(No Model.) 2 Sheets—Sheet 1.

S. W. MARTIN.

LAWN MOWER.

No. 560,514. Patented May 19, 1896.

Fig. 1.

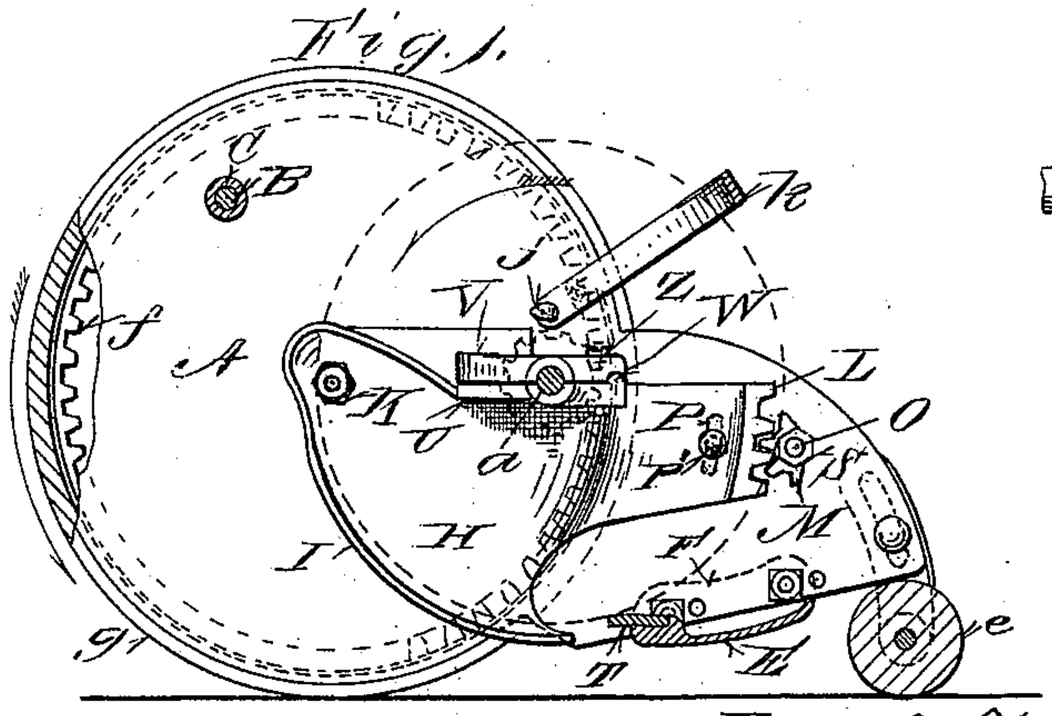


Fig. 1a.

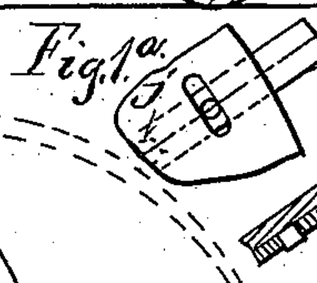


Fig. 1b.

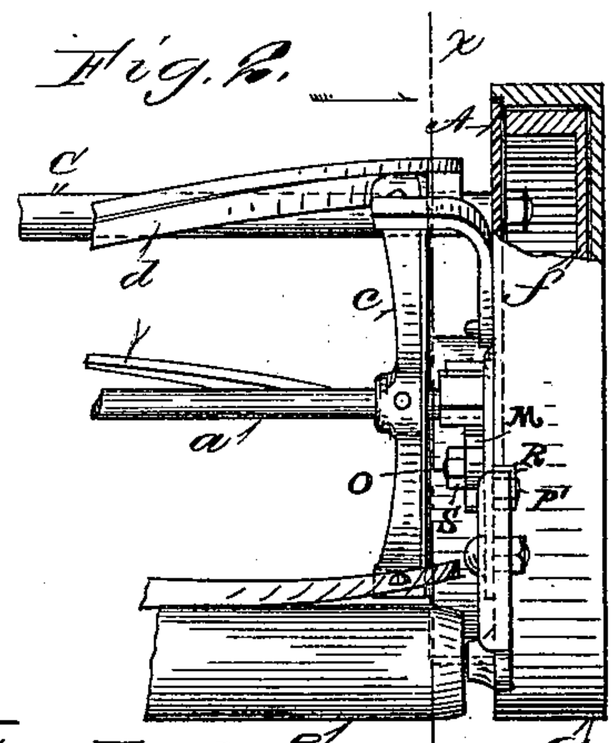


Fig. 2.

