

J. B. HILL.
SOIL PULVERIZER.

APPLICATION FILED FEB. 13, 1911.

1,006,752.

Patented Oct. 24, 1911.

4 SHEETS—SHEET 1.

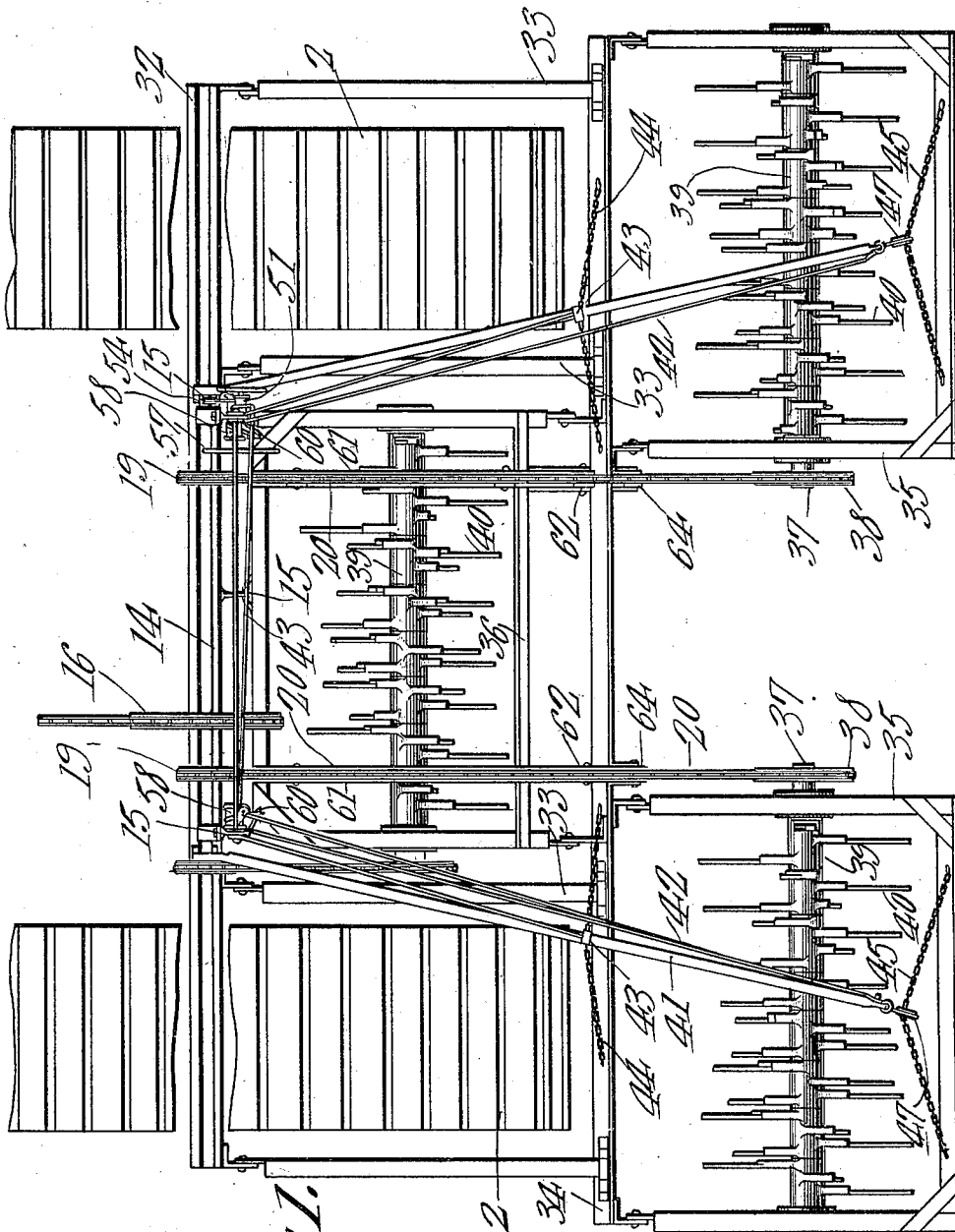


Fig. 1.

Witnesses.

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4 SHEETS—SHEET 2.

