

(No Model.)

2 Sheets—Sheet 1.

M. A. REPLOGLE & H. LANCASTER.
MOWING AND REAPING MACHINE.

No. 403,699.

Patented May 21 1889.

Fig. 1.

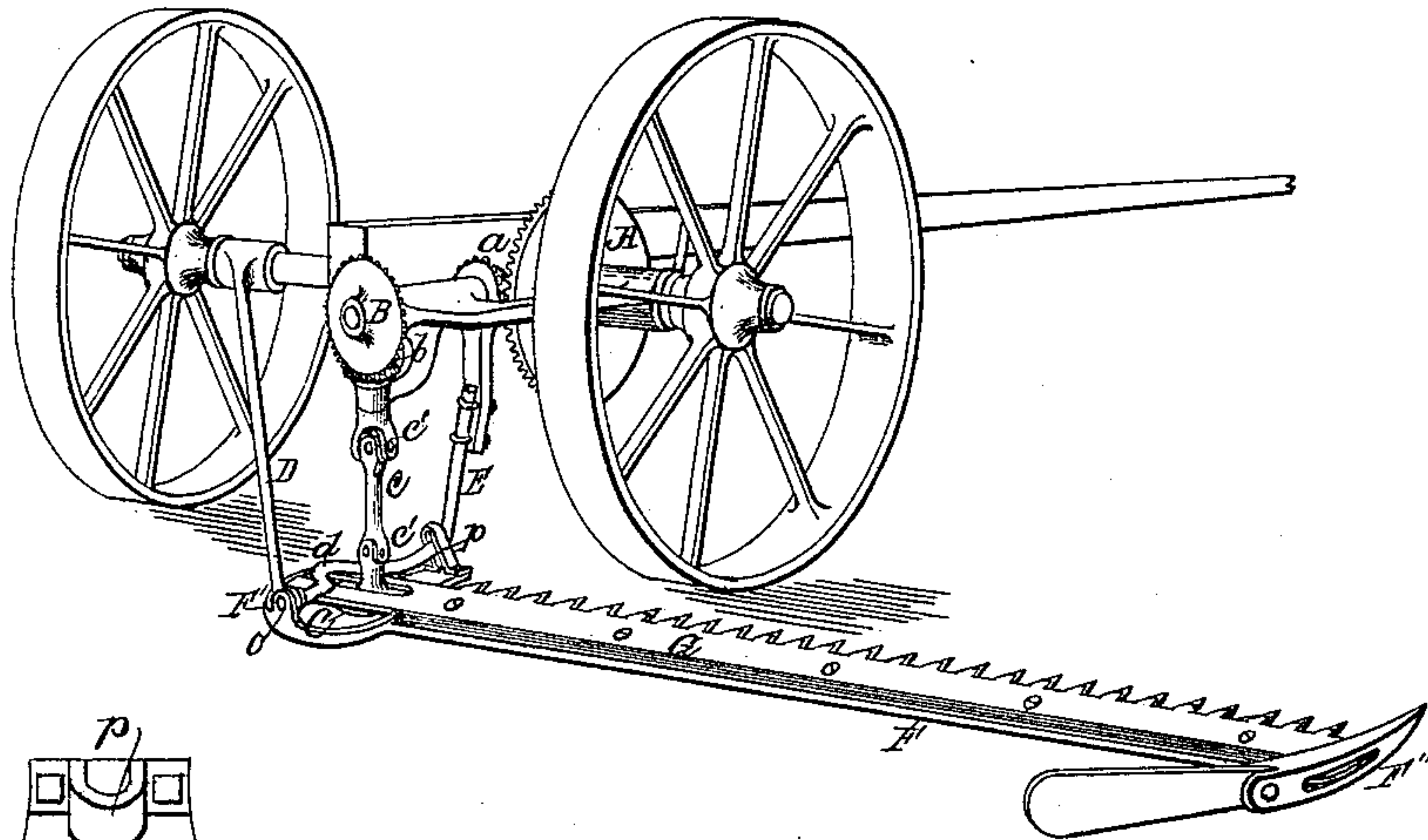


Fig. 2.

