

No. 611,645.

Patented Oct. 4, 1898.

J. PALMER.

ATTACHMENT FOR KNITTING MACHINES.

(Application filed May 3, 1897.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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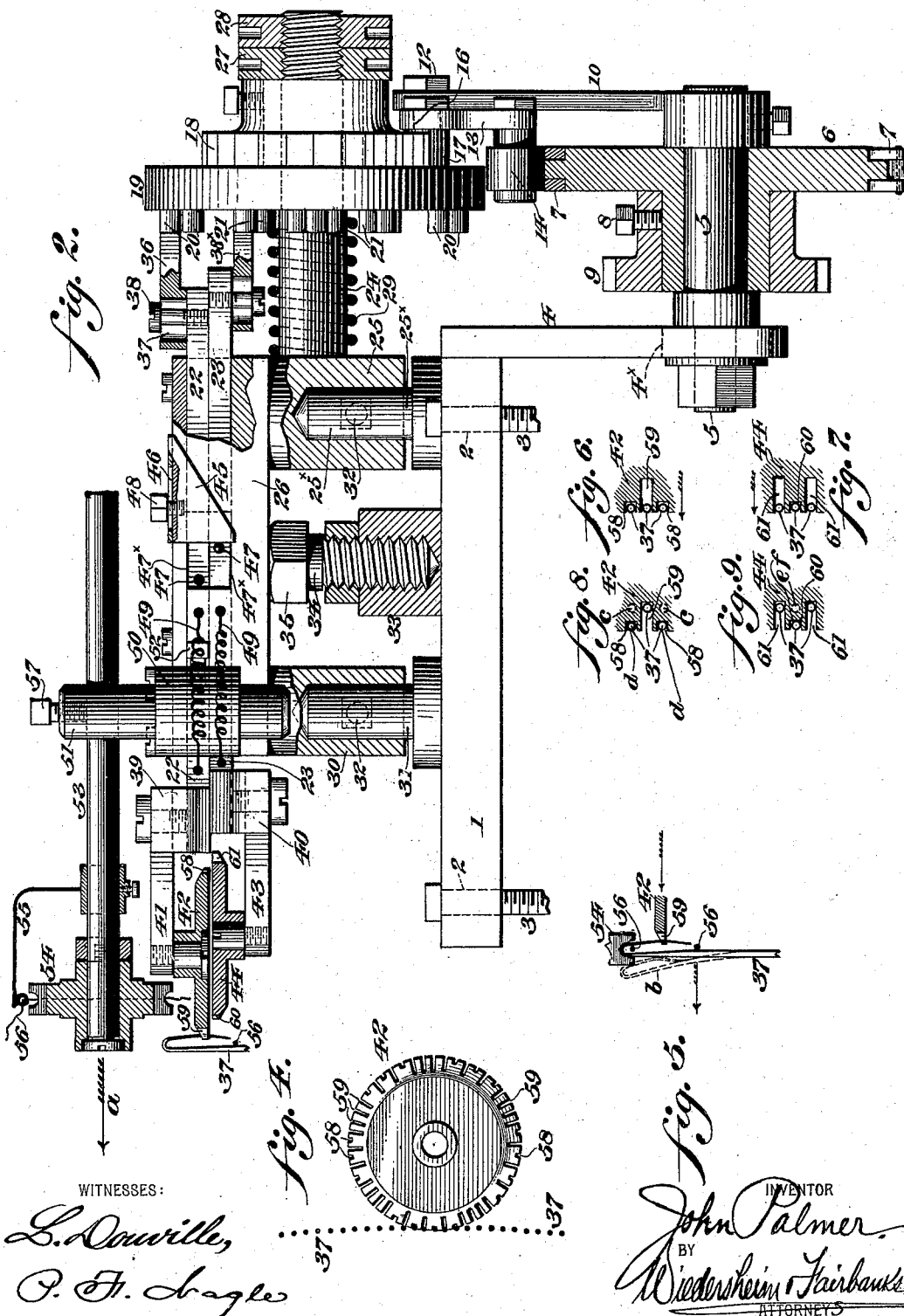
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3 Sheets—Sheet 2.



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fig. 8. fig. 6.

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fig. 9.

62 fig. 2.

fig. 5.

