O. SCHUBERT, DEC'D.

A. SCHUBERT, ADMINISTRATOR.

POWER OPERATED PLOW.

APPLICATION FILED MAR. 25, 1915.

1,161,534.

Patented Nov. 23, 1915.

4 SHEETS—SHEET 1.

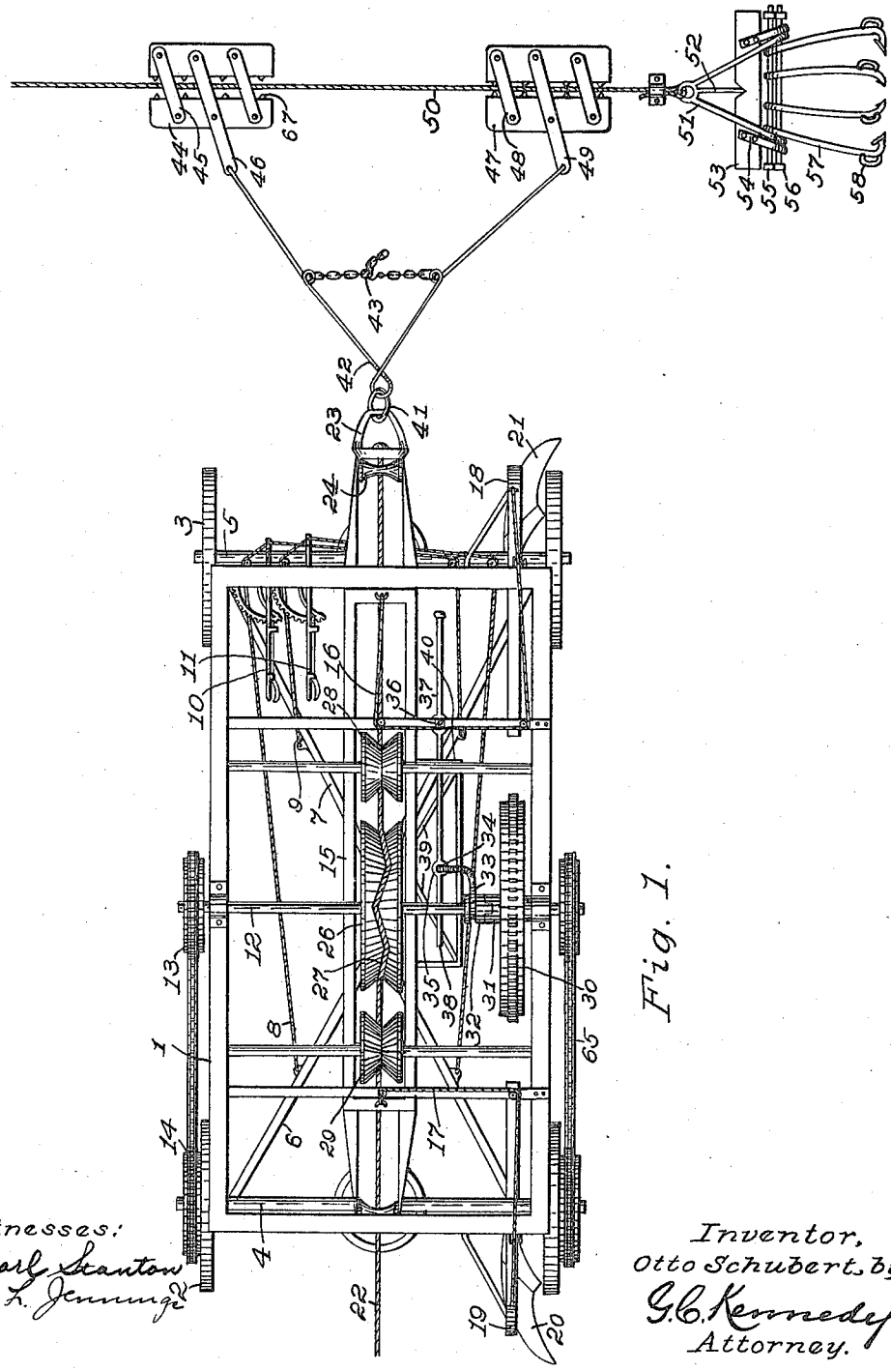


Fig. 1.