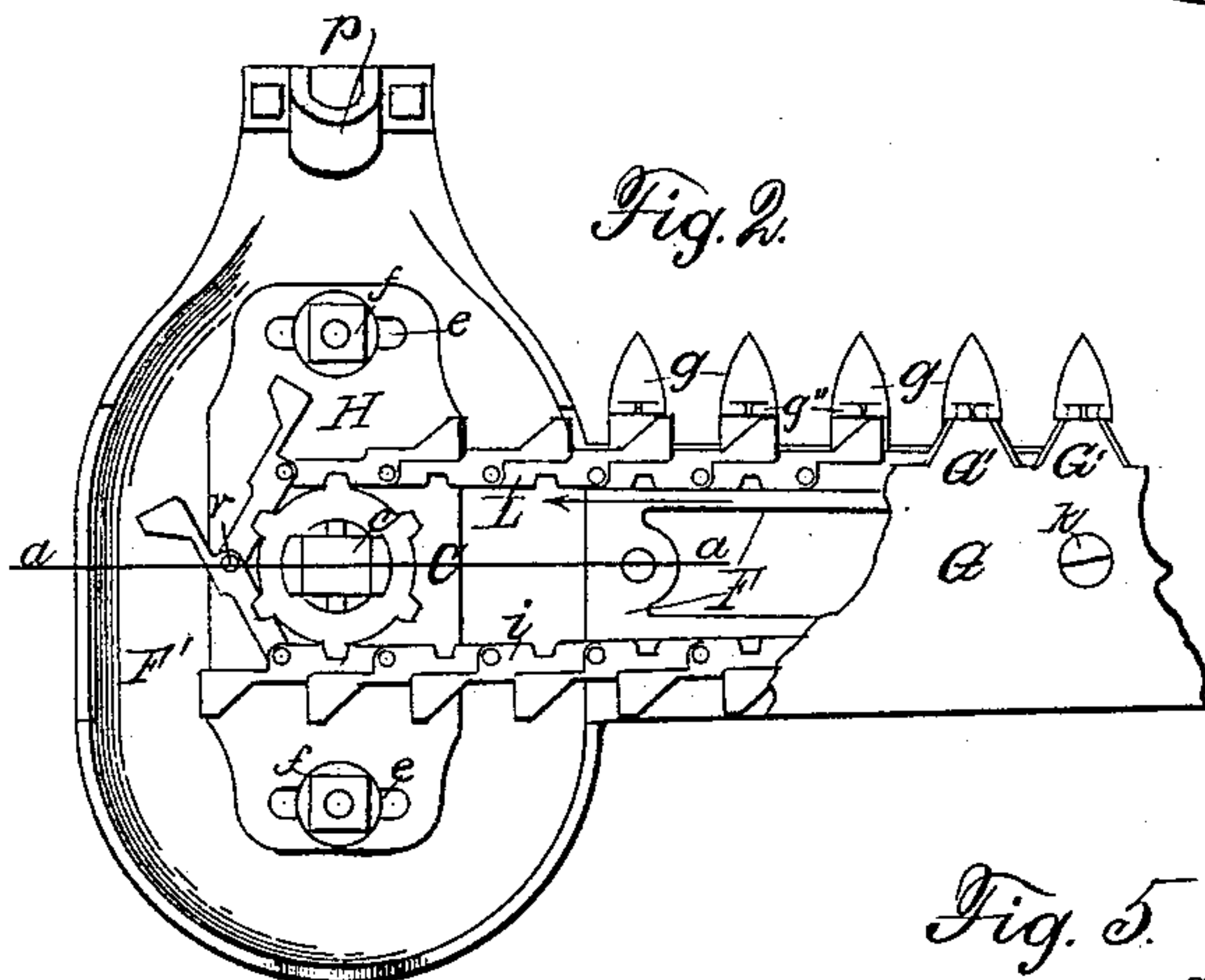


Fig. 3.