Fig. 3.

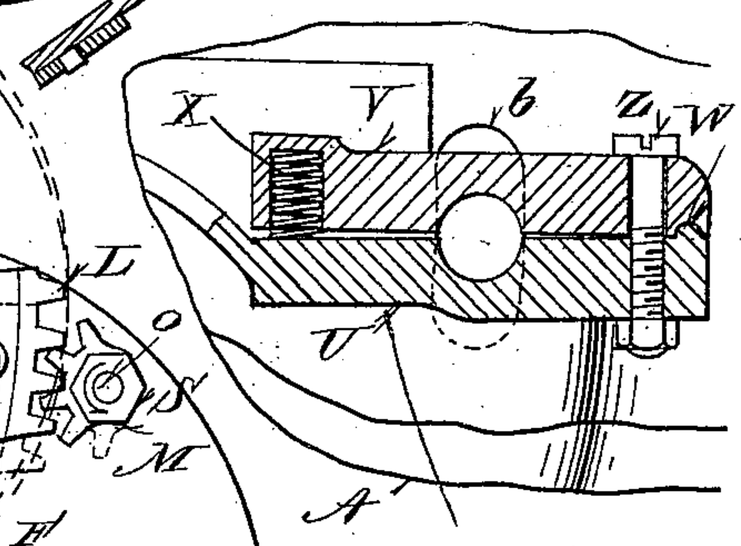


Fig. 5.

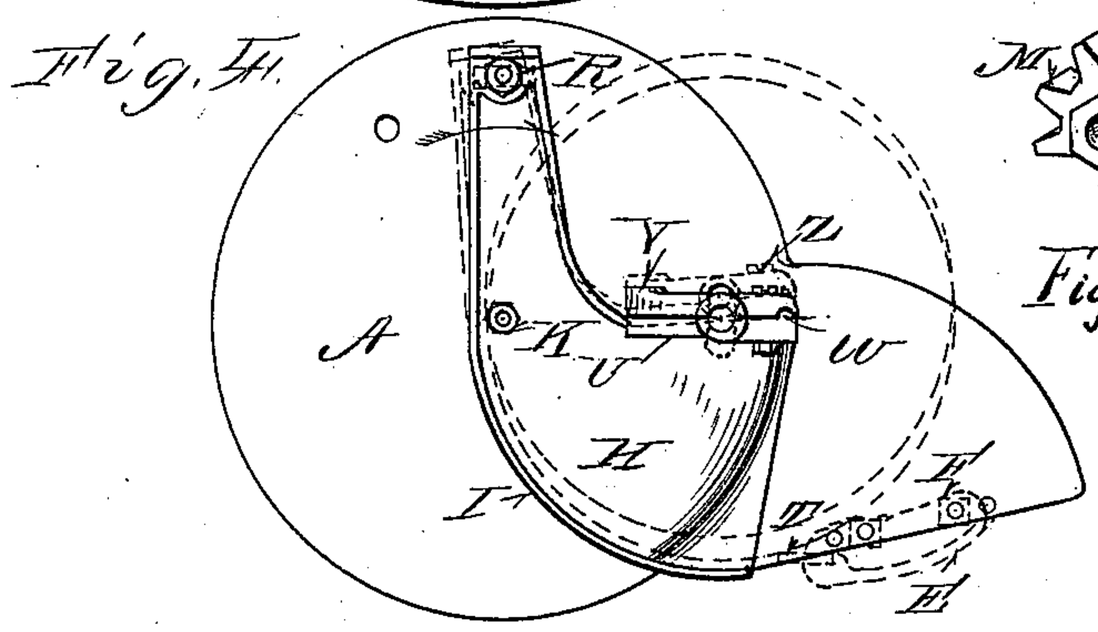


Fig. 4.

