

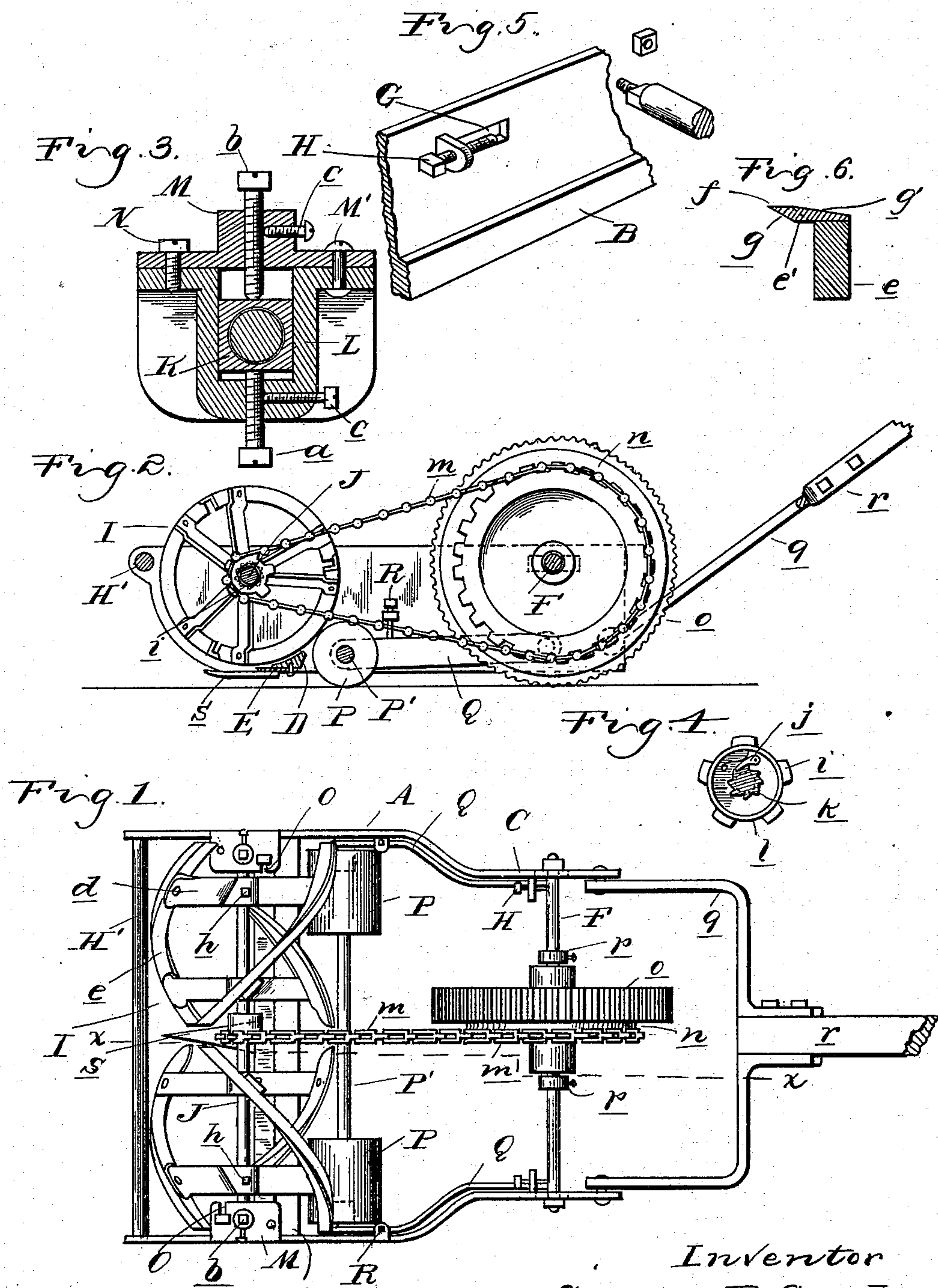
(No Model.)

2 Sheets—Sheet 1.

S. P. GRAHAM.
LAWN MOWER.

No. 503,792.

Patented Aug. 22, 1893.



