No. 762,514. PATENTED JUNE 14, 1904.

R. G. COATES.

MOWING MACHINE.

APPLICATION FILED AUG. 13, 1903.

NO MODEL.

FIG. 1.

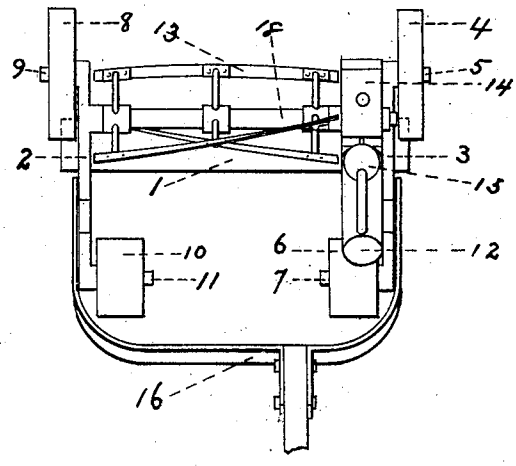


FIG. 2.

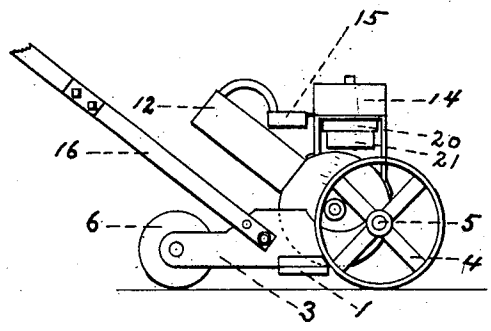


FIG. 3.

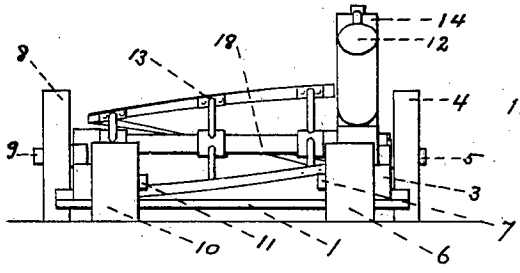


FIG. 4.

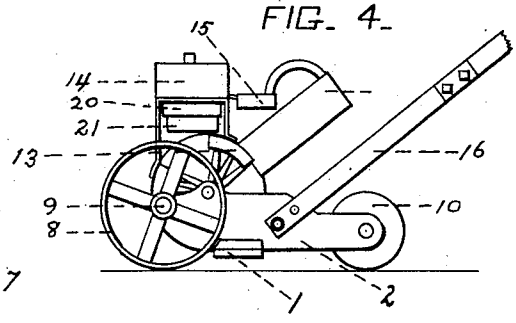
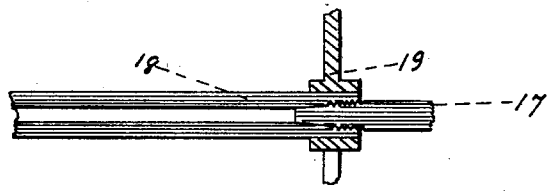


FIG. 5.



Witnesses.
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No. 762,514. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

RAY G. COATES, OF PASADENA, CALIFORNIA.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 762,514, dated June 14, 1904.

Application filed August 13, 1903. Serial No. 169,351. (No model.)

To all whom it may concern:

Be it known that I, RAY G. COATES, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Mowing-Machines, of which the following is a specification.

My invention relates to that class of machines used for cutting lawns. In the general construction of such machines a rotary cutter is driven either by the traction of the supporting-wheels or by some prime mover carried on a suitable supporting-carriage. In the latter case the operator of the machine is carried by it, and it results that the apparatus is heavy, bulky, and more or less unwieldy.

The object of my invention is to reduce the weight of the power-driven machine to the lowest point consistent with a large width of cut. This I accomplish by eliminating all of the parts possible from the apparatus heretofore used in combination with the use of an internal-combustion motor, the absence of any attempt to carry the operator, and the combination of parts hereinafter described.

In the drawings, Figure 1 represents a plan, Fig. 3 a rear elevation, Fig. 2 a right side and Fig. 4 a left side elevation, and Fig. 5 a detail, all showing the application of my improvement to a rotary-cutter mowing-machine.

In the figures a main horizontal member 1 is mechanically secured to the side members 2 and 3. To the member 2 is secured a pin 9, carrying one main supporting-wheel 8, and a pin 11, with an auxiliary supporting-wheel 10. To the member 3 is secured the pin 5, carrying another main supporting-wheel 4, and the pin 7, with another auxiliary supporting-wheel 6. To the members 2 and 3 is attached the controlling member 16, by which the entire machine is guided. For the sake of clearness the member 16 is not shown in Fig. 3. A rotary cutter 13 is mounted with its axis above and parallel with the front edge of the member 1. The left end of the said cutter rests in a bearing in the member 2, and the right end is attached to mechanism hereinafter described.

