(No Model.)

M. W. WRIGHT.

HAND POWER GRASS CUTTING MACHINE.

No. 462,788. Patented Nov. 10, 1891.

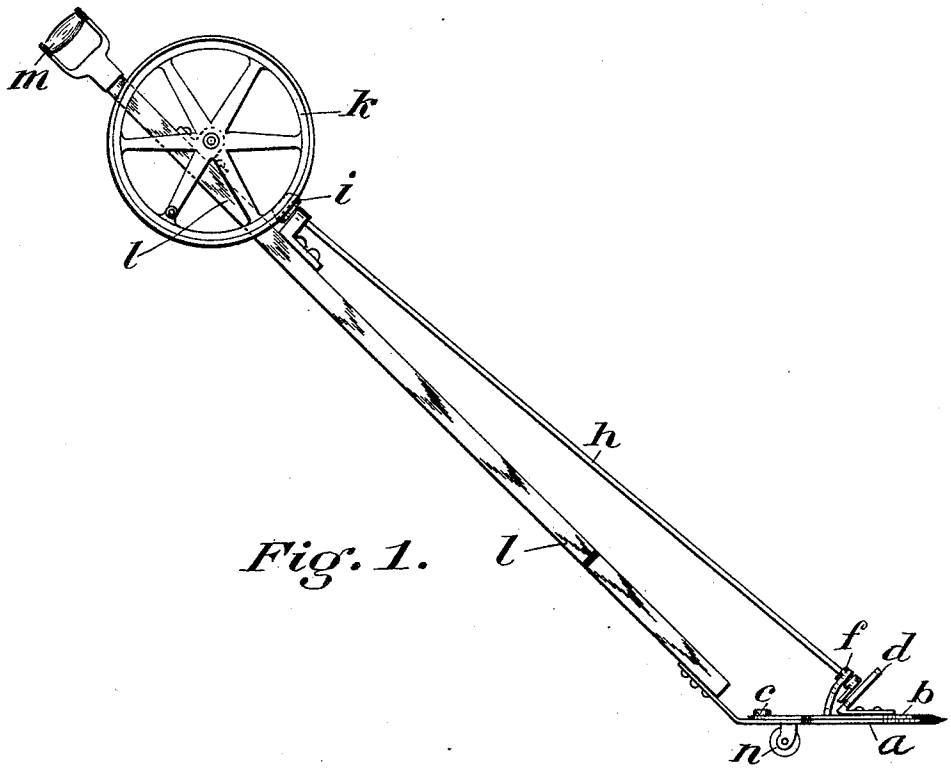

Fig. 1.

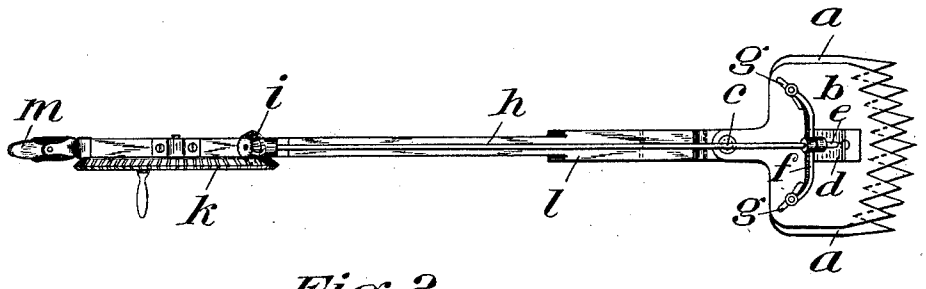

Fig. 2.

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HAND-POWER GRASS-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 462,788, dated November 10, 1891.

Application filed July 16, 1891. Serial No. 399,781. (No model.)

To all whom it may concern:

Be it known that I, MARK W. WRIGHT, a citizen of the United States, residing at No. 30 East Fayette street, in the city of Baltimore and State of Maryland, have invented certain new and useful Improvements in Hand-Power Grass-Cutting Machines; 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 of reference marked thereon, which form a part of this specification.

My invention relates to improvements in small grass-cutting machines operated by hand-power, in which—

Figure 1 is a side elevation of my invention. Fig. 2 is a plan or top view of the same.

Similar letters of reference indicate corresponding parts in the two figures.

The cutting part of the machine consists of two series of knives formed upon the edges of two horizontal plates *a* and *b*, which rub against each other, the lower plate *a* remaining stationary, while the upper plate *b* has a reciprocating and partially-rotary motion, thus: As shown upon the accompanying drawings, the lower plate *a*, upon whose front edge are formed knives for cutting, is firmly affixed to a wooden stale or handle by a shank forming the back part of the plate *a*, while the front of this plate *a* describes a short arc or a circle.

Resting and working upon and in close contact with the plate *a* is another plate *b*, very similar in form, whose front edge describes a trifle shorter arc of the same, or of, perhaps, a trifle smaller circle, and upon whose front edge are also formed a series of knives designed to work in conjunction with the knives upon the front edge of plate *a*. These two plates *a* and *b* have one common center *c*, where the two plates are fastened together with a bolt, and said common center is the center of the circle partly described by the outer or front edges of the two plates *a* and *b*. The knives upon the edge of plate *a* slightly differ from those upon the edge of plate *b*, inasmuch as those of plate *a* are a trifle longer and project from the common center *c* a very little farther than do those on plate *b* to protect the points of the knives upon the plate *b* in their reciprocatory motion. The knives upon plate *a* are pointed and those on plate *b* nearly or quite pointed, and where they rub across each other, as they do throughout nearly their entire length, they are very nearly of the same size. The knives upon plate *a* are beveled upon their lower sides, the knives upon plate *b* are beveled upon their upper sides, and thus the knives upon the two plates rubbing together form a "shear cut." The motion is only in plate *b*, which swings laterally and with a slight rotary motion upon the common center *c*, but the motion being reciprocal, the knives passing over and describing the arc of an imaginary circle, of which the bolt at *c* is the center.