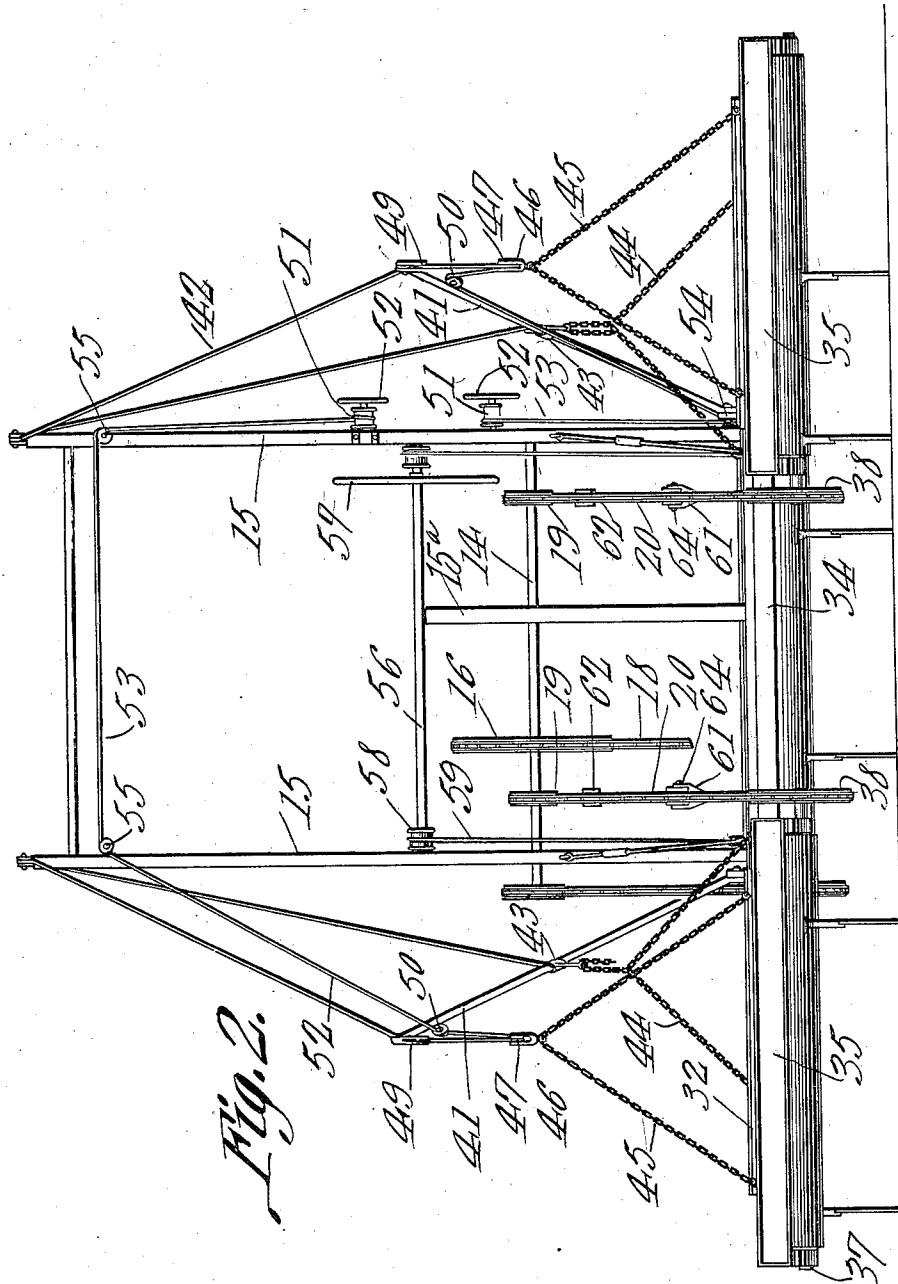


Fig. 2.

