the said head carries a horizontal pivot 16 upon which the draft pole or tongue 17 is mounted. It will thus be readily seen that the tongue may move in a vertical plane so that irregularities in the surface over which the machine is drawn may be accommodated without imposing excessive strain or fatigue upon the draft animals and it may also be readily turned sidewise so as to vary the angles of the steering wheels and thereby effect steering of the machine. Braces or radius rods 18 extend from the cross bar 15 to the front axle and are rigidly secured to the axle and the cross bar so as to maintain the front axle in parallelism with the rear axle and to impart the necessary rigidity to the frame. Braces 19 are extended between the top of the receptacle to the upturned portions 2 of the sills, the extremities of said upturned portions being supported by the axle through posts or standards 20 rising from the axle adjacent the ends of the same.

The driving wheels 21 are fitted upon the axle 6 so as to impart rotation thereto through escapement devices, indicated conventionally at 22, and of any well-known form, whereby the axle will be rotated upon

forward movement of the machine but will not rotate upon backward movement of the machine. Frame bars 23 are secured to the top of the receptacle 7 and extend rearwardly and downwardly therefrom to be joined to the rear ends of the main frame bars 5. To the rear extremities of the frame bars, I secure arcuate guiding plates 24, the ends of which are connected with the frame bars through braces 25 whereby the desired rigid construction will be effected. The beater or gatherer is disposed between the guides 24 and between the rear extremities of the frame bars so that it may be lowered into operative position and raised into inoperative position without interference from any portion of the frame, and it is carried by a shaft 26 mounted in and carried by the rear ends of bars 27 which are pivotally mounted at their front ends upon the rear axle 6. The beater or gatherer consists of a drum 28, which may be of any preferred detail construction, and teeth 29 of hooked or scoop-like form, as clearly shown in Fig. 2. These teeth are secured rigidly upon the drum in rows parallel with the axis of the same and, of course, rotate about the shaft 26 with the drum. In the working position illustrated in Fig. 2, the ends of the teeth in the several rows of teeth will successively penetrate the surface of the ground and pass under the stones so as to loosen and remove the same. Both end teeth of each row are provided with side plates or retainers 30 so that the stones cannot escape over the ends of the several gangs or baskets formed by the teeth. In advance of the drum, a chute 31 is supported by the gathering arms 27, and this chute consists of parallel bars 32 secured to and extending across hangers 33 and 34 depending from the gathering arms and passing under the chute so that the chute will be firmly supported and the bars 32 maintained in parallelism. It will be readily understood that as the hooked teeth 29 pass forwardly and downwardly in operation they will pass through the spaces between the several bars 32 and deposit the gathered stones onto said bars down which the stones will roll to be taken up by an elevator to be presently described. The hangers 33 and 34 are, of course, so located as to clear the elevator members and the gathering fingers, and it will be noted that the rear portions of the bars are steeper than their forward portions so that the stones will quickly roll out of the way of the gathering fingers while the forward extremities of the bars are turned up to form stops 132 to prevent the stones rolling from the chute.