Midway of the upper side of plate *b* and a short distance back of the base of the knives thereon is affixed an ear or projection *d*, and through this ear runs a vertical slot *e*. Just back of the ear *d* is placed the bearing *f* of the driving-shaft. This bearing *f* does not rest upon the plate *b* at any point, but is so adjusted that it rests upon plate *a*, thus: Upon each side of the ear *d* and some distance from it are cut two curved slots *g g* through the plate *b* wide enough and for the purpose of admitting of screws to be run through them and screwed to the plate *a*, thus keeping the plates *a* and *b* in close contact. The bearing *f* above alluded to is shaped something like a bridge, and is so formed that its ends shall rest one in each of the slots *g g*, thus extending from one slot to the other; but the ends of the bridge-like bearing *f* are each formed with a shoulder as they reach the plate *b*, but possess a further extension long enough and small enough to reach through the slots *g g* to plate *a* and rest upon plate *a*. The screws running through the slots *g g* also pass through the ends of bearing *f*, fastening the bearing *f* firmly to plate *a*.

Passing through the center of the bridge-bearing *f* (which is just behind the ear *d*) is the driving-shaft *h*, which has but two bearings, one in the bridge-bearing *f* and the other at or near its other extremity and resting upon the stale *l*. The driving-shaft *h* upon its lower end is provided with a crank or crank-wheel, the wrist of which is run through the slot in the ear *d*, but fitting

loosely therein, and thus as the driving-shaft revolves and the crank revolves in and through the slot *e* reciprocatory lateral motion is given to the plate *b*, and of course carrying with it the knives formed upon its front edge. Upon the upper or opposite end of the driving-shaft *h* is affixed a bevel gear-pinion *i*, which meshes into and is driven by the bevel-cog drive-wheel *k*. The drive-wheel *k*, as well as the upper bearing of the shaft *h*, rests upon the handle or stale *l*. At the upper end of the stale *l* is affixed a convenient handle *m*.

The method of operation is substantially as follows: The operator grasps the handle *m* in the left hand, and it is designed that when this handle *m* is brought to the proper height to be held conveniently the knife-plates *a* and *b* shall lie horizontally. The operator then with the right hand revolves the drive-wheel *k* by means of a convenient handle attached to the same. As the drive-wheel revolves, the bevel-cogs upon its left-hand edge mesh into corresponding bevel-cogs on the pinion *i*, and thus giving the shaft *h* a rapidly-revolving motion. As the shaft *h* revolves, the crank at its lower end is forced into a rapid circular movement, carrying with it in a laterally-reciprocating movement the ear *d*, through which it runs, and, as the ear *d* is firmly affixed to the knife-plate *b*, plate *b* is thus forced into the same movement, and thus the knives upon plate *a* remaining stationary and the knives upon plate *b* plying laterally and in close contact with and across the knives upon plate *a*, as the grass is caught between the knives it is readily and cleanly shaven as the entire machine is pushed foward by the operator. Ease in moving the machine upon the ground and in adjusting the distance of the knives from the ground is facilitated by one or two small wheels or casters *n*, attached to the rear part of plate *a*, the wheels *n* resting upon the ground and the weight of the lower portion of the entire machine resting upon them, they being so adjusted that by slightly depressing the handle *m* the points of the knives are lifted to a greater distance from the ground, or vice versa.

If preferred, this machine may be rendered still lighter in weight by placing the curved slots *g g*, the bearing *f*, and the ear *d* forward much nearer to the base of the knives than shown in the accompanying drawings and cutting away large portions of the rear parts of plates *a* and *b* upon each side of the shank affixed to the stale *l*, leaving only enough of the plates to form shanks running from the center *c* to near the slots *g g*. The casters *n* may then be attached to the shank of plate *a* at or near the center *c*.

I am aware that prior to my invention grass-cutting machines have been made with laterally-reciprocating knives, and some of them with the partly-circular motion given to those herein described, but none having the motive power applied in the manner in which it is in my invention—that is, by applying the power to the knives in front of the common center, (here marked *c*,) and I thus apply the power more directly and avoid the destructive strain placed upon the center *c*, which accompanies the movement of all whose motive power is applied to the rear of the common center *c*, and I thus move the knives more easily and with less resistance and with the use of less power. The knives will also in this machine be longer than those shown in any prior machine.

I am also aware of the fact that the driving-power of hand-power grass-cutting machines has been constructed with some features in common with the one here shown, but none with the same form of direct connection between the application of power and the lateral motion of the knives.

Hence I do not claim as my invention either the reciprocating circular motion of plate *b* or the cranked driving-shaft as such; but

What I do claim as my invention, and wish to secure by Letters Patent, is—

In hand-power grass-cutting machines, the combination of the two knife-plates *a* and *b*, hinged to each other at a point to the rear of the connection of plate *b* with the driving-shaft and the bridge-like bearing *f*, all substantially as shown in the above specification and in the accompanying drawings.

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

MARK W. WRIGHT.

Witnesses:
FRANK DE S. BENZINGER,
H. T. CRANE.