

No. 848,551.

PATENTED MAR. 26, 1907.

A. HILL.
LAWN MOWER.

APPLICATION FILED APR. 3, 1905. RENEWED NOV. 27, 1906.

2 SHEETS—SHEET 1.

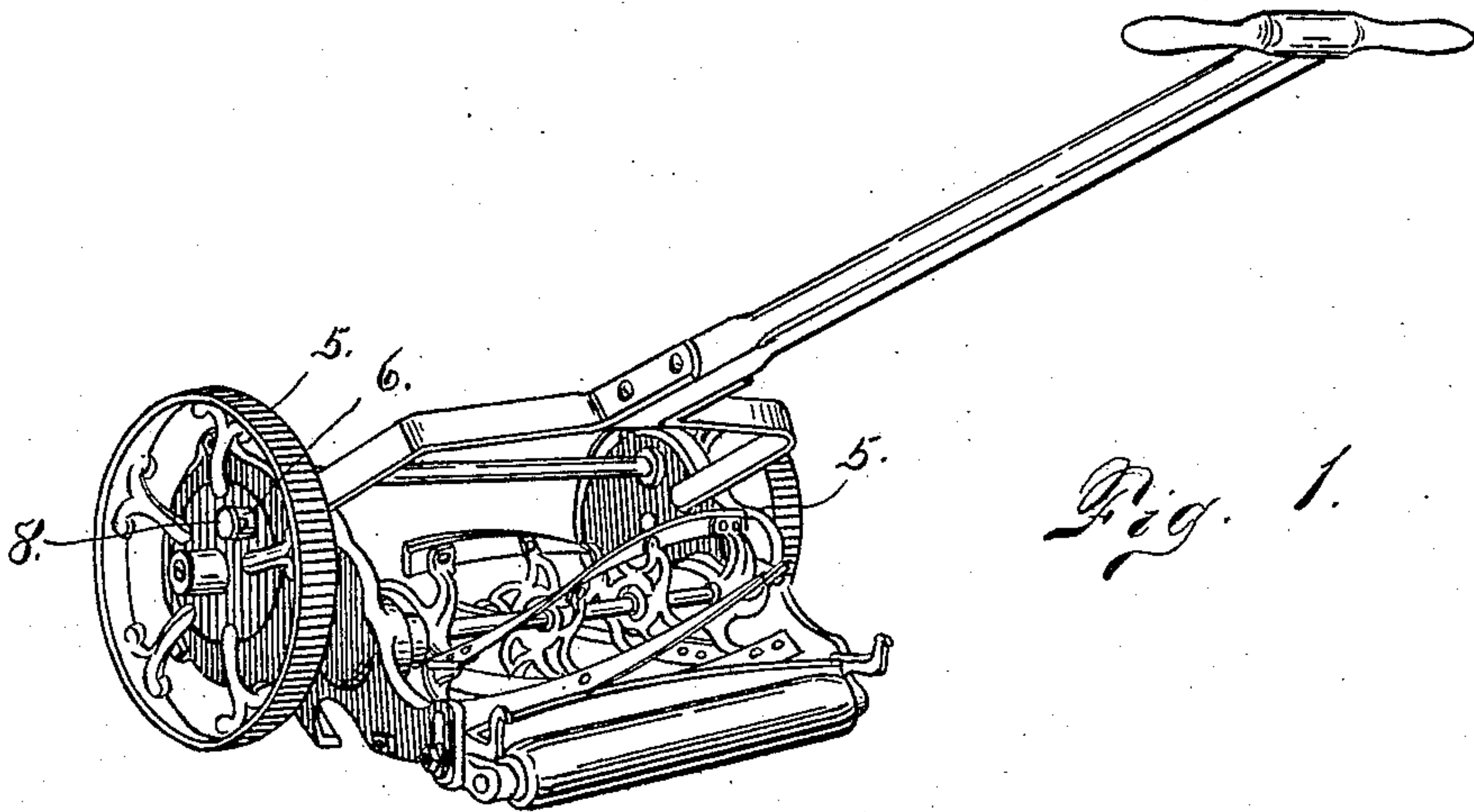


Fig. 1.

