W. L. WALTON.

PLOW.

APPLICATION FILED JUNE 12, 1912.

1,209,084.

Patented Dec. 19, 1916.

3 SHEETS—SHEET 1.

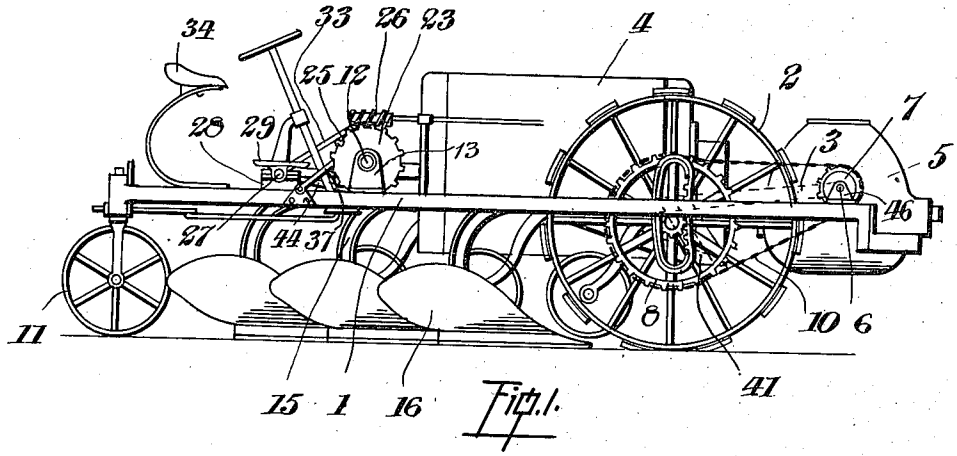


Fig. 1.

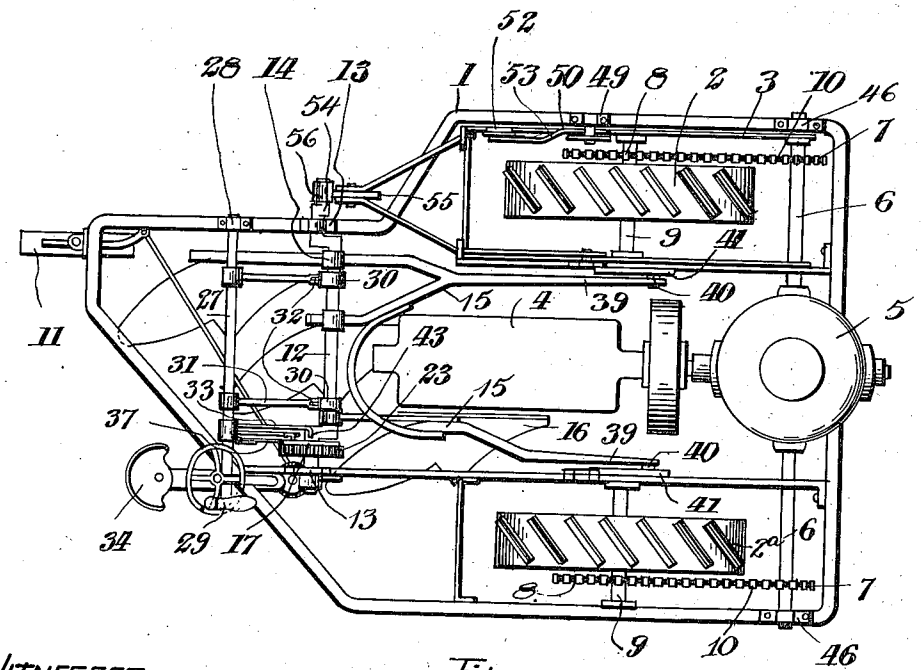


Fig. 2.

WITNESSES

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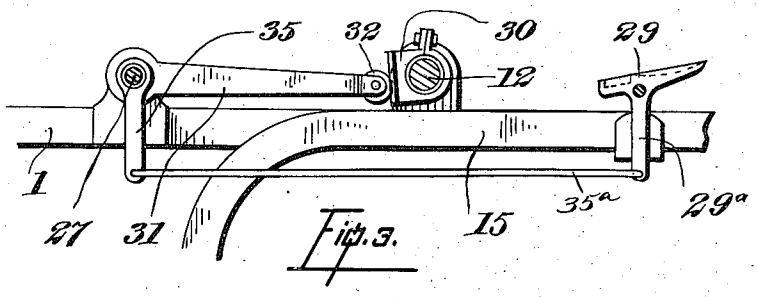


Fig. 3.

