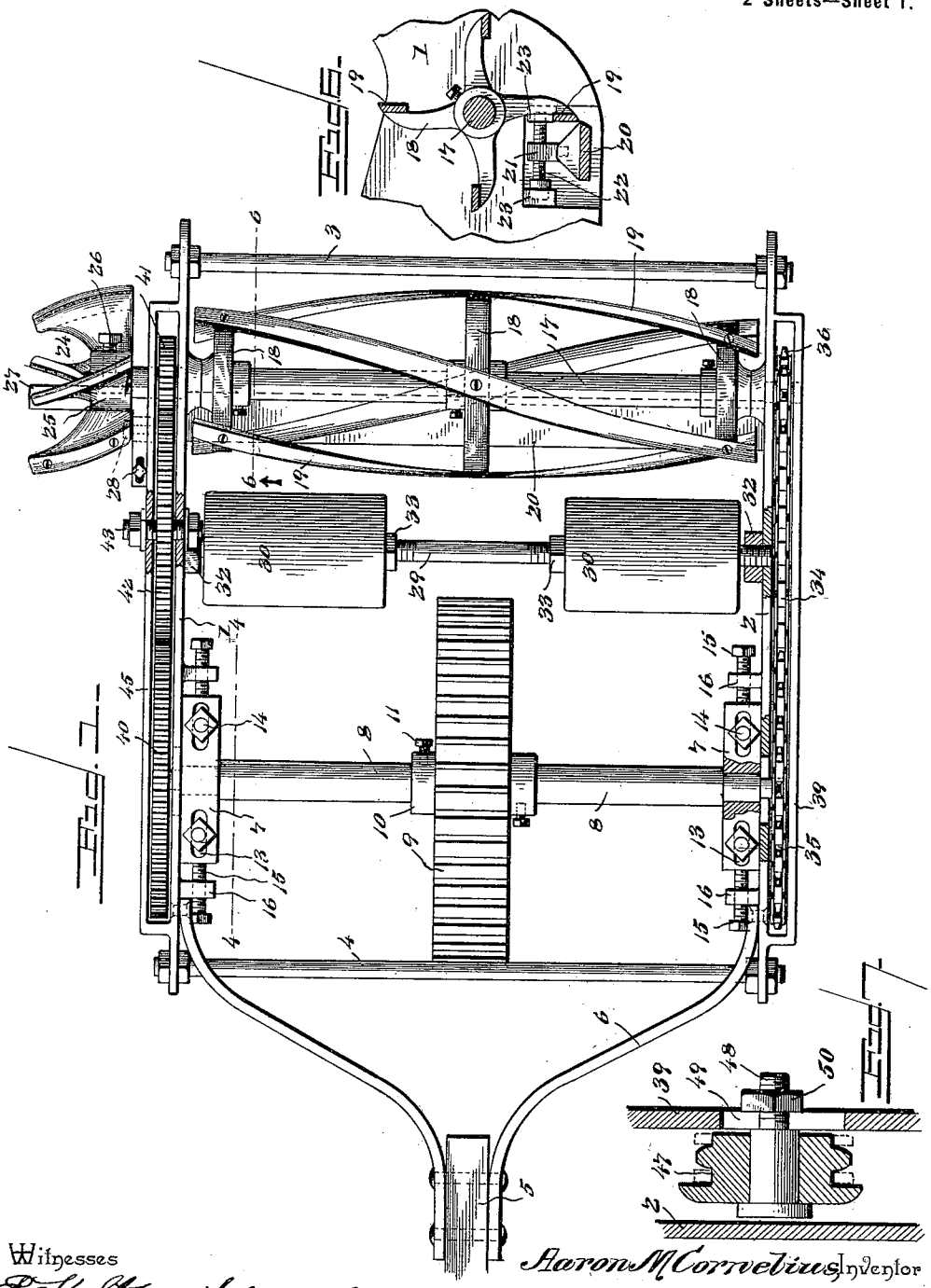
No. 621,901. Patented Mar. 28, 1899.

A. M. CORNELIUS.

LAWN MOWER.

(Application filed Feb. 25, 1898).

(No Model.) 2 Sheets—Sheet 1.



