

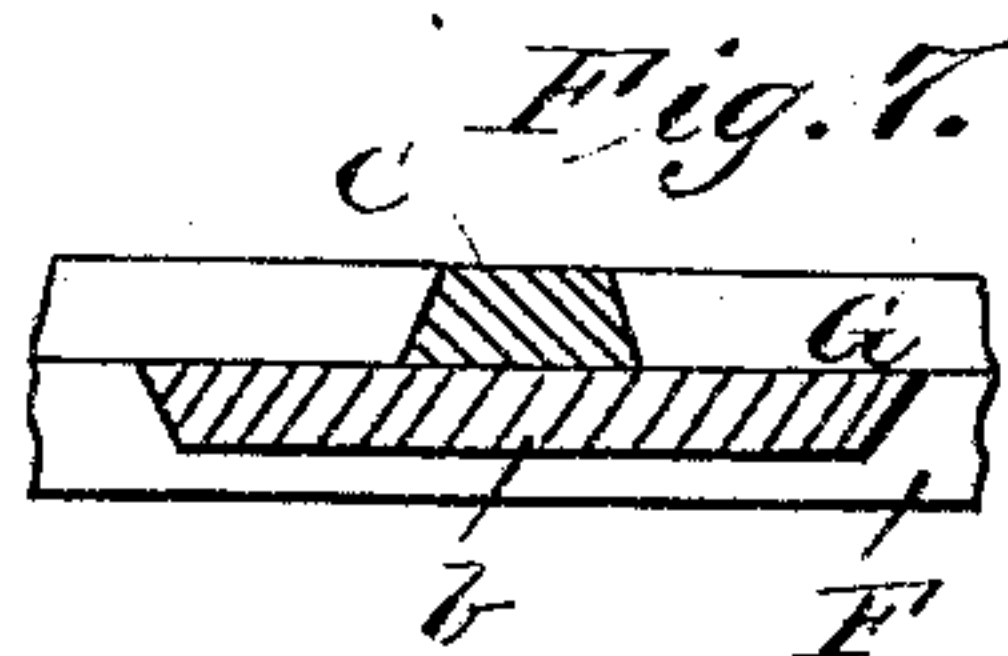
