

(Model.)

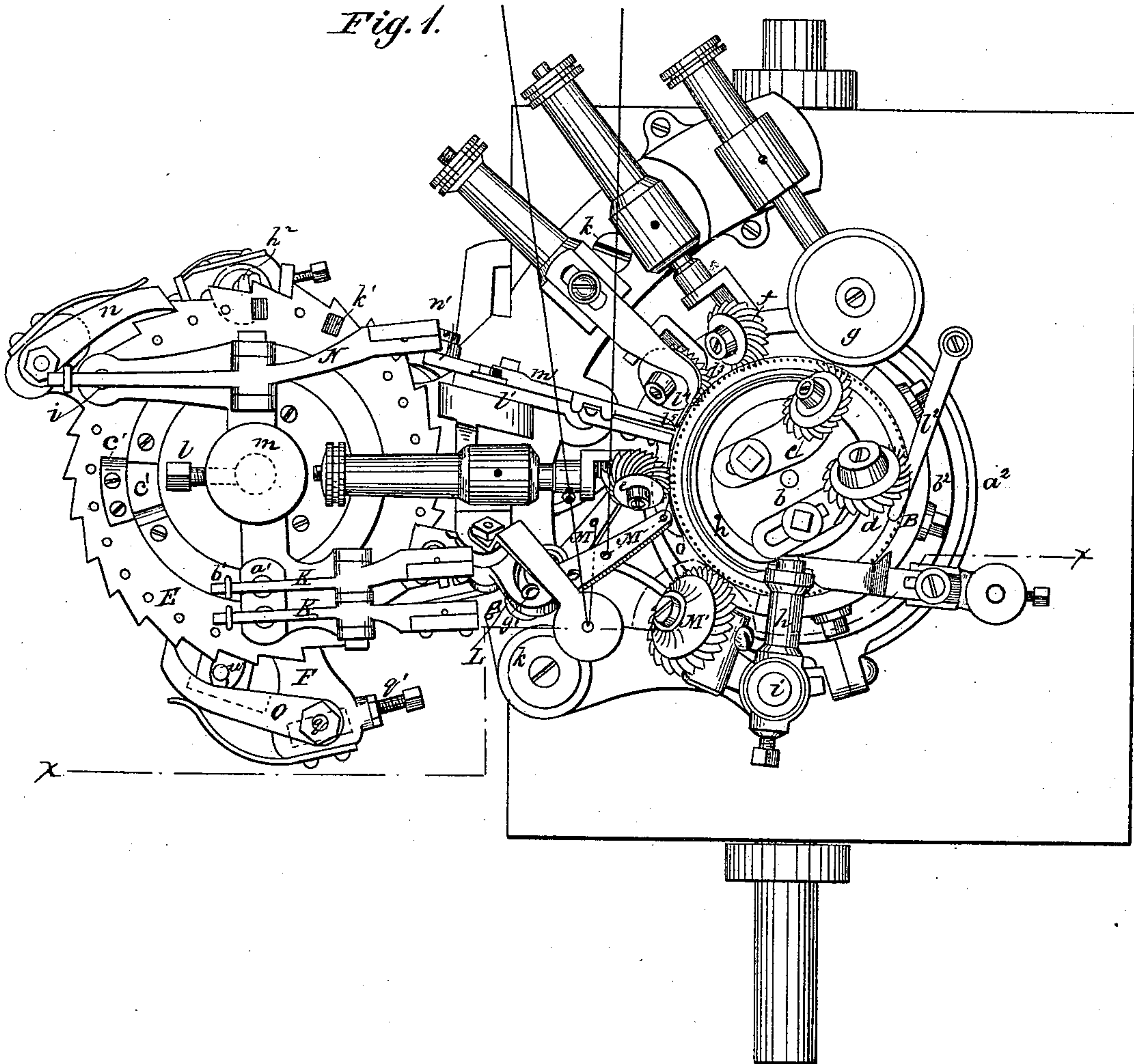
4 Sheets—Sheet 1.

J. A. PARR.
KNITTING MACHINE.

No. 262,467.

Patented Aug. 8, 1882.

Fig. 1.



WITNESSES:

Donn Twitchell
C. Bedgwick

INVENTOR:

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BY *Munn & Co*
ATTORNEYS.

(Model.)

