

S. D. LOCKE.
HARVESTER BINDER.

No. 251,447.

Patented Dec. 27, 1881.

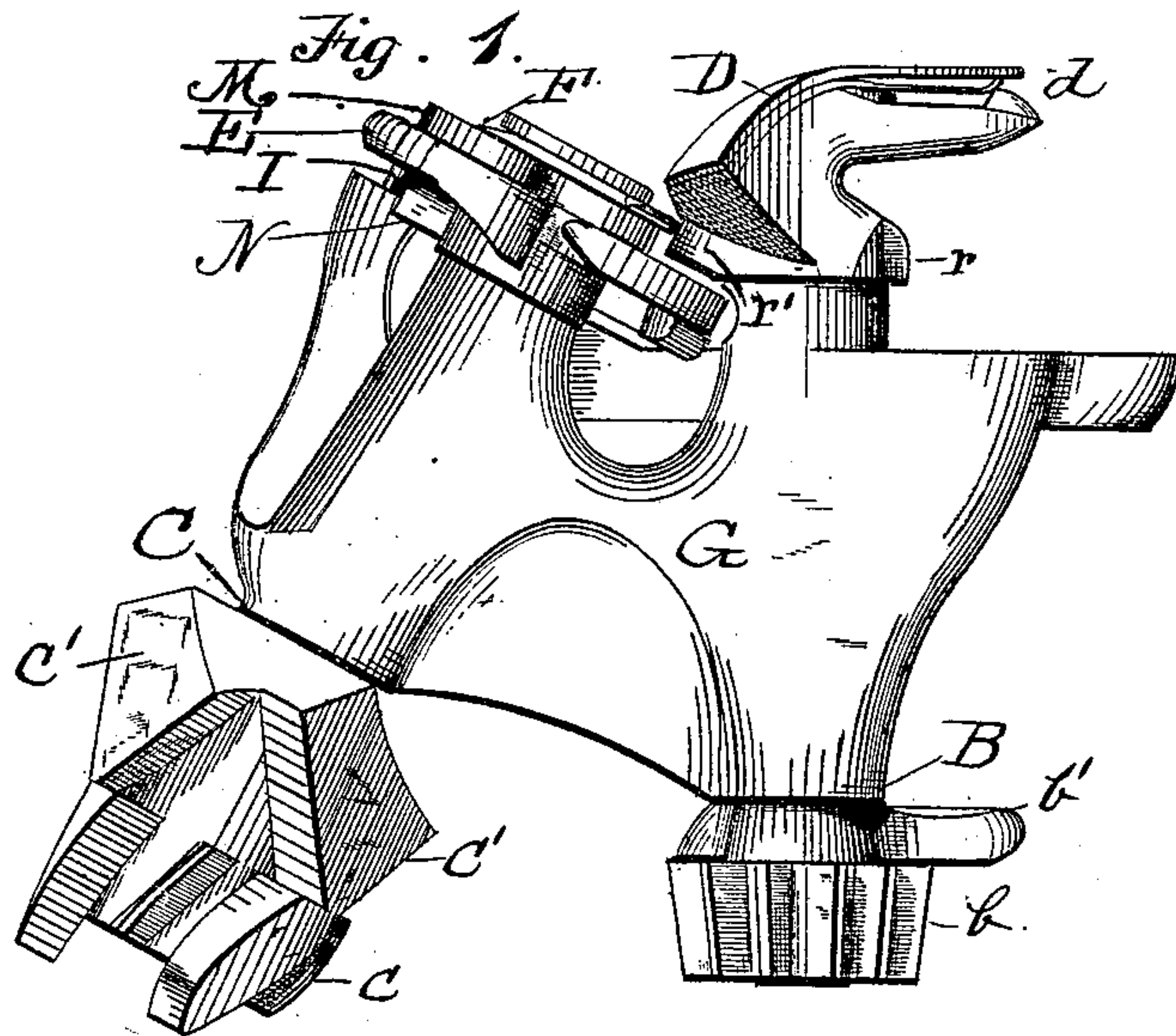
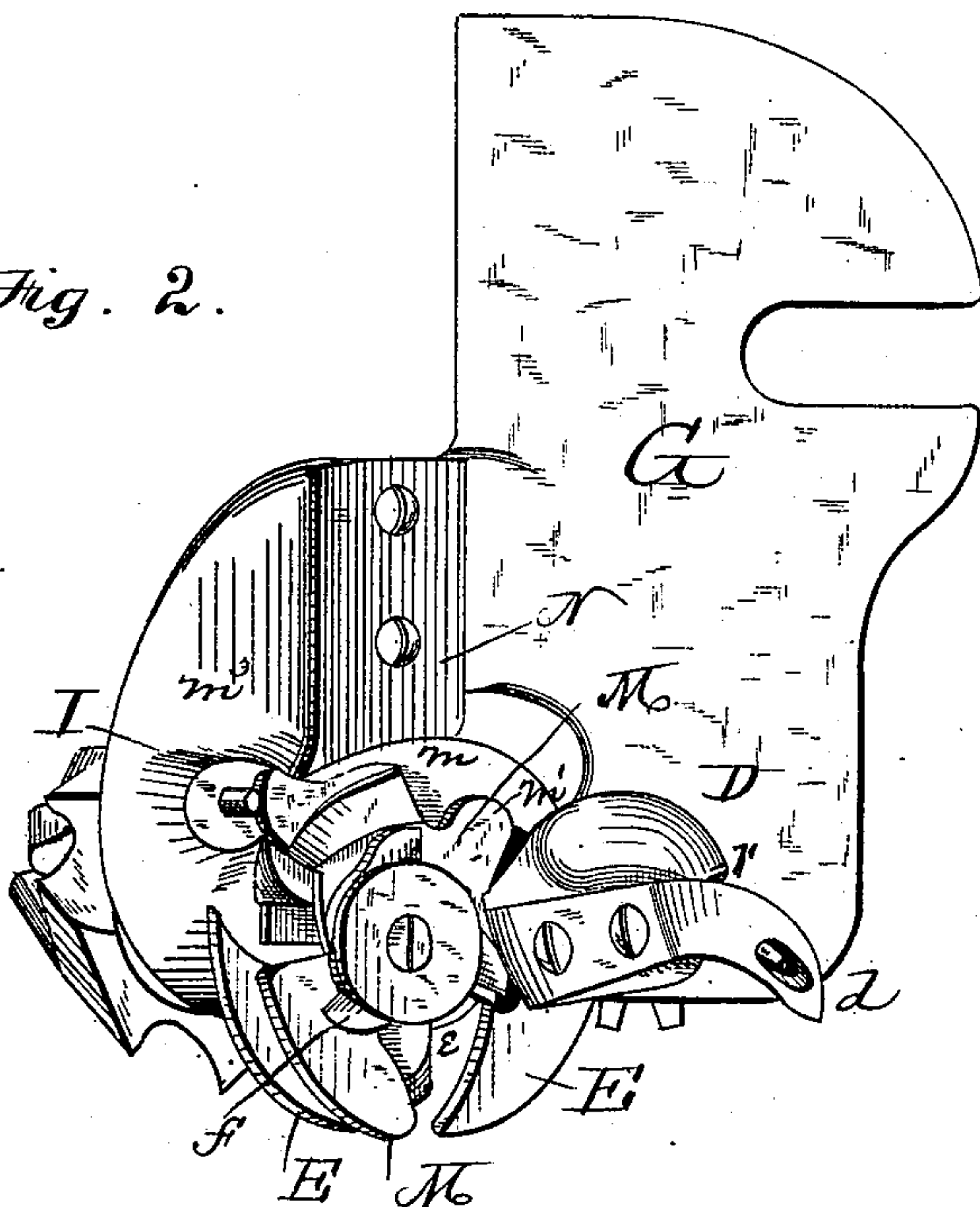