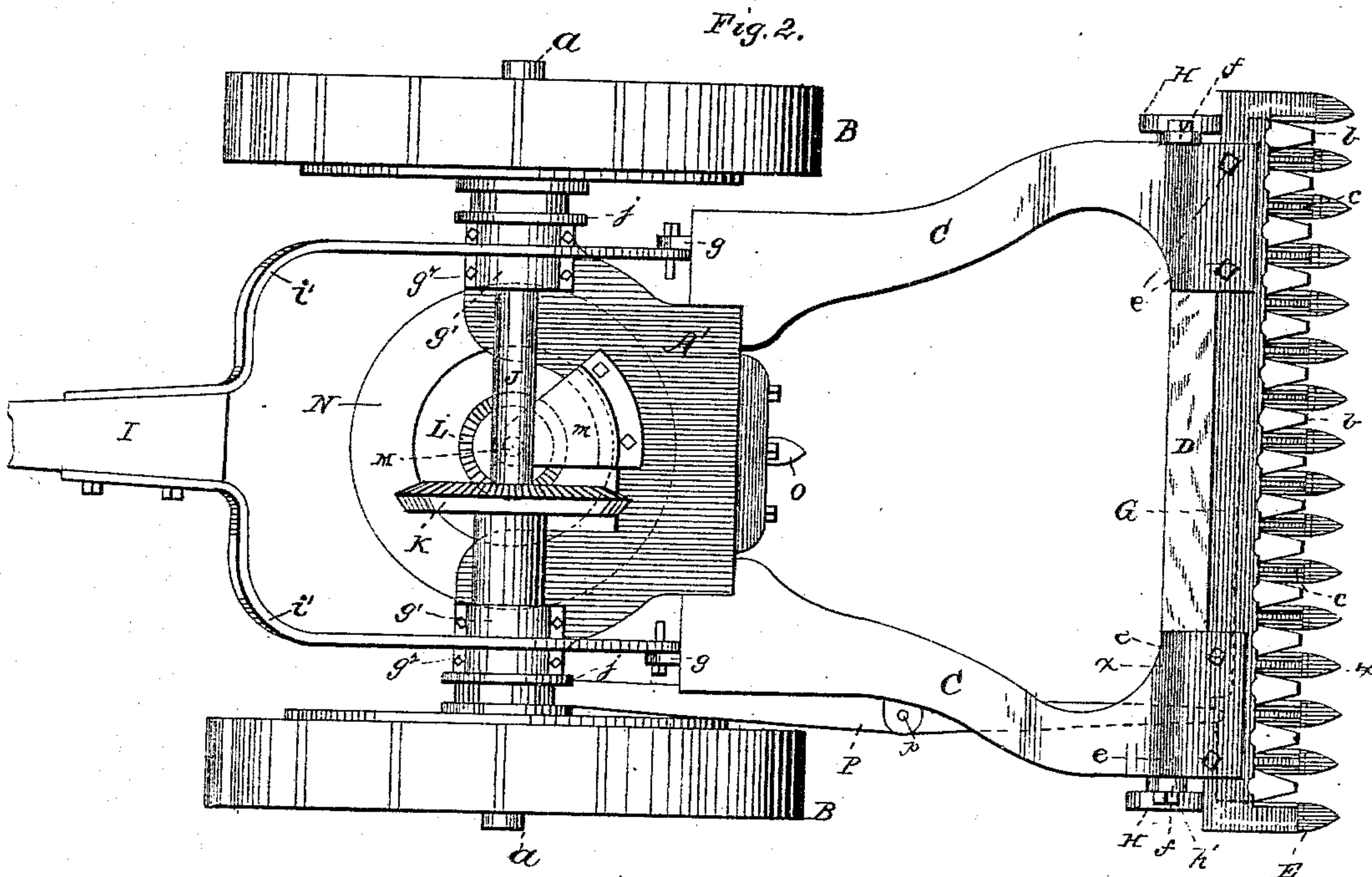
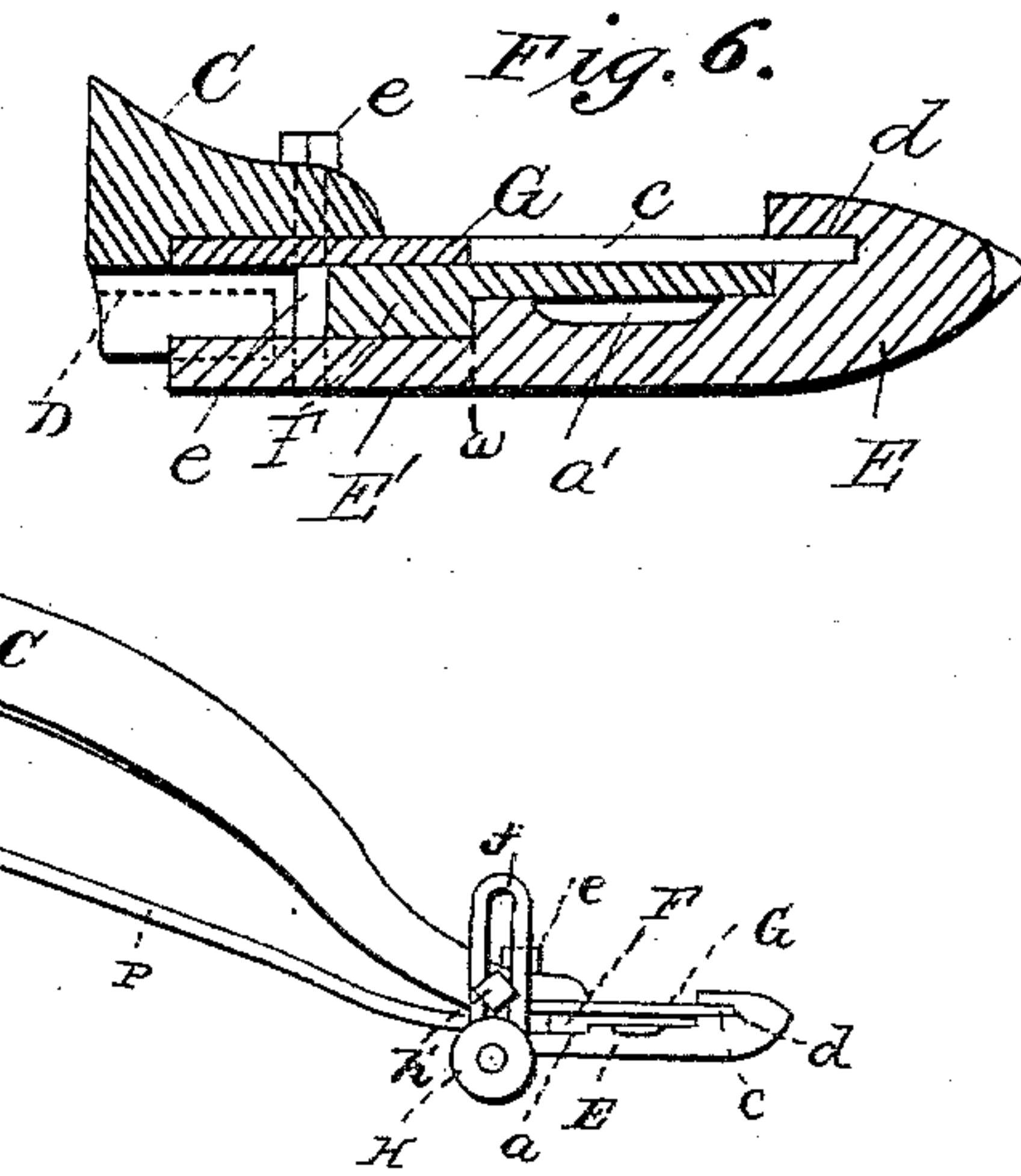