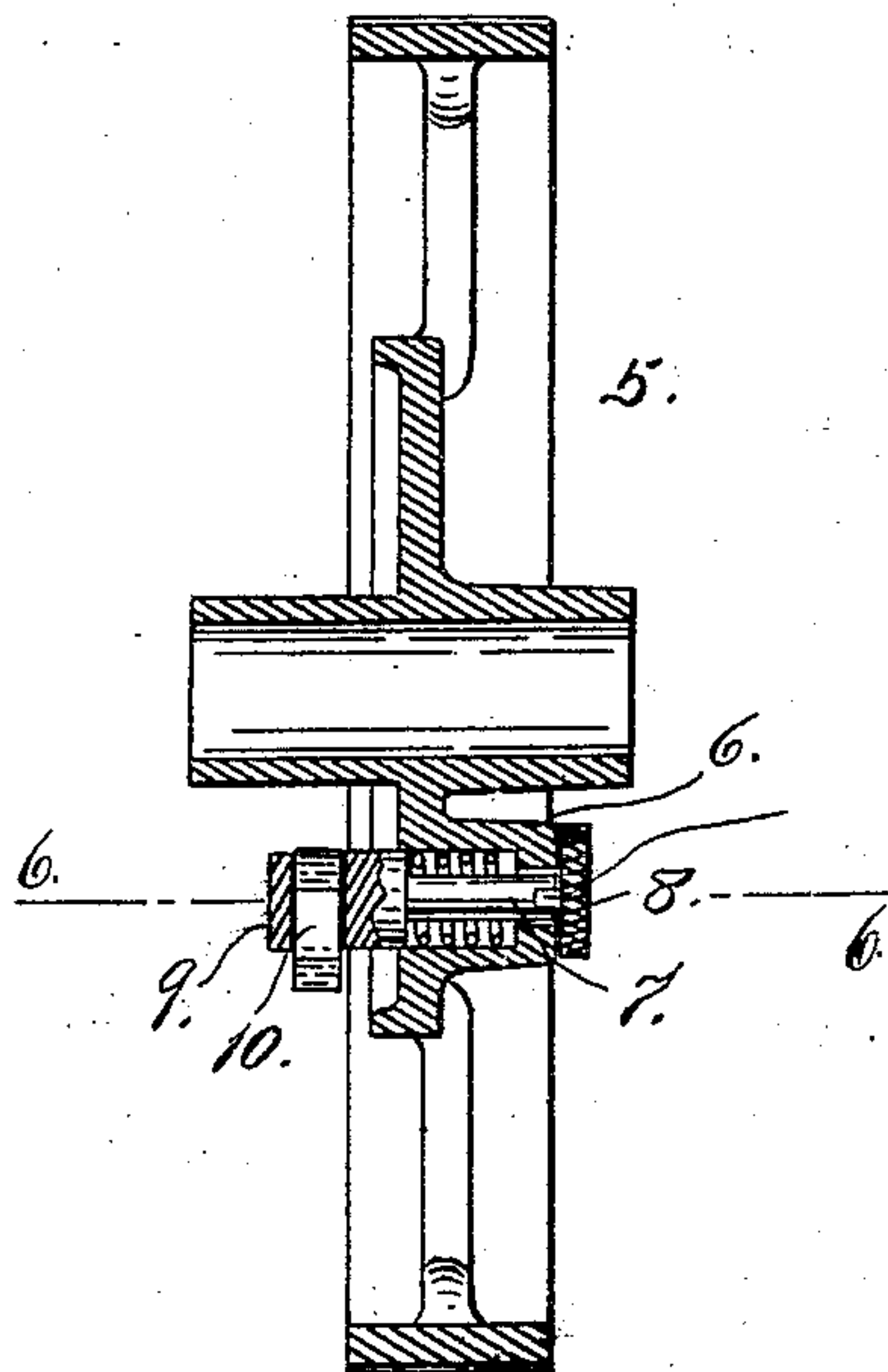