4 Sheets—Sheet 2.

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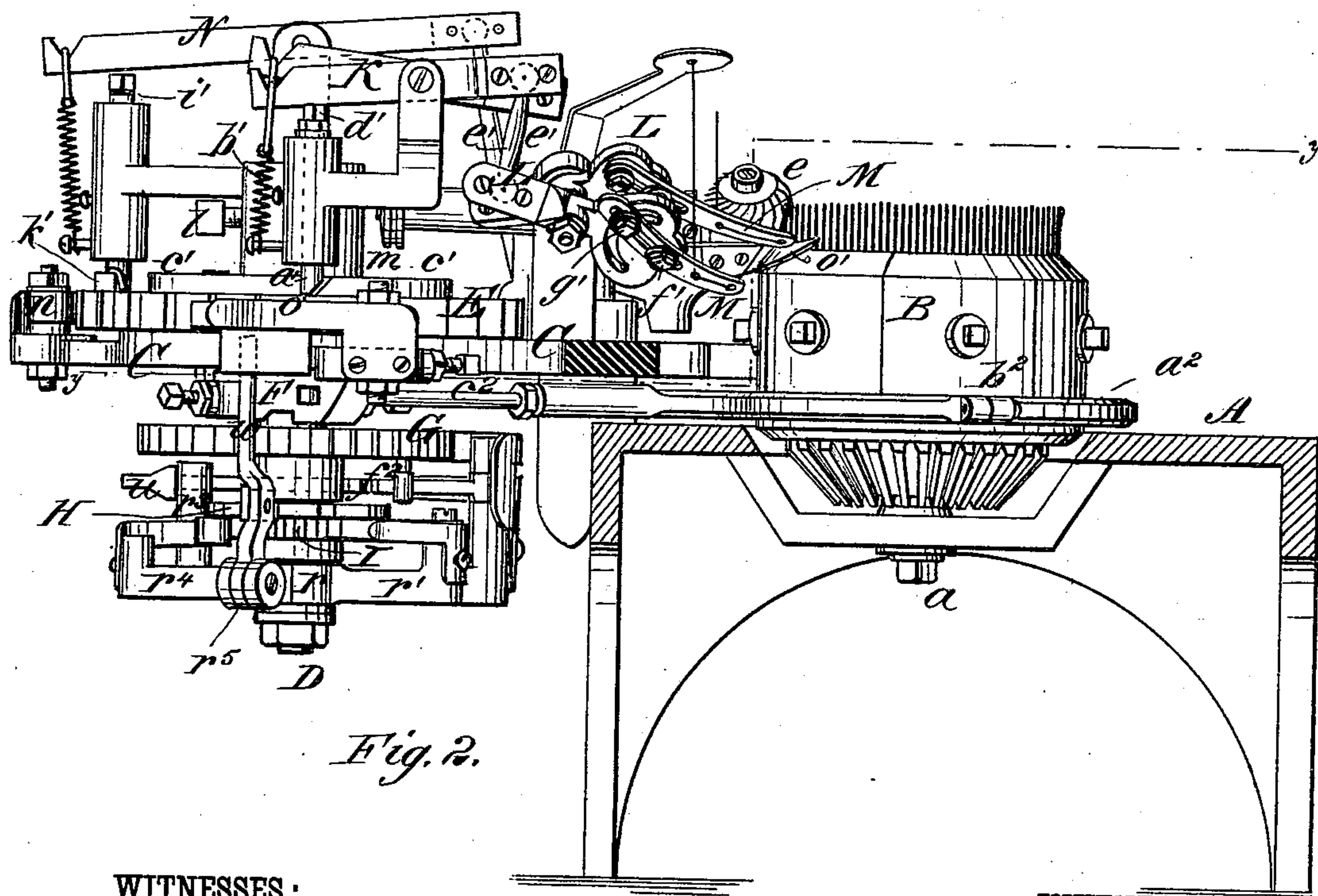


Fig. 2.

