

(No Model.)

3 Sheets—Sheet 1.

F. N. COOKSON.

FEEDING MECHANISM FOR SEWING MACHINES.

No. 411,491.

Patented Sept. 24, 1889.

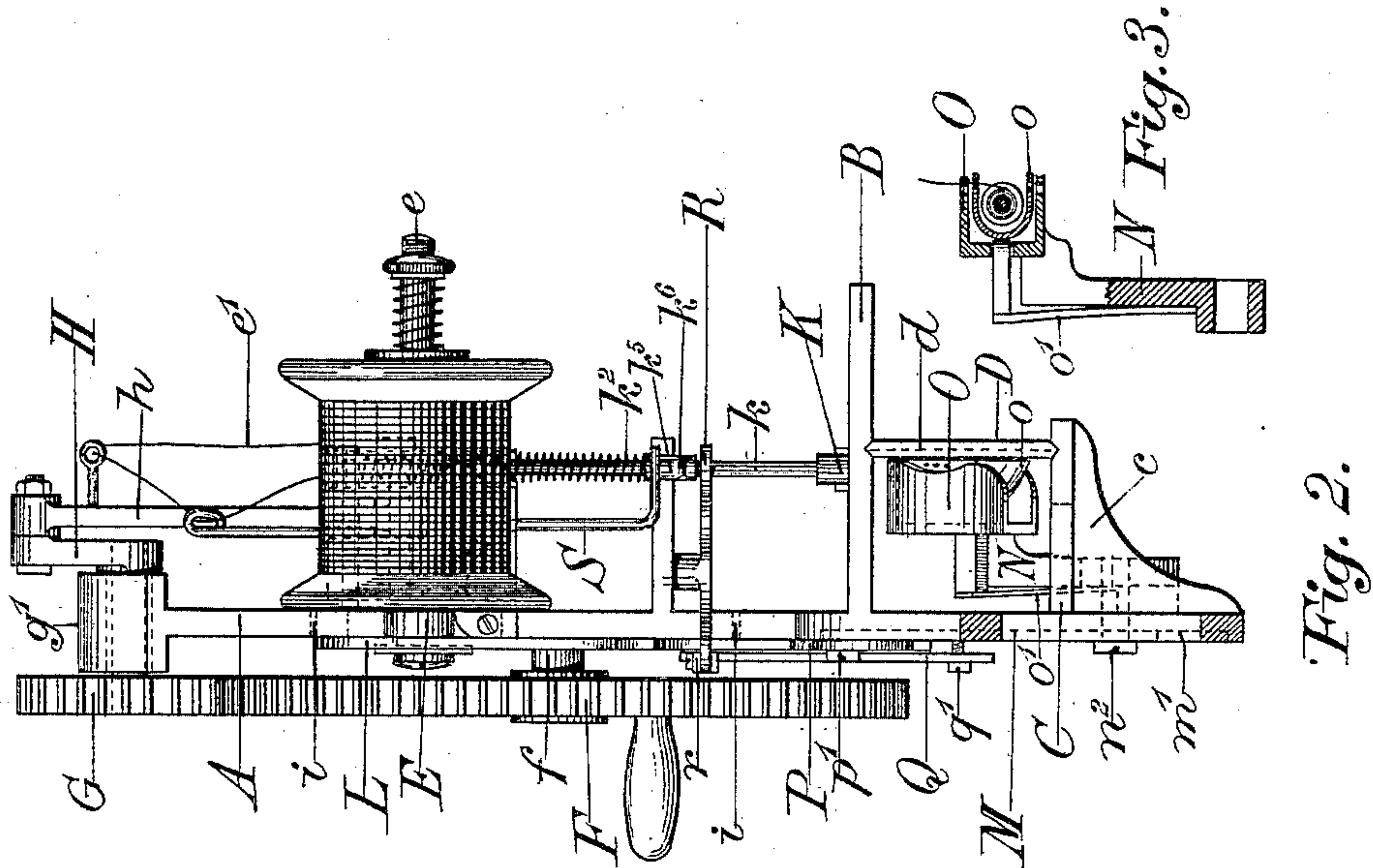


Fig. 2.

