

(No Model.)

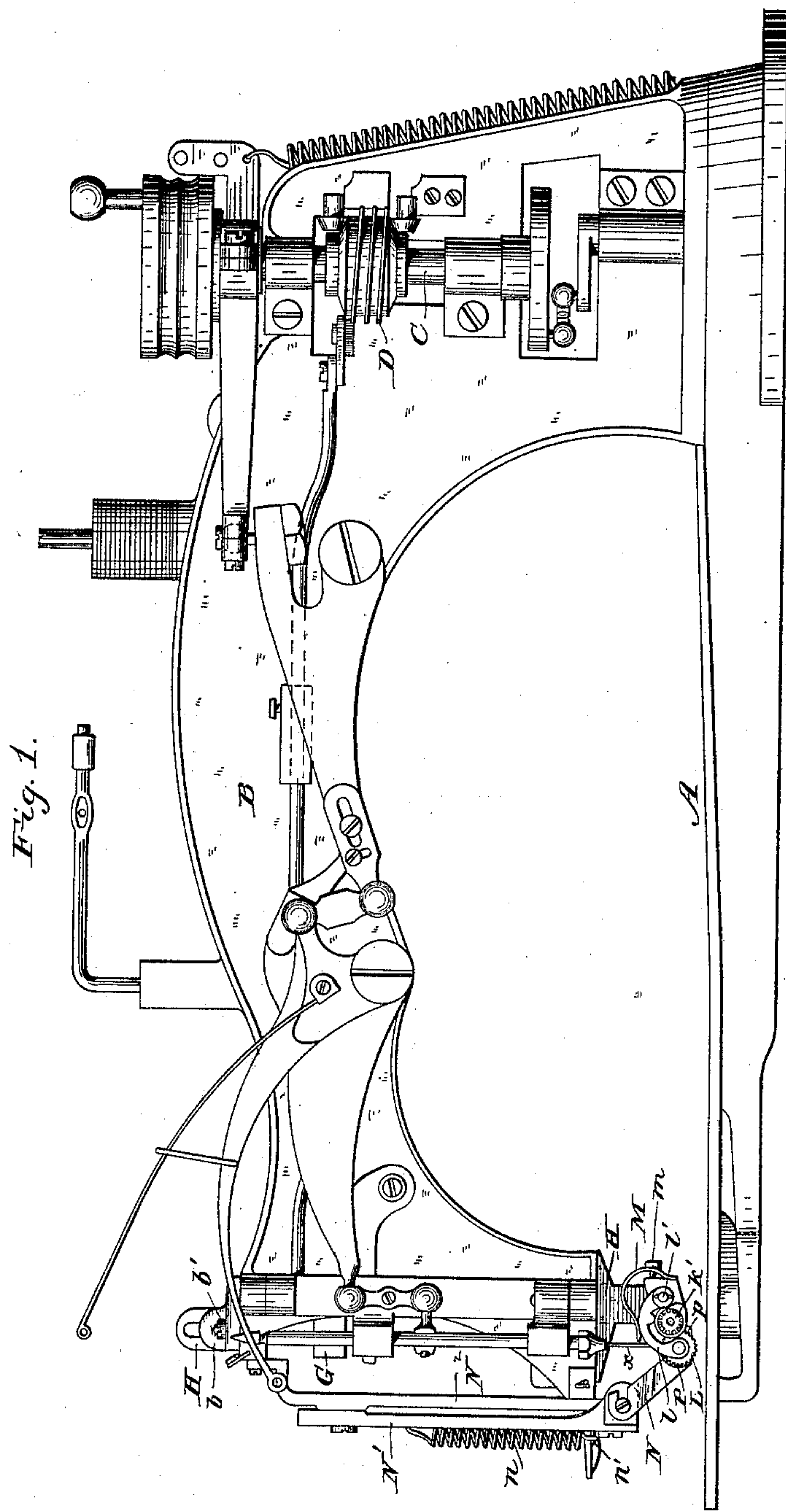
4 Sheets—Sheet 1.

S. ARNOLD.

# FEEDING MECHANISM FOR SEWING MACHINES.

No. 331,108.

Patented Nov. 24, 1885.



*Witnesses:*

H. N. Low.  
William Cabier.

*Inventor:*

S. Arnold,  
by Henry Calver-

(No Model.)

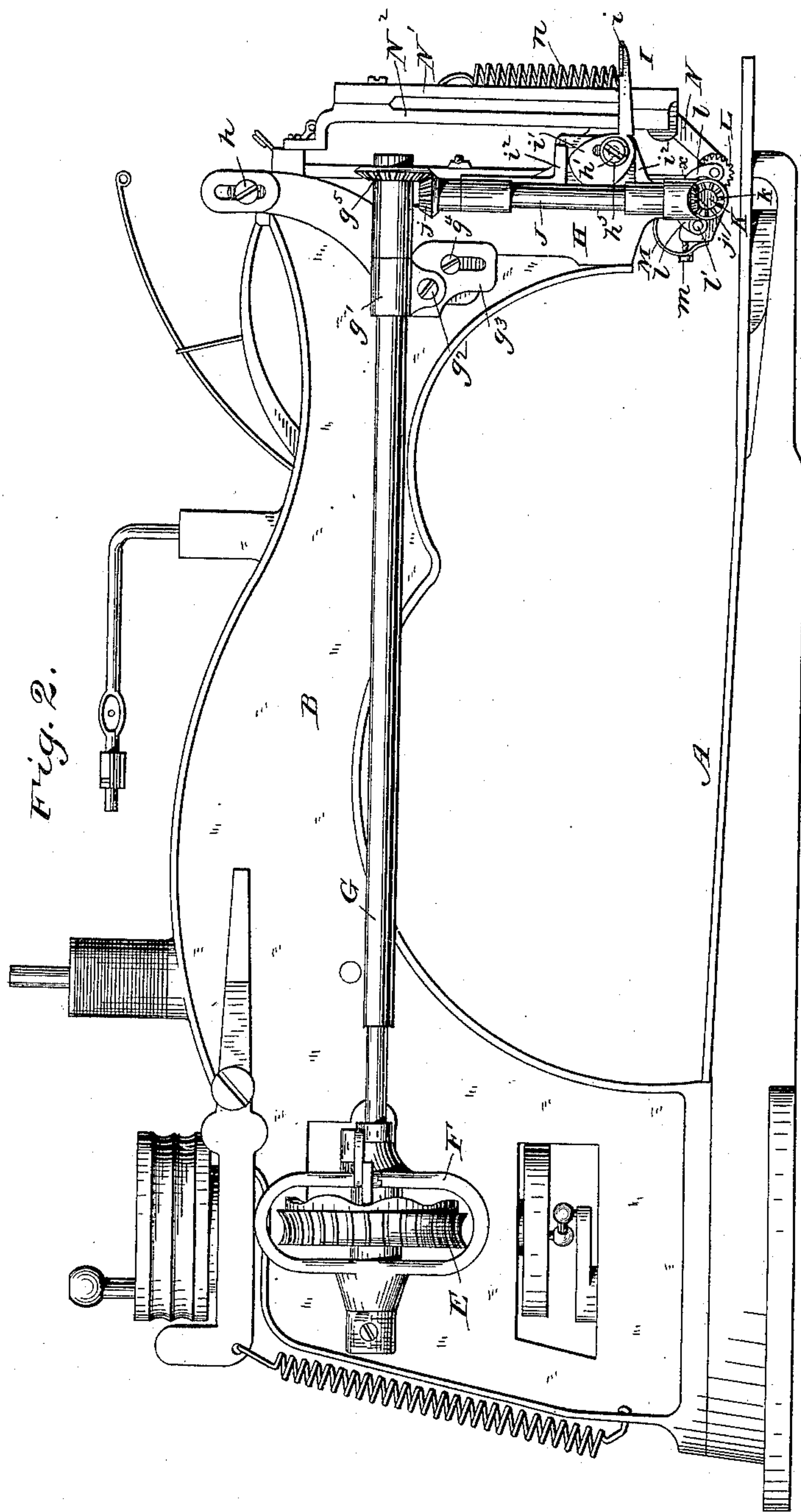
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Patented Nov. 24, 1885.



