C. R. SMITH.

STALK PULLER.

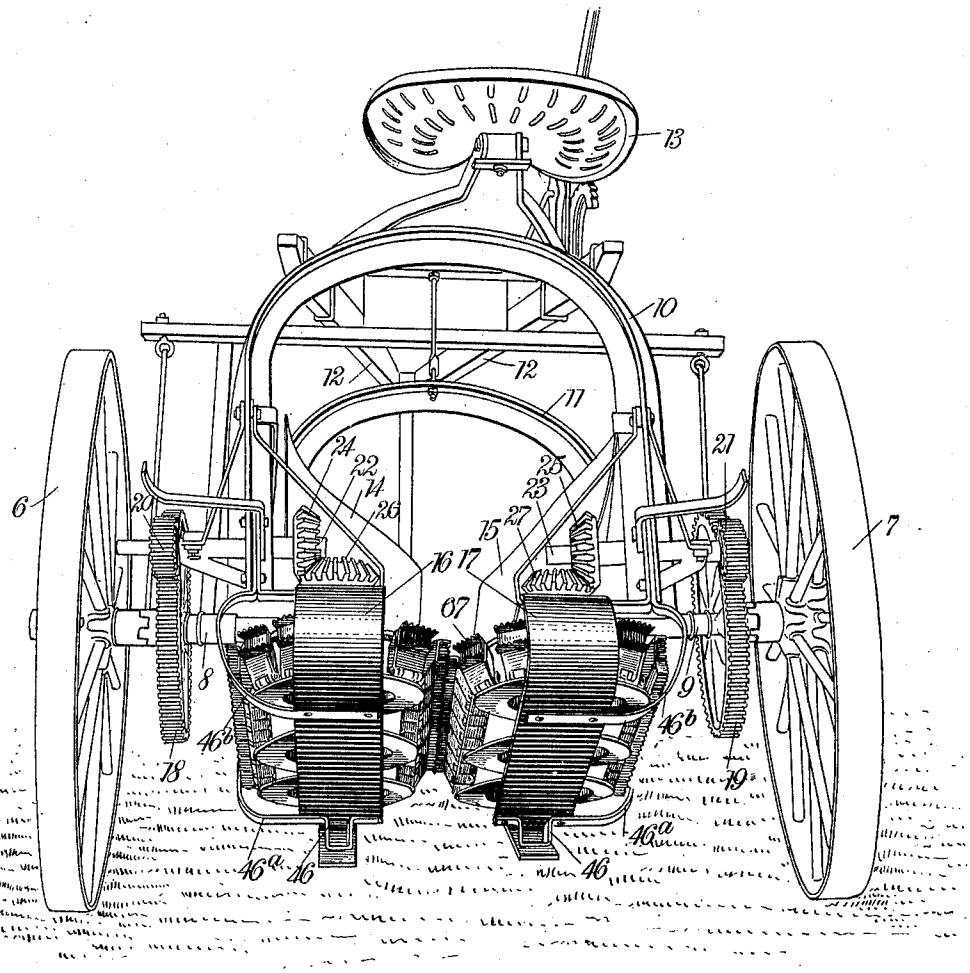
APPLICATION FILED SEPT. 28, 1911.

1,038,978.

Patented Sept. 17, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

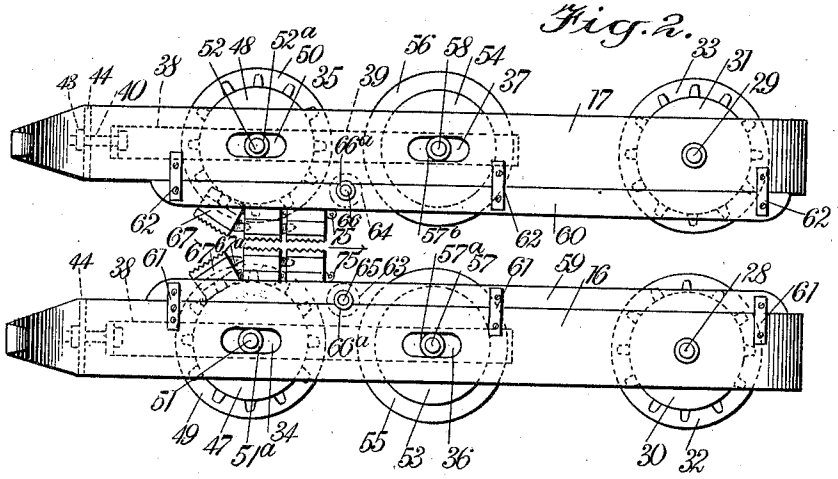


Fig. 3.

