

(No Model.)

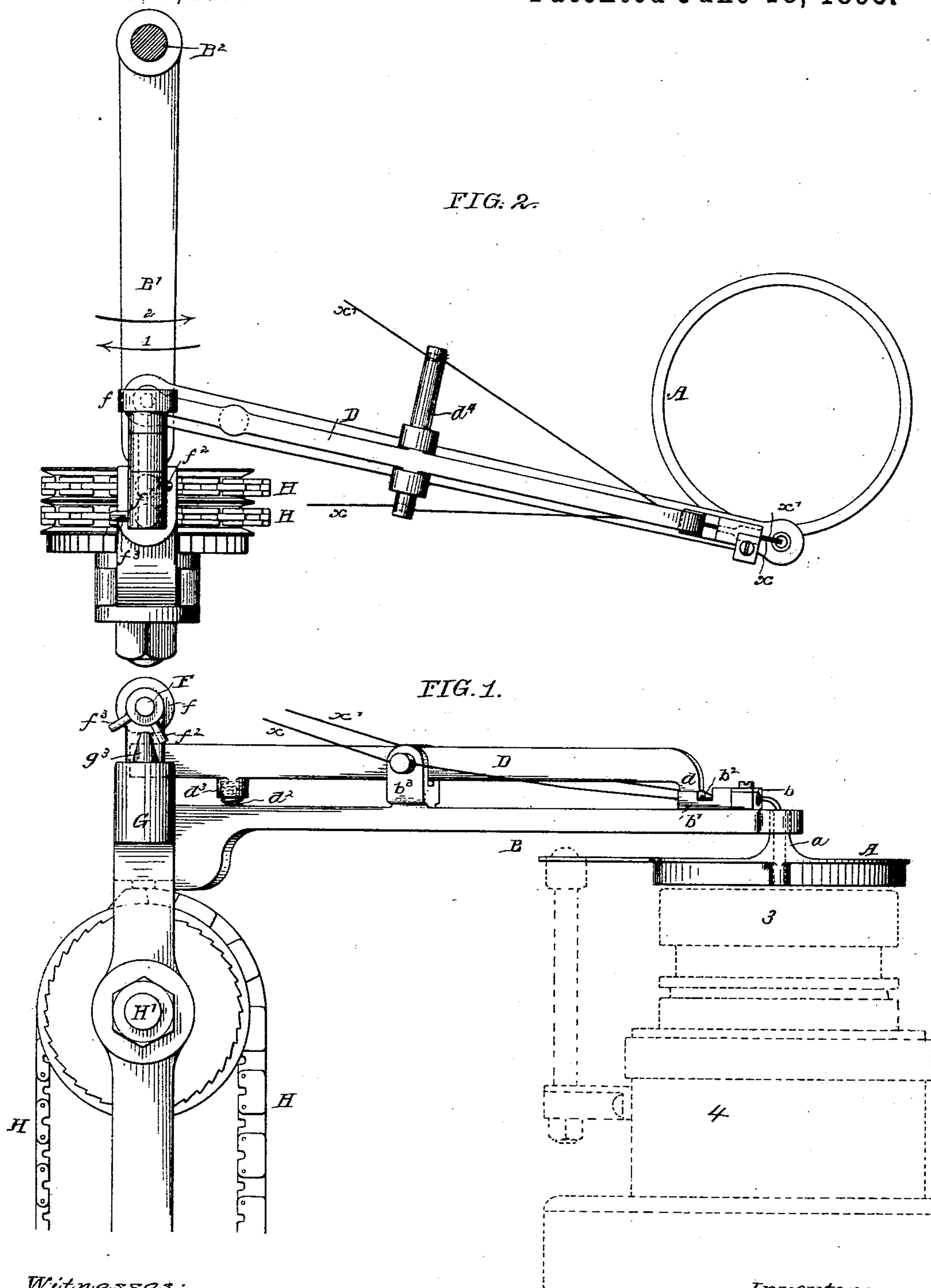
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L. N. D. WILLIAMS.

EXTRA THREAD FEEDING DEVICE FOR KNITTING MACHINES.

No. 541,407.

Patented June 18, 1895.