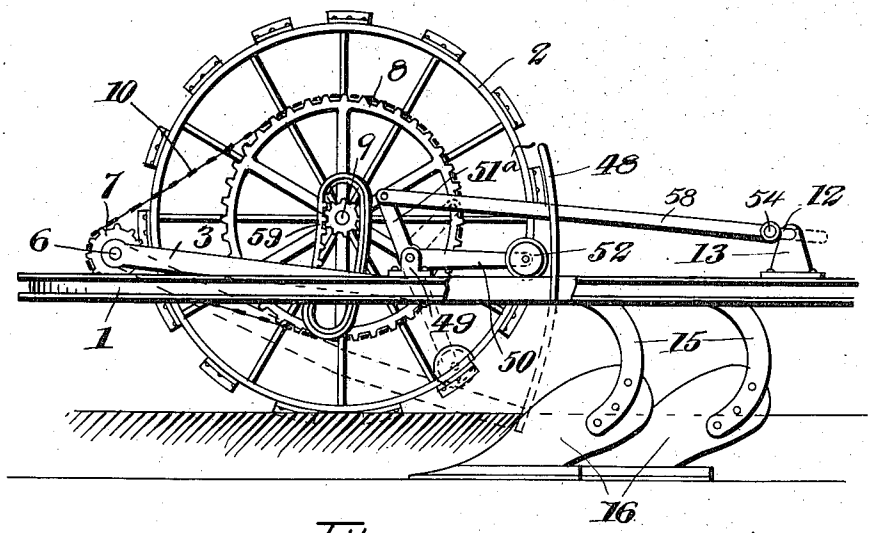


Fig. 4.

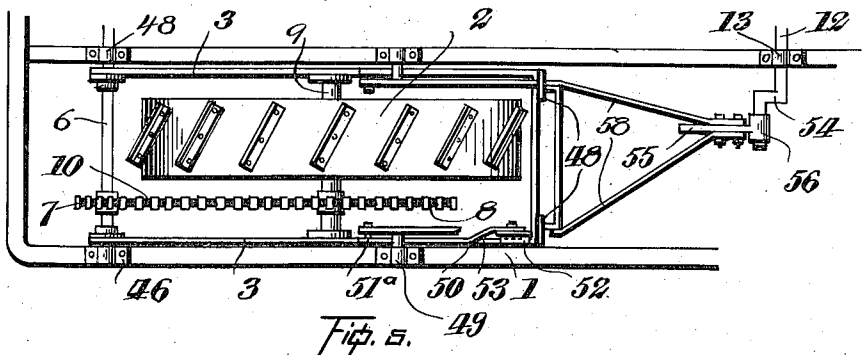


Fig. 5.

WITNESSES.

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3 SHEETS—SHEET 3.

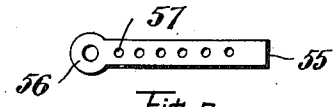


Fig. 6.

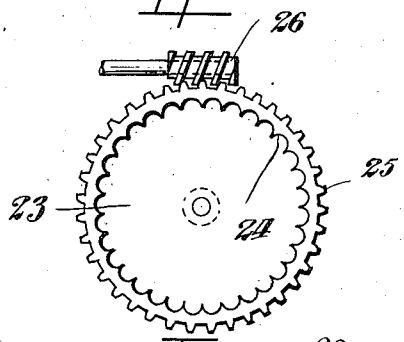


Fig. 7

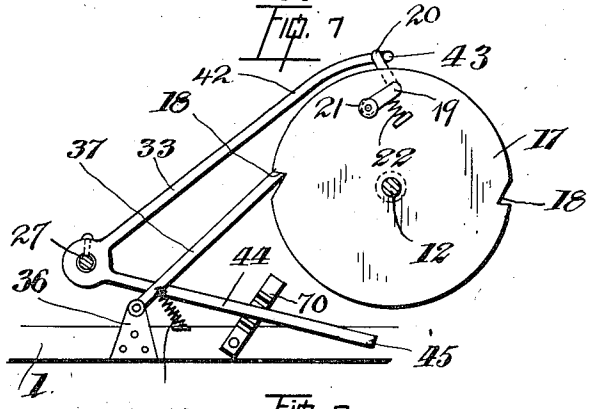


Fig. 8.

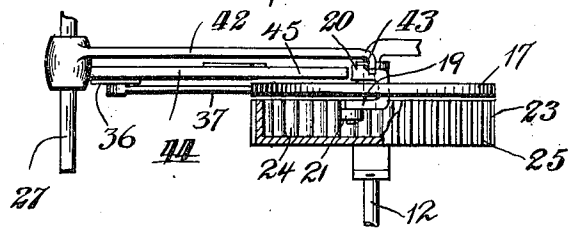


Fig. 9.