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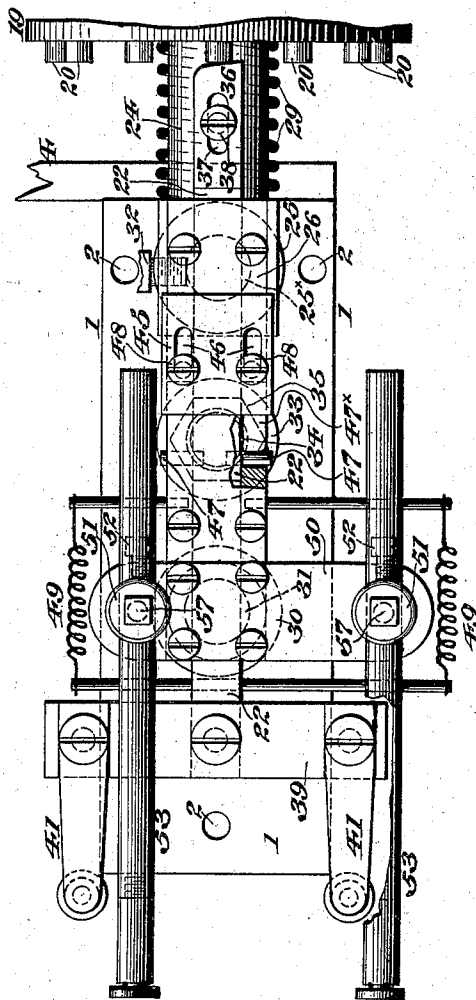
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Fig. 3.



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UNITED STATES PATENT OFFICE.

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ATTACHMENT FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 611,645, dated October 4, 1898.

Application filed May 3, 1897. Serial No. 634,807. (No model.)

To all whom it may concern:

Be it known that I, JOHN PALMER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Attachments for Knitting-Machines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in knitting-machines; and it consists of an attachment therefor embodying novel means whereby presser-wheels may be moved to and from the beards of the needles, so as to cause said beards at certain times to take hold of the yarn fed to them and at other times permit the yarn to slip over the beards, so that a fabric may be produced which shall contain in certain portions thereof loops at regular intervals and in other portions thereof shall contain floats, whereby knit fabrics of various designs or patterns may be produced.

It also consists of novel details of construction, all as will be hereinafter set forth, and pointed out in the claims.

Figure 1 represents an end elevation of my improved attachment for knitting-machines. Fig. 2 represents a partial side elevation and partial vertical section of the attachment embodying my invention. Fig. 3 represents a plan view of certain portions of the attachment shown in Fig. 2. Fig. 4 represents a plan view of a presser-wheel employed in connection with my invention. Fig. 5 represents a partial side elevation and partial vertical section of certain detached portions of the attachment. Fig. 6 represents a horizontal section of a portion of the presser-wheel seen in Fig. 4, the same being on an enlarged scale. Fig. 7 represents a horizontal section of the portion shown in Fig. 6, but in a different position. Fig. 8 represents a horizontal section of the portion shown in Fig. 6 in its advanced position. Fig. 9 represents a horizontal section of the portion shown in Fig. 7 in its advanced position.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the bed or base plate of the attachment, the same being provided with openings 2, through

which bolts or screws 3 may be passed for securing said attachment to a knitting-machine. (Not shown.)

Depending from the base-plate 1 is a hanger 4, in the lower portion of which is a slot 4^x, through which is passed a stud-shaft 5, on which is loosely mounted a sprocket-wheel 6, around which passes a pattern-chain 7. The object of the slot 4^x is for the purpose of adjusting the shaft 5 relatively to certain parts to be hereinafter referred to.

Secured to the hub of the sprocket-wheel 6, in the present instance by a set-screw 8, is a ratchet-wheel 9, which may be driven by any well-known mechanism, so as to impart motion to said sprocket-wheel 6, so that the latter may transmit motion to the pattern-chain 7.

It will be evident that, if desired, the sprocket-wheel 6 and ratchet-wheel 9 may be formed in one piece.

Firmly secured to the outer portion of the shaft 5 is a bracket 10, the same being provided with a slot 11, through which is passed a stud-shaft 12, on which is loosely mounted an arm 13, provided with a roller 14, which is in contact with the pattern-chain 7, so that said roller, and consequently the arm 13, may be caused to rise and fall when said chain is in motion.

The arm 13 is provided with a slot 15, through which is passed a stud 16, on which is loosely mounted a spring-actuated dog 17, which engages the teeth of a ratchet-wheel 18, so as to impart motion thereto for a purpose to be hereinafter described.

19 designates a disk which may be either secured to or formed integral with the ratchet-wheel 18, so that the motion of the latter will be transmitted to said disk, and thereby cause the studs 20 and 21, (the latter being omitted in Fig. 3 for clearness of illustration of said figure,) which project from the disk 19, to impart motion to the reciprocating bars 22 and 23, respectively, and for a purpose to be hereinafter described.

The disk 19 is mounted on a shaft 24, which projects from a sleeve 25, which depends from the portion 26 of the device and in which latter are guided the reciprocating bars 22 and 23.

The ends of the hubs of the ratchet-wheel

18 and disk 19 abut against a nut 27, which is fitted on the threaded portion of the shaft 24 and is retained in position on said shaft by a jam-nut 28.