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(No Model.)

4 Sheets—Sheet 3.

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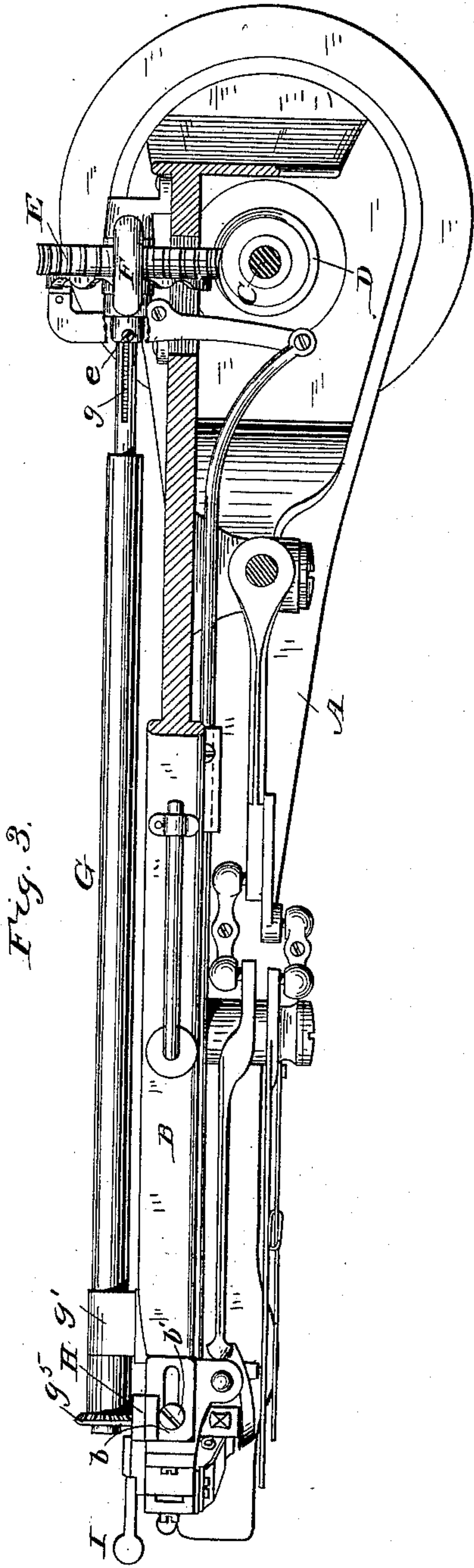


Fig. 3.

Fig. 5a

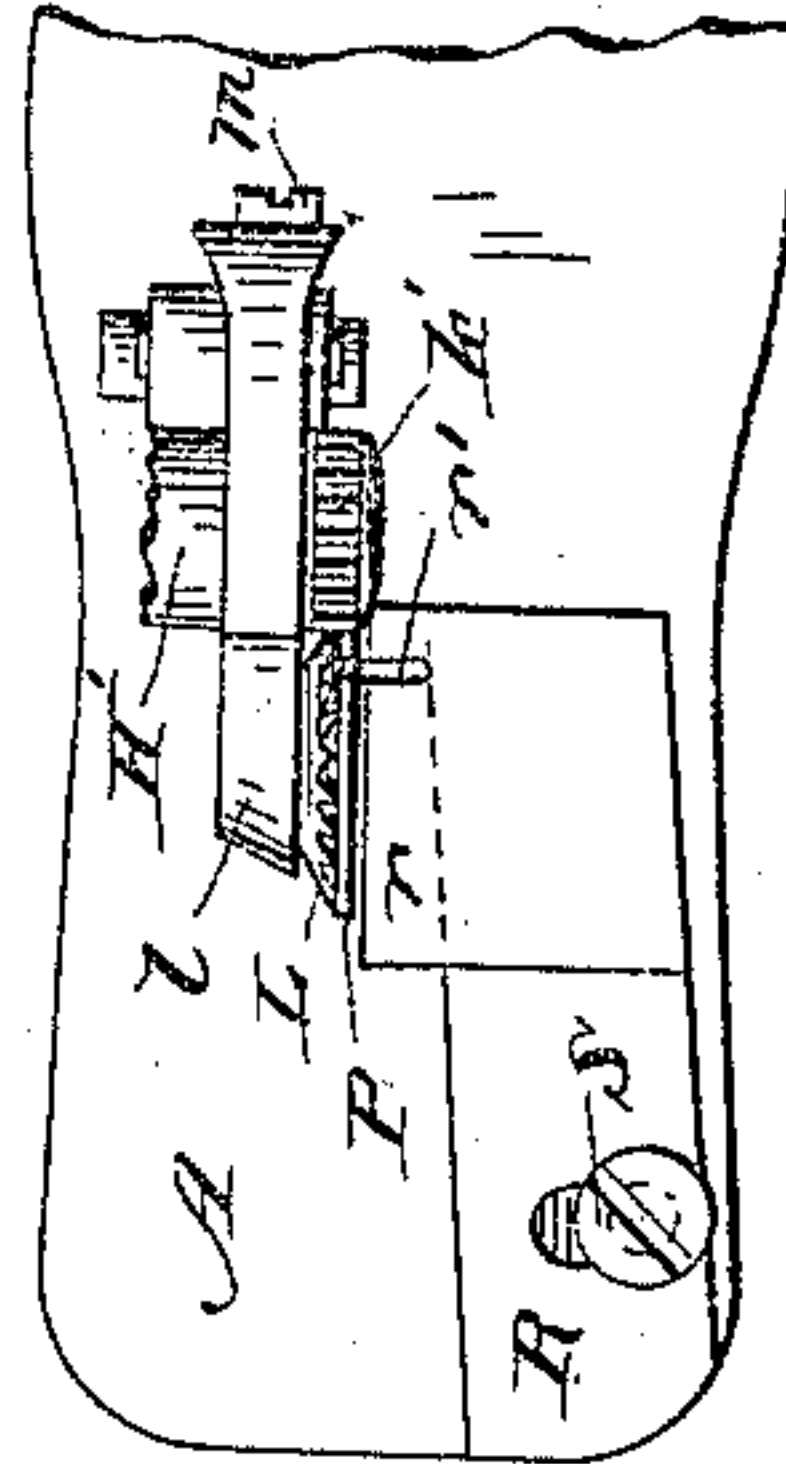


Fig. 5.