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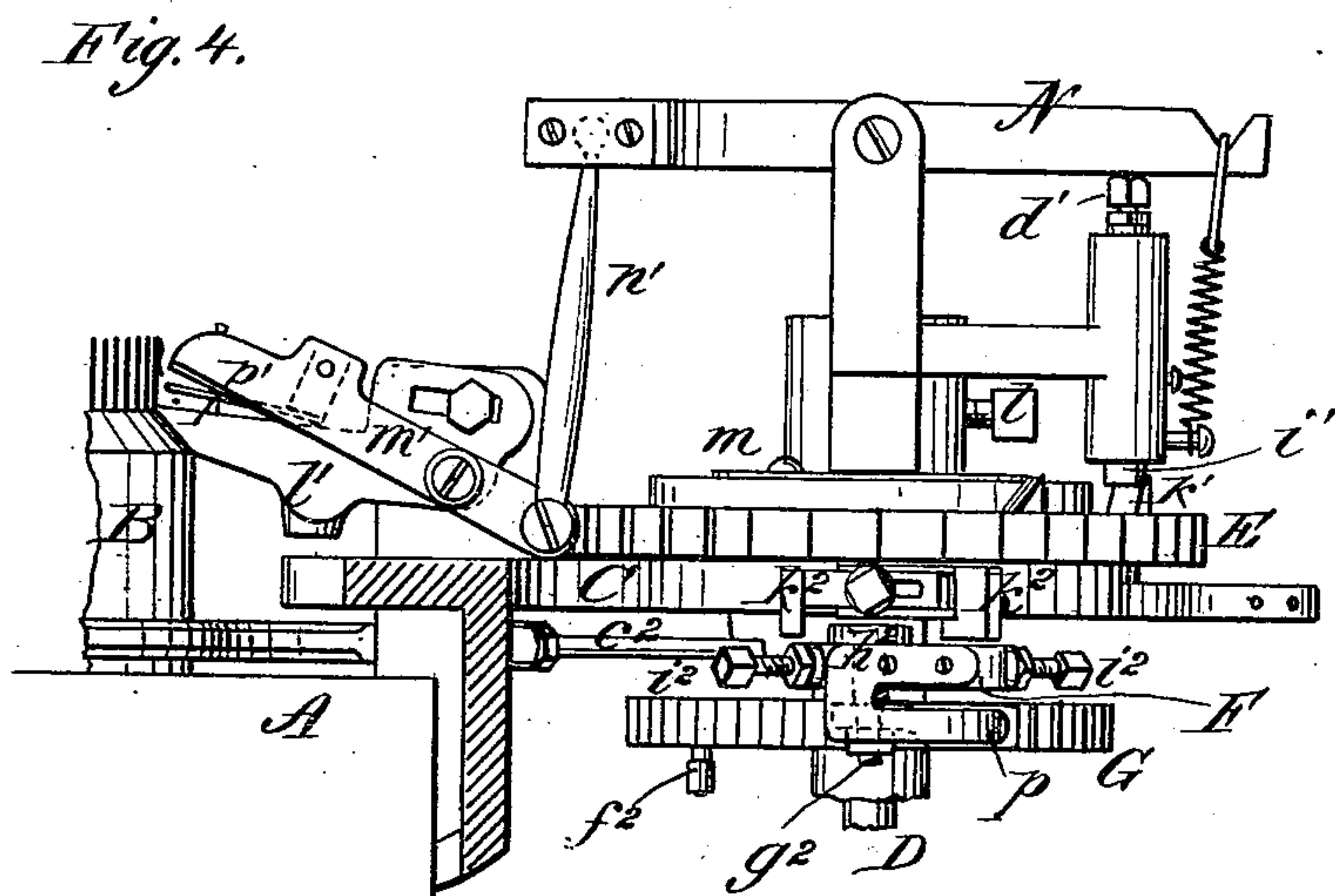
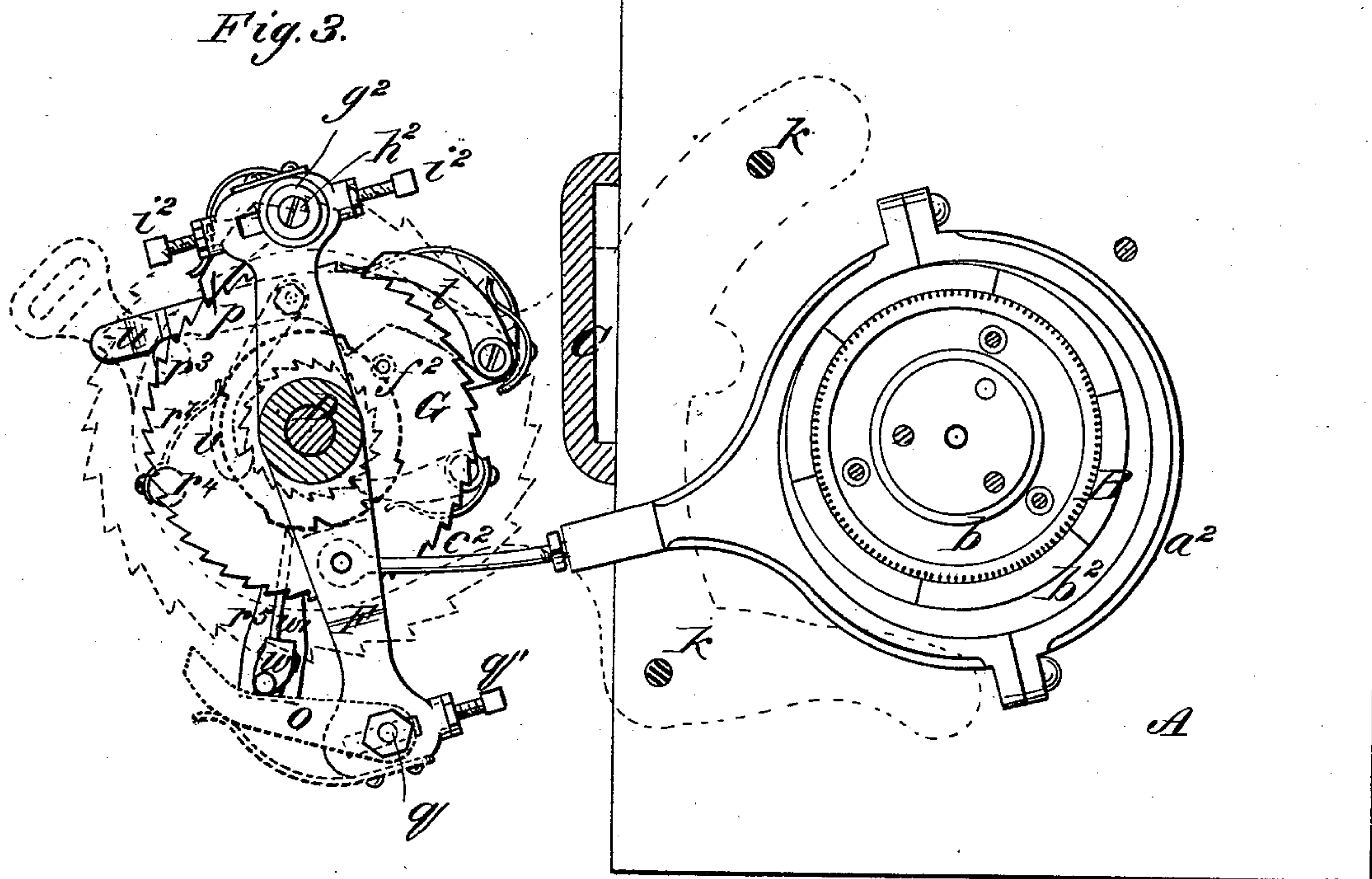
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4 Sheets—Sheet 4.