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Hamilton D. Turner  
Charles E. Cow

Inventor:  
Louis N. D. Williams  
by his Attorneys  
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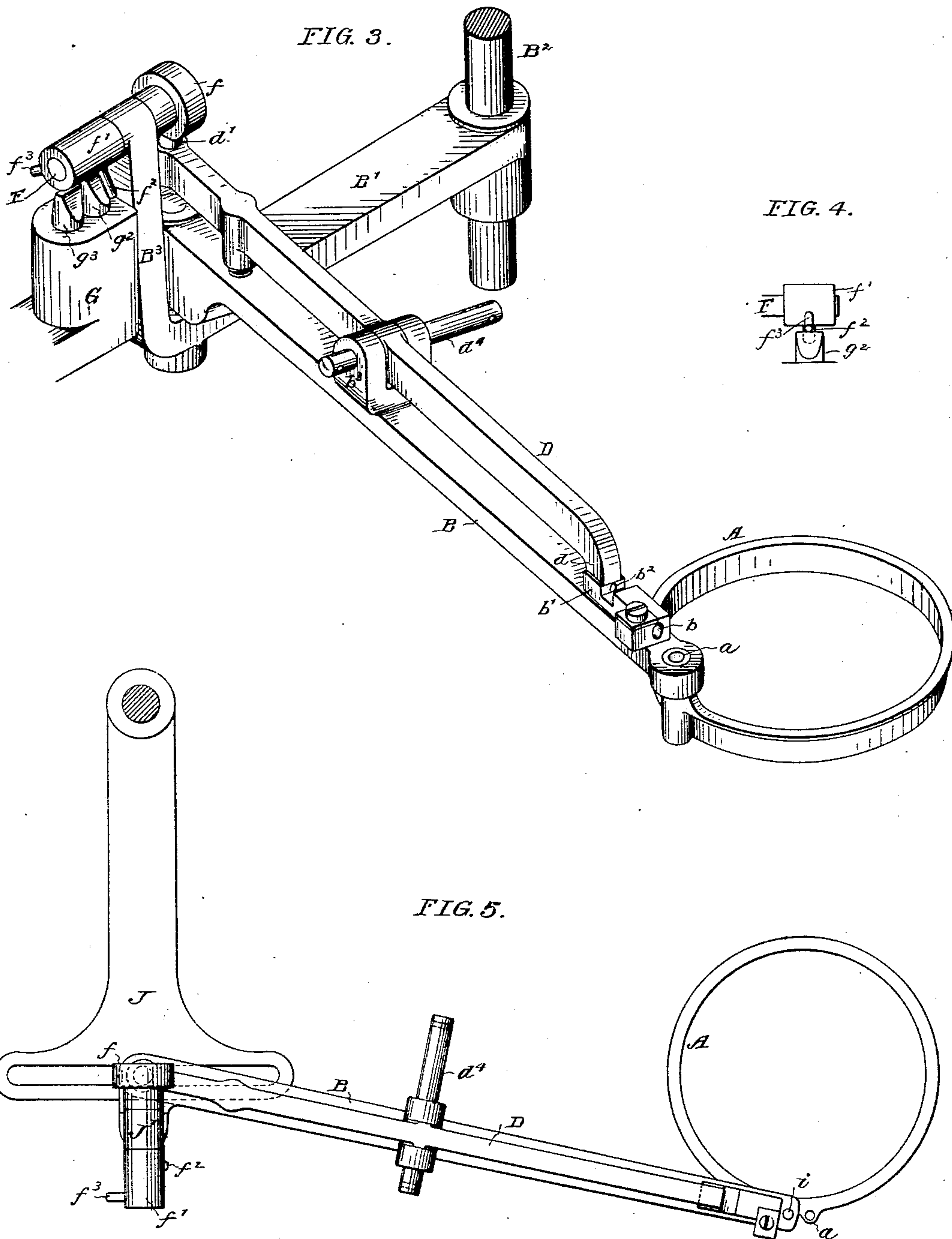
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# UNITED STATES PATENT OFFICE.

LOUIS N. D. WILLIAMS, OF ASHBOURNE, ASSIGNOR OF ONE-HALF TO ROBERT W. SCOTT, OF PHILADELPHIA, PENNSYLVANIA.

## EXTRA-THREAD-FEEDING DEVICE FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 541,407, dated June 18, 1895.

Application filed April 8, 1895. Serial No. 544,914. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS N. D. WILLIAMS, a citizen of the United States, residing in Ashbourne, Pennsylvania, have invented certain Improvements in Extra-Thread-Feeding Devices for Knitting-Machines, of which the following is a specification.