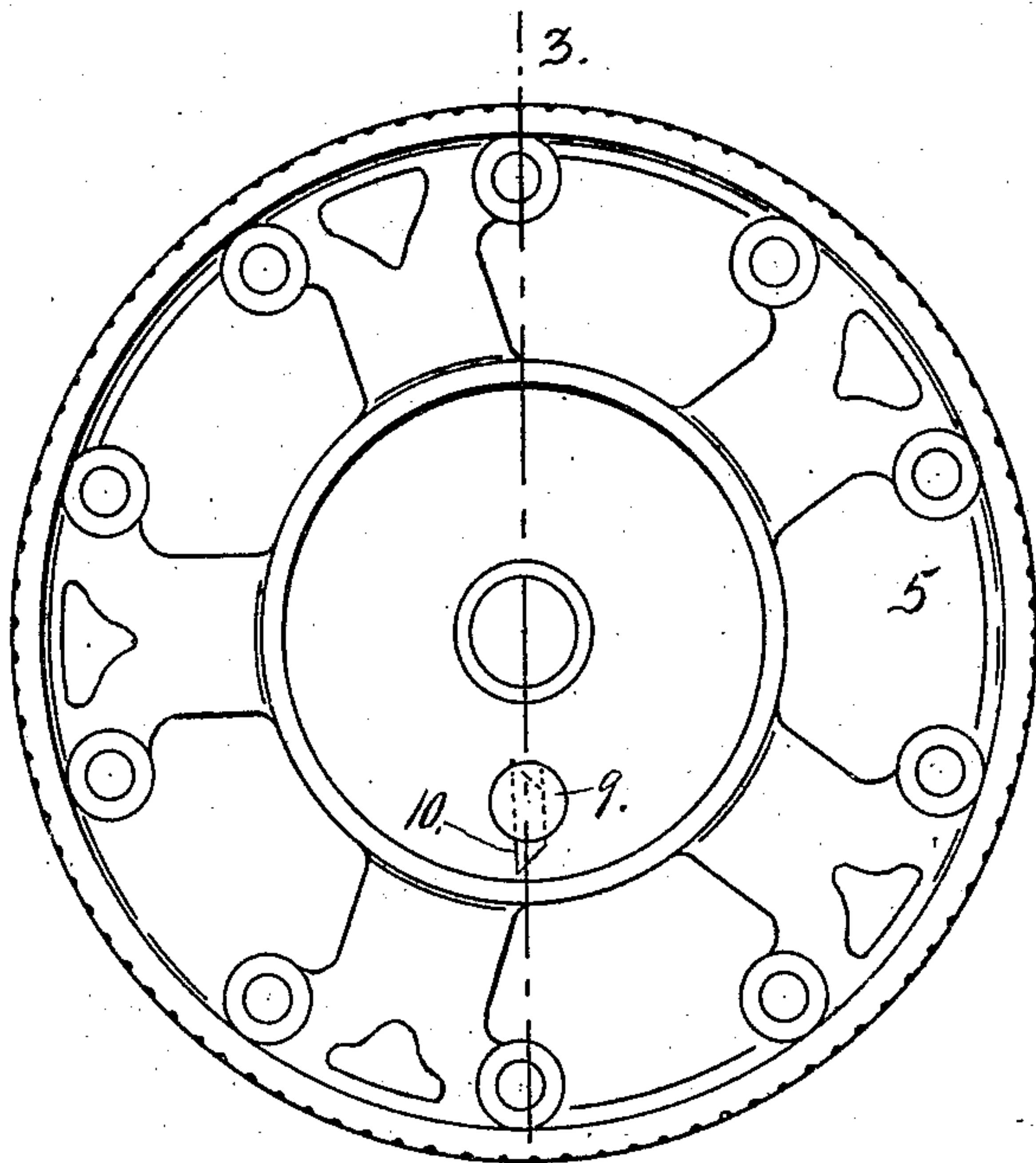