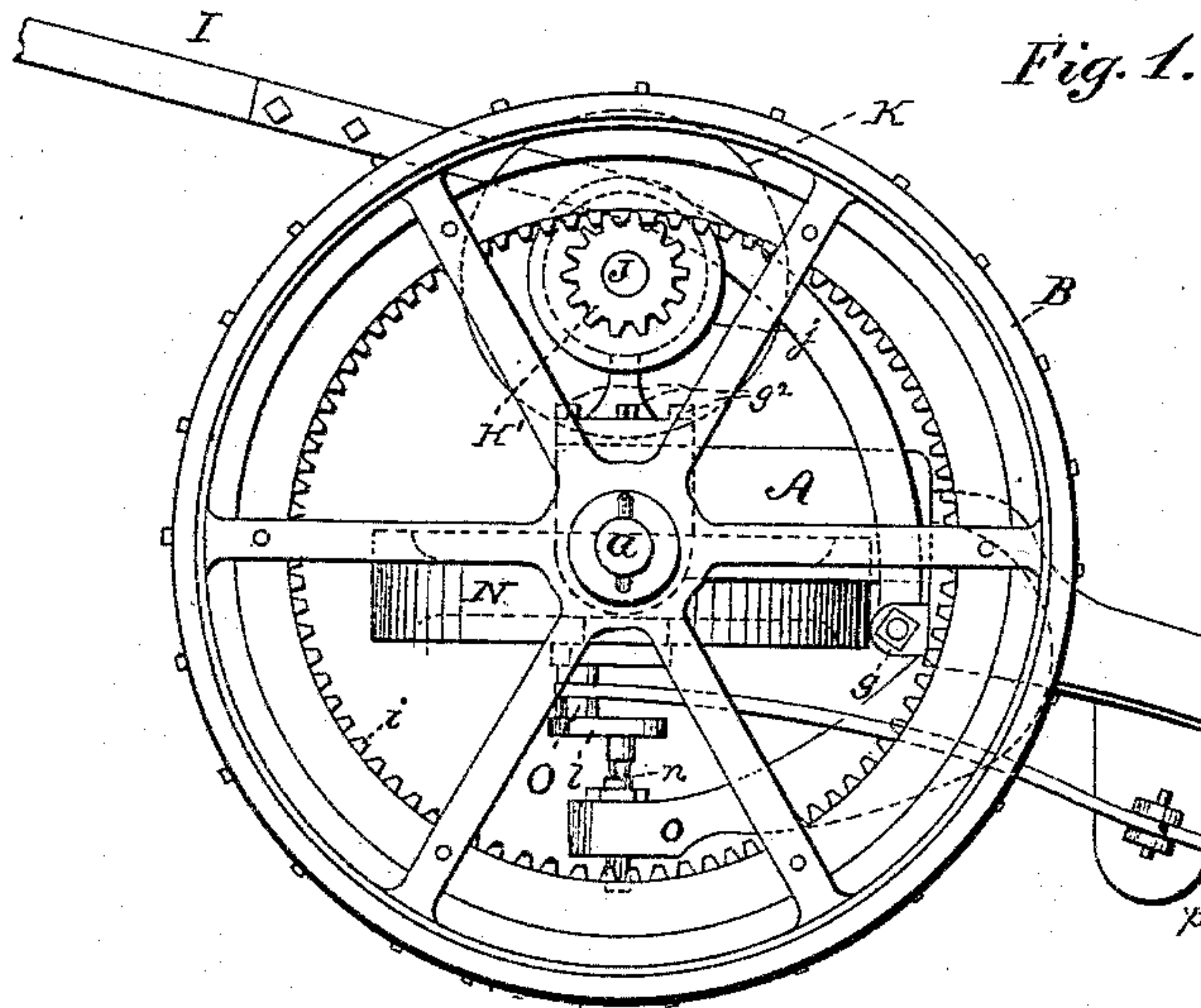
(No Model.)

