R. FISHER.

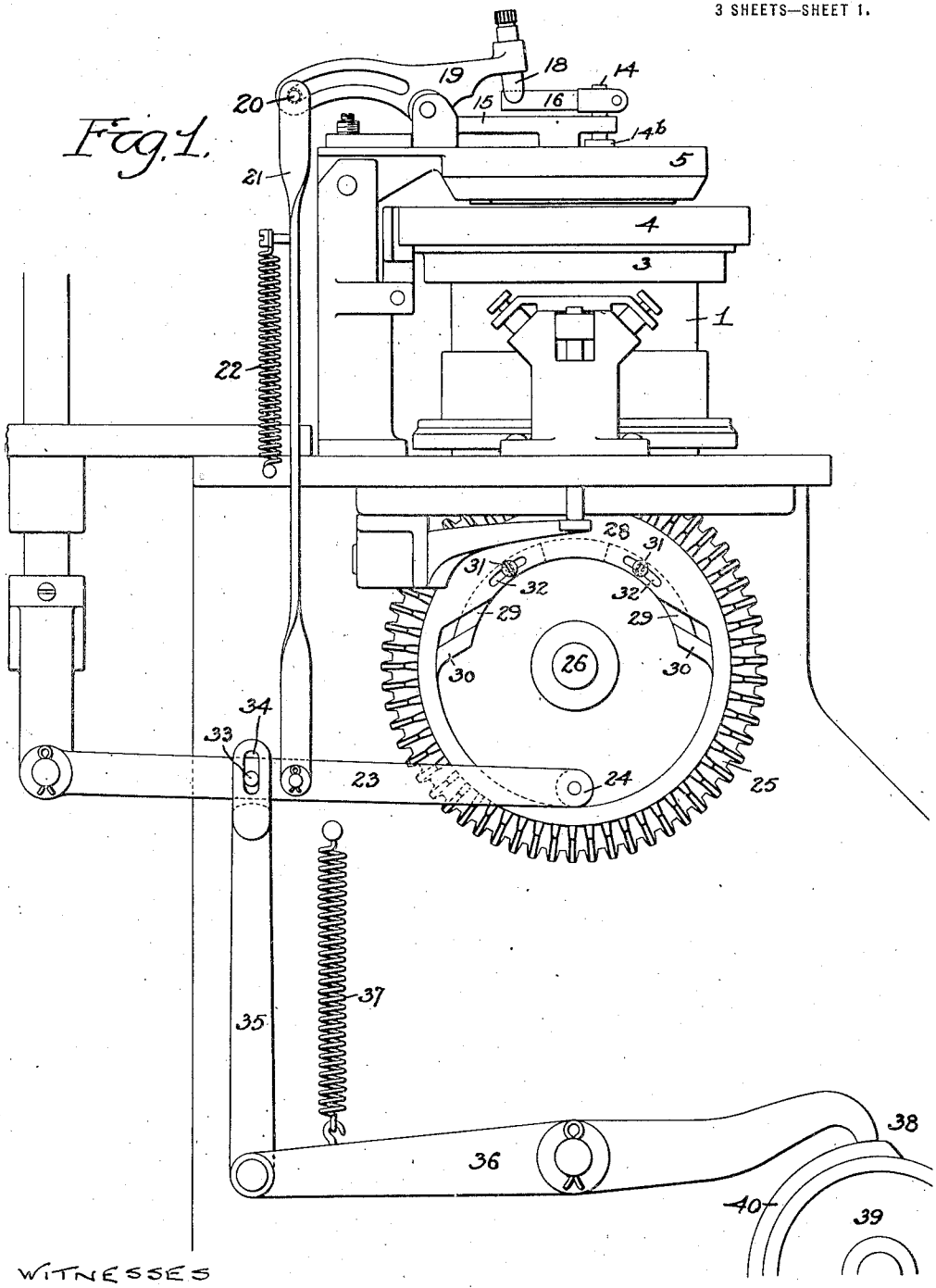
YARN SEVERING DEVICE FOR KNITTING MACHINES.

APPLICATION FILED JUNE 10, 1915. RENEWED DEC. 15, 1917.

