A. INGRHAM.

Lawn Mower.

No. 112,146. Patented Feb. 28, 1871.

Fig. 1.

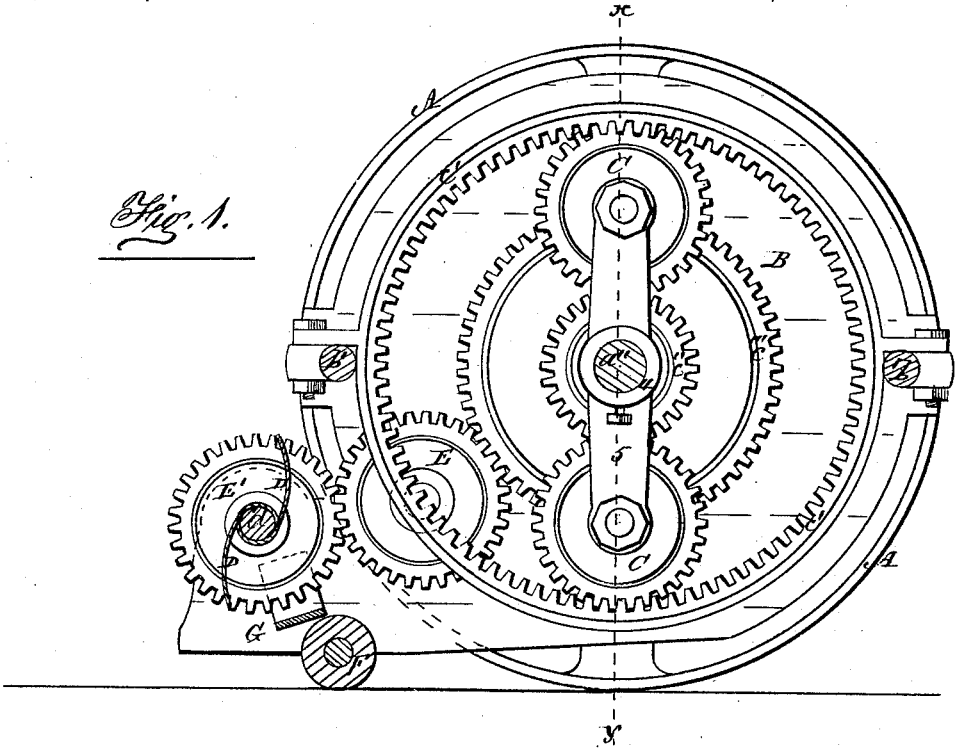
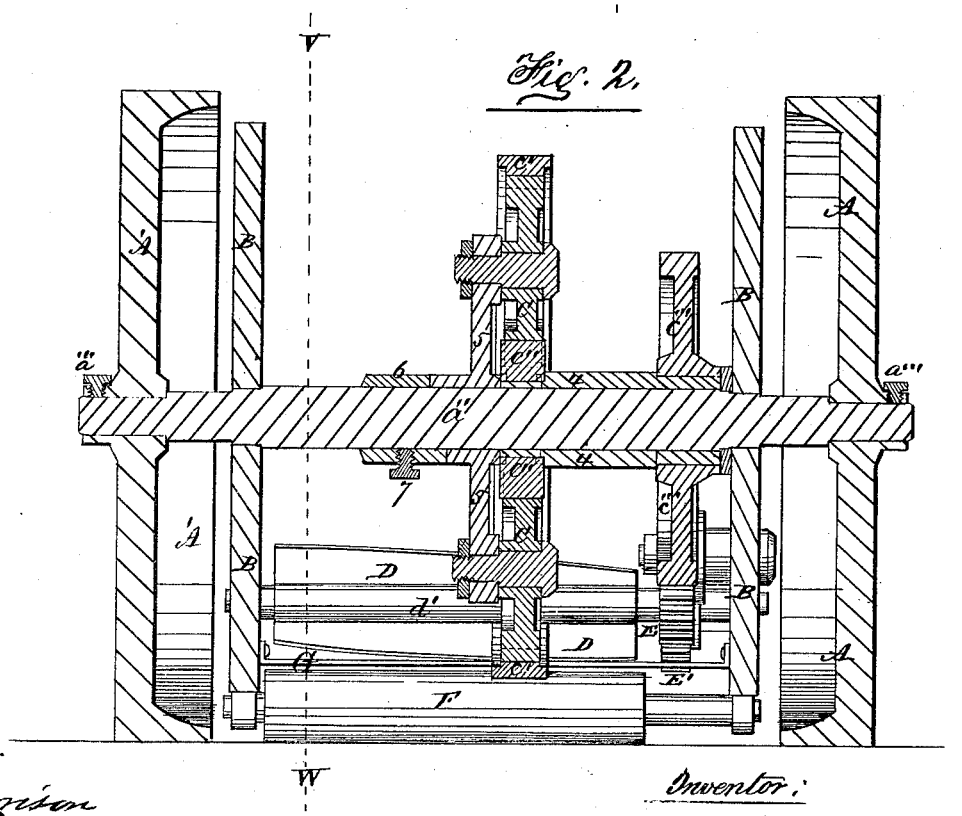


Fig. 2.