Fig. 4a.

Fig. 7.

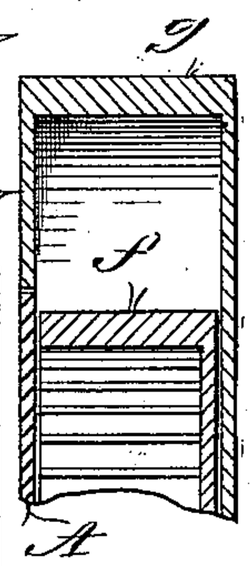
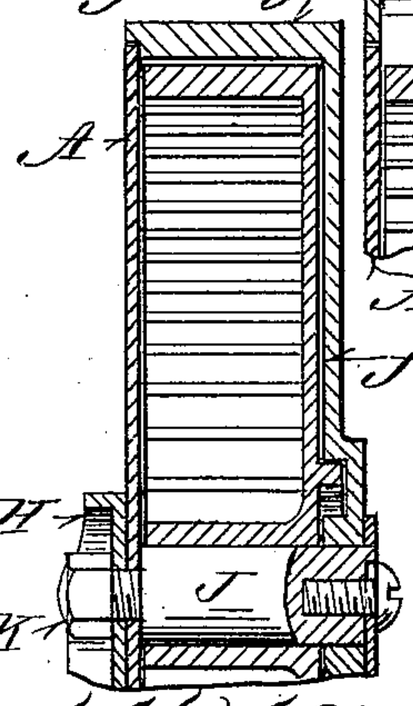


Fig. 6.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

S. W. MARTIN.

LAWN MOWER.

No. 560,514. Patented May 19, 1896.

Fig. 8.