2 Sheets—Sheet 1.

E. M. LETTS.  
MOWING MACHINE.

No. 412,104.

Patented Oct. 1, 1889.



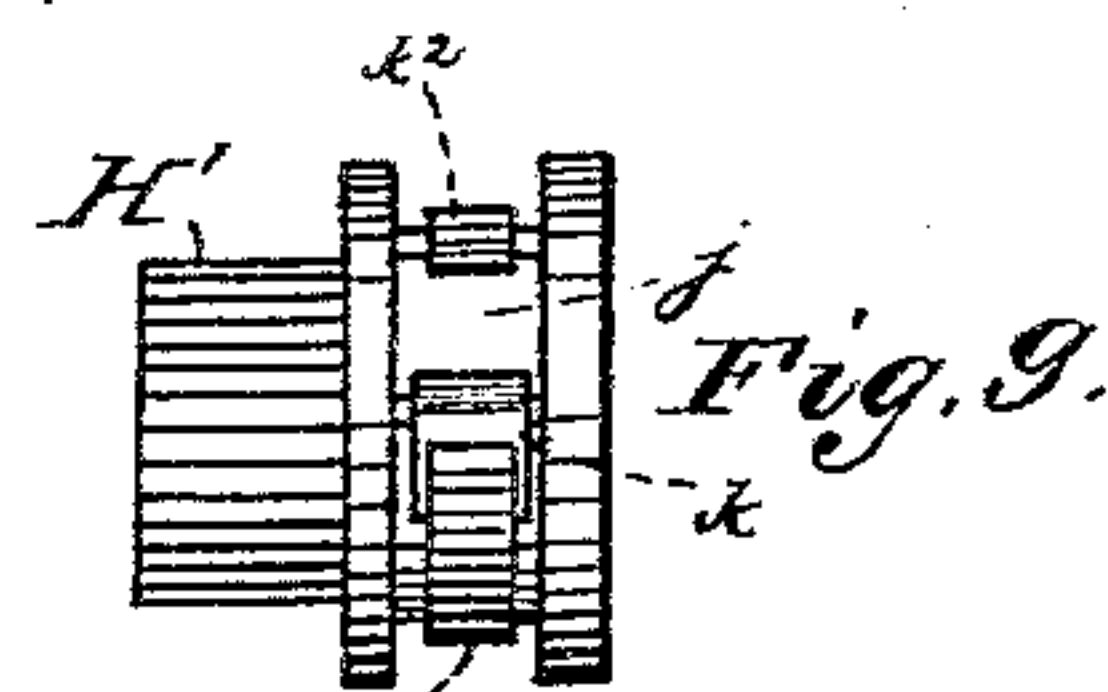