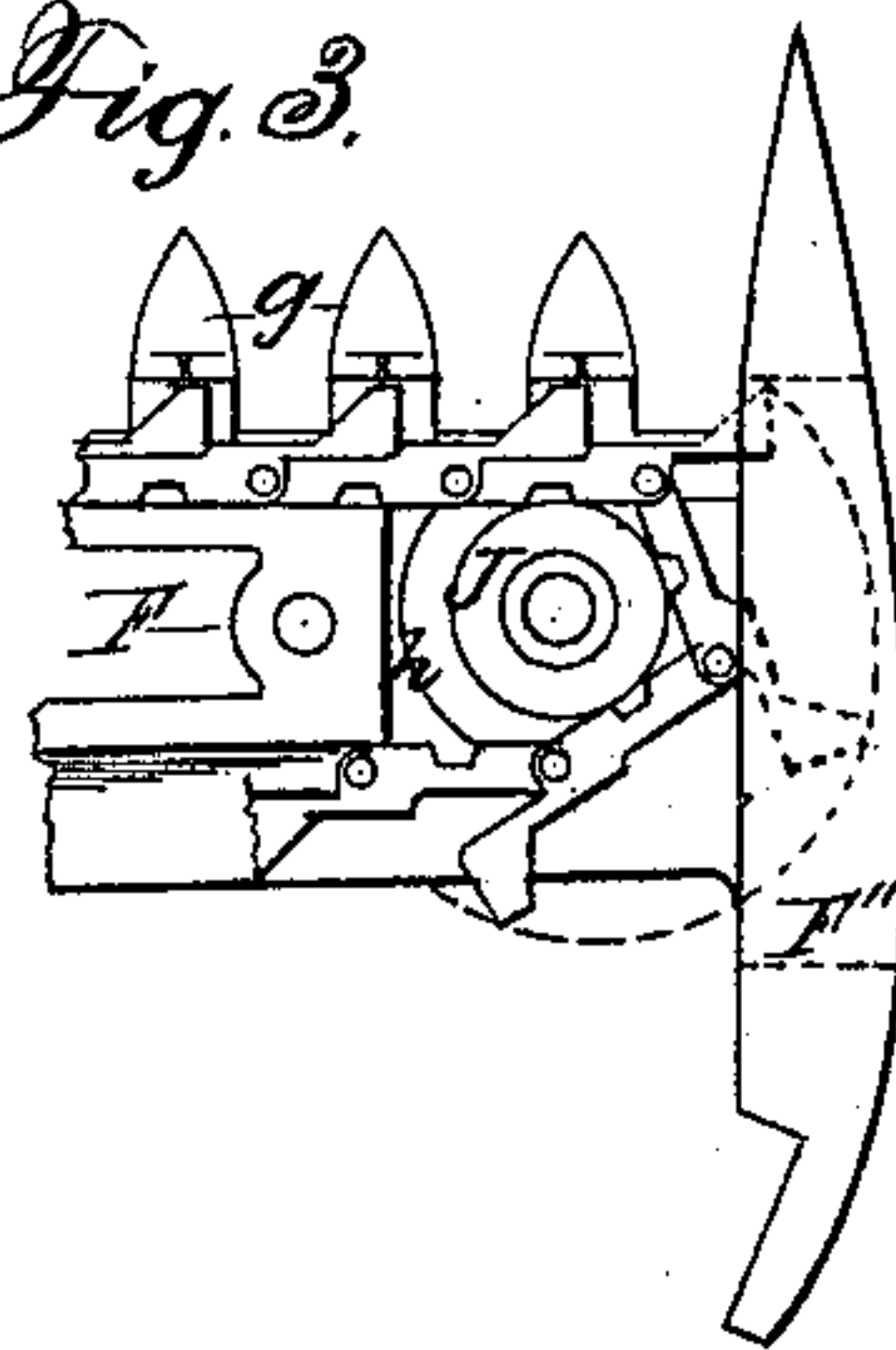


Fig. 4.

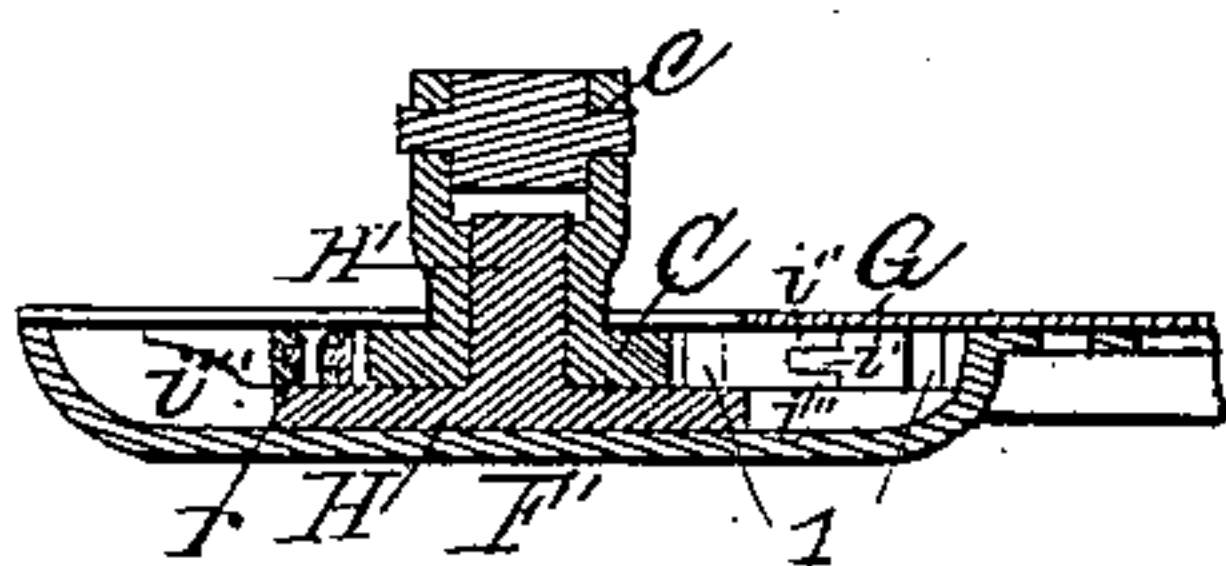


Fig. 5.