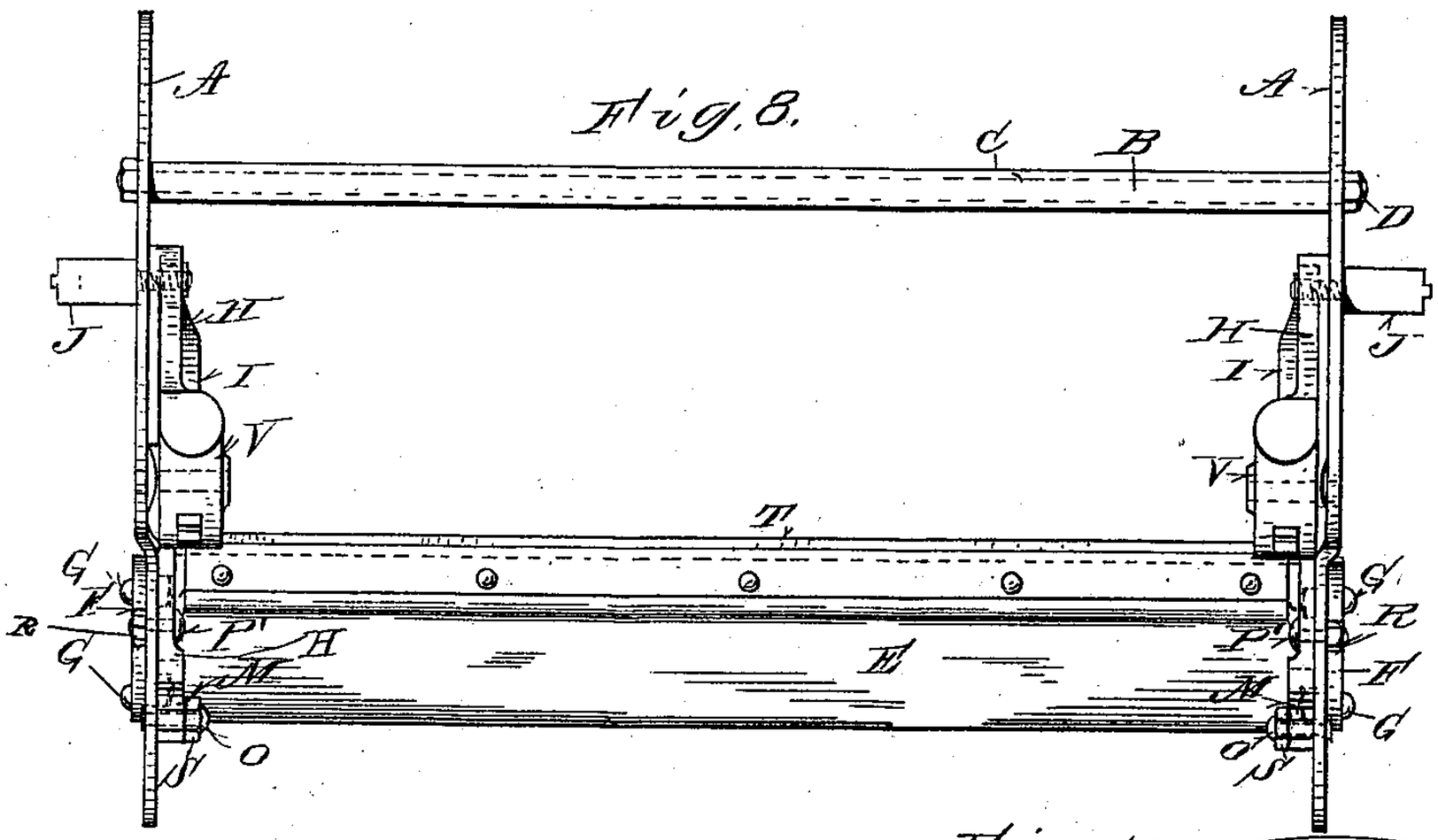


Fig. 9.

