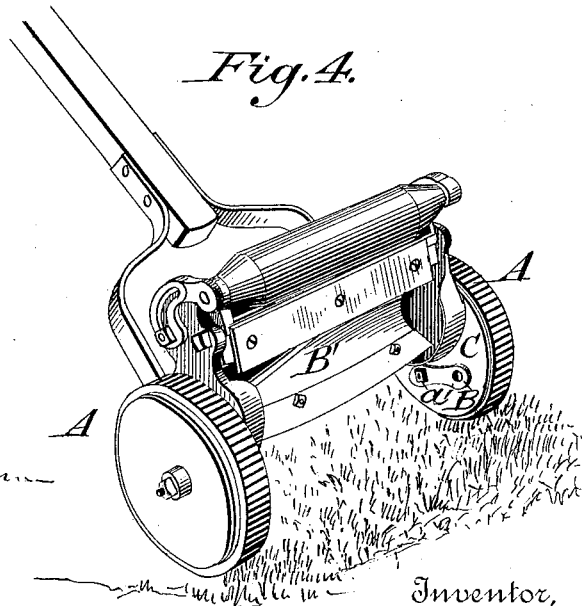
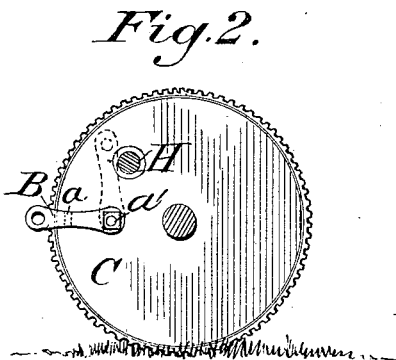
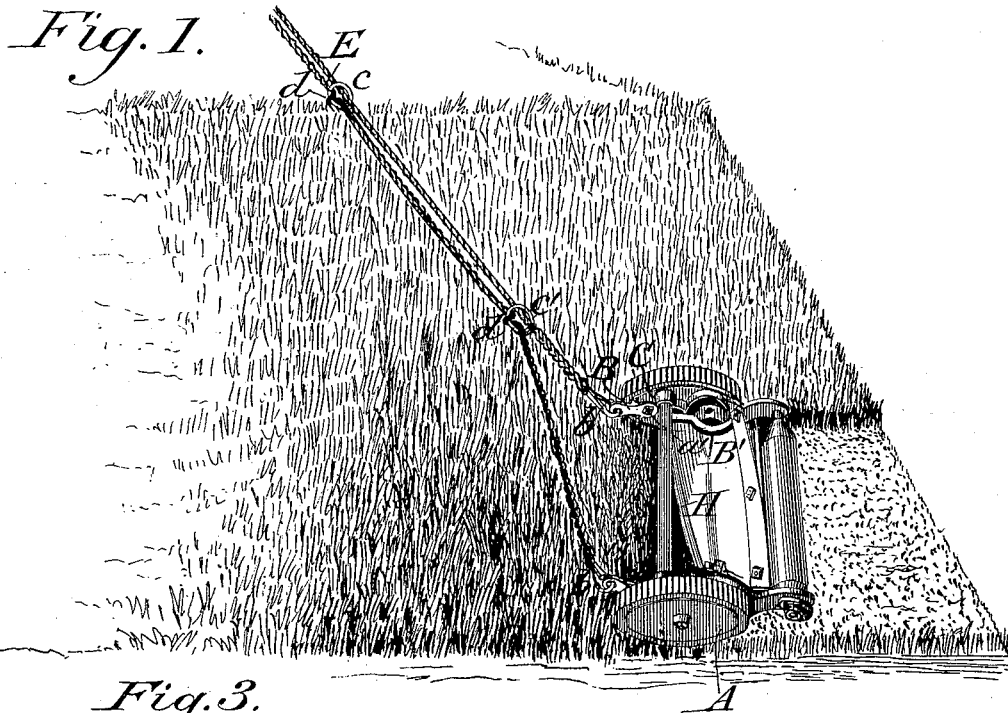


(No Model.)

W. L. WOODRUFF.
LAWN MOWER FOR TERRACES.

No. 386,444.

Patented July 17, 1888.



Witnesses,

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Inventor,

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UNITED STATES PATENT OFFICE.

WILLIAM LIPPINCOTT WOODRUFF, OF TOWANDA, PENNSYLVANIA.

LAWN-MOWER FOR TERRACES.

SPECIFICATION forming part of Letters Patent No. 386,444, dated July 17, 1888.