1,356,060. Patented Oct. 19, 1920.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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Fig. 6.

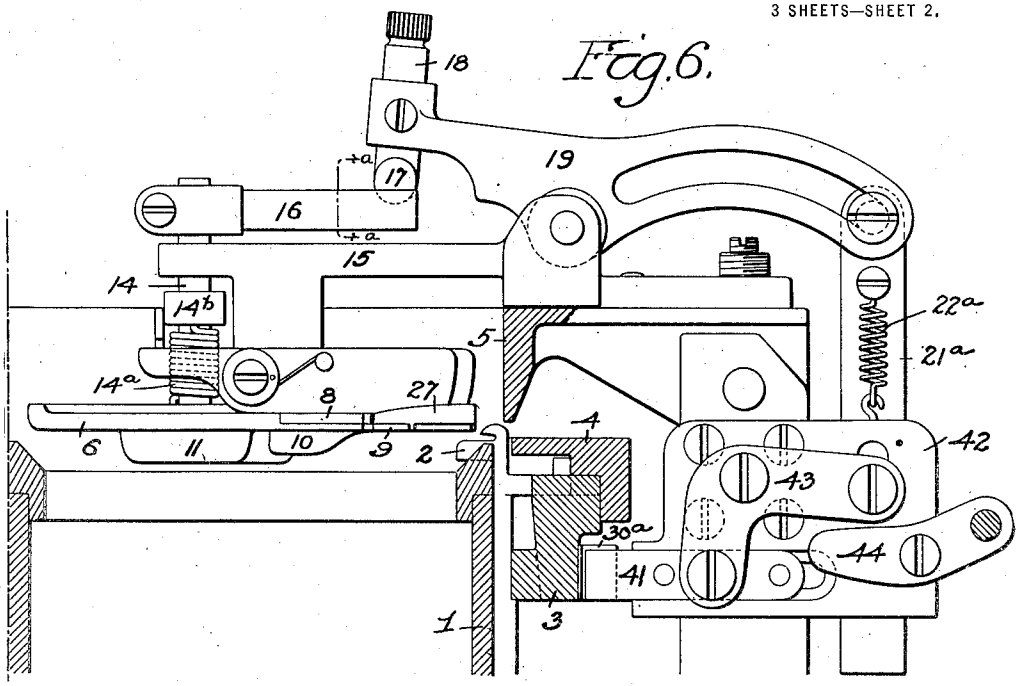


Fig. 2.

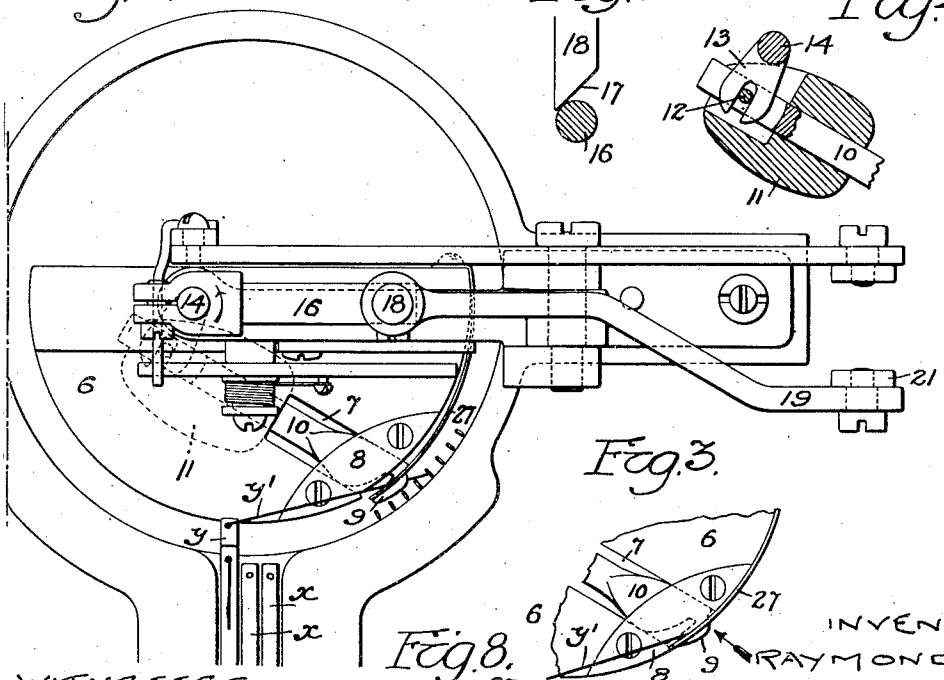
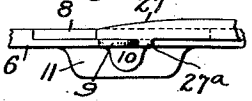


Fig. 7.