Fig. 2.



Attest

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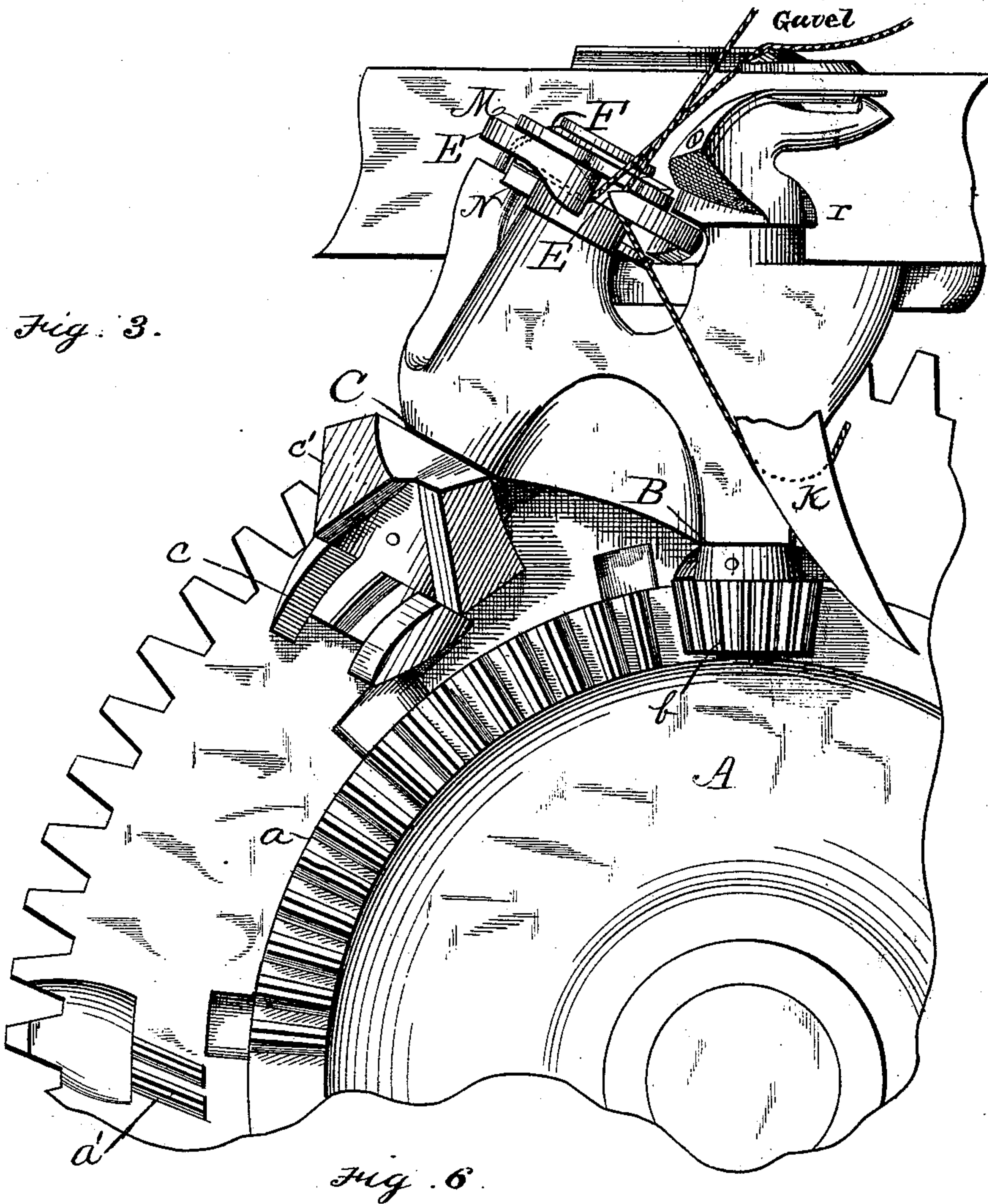
Inventor.