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Fig. 5.

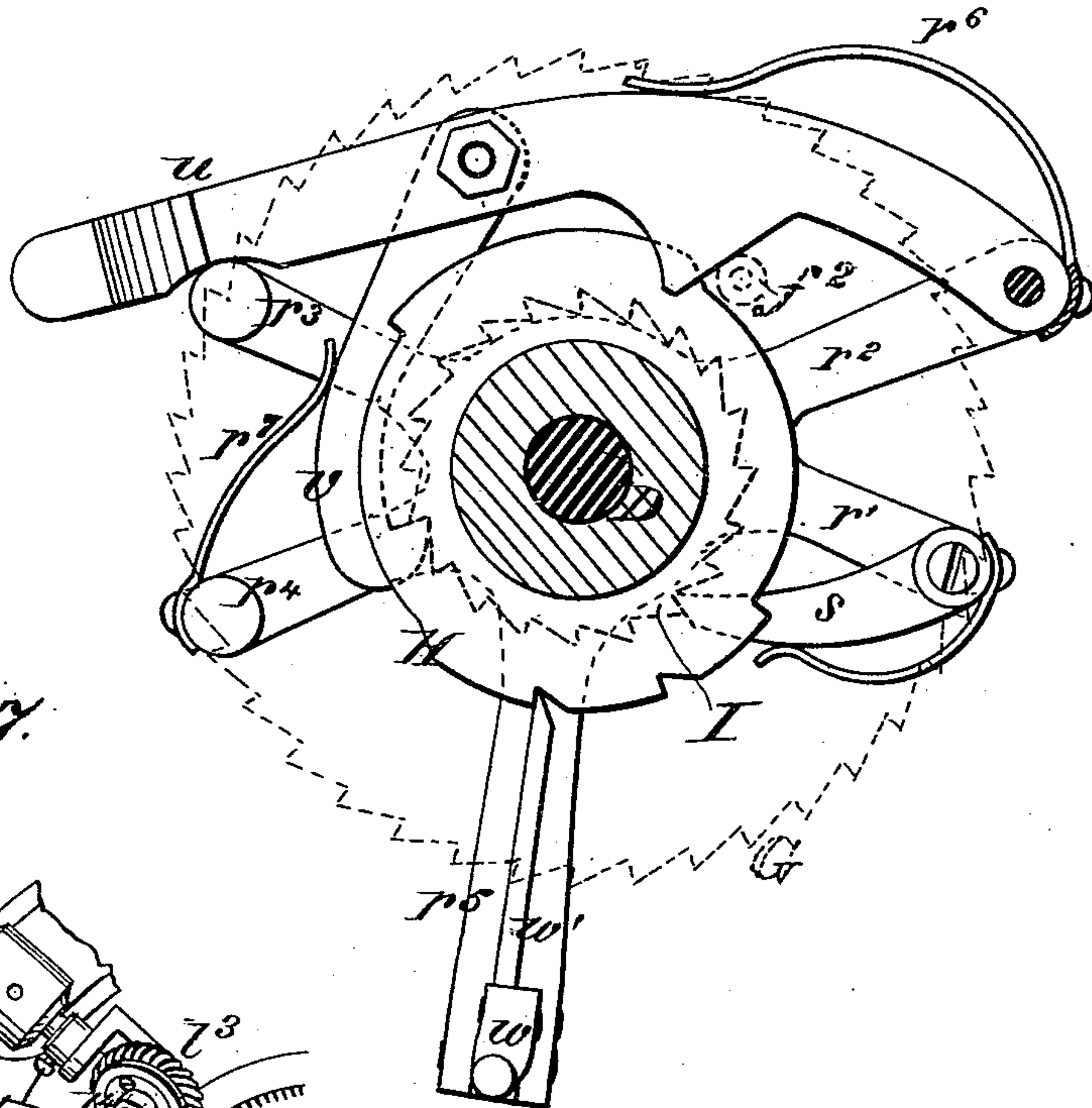


Fig. 7.