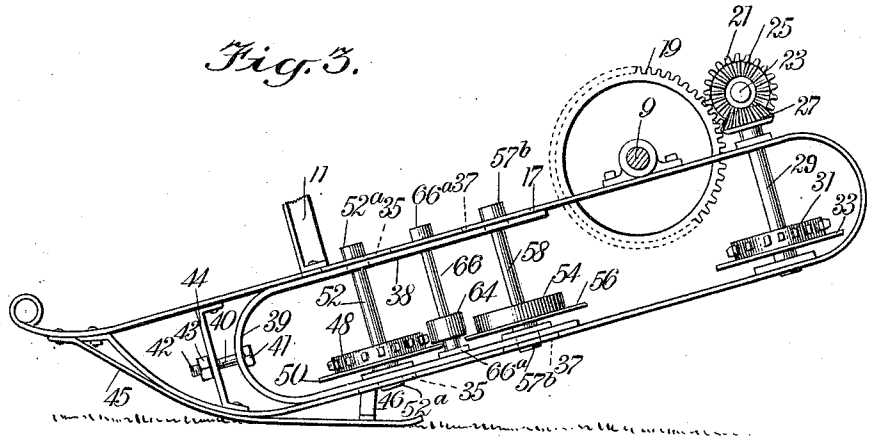


Fig. 4.

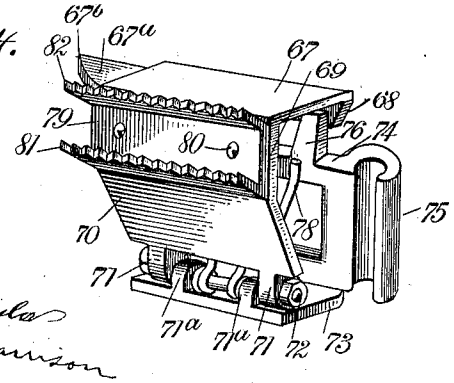
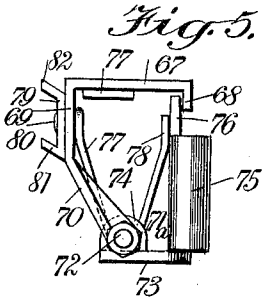


Fig. 5.



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UNITED STATES PATENT OFFICE.

CULLEN ROGERS SMITH, OF PERRIS, CALIFORNIA.

STALK-PULLER.

1,038,978. Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed September 28, 1911. Serial No. 651,757.

To all whom it may concern:

Be it known that I, CULLEN ROGERS SMITH, a citizen of the United States, and a resident of Perris, in the county of Riverside and State of California, have invented a new and Improved Stalk-Puller, of which the following is a full, clear, and exact description.

My invention relates to stalk pullers of the same general class as the one described in my patent of January 12, 1904, No. 749,636, and that of my patent of March 5, 1907, No. 846,255.

The purpose of my present invention is to provide, in connection with a machine of this kind, a number of distinct improvements relating mainly to the gripping jaws for seizing the stalks, the links carrying these jaws and formed into chains, the means for guiding, supporting and adjusting these chains, and mechanism for preventing the entrance of stalks, dirt, or other undesirable material into the spaces between the links of the same chain.

My invention further relates to various details of construction whereby the jaws are given more or less resilience, and the efficiency of the apparatus as a whole and of various parts thereof is greatly increased.

Reference is to be had to the accompanying drawings forming a part of this specification, in which like characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a rear elevation showing my improved stalk puller complete; Fig. 2 is a plan view showing the chain frames and gearing for operating the chains, these parts being exhibited as they appear when removed from the vehicle; Fig. 3 is a detail view, showing one of the chain frames and parts carried by it; Fig. 4 is a detail view, showing in perspective, one of the gripping jaws and the link with which it is associated; and Fig. 5 is an end elevation of the parts shown in Fig. 4.

Two vehicular wheels 6, 7 support practically all of the working parts. Associated with these wheels are axles 8, 9, and a pair of arches 10, 11. Extending from one arch to the other is a V-frame 12. A seat 13 is provided for the driver. Two guides 14, 15 made preferably of thick sheet metal are employed for the purpose of directing the stalks toward the center of the machine as the latter travels along. The parts just mentioned may be of the usual or any desired construction. The chain frames, that is, the frames for supporting the gripping frames and parts associated therewith are shown at 16, 17.