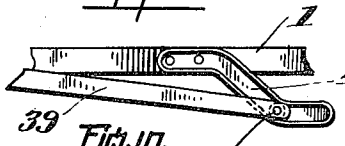


Fig. 10.

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM L. WALTON, OF BANTRY, NORTH DAKOTA.

PLOW.

1,209,084. Specification of Letters Patent. Patented Dec. 19, 1916.

Application filed June 12, 1912. Serial No. 703,239.

To all whom it may concern:

Be it known that I, WILLIAM L. WALTON, a citizen of the United States, residing in the town of Bantry, in the State of North Dakota, United States of America, have invented certain new and useful Improvements in Plows, of which the following is a specification.

This invention relates to improvements in plows and particularly to the plow and wheel lifting mechanism thereof and the objects of the invention are to provide means coöperative with the usual power lifting mechanisms for automatically throwing the same into operation to raise the plows upon striking an obstacle in the ground.

A further object is to provide wheel lifting mechanism automatically coöperative with the plow lifting means adapted to cause the wheels to be brought to the same level when the plows are raised, and it consists essentially of the improved construction hereinafter described in detail in the accompanying specification and drawings.

In the drawings: Figure 1 is a side elevation of the machine. Fig. 2 is a plan view thereof. Fig. 3 is an elevational detail to an enlarged scale of the blocks on the crank shaft, showing the projecting arms connected to the straight shaft having rollers on their ends engaging the blocks, and also the plow beams connected to boxes surrounding the crank shaft. Fig. 4 is a side elevation showing the bell crank lever and means for restoring the left wheel to the same level as the right wheel when the plows are inoperative. Fig. 5 is a plan view showing the subframes to which the left traction wheel is connected. Fig. 6 is a detail view of one of the plates connected to the end crank on the crank shaft. Fig. 7 is a side view of the cam wheel showing the circular corrugations on the inside periphery and also the worm engaging the teeth on the outside periphery. Fig. 8 is a side view of the disk and trip dog. Fig. 9 is a plan view of the disk and cam wheel said disk and wheel being separated on the shaft in this view. Fig. 10 is a detail showing a side view of the front ends of the plow beams with rollers designed to slide in suitable cams.

In the drawings like characters of reference indicate corresponding parts in all the figures.

Referring to the drawings, 1 represents the frame having land and furrow traction wheels 2 and 2^a, power plant 4, transmission gear 5, rear guiding wheel 11 and seat 34 operatively mounted thereon. The traction wheels 2 and 2^a are driven in the usual way from the transmission gear 5 by countershafts 6 carrying sprockets 7 connected through the medium of the chains 10 with the sprockets 8 on the shafts 9 of the traction wheel.

The furrow wheel 2^a is fixed relatively to the frame 1 while the land traction wheel 2 is adapted to be adjusted to regulate the depth of the plowing and to this end is supported in a sub-frame or yoke 3 pivotally mounted at its forward end to the shaft 6 rotatably mounted in the bearings 46, the movement of the yoke being controlled by the plow lifting mechanism in such a way as to bring the traction wheels on the same level relatively to the frame 1 when the plows 16 are raised.

The plows 16 are supported on the plow beams 15 having their upper sides connected to the shaft 12 which is provided with crank ends rotatably mounted in the bearings 13 so that when the said shaft is rotated vertical motion is transmitted to the plows.

Rotatably mounted on one of the crank ends of the shaft 12 is a gear wheel 23 having peripheral teeth 25 adapted to mesh with the worm 26 suitably driven from the source of power and being further provided on its inner periphery with an annular series of circular depressions 24, the object of which will be made clear hereafter.

Coöperating with the gear wheel 23 is a disk 17 rigidly mounted on the shaft 12 and provided with notches 18 on diametrically opposite sides of its periphery adapted to coact with the pawl 37 pivotally mounted on the bracket 36 and designed to be normally held in contact with the periphery of the disk by means of the spiral spring 38. This disk also carries a crank shaped dog 19 extending transversely therethrough and pivotally mounted therein and equidistantly spaced from the notches 18 one arm of the dog having a roller 21 rotatably mounted thereon and designed to engage with the depressions 24 in the gear 23 while the other arm 20 is adapted to act as a tappet lever to facilitate in disengaging the roller from the said depressions.