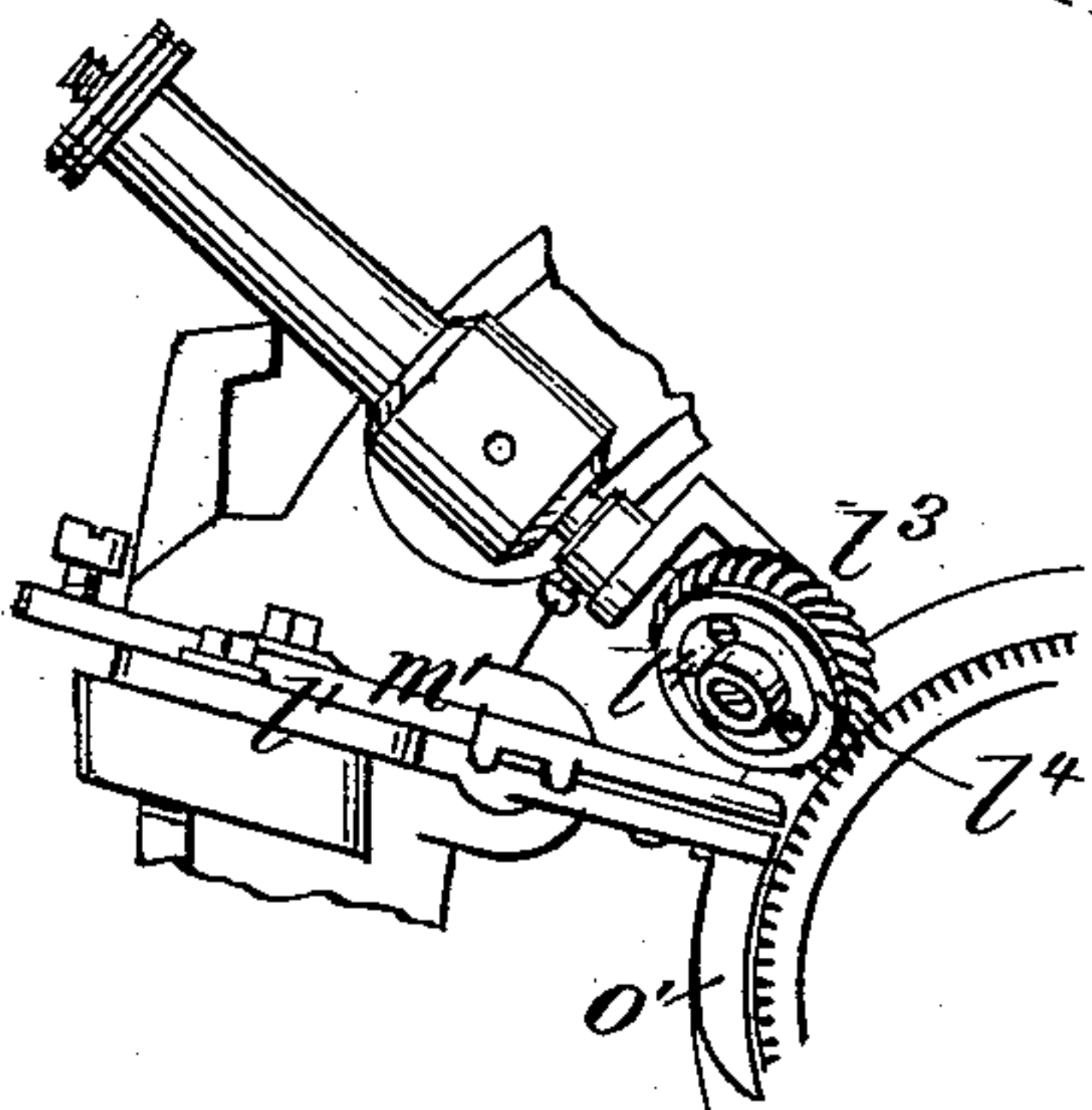
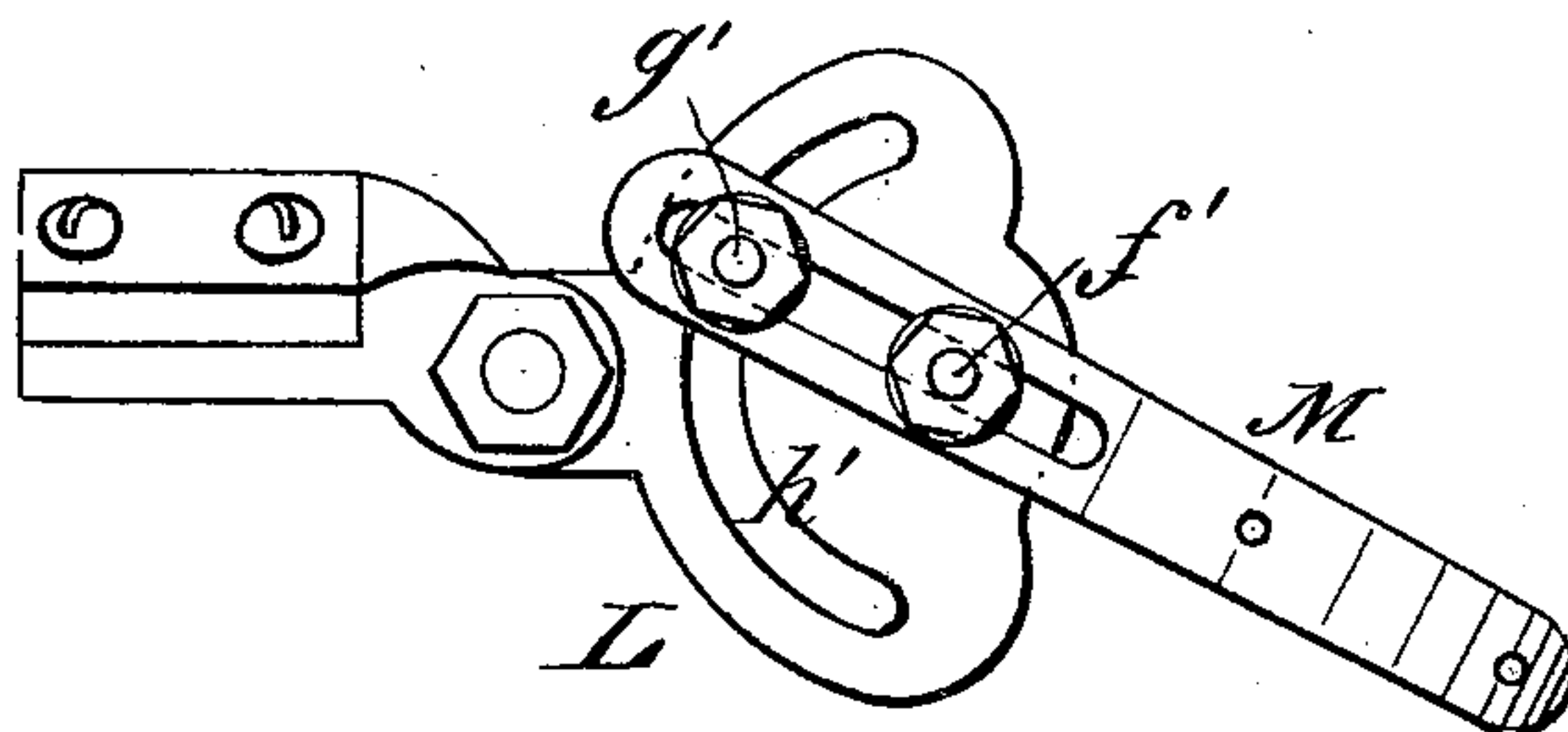