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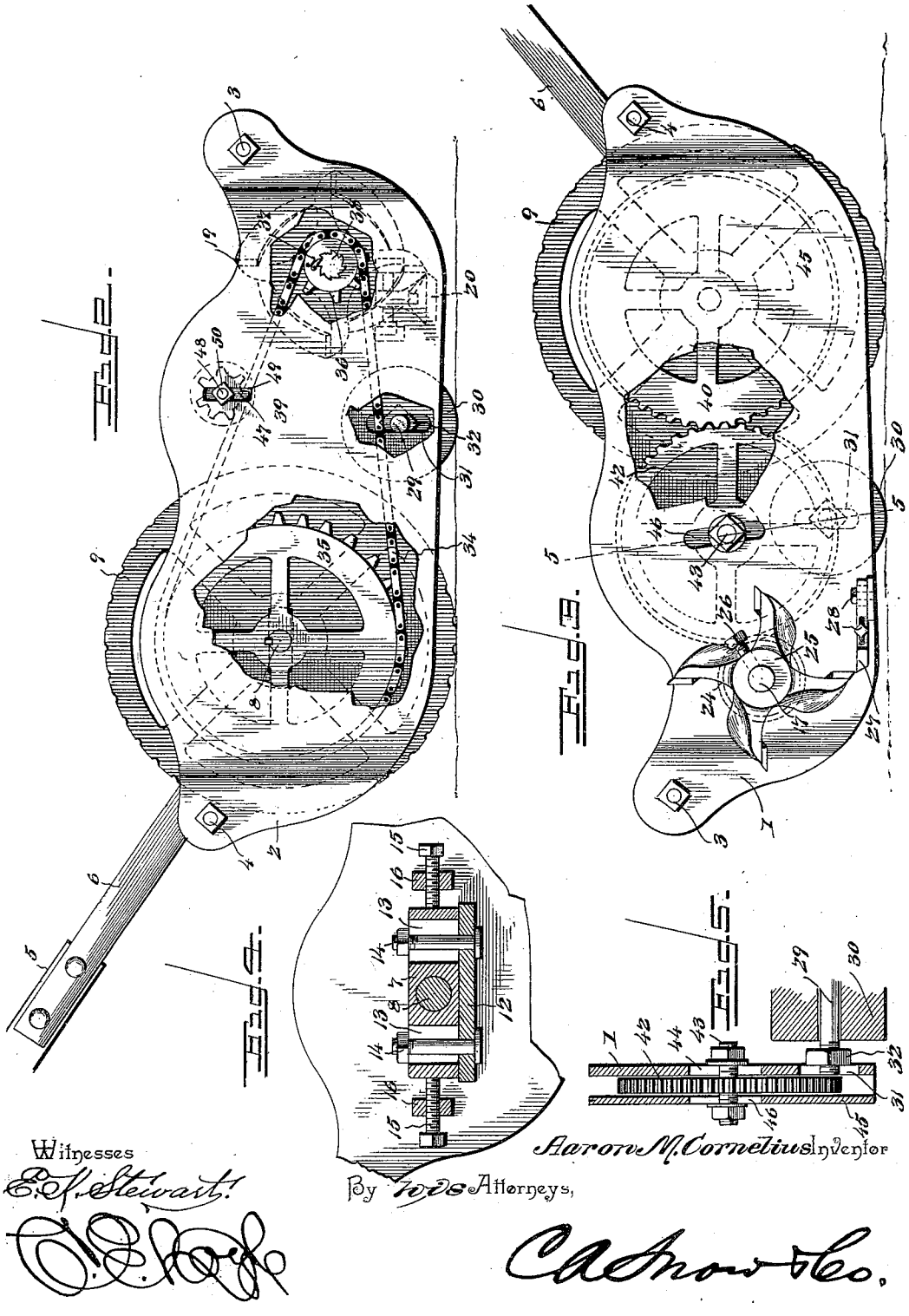
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UNITED STATES PATENT OFFICE.

AARON MILLER CORNELIUS, OF DOWNER'S GROVE, ILLINOIS, ASSIGNOR OF ONE-FOURTH TO WILLIAM H. COLVILLE, OF SAME PLACE.

LAWN-MOWER.

SPECIFICATION forming part of Letters Patent No. 621,901, dated March 28, 1899.

Application filed February 25, 1898. Serial No. 671,582. (No model.)

