No. 854,468. PATENTED MAY 21, 1907.

C. F. CROSBY.

GRASS CUTTER.

APPLICATION FILED OCT. 19, 1906.

Fig. 1.

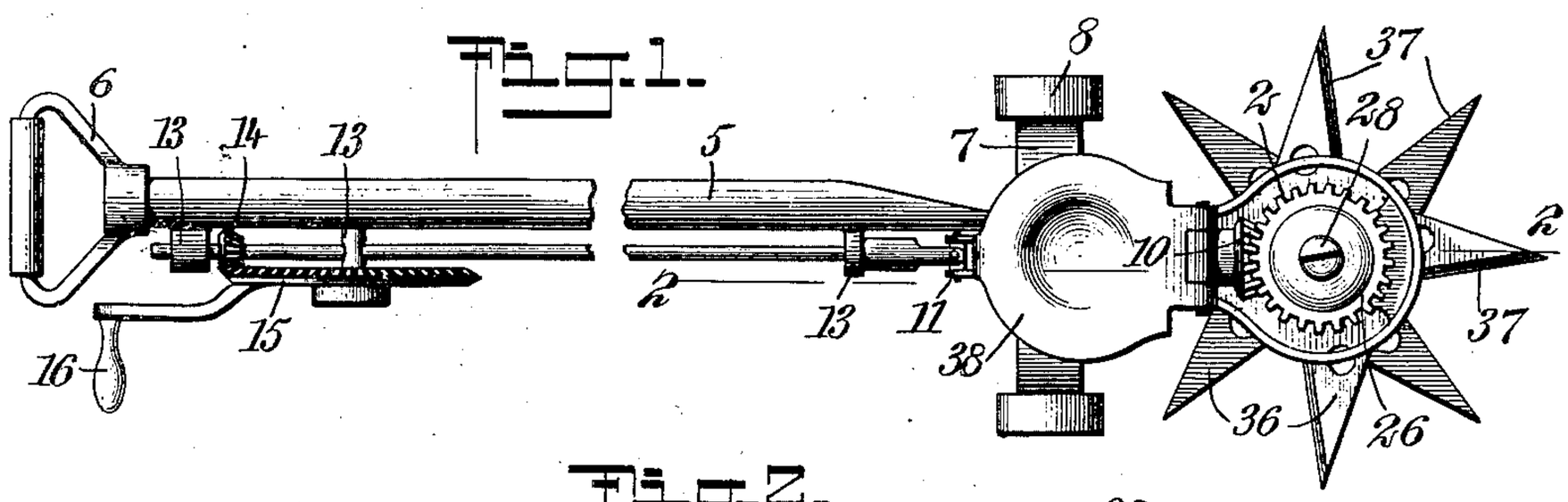


Fig. 2.