The beater is rotated through the action of a driving sprocket wheel 35 upon the rear axle 6, a sprocket 36 on the beater or gatherer shaft, and a chain 37 trained around the said sprockets. The sprocket 35 is loose upon the axle 6 and has its hub elongated at one side, as shown at 38, and constructed with an annular groove 39 which may be engaged by a pin 40 carried by the rear end of a lever 41 which extends forwardly and is pivoted between its ends upon the side of the box 7 or some other convenient support. The end of the elongated portion of the hub is constructed with ratchet teeth 42 adapted to engage the teeth 43 of a ratchet disk 44 which is secured upon the axle 6 in any desired manner and as will be readily understood upon reference to Fig. 8. When the gatherer is not to operate, the sprocket is shifted out of engagement with the ratchet disk 44, as illustrated in Fig. 8, but when the gatherer is to work, the sprocket wheel is shifted so as to engage the ratchet teeth 42 with the teeth 43, whereupon the rotation of the axle 6 will be transmitted to the sprocket. The sprockets 35 and 36 and the chain 37 are housed within a gear casing or dust guard 45 which is of proper form and dimensions to enclose all the said parts and at its front end is constructed on one side with a ring or collar 46 to receive the end of a sleeve or thimble 47 fitted about the hub 38 and the ratchet disk 44 and held against movement in any desired manner, the said thimble being constructed with a longitudinal slot 48 to accommodate the pin 40 and permit the required sidewise movement of the sprocket 35. The front end of the lever 41 is slotted, as indicated at 49, to be engaged by one end of an angle lever or bell crank 50, the opposite end of which is pivotally connected to the rear end of a link 51 which extends to the front end of the machine where it may be manipulated by the driver upon a seat 52 which is illustrated as mounted upon the front side of the receptacle 7 but may, of course, be secured in any convenient manner, a hand lever 150 being provided adjacent the seat and connected to the link 51. The bell crank 50 is arranged to move about a vertical axis so that reciprocation of the link 51 will effect oscillation of the lever 41 and thereby shift the hub 38 and the sprocket 35 into or out of engagement with the ratchet disk 44, as will be readily understood. Upon reference to Fig. 1, it will be noted that the sprocket 35 is considerably larger than the sprocket 36 so that the gatherer will rotate at a higher speed than the driving wheels. This difference in speed is desirable inasmuch as the gathering teeth are thereby caused to travel rearwardly through the soil instead of merely engaging and riding upon the same in a manner similar to the travel of the driving wheels.

The sprocket 36 is constructed and mounted in such a manner that the gatherer may yield and be momentarily restrained from operating should a large rock or other im-

movable obstruction be encountered, this construction and arrangement being shown in detail in Fig. 9. By referring to said Fig. 9, it will be noted that the teeth 53 of the sprocket 36 are carried by a rim 54 extending laterally from a side plate or disk 55 so that one side of the sprocket is closed and the opposite side is open defining a pocket which fits about a disk 56 having a hub 57 which is secured to the gatherer shaft 26. Disposed within the rim 54 and connected therewith in such a manner that it must rotate therewith but may slide thereon toward or from the disk 56 is a plate 58 and connected with said plate by bolts or screws 59 are a series of fingers 60 which are pivoted at their outer ends to the rim 54 adjacent the open side of the same. The open side of the sprocket is covered by a plate 61 which is secured to the edge of the rim 54 and has a hub-like member 62 which extends through an opening in the side of the gear case 45 and fits loosely about the shaft 26. The said hub-like member is provided with a flange or collar 63 bearing against the bar or arm 27 so that it cannot move along the shaft 26. A coiled spring 64 is housed within the hub-like member 62 and bears against the outer end wall of the same and also against the inner free extremities of the fingers 60. Normally, the spring is expanded so that the fingers are pressed inwardly and the clutch plate 58 is thereby held in contact with the driving disk 56, it being understood that the screws or bolts 59 are threaded through the fingers and bear constantly at their inner ends against the clutch plate 58. The sprocket 36, of course, rotates continuously as long as the driving sprocket 35 is locked to the axle 6, and when the clutch plate 58 is in its normal position bearing against the driving disk 56, the motion of the sprocket will be transmitted to the shaft 26 and the gatherers will be caused to travel around said shaft with the drum 28. Should a large rock or other immovable obstruction be encountered, the resistance thereby offered to the rotation of the gathering member will cause the plate 58 to slip upon the driving disk 56, overcoming the tension of the spring 64, so that momentarily no motion will be imparted to the gatherer shaft 26. As soon as the obstruction has been cleared, however, the normal tension of the spring 64 will assert itself and effect the desired clutching engagement between the plate 58 and the driving disk 56 so that the operation of the gatherer will be resumed.