The object of my invention is to so construct an extra thread feeding device for knitting machines that, without the necessity of carrying the bobbin around with the guide whereby the threads are fed to the needles, the extra thread clamping device will be comparatively close to said thread guide. Hence, when the extra thread is broken off at the needle on the closing of the clamp, the loose portion of the thread between the clamp and the needle will be short and will be readily pulled in by contact with the continuously moving main thread when the clamp is again opened, so that a portion of the knitted tube may be reinforced in such a manner that the edges of the reinforcing portion will be sharply defined, that is to say, the extra thread will occupy substantially the same position in each of the successive knitted courses. Hence the termination of each partial course of extra thread will be at or near the same standing wale of the fabric.

In carrying out my invention I mount the extra thread clamping devices upon an arm pivoted at one end to a rotating portion of the knitting machine, preferably to the rotating guide tube of the same, the opposite end of said arm being so supported that it is free to move to and fro as the other end rotates or partially rotates.

In the accompanying drawings, Figure 1 is a side view of sufficient of a knitting-machine to illustrate my present invention. Fig. 2 is a plan view of the same. Fig. 3 is a perspective view of part of the device, and Figs. 4 and 5 are views illustrating modifications of the invention.

In Fig. 1, A represents the rotating guide ring of a knitting machine of the character set forth in Letters Patent No. 484,610, dated October 18, 1892, the needle cylinder 3 and cam box 4 of such machine being represented by dotted lines in Fig. 1. The thread guiding tube *a* of this ring is, however, projected up-

ward beyond the ring and to this upwardly projecting guide is pivoted the front end of an arm B the rear end of which is pivoted to a radius arm B' mounted upon and free to swing on a vertical post B<sup>2</sup>. Secured to the arm B is a thread guiding tube *b* and forming part of the same is the lower jaw *b'* of a clamp for the extra or reinforcing thread *x'*, said jaw *b'* having formed through it an opening *b<sup>3</sup>* for the passage of the main thread *x*. Hung to a forked lug *b<sup>3</sup>* on the arm B is a lever D the front end of which is bent downward so as to form a jaw *d* for acting in conjunction with the jaw *b'*, the rear end of the lever D having a pin *d'* (Fig. 3) which is acted upon by a cam *f* on a shaft F free to turn in the upwardly bent end B<sup>3</sup> of the radius arm B', said shaft F also having secured to it a sleeve or collar *f'*, with projecting pins *f<sup>2</sup>*, *f<sup>3</sup>* adapted to be acted upon by studs *g<sup>2</sup>*, *g<sup>3</sup>* guided in a bracket G and acted upon by pattern chains H, the said chains being carried by pattern drums on a shaft H', which is adapted to bearings in said bracket. A spring *d<sup>2</sup>* interposed between the arm B and a socket *d<sup>3</sup>* on the under side of the rear arm of the lever D tends to elevate said rear arm and thus close the jaw *d* against the jaw *b'* in order to clamp the extra thread *x'* which is fed through a guide opening in one end of the pivot pin *d<sup>4</sup>* of the lever D as shown in Fig. 2, the main thread *x* being fed through an opening in the opposite end of said pin and thence through the opening *b<sup>3</sup>* in the jaw *b'*, both threads then passing through the guide *b* and down through the guide tube *a* of the ring A.

When the low portion of the cam *f* is in contact with the pin *d'* of the lever D the jaw *d* of the lever will be closed against the jaw *b'* by the action of the spring *d<sup>2</sup>* and the extra thread *x'* will be clamped and held so that it will be broken off close to the hook of the needle, the loose end hanging in the guide tube *a* in contact with the main thread *x*. As soon as the cam *f* is turned so as to bring its high part to bear upon the pin *d'* the jaw *d* will be lifted and the extra thread will be free from restraint so that its loose end will be drawn in to the needles by contact with the forwardly moving main thread.

The raising and lowering of the clamp jaw



$d$  is effected by the action of the studs  $g^2, g^3$  upon the pins  $f^2, f^3$  of the sleeve or collar  $f'$  on the shaft F, thus, supposing that the parts are moving in the direction of the arrow 1, Fig. 2, and that the stud  $g^2$  is raised into the path of the pin  $f^2$  the latter will be struck by said stud  $g^2$  and the shaft F and its cam  $f$  will be turned so as to cause the high part of said cam to act upon the pin  $d'$  of the lever D and lift the jaw  $d$  away from the jaw  $b'$ , a restoration of the parts to their former position being effected by raising the stud  $g^3$  into the path of the pin  $f^3$  when the parts are moving in the direction of the arrow 2, Fig. 2.