Mounted upon the axles 8, 9 are gear wheels 18, 19, and meshing with the latter are pinions 20, 21. These pinions are mounted upon stub shafts 22, 23, the latter carrying bevel pinions 24, 25. Meshing with these bevel pinions are other bevel pinions 26, 27 which are mounted rigidly upon stub shafts 28, 29. These stub shafts extend obliquely upward through the chain frames 16, 17, as will be understood from Figs. 2 and 3.

Mounted rigidly upon the stub shafts 28, 29, and disposed within the chain frames 16, 17, are sprocket wheels 30, 31, which are provided with flanges 32, 33. The chain frames 16, 17 are provided with slots 34, 35, 36, 37 for facilitating the adjustment of the gripping chains, as hereinafter described. Mounted within the chain frames 16, 17 are U-frames 38. Each of these U-frames is provided with an arcuate portion 39, and extending through the latter is a bolt 40 provided with a head 41 and with a threaded portion 42 upon which is fitted a nut 43. This bolt 40 extends through a brace 44, the latter being secured to the chain frame and extending internally thereof from top to bottom, as will be understood from Fig. 3. Below each chain frame 16, 17 is a runner 45 which is braced by a portion 46 of an arm 46^a. There are two of these arms 46^a, and associated with them are two other arms 46^b (see Fig. 1). The four arms partially support the chain frames 16, 17, the latter resting, it will be understood, upon the runners 45.

Disposed within the chain frames 16, 17 are sprocket wheels 47, 48 provided respectively with flanges 49, 50 each flange being integral with the sprocket wheel with which it is associated. The wheels and flanges in question are mounted upon shafts 51, 52. Two other wheels 53, 54 are provided with smooth circumferential surfaces and with integral flanges 55, 56. These wheels and their flanges are mounted upon two shafts 57, 58, the latter being supported in bearings 57^a, 57^b, which are carried by the U-frames 38 and which extend through the slots 36, 37. The shafts 51, 52 fit into bearings 51^a, 52^a carried by the U-frames 38 and which fit slidably into the slots 34, 35. Two

guard strips 59, 60 are, by aid of brackets 61, 62, secured upon the respective inner edges of the chain frames 16, 17 for the purpose of preventing the lodgment of dirt and loose stalks upon the various wheels carried within these frames. Two smooth idle wheels 63, 64 of small diameter are mounted upon two shafts 65, 66 which work in bearings 66[a] carried by the U-frames.

The gripping chains are made up of separate units, one of which is shown in perspective in Fig. 4 and in elevation in Fig. 5. Each chain unit comprises a plate 67 having a narrow portion 68 bent substantially to a right angle to it and also having, opposite the portion 68, a longer portion 69 bent obliquely downward at 70 and provided at the lower end thereof with bearing lugs 71. Extending through these lugs is a pivot pin 72. A plate 73 is provided with bearing lugs 71[a] through which this pivot pin extends. A link 74 is also carried by the plate 73 of each unit and is provided with a member 75 which fits into a corresponding part carried by the next successive unit so that the various units are thus united and form a chain. Each link 74 is further provided with lugs 76 integral with it and extending upwardly from it, these lugs being normally engaged by the bent portion 68 of the plate 67 and forming limiting stops for the latter. Within each chain unit is a spring 77 which extends around the pivot pin 72 and is provided with end portions 78 which engage directly the adjacent surface of the link 74. The springs 77 also engage the inner surface of the portion 69 of the plate 67, as will be understood from Fig. 5. The springs, by pressing in opposite directions, normally force the plate 67 to the left, according to Fig. 5, so that the down-turned portion 68 is normally in engagement with the lugs 76. When, however, pressure is applied to the plate 67, as hereinafter described, the tension of the springs is, for the time being, overcome and the plate 67 moves to the right, according to Fig. 5, being ultimately restored to normal condition by the pressure of the spring. Mounted upon the portion 69 of the plate 67 is a plate 79 secured in position by aid of rivets 80, and provided with serrated edges 81, 82, the latter being inclined obliquely upward, as will be understood from Figs. 4 and 5.