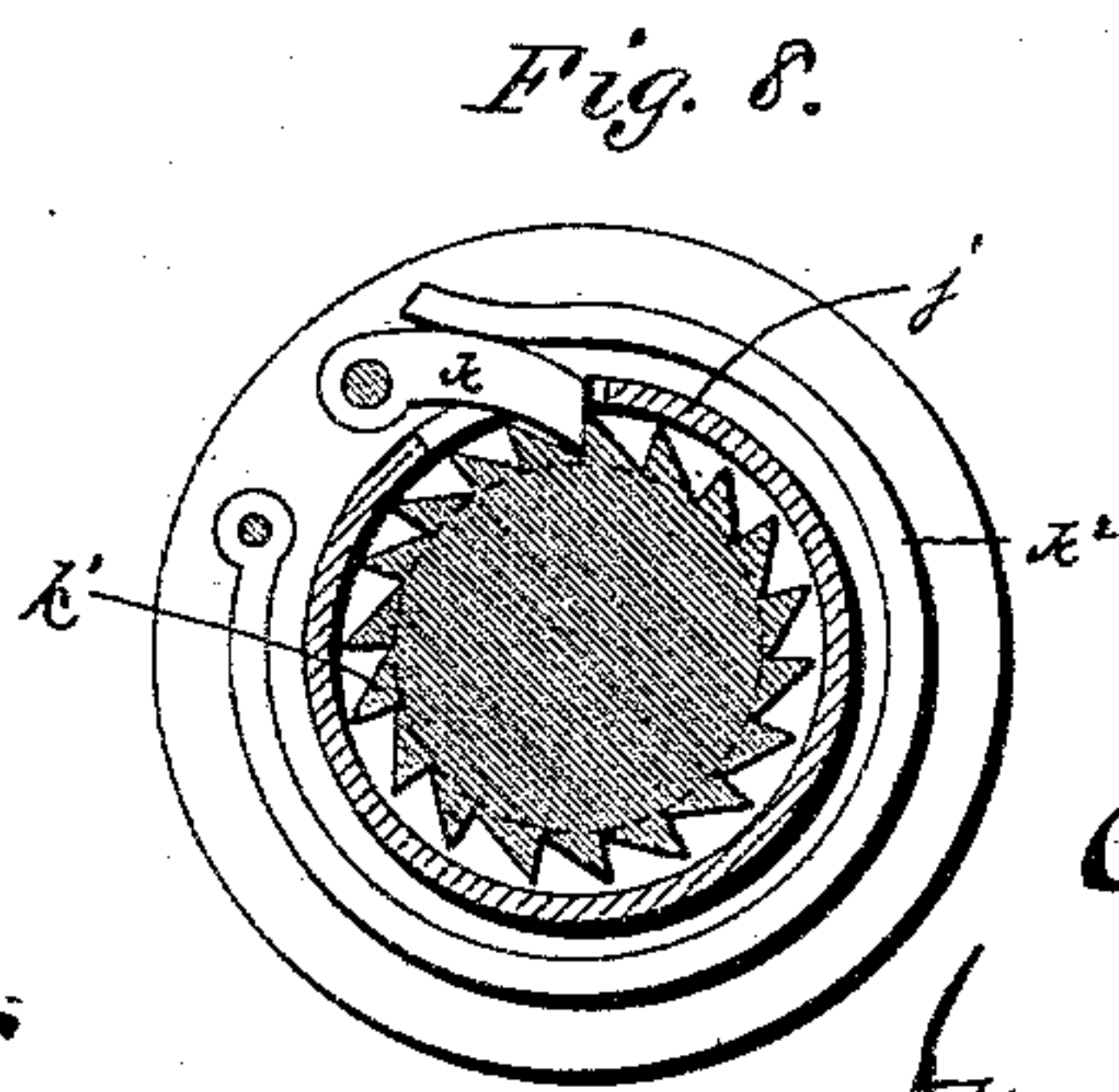
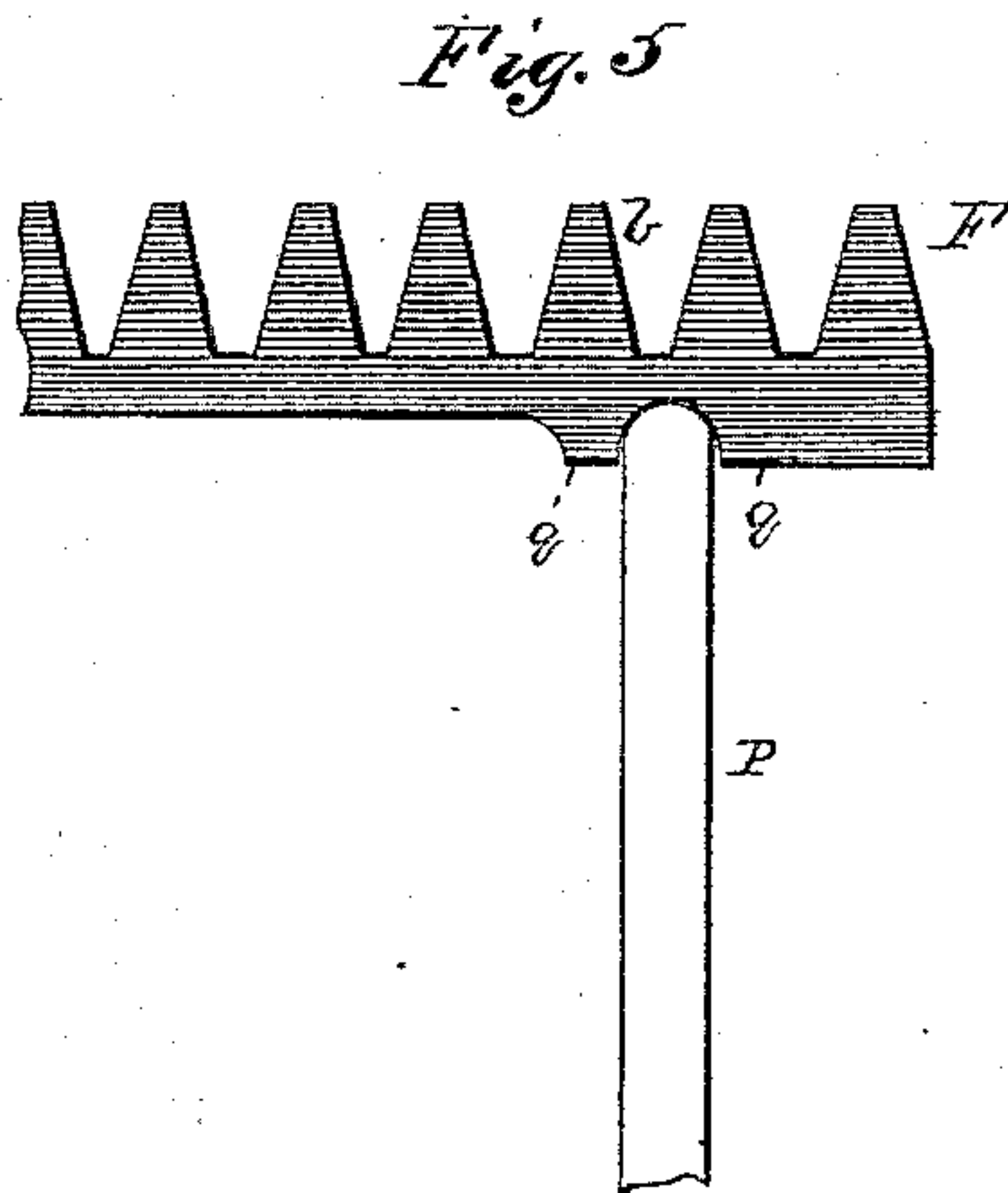