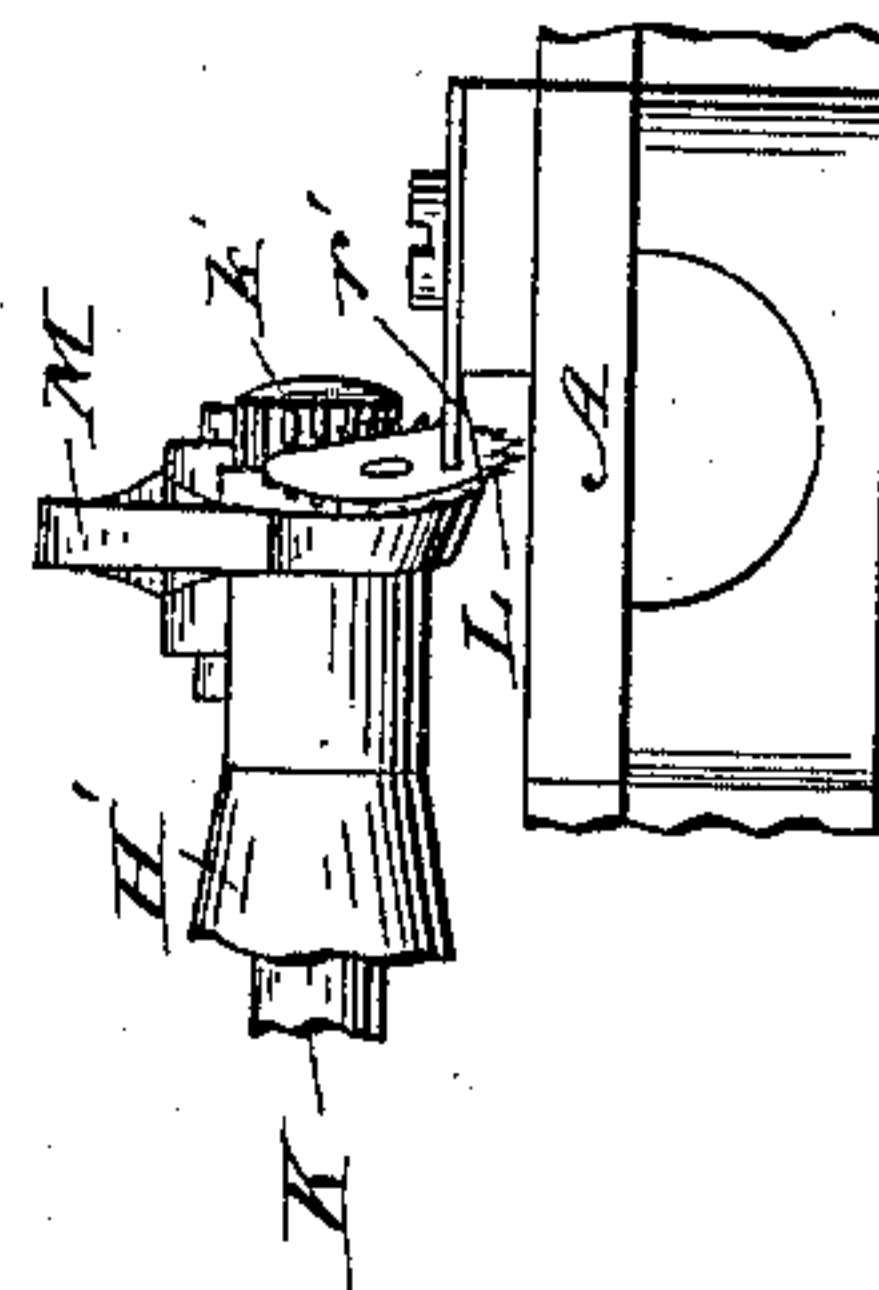
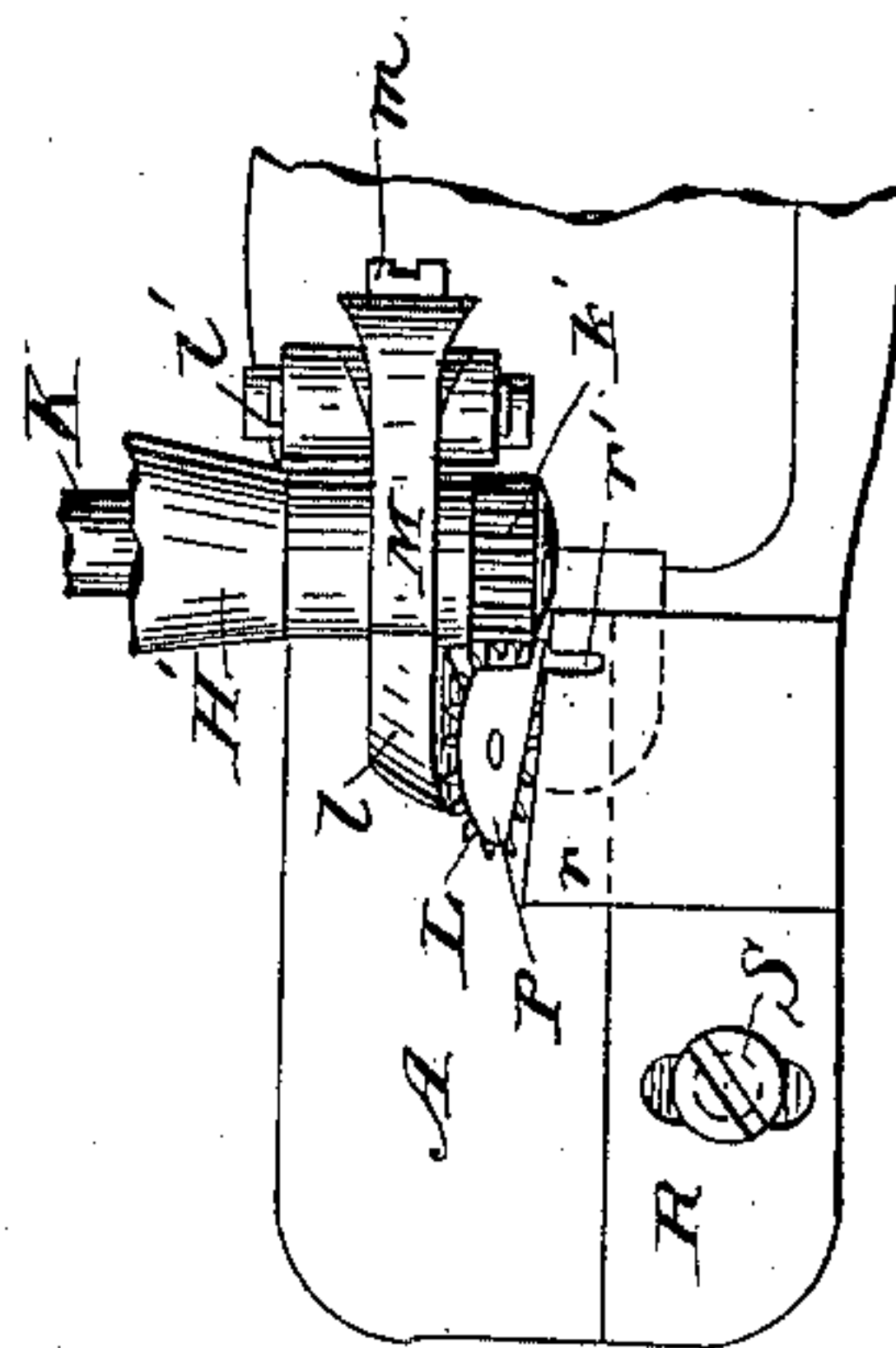


Fig. 4.