Fig. 4.

Fig. 3.

Fig. 8.



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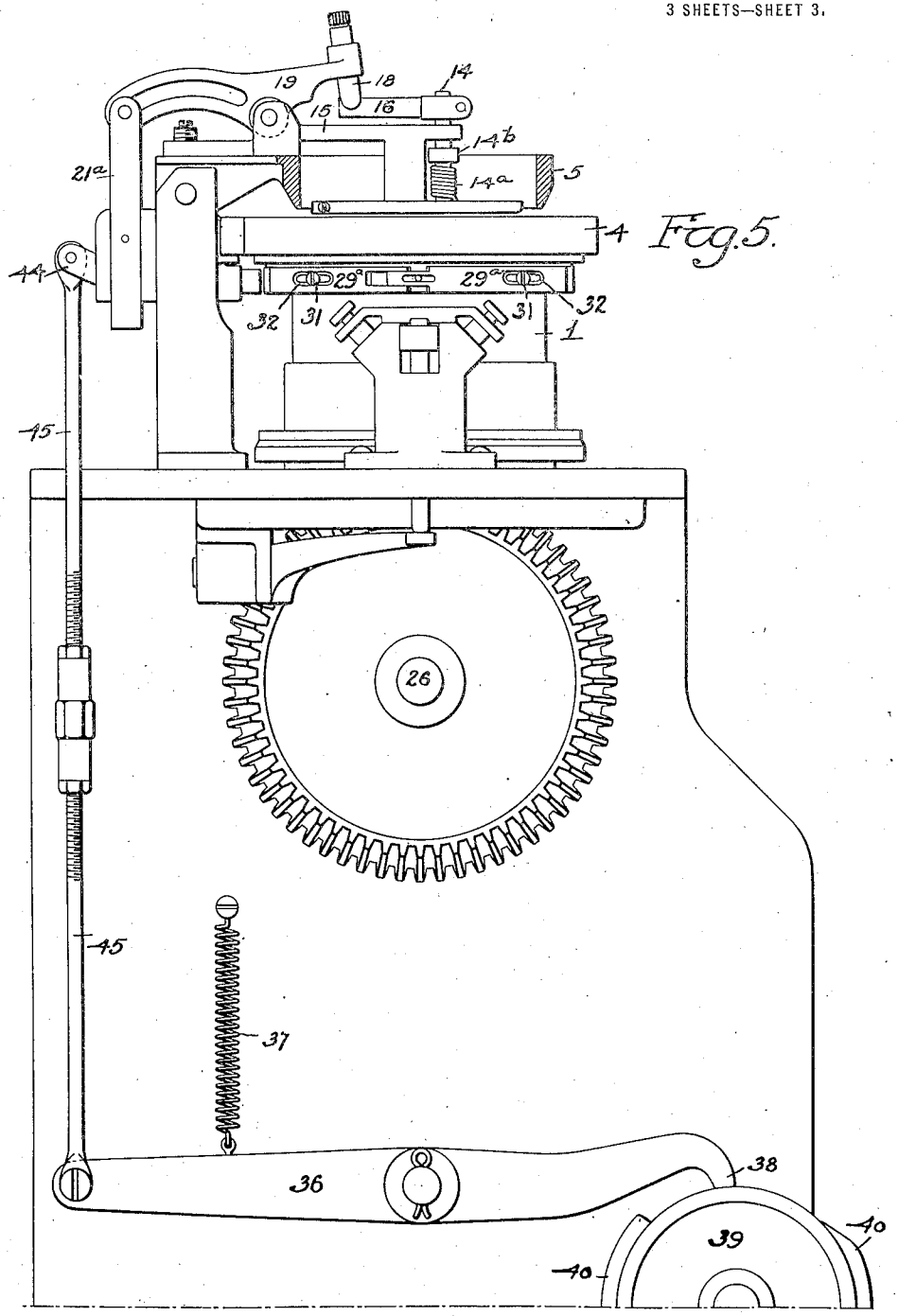


Fig. 5.