The lower end of the chute 31 is disposed below the rear axle 6 of the machine and may be under the axle so that the elevating fingers 65 may enter the lower end of said chute and take up all the stones which may have been deposited in the chute. These elevating fingers are similar in construction to the gathering fingers 29 and are carried by parallel endless chains consisting of links 66 of considerable length and trained around square driving members 67 which are secured upon the rear axle 6. Standards 68 rise from the frame bars 23, and braces 69 extend between the upper ends of the said standards and the frame bars so that there is provided a rigid support for an upper shaft 70, upon which are secured members 71 corresponding in form and dimension to the driving members 67 and disposed respectively in the same vertical planes. This construction provides a very strong elevator which will operate positively and which will eliminate the liability of teeth being stripped as would be the case if ordinary gears or sprockets were employed. The several links of the elevator chains are equal in length to any one side of the members 67 and 71 so that each link, when engaged by a driving member, will be supported throughout its length by the said member and a substantially flat support for the teeth of the elevator will be provided. The pivots connecting adjacent links are, of course, extended across the width of the machine and the teeth are carried by the said pivots. An upper chute 72 extends downwardly and forwardly from the upper end of the elevator to a point over the receptacle 7 and is supported by the receptacle and by standards 123 rising from the frame bars 23. This chute is composed of parallel bars 172, the stones raised by the elevator being delivered at the upper end of the chute and then rolling down the same into the receptacle in an obvious manner.

To effect the raising and lowering of the gathering instrumentality, I provide mechanism which may be readily thrown into or out of operative position by the driver of the machine but it will be actuated by power transmitted from the rear axle. Mounted in bearings 73 upon the frame bars 23 is a shaft 74 which extends across the machine, and upon the ends of this shaft 74 are secured gear wheels 75 which mesh with gear wheels 76 secured upon the outer ends of stub shafts 77 which are mounted in suitable bearings upon the under side of the frame bars 5. Upon the inner ends of the stub shafts 77 are secured cams or eccentrics 78 which are so disposed that their peripheries will ride under rollers 79 carried by brackets 80 rising from the gatherer arms 27. Obviously, if the cam or eccentric be rotated so that its high part or greatest radius will be above or extending upwardly from the shaft 77, the roller 79 will be lifted and the gatherer-supporting arm 27 will be likewise swung upwardly and if the eccentric be disposed with its greatest radius be-

low the stub shaft, the gatherer-carrying arm 27 and the gatherer will be lowered. To effect the desired movement of the eccentric or cam, a sprocket wheel 81 is mounted upon the shaft 74 and is operatively connected by a chain 82 with a sprocket 83 upon the axle 6. The sprocket 81 is loose upon the shaft 74 and is constructed upon its outer side with a ratchet disk 84. Secured upon the shaft alongside the said ratchet is a disk 85 having a pawl 86 pivotally mounted upon its side in position to engage the said ratchet 84 and normally forced to said ratchet by a spring 87, as will be readily understood upon reference to Fig. 5. In the periphery of the disk 85 are diametrically opposite notches 88, across one of which notches one end of the dog or pawl 86 extends. Mounted upon the frame in front and in rear of the disk 85 are levers 89 carrying rollers 90 adapted to engage the notches 88 and thereby hold the disk against movement and release the dog 86 from the ratchet 84. A link 91 connects the levers for simultaneous movement and the parts are so arranged relative to the respective pivots that the rollers 90 will be moved in opposite directions upon actuation of the levers. A cable or other flexible connection 92 is attached to the upper end of the forward lever 89 and extends to the front of the machine within convenient reach of the driver upon the seat 52. A post 93 rises from the arm 25 in rear of the levers 89 and a retractile spring 193 extends between and is secured to the forward lever 89 so as to hold the same normally in its rear position with the rollers 90 engaging the notches 88 and holding the disk 85 against movement, the pawl 86 being released from the ratchet 84. The sprocket 81 rotates constantly during the travel of the machine. If the cable 92 be pulled so that the levers 89 will be set as shown in Fig. 5, the dog 86 will engage the ratchet and the rotation of the sprocket 81 will then impart movement to the shaft 74 which will be transmitted through the gears 75 and 76 to the cams or eccentrics 78 and the gatherer consequently raised or lowered. When the cable 92 is pulled forward, the rollers 90 are withdrawn from the notches 88 and the dog or pawl 86 is at once thrown into engagement with the ratchet 86 and the shaft 74 rotated. The cable is held only momentarily and the spring 193 then retracts and swings the forward lever 89 rearwardly thus holding the rollers 90 to the periphery of the disk 85 so that, when the disk has made one-half a revolution, the rollers will reenter the notches 88, one roller bearing upon the pawl and releasing it from the ratchet. A second pull upon the cable will permit the disk and the cams to complete the revolution so that a slight pull upon the cable will result in automatic elevation of the gatherer and a second pull will result in its return to working position.