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(No Model.)

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Fig. 9.

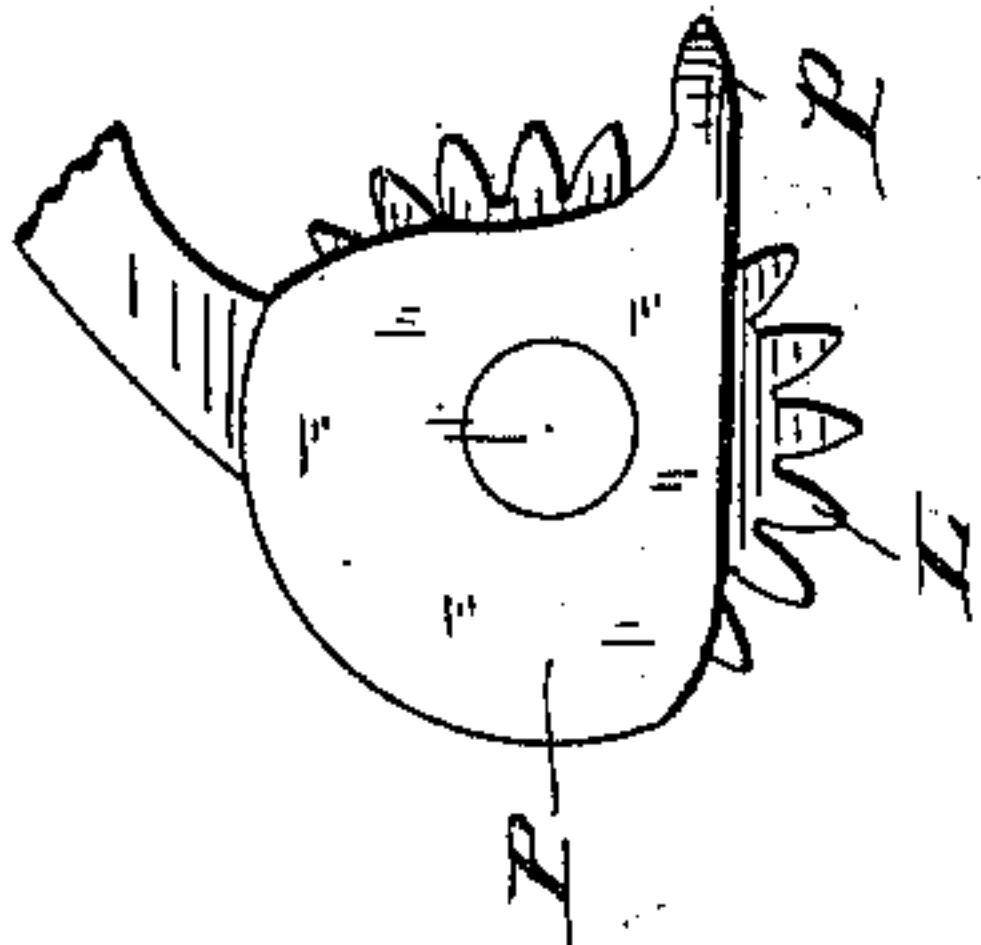


Fig. 10.

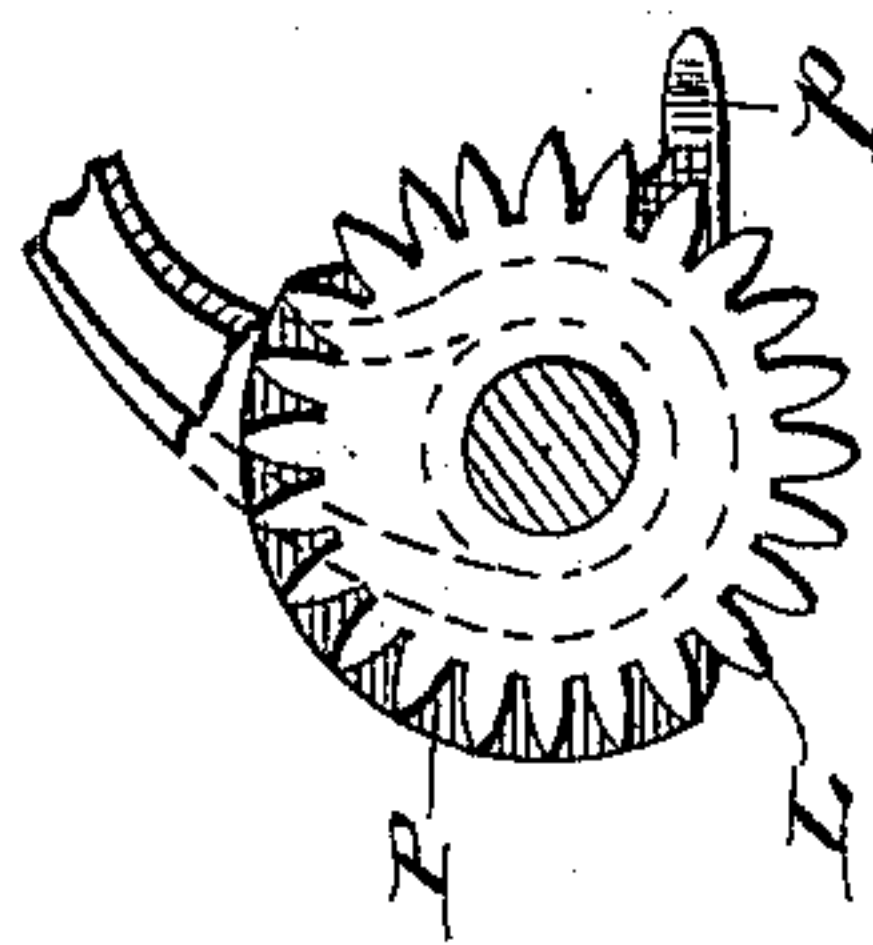


Fig. 7.