*Sylvanus D. Locke
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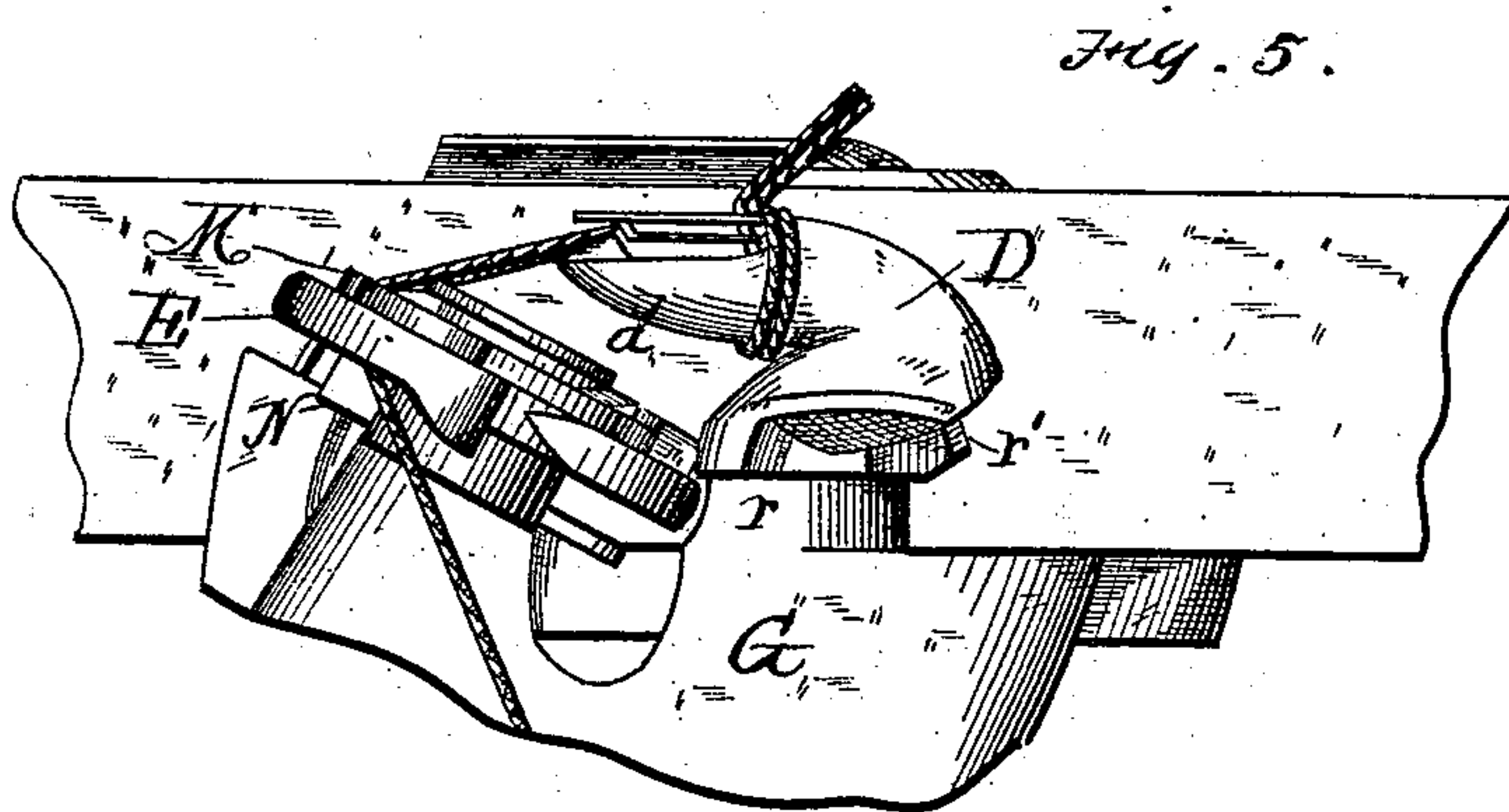
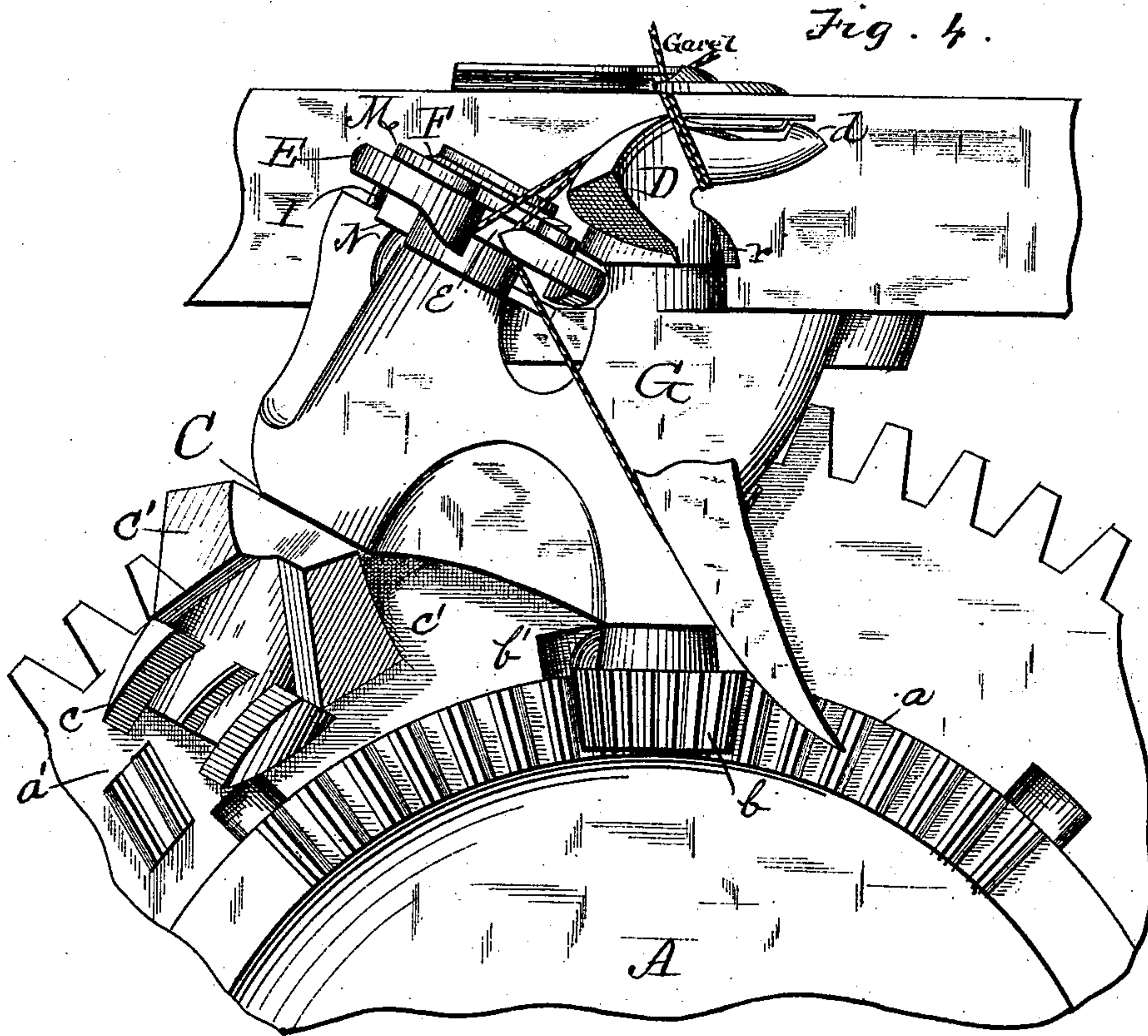
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Fig. 7