Witnesses D
a. L. Kobbie
N. L. Lindop.

Inventor
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By Mrs. S. Spraguet
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(No Model.)

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Fig. 7.

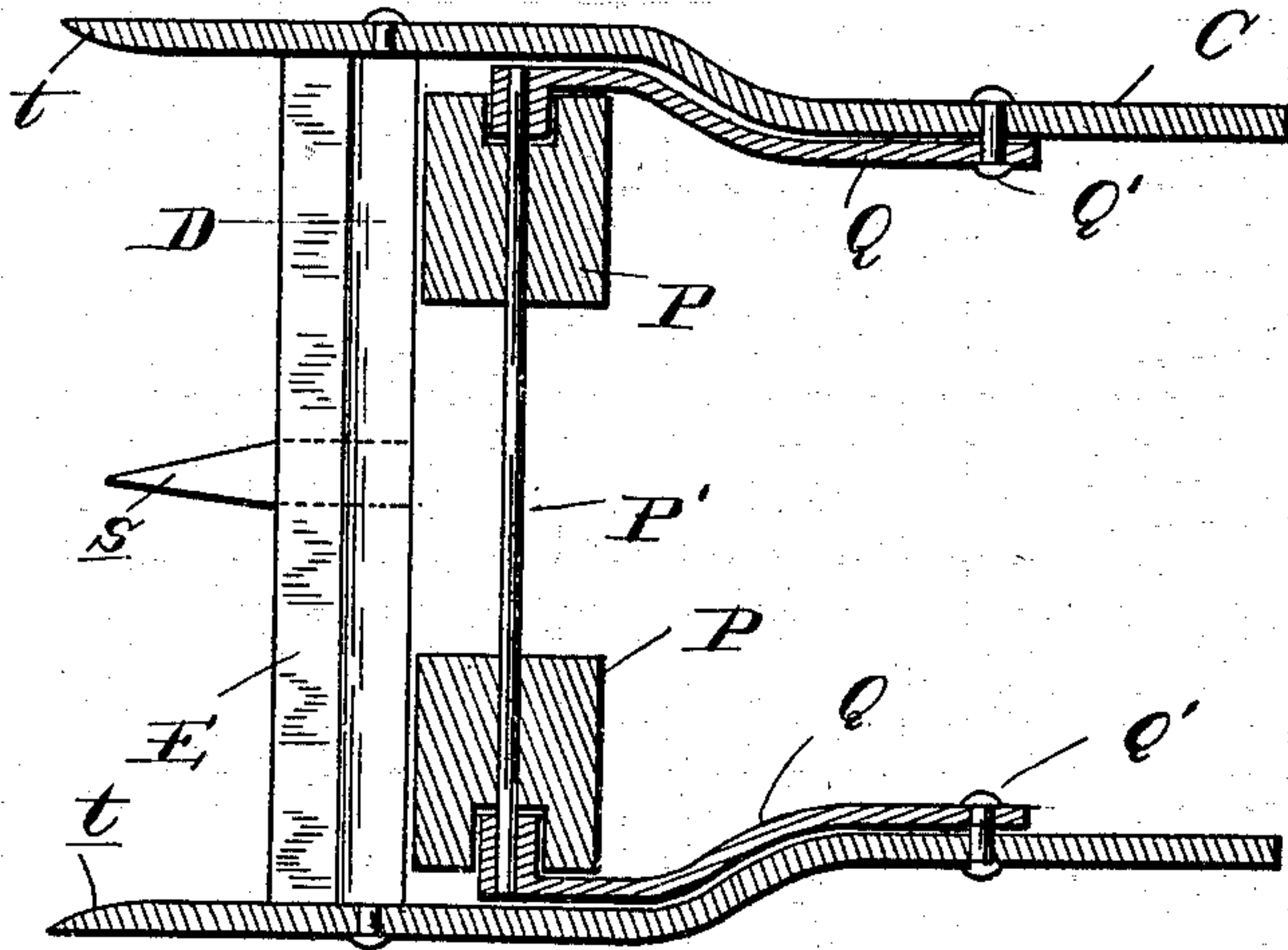
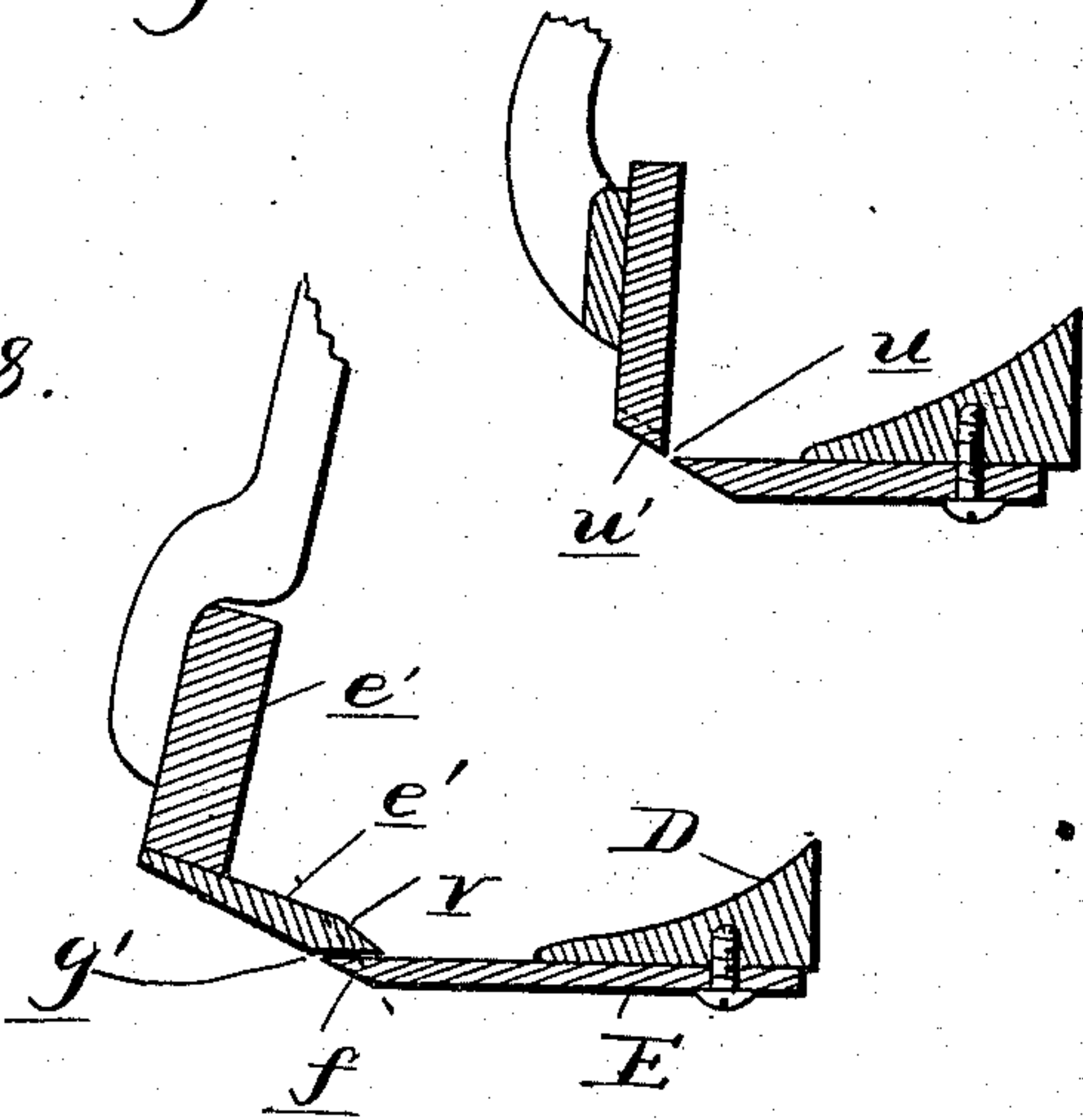