Fig. 3.

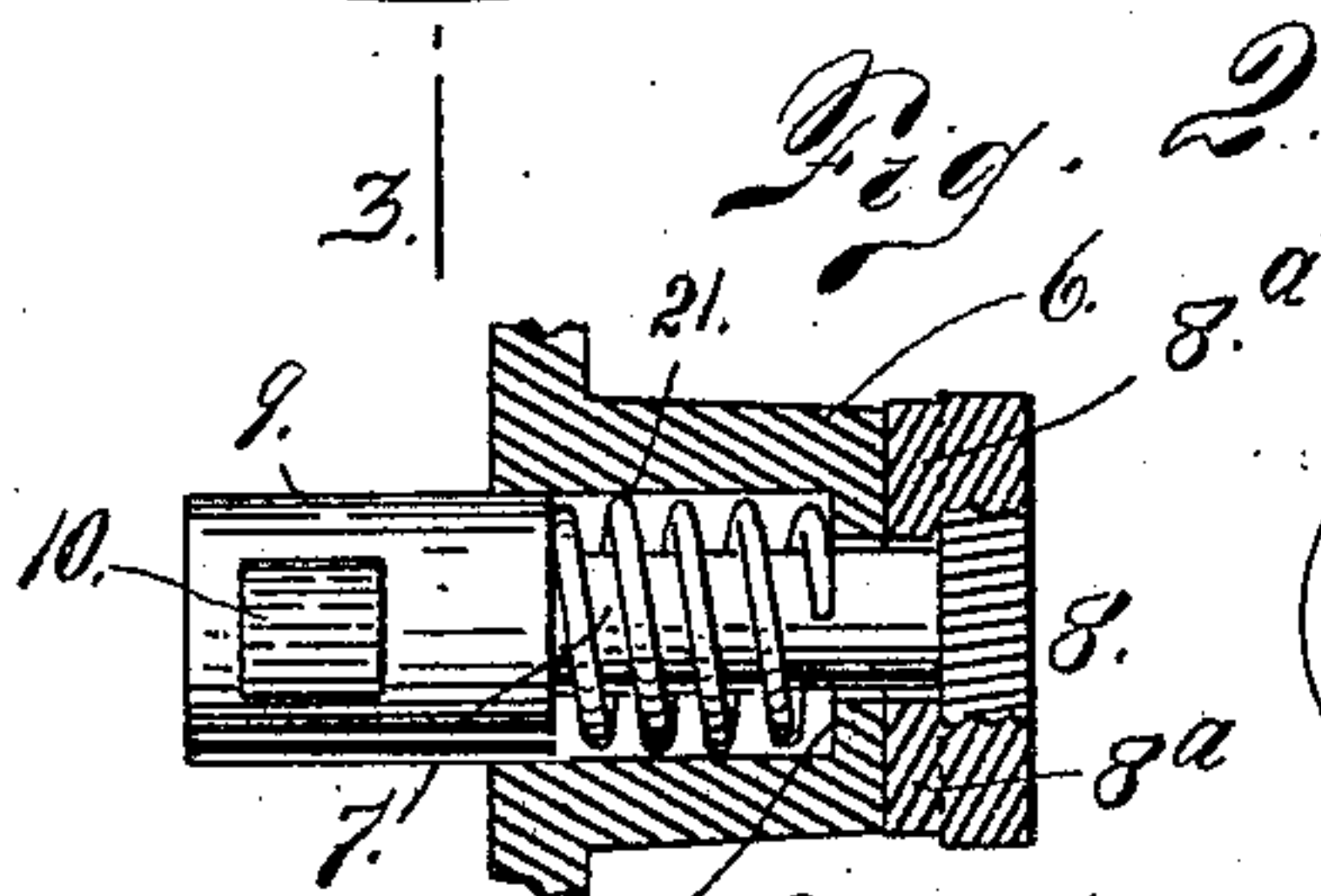


Fig. 4.

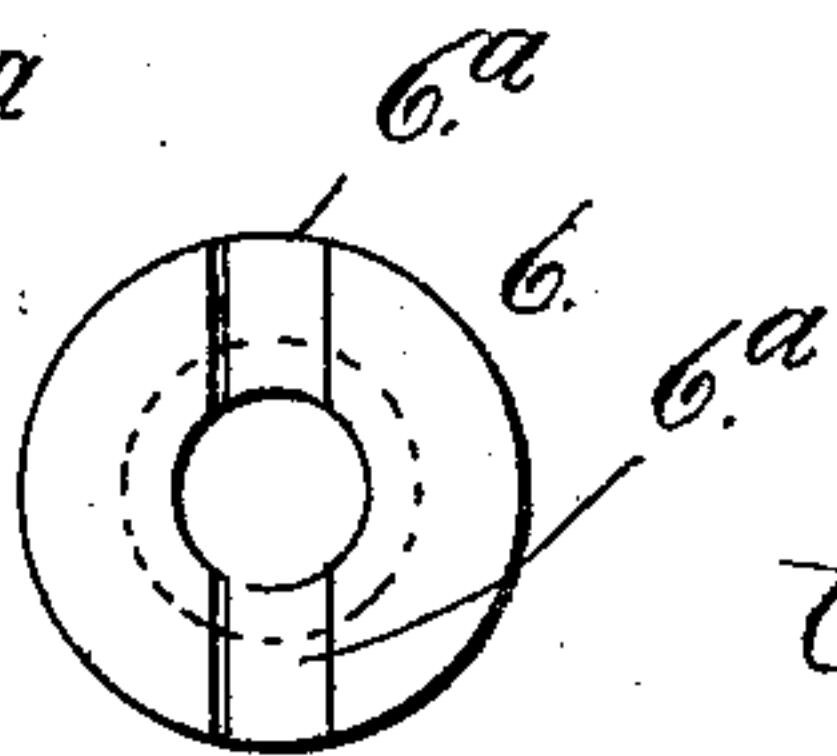


Fig. 5.