To all whom it may concern:

Be it known that I, AARON MILLER CORNELIUS, a citizen of the United States, residing at Downer's Grove, in the county of Du Page and State of Illinois, have invented a new and useful Lawn-Mower, of which the following is a specification.

My invention relates to lawn-mowers, and has for its object to provide a simple, compact, and efficient construction and arrangement of parts adapting the machine for a range of usefulness including the trimming of borders contiguous to flower-beds, walks, &c., and for operating contiguous to obstructions, such as hedges and fences, and, furthermore, to provide an efficient construction and arrangement of operating devices whereby the rolling supports, including the drive-wheel, follow the cutter-head, and hence traverse that surface over which the cutter-head has passed, the various parts being capable of adjustment to suit varying conditions of use.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of a lawn-mower constructed in accordance with my invention. Fig. 2 is a side view of the same, partly broken away to show the driving mechanism. Fig. 3 is a side view from the opposite side of the machine. Fig. 4 is a detail sectional view of one of the adjustable bearing-boxes of the main or driving shaft. Fig. 5 is a detail vertical section on the plane indicated by the line 5 5 of Fig. 3. Fig. 6 is a detail section on the line 6 6 of Fig. 1. Fig. 7 is a detail sectional view showing the chain-tightener and the means for adjusting the same.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The frame of the machine embodying my invention consists of side plates 1 and 2, connected by front and rear tie-bars 3 and 4, an operating-handle 5 being connected by means of a yoke 6 with the side plates near their rear ends. Mounted for longitudinal adjustment upon the side plates are bearing-boxes 7, in which are mounted the extremities of the driving-shaft 8, carrying the driving-wheel 9, the latter being adjustable axially upon the shaft and for this purpose being provided with collars 10, having set-screws 11. The bearing-boxes preferably rest upon suitable inwardly-extending lugs 12 on the side plates and are longitudinally slotted, as shown at 13, for the reception of the fastening-bolts 14, rising from said lugs and fitted with suitable nuts. The desired longitudinal adjustment of the bearing-boxes is attained by means of terminal set-screws 15, also mounted in lugs 16 on the side plates and bearing terminally and in alinement against opposite extremities of the bearing-boxes. Also mounted in suitable bearings in the side plates is a cutter-head spindle or shaft 17, carrying a cutter-head comprising terminal and intermediate spiders 18, connected by cutter-knives 19, which coact with a fixed cutter-bar 20, arranged transversely beneath the cutter-head. In practice this cutter-bar is mounted for adjustment longitudinally of the frame and is provided with terminal arms 21, engaged by feed-screws 22, terminally stepped in suitable lugs or projections 23 on the side plates. The front edge of the cutter-bar is arranged in rear of the vertical plane of the axis of the cutter-head, and as the parts become worn the same may be adjusted forwardly to bring its front edge closer to the vertical plane of the axis of the cutter-head, and thereby insure the proper cooperation of the cutter-bar with the cutter-knives. Furthermore, the cutter-head spindle is extended beyond the side plate 1 and is fitted with a removable trimming-head 24, having a plurality of blades radiating from a hub 25, which is fitted upon the extension of the cutter-head spindle and is secured by means of a set-screw 26. This auxiliary or trimming head being located wholly outside of the frame of the machine is adapted to trim parallel with borders, such as those contiguous to walks, flower-beds, hedges, &c., where the frame of the machine would interfere with the main cutter-head. The trimming-head coöperates with the auxiliary cutter-bar 27, which is longitudinally slotted and engaged by securing bolts or screws 28

for a purpose analogous to that described in connection with the cutter-bar 20. It will be seen that the extension of the cutter-head shaft beyond the side plate of the machine is less than the projection of the auxiliary or trimming head, the hub of the latter being at the inner side thereof, whereby the knives of the trimming-head project laterally beyond the extremity of the shaft. An important advantage of this construction resides in the fact that when the trimming-head is not in use the projection of the cutter-head shaft beyond the frame of the machine is slight, and hence is not liable to come in contact with objects passed by the machine.