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES A. PARR, OF LOWELL, MASSACHUSETTS.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,467, dated August 8, 1882.

Application filed December 12, 1881. (Model.)

To all whom it may concern:

Be it known that I, JAMES A. PARR, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Knitting-Machines, of which the following is a full, clear, and exact description.

My improvements relate to the class of knitting-machines in which yarns of different colors are automatically manipulated for producing striped goods, as described and illustrated in Letters Patent granted to me March 18, 1879, and numbered 213,299.

The special objects of my improvements are to obtain facility in the adjustment of the thread-guides and other parts of the mechanism for moving the yarns in and out of action, and also to construct and apply mechanism whereby the cut-off ends of the yarn may be made to appear on the wrong side only of the fabric, all of which I accomplish by the devices and arrangements hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of a knitting-machine having my improvements applied thereto. Fig. 2 is a vertical section on line $x x$ of Fig. 1. Fig. 3 is a horizontal section on the line $y y$ of Fig. 2, save that certain parts or devices (including the landing-wheel A and knocking-over wheel) located within and directly connected with the needle-cylinder are omitted. Fig. 4 is a sectional side view of my attachment in reverse of Fig. 2. Fig. 5 is a detailed view of the pattern-cam and adjacent parts, and Fig. 6 is a side view of the yarn-guide and its lever. Fig. 7 is a detail view of the shears and the spiral wheel l^3 and the parts with which they are immediately connected and operate, the plate and finger l^5 being removed.

Of the knitting-machine proper, A is the bed. B is the needle-cylinder on a fixed shaft, a . b is a plate attached to the upper end of shaft a , and carrying brackets on which the "landing-wheel" c and "knocking-over wheel" d are attached to work within the cylinder. e is the stitch or loop wheel, f is the ordinary dividing or sinker wheel, and g the presser-

wheel, arranged around the outside of the cylinder; and h is a cloth-presser carried by a fixed post, i . On the outside of the circle of needles is located a toothed wheel, M' , termed the "clearing-wheel," which co-operates with the presser h , and has substantially the same function. These parts are of usual character, operation, and arrangement. The wheels $e f g l^3$, the presser h , and the devices by which the yarn is changed and severed are all attached to the bracket C, which is rigidly attached to one side of bed A by the bolts k , and can all therefore be readily removed from or connected with said bed.