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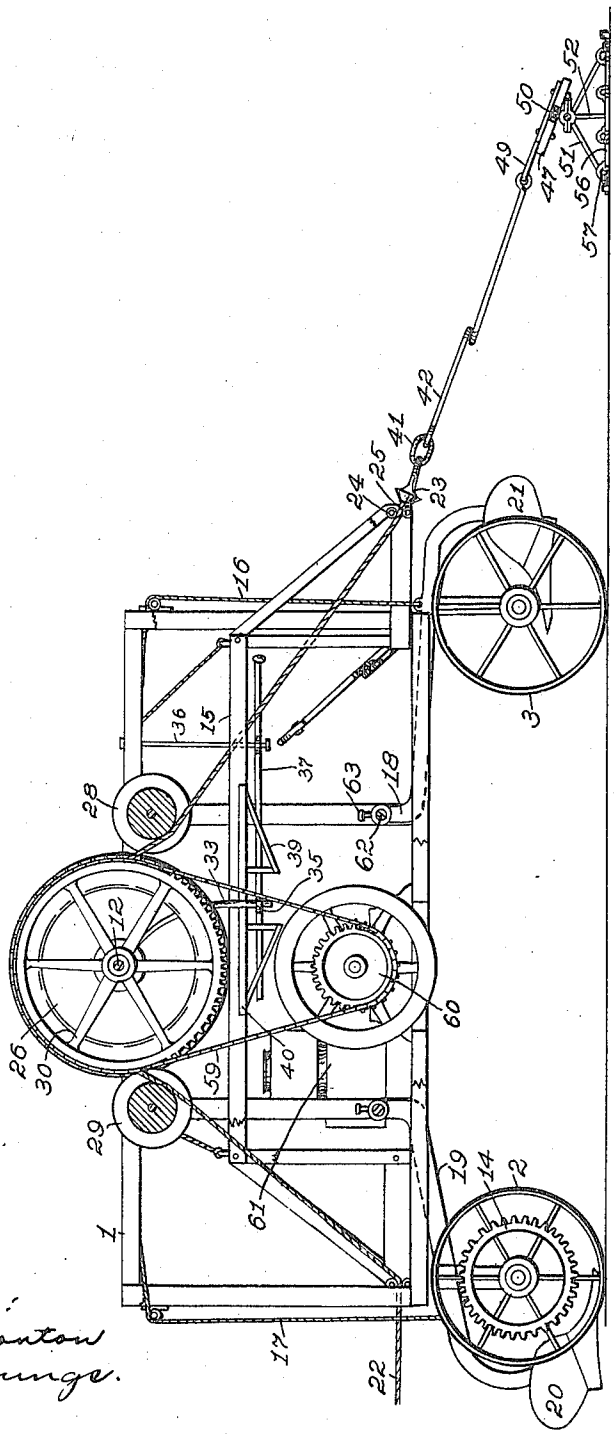


Fig. 2.

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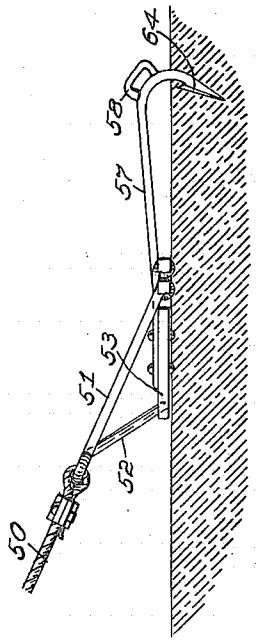


Fig. 4.

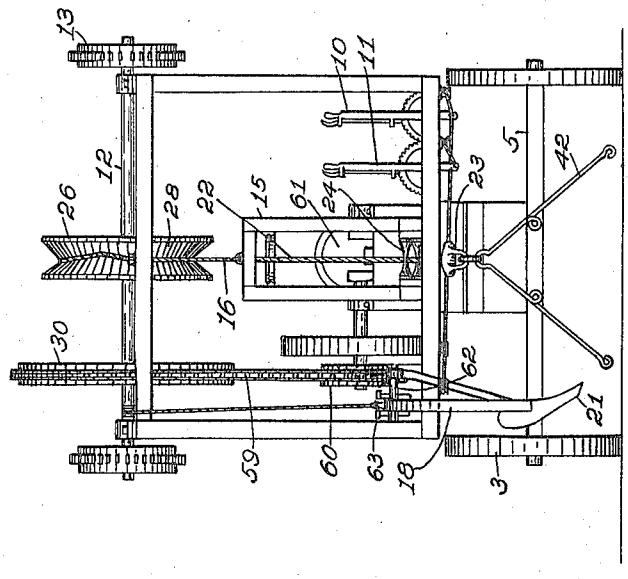


Fig. 3.