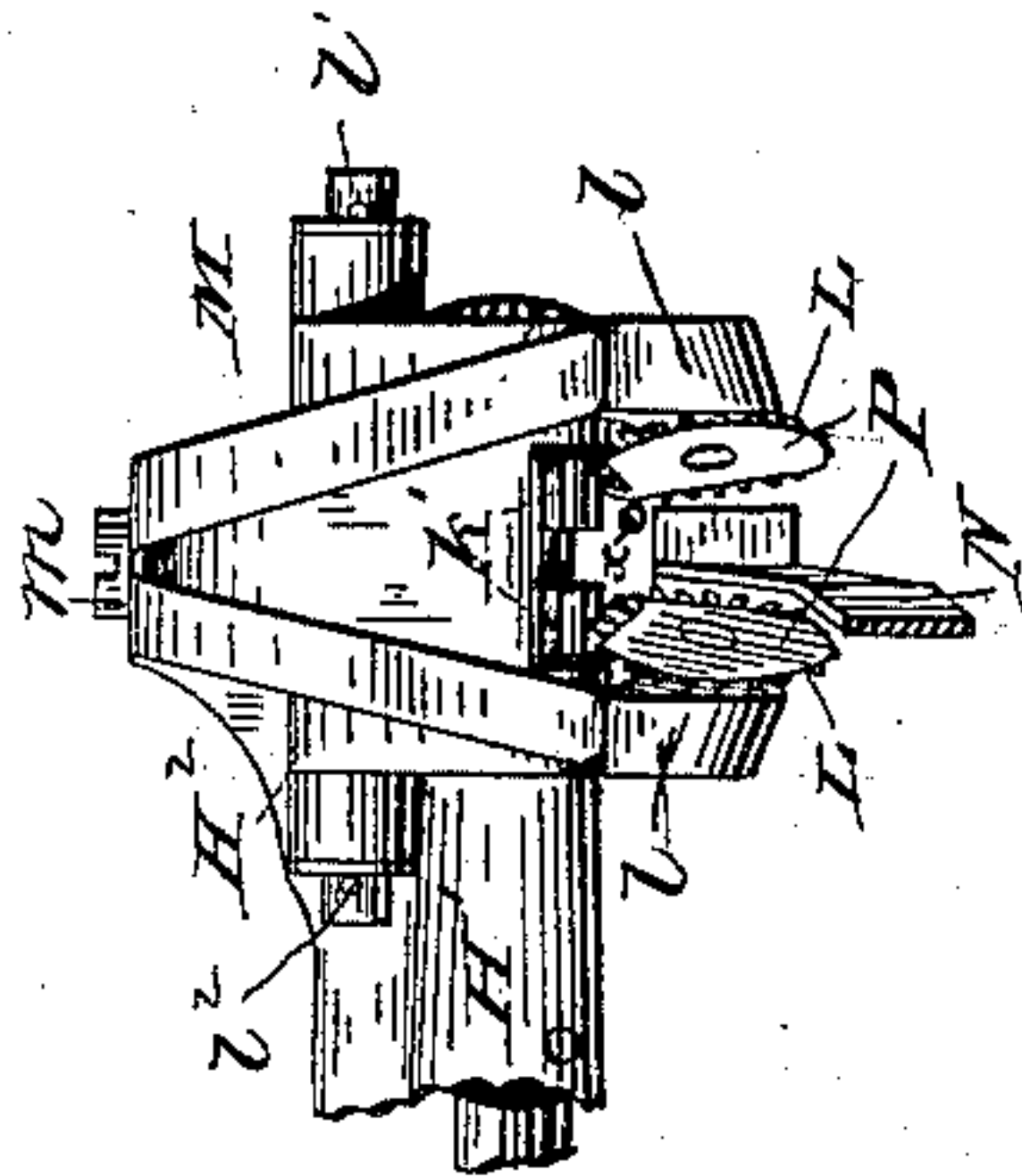


Fig. 8.

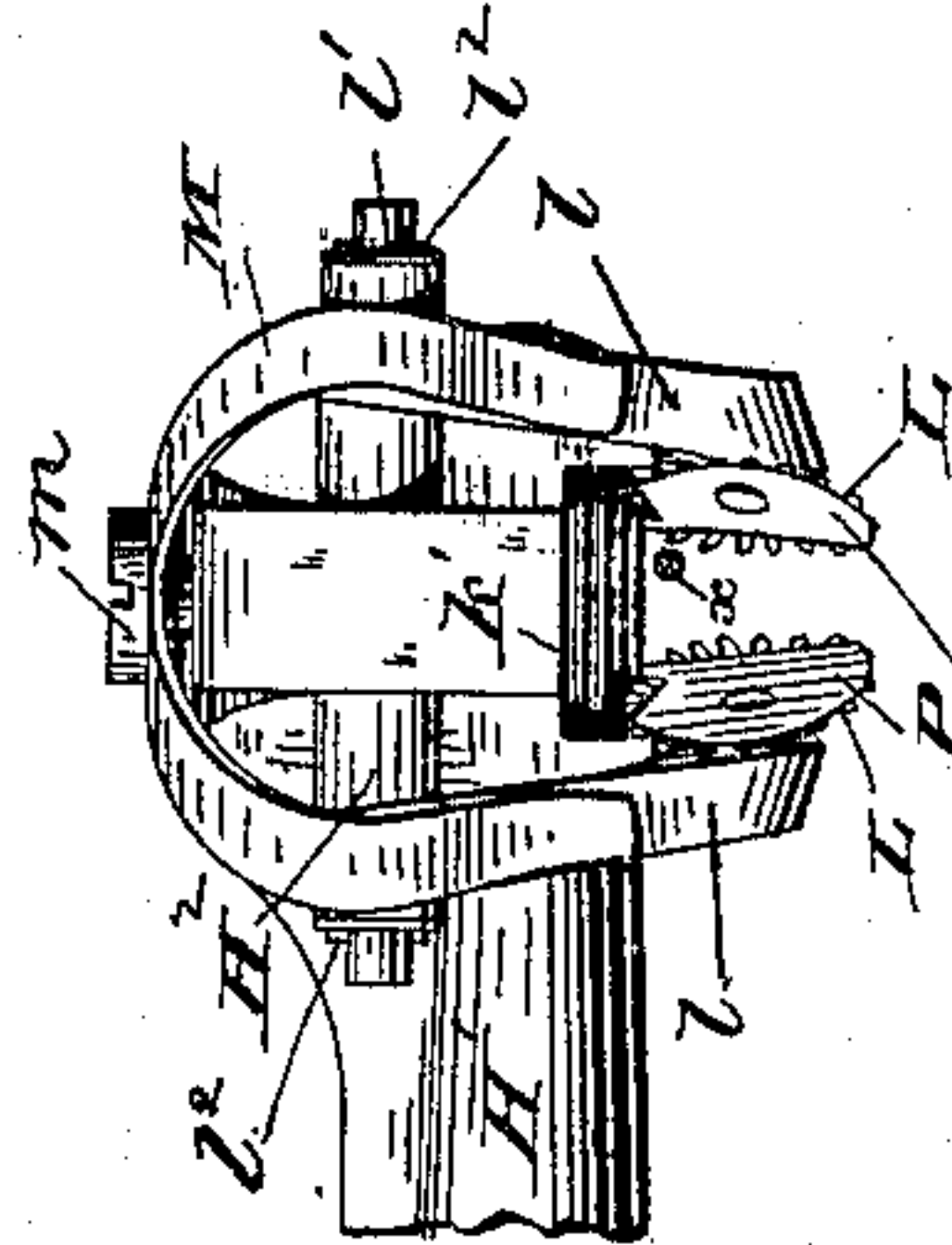
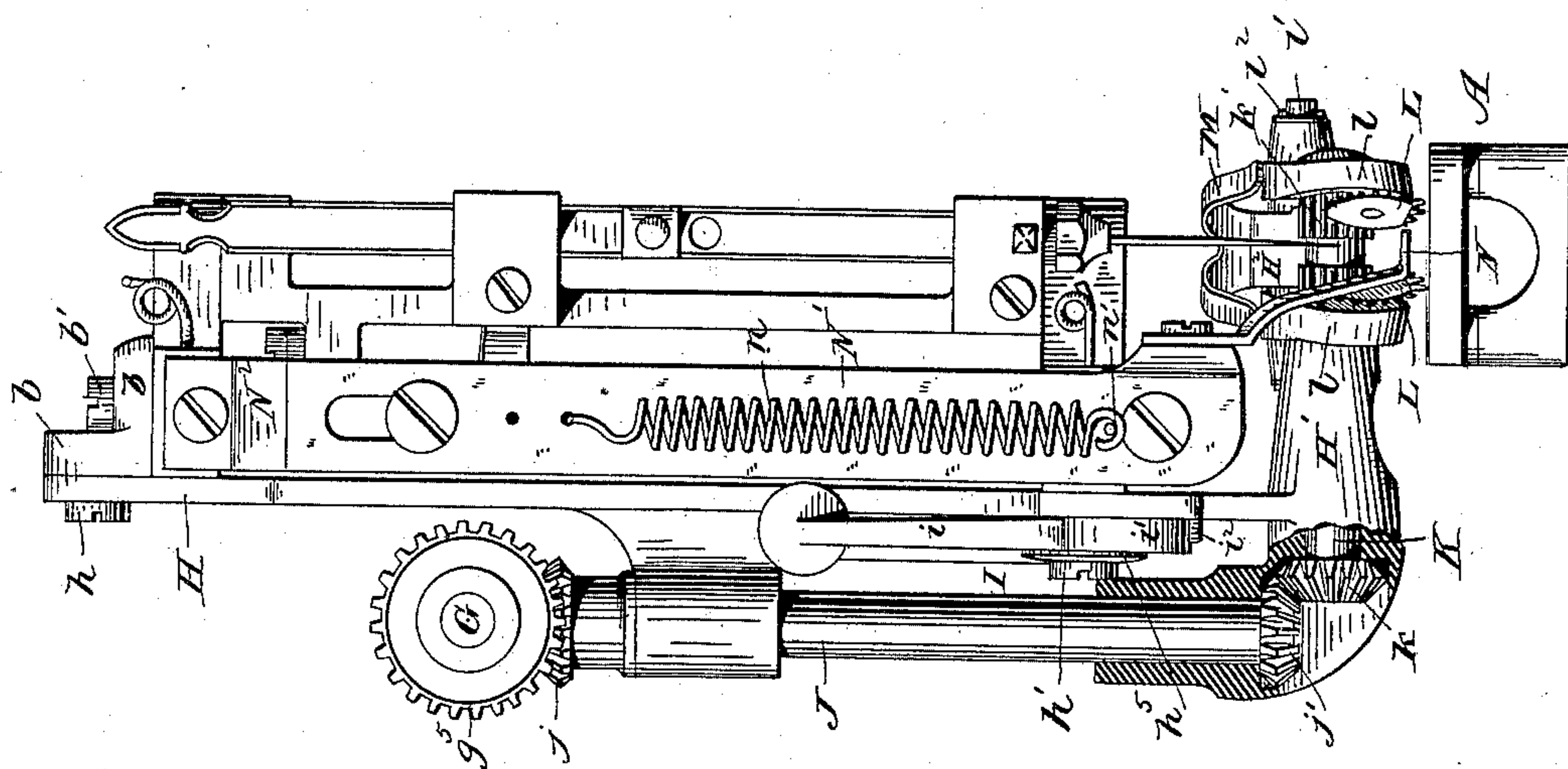