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RAYMOND FISHER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HEMPHILL MANUFACTURING COMPANY, OF PAWTUCKET, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

YARN-SEVERING DEVICE FOR KNITTING-MACHINES.

1,356,060. Specification of Letters Patent. Patented Oct. 19, 1920.

Application filed June 10, 1915, Serial No. 33,259. Renewed December 15, 1917. Serial No. 207,361.

To all whom it may concern:

Be it known that I, RAYMOND FISHER, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Yarn-Severing Devices for Knitting-Machines, of which the following is a specification.

My invention relates to knitting machines which are equipped for introducing reinforcing yarn along with the main knitting yarn or yarns in a part only of the knitted web, as for instance in the sole portion of the foot of a stocking, the reinforcing yarn being severed as soon as each partial course has been completed and the cut end of the yarn being again applied to the needles at the beginning of the next partial course.

My invention consists of certain mechanism for severing the reinforcing yarn and retaining the severed end of the same while the reinforcing yarn feeder is out of action, and releasing it when said feeder has been again moved to feeding position.

In the accompanying drawings:—

Figure 1 is a side elevation of a machine of the Hemphill type to which my invention has been applied;

Fig. 2 is a top view of the same on an enlarged scale, and reversed, right for left;

Fig. 3 is a top view of certain of the parts shown in Fig. 2 but in a different position from that there represented;

Fig. 4 is a horizontal sectional view of parts of the attachment shown by dotted lines in Fig. 2;

Fig. 5 is a view similar to Fig. 1, but illustrating certain modifications of my invention;

Fig. 6 is a view, partly in side elevation and partly in section, of certain of such modified mechanism on a larger scale than Fig. 5;

Fig. 7 is a transverse section on the line *a*—*a*, Fig. 6; and

Fig. 8 is a side elevation of certain of the parts shown in Fig. 3, looking in the direction of the arrow in said figure.

In the drawing, 1 represents part of the rotating needle cylinder of a machine of the Hemphill type, 2 one of the reciprocating web holders at the top of said cylinder, 3 the web holder supporting and guiding ring mounted upon and rotating with the needle cylinder, 4 the non-rotating cam cap for effecting reciprocation of the web holders, and 5 the latch guard ring above the needle cylinder, all of these parts being similar in construction and function to the corresponding parts of the Hemphill machine and hence forming no part of my invention.

Fixedly mounted above the top of the needle cylinder is a semi-circular plate 6 having therein a tangential gap 7 extending to the periphery of the plate, the outer portion of said gap being bridged by a shear blade 8 which is fixedly mounted on the plate, as shown in Fig. 2. Beneath the plate is a movable shear blade 9 which is carried by a stem 10, the latter passing through a lug 11 on the underside of the plate and having a projecting pin 12 which engages a forked arm 13 free to play in a slotted portion of the lug 11 and fixedly mounted upon or forming part of a vertical shaft 14, as shown in Fig. 4.

The shaft 14 is free to turn in bearings in the plate 6 and in an arm 15 which is mounted on the latch guard ring 5 and projects inwardly above the top of the needle cylinder.

The shaft 14 has at its upper end an arm 16 adapted to be acted upon by the beveled lower end 17 of a stud 18 carried by and projecting downwardly from one arm of a lever 19 (Figs. 1, 5 and 6) whose other arm is slotted for the reception of a pin 20 at the upper end of a bar 21 normally pulled downward by means of a spring 22 (Fig. 1) and connected at its lower end to a lever 23 pivotally mounted upon any suitable fixed portion of the machine and having at its free end an anti-friction roller 24 adapted to be acted upon by a cam structure mounted upon a bevel wheel 25 which constitutes one of the elements whereby the needle cylinder is rotated from the main driving shaft 26 of the machine.