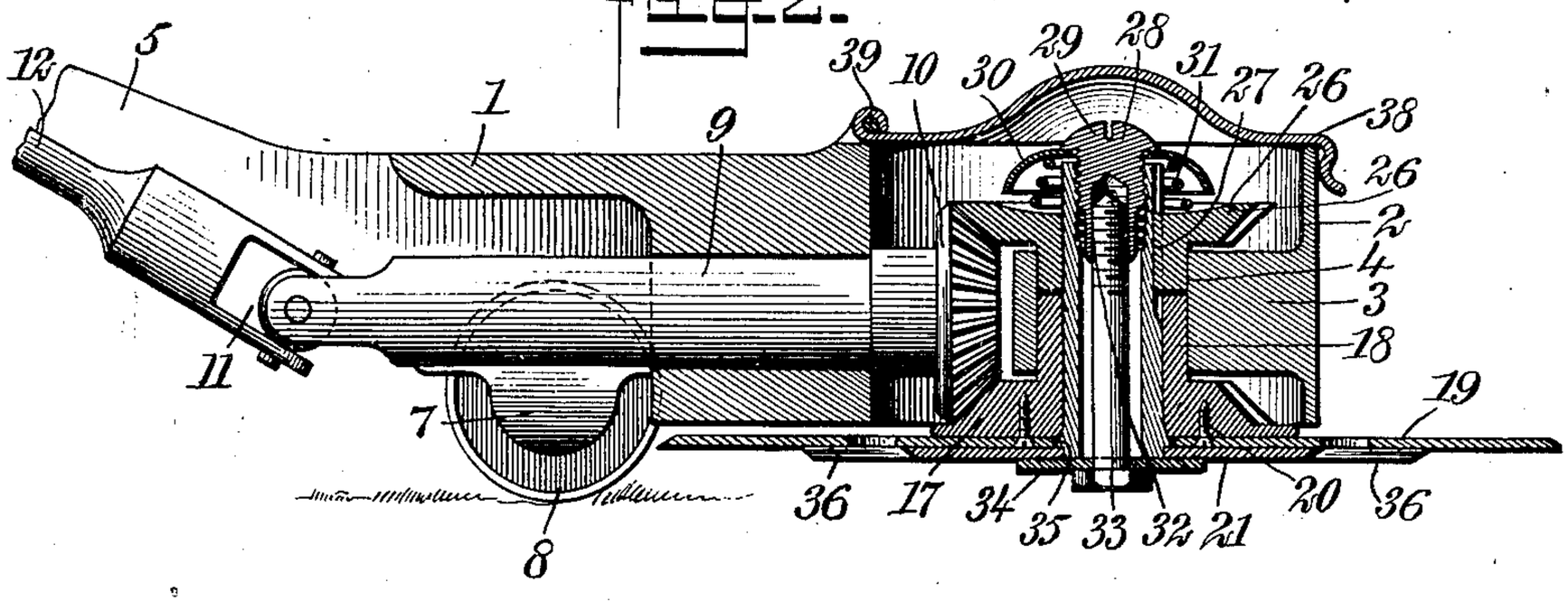


Fig. 5.

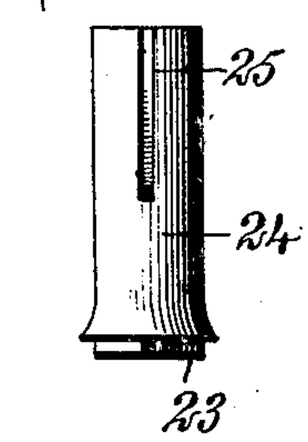


Fig. 3.

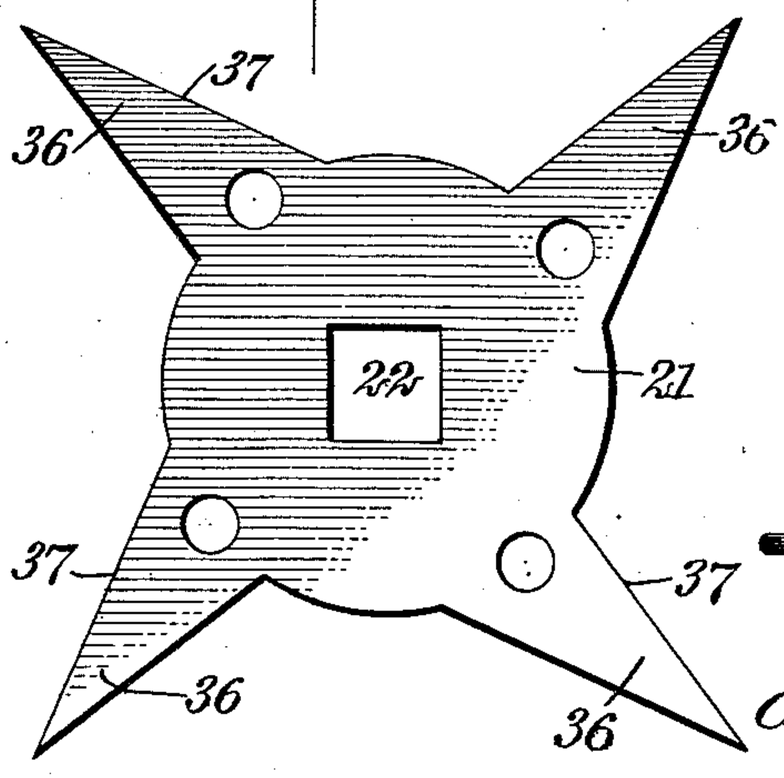
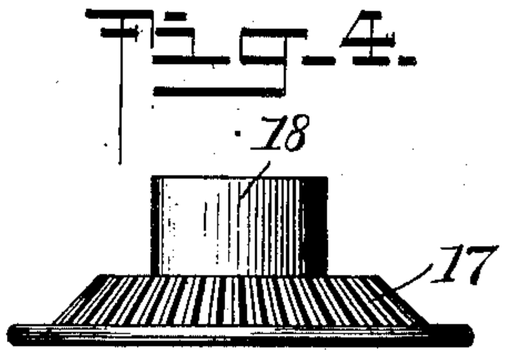


Fig. 4.



WITNESSES

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CHARLES FRANCIS CROSBY, OF BURLINGTON, VERMONT.

GRASS-CUTTER.

No. 854,468. Specification of Letters Patent. Patented May 21, 1907.