It is thought the operation of the machine will be readily understood from the foregoing description, taken in connection with the accompanying drawings. As the machine is drawn over the field, the rear driving wheels 21 will obviously impart motion to the rear axle 6 and if the sprocket 35 on said axle be shifted into the working position, the motion will be transmitted to the gatherer shaft so that the series of gathering teeth 29 will be caused to pass through the soil and take up the stones thereon. The gathering teeth will deliver the stones to the lower chute from which they will be removed by the elevator and delivered to the upper chute whence they will pass into the receptacle. The machine is very compact and does not include any excessive dead weight so that, while it will efficiently accomplish the purpose for which it is designed, it may be expeditiously and economically built and will be of light draft when in use.

Having thus described the invention, what is claimed as new is:

1. In a stone-gatherer, the combination of a portable frame including a rear axle, a rotatable gathering instrumentality supported from the frame in rear of the axle, gearing connecting said instrumentality with the axle, a receptacle on the frame in advance of the axle, a chute having its rear end adjacent the top of the gathering instrumentality and its forward end beneath the axle, an elevator having its lower end mounted upon and driven directly by the axle, and a chute extending downwardly and forwardly between the top of the elevator and the receptacle.

2. In a stone gatherer, the combination of a portable frame including a rear axle, a rotatable gathering instrumentality supported in rear of the axle and geared to the same, a chute rigidly supported on the frame between said instrumentality and the axle and extending under the axle, an elevator mounted on and rising from the axle and driven directly thereby, the elevator being constructed to pass through the lower end of the chute and take material therefrom, and a receptacle on the frame in advance of the elevator and receiving material therefrom.

3. In a stone-gatherer, the combination of a portable frame including a rear axle, a rotatable gathering instrumentality supported in rear of and driven from the axle, a chute secured rigidly upon the frame in rear of the axle and extending from a point adjacent the top of the gathering instrumentality to a point beneath the axle, upstanding stops at the lower end of the chute, a receptacle on

the frame in advance of the axle, and an elevator mounted on and driven directly by the axle and constructed to pass through the lower end of the chute and between the stops thereat to take material from the chute and deliver it to the receptacle.

4. In a stone-gatherer, the combination of a portable frame, a rotatable gathering instrumentality mounted thereon, a plurality of hangers secured upon the frame, a plurality of parallel bars secured rigidly upon and connected by the hangers and receiving material from the gathering instrumentality, and an elevator disposed over the lower ends of the parallel bars and including series of parallel free rigid fingers arranged to pass between the lower ends of the parallel bars and take up material deposited thereon.

5. In a stone-gatherer, the combination of a portable frame, a rotatable gathering instrumentality mounted upon the frame and comprising a cylindrical drum and series of rigid curved fingers secured rigidly upon the drum, the fingers in each series being parallel and free of each other throughout their extent, a chute supported rigidly upon the frame to receive material from the gathering instrumentality and consisting of a series of inclined parallel bars extending into the path of the said fingers to permit the fingers to pass between the bars, and an elevator disposed over the lower ends of the said bars and including series of similar fingers arranged to pass between the lower ends of the parallel bars and take up material deposited thereon.

In testimony whereof I affix my signature.

LELAND D. TETER. [L. S.]