Fig. 9.

Fig. 8.



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UNITED STATES PATENT OFFICE.

SIMON PETER GRAHAM, OF DETROIT, MICHIGAN.

LAWN-MOWER.

SPECIFICATION forming part of Letters Patent No. 503,792, dated August 22, 1893.

Application filed February 29, 1892. Serial No. 423,154. (No model.)

To all whom it may concern:

Be it known that I, SIMON PETER GRAHAM, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, 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.

10 This invention relates to a new and useful improvement in lawn mowers and it consists in the construction and arrangement of parts hereinafter described and definitely pointed out in the claims.

15 In the drawings, Figure 1 is a plan view of my improved mower. Fig. 2 is a vertical, longitudinal section thereof; on line $x-x$, Fig. 1. Fig. 3 is a section through the box and supporting frame for the cutter shaft. Fig. 4 is a detail elevation of the ratchet and pawl connection between the cutter shaft and drive pinion. Fig. 5 is a perspective view of the rear of the frame showing the means of supporting and adjusting the shaft of the drive wheel. Fig. 6 is an enlarged section through one of the cutter knives. Fig. 7 is a horizontal section through the frame of the machine above the stationary cutter blade. Fig. 8 is a section through the stationary cutter blade and one of the revolving cutters, showing the mode of operation of the two cutters. Fig. 9 is a similar section through the cutter blade of the ordinary type of mower.

My frame I preferably make of two side bars 35 A of thin metal, having the reinforcing strip B at the lower edge, and bent or cast with the rear portion C considerably narrower than the forward portion. These side bars are connected together by the cross-bar D, which carries the stationary cutting blade E, and at the rear end the shaft F engaging in slots G in the sides of the frame, set screws H bearing against said shaft to adjust it to or from the front of the machine for the purpose of tightening the drive chain as will more fully hereinafter appear.

45 H' is also a connecting rod arranged at the top of the frame and at the forward edge thereof acting as a guard to the cutter I. This cut-

ter is secured upon the shaft J, the ends of 50 which are supported in boxes K which are slidably secured in bearings L at each side of the frame.

M is a cap over the bearing L pivoted upon the bolts M' and locked in position by the 55 clamping bolt N. The cap is provided with a segmental circular slot O, so that when the clamping bolt N is loosened the cap may be turned upon its pivot M' allowing the shaft carrying the cutter to be removed for the purpose of grinding or sharpening. The shaft is 60 vertically adjustable by means of the set screws a b projecting through the bearing and through the cap respectively, as plainly shown in Fig. 3, and these set screws are 65 locked in their adjusted position by means of set screws c . In this manner the cutter may be adjusted with the greatest nicety to and from the stationary blade E and locked in its adjusted position, and the cutter may also be 70 readily removed by loosening the clamping bolts N and turning the plates M to one side as described.

The forward end of the machine is supported upon the rollers P secured to the shaft 75 P', the ends of which are journaled at the forward ends of the arms Q, which arms are pivoted at the rear ends upon the bolts or pivots Q', as plainly shown in Fig. 7.

R are set screws bearing upon the upper 80 face of the arms Q by means of which the roller supporting frame may be adjusted to raise or lower the stationary knife to cut at different heights.

The cutter is formed of two separate cutter 85 heads, each head consisting of two spiders d preferably having three arms and connected together by the spirally arranged blade supporting flanges e . To these flanges and preferably extending at substantially right angles 90 to their outer edges are the cutting blades e' , of the cross section, as plainly shown in Fig. 6. The outer face f of these blades extends in a plane parallel with the line of motion of the cutter when in operation, and is provided 95 with the beveled portions g on the inner face to form a sharp cutting edge; beyond the face f the cutting blade is provided with a reduced

or chamfered portion g' . The two cutter heads thus constructed are secured upon the shaft J by means of the set screws h and are so arranged as to extend from the ends of the shafts inward toward the middle, the spiral blades being arranged so that in cutting the central point will strike the stationary knife first and that portion near the frame will strike it last, the result being that the grass in being cut will be thrown toward the side of the frame and away from the center upon both sides. There is sufficient space left between the two blades to journal the sprocket pinion i which carries a spring pawl j adapted to engage with the ratchet wheel k secured upon the shaft preferably with an overhanging flange l on the sprocket pinion.

m is a sprocket chain engaging over the sprocket pinion at one end and over the sprocket wheel n at the other end, this sprocket wheel being secured to a ground or drive wheel o sleeved upon the shaft F and supporting the rear of the machine. This ground or drive wheel is prevented from end movement by the set collars p , by means of which it may be adjusted to perfectly align the drive chain.

q is a bail pivoted to the rear of the machine and connected to the usual push handle r .