Mounted in rear of the cutter-head upon a suitable spindle 29 are supporting-rolls 30, arranged upon opposite sides of the plane of the single driving-roller 9 and capable of independent rotation to suit the direction in which the machine is impelled. For instance, in moving in a curved path the roller at the outside of the curve will turn more rapidly than the other without causing the sliding of either. In order to vary the vertical position of the cutter-head to cut closer to or farther from the surface of the ground, the spindle 29 of the supporting-rolls is vertically adjustable, its extremities being fitted in vertical slots 31 in the side plates of the machine and being held in place by means of nuts 32 or their equivalents. In the same way the axial movement of the rolls upon the spindle 29 is limited by suitable stop-collars 33, which may be threaded upon the spindle, as indicated in the drawings.

Various means may be employed for communicating motion from the driving-shaft to the spindle of the cutter-head; but in practice I prefer to arrange at one side of the frame, and preferably exteriorly of the side plate, a drive-chain 34, traversing a sprocket-wheel 35 on the driving-shaft 8, and a sprocket-pinion 36 on the cutter-head spindle, said sprocket-pinion being loosely mounted upon the spindle and having connection therewith for imparting forward rotary motion by means of a ratchet mechanism, including a pawl 37 and a ratchet-wheel 38. This gearing is protected to prevent contact with contiguous objects and to prevent accumulations of cut grass or dirt by means of an exterior guard 39, supported by the side plate. In the construction illustrated there is located at the opposite side of the frame, contiguous to the exterior surface of the other side plate, a train of gears consisting of a main or drive gear 40, fixed to the drive-shaft 8, a pinion 41 on the cutter-head spindle and preferably having a ratchet connection therewith, as described and shown with reference to the sprocket-pinion 36, and an intermediate or transmitting gear 42, interposed between the drive-gear and pinion and having a stub-shaft 43, mounted in a vertical slot 44 in the side plate and fitted with a suitable locking-nut to hold the spindle at the desired vertical adjustment, and hence either in or out of mesh with the drive-gear and pinion. A guard-plate 45 is carried by the side plate 1 to cover the train of gears, as described in connection with the gearing at the opposite side of the machine, and for convenience in adjusting the shaft 43 a slot 46, registering with the slot 44, is formed in the guard-plate to receive the other end of the stub-shaft, as clearly shown in Fig. 5.

In practice I prefer to employ both forms of gearing illustrated in the drawings (the driving-gear 40 and sprocket-wheel 35 being of the same diameters and the sprocket-pinion 36 and gear-pinion 41 being of the same diameters, whereby they rotate at the same speeds) in order to relieve the cutter-head spindle of twist or strain, and hence relieve the frame of unnecessary strain, such as I have found to result from the use of a single driving mechanism. The advantage in using a sprocket-chain connection at one side of the machine and a gear connection at the opposite side resides in the fact that the latter may be thrown out of gear by the simple upward adjustment of the intermediate or transmitting gear 42, while the former remains permanently in gear and can be thrown out of operation only by removing the chain. Thus the chain-gearing forms a permanent connection between the driving and cutter-head shafts and may be used independently of the other gearing, whereas when both forms of gearing are desired, as when operating in tough or a thick growth of grass, the side strain incident to communicating motion to the cutter-head shaft at one end only is avoided. The use of the double gearing is particularly desirable when the trimmer is in use, for the reason that as the strain then comes upon the cutter-head shaft at only one end and that end remote from the permanent gearing the twisting of the frame is liable to result. The variable or adjustable gearing, consisting of the spur-wheels 40, 41, and 42, constitutes a simple auxiliary means of connecting the driving and driven shafts when the nature of the work demands such additional connection. A further advantage of the adjustability of the intermediate or transmitting gearing 42 resides in the fact that the driving-spindle, with its attached driving-wheel, may be adjusted longitudinally of the machine to attain the desired tension of the sprocket-chain, after which said transmitting-gear may be adjusted to secure the efficient intermeshing of its teeth with those of the driving-gear and driven pinion.

The adjustment of the driving roller or wheel 9 transversely of the machine is desirable as facilitating a proper transverse balancing of the machine. This is necessary in order to secure an equilibrium whether the auxiliary cutter-head is in use or not. It is obvious that when the auxiliary cutter-head is applied the driving-wheel must be adjusted toward that side of the machine, whereas

when the auxiliary cutter-head is removed said driving-wheel should be arranged contiguous to the transverse center of the wheel.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

In addition to the above-described means for adjusting the parts of the gearing and for maintaining the same in operative relation I preferably employ a chain-tightener 47, consisting of a flanged sprocket-pinion mounted upon a stub-shaft 48, which is shouldered to bear against the inner surface of the contiguous side plate of the frame and is fitted for adjustment in a slot 49, a nut 50 being employed for securing the stub-shaft at the desired adjustment. This tightener is arranged in operative relation with the upper side of the sprocket-chain to insure the proper tautness thereof to prevent "jumping" without causing the binding of the parts in operation.