Although I prefer the use of two studs  $g^2, g^3$  and two pins  $f^2, f^3$  in different transverse planes, it will be evident that the said pins  $f^2, f^3$  may be in the same plane if desired, and may be operated by a single stud  $g^2$ , as shown in Fig. 4, and instead of pivoting the rear end of the arm B to a swinging radius arm in the manner described and shown, said arm B may be differently guided at the rear end as, for instance, in the slotted bracket J shown in Fig. 5, the shaft which carries the cam  $f$  being adapted to a bearing J' on the arm B and instead of pivoting the front end of the arm to the thread guide tube, said front end of the arm may be pivoted to some other part of the rotating portion of the machine, as for instance to a pin  $i$  adjacent to the thread guiding tube, as also shown in Fig. 5.

I am aware that extra thread devices have been applied to knitting machines, in such manner that the clamping device for the extra thread was located close to the guide which fed the threads to the needles, but in all such cases the clamping device was fixedly mounted upon the rotating part of the machine and it was necessary to rotate with it the bobbin carrying the extra thread, whereas the extra thread feeding device which I have devised has a pivotal connection with the rotating part of the machine, and the clamping jaws have, in respect to a fixed thread supplying bobbin, what is practically a simple back and forth movement, so that there is no tendency to twist the thread, as there would be if the ordinary rotating clamp was employed in connection with a stationary bobbin.

Dispensing with the rotating bobbin is a feature of great importance where heavy bobbins are used, as such heavy bobbins, if rotated, would necessarily cause a reduction in the speed of the machine, especially if more than one reinforcing thread was used with a corresponding increase of bobbins. Moreover, the conditions of the thread can be much more readily observed when the bobbin is stationary than when it is rotating. It will be evident, therefore, that, so far as the main feature of my invention is concerned, it is immaterial what form of clamp operating mechanism be used, so long as the clamp carrying arm is mounted in the manner set forth.

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

1. The combination of the rotating thread guide of a knitting machine, with an arm carrying a thread clamp, one end of said arm having a pivotal connection with a rotating part of the machine, and the other end of the arm being supported so as to be capable of to and fro movement.
2. The combination of the rotating thread guide of a knitting machine, an arm having at one end a pivotal connection with a rotating part of the machine, and supported at the other end so as to be capable of to and fro movement, a thread clamping jaw on said arm, a lever pivoted upon the arm and having the other thread clamping jaw, a shaft having a cam for operating said lever, said shaft being so mounted as to move back and forth with the outer end of the arm, and means for effecting a partial turn of the shaft as it is carried back and forth.
3. The combination of the rotating thread guiding tube of a knitting machine, with an arm carrying a thread clamp, said arm being pivoted at one end to said thread guiding tube, and supported at the other end so as to be capable of to and fro movement.
4. The combination of the rotating thread guide of a knitting machine, with an arm carrying a thread clamp and having at one end a pivotal connection with a rotating part of the machine, and a swinging radius arm to which the other end of said clamp carrying arm is pivoted.
5. The combination of the rotating thread guide of a knitting machine, with an arm carrying thread clamping devices, said arm being pivotally connected at one end to a rotating part of the machine and supported at the other end so as to be capable of to and fro movement, and said arm also having a common guide for the main and extra threads.
6. The combination of the rotating thread guide of a knitting machine, with an arm carrying thread clamping devices, said arm being pivotally connected at one end to a rotating part of the machine, and supported at the other end so as to be capable of to and fro movement, and said arm also having a common guide for the main and extra threads, and having the fixed clamp jaw for the extra thread perforated for the passage of the main thread.
7. The combination of the rotating thread guide of a knitting machine, with an arm carrying a thread clamping device, said arm being pivotally connected at one end to a rotating part of the machine and supported at the other end so as to be capable of moving to and fro, a shaft mounted so as to move with the outer end of said arm and having a cam for actuating the clamping device, and a sleeve or collar with pins projecting therefrom, means for striking said pins to cause movement of the shaft in either direction, and pat-



tern mechanism for rendering said striking means operative or inoperative.

8. The combination of the rotating thread guide of a knitting machine, with an arm carrying a thread clamping device, said arm being pivotally connected at one end to a rotating part of the machine and supported at the other end so as to be capable of moving to and fro, a shaft mounted so as to move with the outer end of said arm and having a cam for actuating the clamping device, and a sleeve or collar with pins projecting therefrom in

different transverse planes, a pair of operating studs located side by side and adapted to act respectively upon the two pins of the cam shaft, and pattern mechanism for moving said operating studs.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS N. D. WILLIAMS.

Witnesses:

WILL. A. BARR,  
JOSEPH H. KLEIN.