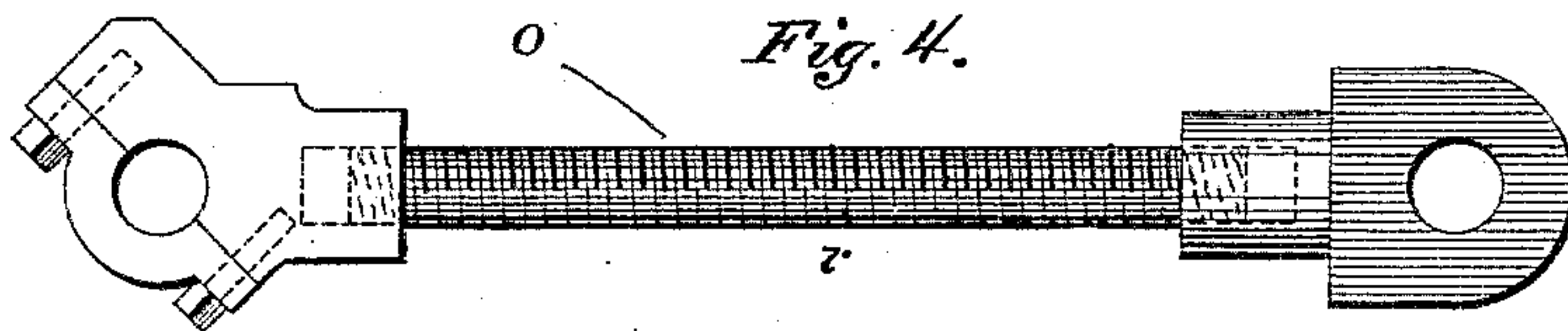
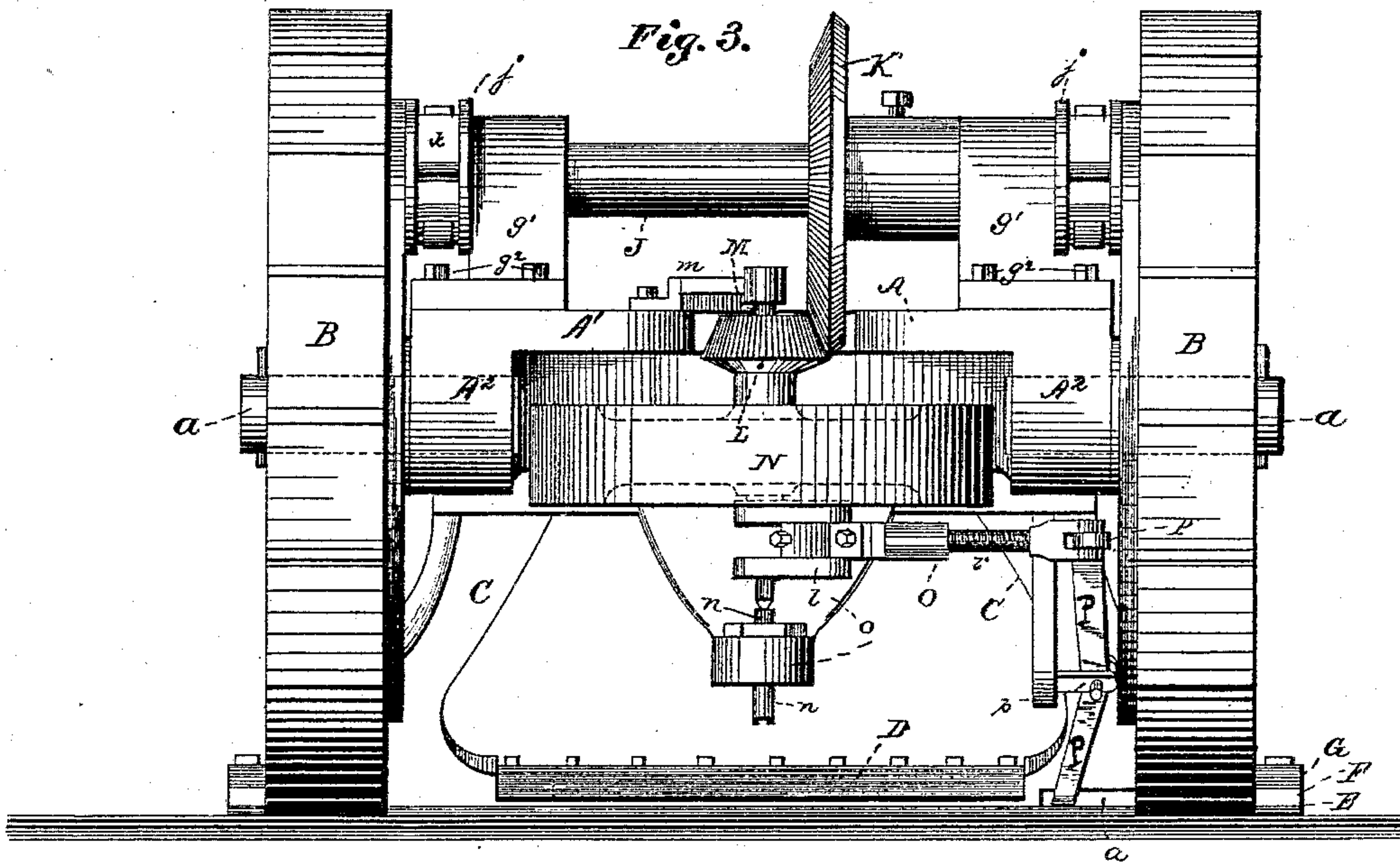
WITNESSES  
O. B. Harris.  
Wm. F. Gardner.