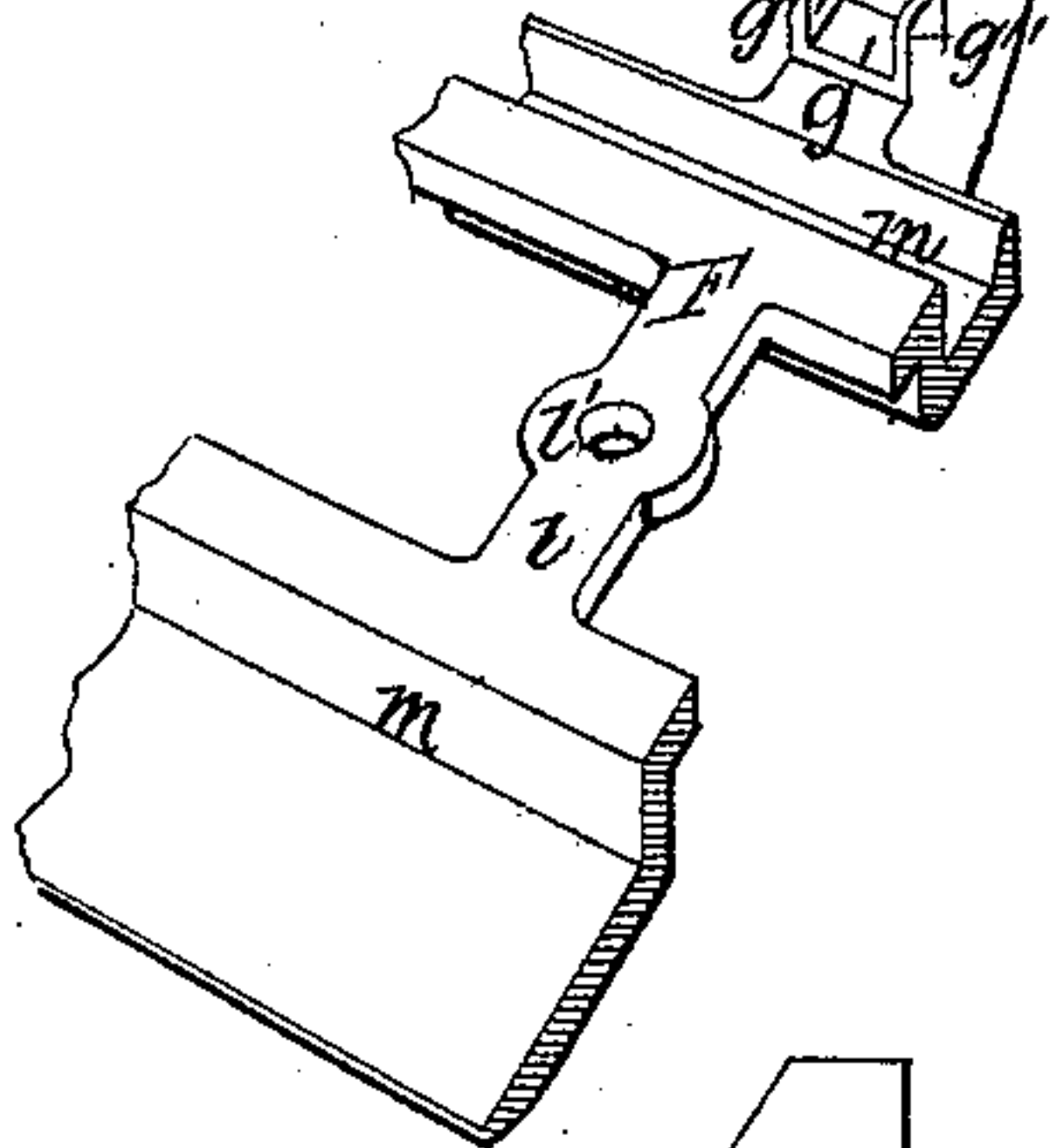


Fig. 6.