The mechanism is as follows:

D is a shaft extending vertically through the bracket C and clamped by a set-screw, l , to a cap, m , that is fixed on the bracket.

Around the cap m is a loose ratchet-wheel, E, and on a projection from the bracket is a pawl, n , carried by a stud adjustable in a slot, which pawl engages the ratchet-wheel to prevent backward movement thereof.

On shaft D, beneath the bracket, is a rocking arm or pawl-carrier, F, carrying at one end a pawl or dog, o , that engages ratchet-wheel E, and at the other end a pawl or dog, p , that engages a ratchet-wheel, G, on the shaft D, next below the pawl-carrier. The arm F is slotted at its ends, and the pawl o is carried by a pin, q , clamped in the slot at the end of the arm to which it is attached, and held by a set-screw, q' , so that the pawl can be adjusted. The pawl p is similarly fitted on a pin, g^2 , held above and below the slot at the end of the arm to which it is attached by friction-washers h^2 . The pin g^2 has a movement in the slot to the extent allowed by set-screws $i^2 i^2$, tapped into the carrier.

On bracket C (see Fig. 4) are adjustable plates h^2 , having lugs placed for contact with washers h^2 for arresting the movement of the pawl while the carrier continues its backward movement.

On shaft D, below wheel G, is a cam-disk, H, having an attached ratchet-wheel, I, on its under side, and beneath that is a fast hub, r , formed with radiating arms $r^1 r^2 r^3 r^4 r^5$. (Shown most clearly in Fig. 5.) A nut on the lower end of shaft D sustains the parts named. The arm r^1 of the hub carries a holding-pawl, s , that en-

gages ratchet-wheel I. Arm r^2 carries a holding-pawl, t , engaging ratchet-wheel G, and also carries on a pivot an arm, u , to which is hung a hook-pawl, v , engaging ratchet-wheel I. Arm r^3 is simply a stop for the moving end of arm u , that is pressed to the stop by a spring, r^6 , secured at one end to arm r^2 . Arm r^4 carries a spring, r^7 , that bears at its free end on pawl v . In the outer end of arm r^5 is hinged an upright arm, w , extending behind dog o , and provided with a finger-piece, w' , extending in contact with cam H.

In suitable supports on cap m are levers K K, their outer ends extending above plungers $a' a'$, which are fitted for vertical movement in the said support. The outer ends of the levers are drawn down upon the plungers by springs b' , and cam-projections $c' c'$ are fitted on the ratchet-wheel E, for acting beneath the lower ends of plungers a' to raise the same, and with them the outer ends of the levers. Screws d' are tapped vertically into the upper ends of the plungers a' , and on their square heads the outer ends of levers K rest, as shown, so that by adjusting the screws higher or lower the distance to which the outer ends of said levers may be drawn down is regulated. In other words, the screws d' limit the upward movement of the yarn-guides M M, (after they have been depressed by reason of cam-wheel E having raised the plungers a'), yet the adaptation of the yarn-guides for independent adjustment is requisite, in order to bring their outer ends into proper working relation to the needles.

On the bracket C levers L L are pivoted beneath the inner ends of levers K, and links $e' e'$, connected to said inner ends of the levers K L by ball-and-socket joints, insure their simultaneous movement.

To the outer ends of levers L are connected the yarn-guides M M, which are of curved form and extend to the knitting-cylinder. The guides M are pivoted to levers L by screw-pins f' , passing through slots in the guides, (see Fig. 6,) so that the guides can be moved endwise and also turned on their pivots for adjustment. Clamping-screws g' , passing through the guides and through curved slots h' in the levers, serve to retain the guide in place. The arrangement of the thread-guides and levers is such that the rise of plungers a' , and consequent lifting of the outer ends of the levers K, moves the ends of the guides in an inclined path upward to the needles into a working position. This is performed alternately by the cam or ratchet-wheel E, the duration of elevation of the guides depending on the length of the cam-projections c' in said wheel. There are to be as many yarn-guides, with operating-levers to correspond, as there are different colors or kinds of yarns used.

On the cap m is also mounted a lever, N, and in connection therewith, at its outer end, a plunger, i' , operated by projections $k' k'$ on wheel E for moving the cutter.

The cutting devices consist of an adjustably

fixed shear, l' , on bracket C, and a shear, m' , pivoted in X form to the fixed blade and connected at its rear end to the inner end of lever N by a link, n' . (See Fig. 4.) The shear ends extend to the needle-cylinder, where the fixed blade is provided with a tongue, o' , which is curved to the circle of needles and terminates by a pointed end near the thread-guide, for catching the yarn and directing it to the shears. The moving shear has a spring-tongue, p' , (see Fig. 4,) bearing on the fixed shear to press and hold the yarn thereon before and during the cutting.