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4 SHEETS—SHEET 4.

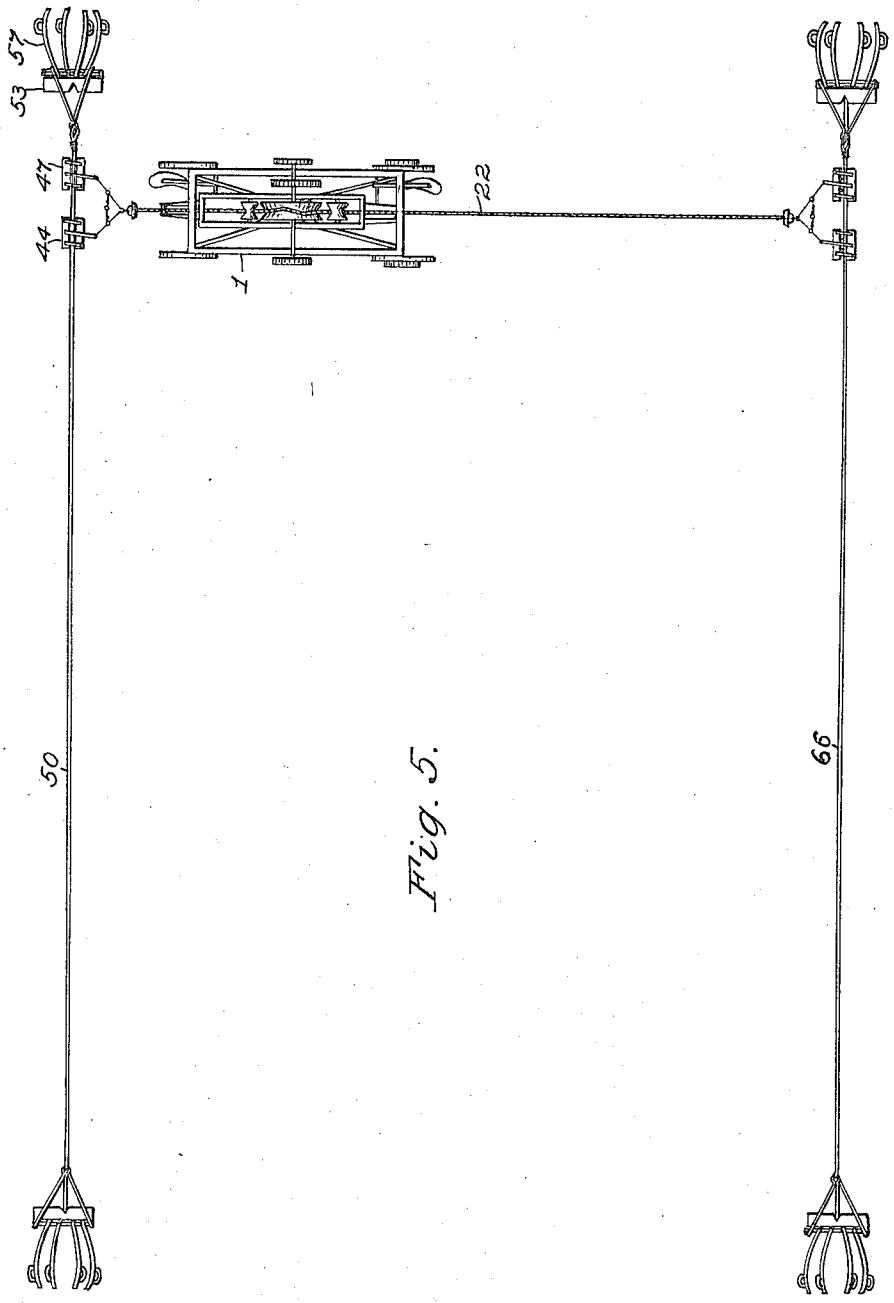


Fig. 5.

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UNITED STATES PATENT OFFICE.

OTTO SCHUBERT, OF WATERLOO, IOWA; ALFRED SCHUBERT ADMINISTRATOR OF SAID OTTO SCHUBERT, DECEASED.

POWER-OPERATED PLOW.

1,161,534. Specification of Letters Patent. Patented Nov. 23, 1915.

Application filed March 25, 1915. Serial No. 16,882.

To all whom it may concern:

Be it known that I, OTTO SCHUBERT, a citizen of the United States of America, and a resident of Waterloo, Blackhawk county, Iowa, have invented certain new and useful Improvements in Power-Operated Plows, of which the following is a specification.