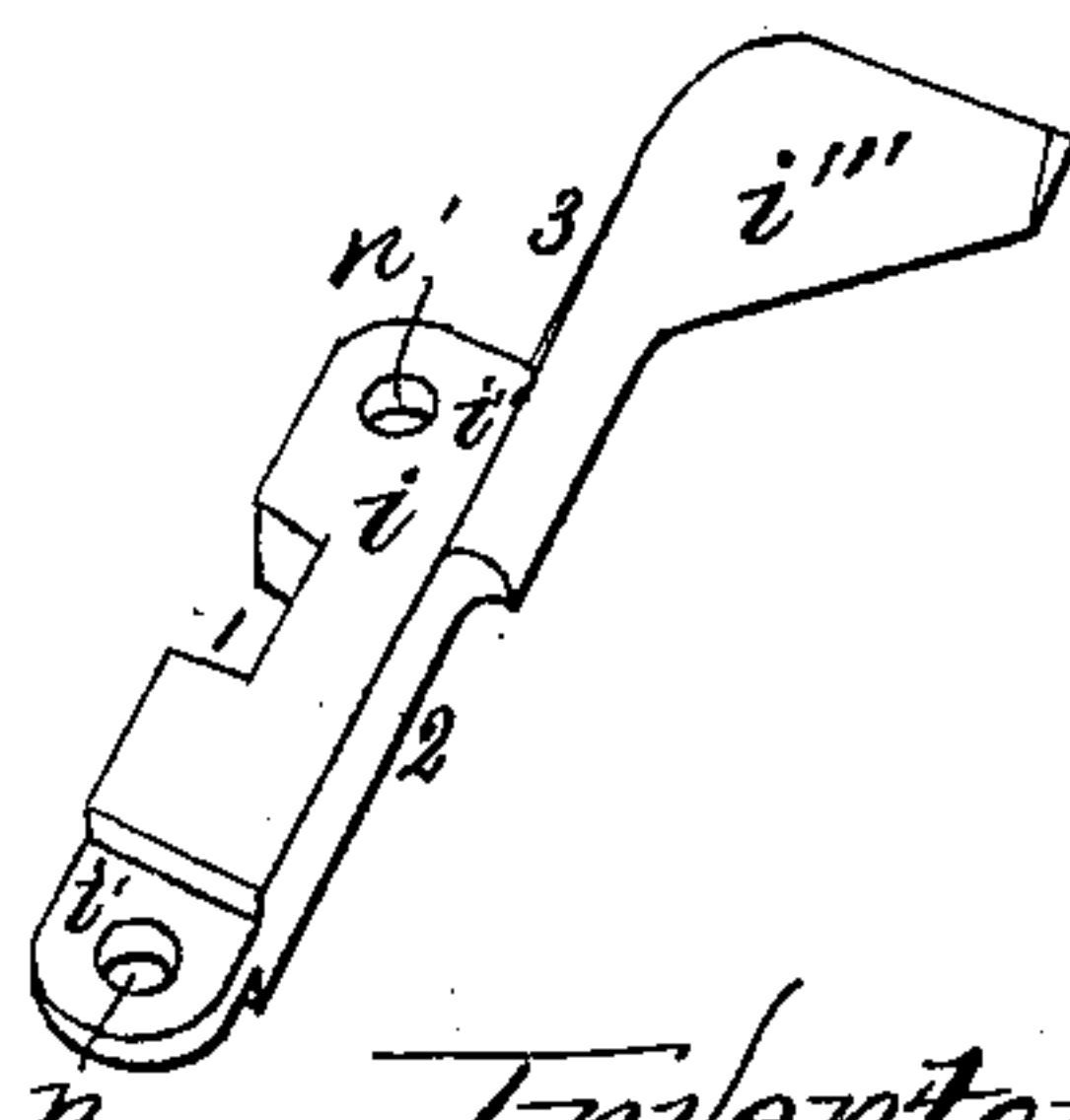
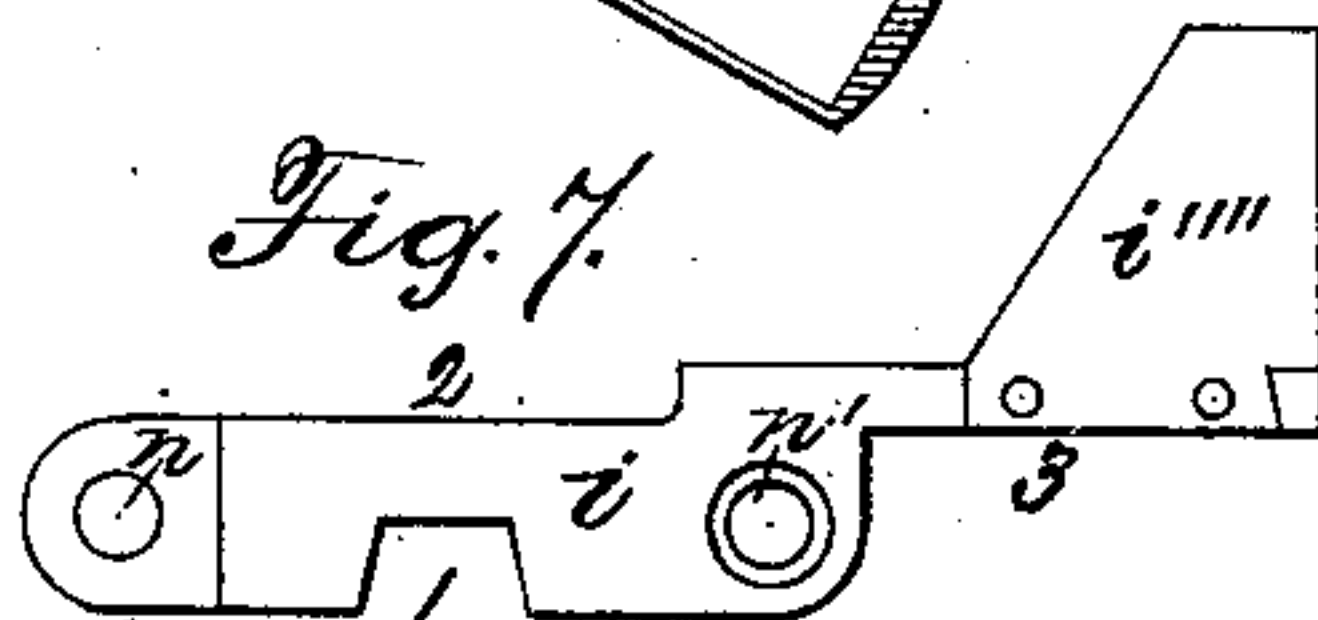


Fig. 7.