Witnesses
Otto E. Haddick.
Dena Nelson.

Alfred Hill
Inventor
By *[Signature]*
Attorney

UNITED STATES PATENT OFFICE.

ALFRED HILL, OF DENVER, COLORADO, ASSIGNOR TO THE KENDRICK AND HILL MANUFACTURING COMPANY, OF DENVER, COLORADO.

LAWN-MOWER.

No. 848,551.

Specification of Letters Patent.

Patented March 26, 1907.

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To all whom it may concern:

Be it known that I, ALFRED HILL, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Lawn-Mowers; 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.

My invention relates generally to improvements in lawn-mowers, and more specifically to means for reversing the action of the gears, whereby the cutting device is made to rotate in the reverse direction by reversing the movement of the ground-wheels.

In order that the knives of the cutting device may be sharpened upon the sharpening device or blade usually employed, it is necessary that the movement of the cutter be reversed or operated in the direction the reverse from that which it takes during the cutting operation.

By virtue of the ordinary mechanism the ground-wheels, through the instrumentality of pawls connected therewith, act on a ratchet of one of the gears to operate the gearing mechanism when the mower is moved forwardly during use. When, however, the mower is moved in the opposite direction, the pawls of the ground-wheels slip over the ratchet-teeth of the gear-wheels, whereby there is no operation of the gear-wheels, and consequently no rotary movement imparted to the cutting device. In order to sharpen a construction of this class, it is necessary to apply a crank to the cutting device and rotate the same by hand.

My improvements consist in providing the gear-wheels adjacent the ground-wheels with teeth or projections adapted to engage the pawl in operative relation from either side, and, further, in mounting the pawl-holder so that it may be turned to cause the pawl to engage an interior tooth from either side. By virtue of this construction the pawl is adjusted to engage an interior ratchet tooth or lug of the gear on one side when the mower is moved forwardly. Then if it is desired to

sharpen the device by turning the ground-wheels in the opposite direction the pawl-holder is given a half-turn, whereby the pawl is made to engage the interior ratchet-teeth of the gears on the opposite side.

Having briefly outlined my improved construction, as well as the function it is intended to perform, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a perspective view of a lawn-mower equipped with my improvements. Fig. 2 is an interior view of one of the ground-wheels equipped with my adjustable pawl-holder. Fig. 3 is a section taken on the line 3 3, Fig. 2. Fig. 4 is a side elevation of the device with one of the ground-wheels removed, but showing the ground-wheel pawl in place, the pawl-holder being indicated in section. In this view the pawl is in position to operate the cutting device when employed for grass-cutting purposes, the outer casing of the gears being removed. Fig. 5 is a similar view showing the pawl-holder adjusted to move the mechanism in the opposite direction when the movement of the ground-wheels is reversed. In this view the gear-casing is shown in elevation, while the position of the ground-wheels is indicated by dotted lines. In Figs. 4 and 5 the dotted line below the view indicates the ground or the surface upon which the machine is operated. Fig. 6 is an enlarged detail view illustrating the manner of connecting the pawl-holder with the ground-wheel, the parts being shown partly in section on the line 6 6, Fig. 3. Fig. 7 is a face view of the sleeve through which the pawl-holder passes.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the ground-wheels, which are journaled on the frame in the usual manner. Mounted in the central web of each ground-wheel, which is reinforced or provided with a sleeve for the purpose, as shown at 6, is a spindle 7, having an exteriorly-exposed milled head 8. The inner extremity of this spindle is enlarged, as shown at 9, and provided with an opening in which is located a sliding pawl 10, the same being beveled to engage ratchet-teeth when the