Witnesses

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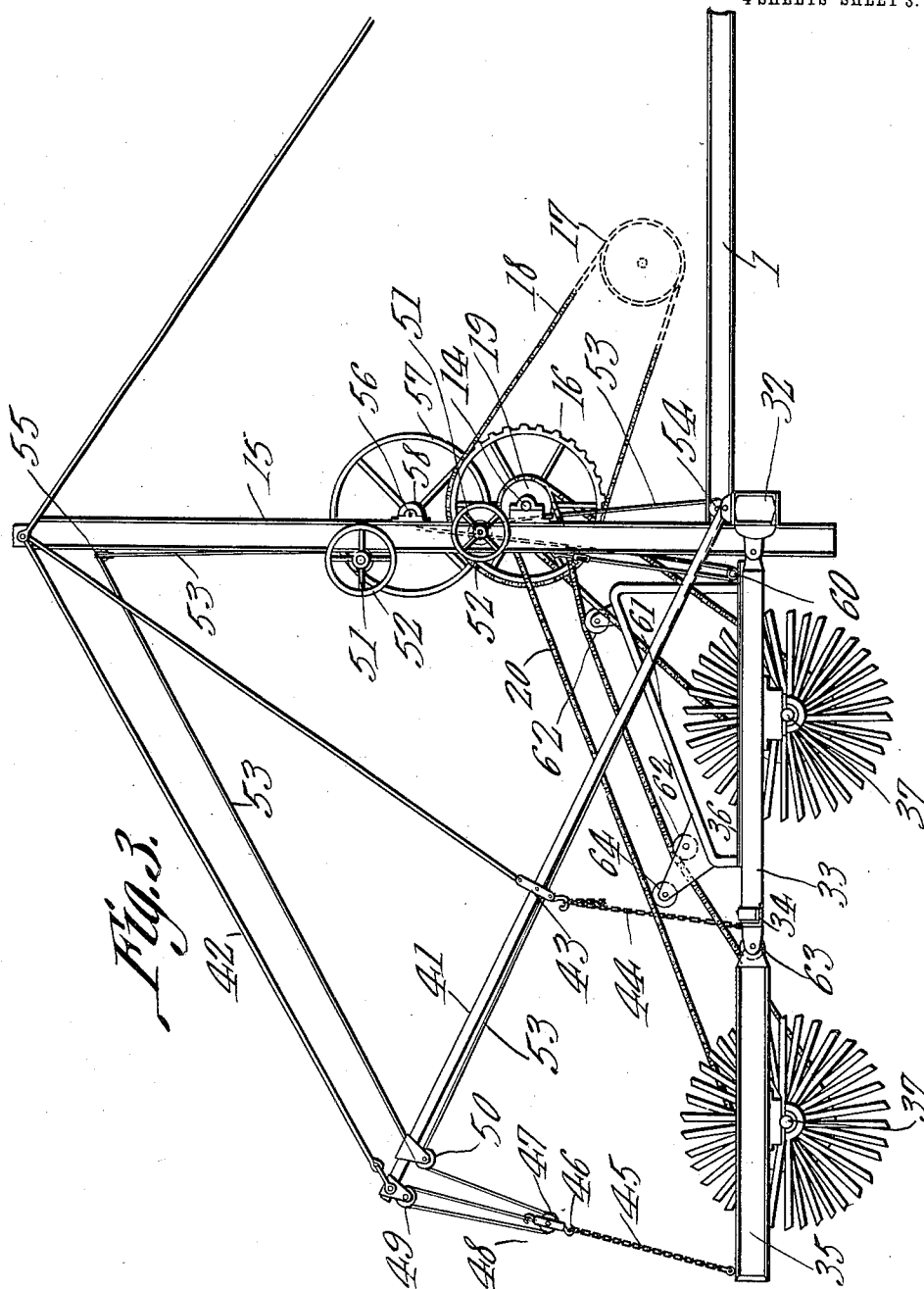
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Witnesses