Fig. 6.



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# UNITED STATES PATENT OFFICE.

SATTERLEE ARNOLD, OF BROOKLYN, NEW YORK, ASSIGNOR TO ANNA M. ARNOLD, OF SAME PLACE.

## FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 331,108, dated November 24, 1885.

Application filed June 28, 1884. Serial No. 136,233. (No model.)

*To all whom it may concern:*

Be it known that I, SATTERLEE ARNOLD, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Feeding Mechanism for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates more particularly to that class of sewing-machine feeding mechanisms in which the work is moved forward by a roughened or serrated wheel, or by two such wheels in co-operation; and the object of my invention is to adapt feeding mechanisms of this class to some kinds of work for which they have not heretofore been entirely suitable.

In the accompanying drawings, Figures 1 and 2 are opposite side elevations of a sewing-machine embodying my invention in its preferred form. Fig. 3 is a plan view of the same, partly in section. Fig. 4 is a plan of a single feed-wheel and guide. Fig. 5 is an elevation of the same. Fig. 5<sup>a</sup> is a plan view similar to Fig. 4, but showing a modified form of guide. Fig. 6 is a detail view of the front of the machine. Fig. 7 is a detail plan view of the feeding-wheels and adjacent parts. Fig. 8 is a similar view with the wheels differently arranged, and Figs. 9 and 10 are detail views of a feeding-wheel and its combined stripper and guard.

The drawings represent my invention as being applied to a machine having the stitch-forming mechanism fully shown and described in my applications Nos. 131,487 and 131,488, filed May 12, 1884, and which need not therefore be herein particularly referred to.

A indicates the work-plate or work-support, made in the form of an arm or horn, and B the bracket-arm secured to the work-support and sustaining the operating mechanism of the machine. C is the driving-shaft, on which is mounted (and preferably fixed to said shaft) a worm, D, meshing with a worm-wheel, E, journaled in a frame, F, attached to the bracket-arm B. A screw-pin, e, passing through the hub of the wheel E, engages a groove, g, in the rear end of a transmitting-shaft, G, loosely entering said hub. The forward end of the shaft

G is supported by a bearing, g', pivotally attached by a screw, g<sup>2</sup>, to an adjustable slotted plate, g<sup>3</sup>, secured by a screw, g<sup>4</sup>, to the feed-hanger H, the latter being connected to the arm B by screws h and h', passing through slots in said hanger. The screw h enters a slotted plate, b, adjustably attached to the upper side of the arm B by a set-screw, b', and the screw h' serves also as a pivot for the lifter I, which consists of a handle, i, and cam i', the latter being arranged between ribs or lugs i<sup>2</sup> on the hanger. To the forward end of the shaft G is secured a beveled gear-wheel, g<sup>5</sup>, meshing with a similar gear-wheel, j, at the top of a vertical shaft, J, having bearings in the hanger H. The shaft J carries at its lower end a gear-wheel, j', meshing with the gear-wheel k on a shaft, K, journaled in a horizontal arm, H', forming part of the hanger H. The shaft K is also provided with gear-wheels k' k', (which may, if desired, be a single wide gear-wheel, as shown in Fig. 8,) meshing with the feed-wheels L. The two wheels k' are however preferable, as the space between them admits of a greater adjustment of the feed-wheels relative to the needle, the purpose of which will be explained presently.