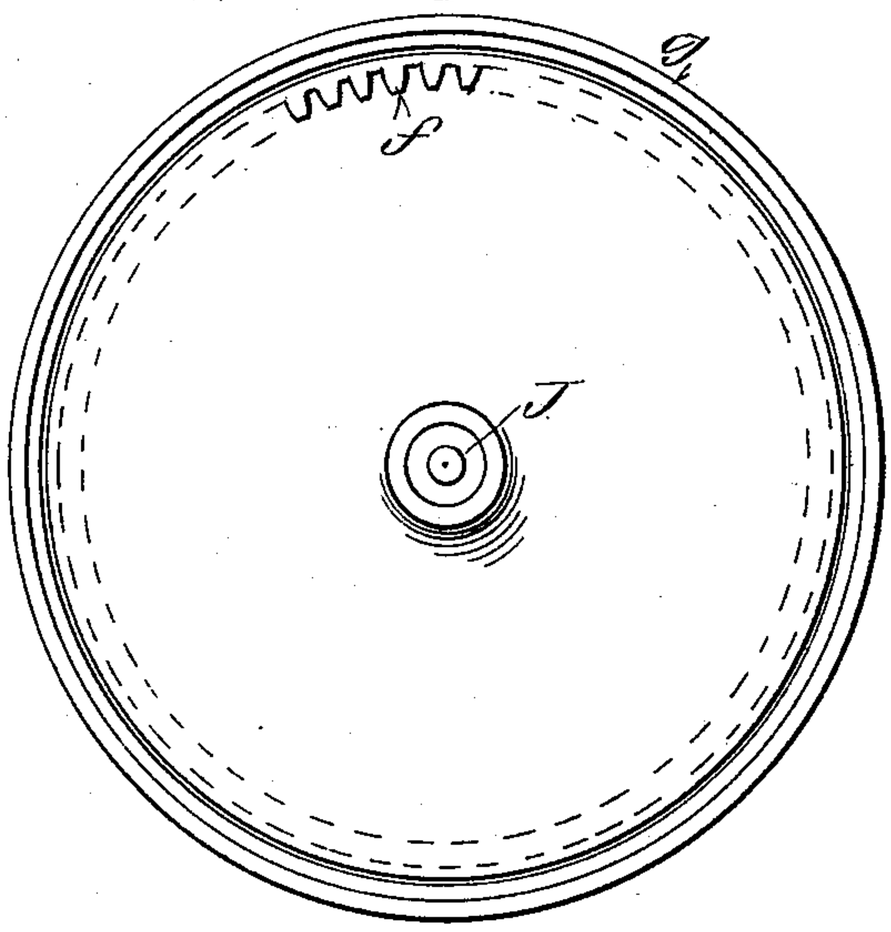


Fig. 10.