My invention relates to improvements in motor-operated plows, and the object of my improvement is to supply devices of this type with means for guiding the plow in a straight furrow, with mechanism for changing to make another like furrow beside it, said device being actuated by traction applied to a guiding cable connected transversely between adjustable anchoring-means at opposite ends of the furrows. This object I have effected by the means which are hereinafter described and claimed, and which are illustrated in the accompanying drawings, in which—

Figure 1 is an upper plan view of my improved power-operated plow and of portions of the cables and anchoring-means for same. Fig. 2 is a side elevation of said device, showing parts broken away, or removed. Fig. 3 is a front elevation of my improved machine. Fig. 4 is a side elevation, on a larger scale, of one of the earth grappling hooks or anchors of said device. Fig. 5 is a plan diagram, showing the taut parallel guide-rods with their anchors and having a transverse cable connected therebetween with my improved power-actuated plow operatively engaged with said cable.

Similar numerals of reference denote corresponding parts throughout the several views.

In the drawings, the numeral 1 denotes a rectangular main frame supported on the pivoted axles 4 and 5, the latter having carrying wheels 2 and 3 mounted thereon respectively.

The numeral 15 denotes a longitudinally arranged and movable structure or frame seated within said main frame and being a little longer than said main frame with like pairs of vertically spaced rollers 24 and 25 mounted in the lower parts of the extremities of said structure. A shaft 12 is mounted transversely in bearings on the upper part of said frame and has a relatively large sprocket wheel 30 rotatably but non-slidably thereon and having one end of its hub provided with a clutch face 31. A sleeve 32 is slidably non-rotatably mounted on said shaft and has a clutch face adapted to be mated with the clutch face 31. The sleeve 32 has an annular groove adapted to receive a fork on a bent arm 33 which has a downwardly-directed part 34 received into an eye 35 of a lever 37 extending longitudinally along one side of the structure 15. On the same side, said structure 15 has a rectangular open bracket 40 and which has converging downwardly sloped braces 39. The lever 37 lies across said braces and is pivoted on a rod 36 to a transverse part of the frame 1. Said lever may be operated by hand when desired to clutch or unclutch said parts. When the structure 15 is moved longitudinally to the left from its extreme position to the right shown in Fig. 1, the lever is forced up on one of said braces 39 and rocked transversely in such a way that the arm 33 is caused to shift said clutch parts out of mesh with each other. The clutch parts remain uncoupled until the structure 15 has passed to the left-hand limit of its movement, when the lever 37 may be rocked back by hand when slightly slid up on said rod to engage said clutch parts together. The lever is acted upon by the other oblique brace 39 on the return movement of the structure 15 to disengage the clutch parts while such transfer is being made. A prime-mover 61 is mounted in the frame 1, whose crank-shaft carries a sprocket-pinion 60 operatively connected to the sprocket-wheel 30 by a sprocket-chain 59. On the extremities of the shaft 12 without the frame 1, are mounted like sprocket wheels 13, and sprocket wheels 14 are mounted on the outer ends of the axle 4 so that sprocket chains 65, as indicated by Fig. 1, may be operatively engaged about said sprocket wheels on each side of the machine when desired, to furnish forward traction to the machine by direct action of the prime-mover therein. These chains may be left on said sprocket wheels when the plow is in use and additional forward traction is necessary, but under ordinary conditions are removed and used only for road traction purposes since other means are provided for ordinary traction of the machine while plowing.

The numeral 26 denotes a relatively large traction-wheel or concaved edged driving

pulley fixed medially on the shaft 12. Said pulley has a wavy or broken line groove 27 around its circumferential edge.

The numerals 28 and 29 denote idler-pulleys with concaved edges rotatably mounted in the frame 1 oppositely relative to the pulley 26 and alined therewith.