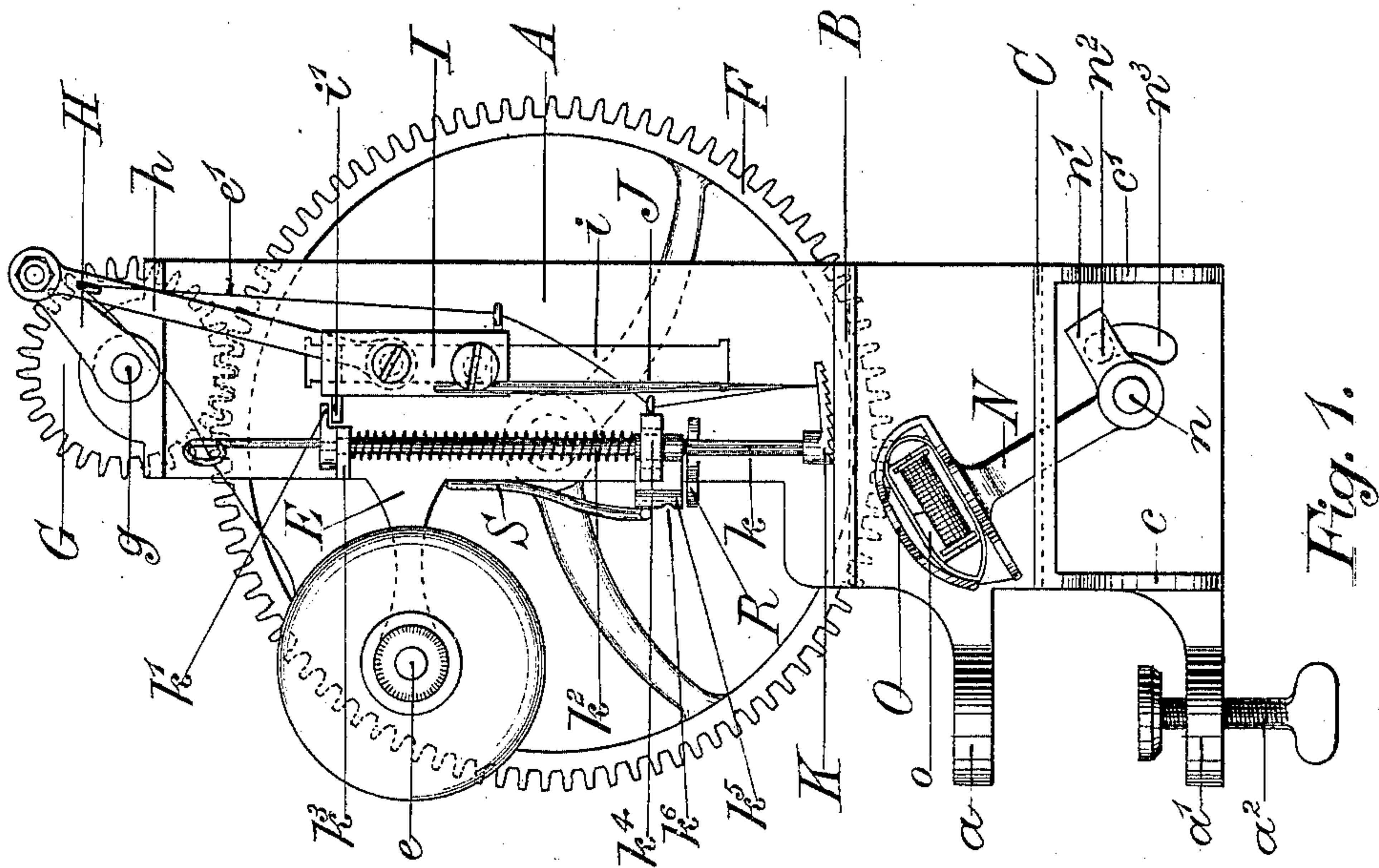


Fig. 1.