Application filed September 29, 1887. Serial No. 251,026. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LIPPINCOTT WOODRUFF, a citizen of the United States, residing at Towanda, in the county of Bradford and State of Pennsylvania, have invented certain new and useful Improvements in Lawn-Mowers for Terraces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

15 This invention relates to an improvement in lawn-mowers, by which they are made capable of operating on the slope of a terrace or other inclined surface with the same speed and facility as they are operated on a level.

20 Heretofore, so far as my knowledge extends, lawn-mowers have been operated upon inclined surfaces by pushing them up from the lower side by means of the handle, by letting them down from the top and pulling them back by 25 means of a rope, by two men, one walking along the top of the bank and holding the machine at the proper height by means of a rope, while the other (with spurs on his boots) walks along the surface of the terrace and pushes the machine, and by the method covered by Letters 30 Patent No. 362,862, granted to me May 10, 1887. By the first method only terrace-banks whose heights are not greater than the length of the handle could be conveniently cut. By 35 the second method, as there is nothing to guide the machine, it is liable, instead of cutting parallel swaths, to run in a crooked or zigzag course. The third method is slow and requires the labor of two men.

40 By the method covered by my former patent (No. 362,862) it is necessary to shift the ring to which the draft-rope is attached from the notch in which it may be at one end of the bar to the proper notch on the other end of the 45 bar when the end of the terrace is reached and it is desired to cut a swath with the machine moving in the opposite direction. To do this from the top of the bank requires a dexterous movement of the hand of the operator, causing a motion in the draft-rope similar to that 50 of a whip-lash when cracked. This must be

quickly done; otherwise on very steep slopes the machine is apt to run to the bottom of the bank and necessitates the labor of pulling it back to position. This movement requires 55 more skill than is required by my improved arrangement. To obviate the inconvenience of operating a lawn-mower by any of these methods is the object of my present invention, which consists, essentially, in attaching to each 60 side of the machine a draft-arm, to each of which arms a draft-rope is attached. The position of the mower upon the inclined surface of the bank, along which it is drawn by the operator walking along the top of the bank or terrace, 65 is regulated by unequal drafts on the ropes, as may be required. The upper rope is always taut and the lower one more or less slack, depending on the resistance and steepness of the bank. By this arrangement it will be seen 70 that the machine is operated by a side draft and moves in a line parallel to that followed by the operator, the difference of tension of the draft-ropes and the steepness of the bank determining the angle of inclination of the line 75 pursued by the machine to said ropes, and the length of the ropes determining the distance between the line followed by the person operating and that followed by the machine. The lower draft-rope, being more or less slack and 80 drawing diagonally across the path and in front of the mower, might drag and be caught by the cutter. To prevent this accident, rings are slipped over the ropes, of such size as to admit of both ropes passing freely through 85 them. The tension of the upper rope is sufficient to support the other. The first ring upon the draft-ropes above the mower may be free, its tendency being to slide down and support the slack immediately in front of the machine. 90 This, however, is more surely accomplished by passing one rope through, once around, and again through said ring, so as to form a loop, which causes it to be retained in position to properly support the slack rope. This simple 95 method of retaining the ring in place enables the operator to quickly and easily adjust it to such distances from the mower as may be desired.

In mowing high banks additional rings may 100 be required and distributed along the ropes as may be necessary, and may be secured in

place as above described. On reaching the end of the swath the relative length of the draft-ropes is changed, (the slack one being drawn taut,) thus turning the machine around and leaving it in position for the return-swath. The arms to which the draft-ropes are attached may be cast as a part of the frame-work or wheel-covering plates of the machines, but are preferably made separate and provided with projections or feet of different shape, as may be required by the exterior surface contour of the wheel-covering plates of the mowers to which they are to be attached, and are screwed or bolted to the frame-work or wheel-covering plates of the machine as nearly in line of draft from the cutter to the operator as possible.

In the accompanying drawings, which illustrate the invention, similar letters of reference indicate like parts in the different figures.

Figure 1 is a perspective view of the machine in operation upon the sloping bank of a terrace, showing the manner in which the draft-ropes are attached in order to make the machine follow a line parallel to the path of the operator. Fig. 2 shows one of the arms to which the draft-ropes are fastened attached to a wheel-covering plate. Fig. 3 is a perspective view of one of the arms to which the draft-ropes are fastened entirely detached, illustrating its construction. Fig. 4 shows the machine with the arms to which the draft-ropes are attached placed in such a position as to allow the use of a handle.