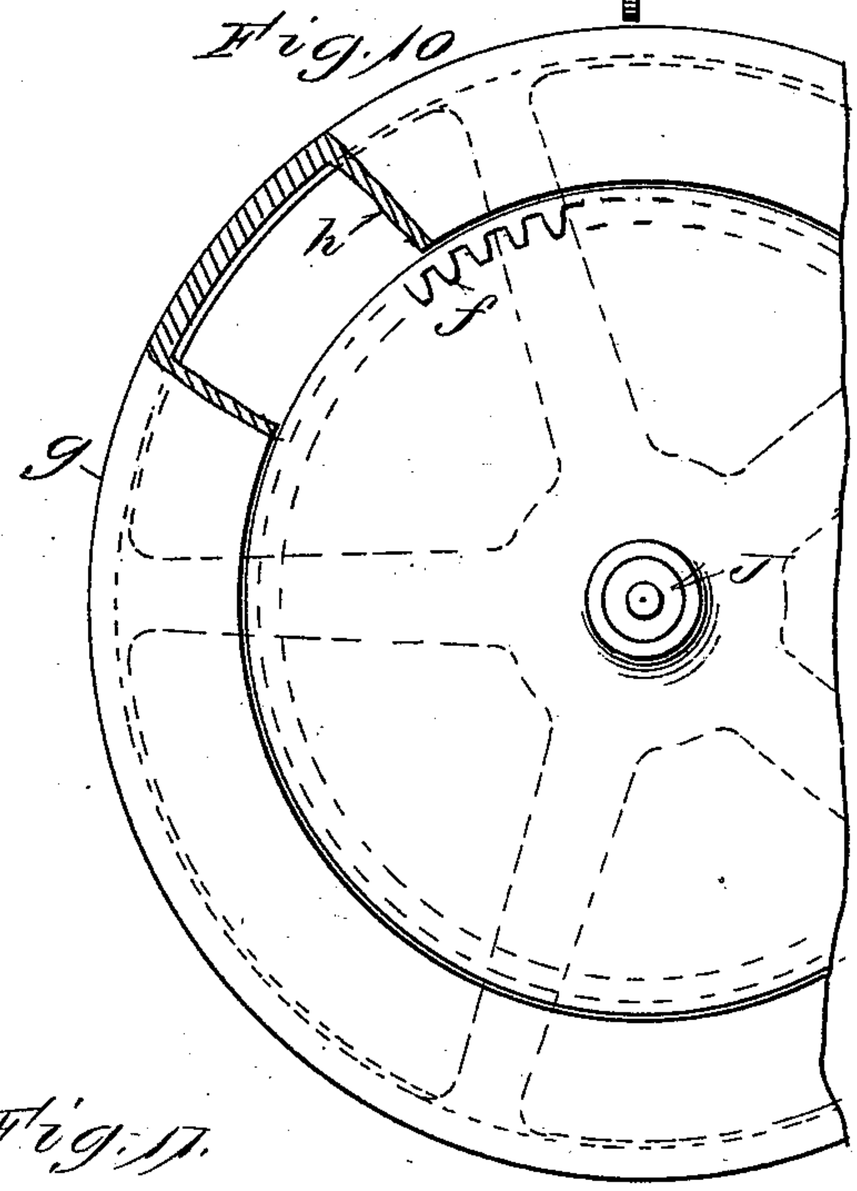
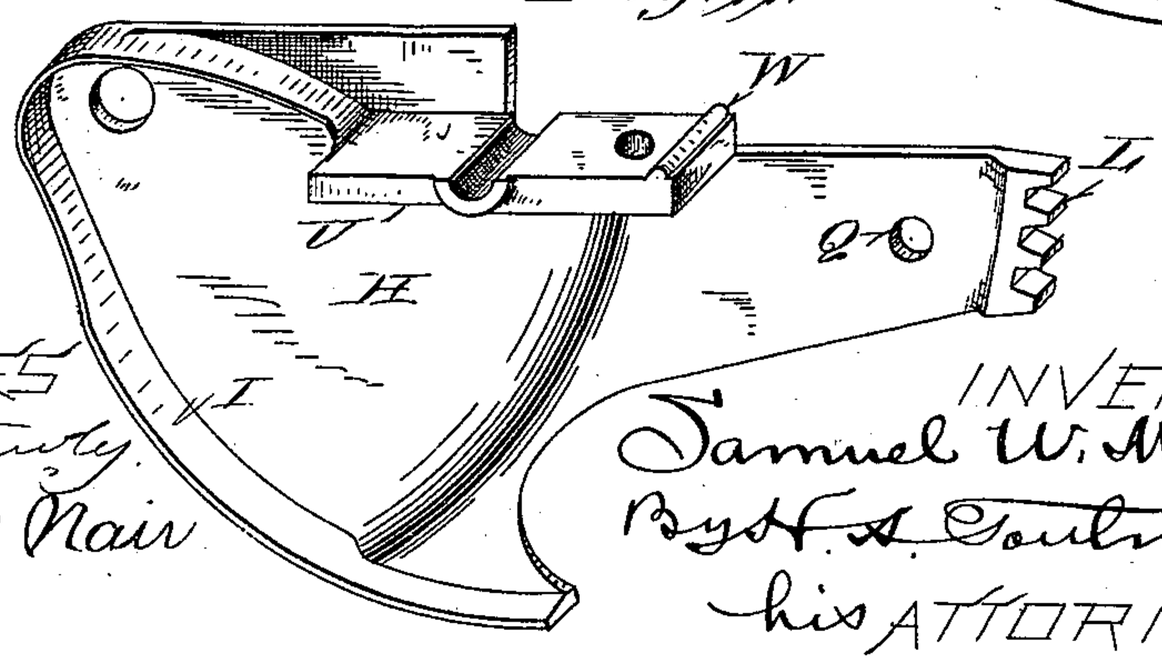