5 Interposed between the disk 19 and sleeve 25 and encircling the shaft 24 is a spring 29, which retains said disk in its proper position relatively to the sleeve 25 by preventing the disk from moving toward said sleeve. The
10 spring 29 acts also as a tension device on the disk 19 and prevents the latter from rotating when not driven by the ratchet-wheel 18.

Depending from the portion 26 of the device is a sleeve 30, which is guided on a post
15 31, which rises from the base-plate 1, it being noted that the sleeve 25 is guided on a post 25^x, which also rises from the bed-plate 1, the object of said sleeves and posts being to permit the portion 26 and parts carried thereby
20 to be raised and lowered for the purpose of an adjustment to be hereinafter described.

The sleeves 25 and 30 are each provided with a set-screw 32, which retain said sleeves firmly in position when the same have been
25 adjusted.

Rising from the base-plate 1 is a boss 33, in which is fitted a bolt 34, whose head 35 bears against the under side of the portion 26 of the device, the object of said bolt being to either
30 raise or lower the portion 26 and parts carried thereby, it being evident that when the bolt is rotated in a certain direction it will raise the portion 26 of the device and when rotated in a reverse direction will permit said portion
35 26 to descend.

The reciprocating rod 22 has secured thereto a finger 36, the latter being provided with a slot 36^x, through which is passed a screw 38, which retains said finger in position on said
40 rod.

The object of the slot 36^x is to permit the finger 36 to be moved in the direction of its length on the reciprocating rod 22, so as to adjust the latter relatively to the needles 37
45 for a purpose to be hereinafter described.

The reciprocating bar 23 is provided with an adjustable finger 38^x, whose object is the same as above described in connection with the finger 36.

50 The reciprocating bars 22 and 23 are provided with the cross-pieces 39 and 40, respectively. Projecting from the cross-piece 39 are brackets 41, which carry the presser-wheels 42, as best seen in Figs. 1, 2, 4, and 5,
55 it being evident that said wheels will be moved to and fro by the reciprocating motion of the bar 22. The cross-piece 40 is provided with brackets 43, which carry the presser-wheels 44, which are moved to and fro by the recip-
60 roating motions of the bar 23.

Secured to the portion 26 of the device is a stop 45 for limiting the movement in one direction of the reciprocating bars 22 and 23 for a purpose to be hereinafter described, it
65 being noted that the stop 45 is provided with slots 46 for the purpose of adjusting it relatively to the studs 47, which project from the

sides of the reciprocating bars 22 and 23 and move in a slot 47^x on both sides of the portion 26 of the device. The stop 45 is retained
70 in its adjusted position by bolts 48, which enter the slots 46 and are screwed into the top of the portion 26 of the device.

The reciprocating bars 22 and 23 are provided with springs 49 for returning the same
75 to their normal positions after having been moved forward by the studs 20 and 21 on the disk 19.

The portion 26 of the device is provided with a block 50, which supports the posts 51,
80 and the latter may be raised and lowered in said block for the purpose of an adjustment to be hereinafter described, and when adjusted may be firmly held in position by set-screws 52. The posts 51 carry the rods 53, on
85 which are mounted the yarn-wheels 54, and each of said rods has secured to it a yarn-guide similar to that shown at 55 in Fig. 2, and both rods 53 may be adjusted by sliding the same in openings in the posts 51, through
90 which they are passed, so as to move the yarn-wheels 54 either toward or away from the needles 37, as may be required.

When the yarn-wheels 54 have been properly adjusted relatively to the needles 37, the
95 rods 53, which carry said wheels, may each be secured in its adjusted position by tightening a set-screw 57 in each post 51.

The operation is as follows: The set-screws 57 are loosened, so as to permit the rods 53 to
100 be moved in the direction indicated by the arrow *a* in Fig. 2, and when the yarn-wheels 54 have been brought directly over the needles 37 adjacent thereto the rods 53 are secured in position in their respective posts 51
105 by tightening the set-screws 57. When a yarn-wheel 54 is in its proper position relatively to the needles 37, the two will be in substantially the positions shown in full lines in
110 Fig. 5.