Application filed October 19, 1906. Serial No. 339,640.

To all whom it may concern:

Be it known that I, CHARLES FRANCIS CROSBY, a citizen of the United States, and a resident of Burlington, in the county of Chittenden and State of Vermont, have invented a new and Improved Grass-Cutter, of which the following is a full, clear, and exact description.

This invention relates to grass cutters, and the object of the invention is to produce a device of this class which is simple and which is specially constructed with a view to enabling it to reach inaccessible places, such as into corners and near fences.

A further object is to construct the mechanism with a special view to preventing injury to the same from grass or other obstructions which might get between the gears or the cutters.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan of the device, a portion of the handle being represented as broken away, and the cover of the case for the mechanism being represented in an open position; Fig. 2 is a vertical central section taken on the line 2—2 of Fig. 1 but upon an enlarged scale; in this view the cover is represented as closed; Fig. 3 is a plan of one of the cutters of the device; Fig. 4 is a side elevation of a gear wheel by means of which one of the cutters is operated; and Fig. 5 is a side elevation of a sleeve on the axis of which the cutters rotate.

Referring more particularly to the parts, 1 represents the frame of the machine, which is formed forwardly into a substantially circular gear case 2, said gear case having an inwardly projecting bracket 3 formed with a vertical bore 4, the axis of which bore preferably coincides substantially with the axis of the circular gear case. This bracket is preferably disposed near the middle point of the gear case as shown. The rear portion of the frame is formed into an upwardly inclined and rearwardly extending handle 5, to the extremity of which a suitable grip 6 is attached.

As shown most clearly in Fig. 1, the frame is formed below into laterally projecting arms 7, and these arms carry wheels 8 which are adapted to run upon the ground when the machine is in use. In the lower portion of the frame 1 and near the gear case 2, a horizontal driving spindle 9 is rotatably mounted, as shown. The axis of this driving spindle extends longitudinally with the handle 5 and its inner extremity projects into the gear case 2 where it carries a rigid bevel gear 10. The rear extremity of the spindle projects as shown and is connected by a universal joint 11 with a driving shaft 12, which shaft is disposed parallel with the handle 5 and rotatably mounted in brackets 13 which project from the side of the handle as shown. At or near its upper extremity, this shaft 12 is provided with a beveled pinion 14, which meshes with a bevel gear wheel 15 mounted on the side of the handle as shown, and this bevel gear wheel is provided with a suitable crank 16 by means of which the pinion may be rotated. In this way, when the machine is in use, a continuous rotation may be imparted to the shaft 12, which is transmitted to the spindle 9.

In the lower portion of the gear case 2 below the bracket 3, there is rotatably mounted a bevel gear wheel 17 which meshes with the bevel gear 10, and this bevel gear has a tubular hub 18 which is rotatably mounted in the lower portion of the bore 4 as shown. To the lower face of this bevel gear wheel a cutter 19 is rigidly attached by means of suitable fastening devices such as the screws 20. On the under face of this cutter 19, a similar cutter 21 is placed; this cutter 21 is illustrated in Fig. 3. It is provided with a square opening 22 which is received upon a square head 23 formed on the extremity of an inner sleeve 24, and this inner sleeve extends upwardly through the hub 18 of the bevel gear wheel 17 and projects into the upper portion of the case beyond the upper face of the bracket 3, as indicated. The upper portion of this sleeve is formed with a key-way 25, as illustrated most clearly in Fig. 5, and on this part of the sleeve a second bevel gear wheel 26 is mounted, the hub of the said bevel gear being received rotatably in the bore 4 as shown, and being provided with a feather or spline 27 which runs in the aforesaid key-way 25, as will be readily understood.