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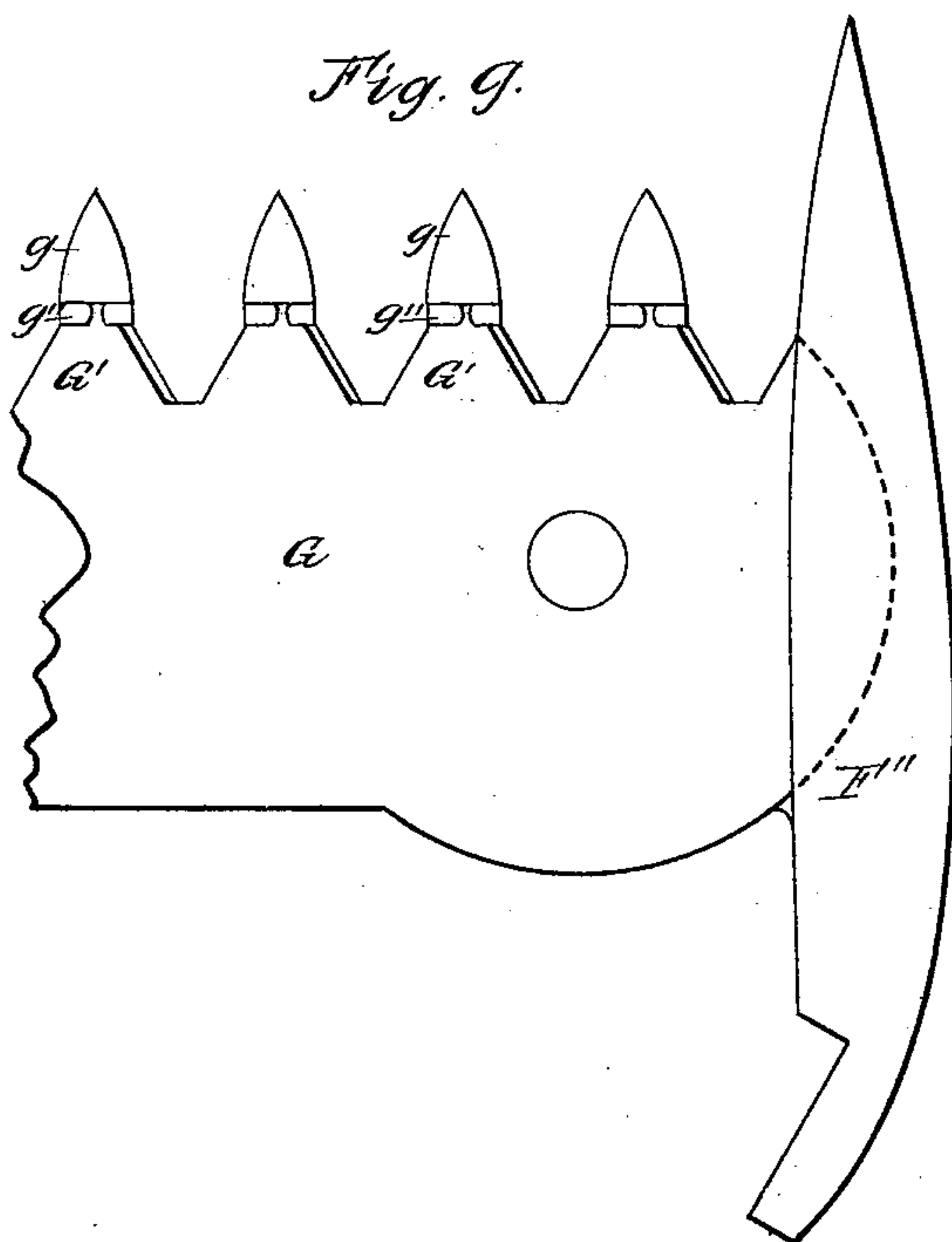
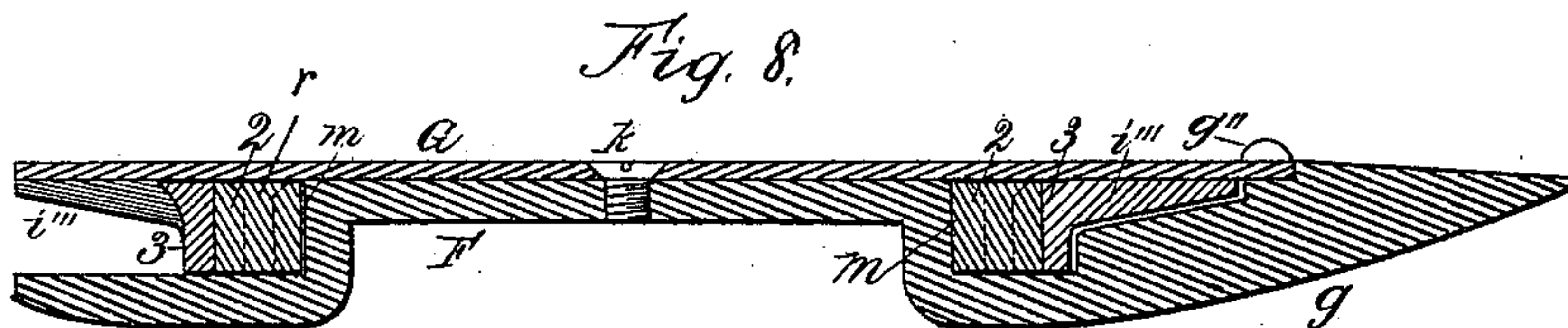
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2 Sheets—Sheet 2.

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MOWING AND REAPING MACHINE.

No. 403,699.

Patented May 21 1889.



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UNITED STATES PATENT OFFICE.

MARK A. REPLOGLE AND HAHNEMANN LANCASTER, OF CEDAR FALLS, IOWA.

MOWING AND REAPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 403,699, dated May 21, 1889.