The feed-wheels L are carried by arms l, pivoted on a pin, l', passing through a block, H<sup>2</sup>, secured to or formed integral with the horizontal arm H' of the feed-hanger, the feed-wheels being yieldingly held upon the work which passes beneath them by a forked spring, M, secured to the block H<sup>2</sup> by a screw, m. By tightening said screw the pressure of the forked spring M on the arms l may be increased, and by loosening the said screw the pressure may be diminished. As the feed-wheels are thus carried by separate spring-pressed arms, it is obvious that they may rise and fall independently according to the requirements of the work, thus permitting a single thickness of thin fabric to be properly fed by one wheel, while a doubled or thicker fabric is being fed by the other.

One of the uses for which my machine herein shown is specially adapted is for uniting the abutted edges of knit or other fabrics, the needle having a lateral movement, so as to cross and recross the line of the abutted edges,



and in the present embodiment of my invention the feeding-wheels L are placed a sufficient distance apart to admit of this lateral movement of the needle.

5 In sewing fabrics together with their edges abutted, it is desirable that the edges should be closely pressed against each other, and to effect this result I have shown my feeding-wheels as being arranged at acute angles to  
10 each other and to the line of movement of the work, the said wheels converging toward each other rearwardly, and thus having a tendency to press the abutted edges of the fabric toward each other. In some classes of work,  
15 as in forming clocking on hosiery, for which my machine is also adapted, it will be desirable to stretch or distend the fabric laterally as it is presented to the needle, and in such case the feeding-wheels will be arranged at  
20 acute angles to the line of the work, but diverging rearwardly, as shown in Fig. 8; but it will be obvious that for many kinds of ordinary work it will be preferable to arrange the wheels with their faces parallel to each  
25 other. These different arrangements may be effected by providing interchangeable sets of arms l, some bent outward, as shown in Fig. 7, some bent inward, as shown in Fig. 8, and others not bent at all. The arms l may be  
30 readily removed from their pivot-pin l' when the detaining-pins l'' have been taken out.

As it is desirable in sewing fabrics together with their edges abutted, and in some other  
35 classes of work, to push the goods forward or toward the needle rather than to pull them forward, the feeding-wheels L are preferably arranged with their centers or feeding portions in front of the needle or sewing-point, as shown in Figs. 1, 2, 7, and 8, in  
40 which x indicates the needle. With some kinds of work, however, it will be better to have the centers of the feeding-wheels alongside of or behind the needle, and thus to adapt my machine to a wide range of work, I have  
45 made the feed-hanger H adjustable, so that the feeding-wheels may be made to occupy different positions relative to the needle or sewing-point. The feed-hanger is connected with the arm B by the screws h and h', as before  
50 stated, the latter screw entering a threaded hole in a fixed portion of the arm, while the former enters a threaded hole in the adjustable plate b. When the set-screw b' is loosened, the feed-hanger may be turned on  
55 the screw h' as a pivot or center, thus adjusting the feed-wheels backward or forward in the line of the feed, or of the movement of the work, to any desired position, and after adjustment the screw b' will again be tightened  
60 to fix the hanger in place.

The adjustment just above described may also be utilized to regulate the effective degree of convergence or divergence of the feeding-wheels without changing the arms l. Thus,  
65 if the feeding-wheels should be found to converge or diverge too much for the work being done, it would only be necessary to adjust

them toward the needle, as the effect of the convergence or divergence would of course be lost if applied to the work after it was sewed. 70

N is the presser-foot, which is placed between the feeding-wheels and attached to a vertically-movable bar, N', having a slotted connection with a supporting-bar, N'', rigidly fixed to the arm B. The presser-foot, which is short and  
75 entirely in front of the needle, is yieldingly held upon the work by a spring, n, connected with a pin, n', attached to the rigid bar N'' and to the presser-bar.

As it has been found that a presser-foot that  
80 would serve as an effective stripper to prevent the goods from winding on the feeding-wheels required a very nice adjustment, and that its position had to be changed every time the position of the feeding-wheels relative to  
85 the needle was varied, I have provided independent strippers P, which consist of thin plates arranged adjacent to the inner faces of the feeding-wheels and rigidly attached to the pins on which said wheels revolve. The  
90 working parts of these strippers consist of the rearwardly-projecting points p. The said plates or strippers are preferably extended so as to be flush with or project slightly beyond the upper and forward parts of the wheels,  
95 thus serving as guards for the same and preventing the fabric from becoming entangled therewith. These guards will also serve to protect the points of the feeding-wheels from accidental injury. 100

As my machine is more particularly intended for manufacturing purposes rather than for domestic use, it will not be necessary to vary the feed frequently; but when it is desirable to change the feed to adapt it to a particular class of work the gear-wheel g<sup>5</sup> may be removed from the shaft G (by taking out the pin by which said wheel is secured to said shaft) and a larger or smaller interchangeable gear-wheel be substituted therefor, the vertically-adjustable slotted plate g<sup>3</sup> permitting the forward end of the shaft G to be raised or lowered. As the rear end of the shaft G is loosely fitted to the hub of the worm-wheel E, and is caused to rotate by the engagement of  
110 the screw-pin e in the groove g in the shaft, the forward end of the shaft may be adjusted vertically without causing said worm-wheel to bind in its bearings. 115

The slots in the feed-hanger H, through  
120 which the screws h and h' pass, permit said hanger to be positively raised and lowered by the cam lever or lifter I, the screw h' being set tight enough to make the frictional contact between said lifter and hanger sufficient  
125 to cause the latter to remain in any position, either raised or lowered, in which it may be placed by the movement of the lifter. This frictional contact may be provided for by a spring-washer, as h<sup>5</sup>, placed beneath the head  
130 of the screw h', or by the adjustment of the screw alone. Thus, when the hanger has been positively lowered and the feed-wheels forced against the work by the movement of the cam



lever or lifter I, the said wheels will remain in working position until the hanger has again been raised by the lifter.

As the machine herein shown is intended to be used mainly in sewing short stitches in knitted fabrics which are very elastic, the feeding-wheels are connected with the driving-shaft, so that their movement will be continuous, the fabric yielding sufficiently when the needle is in the work to compensate for the movement of the latter during that time, and thus the sewing is not interfered with. The advantages of a continuous feed, when practicable, in machines intended to run at high rates of speed will be readily appreciated by those skilled in the art to which my invention relates, as the jerky movements incidental to all intermittent feeds are thereby avoided. The movements of my feed may, however, be rendered intermittent, if desired, by mounting the worm-wheel loosely on the driving-shaft, so that while being connected with said shaft so as to rotate therewith it may be made to reciprocate longitudinally thereof in the manner and by the means described in my application No. 131,487, hereinbefore referred to.

While two feeding-wheels, arranged at acute angles to each other and to the line of movement of the work, will usually be preferable, it will be understood that in some cases a single feeding-wheel arranged at an angle to such line of movement may be used. In such case a guide against which the fabric would be urged by said inclined feeding-wheel will generally be employed. This use of my invention is shown in Figs. 4 and 5, in which R indicates the guide adjustably attached to the work-plate by a set-screw, S, passing through a slotted hole in said guide. The guide is preferably formed with an overhanging lip, *r*, having an inclined edge fitting against the inclined face of the feed-wheel or of the stripper, said overhanging lip, which is intended to take the place of the presser-foot, having a slotted needle-hole, *r'*, to admit of lateral movements of the needle.

