

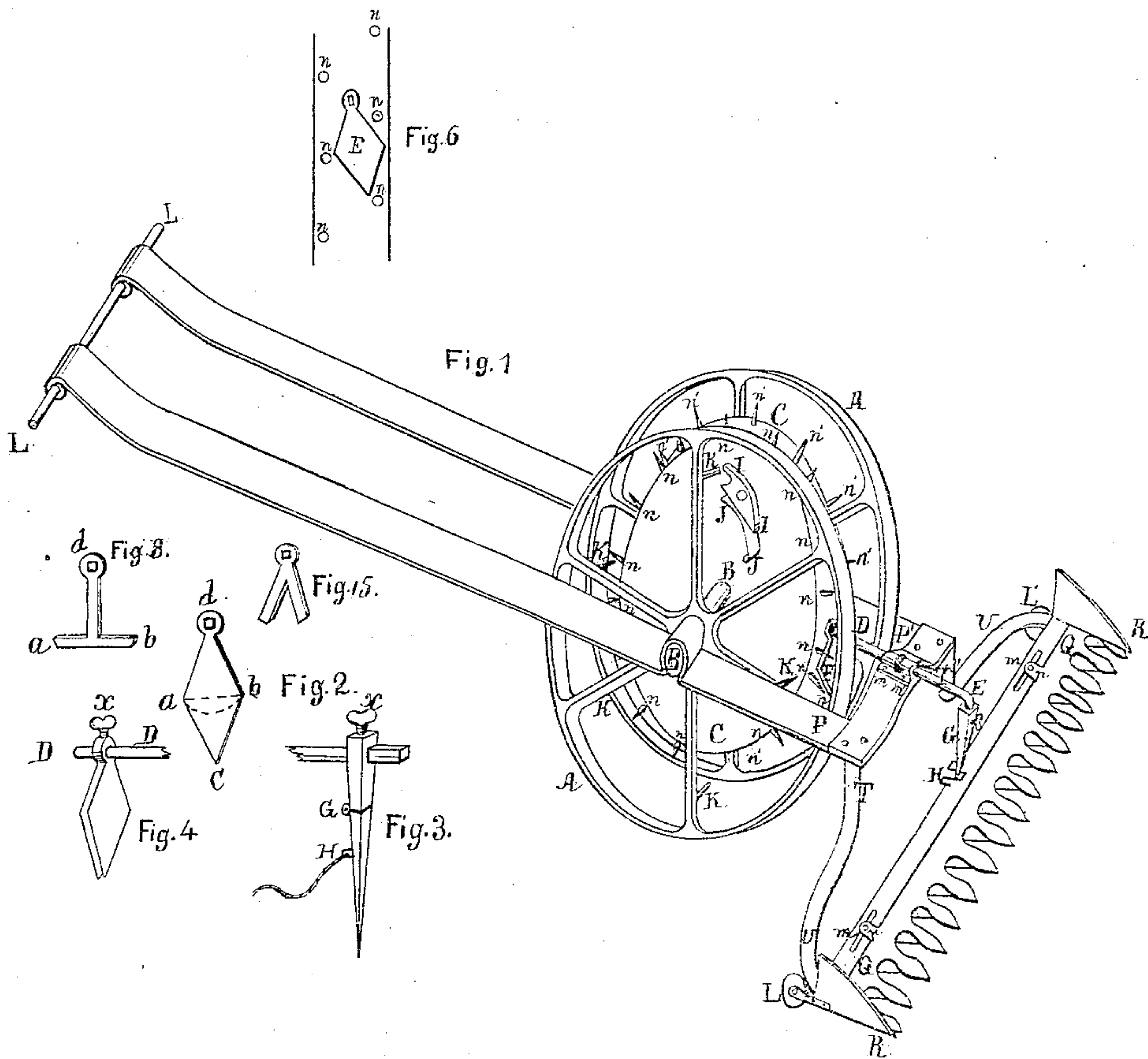
R.G. Pike,
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Witnesses: *Thos. A. Freeland,*
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UNITED STATES PATENT OFFICE.

ROBERT G. PIKE, OF MIDDLETOWN, CONNECTICUT.

IMPROVEMENT IN MOWING-MACHINES.

Specification forming part of Letters Patent No. 52,317, dated January 30, 1866.

To all whom it may concern:

Be it known that I, ROBERT G. PIKE, of the city of Middletown, in the county of Middlesex and State of Connecticut, have invented and made a new and useful Improvement in Mowing-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, which make a part of this my specification.

My design has been to construct a mowing-machine in which the motion would be communicated from the main wheel or axle to the cutter by as direct means as possible without the use of cogs, pulleys, or cranks. My machine goes by hand for light work or by horses for heavier work.

Figure I is a perspective drawing of the hand-machine.

A A are the main wheels. C C is a drum, of smaller diameter than the main wheels, turning upon the same axle B B.

n n n and *n' n' n'* are two parallel lines of pins equidistant from each other in the line and extending around the periphery of the drum, so arranged that a pin in one line is opposite the space between two pins in the other line.

D E is a spindle resting and turning easily upon its bearings at *m* and *m'*, which bearings are supported by the frames P P', which extend from and turn on the main axle B B.

F is a steel lever or vibrator (more fully explained hereinafter) firmly attached to the end of the spindle and playing between the lines of pins.

G is a lever or finger firmly attached to the other end of the spindle and extending down to the cutter, where it is loosely inserted into a slot cut in the back of the cutter or in a shoulder extending back from the cutter at H.