Witnesses.

Robt A Blake
L W. Hitchcock

Inventor :-
Frederick Nesfield Cookson.
per Henry Harrington Leigh
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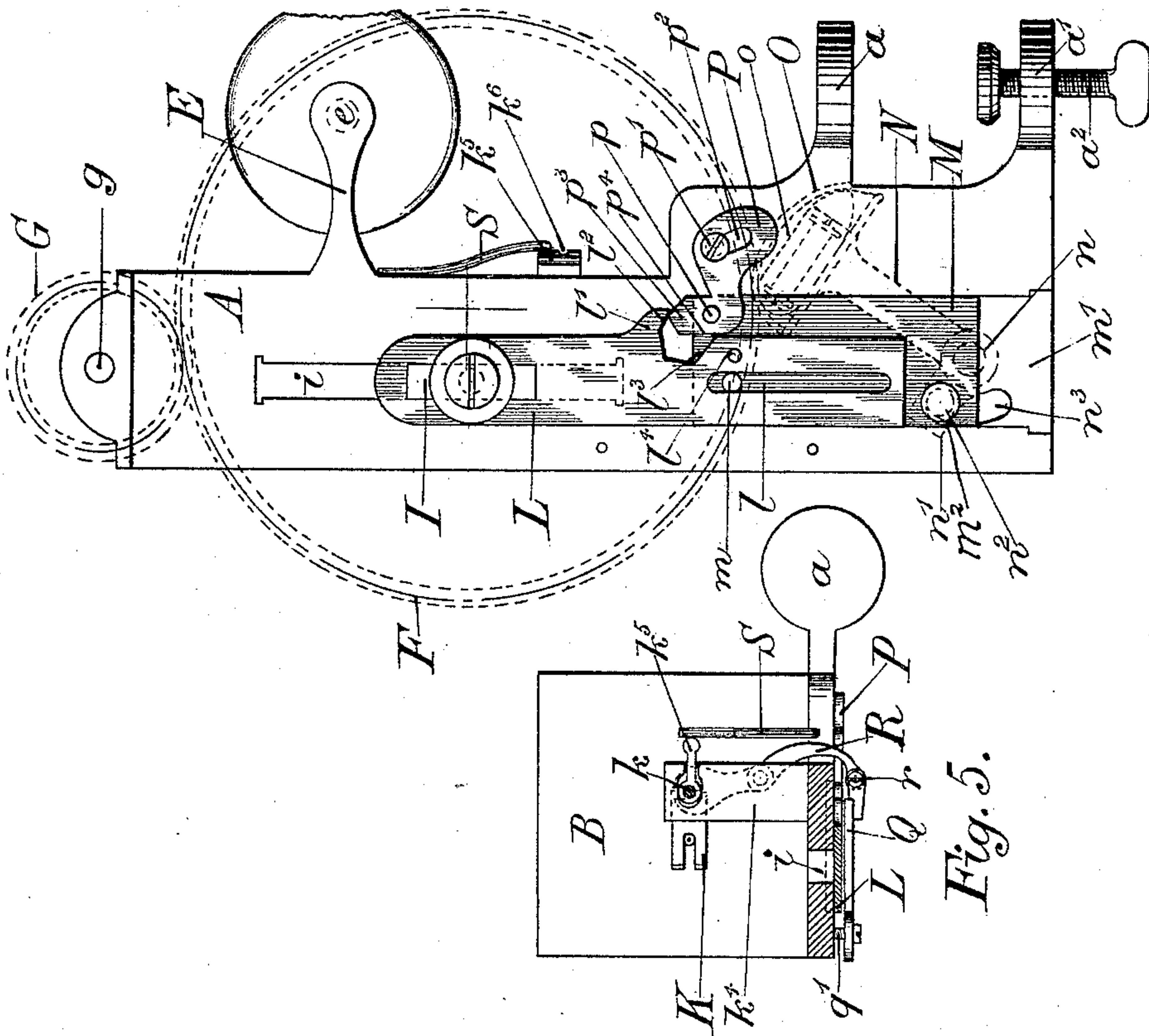


Fig. 6.