Application filed February 20, 1888. Serial No. 264,611. (No model.)

To all whom it may concern:

Be it known that we, MARK A. REPLOGLE and HAHNEMANN LANCASTER, citizens of the United States, residing at Cedar Falls, in the county of Blackhawk and State of Iowa, have invented certain new and useful Improvements in Mowing and Reaping Machines, of which the following is a specification.

This invention relates to that class of mowing and reaping machines in which the cutting apparatus is in the nature of a chain belt with knives attached thereto; and the object of our invention is to improve the construction of the cutting apparatus and connected parts, so as to simplify the machine and provide, generally, for the more efficient action of cutting apparatus of this nature, as well as to reduce the cost of manufacture.

The invention consists in the construction, combination, and arrangement of parts, as hereinafter more fully set forth and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a rear view of a machine embodying our invention in perspective; Fig. 2, a fragmentary plan view of the end of the cutting apparatus nearest the mower and adjacent parts, a portion of the upper plate of the finger-bar being cut away to show the construction of the parts below; Fig. 3, a similar view of the outer end of the cutting apparatus and adjacent parts; Fig. 4, a sectional view of the shoe at the inner end of the finger-bar and connected apparatus in the line *a a* of Fig. 2; Fig. 5, a fragmentary view in perspective of one of the fingers and parts integral therewith, showing the construction of the same; Fig. 6, a view in perspective of one of the sections of the cutting apparatus; Fig. 7, a plan view of a modified form of the same; Fig. 8, Sheet 2, a transverse section of the finger-bar and its connections in the line of the center of the guard-finger; and Fig. 9, a plan view of the outer end of the finger-bar, guard-fingers, and shoe with the cap-plate attached.

Similar letters of reference indicate corresponding parts.

In the following description the term "cutting apparatus" will be used to designate all that part of the machine which corresponds in function to the common cutter-bar or sickle, being in this case an endless chain with

knives thereon. The separate parts of this cutting apparatus, which are connected to form the same, will be designated as "sections," and all of each section, excepting the knife, as a "link."

The general arrangement of the machine is illustrated in Fig. 1. The cutting apparatus is actuated through the medium of gearing in the ordinary manner, motion being communicated from the axle of the mower by a bevel gear-wheel, A, meshing with a pinion, *a*, and thence by the bevel gear-wheel B, meshing with the pinion *b*, to a sprocket-wheel, C, revolving in a horizontal plane in the inner shoe, F', at the inner end of the finger-bar F, which is that part of the cutting-apparatus-holding device between the terminal shoes under the top plate and back of the guard-fingers. The finger-bar is suitably attached to the running-gear of the machine by a brace-rod, D, and a drag-bar, E, connecting with the inner shoe, F'. The horizontal portion of this drag-bar passes from the front to the back side of the inner shoe, which is pivoted upon it, as shown, the lug *o* serving as one bearing and the stirrup *p* as the other. This stirrup is adapted to allow for all necessary vibration of the inner shoe in work or otherwise. An offset, *d*, in the drag-bar allows the same to pass around the hub or shaft of the sprocket-wheel C, and also admits of lateral adjustment of the same, as will be hereinafter more fully explained.

To admit of the vertical vibration of the finger-bar in operation and the lifting of the same to a perpendicular position when not in use, the shaft *c* has a universal-joint connection, *c'*, with the pinion *b* and also with the sprocket-wheel C.

The sprocket-wheel is mounted and revolves on the central stud, H', of a plate, H, attached to the upper side of the inner shoe, F', by suitable bolts and nuts, *f f*. Slots *e e* admit of an adjustment of this plate transversely to the shoe, or in the line of the longest diameter of the finger-bar, whereby any slack in the cutting apparatus L may be taken up.

In practice we prefer to make the finger-bar F, the inner and outer shoes, F' and F'', respectively, and guard-fingers *g g* all in one piece, being cast in substantially the form

shown and of malleable iron or steel. It is preferably tapered somewhat from the inner end, that being the end nearer the machine, and in cross-section it is of the stirrup form indicated in Figs. 5 and 8. The shoulders *m m* correspond to the vertical thickness of the cutting apparatus *L* and form a bearing for the inner side of the same. To the top of the highest part of the finger-bar we attach a plate of thin metal, *G*, which serves to hold the cutting apparatus in position, while of course allowing it to move freely in the direction of its length. The top of the finger-bar *F* need not be continuous, and may for the most part be open, connecting-bridges *l*, provided with screw-holes *l'*, being sufficient for strength and for the attachment of the plate *G* by suitable screws, *k*. This plate may be made in the serrated form shown in Fig. 2, and the teeth *G' G'* adapted to form a part of the guard. To this end said teeth are preferably beveled on the upper side, and the forward ends are fixed to the guard-fingers *g g*. A simple manner of so securing them is shown in Fig. 2, reference being had to the short dotted lines which indicate the ends of the teeth *G' G'*, and in Fig. 5, where the construction of the guard-fingers *g* is shown in larger detail. The guard-finger is provided with a suitable recess, *g'*, for the end of the tooth *G'*, and each side of this recess is a lug, *g''*, adapted to be bent over and upon the tooth, as indicated in Fig. 2.