It will be perceived from the construction thus far described that a slight space equal to the width of the drive chain and a little more, is left between the inner ends of the cutting heads, and unless some provision were made to cut the grass in this space a ridge would be left uncut. To overcome this difficulty I secure the forwardly extending divider or guide s to the stationary blade E, this divider being of a width at its lower edge slightly wider than the space between the cutter and tapering to a point at its forward edge. The end of this divider as well as the entire portion thereof is on the plane of the under face of the stationary knife, so that the same will enter between the grass at a point near the base of the stems thereof, thereby bending the grass from that point which carries the upper ends onto the cutters at a point which will cause the cutters to sever the grass, of this intermediate strip, so that a uniform length of stubble will be left corresponding to the length of the stubble at the regular cut. That is to say the farther down the stems or blades of grass are engaged the more extensive will be the movement of the upper ends thereof.

The frame at each edge is provided with the inclined or tapering fingers or guides t extending from the outer edge of the frame to the inner edge thereof and acting as guides to draw in that portion of the grass in line with the frame into the path of the cutters, the guides t and the divider s thus bringing all the grass which is in the path of the lawn mower from outside of the frame into the path of the revolving cutters. With this

construction I can thus cut close beside a fence, a house or similar obstacle, and thus dispense with the necessity of clipping the edges of the lawn.

Any wear in the drive chain m may be taken up by turning the set screws H. The use of the two cutter heads enables me to obtain a much greater pitch in the screw or spiral arrangement of the cutters upon each edge, and I get a sharper shear for the cutter and also get a positive action to throw the grass to one side of the middle, thereby preventing the clogging up of the driving mechanism.

With my construction the cutting blade has a section f , extending parallel with the line of movement, which in the act of cutting is substantially horizontal, and any grinding which is done would take off a section such as v shown in Fig. 8 leaving the cutting edge in exactly the same relation through which I obtain a much better effect with an easier cut than with the construction shown in Fig. 9 in which the grass is substantially bruised or scraped off against a single cutting edge. Thus my machine may be adjusted when it is sent out from the factory and no further adjustment will ever be required under ordinary circumstances, no matter to what extent the knives may be ground, until they are ground back to the reduced portion g' of the knife which is formed to give a clearance for the blade.

It will be seen that my drive wheel is a single ground wheel arranged centrally of the machine or substantially so, supporting the entire rear portion thereof. This wheel in connection with the rollers P gives an ample and suitable support for the machine under all circumstances and enables me to very materially lighten the structure over present forms.

What I claim as my invention is—

1. In a lawn mower, the combination with a frame consisting of rigid side bars having their rear portions bent slightly inward, of a drive shaft journaled in the rear ends of the frame, a single drive wheel mounted on the shaft between the side bars, a sprocket wheel rigid on the drive wheel, ground rollers adjustably secured to the frame in advance of and below the shaft, a stationary knife on the frames, a cutter shaft extending entirely across the front portion of the frame, and journaled at its opposite ends only, on the side bars blades rigid on the shaft extending from points adjacent to the center to points near the outer ends thereof, a sprocket wheel centrally secured on the cutter shaft, a sprocket chain passing over the sprocket wheels and means for adjusting the chain, substantially as described.

2. In a lawn mower, the combination with the frame consisting of single piece side bars, of a driving shaft journaled in the side bars, a driving wheel on the shaft, a sprocket wheel

centrally secured on the shaft, ground rollers
on the frame in advance of the shaft, a fixed
knife on the frame a rotary cutter shaft ex-
tending entirely across the frame, and jour-
naled at its opposite ends only on the side
5 bars centrally separated blades rigid on the
cutter shaft, a sprocket wheel directly on the
shaft between the blades, and a sprocket

chain passing over the sprocket wheels, sub-
stantially as described. 10

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

SIMON PETER GRAHAM.

Witnesses:

JAMES WHITEMORE,
M. B. O'DOHERTY.