The roller 21 is adapted normally to be held in contact with the depressions 24 by means of the compression spring 22, the dog 19 being operated by a V-shaped trip

lever 33 having arms 42 and 44 extending above and below the disk 17 respectively, the former terminating in a hooked end 43 and the latter in a stub end 45 adapted to coact with the arm 20 of the dog 19 thereby disengaging the roller 21 from the depressions 24 in the gear 23.

The trip lever 33 is rigidly mounted on the transversely extending shaft 27 carried by the bearings 28 supported by the frame and is designed to be turned by a suitable tread pedal 29 mounted either on the shaft direct or on the frame 1, in the latter case the pedal being provided with an integral operating lever 29^a suitably connected to the lever 35 on the shaft 22 by means of the link 35^a. The lever 33 is held in the desired position by a spring detent 70 mounted in the frame 1 and preferably formed with corrugations adapted to embrace the arm 44 of the said lever.

The forward ends 39 of the plow beams 15 are adjustably supported by rollers 40 operating in channel cams 41 carried by the frame 1 and formed as shown in Fig. 10 with an inclined portion terminating at the top and bottom in parallel horizontal portions.

When the shaft 12 has been rotated to elevate the plows 16, it will be readily seen that the plows, due to the throw of the cranks on the shaft, are drawn backwardly, the motion being transmitted to the plow beams 15 so that the rollers 40 on the ends 39 of the beams are drawn up the incline to the inner end of the cams 41 resulting in an elevating of the point of the plow which consequently cuts upwardly out of the ground as it is being elevated.

The motion is reversed when the plows 16 are being lowered, since on the shaft 12 being rotated the plows 16 are pushed forwardly so that the rollers 40 carried by the ends 39 of the plow beams 15 descend on the incline and are pushed to the front end of the cams 41 resulting in a lowering of the point of the plows 16 which consequently cut into the ground.

To cause the plows to be lifted automatically when excessive pressure comes upon them, flat cam blocks 30 are adjustably mounted in the crank shaft 12 and adapted to be engaged by a roller 32 carried by the lever 31 mounted on the shaft 27.

Should the plows when lowered strike an obstacle, the undue pressure brought to bear on the crank shaft 12 will cause it to turn slightly whereupon the cam blocks 30 engaging with the rollers 32 will force the levers 31 downwardly turning the shaft 27 and trip lever 33 which is adapted to release the dog 19, thereby permitting of rotary motion being transmitted from the gear 23 to the disk 17 and consequently raise the plows 16.

Simultaneously with the elevating or lowering of the plows the land traction wheel 2 is adapted to be brought to the desired position relatively to the frame 1 by a mechanism to be presently described.

Bell crank levers 50 are pivotally mounted on brackets 49 carried by the frame 1 and are each provided on one arm with rollers 52 designed to engage the upper side of the offset arms of the yoke 3 and having the other arm 51^a connected by a link 58 with the crank 54 formed on an extension of the shaft 12, which crank is arranged at substantially right angles to the crank ends of the said shaft.

It is desirable that adjustment should be provided so that the depression of the yoke 3 to the desired position is readily obtainable and to this end I provide a strap 55 carrying a boss rotatably mounted in the crank 54 and being provided on its opposite end with a plurality of holes 57 adapted to engage the adjacent end of the link 58.

During the movement of the yoke 3 it is desirable that the same should be properly positioned so that it will not inadvertently foul or lock with the frame 1 and to facilitate in obtaining this result the guide pieces 48 are attached to the rear end of the subframe and adapted to engage with the inner faces of the frame.

In the operation, when the driver wishes to elevate the plows the tread lever 29 is depressed at the point, the motion being transmitted to the shaft 27 which rotates the V-shaped trip lever 33 thereby disengaging the stub end 45 of the arm 44 from the arm 20 of the dog 19, permitting of the roller 21 to engage with the depressions 24 in the gear 23 so that rotary motion is transmitted to the shaft 12 through the medium of the disk 17.

It will be readily understood that during the operation of elevating or lowering the plow the disk 17 is adapted to rotate half a revolution and that as the disk 17 is being rotated the arm 20 of the dog 19 when at its highest position is engaged by the hooked end 43 of the arm 42, thereby disengaging the roller 21 from the depressions 24 and bringing the disk 17 to rest. Simultaneously with this disengagement of the roller 21 from the depressions 24 the pawl 37 automatically engages one of the notches 18 in the disk 17 thereby preventing retrograde movement.

As the shaft 12 is rotated the motion is transmitted to the beams 15 elevating the plows 16 which as has been previously mentioned are drawn backwardly, causing the rollers 40 of the ends 39 of the beams to be elevated so raising the point of the plows which are then adapted while being raised to cut upwardly out of the soil.