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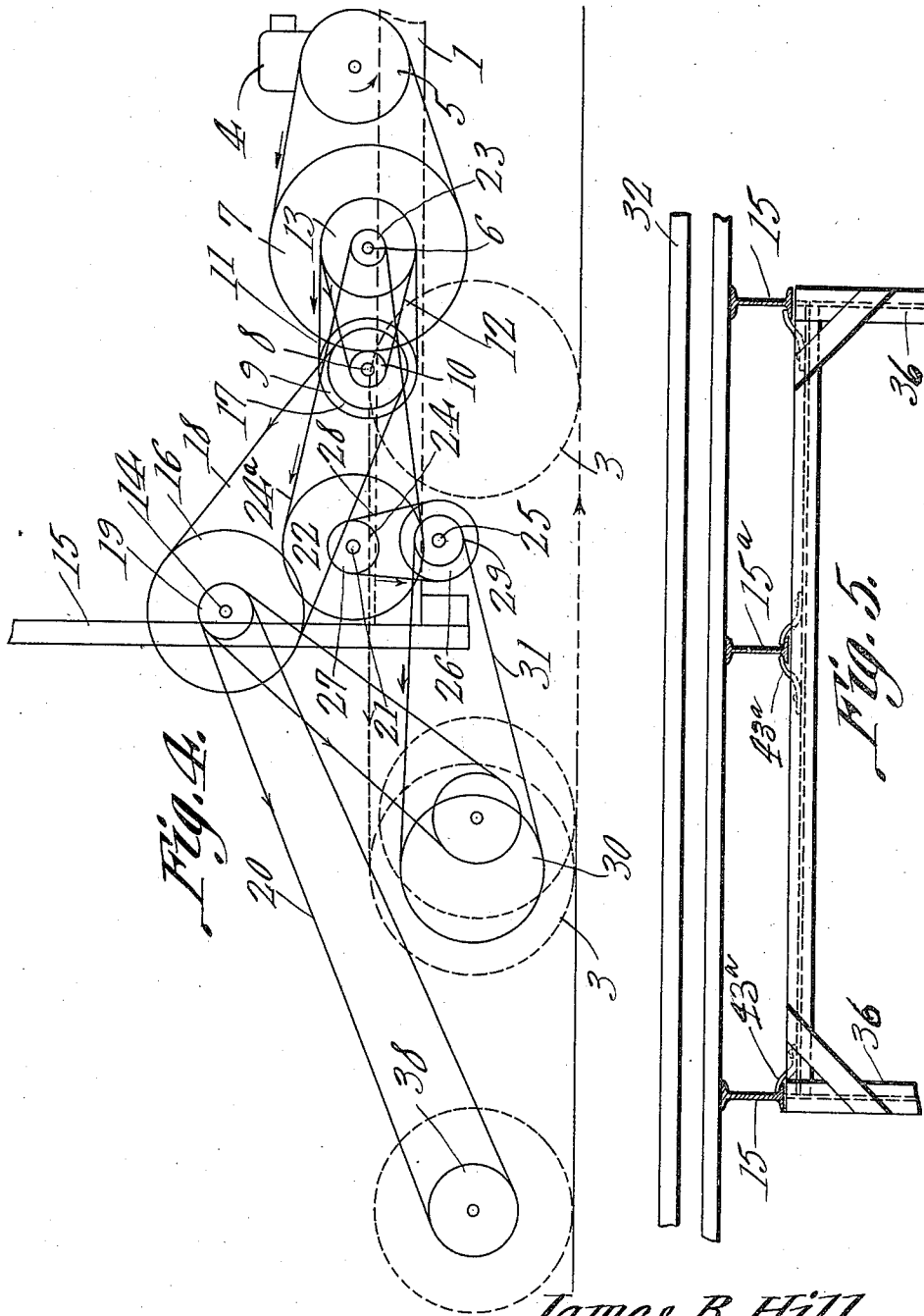
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4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

JAMES B. HILL, OF RACELAND, LOUISIANA.

SOIL-PULVERIZER.

1,006,752.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed February 13, 1911. Serial No. 608,256.

To all whom it may concern:

Be it known that I, JAMES B. HILL, a citizen of the United States, residing at Raceland, in the parish of Lafourche and State of Louisiana, have invented a new and useful Soil-Pulverizer, of which the following is a specification.

This invention has relation to soil pulverizers and consists in the novel construction and arrangement of its parts as hereinafter described and claimed.

The object of the invention is to provide a pulverizer in the form of an attachment adapted to be applied to a frame mounted upon supporting and propelling devices and carrying an engine with means for operating the pulverizing element from the said engine.

Also it is the object of the invention to provide a pulverizer attachment consisting of a series of sections with means for adjusting the sections with relation to each other and another means for raising or lowering the gang of sections simultaneously.

This pulverizer is especially designed to be used upon reclaimed swamp lands generally known as floating prairie land for the purpose of cutting the mat of roots that usually exist just below the surface of the land and lifting the sections of root thus cut and depositing the same upon the surface where they are destroyed by the action of the sun. At the same time the soil is pulverized and is in condition for simultaneous or subsequent planting.

In the accompanying drawings:—Figure 1 is a top plan view of the pulverizer. Fig. 2 is a rear elevation of the same. Fig. 3 is a side elevation of the same. Fig. 4 is a diagrammatic view of the operating parts of the pulverizer illustrating how they and the propelling members of the supporting frame to which the pulverizer is attached are operatively connected with the engine mounted upon the said frame. Fig. 5 is a detail horizontal sectional view of a portion of the pulverizer.

As the frame to which the pulverizer is attached forms no part of the present invention, only so much thereof will be shown and described as will enable those skilled in the art to have a clear understanding of the operation of the pulverizer.

The frame 1 is mounted upon propelling elements 2 which are preferably in the form of apron tractions and consist of sections

connected together by flexible members and arranged to move about wheels 3 journaled at the end of a supporting structure (not shown). The wheels 3 are illustrated in the diagram in Fig. 4.