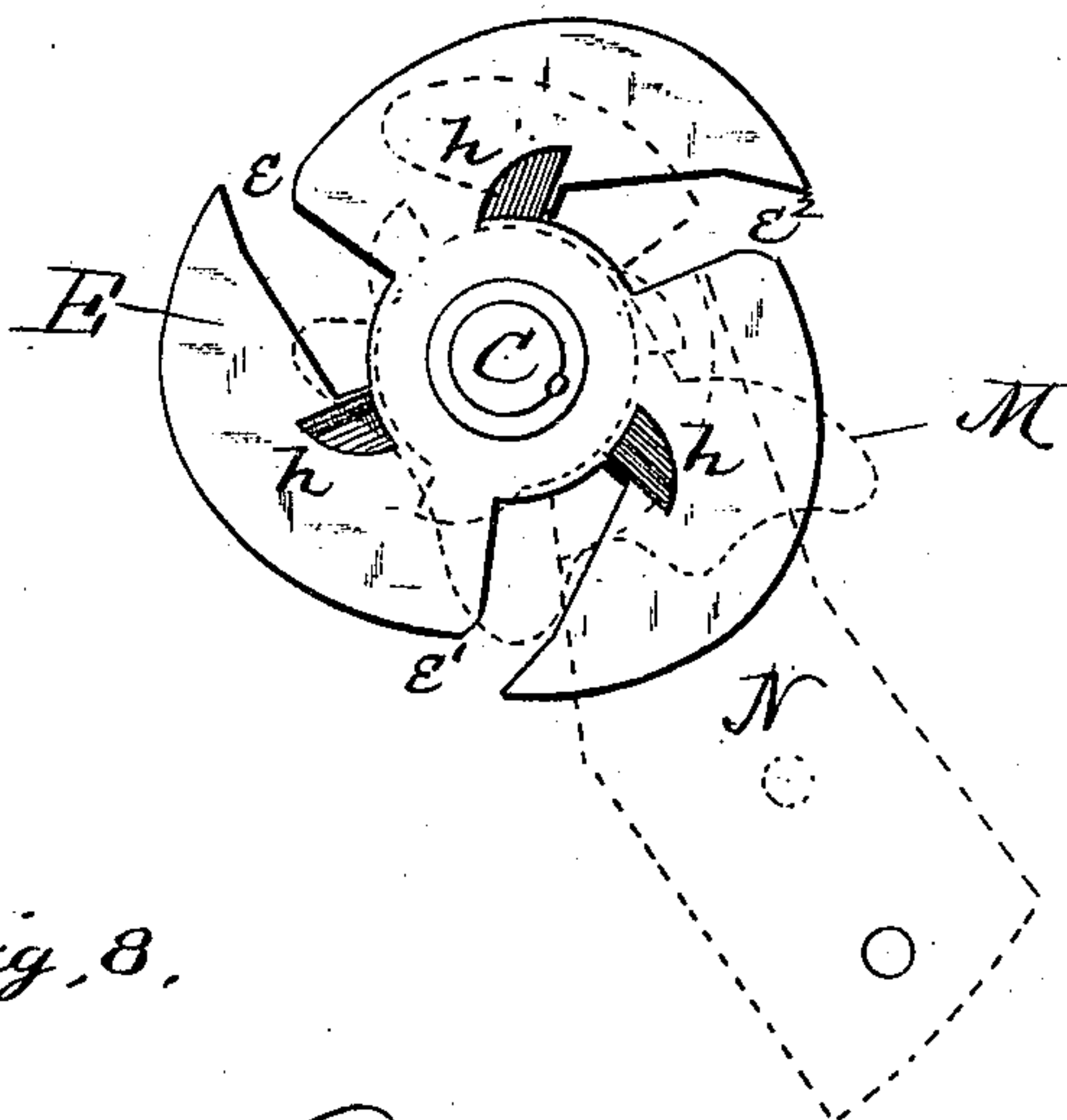
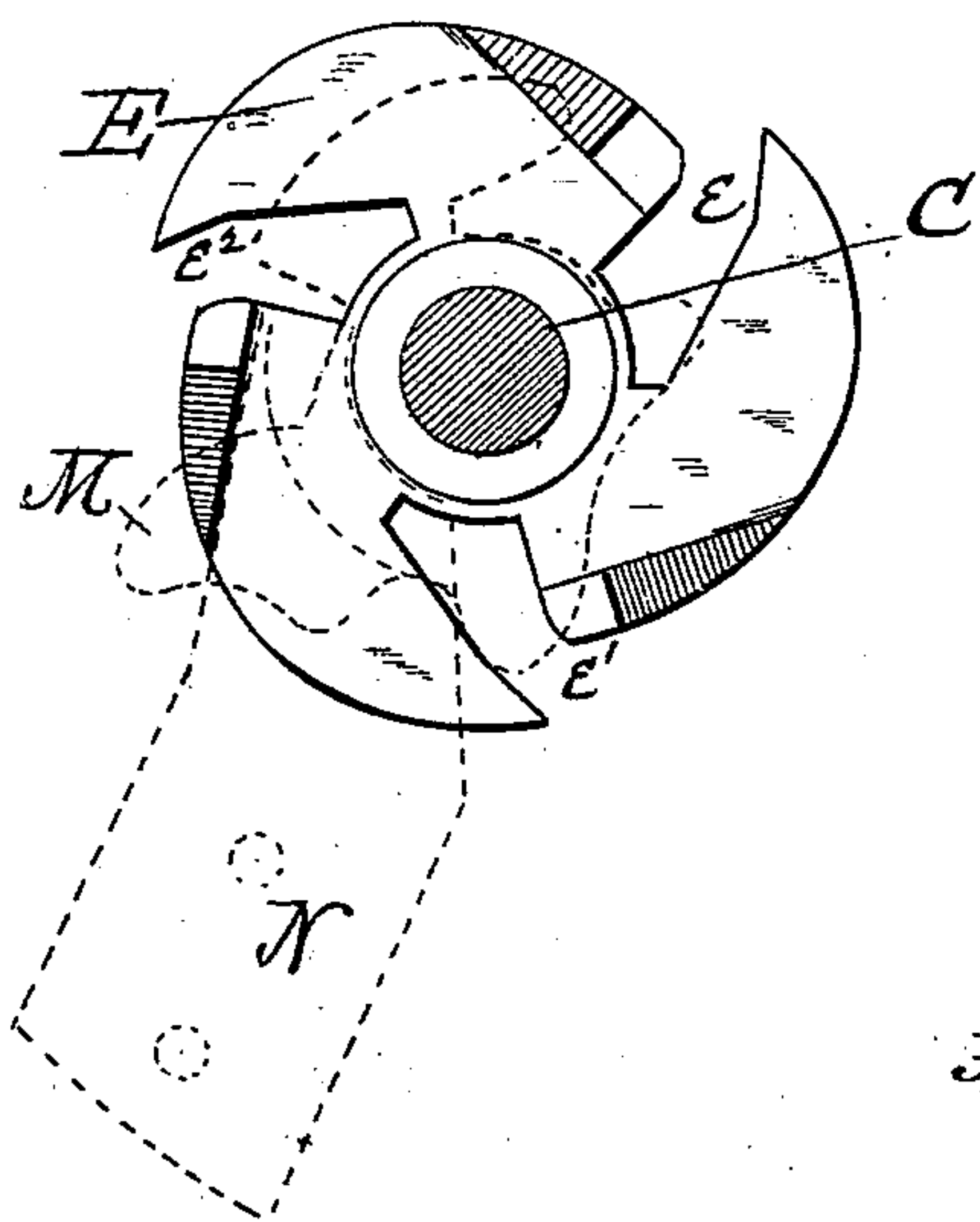