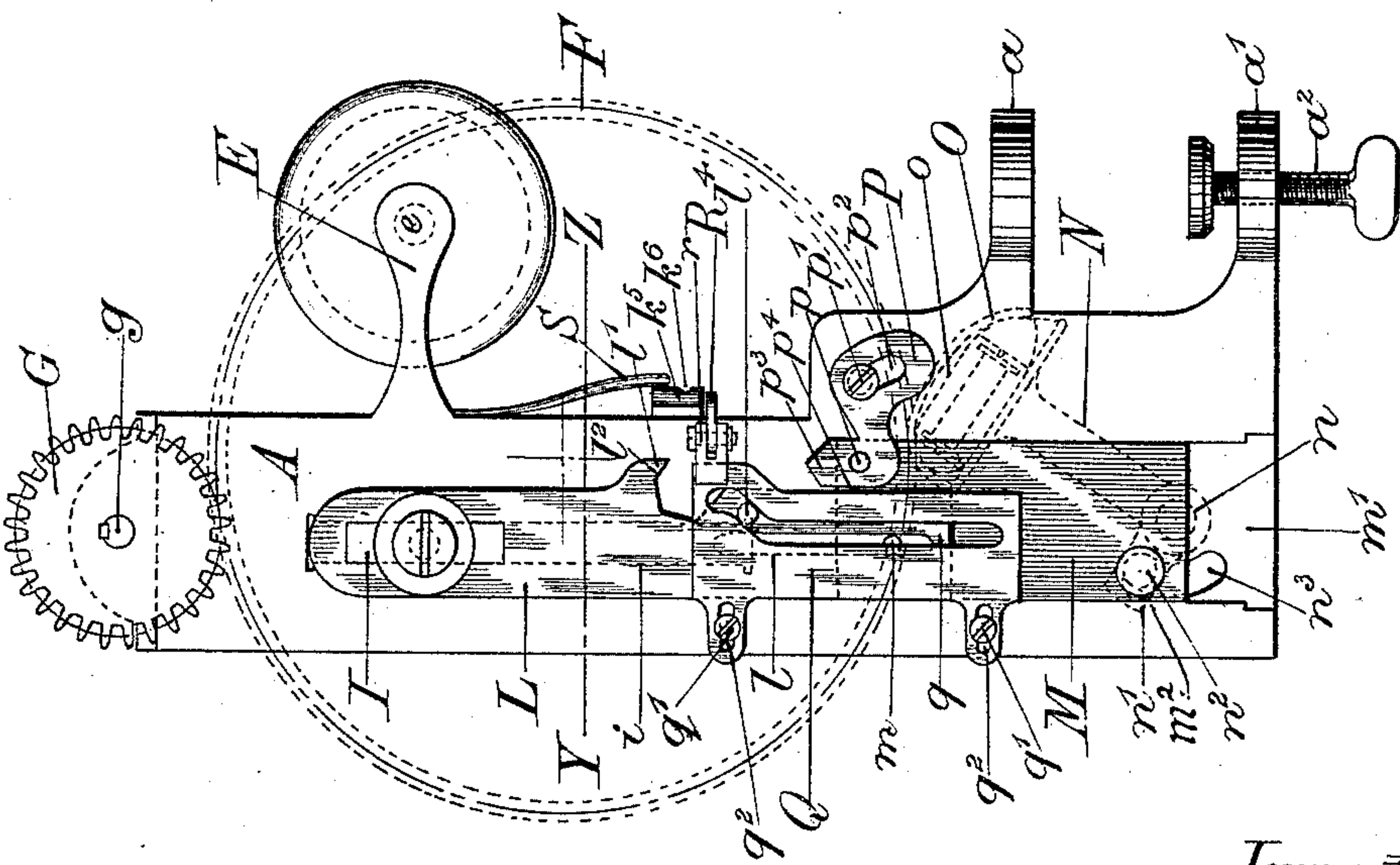


Fig. 4.