Referring to said Fig. 5, the numerals 50 and 66 denote like steel rods or cables which are stretched in parallel relation across opposite ends of a tract of land and each having its opposite ends firmly yet detachably secured to the soil. The anchoring means for said rods are best shown in Figs. 4 and 1. The numeral 53 denotes a short section of plank laid flat on the ground and having a pair of parallel bars 55 and 56 secured thereto by means of clamping brackets 54. A plurality of curved anchors 57 are pivotally mounted on the bar 55 independently of each other, and each has a handle 58 convenient for use when fixing the anchor in the ground or removing it therefrom. Each anchor has a spadiform barb 64 which gives it a firm hold upon the soil when embedded in the ground. Each end of the rods or cables 50 and 66 is provided with a set of these anchors secured thereto by means of pivoted bars 51 and a prop 52, the latter holding up the end of the cable a suitable distance from the ground surface. Said rods 50 and 66 are stretched as rigidly as possible between said anchors. On each end of the transverse flexible cable 22 is secured a loop 23 formed on a solid transverse body or stop. The numeral 42 denotes a flexible bar or rod bent medially to have its members crossed and form a medial loop which is connected by means of a ring 41 to said loop 23. The numerals 24 and 25 denote vertically spaced idler rollers mounted in the ends of the longitudinal movable structure 15 with the cable 22 passed outwardly between them. The members of the spring bar 42 have their middle parts connected by means of adjustably connected chain parts 43. Upon each rod 50 and 66 is mounted a pair of like releasable grabs or clamps arranged for alternate step by step movements therealong. Said clamping means nearest one of said anchors at the starting point along the rod 50 comprises a pair of oblong plates 47 hinged together by means of pivotally connected straps 48 and 49 of which the middle strap 49 only, extends beyond the clamp, and is pivotally connected to the end of one of the members of the spring rod 42. Grab points 67 extend from the opposed inner longitudinal edges of the plates 47 toward each other and opposite sides of the rod 50 and are adapted to securely engage the said rod when the said plates are forced together. The other clamping means comprises like plates 44 hinged together by like straps 45 and 46 of which the longer middle strap 46 is pivotally connected to the end of the other member of the spring rod 42. It will be observed that the inclinations of the straps in both said clamping means are the same, so that when the spring rod 42 is under tension, one pair of clamping means is free from the rod 50 while the other clamping means is secured thereto.

Referring now to Fig. 2, the numerals 20 and 21 denote oppositely directed plows located at the opposite ends of the machine, mounted on beams 19 and 18, respectively. The ends of said beams are pivotally mounted on horizontal fixed shafts 62 and are adjustable longitudinally thereon between pins 63 seated in certain of a plurality of openings, not shown.

Referring to Fig. 1, the numeral 16 denotes a short cable passed over rollers on the frame 1 and having its ends connected to adjacent parts of the plow-beam 18 and of the longitudinally movable structure 15, and so mounted therebetween that when said structure 15 is moved longitudinally in one direction, said connecting cable elevates the plow 21 and lowers said plow when said structure is moved in an opposite direction. A like cable is similarly connected between the plow 20 and the opposite end of the structure 15, whereby, when said structure is moved longitudinally, one plow is raised while the other is lowered. Said machine is made dirigible by the following means: Numerals 10 and 11 denote hand levers having the usual manually actuated detents adapted to be engaged with teeth on the rack sectors placed thereunder. The lower ends of said levers which extend below their fulcrums, are connected to medial parts of cables 8 and 9, respectively, and the ends of said cables are secured to opposite sides of V-shaped hounds 6 and 7 secured to the medially pivoted axles 4 and 5, respectively. By this means, either pair of carrying wheels 2 or 3 may be rocked laterally, while the other pair have their axle fixed.

Operation: When the clutch parts 31 and 32 are engaged with each other and the motor started, the wheel 26 is rotated and the latter, by reason of the grip which the opposed walls of the zigzag grooves 27 exerts upon the stretched cable 22, the wheeled frame 1 is pulled along said cable until the transverse stop on the loop 23 engages the adjacent end of the longitudinally movable structure 15. The pressure thereby exerted upon the members of the spring rod 42 spreads them apart as far as permitted by the limiting chains 43 and while it pushes upon the strap 49 in such a way as to pull the detents of the plates 47 engaged with the cable 50, a push is imparted to the other clamping means while yet in its freed condition which shoves the whole device a step farther along on said rod 50. The pressure

of said stop then reacts upon the longitudinally movable structure 15 by reason of the continued forward movement of the machine to push said structure back or toward the opposite end of the machine. In making this movement, the structure 15 pulls upon one cable 17 to lift the plow 20 out of the soil simultaneously slackening the other cable 16 to lower the other plow 21 into a working position. When the structure 15 moves back, one of its sloping bars 39 pushes over the lever part 38 to cause the arm 33 to separate the clutch parts 31 and 32, thereby stopping the rotation of the wheel 36 and the forward movement of the machine. The machine is placed in proper position to return on another furrow by using one of said hand levers to shift the appropriate pair of carrying wheels to allow the machine to ride to one side the space of the furrow and said wheels then return to their former position to move straight back to plow a parallel furrow. The engine is then reversed by means not shown and the hand lever 37 moved by hand to reëngage the clutch parts 31 and 32. As the machine starts back, the spring rod members 42 are released from tension and move somewhat toward each other which causes the clamping members 44 to engage the rod 50 and free the other clamping members 47 while drawing them toward the first-mentioned clamping members the space of one furrow. In this manner, said sets of clamping members are moved along step by step on the rods 50 and 66 progressively to conform to the progress of the operation of the machine.