At the outer end of the finger-bar is mounted a wheel, *J*, revolving in a horizontal plane and with its upper face flush with the top of the finger-bar *F*. The lower side of this wheel is preferably provided with a flange, *h*, and on this flange rests the cutting apparatus *L*, mounted on said wheel.

It will be noticed that the projecting portions of the sections of the cutting apparatus extend out to some distance from the wheel as they pass around it, and more especially on the rear side. It is preferable, therefore, to make the plate *G* to correspond with the curve described by these sections, and this form is clearly indicated in Fig. 9.

The knives are attached to or form a part of this cutting apparatus *L*. In practice we prefer to make them a part of the sections, as shown in Fig. 6; but they may be separately attached, as in Fig. 7. The general form of each section is indicated in both these figures. It consists of a body portion, *i*, at one end of which is a single central lug, *i'*, and at the opposite end the double lugs *i'' i''*. About midway between these connective parts of the link is a notch, *1*, adapted to engage with the teeth of the sprocket-wheel *C*. Suitable holes, *n n'*—the latter countersunk for the beveled head of a suitable pin, *r*—are formed in the lugs at each end. On the side of the link opposite the notch *1*, and near the hole *n'*, a shoulder is formed, and this portion of the link is carried out to some distance and forms an extension, *3*, to which the knife is secured or of which it constitutes a part. In

the latter case the whole section is necessarily made of steel, and the knife *i'''* is preferably sharpened from the under side, that being the side seen in Fig. 6. The outer side, *2*, of the body portion of the link and the inner side of the extension *3* are, as will be seen, in line, so that when the links are connected, as in Figs. 2 and 3, they are adapted to open outwardly, but form a lock in the other direction, making the chain rigid as against pressure from the outer side. The effect of this is to materially increase the efficiency of the cutting apparatus.

It will be observed that the knives are set relatively to the motion of the chain behind the pivotal parts of the cutting apparatus, which moves in the direction indicated by the arrow in Fig. 2. The effect of this is to naturally draw the link back to its place in operation and to prevent any tendency to buckle or get out of place. A further effect is indicated in Fig. 3, where it will be seen that the knife is in proper position for work while still some distance farther out than the center of the wheel *J*, so that the machine is adapted to cut the full length of the finger-bar.

It will be understood that the plate *G*, with its teeth *G'*, covers the entire cutting apparatus. As it sets quite close to the top of the cutting apparatus, it renders the riveting or otherwise fastening of the pins in the chain unnecessary, the pins being held in place by the contact of the plate, as indicated in Figs. 4 and 8. Accordingly, when the operator wishes to sharpen his cutting apparatus he has only to remove the plate *G*, take out the cutting apparatus, remove the loose pins, and grind each cutter separately.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a mowing and reaping machine, the finger-bar *F*, the inner shoe, *F'*, outer shoe, *F''*, and guard-fingers *g g*, said finger-bar having a central longitudinal portion arched upwardly in transverse section, forming shoulders *m m*, adapted to serve as bearings for the cutting apparatus, in combination with a plane upper plate, *G*, having teeth *G' G'*, beveled on the upper side, extending forward and secured to said guard-fingers, substantially as and for the purpose set forth.

2. The combination of the plate *G*, having teeth *G' G'*, the finger-bar *F*, and the guard-fingers *g g*, having lugs *g'' g''*, adapted to be bent down upon the end of said teeth and secure them in position, substantially as specified.

3. In a mowing-machine, the described cutting apparatus, composed of a series of links having a body portion, *i*, with lug *i'* at one extremity and lugs *i'' i''* at the other, and provided with holes *n* and *n'*, respectively, pins *r*, connecting said links, a notch, *1*, on the inner side of the link, adapted to engage with the teeth of a sprocket-wheel, and an extension, *3*, with a knife thereon, the inner line of

said extension coinciding with the line of the outer side, 2, of the body portion of the link, whereby the cutting apparatus is adapted to bend only in one direction, substantially as 5 and for the purpose set forth.

4. In a mower cutting apparatus, the described section, consisting of a body portion, *i*, having a notch on the inner side adapted to engage with the teeth of a sprocket-wheel, 10 and terminal lugs *i'* and *i''*, with suitable holes for a hinge-pin therein, and the extension 3, a portion of which constitutes the knife *i'''*, the inner line of said extension being coincident with the line of the outer side, 15 2, of the body portion of the section, whereby the sections when connected overlap and are locked in one direction, the said section being made of steel, substantially as and for the purpose set forth.

20 5. The combination of a cutting apparatus

composed of a series of links with knives thereon, each of said links having hole *n* at one end and a countersunk hole, *n'*, at the other, adapted to receive the corresponding head of a pin, pins connecting said links and capable 25 of being inserted or removed at will, and finger-bar having shoulders *m m*, corresponding practically to the vertical diameter of the links, and a plate removably secured to said 30 finger-bar and forming an upper bearing for said cutting apparatus to prevent displacement of the loose pins, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

MARK A. REPLOGLE.

HAHNEMANN LANCASTER.

Witnesses:

H. C. HEMENWAY,

D. S. WRIGHT.