ground-wheels are turning in one direction in such a manner as to actuate the gearing, while when the ground-wheels are moving in the opposite direction the pawl will slip over the ratchet-teeth. The parts designated by the reference characters 6, 7, 8, and 9 may be said to constitute the holder for the pawl 10. The gear adjacent each ground-wheel instead of having the ordinary ratchet-teeth is provided with teeth or projections 12 and 13, there being an exterior set of teeth 12 and an interior set of teeth 13 of the same construction mounted on the same gear. The pawl 10, being slidable, acts on an exterior tooth 12 when the ground-wheel is in such position that the pawl is below the axis of the wheel, while when the ground-wheel is in position to bring the pawl above the axis of the wheel, so that the latter is allowed to slide inwardly toward the axis, the pawl engages a tooth 13 and performs the same function. Attention is called to the fact that these teeth 12 and 13 are both provided with abrupt offsets on both sides. By virtue of this construction the lawn-mower may be used in the usual way. When, however, it is desired to sharpen the same by moving the ground-wheels in the reverse direction, it is only necessary to give the pawl-holder a half-turn or throw it from the position shown in Fig. 4 to the position shown in Fig. 5, when the pawl will act on the teeth 12 and 13 from the opposite sides, and thus cause the train of gears composed of the members 14, 15, and 16 to operate in the reverse direction, whereby the cutter 17, having the knives 18, is also caused to rotate in the reverse direction, bringing the knives in such position with reference to the sharpening-blade 19 as to sharpen the said knives. This blade 19 is provided with a holder 20, which is vertically adjustable. When it is desired to sharpen the knives of the cutter, this blade is adjusted to bring it close to the cutter-knives. The machine is then operated by moving it over the ground or other surface to cause the ground-wheels to move in the opposite direction, thus operating the train of gears and the cutting device in the opposite direction as required, this movement being continued until the knives of the cutting device are sharpened, and thus worn sufficiently that they occupy the proper relation with reference to the sharpening-blade 19. After this is done the machine may be immediately used for cutting purposes without readjusting the said sharpening-blade.

The movement of the ground-wheels and the different gears when the machine is used in the ordinary way is indicated by arrows in Fig. 4, while the movement of the corresponding parts when the machine is operated for sharpening purposes is also indicated by arrows in Fig. 5. It will be noted that these arrows point in opposite directions in the two

views, also that the pawl 10 is on the opposite sides of the teeth 12 of the gears in the two views.

Attention is called to the fact that when the parts of the mechanism are assembled the pawl-holder of each ground-wheel projects inwardly sufficiently to bring the pawls 10, carried by the ground-wheels, into proper operative relation with reference to the teeth 12 and 13 as the machine is operated for either purpose.

In using my improvement for sharpening purposes attention is called to the fact that the sharpening-blade is provided with a quantity of oil and powdered emery placed thereon adjacent the cutter-knives, whereby the sharpening operation is facilitated, as will be readily understood.

In order to lock the pawl-holder in either position of adjustment—that is to say, the position shown in Fig. 4 or that shown in Fig. 5—the head 8 is provided with interiorly-projecting lugs 8^a, which enter recesses 6^a, formed in the outer extremity of the sleeve 6. These lugs are located on opposite sides of the head. Hence in turning the pawl-holder from the position shown in Fig. 4 to that shown in Fig. 5, or vice versa, the lugs will engage the recesses 6^a in either case. The sleeve 6 is provided with an interiorly-projecting shoulder 6^c, against which one extremity of a coil-spring 21 bears. This spring surrounds the spindle 7, its opposite extremity bearing against the enlarged inner extremity 9 of the pawl-holder. From this description it will be understood that when it is desired to adjust the pawl-holder to cause it to occupy the position shown in either Fig. 4 or Fig. 5 it is only necessary to first grasp the milled head and pull outwardly against the spring 21 until the lugs 8^a are disengaged from the recesses 6^a. A half-turn of the holder will then give it the required degree of movement, in which event the lugs will again enter the recesses 6^a.