Witnesses:

Inventor:

Amer Ingrham

UNITED STATES PATENT OFFICE.

AMER INGRHAM, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO WILLIAM L. BOYER & BROTHER, OF SAME PLACE.

IMPROVEMENT IN LAWN-MOWERS.

Specification forming part of Letters Patent No. **112,146**, dated February 28, 1871.

To all whom it may concern:

Be it known that I, AMER INGRHAM, of the city of Philadelphia, in the State of Pennsylvania, have invented certain Improvements in Hand Lawn-Mowers, of which the following is a specification:

My invention relates to the construction and arrangement, in a hand lawn-mower, of a rotary cutter and a planetary-gear motion, connected and operating together substantially as herein described and set forth; the object of said invention being to give increased velocity to the motion of the cutter of a hand lawn-mower, without increasing the usual speed of the movement of the machine over the lawn, and to render less power sufficient to operate it.

Referring to the accompanying drawing, Figure 1 is a vertical transverse section of the said hand lawn-mower (without the usual handles) on the right-hand side of the dotted line *v w* of Fig. 2. Fig. 2 is a vertical longitudinal section of the same machine on the left-hand side of the dotted line *x y* of Fig. 1.

Referring to the drawing, A A′ are the carrying-wheels on the main axle *a″*; B B *b′ b′*, the main frame; C C *c′ c″ c‴*, the planetary-gear motion; D, the rotary cutter; E E′, the gear-wheels which connect the rotary cutter with the planetary-gear motion; F, the roller for supporting the forward or cutter end of the frame, and G the plate for supporting the standing grass against the shearing action of the cutter upon the latter.

The carrying-wheels A A′, in this instance, are secured rigidly or fixedly to the main axle *a″* by means of set-screws *a‴ a‴*; but the required forward rotary motion of the said axle may be given, if preferred, by means of a ratchet-toothed wheel and pawl, in connection with it, and either one or both of the driving-wheels, in the usual manner, for the purpose of permitting a backward movement of the machine without continuing the rotary motions in the planetary gear and the cutter D.

The spur-wheel *c‴* and the pinion *c″* of the planetary-gear motion are each fixed concentrically around on opposite ends of a hollow shaft, 4, which fits, like a sleeve, around the shaft *a″*, and with the hub of the wheel *c‴* against the inner side of one of the end disks B of the frame, while the pinion *c″* is in the same vertical plane with the large toothed concave wheel *c′*, which is rigidly fixed upon the bars *b′ b′* of the said frame, so as to be concentric in relation to the main shaft *a″*.

The two pinions or wheels C C are each secured to rotate freely at the respective ends of an equal-armed carrying-bar, 5, through which the shaft *a″* fits accurately, and is held rigidly to the latter by means of an adjustable thimble, 6, provided with interlocking projections or recesses, which fit into like recesses or projections on the abutting hub of the said bar, and is also adjustably secured to the shaft *a″* by a set-screw, 7, so that when interlocked with the thimble 6, fixed rigidly to the shaft *a″*, as described, the rotary motion of the shaft *a″* will carry around the said bar 5; but when the latter is released by setting the said thimble 6 back, the shaft *a″* may be rotated without its carrying around with it the said bar 5.

The two wheels or pinions C C are alike, and, gearing into the teeth of the fixed concave wheel *c′* and pinion *c″*, revolve around the latter in the annular space which is between the said pinion and concave, and also rotating upon their respective axes in the bar 5, necessarily give a very rapid rotary motion to the spur-wheel *c‴* of the hollow shaft 4, and this latter gearing into the small wheel E, which gears into the small wheel E′ on the shaft of the rotary cutter D, the most rapid rotary motion that may be desired will be given to the said cutter during a moderately-slow forward movement of the machine on its carrying-wheels A A′.

The rotary cutter D consists of two oppositely-arranged spiral blades secured to its shaft *d′*, (see Fig. 2,) and rotates so that its cutting-edges will pass, like the blade of a pair of shears, just above the forward upper edge of the stationary plate G, and thus cut the grass at whatever height from the ground the said plate G may be supported by the roller F, as the machine is being pushed along in the forward direction.

In transporting the machine the planetary-gear motion and the rotary motion of the cutter can be readily suspended by simply setting

back, on the axle a'', the adjustable thimble 6, and thus allowing the axle a'' to rotate freely within the hollow shaft 4.

It will be understood, without any further explanation, that the above-described connection of a rotary cutter and planetary-gear motion with a hand lawn-mower will greatly increase the velocity of the cutter, and thus effect the perfect result sought in lawn-mowing, without requiring that the machine be pushed along over the lawn with greater speed than is usually necessary in the hand lawn-mowers in common use, and that less power will be required to operate it.

I claim as my invention—

In a hand lawn-mower, the planetary gear C C c' c'' c''', the rotary cutter D, and the intervening gear-wheels E E′, the said parts being constructed and arranged to operate together substantially as and for the purposes hereinbefore set forth and described.

AMER INGRHAM.

Witnesses:
BENJ. MORISON,
WM. R. HEINS.