The outline thus far presented represents an elementary part of a well-known form of mowing-machine, and it is used herein for the purpose of making my invention clear.

Secured to the members 1 and 3 is a small internal-combustion motor 12, placed with the axis of its shaft coincident with the prolongation of the axis of the cutter 13 and mechanically secured thereto. This connection may be made in any appropriate manner, or the two shafts may be replaced by one continuous shaft. A method of connection adapted to the small incased internal-combustion motor well known in the arts is shown in Fig. 5, in which 17 represents the end of the motor-shaft extending toward the cutter-shaft, to which latter it is to be connected. The hollow shaft of the said cutter is represented by 18, and 19 is the "hub" of the right-hand "spider" of the several "spiders" that are mounted on and secured to the shaft 18 for the purpose of carrying the several cutting-blades. A female screw is cut in the end of the hollow shaft, and farther within the hollow shaft is reamed out to a "taper." The end of the shaft 17 is turned to a taper corresponding to that formed in the hollow shaft and a screw-thread cut to engage the thread in the shaft. The screw-threads will thus draw the shafts together, while the taper parts will secure the alinement and firmness of the connection. It will be evident that the threads should be so cut that the joint will tighten with the work of the motor. The motor 12 is provided with a fuel-tank 14, a carbureter 15, and the connection between the motor and these members is to be of any of the usual constructions. A battery 20 and spark-coil 21 are mounted below the fuel-tank and connected in the customary manner with the igniting apparatus of the motor. Any appropriate means of ignition may be used for the motor. The motor may be started by rotating the cutter by turning the cutter-blades by hand until the first ignition occurs, or a starting-crank of the common form may be applied either to the right-hand end of the motor

shaft or to the left-hand end of the cutter-shaft. In these latter cases that part of the shaft that is to be used for the application of the starting-crank is to be fitted for such application, the manner of so doing being well known in the arts to-day.

In operation the entire machine is pushed over the ground by means of the member 16, which latter is made of a length suitable for the purpose. The supporting-wheels 4, 8, 6, and 10 have no action except that of the easy carriage of the machine. They turn freely on their axles in either direction. When the machine reaches the grass to be mown, it is momentarily stopped and the motor started, thereby putting the cutter in rapid rotation. The machine is then moved against the grass to be cut, the cutter acting on the grass in the usual manner. It will be noted that the animal power required to move the machine is not more than that required to overcome the rolling friction of the machine in its movement over the earth. The rapid speed required by the cutter is obtained from the motor 12. The "width of cut" is limited by the power of the motor, and this may be made of such a power as to secure the operation of the cutter for any particular width of cut. Since there is no resistance against the wheels caused by efforts to rotate the cutter, it is evident that a much heavier machine may be moved by the animal power applied than could be moved by the same power when the wheels had to also drive the cutter, since the power used in the latter service may be applied in overcoming increased rolling friction. Since the cutter rotates regardless of the forward motion of the entire machine, heavy grass may be cut by decreasing the speed of the advance, whereas in the usual construction heavy grass is quite apt to clog and stop the machine, since decreasing the advance of the latter operates also to decrease the speed of the cutter. In cutting close to objects the machine may be advanced as slowly and carefully as may be desired and the cutting performed in irregular places, since the lack of mechanical connection between the cutter and the wheels allows of more flexibility in the movements of the machine as a whole.

I am aware that mowing-machines have been constructed in which the cutting mechanism was driven by other than animal power; also, that in these constructions the apparatus has been both self-propelling and propelled by animals. I am also aware that internal-combustion motors have been adapted to the operation of mowing-machines. None of the above constructions do I broadly claim.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a mowing-machine, the combination of a cutter-bar, a rotary cutter coöperating with said cutter-bar, and an internal-combustion motor having its shaft axially in line with the shaft of said rotary cutter and operatively connected thereto, substantially as described.

2. In a mowing-machine the combination of a cutter-bar, side members attached to said cutter-bar, supporting-wheels with their axes secured to said side members, a rearwardly-projecting controlling member attached to the structure formed by said side members and said cutter-bar, a rotary cutter mounted on said structure and situated to coöperate with said cutter-bar, and an internal-combustion motor mounted on said structure with its shaft axially coincident with the shaft of said rotary cutter, said shafts being operatively connected substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RAY G. COATES.

Witnesses:
W. B. MERWIN,
H. S. ROLLINS.