Secured to the outer face of the plate 6 is a spring 27 whose free end has a normal tendency to move inwardly, as shown in Fig. 3, and on said spring is a depending lug 27^a (Fig. 8) which bears upon the outer face of the shear blade 9.

A coiled spring 14^a (Fig. 6) surrounds the shaft 14, the lower end of this spring engaging the plate 6 and its upper end engaging a collar 14^b on the shaft 14, the tendency of this spring being to move the shaft 14 in the direction of the arrow Fig. 2, so as

to open the shear blade 9, and thus push the spring plate 27 away from the face of the fixed shear blade 8, as shown in Fig. 2, but when the shear blade 9 is drawn toward the shear blade 8 so as to sever the yarn passing between them the spring 27 will contact with the outer face of the shear blade 8, as shown in Fig. 3.

When the parts are in the position shown in Figs. 1 and 2 the arm 16 is free from contact with the beveled lower end of the stud 18, but when the lever 19 is actuated so as to depress the stud 18 the beveled lower end of the latter contacts with the arm 16 and moves the shaft 14 and its arm 13 in a direction the reverse of that indicated by the arrow in Fig. 2.

The cam on the bevel wheel 25 which effects the movement of the lever 19 at the proper times as capable of expansion and contraction, said cam being, as shown in Fig. 1, composed of a segmental plate 28 secured to or forming part of the bevel wheel 25 and carrying two segmental arms 29 which have cam-forming ends 30, the arms 29 being mounted upon the plate 28 so as to be susceptible of circumferential adjustment thereon, screws 31 carried by the arms 29 being adapted to segmental slots 32 in said plate 28, so that by loosening the screws 31 the arms 29 may be adjusted on the plate 28 to expand or contract the cam, after which said arms 29 can be secured to the plate by again tightening said screws.

The lever 23 has a projecting pin 33 thereon which enters a slot 34 in the upper end of a link 35, the latter being connected at its lower end to one arm of a lever 36 pivotally mounted on some part of the fixed frame of the machine, said arm being acted upon by a spring 37 which tends to draw a toe 38 on the other arm of the lever 36 down onto the periphery of a pattern drum 39 which is provided with one or more cams 40, as shown in Fig. 1. When the lever 36 is being acted upon by a cam 40, as shown in Fig. 1, the lever 23 is free to rise and fall under the action of the cam on the bevel wheel 25 so as to alternately open and close the shear blade 9. When, however, the lever 36 is free from the influence of the cam 40 the lever 23 will be lifted so as to free its roller 24 from the action of the cam on the bevel wheel 25 and the shear blade 9 and spring clamp 27 will be moved to the position shown in Fig. 3 and will be retained in that position until the lever 36 is again acted upon by a cam 40.

The regular yarn guides of the machine are shown at x—x in Fig. 2, and the supplementary or reinforcing yarn guide at y in said figure. When the yarn feeding ends of these guides are down, as shown at x the yarn will be fed to the needles, but when said end of the yarn guide is elevated, as shown at y, it will be carried above the tops of the needles and will cease to feed yarn thereto. When, therefore, the reinforcing yarn guide is raised to non-feeding position, as shown in Fig. 2, the yarn y' in passing therefrom to the last needle which drew a stitch of said yarn will pass between the fixed and movable shear blades 8 and 9 and between said shear blade 8 and the spring clamp 27, as shown in Fig. 2, and will afterward be severed by the inward movement of the movable shear blade 9, one of the severed ends being carried around by the needles and the other being caught and held between the face of the shear blade 8 and the clamping spring 27, as shown in Fig. 3.

While I prefer, in all cases, to mount the cam which actuates the movable shear blade 9 upon the driving wheel 25 of the machine other locations thereof and other means for causing the same to act upon the lever 19 are permissible within the scope of my invention, and in Figs. 5 and 6 I have illustrated one such modification of my invention.