Fig. 8.

Fig. 9.

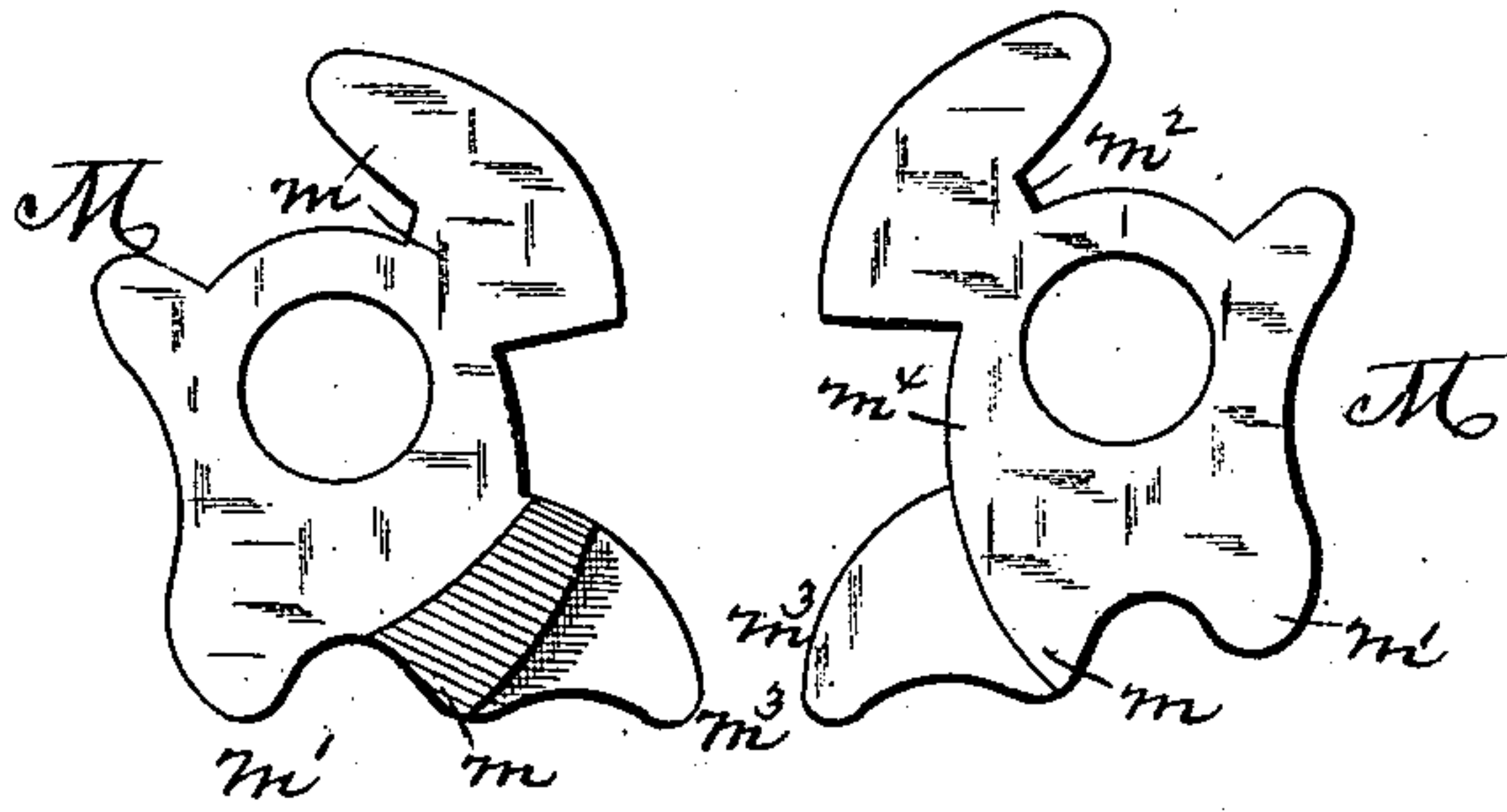
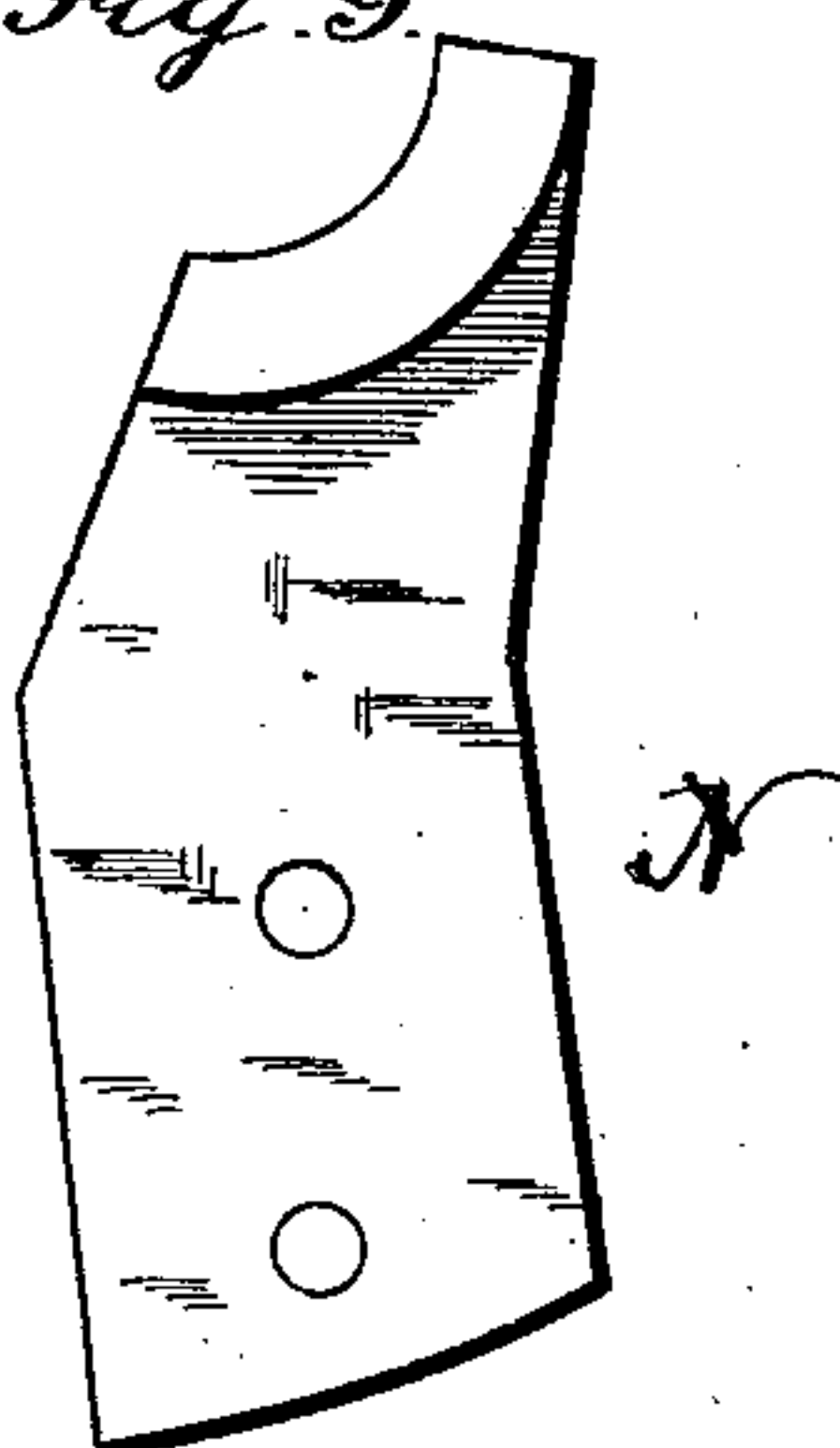