Simultaneously with the elevating of the

plows the crank 54 transmits its motion through the links 58 to the bell cranks 50 pressing the arm 51ª of the bell cranks 50 upwardly so that the rollers 52 are elevated, permitting of the yoke 3 being elevated to bring the land traction wheel 2 to the same level relatively to the frame 1 as the furrow traction wheel 2ª.

When the plows 16 are lowered the operation above described is reversed, the motion being primarily transmitted to the rear end of the tread lever 29 which rotates the shaft 27, and consequently operates the trip lever 33 disengaging the hooked end 43 of the arm 12 from engagement with the arm 20 of the dog 19 whereupon the roller 21 engages the depressions 24 of the gear 23 and rotary motion is transmitted to the disk 17.

When the disk 17 has been rotated through half a revolution the arm 20 of the dog 19 engages with the stub end 45 of the arm 44 disengaging the roller 21 from the depressions 24 in the gear wheel 23 thereby permitting of the disk 17 to come to rest at each instance the pawl 37 engages with the notch 18 and prevents retrograde movement. During this motion of the disk 17 the plows 16 are lowered and as has been already described the ends 39 of the beams 15 are pushed toward the front end of the cams 41 thereby lowering the point of the plows which are adapted to cut into the soil. The yoke 3 is also simultaneously lowered to permit of the land traction wheel 2 coming to the desired level relatively to the frame 1 and this being accomplished through the backward motion of the arm 51ª of the bell crank 50 which through engagement of the roller 52 with the yoke causes the rear end of the said yoke to be depressed permitting of the wheel coming to the desired position.

It will be understood that the frame 1 should under all conditions be kept level, thereby insuring that the furrows cut will be of equal depth, but since in the operation of the plow the furrow traction wheel 2ª will lie lower than the land traction wheel 2 it is necessary that the latter be capable of vertical adjustment so that the frame may be kept in the desired position.

From the foregoing it will be seen that the plows may be lifted or lowered by the plow beams controlled by the driver and may also be raised automatically upon striking an obstacle and further that the traction wheels will be simultaneously and automatically brought to the desired level when the plows are operated.

What I claim as my invention is:

1. In a plow, power actuated means for raising and lowering the plow shares into operative and inoperative position respectively, said means being controlled by the operator of the plow, and automatic means coöperative therewith for raising the plow shares should the same strike an obstacle, as and for the purpose specified.

2. In a motor operated plow, the combination with a main frame, an engine on said frame, traction wheels near the front of the main frame, and a guiding wheel at the rear of the main frame, said traction wheels being suitably driven by an engine located on the main frame, plows and means driven by the engine for lowering and raising the plows, said means being actuated by the operator, and automatic means coöperative therewith for raising the plow shares should the same strike an obstacle as and for the purpose specified.

3. In a motor operated plow, and in combustion, an engine, plow lift mechanism operated by the engine, a wheel lift mechanism and automatic means coöperating therewith for both actuating the plow lift and the wheel lift mechanism should the plow share strike an obstacle.

4. In a plow and in combination, a frame, land and furrow traction wheels on the frame, plow lifting mechanism, means for automatically and manually actuating the plow lifting mechanism and means coöperating with the first said means for simultaneously adjusting the land traction wheel relatively to the frame.

5. In a plow and in combination, a frame, land and furrow traction wheels on the frame, plow lifting mechanism, automatic means for both actuating the plow lift and adjusting the land traction wheel should the plow share strike an obstacle, said means including a crank shaft operatively connected to the plows and land traction wheel, and means normally restraining the turning of the crank shaft but adapted to yield under pressure.

6. In a plow and in combination, a plurality of plow beams, plows thereon, an engine, plow lift mechanism operated by the engine and connected to the plow beams, means thrown into operation by excessive pressure on the plows for throwing the plow lift mechanism into operation, and means for tilting the points of the plows simultaneously with the elevation thereof.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WILLIAM L. WALTON.

Witnesses:
TILLMAN SMITH,
N. D. CAMPBELL.

Correction in Letters Patent No. 1,209,084.

It is hereby certified that in Letters Patent No. 1,209,084, granted December 19, 1916, upon the application of William L. Walton, of Bantry, North Dakota, for an improvement in "Plows," an error appears in the printed specification requiring correction as follows: Page 3, lines 83–84, claim 3, for the word "combustion" read *combination;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of February, A. D., 1917.

[SEAL.]

F. W. H. CLAY,
Acting Commissioner of Patents.

Cl. 97—70.