INVENTOR  
Ellsworth M. Letts  
by W. J. Johnston  
Attorney

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# UNITED STATES PATENT OFFICE.

ELLSWORTH M. LETTS, OF WAVERLY, NEW YORK.

## MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 412,104, dated October 1, 1889.

Application filed August 9, 1888. Serial No. 282,386. (No model.)

*To all whom it may concern:*

Be it known that I, ELLSWORTH M. LETTS, a citizen of the United States, residing at Waverly, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Mowing-Machines and Lawn-Mowers; and I do hereby 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.

My invention relates to mowing-machines, and more especially to lawn-mowers; and it consists in certain details of construction and novel arrangement of parts, as hereinafter more particularly described, illustrated in the drawings, and pointed out in the claims.

In the ordinary lawn-mowers as heretofore constructed a difficulty has been experienced in mowing close up to a wall or obstruction or beneath brush or shrubbery. My invention is designed to in a measure obviate this difficulty.

In the drawings, Figure 1 is a side elevation of my invention. Fig. 2 is a plan view thereof. Fig. 3 is a rear end view. Fig. 4 is an enlarged plan view of the pitman. Fig. 5 is a plan view of a section of the cutter-bar. Fig. 6 is a detail vertical section through the entire cutting mechanism, showing the relative positions of the several parts. Fig. 7 is an enlarged transverse section through one of the movable cutter-blades, and also through one of the teeth of the stationary cutter-plate, when the former is immediately beneath the latter, for the purpose of showing the relative position of the beveled edges. Fig. 8 is a vertical section of the ratchet-housing, showing the ratchet in section, and the spring-controlled pawl. Fig. 9 is a detail side view of the housing and ratchet.

The objects of my invention are to provide in a lawn-mower a double set of knives or cutters, one set of which is stationary and the other rapidly reciprocated by the driving mechanism; also, to provide a cutting-front equal in length to the width of the machine and to convey a great velocity to the reciprocating cutters.

Referring more particularly to the drawings by letter, A designates the main frame of the machine, which consists of a somewhat cres-

cent-shaped platform A', with downward projections A<sup>2</sup> at each end, from which project outwardly short spindles or shafts a, upon which the drive-wheels B are mounted. From the front of these downward projections A<sup>2</sup> extend forwardly and downwardly the outwardly-curved arms C, which are connected near their outer ends by the transverse bar D, to which the fingers are secured. Upon the top of the crescent-shaped platform are secured by bolts g<sup>2</sup> the bracket-bearings g', through which is journaled the shaft J.

H' are the pinions loosely mounted on the outer ends of the pinion-shaft, and which mesh with the gears i on the inner sides of the main wheels.

k' are ratchets rigidly secured to or made integral with the pinion-shaft adjacent to the pinions, and j is a sleeve or spool-shaped housing surrounding and inclosing the ratchet and rigidly fixed to the inner face of the pinion. Between the rims or annular flanges fixed on each end of this housing is pivoted a pawl k, which projects through an opening k' in the housing and engages the ratchet. This pawl is controlled by a spring k<sup>2</sup>, secured between the flanges of the spool, as shown in Fig. 8.

K is a vertically-arranged beveled gear in the center of pinion-shaft J, and is considerably larger than the pinions at the end of the shaft.

M is a vertical shaft having its upper end journaled in a rearwardly-extending bracket m secured to the top and projecting from the center of the platform A', and its lower end is journaled in a similar bracket o secured beneath the platform, and which is provided with an adjustable cup-bearing n to lessen friction.