Witnesses.

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UNITED STATES PATENT OFFICE.

FREDERICK NESFIELD COOKSON, OF WOLVERHAMPTON, ENGLAND.

FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 411,491, dated September 24, 1889.

Application filed October 11, 1886. Serial No. 215,855. (No model.) Patented in England August 11, 1886, No. 10,297.

To all whom it may concern:

Be it known that I, FREDERICK NESFIELD COOKSON, manufacturer, a subject of the Queen of Great Britain and Ireland, residing at Wolverhampton, England, have invented a new and useful Improved Sewing-Machine, (for which I have obtained Letters Patent in Great Britain, No. 10,297, dated August 11, 1886,) of which the following is a specification.

My invention relates to improvements in lock-stitch sewing-machines, and is more particularly applicable to small and portable hand-machines, although I wish it to be distinctly understood that my invention is not confined to the latter class of sewing-machines.

The said invention relates more particularly to improved mechanism for actuating the cloth-feeding presser-foot.

I attain the objects of my said invention by means of the mechanism illustrated in the following figures, in which like parts are marked throughout the figures with the same reference-letter.

Figure 1 is a side elevation showing the needle as on the point of piercing the cloth. Fig. 2 is a rear elevation corresponding with Fig. 1, but without the cramping device. Fig. 3 is an enlarged sectional elevation of the shuttle, shuttle-case, shuttle-spring, and bell-lever. Fig. 4 is a rear elevation. Fig. 5 is a plan, partly in section, taken on the line Y Z of Fig. 4. Fig. 6 is a rear elevation—the horizontal traversing plate having been removed—showing the position of the parts when the shuttle is on the point of making its return-stroke preparatory to making a stitch. Figs. 7 and 8 are respectively side and rear elevations of my improved sewing-machine fitted with an alternative-traversing gear, the crank being a little in advance of the position illustrated in Figs. 1 and 2.

I wish to point out that the figures illustrate my invention as applied to a small hand-machine, and that although this is the type of sewing-machine to which the invention is more particularly applicable with the greatest advantage my invention is not confined to the type of machine illustrated, inasmuch as the novelties of construction constituting my invention may be advantageously applied to

lock-stitch sewing-machines of any size and kind.

A is the standard of the machine. Two lateral extensions a a' project from the lower part of the rear edge of the standard and constitute, with the thumb-screw a^2 , a convenient means by which the machine can be cramped to a table. This method of fixing the machine may be replaced by a base of any convenient kind; but it is one that is peculiarly suitable as a means of holding the machine made as illustrated in a working position.

B is the cloth-plate; C, a plate in a parallel plane therewith and conveniently strengthened by two brackets c c' . The adjacent faces of these two plates B and C are grooved to receive a slide D, which forms one side of the shuttle-race and in the inner face of which the needle-groove d is formed.

E is a bracket from which the spool-peg e projects.

F is the first-motion wheel, capable of rotation upon an axis f , projecting from the standard, and of gearing with its pinion G, the shaft g of which works in a journal g' , formed for that purpose on the top of the standard.

H is a half-crank fast on the opposite end of the pinion-shaft, making junction by means of the connecting-rod h with a cross-head I, which receives therefrom a reciprocating linear stroke in the vertical guide-slot i in the standard A.

J is the needle carried by the cross-head I, which is thus made to do duty as a needle-bar, and to which the thread e' is led from the top spool through any convenient or suitable tension device.

K is the cloth-feeding presser-foot, carried by the lower extremity of the stem k . The presser is raised by a stud i' on the cross-head engaging with a corresponding projection k' from the upper extremity of the stem k and returned by a spiral spring k^2 . Two guides k^3 k^4 are provided to serve as guides for the stem.

L is a link fixed to the cross-head I by a set-screw, and having a vertical slot l formed in its lower half, which slot receives a stud m , projecting from the upper part of the face of a second link M, which works in a groove m' ,

cut in the back face of the standard A. The accuracy of the travel of the second link M is guaranteed by the rectilinear groove in which it works, and the stud m and slot l act as a guide for the link L. The length of the slot l is about three-quarters of the length of the stroke of the needle.