An engine 4, preferably of the hydrocarbon type is mounted upon the frame 1 and is provided upon its shaft with a belt pulley 5. A shaft 6 is journaled upon the frame 1 and a belt pulley 7 is mounted upon the said shaft 6. As compared with the pulley 5 the pulley 7 is of greater diameter. A shaft 8 is journaled upon the frame 1 and is provided with a large pulley 9 and a small pulley 10. A belt 11 may be trained around the pulley 9 and a pulley 13 mounted upon the shaft 6 whereby the shaft 8 will be rotated at a relatively slow rate of speed or a belt 12 may be trained around the pulleys 10 and 13 whereby the said shaft 8 may be rotated at a relatively fast rate of speed. A shaft 14 is journaled for rotation upon masts 15 and intermediate masts 15^a which are mounted at one end of the frame 1. A relatively large pulley 16 is fixed to the shaft 14 and a relatively small pulley 17 is fixed to the shaft 8. A belt 18 is trained around the pulleys 16 and 17 and is adapted to transmit rotary movement from the shaft 8 to the shaft 14. Pulleys 19 are mounted upon the shaft 14 and are operatively connected with the pulverizing element by means of a belt 20 as will be hereinafter explained.

It is to be understood that chain belts and sprocket wheels may if desired be used throughout the entire system for transmitting movement from the engine to the operated parts. A shaft 21 is journaled for rotation upon the frame 1 and carries a relatively large pulley 22. A pulley 23 is fixed to the shaft 6 and a belt 24^a is trained around the pulleys 22 and 23 and is adapted to transmit rotary movement from the shaft 6 to the shaft 21. Pulleys 24 are fixed to the end portions of the shaft 21 and shafts 25 are journaled for rotation at the side portions of the frame 1. Relatively large pulleys 26 are fixed to the shafts 25 and relatively small pulleys 27 are fixed to the end portions of the shaft 21. Belts 28 are trained around the pulleys 26 and 27 and are adapted to transmit rotary movement from the shaft 21 to the shafts 25. Relatively small pulleys 29 are fixed to the shafts 25 and relatively large pulleys 30 are fixed to

the axles of the wheels 3. Belts 31 are trained around the pulleys 29 and 30 and are adapted to transmit rotary movement from the shafts 25 to the wheels 3 with which the said belt pulleys 30 are connected. Therefore it will be seen that means is provided for rotating the wheels 3 and operating the apron traction devices 2 mounted thereon at a relatively slow rate of speed from the engine 4. At the same time means is provided for operating the chain belt 20 at relatively fast rate of speed from the said engine the two operating means having their parts so arranged that the corresponding lower and upper runs of the belt 20 and the apron traction devices 2 move simultaneously in the same direction.

The pulverizer includes a beam 32 which is attached to the rear portion of the frame 1 and which is passed transversely through the apron traction devices 2 between the upper and lower runs thereof as indicated in Fig. 1 of the drawings. Arms 33 are pivotally connected at one end with the beam 32 and the opposite ends of the said arms 33 are connected together by a beam 34 which is parallel with the beam 32. The arms 33 are arranged in pairs with a pair located in the vicinity of each end of the beams 32 and 34 the members of the pair being located at the opposite sides of the apron traction devices 2. Frames 35 are pivotally connected with the beam 34 at the end portion thereof and the said frames are spaced from each other. A frame 36 is pivotally connected with the intermediate portion of the beam 34 and lies at the opposite side of the said beam 34 from the side at which the frames 35 lie. The frame 36 is located at the interval or space between the frames 35. The frames 35 and 36 carry rotating earth engaging members and as the said members are all of the same pattern a description of one will answer for all. Each engaging member consists of a shaft 37 which is journaled in its respective frame and which is provided at one end with a sprocket wheel 38 around which one of the chains 20 hereinbefore described is trained. Hub members 39 are strung upon the intermediate portions of the shafts 37 and carry blades 40 which are radially disposed with relation to the shafts 36 and which are arranged in gangs extending spirally along the shafts 37 as indicated in Fig. 1 of the drawings. Booms 41 are pivotally connected to the beam 32 and guys 42 connect the outer portions of the booms 41 with the upper ends of the masts 15. The masts 15 and intermediate mast 15^a are made from eye beams and the frame 36 is provided at its inner edge with lugs 43^a which pass behind the flanges of the said masts and serve as means for bracing the frame 36 against edgewise movement with relation to the