Fig. 11.



WITNESSES
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UNITED STATES PATENT OFFICE.

SAMUEL W. MARTIN, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE MAST, FOOS & COMPANY, OF SAME PLACE.

LAWN-MOWER.

SPECIFICATION forming part of Letters Patent No. 560,514, dated May 19, 1896.

Application filed September 7, 1893. Serial No. 485,006. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL W. MARTIN, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Lawn-Mowers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in lawn-mowers, and the special features of the invention have reference to a new means of supporting the reel-shaft and adjusting it to and from the cutter-bar; have reference to an improved bearing for the reel-shaft; have reference to constructing the end plates of thin material, preferably steel, struck up by dies and shaped by formers and reinforced by a cast plate, whereby lightness and yet great strength, as also cheapness, are obtained; have reference to a provision for using various-sized ground-wheels, yet without changing the driving gear-wheel, so as to make machines with large or small or intermediate sized wheels without changing the relative positions and distances of the centers and working parts, and have reference to several details hereinafter pointed out.

In the accompanying drawings, on which like reference-letters indicate corresponding parts, Figure 1 is a vertical sectional view on the line *x x* of Fig. 2, showing a lawn-mower embodying my improvements; Fig. 1[a], a detail view of the handle-yoke and its means of connection with the end plate; Fig. 1[b], a sectional view of such parts. Fig. 2 is a rear view of a portion of such lawn-mower with a part in section. Fig. 3 is a detail view, looking at one of the side plates and attached bearing-plates, on a larger scale. Fig. 4 is a similar view to Fig. 3, showing a modified form of bearing-plates; Fig. 4[a], a detail perspective of the toothed segment. Fig. 5 is a fragment of the bearing-plate and side plate, showing the reel-shaft bearing in vertical section. Fig. 6 is a sectional view of the ground-wheel, gear, side plate, bearing-plate, and axle-stud. Fig. 7 is a similar sectional view of a part of the ground-wheel, side plate, and gear-wheel, in which the carrying-wheel is of large diameter. Fig. 8 is a plan view of a machine with the ground-wheels, driving-gears, and reel removed. Fig. 9 is an inner elevation of one of the ground-wheels and its contained driving-gear, which is clutched to it. Fig. 10 is a side elevation of a larger ground-wheel with the same-sized driving-gear, which is clutched to it; and Fig. 11 is a detail perspective view of the preferred form of bearing-plate, which is also illustrated in side elevation in Figs. 1 and 3.

The frame of the machine is constructed of the struck-up sheet metal, preferably steel, end plates A, which are light, strong, and cheaply made. They are fastened together by the through-rod B in a pipe C, which forms shoulders for the nuts D to clamp the plates against. They are also interconnected by the stout blade-bar E, whose ends are cast with flanges F, which fit upon the outside of end plates. Bolts G pass through the plates and these flanges and thus make a strong and rigid frame.

To reinforce and strengthen the end plates, as also to afford bearings for the reel-shaft, I provide the bearing-plates H, which are preferably of cast or malleable iron. They have suitable webs, as at I, to stiffen them, and they are clamped to the end plates by the axle-studs J, one end of each of which is reduced, so as to leave a shoulder and to pass through the end plate and bearing-plate and receive a nut K. These nuts are drawn up very tight, so that the two plates are strongly clamped together, thus affording rigidity to the struck-up plates as well as effecting friction between the plates, which friction is of use in holding the bearing-plates against suddenly moving or moving too far when their free end is moved to adjust the reel to the fixed blade. There are two forms of these bearing-plates shown in respect to adjusting them. In the preferred form the plate extends rearward alongside of the end plate and is provided with cog-teeth L, with which mesh the teeth of a segment M, mounted on a stud O, carried by the end plate. A slot P in the end plate receives a bolt P′, which passes through a hole Q in the bearing-plate, and a nut R is used to clamp the two plates together at this point. By loosening the nut R and applying a wrench to the boss S on the

segment M the bearing-plate can be slowly and accurately moved until the reel-knives are adjusted with respect to the fixed blade T, carried by the bar E, with the greatest nicety. This construction is equal in its effects to a micrometer-screw, so nice is the adjustment. The frame of the machine being rigid is kept perfectly symmetrical and true, and consequently the machine is free from the objections consequent upon the loosening of the blade-bar in order to adjust it to the reel as in machines generally.

In the modified form of bar-plate shown in Fig. 4 the same construction just described is retained; but the extension of the plate is upward instead of rearward and the teeth and segment are omitted and resort is had to a hammer or other instrument to tap the plate after loosening the nut R. By tapping it gently it will move but a hair's breadth on account of the friction between the two plates. Thus the adjustment may be nicely made.

The bearing-plate is cast with a flange U, which forms the lower part of the box for the reel-shaft. The upper part is formed of a plate V. The two plates are interlocked by a bead W on one, which enters a groove in the other. A spiral spring X fits a recess in the upper plate and rests upon the lower plate. A bolt and nut Z are used to draw the upper plate down against the spring and to the reel-shaft *a*. By using the spring the weight of the upper plate is sustained and a resistance to the bolt is offered, so that the upper plate can be adjusted to come down and barely touch the shaft, whereby it is prevented from rattling and yet is not unduly bound. In practice this is a valuable detail. The side plate is slotted, as shown at *b*, to accommodate the up-and-down adjustment of the reel-shaft.