N is a bell-crank having its axis upon a stud n , projecting from the front face of the standard. The shorter arm n' of the bell-crank is connected to the lower extremity of the second link M by a pin n^2 . A quadrantal slot n^3 is cut in the standard and a horizontal one m^2 in the link M to allow of the throw of this pin.

O is the shuttle-case, fixed upon the extremity of the longer arm of the bell-lever N; o , the shuttle, and o' the spring to press the shuttle up to the inner face of the slide D.

P is a bent link having its axis upon p' , a stud projecting from the top of the link M. A screw-pin p' , passing through a curved slot p^2 into the standard A, prevents the link P being moved otherwise than by the link L. Upon the side of the link L, I form a projection l' , the lower edge l^2 of which can engage with the nose p^3 of the link P as the link L descends, thereby compelling it to enter the notch in the edge of the link L, from which it is expelled by the bottom edge l^3 of said notch as the said link L ascends. During this ascent or upstroke the straight edge p^4 of the link L is in close contact for the whole of its length with the edge p^4 of the link.

Q is a plate receiving a reciprocating horizontal movement from the stud l^4 , which projects from the link L into a twice-bent or serpentine slot q , formed in said plate, and which bears against the opposite faces of said slot alternately as the link L makes its up and down strokes, respectively. I provide two studs q' q' , passing through two guide-slots q^2 q^2 , for the purpose of keeping the motion of the plate truly horizontal.

R is a lever having its fulcrum in the bracket k^4 or in a stud depending therefrom. One end of it is connected to the plate Q by means of a knuckle-joint r , or its equivalent, while the other end is forked and embraces the stem k of the cloth-feeding presser-foot.

S is a spring-detent always bearing against a projection k^5 on the stem of the cloth-feeding presser-foot. A small notch k^6 is cut in the edge of this projection, into which the detent engages when the cloth-feeding presser-foot is raised to the top of its stroke for the purpose of detaining it there for a moment. The projection k^5 is released from the hold of the detent S by the lever R as the latter is moved by the downstroke of the stud l^4 .

In Figs. 7 and 8 I illustrate an alternative device for raising the cloth-feeding presser-foot, which may replace the two projections i' k' on the cross-head and stem k of the cloth-

feeding presser-foot, respectively illustrated in Fig. 1 and described in reference thereto.

I use a cranked lever having its fulcrum in the standard A at t . One arm T of the lever lies upon the top of the guide k^3 . Its extremity t' , bent at a right angle, is immediately under an enlargement k^7 upon the end of the stem k of the cloth-feeding presser-foot. The other arm t^2 is bent forward, so that a pin g^2 , projecting from the pinion, can engage with it as the pinion revolves. As the pinion revolves, the pin g^2 therefore bears against the arm t^2 at the moment when the presser-foot is required to begin to rise and pushes the arm t^2 before it. The extremity t' of the arm T moves through a corresponding arc, and consequently raises the stem k by lifting the enlargement k^7 . As soon as the cloth-feeding presser-foot has been raised as high as required the pin g^2 releases the arm t^2 , and the lever and cloth-feeding presser-foot are returned by the spiral spring k^2 .