The several movements of the automatic mechanism are given by the rocking motion of the pawl-carrier F, obtained by connection of the carrier to a strap, a^2 , which is upon an eccentric flange, b^2 , formed on needle-cylinder B. The carrier is connected with the strap a^2 by an adjustable rod, c^2 . By using an eccentric and strap I am enabled to time the movements so as to avoid excessive friction, and with the rocking carrier to obtain continuous action, as next described.

The disk H is the pattern-cam, and regulates the width of stripe by its action on hinged arm w to release dog o from wheel E. The pattern-cam is moved intermittently by the pawl v and arm u , acting on ratchet I, the arm u being moved by a pin, f^2 , projecting from ratchet-wheel G, which, acting on a projection of arm u at every revolution of wheel G, moves the arm outward. Ratchet-wheel G has teeth half the length of those on wheel E, so that a fine adjustment of its movement by pawl-carrier F can be made. The adjustment is further regulated by the extent of lost motion between pawl p and carrier, that is varied by adjustment of plates k^2 before mentioned.

Supposing the machine to be working with yarn presented by one yarn-guide held up by its lever K and plunger a' , the cam or ratchet wheel E is moved progressively and the knitting continues with that yarn until the plunger a' , having reached the end of cam c' , is drawn down by the spring and the guide M thereby depressed. The other plunger, a' , is at the same movement raised by another and shorter cam c' , and the yarn-guide connected thereto thereby raised into working position, and the plunger i' at the same time raised by the first projection k' , thereby through lever N closing the shears and severing the first yarn. The knitting then proceeds for a certain number of courses, regulated by the length of the cam on wheel E, until the end of the cam is reached, when a change of yarn and severance of the one in use takes place, as before. This operation would produce a simple stripe alternating with broad bands. Variation is obtained by the pattern-cam H, which is moved by the ratchet-wheel G and arm u until a projecting portion of the cam reaches the finger w' of the arm w and, forcing the arm out, disengages the pawl o from wheel E, thereby arresting movement of the wheel. The ratchet-wheel G

continues to move the cam, and wheel E remains at rest until the cam permits return of the lever *u* and pawl *o* inward, when the wheel E is again moved.

5 It is evident that by changing the pattern-cam any desired arrangement of stripes can be produced.

10 The several parts all being adjustable at every point, perfect operation can be secured and compensation made for wear.

It is desirable that the severed ends of the yarn be carried on the outside of the tube being knit, so as not to appear on the right side of the goods. To accomplish this I provide 15 the following mechanism:

Fastened to the post which carries wheel l^3 is a plate, having a finger, l^5 , extending in front of the shears. Upon this finger the cut end of yarn falls, and is held up in a position 20 for the wheel l^3 to take hold of it. This wheel retains the cut end in its upward position, while the plate l^4 on the side of said wheel l^3 presses on the beards of the needles, so that the yarn end cannot catch under the beards. The 25 cut yarn end is thus kept above the tops of the needles until it reaches the finger l^2 , which bends it inwardly. Thus it will be seen that the cut-off ends of the yarn are carried on the outside of the tubular fabric which is being 30 knitted, and cannot appear on the right side of the goods.

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

35 1. The combination, with the needle-cylinder B, of the loose ratchet-wheels E and G, the vertical shaft D, the pivoted rocking arm F, carrying at opposite ends the pawls *o* and *p*, and suitable means for operating said arm, 40 substantially as shown and described.

2. The combination, with the yarn-guiding levers M, the ratchet-wheel having cams thereon, an eccentric-strap, a pawl-carrier, a rod connecting the pawl-carrier with said strap, the needle-cylinder, the levers K L, and mechanism for connecting lever K with the ratchet-wheel, of the ball-jointed pitmen, arranged as and for the purpose specified. 45

3. The combination, with the hinged arm *w*, finger-piece *w'*, dog *o*, ratchet-wheel E, ratchet-wheel G, having pin f^2 , and means for operating said wheel G, of the pattern-cam H, pawl *v*, arm *u*, and ratchet-wheel I, substantially as shown and described. 50

4. The combination of the pawl *p*, pin g^2 , washers h^2 , slotted pawl-carrier F, adjustable plates k^2 , ratchet-wheel E, bracket C, and mechanism for operating the said pawl-carrier F, substantially as shown and described. 55

5. The combination, with the needle-cylinder and needles, the loop-wheel *e*, the shears, and suitable means for operating said shears, of the finger e^5 , extending in front of the shears and terminating near said loop-wheel *e*, the wheel l^3 , having spiral teeth adapted to work 60 between the needles, the plate l^4 , adapted to press on the beards of the needles, and the finger l^2 , all as shown and described, whereby the cut-off yarn end is kept above the top of the needles and then bent inwardly by the 70 finger, as described.

6. The combination, with the carrier F and suitable means for operating it, the pawl *p*, and the ratchet-wheel G, of the adjustable plates k^2 , as and for the purpose set forth.

JAMES A. PARR.

Witnesses:

JOSHUA N. MARSHALL,
ALFRED P. SAWYER.