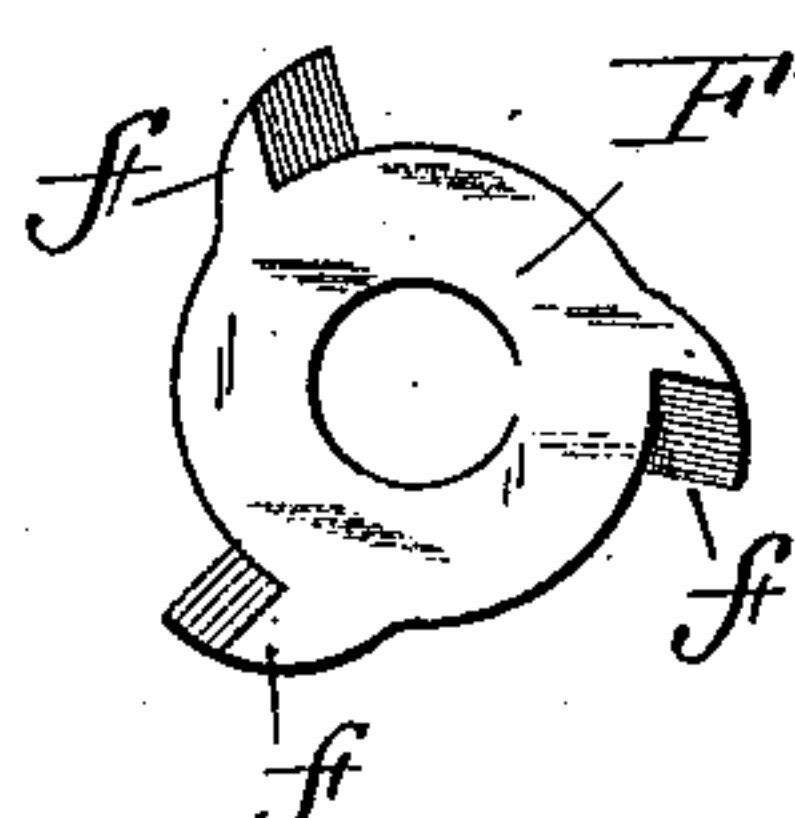


Fig. 10



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UNITED STATES PATENT OFFICE.