A lock-stitch sewing-machine constructed according to my invention operates as follows: As the needle descends, and when it has made about five-eighths of its downstroke, the projection l' on the link L bears upon the nose p^3 of the bent link P, causing the latter to turn upon its axis p and to drive the link M downward. As soon as the link M is set in motion the shuttle is thrown to the front of the shuttle-race by means of the pin n^2 and the bell-crank lever N. This throw is accomplished by the time the needle has reached the end of its stroke. The needle at once commences its upstroke, looping the top thread in the shuttle-race in the well-known way, the shuttle remaining the while in its last-mentioned position until the lower edge l^3 of the notch in the link L bears against the straight edge p^4 of the nose p^3 , when the shuttle-case is thrown forward, thereby taking the shuttle through the increasing loop in the top thread. The stitch is locked by the completion of the upstroke of the needle. When, however, the crank is about fifty degrees from the vertical, the stud l^4 bears against the upper edge of the serpentine part of the slot q in the plate Q, causing it to move on the studs q' toward the front of the machine. This motion is communicated to the cloth-feeding presser-foot K through the lever R, and the cloth is moved over the cloth-plate B the distance of one stitch. After the completion of the cloth-feeding presser-foot the stud i' on the cross-head I bears against the projection k' on the top of the presser-stem k and lifts the cloth-feeding presser-foot K, whereupon the detent S engages in the notch k^6 , thereby keeping the cloth-feeding presser-foot up after the stud i' has freed the projection k' . The needle has now commenced another downstroke, and the stud l^4 bears against the lower edge of the serpentine slot q , whereupon the lever R is moved a little and the

notch k^6 thereby released from the hold of the detent S, when the cloth-feeding presser-foot K is brought down upon the cloth by the spring k^2 in time to hold the cloth steady while the needle is penetrating it.

With reference to the bent link P and its function as the intermediary between the two links L and M, I wish to point out that the slot l and stud m will throw the shuttle backward and forward, though the use of the intermediary link P causes the shuttle to be thrown through the loop in the top thread earlier than it would be by the operation of the slot l and the stud m only, and that in addition to the acceleration of the throw of the shuttle irregularities of motion on the part of the latter, which might be occasioned by the weight of the bell-lever N, the shuttle-case O, and the shuttle o during the time the stud m is out of contact with either end of the slot l , are prevented by the bent link P, and the link M is kept always under the control of the link L. When the slot l and stud m are relied on for the actuation of the shuttle, the length of the former should be about three-quarters that of the stroke of the needle.

I am aware that there have been already patented the following combinations in connection with small and portable hand sewing-machines as constituting more hopefully than practically a pocket sewing-machine:

"1. The combination, with the bracket-frame and its cloth plate, of the needle-bar arranged to slide vertically in said frame and extending both above and below the cloth-plate, and the pivoted shuttle-lever having a pin-and-slot connection with said needle-bar.

"2. The combination, with the bracket-frame and its cloth-plate and the needle-bar sliding vertically therein, of the pivoted lever F, the cloth-presser and feed-lever G, provided with cam projections, and the shuttle-lever H, all of these instrumentalities connected to and operated directly by the needle-bar.

"3. The pivoted shuttle-lever and the shuttle basket or cradle attached thereto, in combination with the bracket-frame, the cloth-plate, the vertically-sliding needle-bar pro-

vided with a pin which enters a slot in the shuttle-lever, and the guard-plate l , under the arrangement and for the operation as set forth."

I wish it to be distinctly understood that I lay no claim to any of the above-recited combinations; but

What I do claim is—

1. The combination of a cross-head or needle-bar, a link rigidly attached to the said needle-bar, a bar carrying the cloth-feeding presser-foot, a stud projecting from the said needle-bar and adapted to engage with a corresponding projection on the top of the stem of the said cloth-feeding presser-foot at each upstroke of the said needle-bar, a spiral spring upon the said stem adapted to return it after each engagement by the said stud, a plate adapted to be moved in a direction at right angles with that of the said link, and a stud upon the said link adapted to engage in a twice-bent slot in the said plate with a lever adapted to move in a plane at right angles with the direction of the said needle-bar and having its fulcrum upon the lower guide of the presser-foot stem, said lever being connected with said plate and with said presser-foot bar, as set forth.

2. The combination of a stud projecting from the cross-head or needle-bar and adapted to engage with a corresponding projection on the top of the stem of the cloth-feeding presser-foot at each upstroke of the said needle-bar, a spiral spring upon the said stem adapted to return it after each engagement by the said stud, a groove in an enlargement upon the presser-foot stem, and a spring-detent fixed to the standard of the machine and adapted to engage in the said groove each time the said stem is raised, as set forth.

In testimony whereof I have hereunto set my hand.

FREDERICK NESFIELD COOKSON,

Witnesses:

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