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

1. In combination, a frame mounted on carrying-wheels, a cable passed lengthwise through said frame, a wheel mounted rotatably in said frame, said cable being carried upon the circumference of said wheel and said wheel having means thereon for gripping the cable releasably as the wheel is rotated to roll thereon, and relatively rigid parallel spaced rods or cables stretched between anchors, the first-mentioned cable being arranged between the second-mentioned cables with its ends movably connected thereto.

2. In combination, a frame mounted on carrying-wheels, a cable passed lengthwise through said frame, a positively rotated wheel mounted in said frame in operative contact with said cable to roll therealong and having releasing-gripping means adapted to grasp the cable, parallel spaced cables between which said cable is arranged transversely, said spaced cables being stretched between fixed supports releasably, the ends of the first-mentioned cable having means thereon for adjustably securing them to the other cables, and means for actuating said securing means to move them in one direction laterally by a step-by-step movement when the said machine has progressed to its limit of movement toward the securing-means.

3. In combination, relatively rigid spaced rods or cables stretched between anchors, anchors fixed at each end thereof to the ground, each anchor comprising a body adapted to rest upon the ground, said body being connected to the end of the adjacent cable, a plurality of anchor-hooks independently movably mounted on said body, a flexible non-elastic cable stretched between said other cables transversely, a machine movable along and guided in direction by said cable clutching-means connected movably between each end of said flexible cable and the adjacent rigid rod adapted to shift step-by-step along the latter when contacted and moved by said machine.

4. In combination, a frame mounted on dirigible carrying-wheels, a prime mover on said frame, a rotatable shaft in said frame, a sprocket-wheel rotatably non-slidably mounted on said shaft and having a clutch-face on its hub, a clutch-sleeve non-rotatably slidably mounted on said shaft to mate detachably with said hub clutch-face, a slide-body mounted for longitudinal movement in said frame, movable connections between said slide-body and said clutch-sleeve adapted to disengage said clutch-parts when the slide-body is moved in either direction, said connections being adapted for manual actuation to engage the clutch-parts, hitching-means for implements at opposite ends of the machine, connections between opposite ends of said slide-body and said implements adapted to raise or lower one while the other is being simultaneously lowered or raised, a wheel mounted on said rotatable shaft and provided with a peripheral zigzag groove, a flexible non-elastic cable passed about said wheel in said groove, means for preventing the escape of the cable from said groove, and adjustable anchoring means for the ends of said cable.

5. In combination, relatively rigid spaced anchored rods or cables, a flexible non-elastic cable connected between said other cables, a machine movable along and guided in direction by said flexible cable, and automatically adjustable clutching-means connected movably between each end of said flexible cable and the adjacent rigid rod adapted to shift step-by-step along the latter when contacted and moved by said machine.

6. In combination, a stretched cable, another cable arranged angularly thereto, a machine movable along and guided in direction by the latter cable, and elastically-connected clutching-devices connected between an end of the latter cable and the former

cable to ride along the latter side by side, said clutching-devices being operable by contact of said machine at the termination of its movement in one direction to in turn shift along the former cable with a step-by-step movement to change the location of the latter cable along the former cable.

7. In combination, a stretched cable, another cable arranged angularly thereto, a machine movable along and guided in direction by the latter cable, and a pair of like clutching-devices mounted movably side-by-side on the former cable, each having a pair of separable clamp-members adapted to engage opposite sides of the former cable, and a medially bent elastic bar having its ends movably connected to the members of the clutching-means adjacent thereto, the middle of the bar being connected to the adjacent end of the second-mentioned cable, said members being so disposed with relation to the cable that one set of them is engaged therewith while the other set is released therefrom, the parts of the said elastic bar being adjustably connected, and said clutching-devices being operable by pushing contact of said machine against the middle of said bar followed by a release thereof to shift the clutching-means with a step-by-step movement along said cable.

Signed at Waterloo, Iowa, this 20th day of March, 1915.

OTTO SCHUBERT.

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