The upper extremity of the sleeve 24 pro-

jects beyond the upper face of the bevel gear wheel 26, and is internally threaded, as shown, to receive a plug 28. This plug is formed with a head 29 having a notch, so that it may be applied by means of a screw-driver, and under the head 29 an inverted cup 30 is placed. Between this cup and the upper face of the bevel gear wheel 26 a helical or spiral spring 31 is placed. The plug 28 in its lower portion, is internally threaded, as illustrated at 32, so as to receive a bolt 33. This bolt passes upwardly in the bore of the sleeve and holds in position a washer 34 at its lower extremity, which washer abuts against the under face of the cutter 21. From this arrangement, it should be understood that the force of the spring tends to pull the bolt 33 upwardly, and this maintains the cutter 21 against the cutter 19. The upward pressure of the cutter 19 is imparted to the bevel gear wheel 17, so that this bevel gear wheel is maintained in mesh with the bevel gear wheel 10. The downward pressure of the spring is exerted upon the bevel gear wheel 26, so that this bevel gear is held in mesh with the bevel gear 10. It should be understood that the sleeve 24 passes freely through a central opening 35 formed in the cutter 19, so that the sleeve may rotate independently of this cutter. It should be understood, also, that in addition to holding the gear wheels 26 and 17 resiliently in mesh with the gear wheel 10, the spring operates to hold the cutters resiliently together. This is a very desirable result, for it prevents injury to the mechanism when grass or small sticks become caught between the gears or cutters. The general construction of the cutters is very clearly shown in Fig. 3, where the cutter 21 is illustrated. These cutters have substantially circular bodies with outwardly projecting teeth 36 which are beveled on the sides remote from each other, at their cutting edges 37 as indicated. These beveled edges are preferably inclined to a radial line drawn on the cutters, and the arrangement of the gearing in the gear case 2 is such that the cutters will be rotated in opposite directions. This follows, of course, from the fact that the bevel gear 10 rotates the bevel gears 17 and 26 in opposite directions, and each of these drives one of the cutters independently of the other. The gear case 2 is normally closed by a suitable cover 38 which is attached at one side by a hinge connection 39 to enable it to be readily raised when the mechanism is to be inspected or oiled.

The grass cutter constructed as described can evidently be used to advantage at points on a lawn which would normally be inaccessible for a grass cutter of ordinary construction.

In the operation of the device, of course, the grip 6 is seized by one hand and the cutters are advanced into the corner where the grass is to be cut. The continual rotation of the cutters by the crank 16 operates to clip the grass very effectively.

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

1. In a machine of the class described, in combination, a frame, a pair of rotary cutters mounted therein, gear wheels adapted to drive said cutters respectively, a third gear wheel meshing with said first gear wheels, and means for resiliently holding said first gear wheels in mesh with said last gear wheel.

2. In a machine of the class described, in combination, a frame, a pair of rotary cutters rotatably mounted therein, a pair of gear wheels adapted, respectively to drive said cutters, a third gear wheel meshing with said first gear wheels and adapted to drive the same in opposite directions, and resilient means for holding said cutters in co-operative relation and maintaining said gear wheels in mesh.

3. In a machine of the class described, in combination, a frame, a pair of rotary cutters rotatably mounted in said frame, a gear wheel rigid with one of said cutters, a sleeve rigid with the other of said cutters, a second gear wheel adapted to rotate said sleeve, a driving gear meshing with said first gears, and a spring maintaining said gears in mesh.

4. In a machine of the class described, in combination, a frame presenting a substantially vertical bore, a gear wheel rotatably mounted in the lower portion of said frame, a rotary cutter rigid therewith, a sleeve passing upwardly through said first gear wheel, a second cutter attached to the lower portion of said sleeve and abutting the face of said first cutter, a second gear wheel slidably mounted on said sleeve and adapted to rotate the same, a spring pressing said sleeve upwardly and forcing said last gear wheel downwardly, and a driving gear meshing with said first gear.

5. In a machine of the class described, in combination, a frame having a gear case presenting a substantially vertical bore, a gear wheel having a hub rotatably mounted in the lower portion of said bore, a rotary cutter carried by said gear wheel, a sleeve passing upwardly through said cutter and said hub, a second cutter carried by said sleeve and adapted to be driven thereby, a second gear wheel rotatably mounted in said bore and engaging said sleeve to rotate the same and slide thereupon, a spring forcing said sleeve upwardly and said second gear wheel downwardly whereby said spring affords means for holding said cutters resiliently in position, and a gear wheel meshing with both of said first gear wheels.

6. In a machine of the class described, in combination, a frame having a gear case presenting a substantially vertical bore therein, a bevel gear having a hub rotatably mounted

in said bore, a rotary cutter rigidly attached to said bevel gear, a sleeve passing upwardly through said hub, a rotary cutter attached to said sleeve, a second gear wheel rotatably mounted in said bore and having a feather connection with said sleeve whereby it may slide upon said sleeve and rotate said sleeve, said sleeve projecting beyond said second gear wheel, and a bolt passing upwardly through said sleeve and holding said second cutter in engagement therewith, a plug attached to the upper end of said sleeve, a cup held in position by said plug, a spring under said cup and thrusting downwardly on said second gear wheel, and a third gear wheel meshing with said first gear wheels and affording means for driving the same in opposite directions.

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

CHARLES FRANCIS CROSBY.

Witnesses:
F. G. WEBSTER,
MATTHEW G. LEARY.