Having described my invention, what I claim is—

1. In a lawn-mower, the combination with a supporting-frame having side plates, of a main rotary cutter-head arranged between the side plates and having its spindle mounted in bearings in the side plates, one end of said spindle projecting beyond the adjacent side plate to form a terminally-unsupported extension, operating mechanism for said cutter-head, an auxiliary cutter-head having its hub detachably secured to said spindle extension, and an auxiliary cutter-bar for cooperation with the auxiliary cutter-head, detachably secured to that side plate of the frame beyond which the main cutter-head spindle is extended, substantially as specified.

2. In a lawn-mower, the combination of a supporting-frame having side plates, a main rotary cutter-head arranged between said side plates and having its spindle mounted in bearings in the plates, one end of the spindle being carried beyond one of the side plates to form a terminally-unsupported extension, driving mechanism for said cutter-head, an auxiliary cutter-head having a hub removably mounted for axial movement upon said spindle extension, means for securing the hub in a fixed position on the spindle extension, the blades of the auxiliary cutter-head being extended outwardly beyond the outer end of the hub, an adjustable cutter-bar removably attached to the frame for coöperating with the auxiliary cutter-head, and means for securing said auxiliary cutter-bar at the desired adjustment, substantially as specified.

3. In a lawn-mower, the combination with a supporting-frame having side plates, of a rotary main cutter-head, a driving-shaft having an attached driving-wheel, a permanent gearing mounted contiguous to one of the side plates and connecting the driving-shaft with the cutter-head spindle, a supplemental gearing mounted contiguous to the opposite side plate and connecting the driving-shaft and cutter-head spindle, said supplemental gearing having an intermediate adjustable gear, and an auxiliary cutter-head detachably secured to the main cutter-head spindle, substantially as specified.

4. In a lawn-mower, the combination with a supporting-frame, of a rotary main cutter-head, a driving-shaft having an attached driving-wheel, a drive-chain connecting said driving-shaft with the spindle of the cutter-head, longitudinally-adjustable bearings for the driving-shaft, and means for securing said bearings at the desired adjustment, an auxiliary cutter-head detachably secured to the main cutter-head spindle, and a supplemental gearing connecting the driving-shaft and cutter-head spindle at a point near the auxiliary cutter-head, and having an intermediate adjustable gear, substantially as specified.

5. In a lawn-mower, the combination with a supporting-frame having side plates, of a cutter-head, a driving-shaft having a driving-wheel fixed thereto, longitudinally-adjustable bearing-boxes for the driving-shaft, and means for securing said boxes at the desired adjustment, a permanent gearing connecting the driving-shaft with the cutter-head spindle, and including a sprocket-chain traversing chain-wheels on said shaft and spindle, driving and driven gears fixed to the extremities of the driving-shaft and cutter-head spindle contiguous to the opposite side of the cutter-head frame, an intermediate or transmitting gear for communicating motion from the driving to the driven gear and having a shaft mounted for adjustment perpendicular to a line connecting the axes of said driving-shaft and cutter-head spindle, and means for securing said shaft of the intermediate gear at the desired adjustment, substantially as specified.

6. In a lawn-mower, the combination with a supporting-frame, a main cutter-head, and a driving-shaft parallel with the axis of said cutter-head, and connections between the extremities of the driving-shaft and the cutter-head spindle, of an auxiliary cutter-head arranged beyond one side of the supporting-frame and detachably secured to an extension of the main cutter-head spindle, a driving roller or wheel fitted upon the driving-shaft for axial adjustment, and means for securing said driving roller or wheel at the desired adjustment, to enable the machine to be balanced irrespective of the use of the auxiliary cutter-head, substantially as specified.

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

AARON MILLER CORNELIUS.

Witnesses:

HENRY SPIEGLER,

F. F. SPIEGLER.