The reel is of any approved construction, consisting, besides a shaft *a*, of spider-arms *c* and cutting-blades *d*.

A ground-roller *e* is provided and is attached to the end plates in the usual manner, as shown.

As already intimated, the driving-gear *f* is clutched to the driving-wheel *g*, so that the wheel will drive the gear when the machine is pushed forward, but will not operate the gear when the machine is drawn back. This clutch is not described in detail because it forms no part of this invention, having been used on machines manufactured by my assignees of this case for years past.

The axle-stud J not only carries the driving-wheel *g*, but also the gear-wheel *f*, as clearly shown in Fig. 6. There is a demand in the market for machines with small wheels, machines with large wheels, and machines with medium-sized wheels. I have provided for a change in the size of the wheels without a change of any other part of the machine and without disturbing the relative position of the centers and operating parts. This I accomplish by constructing the various-sized wheels above the smallest wheel with an annular flange *h*, as shown in Figs. 7 and 10, whereby the wheel is made to fit snugly about the outside of the end plate A just the same as the smallest wheel fits it, as shown in Figs. 6 and 9. Thus by making wheels with different widths of flanges *h* the machine may be provided with different-sized wheels, and yet grass and other foreign matter cannot get into these wheels, because the flange coming in to the end plate serves the same purpose as the joint between the wheels and end plate. (Shown in Figs. 6 and 9.)

The end plates are slotted at *i* and provided with a hook-stud *j*. The handle-yoke *k* has a stud which fits in the slot *i* and a hole which is slipped over the hook-stud *j*.

This machine, constructed as shown and described, has been subjected to severe tests and has proved to be of great practical value and to possess peculiar excellencies as a grass-cutter. It runs smoothly, is light, yet very strong. The frame never loses its trueness and is not exposed to being drawn out of symmetry by manipulation incident to adjusting the cutter-bar and reel relatively.

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

1. In a lawn-mower, the combination with an end plate, an axle-stud fitted thereto, a wheel on the axle-stud at one side of the plate, an inward projection on the stud, a bearing-plate mounted on said projection and a fastening device on the projection to frictionally bind the two plates together, and a device to fasten and unfasten the two plates with respect to each other so that upon unfastening them the bearing-plate may be adjusted with respect to the end plate, a cutting-reel mounted in the bearing-plate and a fixed knife-bar secured to the end plate, a gearing between the ground-wheel and the reel-shaft whose centers are coincident with the axle-stud and the reel-shaft, whereby when the bearing-plate is adjusted on the axle-stud projection the mesh of the gearing is not destroyed, while the knife-bar remains fixed when the reel is adjusted to and from it.

2. In a lawn-mower, the combination with an end plate, of a bearing-plate, and an axle-stud, carried by the end plate, having an inward projection on which the bearing-plate is mounted, a nut on the projection by which the two plates are frictionally bound together, and a wheel mounted on said stud and free to turn without being affected by the binding action of the stud and nut on the two plates, and a fastening device carried by the two plates to hold them in a fixed relation.

3. In a lawn-mower, the combination with an end plate and driving-gear, of a ground-wheel separate therefrom and clutched thereto with a substantially vertical flange extending inward from the tread of the wheel to near

the end plate, the width of the flange varying with the excess of diameter of the ground-wheel over the gear-wheel.

4. In a lawn-mower, the combination with an end plate and driving gear-wheel, of a ground-wheel of more or less excessive diameter over the gear-wheel and having a substantially vertical flange from its rim to near the end plate, the width of the flange varying with such excess of diameter.

5. In a lawn-mower, the combination with an end plate struck up of sheet metal, a bearing-plate of cast metal, an axle-stud carried by one of the plates and on which the other is mounted, and a fastening device on the said stud and operating to frictionally bind the two plates firmly together, whereby the struck-up plate is reinforced by the cast plate and whereby they may be relatively adjusted about the axle-stud as a center when the friction is overcome.

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

SAMUEL W. MARTIN.

Witnesses:

OLIVER H. MILLER,

W. M. MCNAIR.