The various chain units being connected up into chains, as above described, and the units of one chain being adjusted to mate the units of the opposite chain, it follows that the various serrated edges are disposed in bearings as indicated in Fig. 2. Each plate 67 carries upon its underside a guard 67[a] having rigidly secured in position an arcuate surface 67[b] and adapted to slidably engage the under surface of the next successive plate 67 as will be understood from Fig. 2. The purpose of the guard 67[a] is, while allowing sufficient flexibility to the chain, to prevent at the same time the undesirable entrance of stalks, twigs and dirt between the successive units of the same chain. Except for this provision, the stalks, twigs and other obstacles would tend to lodge in between the units, and that too, under conditions where they would be likely to clog the movements of the chain or to break the chain or some part employed for actuating the same.

The operation of my device is as follows: The parts being assembled and arranged as above described, draft animals, such as horses, are harnessed to the machine and caused to move it forwardly along by aid of the wheels 6, 7. The front ends of the chain frames, being now lowered so that the runners 45 rest upon the ground and the machine being driven along a row of stalks, the work begins. The forward travel of the machine by causing the rotation of the vehicular wheels 6, 7 and the shafts upon which the latter are mounted actuate the various gear members 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, and thus cause the shafts 28, 29 to turn in opposite directions. The chains engaging the sprocket wheels 30, 31, 47, 48 are driven at the same rate of speed and in opposite directions. If the chains are too slack, they are tightened up by turning the nuts 43, thereby practically turning the bolts 40 and forcing the U-frames 38 obliquely downward to the left, according to Fig. 3. In thus adjusting the U-frames 38, the shafts 51, 52, 57, 58 are drawn toward the front ends of the frames. The slots 35 readily permit this bodily adjustment of the various shafts. Whenever, owing to wear or other cause, either one of the chains becomes slightly looser, the rotation of the nut 43 upon the corresponding chain frame, will cause the chain to become sufficiently tight. The chains engage the idle wheels 53, 54 and cause the latter to turn. The idle wheels 53, 54, as well as the sprocket wheels have flanges integral with them, as above explained, so that the chains are very effectively guided. The idle wheels 63, 64 are not movable bodily in relation to the chain frames, and are, therefore, not affected by the adjustment. Neither are the idle wheels 63, 64 provided with flanges, as none are necessary. The guard strips 59, 60 may readily be removed or replaced when worn out or damaged, or even when the operator desires access to the working parts of the machine.

As the machine is moved forward and the chains operate as above described, stalks are guided in between the chains and successively gripped by the serrated edges 81, 82 and thus drawn backwardly and at the same time pulled out of the ground. The stalks

are thus carried to the rear and released, or otherwise disposed of, as desired.

I do not limit myself to the precise arrangement shown for the reason that variations therein may be made without departing from the spirit of my invention.

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

1. In a stalk puller, the combination of a pair of chains made up of units connected together and movable relatively to each other for the purpose of giving flexibility to the chain, each unit comprising a link, a swinging member carried by said link and movable relatively in the direction lateral to the general direction of travel of said link, said movable member being provided with gripping edges, and spring mechanism for normally maintaining said swinging member in a predetermined position relatively to said link.

2. In a stalk puller, the combination of a pair of movable chains, each comprising links, a swinging member carried by each link and provided with a plate having serrated surfaces, and a spring disposed between said link and said plate for the purpose of normally holding said plate in a predetermined position relatively to said link.

3. In a stalk puller, the combination of a plurality of chains each made up of units provided with gripping surfaces, each unit being further provided with a guard extending into the next successive unit for the purpose of preventing the entrance of stalks or the like between the successive units of the same chain, framework for supporting said chains, and means for moving said framework and chains along the ground.

4. A stalk puller comprising a pair of chains provided with gripping surfaces, each chain being made up of units movable relatively to each other for the purpose of giving flexibility to the chains, each unit being provided with a member having an arcuate surface and mounted upon one of said units, said member extending from the unit on which it is mounted so as to slidably engage the next successive unit for the purpose of preventing the entrance of foreign substances between the successive units of the same chain, and means for actuating said chains.

5. A stalk puller comprising endless sprocket chains having portions traveling in parallelism, and embodying links, each of which links carries a stalk gripping member and sprocket wheels over which said chains travel having flanges on which the chains are supported.

6. A stalk puller comprising endless chains having portions traveling in parallelism and embodying links, each of which links carries a stalk gripping member, and a guard strip extending into the adjacent link at one side, to prevent stalks from getting between the links.

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

CULLEN ROGERS SMITH.

Witnesses:
WILBERT W. STEWART,
WILBERT G. STEWART.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."