SYLVANUS D. LOCKE, OF HOOSICK FALLS, NEW YORK.

HARVESTER-BINDER.

SPECIFICATION forming part of Letters Patent No. 251,447, dated December 27, 1881.

Application filed December 31, 1879.

To all whom it may concern:

Be it known that I, SYLVANUS D. LOCKE, of Hoosick Falls, in the county of Rensselaer and State of New York, have invented a certain
5 new and useful Improvement in Harvester-Binders; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figures 1 and 2 are respectively side and top views of the invention; Fig. 3, a view showing the position of the parts of the mechanism just before the looping and tying head begins to operate. Figs. 4, 5, and 6 show the position of the parts at various stages of the looping and tying operation. Fig. 7 represents top
15 and bottom views of the holding-plate; Fig. 8, top and bottom views of the oscillating plate; Fig. 9, a top view of the clamping-jaw; and Fig. 10 a top view of the cutter-head.

Similar letters of reference in the several figures denote the same parts.

25 This invention relates to that class of self-binders in which a cord is employed for binding the gavel; and it consists in certain improvements on a cord-clamping, tying, and cutting device, which is described and claimed in Letters Patent No. 238,939, granted to me on
30 the 15th day of March, 1881. In said original device the looping-jaws were arranged to rotate in a plane inclined to the plane of rotation of the clamping and cutting plates, whereby the latter carried the cord upward and
35 caused it to enter properly between the jaws, and the inclined shafts of said two parts were driven by a large wheel having peculiar gear-segments. In the present invention the large wheel, with its peculiar gear-segments, is retained, the inclined shafts are constructed and
40 driven as before, the looping-jaws are not necessarily changed, and the plane of rotation of the jaws is inclined to that of the holding and cutting plates, as in the former case; but the form of the holding-plate is somewhat modified, the cutters are applied differently, a loosely-pivoted plate, arranged between the cutters and the holding-plate, is employed to assist in cutting off the cord by forcing it against the
45 knives, and also in securely holding the spool or ball end of the cord after the band is cut,

and until the secondary holder operates, and the lower end of the looping-head is constructed with projections which operate the loose pivoted plate at the proper moment.

55 In the drawings, A is the large wheel through which motion is given to the mechanism, and *a a'* represent the gear-segments arranged upon its side for driving the inclined shafts.

60 B C are the inclined shafts, provided with pinions *b c* and delay-plates *b' c'*. The shaft B carries the looping-jaws *d* and looping-head D, and makes two full revolutions to every one revolution of the wheel A, which two full revolutions are effected continuously by the gear-
65 rim *a*. The shaft C, which carries the holding-plate E and the cutters *f f f*, and furnishes the pivot for the loose oscillating plate M, makes one-third of a revolution at every full revolution of the wheel A, which one-third of
70 a revolution takes place quickly and just as the other shaft, B, has completed its first and about one-third of its second revolution. When the two shafts B C are not in rotation by the action of the gear-segments they are held immov-
75 ably by their respective delay-plates which bear against the side of the large wheel A.

The normal position of the rotating parts is as shown in Fig. 3, with the delay-plates resting against the side of wheel A and the gear-
80 segments not in action. The cord is now brought down and swept forward by the needle, and engages in the notch *e* of plate E. A moment later the pinion *b* strikes the gear-segment *a*, and the jaws *d d* rotate about one and one-
85 third around, catching against the cord and looping it around them by their movement. Then, while the jaws are yet in motion, the pinion *c* strikes the teeth *a'* and rotates the plate E until its notch *e* is carried one-third
90 around in a direction away from the shaft B, thus raising the cord and holding it in line with the opening between the two jaws. The jaws, moving simultaneously in the same direction, hold the cord away from the cutters, 95 and finally seize it between them about the time or immediately after the plate E and cutters stop; but the head D not having fully completed its second revolution keeps on, and while so doing a projection, *r*, upon it strikes
100 a shoulder, *m*, on the loose plate M and turns it backward, when another projection, *r'*, on

the head D strikes another shoulder, m' , on the loose head and completes the backward movement of the latter, restoring all the parts to their normal position. (Shown in Fig. 3.) In moving back thus to its normal position the plate M strikes at the point m^2 against the cord stretched through notch e , forcing it against and upon the edge of the arm of the holder-plate E, just back of the notch, thereby causing the end of the cord to be seized and held ready for work. As the band-carrier operates to encircle the gavel the cord is carried forward underneath the arm of the holder-plate, upon which the end is clamped by plate M, and swings or is forced up into the second notch, e' . As the band-carrier completes the encircling of the gavel by the band it brings the other end of the latter down and presents it also in notch e' , after which, as the wheel A rotates, the knotting-jaws d and holder and cutter-plate E rotate as before. As the plate E makes this and every subsequent one-third of a revolution it carries the end of the previously-presented cord in notch e , or whichever notch it may be, and that is securely held, as above described, on the rear edge of the arm immediately in front of that notch, backward over and upon the spring clamping plate or jaw N, which bears upward against the under side of the plate E in such a position that the rotary movement of the latter plate forces the cord between it and the jaw. Immediately after the cord is seized by this secondary clamping or holding jaw the rotation of the looping-head brings the projection r against the shoulder m of the loose vibrating holding and cutting plate M, causing the latter in its backward movement to run off of and so loosen the end of the cord previously held by it. The end of the cord is now only held, and not so firmly, by the clamping-jaw N. The knotting-jaws d , continuing their second revolution, seize the two ends of the band looped by their first rotation around them. At this stage of the tying process, if the ends of the band were firmly held, the final rotation of the knotting-jaws would break it. To prevent its breaking I have, as just stated, caused the end to be released by the rigid clamping-plate M, that during the time the bundle is being compressed unyieldingly holds it and the cord to be seized by the spring clamping-jaw N between the end thereof and the loop on the knotting-hook. This secondary clamping-plate is so adjusted as to allow the end of the cord to pull through it as the knotting-hook completes its last revolution. The cord should be so firmly held by the secondary holder as to prevent the end from being withdrawn therefrom by the expansion of the bundle, and to insure its being inserted in the knotting-jaws, but also so loosely held as to allow the end to pull through it to avoid breaking. Just before the completion of the rotation of the knotting-hook a second lug or projection, r' , on the head D strikes another shoulder, m' , of the vibrating cutter and hold-