In this case the cam carrying arms 29^a are adjustably mounted upon the needle cylinder 1 by means of screws 31 and slots 32, the adjoining ends of said arms 29^a being preferably interlocked, as shown in Fig. 5. The cam formations 30^a (Fig. 6) act upon a bar 41 slidably mounted in a fixed plate 42 on the frame of the machine and engaging one arm of a lever 43 pivotally mounted on said plate, the other arm of said lever engaging a bar 21^a which is slidably mounted upon the plate and is operatively connected at its upper end to the lever 19, a spring 22^a tending to normally depress the bar. The latter will therefore be raised and lowered on each rotation of the needle cylinder so as to open and close the shearing blades at the proper times. When it is desired to put the shearing mechanism out of action temporarily the lever 43 is acted upon by another lever 44 pivotally mounted on the plate 42 and connected by means of an adjustable rod 45 to the lever 36, as shown in Fig. 5, the cams 40 in this case operating in a manner the reverse of that shown in Fig. 1.

I claim:

1. The combination, in a reinforcing yarn severing and clamping device for knitting machines, of a fixed shear blade, a shear blade movable from and toward said fixed shear blade, means for so moving the movable shear blade, and a resilient clamping plate normally acting to press the yarn against the fixed shear blade, said clamping plate also having a bearing upon the movable shear blade whereby when the shears are opened the yarn engaging portion of the clamping plate will be moved away from the fixed shear blade and when the shears are

closed said yarn engaging portion of the clamping plate will be permitted to move toward said fixed shear blade.

2. In a reinforcing yarn severing device for knitting machines, the combination of a pair of shear blades occupying a fixed circumferential relation to the needles, and means for moving one of said shear blades in respect to the other, said means comprising a shaft having two arms one in engagement with the stem of the movable shear blade, a lever having a stud with beveled end for acting upon the other arm to move the same, and means for vibrating said lever at intervals.

3. In a reinforcing thread mechanism for knitting machines, the combination of a pair of shear blades, means for opening and closing the same, and actuating mechanism therefor having as elements a cam rotating in unison with the needle cylinder of the machine, a lever operated by said cam, a cam independent of the first, and a lever actuated by said second cam and in operative connection with the first-named lever, said operative connection having a lost motion connection with one of the levers.

4. In a knitting machine, the combination with the needle cylinder, of a plate fixedly mounted above the top of said needle cylinder, a pair of shear blades tangentially mounted in said plate, and means for moving one of said shear blades with respect to the other.

5. In a knitting machine, the combination with the needle cylinder of a plate fixedly mounted above the top of said needle cylinder, a tangential gap therein extending to the periphery of the plate, the outer portion of said gap being bridged by a fixed shear blade, a movable shear blade mounted upon said plate and means for reciprocating said movable shear blade.

6. In a knitting machine, the combination with the needle cylinder, of a semi-circular plate fixedly mounted above the top of said needle cylinder and at right angles therewith, a tangential gap in said plate extending to the periphery thereof, a fixed shear blade bridging the outer end of said gap, a movable shear blade upon said plate, a spring secured at one end to the periphery of said plate and having a lug arranged to bear upon the outer face of said movable shear blade, and means for reciprocating said movable shear blade.

7. In a knitting machine, the combination with the needle cylinder, of a yarn severing and clamping device embodying a fixed shear blade, a movable shear blade, means for reciprocating said movable shear blade, and a spring member having a portion thereof in continuous engagement with said movable shear blade and its free end arranged and adapted to engage and disengage said fixed shear blade.

8. In a knitting machine, the combination with the needle cylinder, of a plate fixedly mounted above the top of said needle cylinder a fixed shear blade and a movable shear blade mounted upon said plate, means for reciprocating said movable shear blade and a spring member provided with a lug arranged to bear against the outer face of said movable shear blade, the free end of said spring member being arranged and adapted to engage and disengage said fixed shear blade.

9. In a reinforcing yarn severing device for knitting machines, the combination of a fixed shear blade, a sliding shear blade movable from and toward said fixed blade, a shaft having two arms, a stud on the stem of the movable shear blade engaging one of said arms, a lever acting upon the other arm to move the same, and means for vibrating said lever at intervals.

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

RAYMOND FISHER.

Witnesses:

ELSIE M. HEEBNER,

KATHRYN ASHWORTH.