In the operation of the device it is believed important to call attention to the fact that the pawl 10 is always loose and slidable freely in its holder whether the latter is in the position shown in Fig. 4 or Fig. 5. As heretofore explained, when the holder is in the position shown in Fig. 4 the machine is in position for use or for the regular performance of its function. If it is desired to sharpen it, the pawl-holder is given a half-turn, whereby the pawl is thrown to the position shown in Fig. 5. After this is done it is preferred to turn the machine over or inverted, so that the position of the mechanism will be reversed from that shown when in the regular performance of its function. In this case it will only be necessary for the user in order to sharpen the knives of the cutter to move the machine back and forth. As he moves it away from him the ground-wheels will turn

in the direction indicated in Fig. 5 and reverse the movement of the gears. Consequently the movement of the cutter and the knives acting on the sharpening-blade 19 will be sharpened, as heretofore explained. By moving the machine back and forth quite rapidly when in the position just stated the gear and cutters may be given a continuous rotation in the direction for sharpening purposes, since the momentum imparted by the movement away from the operator will continue the rotation of the gears and the cutter during the movement toward him. It will be observed that after the ground-wheels stop movement as the machine is shoved from the operator, if it is done quickly or with some force, the momentum of the gears and cutter will continue this movement, since the teeth 12 or 13, as the case may be, can move freely past the pawl 10. This is a very important feature and cannot be accomplished except when the pawl is loose and free to move in its holder, and it is this feature that enables the operator while sitting or standing in one position to accomplish the sharpening function by moving the machine back and forth in front of him after it is turned over, but still resting on the ground-wheels. This is an important distinction over the construction shown in my previous patent, No. 600,913, dated March 22, 1898, since in the last-named patent the pawl was locked, whereby when the ground-wheels cease to move during the sharpening operation the gears and cutter would also stop movement. This necessitated a continuous movement of the ground-wheels in one direction in order to accomplish the sharpening function. In other words, in the patent just referred to the sharpening operation could not be accomplished conveniently by moving the machine back and forth, the operator standing in one place, since the entire mechanism must be operated in opposite directions during the two movements. Hence nothing is claimed on the construction disclosed in the said patent.

Having thus described my invention, what I claim is—

1. In a lawn-mower, the combination with the ground-wheels, cutting device and gears, the gears adjacent the ground-wheels being provided with interiorly and exteriorly located teeth or lugs formed substantially the same on both sides, and a pawl-holder mounted on each ground-wheel and adjustable, and a pawl carried by the pawl-holder, the latter being capable of such adjustment, as to bring the pawl into operative engagement with opposite sides of the teeth or lugs of the gear, whereby the gearing may be operated by moving the machine in either direction.

2. In a device of the class described, the combination of a ground-wheel, a gear located in suitable proximity to the ground-

wheel and provided with interior and exterior teeth fashioned to engage a pawl on opposite sides for operating the gear in the reverse directions, a pawl-holder rotatably mounted on the ground-wheel, and a pawl slidable in the pawl-holder, whereby when the holder is in one position, the pawl occupies such a position with reference to the teeth or lugs of the gear that the latter may be rotated in one direction, while when the pawl-holder is given a half-turn, the pawl will engage the teeth or lugs of the gear to rotate the latter in the opposite direction.

3. In a lawn-mower, the combination with the ground-wheels, cutter and interposed gearing, of means mounted on the machine for reversing the movement of the operating-gears when the motion of the ground-wheels is reversed, comprising a pawl-holder rotatably adjustable on a ground-wheel, the gear adjacent the ground-wheel being provided with interiorly and exteriorly projecting lugs arranged in concentric series and adapted to be engaged in operative relation by the pawl when the latter is on either side thereof.

4. In a machine of the class described, the combination with a ground-wheel, of a pawl slidably mounted and revolubly adjustable on the ground-wheel.

5. In a machine of the class described, the combination with a ground-wheel, of a pawl-holder revolubly mounted on the ground-wheel, and a pawl slidable in the holder and having beveled ends.

6. In a machine of the class described, the combination with a ground-wheel, of a pawl-holder revolubly mounted on the ground-wheel, and a pawl slidable in the holder and having both ends beveled on one side of the pawl.

7. In a lawn-mower, the combination with the ground-wheels, a cutter and an operating-gear, of a sleeve mounted on a ground-wheel, a pawl-holder having a stem passing through said sleeve, a spring surrounding the stem within the sleeve, the pawl-holder having a head projecting beyond the sleeve and provided with a lug, the sleeve adjacent the head having a recess adapted to receive the lug whereby the pawl-holder is normally locked in the adjusted position, the pawl-holder being revolubly adjustable in the sleeve, and a pawl slidable in the pawl-holder and engaging the gear for the purpose set forth.

8. In a machine of the class described, the combination with a pair of ground-wheels, of a pawl-holder revolubly mounted on each wheel, and a pawl slidable in the holder.

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

ALFRED HILL.

Witnesses:

DENA NELSON,
A. J. O'BRIEN.