er-plate M, forcing the latter backward against the strands, severing the band between its upper cutting-edge and one of the fixed cutters, f , and firmly clamping the new end between its under or holding face and the upper face of the rear edge of one of the arms of the plate E, just back of the notch e' , after which, in the binding of the succeeding bundle, the movement of the binding-arm carries the cord forward underneath the arm of the plate E until it swings up into the succeeding notch e^2 , when the carrier completes the encircling of the bundle by the band and the knotting-hook, and the primary and secondary cord-holders are operated as before, and so continuously these operations are repeated for each bundle.

The holding-surface in top of plate E, I prefer to make quite narrow. A slight recess, h , in the top of each arm of the plate, just back of this holding-surface, aids somewhat in securely holding the end of the cord by leaving the extreme end unclamped, and so keeping it full-sized.

A stop, I, and projection m^3 limit the backward movement of plate M, its forward movement being limited by the projection m^3 striking against the side of the head D. None of the parts can thus get out of working position.

It will be observed that the cutters f and the plate E are both rigidly fixed to the shaft C and revolve therewith, while the plate M is simply pivoted to the said shaft between the cutters and plate E. The form of the plate M is fully shown in Fig. 8.

To prevent lint or broken pieces of the cord or grain from clogging the cord-holder, I provide the vibrating part M with a stripping edge or shoulder, m^4 , which, following just behind the holding-surface and being made on a tangential curve, gets in beneath at its forward end, and so sweeps these clogging substances outward as the plate E revolves.

The casting or frame G, which supports the several parts, is of the same general construction as the casting supporting corresponding parts in my patent aforesaid, and is attached to the binder in the same manner. The one casting, with the parts supported by it, may be removed from any machine and the other attached in its place and by the same screws.

It will be observed that the plate E is adapted to the binding of three gavels at one revolution, a gavel being bound and tied off at each notch e successively. It is evident, however, that the number three is taken arbitrarily, as is the number of notches or arms with concentrically-arranged holding-surfaces of plate E, and also the number of cutters f on plate E. These may be decreased to two and even to one, or increased at pleasure.

The tying bill or knotter shown in the drawings has certain features of construction non-essential to the combinations herein claimed, which I have made the subject of a separate application.

Having thus described my invention, I claim as new—

1. In a harvester-binder, the combination of a rotating hooked looping and tying head and jaws with an inclined rotating notched plate for guiding and presenting the cord properly to the jaws, a cutter for severing the cord, a clamp for holding the lower end of it, and a pivoted plate operated by power derived from the shaft of the looping-head to force the cord against the cutters at the proper time, substantially as described.

2. In a harvester-binder, a rotary tying or knotting device combined with a primary cord-holder adapted to seize and securely hold the end of the cord while the gavel is being compressed and encircled by the band, and a secondary yielding cord-holder working upon the cord between the primary holder and the tying device, and permitting the cord to pull through it under stress by the action of the tying device, substantially as and for the purpose described.

3. As an organized mechanism to which the cord is delivered by an independent binding-arm, a primary cord-holder adapted to seize and securely hold the end of the cord while the gavel is being compressed and encircled by the band, combined with a secondary yielding cord-holder working upon the cord between the primary holder and the tying device, and adapted to allow the cord to pull through it by the action of the tying device, substantially as and for the purpose described.

4. The combination, to form a cord-holder, of a rotary notched plate, to which the cord is delivered by the binding-arm, a clamping-plate adapted to carry the end of the cord tightly between it and the said rotary plate while the band is being passed around the gavel and to release said end after the gavel has been encircled, and a secondary yielding clamp, into which the end of the cord is carried by the onward rotation of the notched plate just before it is released from the primary clamp, substantially as and for the purpose set forth.

5. The combination of a rotary looping and tying head, a rotary notched plate for guiding and presenting the cord properly to the action

of said head, a plate adapted to carry the end of the cord tightly between it and the notched guiding-plate while the band is being passed around the gavel, but which releases said end after such operation has been effected, and a secondary yielding clamp, into which the end of the cord is carried just before it is released from the primary clamp, and from which it is drawn out after the looping and tying head operates to complete the knot, substantially as described.

6. The combination of the looping and tying head, the rotary notched plate for guiding and presenting the cord properly to the action of the head, the clamping-plate operated by the looping and tying head, and constituting, with the notched plate, the primary clamp, and the spring clamping-plate below the notched plate and co operating therewith to form the secondary clamp, substantially as described.

7. The combination of the looping and tying head, the rotary notched guiding-plate, the clamping-plate operated by the looping and tying head, the spring clamping-plate of the secondary clamp, and the rotary cutters, substantially as described.

8. The combination of the plates E and M with the cutters, the lower yielding clamp, and the tying and looping head, substantially as described.

9. In a harvester-binder, the combination of a rotary notched plate receiving the cord from the binding-arm in one or the other of its notches, a movable cord-cutter, which advances to position for severing the cord passing through said notch, and a movable plate between the two, which forces the cord against the cutter thus advanced, substantially as described.

10. In a harvester-binder, the plate M, or its equivalent, pivoted on the cord-holding head and operated by the cord looping and tying head, substantially as described.

11. The plate M, formed with the tangentially-curved stripping edge or shoulder m^4 , as and for the purpose set forth.

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Witnesses:

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CHAS. A. BROWN.