I I is a catch on the head of the drum, kept in position by the spring J J, so placed that when the driving-wheel turns forward the lug K on the main wheel moves into it and carries the drum around with it; but when the main or driving wheel is backed the lug K, coming in an opposite direction, slips over the catch which yields with the spring, and the drum is left stationary.

L B and L' B are handles for pushing the machine, and they rest and turn on the main axle with B P.

L L' are small wheels upon which the cutter-sheath Q R Q' R' rests. This sheath is open along the back, so that the cutter can be lifted in and out, instead of being pushed in at the end, as in other machines. The cutter bears and runs on three points or bosses, one near each end, near the back, and one at the middle nearer the knives, to avoid friction. These bosses or points may be on the sheath under the cutter, placed in the same relative position. The cutter is held and guided by two bolts, which pass through the upper part of the sheath, as represented at *r r*, then through slots made in the back of the cutter long enough for its required movements, and then through holes in the under part of the sheath, where they are held in place by screw-threads or by nuts or pins.

Its operation is as follows: Upon pushing the machine forward at L L the main wheels go round, the lug K strikes the catch I and turns the drum in the same direction, bringing the pins to bear alternately in succession upon the vibrator F, striking first one side, then the other, and giving it a slight vibratory motion, which is communicated through the spindle to the lever or finger G, which gives the required reciprocal motion to the cutter.

Having thus given a general description of my machine and its operation, I proceed to explain more particularly its several parts and proportions.

The main wheels are of any convenient size, made of iron or wood, like any ordinary wheel. The drum should be from nine to twelve inches from head to head, and its diameter (including the pins from point to point) should be about nine-tenths the diameter of the main wheels. The pins should be at least a fourth of an inch in diameter at the base, fastened with a firm strong flange or shoulder screwed in or cast upon the drum, and they should be from an inch to an inch and a half long, or even longer, if it should be found more convenient to make the drum smaller in diameter, taking care to leave space enough to clear the ground as they revolve.

Having determined in the outset upon the circumference of the main wheel, I readily ascertain the number of vibrations of the cutter which will be required at each revolution of such main wheel, (being the same number in

the same given distance as is required in other machines,) and this determines the number of pins to be placed on the drum. Thus, if the cutter must move twenty times one way and twenty times the other at each revolution of the main wheel, I have forty pins, twenty on one line and twenty on the other. The vibrator, which fits so as to properly play between them, should be from one-half to three-fourths of an inch thick on its working edges, and of the form as represented in Fig. II, although it may be varied, as hereinafter explained, without destroying the principle of its action, care being always taken to have the center of its motion, *d*, so far above the points of escapement, *a* and *b*, as to insure sufficient oscillation of the vibrator between the pins. These points *a* and *b* should be wider apart than the lines of pins, and should be at such angle with *d* that when the pin on one line slips by the point *a* the next pin on the other line catches the side *d b*, about midway between *d* and *b*, as represented in Fig. VI, where *n n n* and *n' n' n'* represent the relative position of the pins, and *F* the vibrator. As the pins come in contact with the sides *a d* and *b d* these sides should be well polished and oiled.

The spindle should be about an inch in diameter, or larger, neatly turned, with a collar or groove around the middle or any other convenient point to hold it from slipping toward or away from the drum; and it is best set so that its axis is at right angles with the main axle, and about coincident with a line radiating from the main axle. The vibrator may be permanently fixed upon the spindle, as in Fig. I, or it may be set on so as to slide on or off, as represented at Fig. IV, where *D D* is the spindle, cut square a little way on the end, so as to fit and slide easily through the socket in the angle of the vibrator, over which the binding-screw *X* is seen, which fastens it firmly for its work. I prefer this last arrangement because it is thereby made easy to adjust the vibrator, as well as to put it out of its work. The lever or finger may be attached to the other end of the spindle in a similar way, as represented in Fig. III, and the machine may be thrown out of work by turning the binding-

screw *X* and sliding the finger back out of the socket *H*. It may be thrown out of work, also, temporarily but instantly by means of a rod or chain attached to the lower part of the finger at *H* in Fig. III, pulling it up on a spring-hinge at *G*, and when the rod or chain is released the finger flies back to the socket and work.

The length of the cutter's vibrations depends upon the length of the arc of the finger's vibration, which, in turn, depends upon the angle through which the vibrator moves. Hence, to adjust the cutter's motion I can raise or lower the bearing of the spindle to make the finger longer or shorter, or I can make the angle of the vibrator more obtuse or acute, or I can make the spaces between the pins greater or less, any or all of which tend to the same result—that is, to lengthen or shorten the motion of the cutter.

In Fig. I, I have represented each spoke as carrying a lug. One is sufficient, but one on each spoke is preferable, for the reason that where there is but one on the wheel sometimes the wheel has to make nearly a whole revolution before the lug reaches the catch and turns the drum.

The vibrator also may be varied without affecting its principle of action. It may take the forms, respectively, as represented in Figs. VIII and XV, or as it would appear when the lower part is cut off at either of the dotted lines in Fig. II, for in all these forms it acts on the same lever principle.

It is manifest that the machine can be so far modified as to be other than a hand-implement without changing the nature of my invention.

Now, what I claim, and desire to secure by Letters Patent, is as follows:

The combination of the drum *C C*, pins *n n'*, steel lever or vibrator *F*, spindle or shaft *D E*, and lever or finger *G*, when arranged in the manner described and employed to operate the cutter-bar, as set forth.

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Witnesses:

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