The lawn-mower to which these devices are attached may be one of the various kinds commonly in use. I have taken one to illustrate my improvement—known to the trade as the "Philadelphia Lawn-Mower"—in which the wheels are provided with internal gear acting upon a pinion which drives the spiral cutter. These machines are each provided with a handle, by which they are propelled, but which is removed when it is to be operated by my improved mechanism.

A A are the wheels of the machine, which are preferably corrugated on their peripheries, as shown, and B' is the ordinary spiral cutter, rotated by the movement of the wheels A. A covering-plate, C, upon the inner side of each wheel A furnishes the journal-bearings for the axle, and also for the shaft of the spiral cutter. To these plates C C the handle is attached when the machine is to be propelled in the ordinary manner.

In my improved machine the arms B, to which the draft-ropes are attached, are provided with projections or feet *a*, which rest upon the inner surfaces of the wheel-covering plates C, and are attached thereto by bolts or screws *a'* in line of draft from the cutter to the operator, (thus preventing tilting of the machine.) The arms projecting beyond the periphery of the wheels prevent friction and abrasion of the ropes thereon. The bolts or screws *a'* are eccentric to the axes of the wheel-

plates, so that the arms can be turned to be wholly within the peripheries of the wheels.

By disengaging the draft-ropes E, which are preferably provided with snap-hooks *b*, and slightly loosening the bolts *a'*, the arms B B may be revolved on the bolts *a'*, by which they are attached to plates C, as on an axis, till they rest against the bar H, which connects the two plates C C; or they may be revolved in the opposite direction or dropped till they occupy the position represented in Fig. 4. In either of these positions they come within the peripheries of the wheels and do not interfere with the ordinary operations of the mower.

The draft-ropes E are preferably united or formed of one piece, and, as hereinbefore stated, are provided with snap-hooks *b* for engagement with the arms B B. Slipped over these draft-ropes are the adjusting-rings *c* and *c'*, movably attached to one draft-rope by passing the rope through and around said rings, as shown at *d*, and at such distances from each other as may be required. Changing the relative length of the draft-ropes will cause the machine to occupy a position of greater or less inclination to the path pursued by the operator.

The length of the ropes between the operator and this machine can be changed sufficiently to shift the position of the machine a distance equal to the width of swath cut, so that the operator may walk back and forth in the same line at the top of the terrace-bank, and by changing the relative length of the draft-ropes at each end of the swath and the length of the ropes used he can cause the machine to cut the whole of the inclined surface of the terrace-bank.

It is evident that the draft-ropes would come in contact with a corner of one of the wheels and be abraded thereby if there were no means of preventing it, and that after the removal of the handles the machine would, having nothing to stay it, be liable to tilt forward. To prevent these accidents, the arms may be made to project beyond the peripheries of the wheels and prevent the ropes from coming in contact with them, and, as before stated, these arms are attached to the plates C C directly in the line of draft from the cutter to the operator, thus preventing a forward tilting movement of the machine.

Having thus described my invention, I claim as new and desire to secure by Letters Patent the following:

1. As an improvement in lawn-mowers, the combination, with the wheel-covering plates, of the arms attached to said plates, the draft-ropes attached to the arms, and the ring or rings slipped upon one of the draft-ropes and retained in position on the other rope by passing the latter through and around the ring, so as to form a loop, as set forth.

2. As an improvement in lawn-mowers, the combination, with the wheel-covering plates, of the arms pivoted to the plates eccentrically

to the axis of the wheels, and securing-bolts upon which the arms may be turned to bring the outer ends wholly within the peripheries of the wheels, each of said arms having a
5 greater length than the shortest distance from its pivoting-bolt to the wheel's periphery, but not longer than the greatest distance, the draft-ropes attached to the arms by snap-hooks, and the ring or rings slipped upon one of the draft-
10 ropes and retained in position on the other rope by passing the latter through and around the ring, so as to form a loop, as set forth.

3. As an improvement in lawn-mowers for mowing terraces, the combination, with the
15 wheel-covering plates, of the arms pivoted

thereto, the draft-ropes, the snap-hooks attaching said ropes to the arms, and the ring or rings slipped upon one of the ropes and retained in position on the other rope by passing the latter through and around the ring, so as to form
20 a loop, said rings acting as a support for the slack rope when the machine is in use, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM LIPPINCOTT WOODRUFF.

Witnesses:

D. C. MITTEN,
G. W. BERCK.