L is a beveled pinion keyed on the vertical shaft M, and which meshes with the beveled gear K on shaft J. N is a fly-wheel located centrally upon the vertical shaft, and l is a crank beneath the fly-wheel.

O is a pitman engaging at one end with the crank l, and at its opposite end with the lever P, pivotally connected to one arm C of the frame, as at p, and having its outer end inserted between the lugs q of the cutter-bar F. I prefer to place the pivot p of the lever beyond its middle toward its front end, so



that less power is required to reciprocate the cutter-bar.

The pitman O is made in two sections connected by the screw-bolt *r*, so that its length  
5 may be adjusted to regulate the throw of the cutter-bar.

The finger-bar E' is provided at its rear with a channel *a*, in which the rear end of the cutter-bar F reciprocates, and each finger  
10 with a transverse channel *a'* beneath the cutter-blades, in order to enable it to be readily cleared by the reciprocating motion of the knives of dirt or other fine material that would otherwise foul and obstruct the free  
15 motion of the knives by getting beneath them.

G is a plate preferably of steel bolted to the finger-bar in rear of the cutter-bar F and extending forward over it, as shown in Figs.  
20 1 and 2. This plate is provided with teeth *c*, which extend forward over the knives or blades *b* of the cutter-bar F and have their points seated in notches *d* in the fingers E. The knives or blades *b* of the cutter-bar are  
25 beveled at their edges upward and outward, and the teeth *c* of the plate G are beveled in an opposite direction or downward and outward, as shown in cross-section, Fig. 7, whereby a shear cut is afforded as the edges pass each  
30 other, when the cutter-bar is reciprocated.

It is obvious that by removing the bolts *e*, which unite the finger bar and plate with the arms C, the parts may be easily removed for the purpose of sharpening the cutting-edges.

35 To render the front part of the machine vertically adjustable, so that it may be regulated to cut grass at any length, I provide wheels H, journaled at the bottom of slotted standards *f*, which are secured to the arms C  
40 of the frame in rear of the cutter-bar by set-screws *h'*. It will be observed that the position of these wheels being in rear of the outer ends of the finger-bar do not prevent the ends of said bar from passing close up to a wall or  
45 other obstruction during the operation of cutting, as is the case with lawn-mowers, where the wheels are on a line beyond the ends of the cutter.

I represents the handle of my machine,  
50 which is provided at its front end with a fork *i'*, curved so that its ends will project over the pinion-shaft and down to the ears *g* on the rear end of the side arms C of the frame, to which ears they are pivotally connected.

55 The operation of my invention is as follows: The operator seizes the handle and propels the machine forward, when the pinion-shaft is rapidly rotated by means of the drive-wheels operating upon the pinions, which in  
60 turn operate upon the fixed ratchet by means of the spring-controlled dog or pawl, and the

large bevel-wheel K, meshing with the beveled pinion L upon the vertical crank-shaft M, causes the latter to revolve rapidly, its momentum being increased and maintained by the  
65 fly-wheel N, the rapid reciprocating motion is communicated to the cutter-bar through the pitman O and pivoted lever P, and by means of the momentum imparted to the crank-shaft by the fly-wheel the reciprocating motion of the cutters is maintained during the  
70 temporary stoppage or backward movement of the machine for the purpose of commencing a new forward cut, the ratchet and pawl permitting the direction of the pinions to be  
75 meantime reversed without interfering with the rotation of the pinion-shaft.

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

80 1. The combination, in a mowing-machine, of the fixed shear-plate rigidly secured to the finger-bar and provided with teeth having downwardly and outwardly beveled edges and their points seated in notches in the points of  
85 the fingers, the reciprocating cutter-bar located beneath the fixed shear-plate, the teeth of which have upwardly and outwardly beveled edges, and the fingers provided with the open clearing-channel beneath the teeth or  
90 blades of the cutter-bar, substantially as described.

2. In a lawn-mower, the main frame constructed as described, having the upper and lower rearwardly-extending brackets *m o*, the  
95 lower one of which is provided with the adjustable cup-bearing, in combination with the vertical crank-shaft having the fly-wheel thereon, substantially as and for the purpose described. 100

3. In a lawn-mower, the combination of the main frame, the drive-wheels, the pinion-shaft mounted in brackets on the main frame and provided with the vertical bevel-wheel in its center and the fixed ratchets near its ends,  
105 the pinions loosely mounted on the ends of the pinion-shaft and provided with ratchet-housings containing the spring-controlled dog, the vertical crank-shaft mounted in brackets secured to the main frame, the lower one of  
110 which is provided with an adjustable cup-bearing, the fly-wheel mounted on the vertical shaft, the adjustable pitman, and the pivoted lever actuating the sickle-bar, substantially as and for the purpose described. 115

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

ELLSWORTH M. LETTS.

Witnesses:

ALEX. D. STEVENS,  
J. W. ADAMS.