It has been found that the ordinary four-motioned feed does not always work satisfactorily with knitted goods, for which my machine is more particularly intended, as they are so elastic that they will stretch when engaged by the feeding-surface and then again contract when the latter is disengaged therefrom, and thus the goods may fail to be properly moved to form the stitches. For this reason a wheel-feed which always has a positive hold on the goods is found most advantageous, and in operating my wheel-feed it has been demonstrated that a worm and worm-wheel serve a much better purpose than ordinary gearing, as the movement is smooth and positive, and the "backlash," to which ordinary gearing is liable, is mostly avoided.

I am aware that it is not new to arrange a feeding-wheel above the work-plate or work-support; and I am also aware that two feeding-wheels arranged on opposite sides of the

needle have heretofore been employed, but in such instance said feeding-wheels were below the work, and were so placed that their axes were opposite to the sewing-point or the line in which the needle reciprocated.

Instead of using a single feed-wheel arranged at an angle to the line of movement of the work, in connection with a guide whose guiding-face is parallel to such line, as shown in Figs. 4 and 5, it will be understood that the feeding-wheel may be parallel to the line of movement of the fabrics and the face of the co-operating-guide be inclined relative thereto, as shown in Fig. 5<sup>a</sup>, without departing from my invention.

It will be understood that the term "feeding-wheel" as employed in this specification and the claims thereof has reference to a wheel having a toothed or roughened periphery, and being thereby adapted to take hold of the fabrics to move the same along. It will also be understood that the term "opposing member" as used in my first claim is intended to cover either an opposing feed-wheel which counteracts the tendency of the work to move laterally or a guide which serves the same purpose.

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

1. In a sewing-machine, a work-plate, a feeding-wheel arranged at an angle to the line in which the work is to move, and mechanism for supporting and operating said wheel, combined with an opposing member co-operating with said feeding-wheel, substantially as set forth.

2. In a sewing-machine, a feeding-wheel arranged above the work-plate, and having its center in front of the sewing-point, combined with a work-plate, and mechanism for supporting and operating said wheel, substantially as set forth.

3. In a sewing-machine, a feeding-wheel and a co-operating-guide, one of which is inclined relative to the line in which the work is to move, said wheel being arranged above the work-plate, and said guide being to one side of said wheel, combined with a work-plate, and with mechanism for supporting and operating said feeding-wheel, substantially as set forth.

4. In a sewing-machine, a feed-hanger and a feed-wheel carried by a pivoted arm yieldingly supported on said hanger, combined with mechanism for operating said wheel, substantially as set forth.

5. In a sewing-machine, a feed-hanger, a gear-wheel sustained thereby, a pivoted arm also supported by said hanger, and a feed-wheel carried by said arm and held thereby in engagement with said gear-wheel, and adapted by its pivoted connection with the hanger to rise and fall and still retain its connection with said gear-wheel, combined with mechanism for operating said gear-wheel, substantially as set forth.

6. In a sewing-machine, two feeding-wheels



arranged above the work-plate and on opposite sides of the needle, combined with a work-plate, and mechanism, also arranged above said work-plate, for supporting and operating said wheels, substantially as set forth.

7. In a sewing-machine, two feeding-wheels arranged on opposite sides of the needle at acute angles to each other and to the line of movement of the work, combined with a work-plate, and mechanism for supporting and operating said wheels, substantially as set forth.

8. In a sewing-machine, two feeding-wheels arranged on opposite sides of the needle and converging rearwardly toward each other, combined with a work-plate, and mechanism for supporting and operating said wheels, substantially as described.

9. In a sewing-machine, the combination of two feeding-wheels arranged above the work-plate, mechanism for operating said wheels, a presser-foot placed between the feeding-wheels, and a support for said presser-foot, substantially as set forth.

10. In a sewing-machine, two feeding-wheels arranged on opposite sides of the needle, and having their centers in front of the sewing-point, combined with a work-plate, and mechanism for supporting and operating said wheels, substantially as set forth.

11. In a sewing-machine, a vertically-movable feed-hanger arranged above the work-plate, and two feeding-wheels sustained by said hanger, combined with mechanism for operating said wheels, substantially as set forth.

12. In a sewing-machine, two feeding-wheels and two arms for supporting said wheels independently of each other, combined with a feed-hanger or support for sustaining said arms, and mechanism for operating said wheels, substantially as described.

13. In a sewing-machine, two feeding-wheels and two pivoted yielding arms by which said wheels are carried independently of each other, combined with a feed hanger or support for sustaining said arms, and mechanism for operating said wheels, substantially as set forth.

14. The combination, with a stationary part of a sewing-machine frame, as the bracket-arm, of a feed hanger or support which is adjustable in the line of the movement of the work, and one or more feeding-wheels sustained by said hanger, whereby said wheel or wheels may be placed in different positions relative to the needle or sewing-point, substantially as set forth.

15. In a sewing-machine, the combination, with the bracket-arm, a vertically-movable feed-hanger attached thereto, and feeding devices carried by said hanger, of a lifter or device for raising and lowering said hanger hav-

ing a frictional connection with the latter, and thus adapted to rigidly retain said hanger in any position in which it may be placed, substantially as set forth.

16. In a sewing-machine, the combination, with the feed-hanger and its shafts and their gearing, of a plate adjustably secured to said hanger, a pivoted bearing attached to said plate, and a transmitting-shaft having its forward end journaled in said bearing and provided with a removable gear, whereby the transmitting-shaft is adapted to receive interchangeable gears of varying sizes and to be adjusted into operative relation to the vertical shaft of the hanger, substantially as set forth.

17. In a sewing-machine, the combination, with the driving-shaft and one or more feeding-wheels, of a worm mounted on said shaft, a worm-wheel engaged by said worm, and intermediate mechanism for transmitting the movement of said worm-wheel to said feeding wheel or wheels, substantially as set forth.

18. The combination, with the driving-shaft C, worm D, worm-wheel E, transmitting-shaft G, having gear-wheel  $g^5$ , feed-hanger H, having arm H', shaft J, having gears  $j$  and  $j'$ , shaft K, having gears  $k$  and  $k'$ , and the feed-wheels L, substantially as set forth.

19. The combination, with the feed-hanger having the horizontal arm H', of the arms  $l$ , the forked spring M, bearing on said arms, the securing and adjusting screw  $m$ , and the feeding-wheels L, carried by said arms, substantially as set forth.

20. In a sewing-machine, the combination, with a feed-wheel, of a stripper arranged adjacent to the face thereof, and serving to strip the fabric from the teeth of said wheel, substantially as described.

21. In a sewing-machine, the combination, with a feed-wheel, of a stripper supported on the axis on which said wheel revolves, substantially as set forth.

22. In a sewing-machine, the combination, with a feeding-wheel, of a combined stripper and guard arranged adjacent to the face thereof, substantially as set forth.

23. In a sewing-machine, the combination, with a feeding-wheel, of a stripper arranged adjacent to the face thereof, its stripping portion projecting rearwardly of the wheel and its front portion being extended to the periphery of the wheel, and thus adapted to serve as a guard, substantially as set forth.

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

SATTERLEE ARNOLD.

Witnesses:

PERCIVAL J. PARRIS,  
GEO. B. LAUCK.