masts but which will permit the inner portion of the said frame 36 to be swung vertically along the said masts. Hooks 43 are mounted upon the booms 41 at points intermediate their ends and chains 44 are connected with the end portions of the beams 34 and are also engaged with the hooks 43 and serve as means for supporting the outer end portions of the arms 33 and the parts carried thereby. Chains 45 are connected to the outer end portions of the frames 35 and at intermediate points are connected with hooks 46 carried by blocks 47. Pulleys 48 are journaled in the blocks 47 and pulleys 49 and 50 are journaled upon the outer end portions of the booms 41. Winding drums 51 are journaled upon the masts 15 and are provided with operating handles 52. Cables 53 are arranged to wind upon the drums 51 and one of the cables 53 is trained down under a pulley 54 which is journaled upon the beam 32 thence passes out along one of the booms 41 over the pulley 50 thence under the pulley 47 in the block 48 thence up and over the pulley 49 thence down and is attached to the said block as illustrated in Fig. 3 of the drawings. The other cable 53 is arranged to wind upon the upper drum 51 and from thence is trained up over pulleys 55 journaled at the upper ends of the masts 15 thence down and over the pulley 50 at the opposite side of the apparatus from the pulley 50 last above described, thence down under the pulley 46 in block 48 thence over pulley 49 and then down and is secured to the said block 48 as illustrated in Fig. 2 of the drawing. Therefore it will be seen that by rotating the drums 51 by using the hand wheels 52 means is provided for raising and lowering the frames 35 upon their pivotal connections with the beam 34.

A shaft 56 is journaled upon the mast 15 and is provided with a fixed hand wheel 57. Drums 58 are fixed to the end portions of the shaft 56 and cables 59 are arranged to wind upon the said drums 58. From the drums 58 the cables pass down and are trained under pulleys 60 journaled at the inner edge portion of the frame 36 and from the said pulleys the said cables extend up and are secured to the edge portions of the masts 15 as indicated in Fig. 3 of the drawings. Therefore it will be seen that by rotating the shaft 56 and winding the cables 59 upon the drums 58 the inner edge portion of the frame 36 may be swung vertically upon the pivotal connections between the said frame and the beam 34.

Brackets 61 are mounted upon the end portions of the frame 36 and pulleys 62 are journaled at the upper portions of the said brackets. The lower runs of the chains 20 which operate the soil engaging members located in the frames 35 bear upon the

upper portions of the pulleys 62 and also upon pulleys 63 journaled upon the beams 34. Thus the said chains 20 serve to hold the frame 36 down so that its soil engaging member will properly engage its work. Pulleys 64 are also journaled upon the brackets 61 and the upper runs of the said chains 20 bear against the upper portions of the said pulleys 64. Therefore the pulleys 64 will prevent the upper runs of the chains 20 from interfering with the lower runs thereof as the parts of the pulverizer are adjusted.

From the description it will be seen that means is provided for adjusting the inner edge portion of the frame 36 upon the beam 34 and also means is provided for adjusting the outer edge portions of the frames 35 with relation to the said beam 34. Also by lengthening or shortening the chain 44 the beam 34 may be raised or lowered with relation to the beam 32. As a machine having the pulverizer attachment is moved along the surface of the ground the blades 40 rotate in the same direction as the wheels which propel the machine and as they encounter the ground they assist in propelling the machine along the surface. By reason of the fact that the said blades 40 revolve at a much more rapid rate of speed than the propelling wheels of the machine they will enter the soil and cut the roots therein below the surface and force the cut sections of roots to the surface of the soil where they are exposed to the action of the sun.

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

1. A pulverizer comprising a beam, arms pivoted to said beam, a beam fixed to the free ends of said arms, frames pivoted to the last mentioned beam and lying at the opposite sides thereof, and earth engaging members carried by said frames.

2. A pulverizer comprising a beam, arms pivotally connected to said beam, a beam fixed to the free end portions of the said arms, frames pivotally connected to the last mentioned beam and located at the opposite sides thereof, earth engaging members carried by the said frames and means for raising and lowering the pivoted frames independently of each other.

3. A pulverizer comprising a beam, arms pivoted to the beam, a beam fixed to the free end portions of the said arms, frames pivotally connected to the last mentioned beam and located at the opposite sides thereof, soil engaging members carried by the said frames, and means for raising and lowering the said frames independently of each other and of the said arms.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES B. HILL.

Witnesses:

SIMON KAHN,
F. THIBODUNE.

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