Referring now to Fig. 2, the loose end of the yarn 56 from a cop or bobbin is passed through the eye of the yarn-guide 55 and from this point to and under the yarn-wheel 54, so as to be fed to the needles 37, and
115 consequently produce a knit fabric. The set-screw 38 is then loosened and the end of the finger 36 is brought against the inner upright face of the disk 19, it being understood that when the finger 36 is in this position the
120 end thereof which contacts with the inner face of the disk 19 will occupy a space between two adjacent studs 20. The reciprocating bar 22 is then moved toward the needles 37, so as to bring the presser-wheel 42 in
125 such a position relatively to said needles that the beards of the latter will enter the shallow and deep slots 58 and 59, respectively, in said wheel 42. The beards of the needles 37 enter the slots 58 and 59 just enough to impart
130 a rotary motion to said wheel when the needles 37 are being carried around by the needle-cylinder in the usual manner, as will be understood from Fig. 4. The set-screw 38 is

then tightened, so as to firmly retain the finger 36 in its adjusted position on the reciprocating bar 22. The reciprocating bar 23 and the finger 38^x thereon are adjusted in the same manner as that described in connection with the bar 22 and finger 36, the adjustment of the bar 23 and finger 38^x being to so locate the presser-wheel 44 that the shallow and deep slots 60 and 61, respectively, therein shall engage the needles 37 in a similar manner and for the same object as that described in connection with the presser-wheel 42 and needles 37.

It will be observed that the presser-wheels 42 are located above the presser-wheels 44 and that one of the former and one of the latter are worked in pairs, the object of which will be hereinafter explained.

It will be seen by referring to Fig. 1 that the studs 20 and 21 are equal in number and that a radial line drawn from the center of a stud 21 will pass through the space between two adjacent studs 20 and midway between the latter, it being evident that by thus locating the series of studs 20 relatively to the series of studs 21 the two series will be in staggered order relative to each other. It will be apparent that by thus locating the studs 20 and 21 it will be impossible for the reciprocating bar 22 to be advanced by a stud 20 when the reciprocating bar 23 is in its advanced position. Neither will it be possible for the reciprocating bar 23 to be advanced by a stud 21 when the bar 22 is in its advanced position. The stud-shaft 5, the arm 13, and stud 16 are then adjusted so as to properly locate said parts relatively to each other, and motion is then imparted to the ratchet-wheel 9 in any well-known manner—for instance, by a rising-and-falling arm 9^x and a dog 10^x. (See Fig. 1.) The sprocket-wheel 6 in rotating will transmit motion to the pattern-chain 7, and when a link 7^x therein passes under the roller 14 the latter, and consequently the arm 13 and dog 17, will be raised and the latter will impart a partial rotation to the ratchet-wheel 18 and disk 19. When a link 7^x passes from under the roller 14, the latter will drop and carry with it the arm 13 and spring-pressed dog 17, so as to cause the latter to engage with another tooth of the ratchet-wheel 18, so that a partial rotation may again be imparted to said wheel when a subsequent link 7^x passes thereunder. The disk 19, when not impelled by the dog 17, will be caused to remain stationary by the pressure of the spring 29 thereagainst, and improper rotation of the same cannot occur. The disk 19, when rotated, will cause a stud 20 thereon to contact with the finger 36, and thereby advance the same, and also the reciprocating-bar 22, the cross-piece 39, and presser-wheels 42, as is evident. When a slot 59 in a presser-wheel 42 registers with a needle 37, as best seen in Fig. 6, said wheel will produce no effect on the needle, for when said wheel is advanced by the mechanism hereinbefore de-

scribed the slot 59 will permit the needle 37 to enter therein, as seen in Fig. 8, and the same will remain in its normal or vertical position, as shown in full lines in Fig. 5, thereby causing the yarn 56 to enter the beard of the needle and be formed into a loop in the usual manner in the process of knitting.

It will be evident that sometimes two or more slots 59 may be made to register at the same time with a corresponding number of needles, the number of consecutive slots being determined by the pattern of the fabric.

When a slot 58 in a presser-wheel 42 registers with a needle 37, the latter will be deflected or bent out of its normal or vertical position, as shown at *b* in dotted lines in Fig. 5, when a presser-wheel 42 is advanced.

In Figs. 6 and 8 two slots 58 are shown, and in the former figure the presser-wheel 42 and needles 37 are in their normal positions. When the presser-wheel 42 is advanced, as hereinbefore described, the same will be moved in the direction indicated by the arrow in said Fig. 6, and the slot 59 in said presser-wheel will produce no effect on the needle 37 in its path, as hereinbefore stated, but the slots 58 will bear against the beards of the needles 37 with which they contact and close the same and also deflect the upper portions of said needles, causing said portions to bend, and in so doing be moved from their original positions (seen at *c* in Fig. 8) to the positions seen at *d* in said figure. The yarn 56 fed to the needles 37 which are deflected will be prevented from entering the beards of the same, as the latter are closed by the slots 58 in the presser-wheel 42, and said yarn must consequently slip off the needles when the presser-wheel 42 is returned to its normal position, and thereby form a float in the fabric, the length of said float depending on the number of consecutive slots 58 presented to the needles 37. When a stud 20 leaves the finger 36, due to the rotation of the disk 19, the reciprocating bar 22 will be returned to its normal position by the spring 52, so as to be in readiness for a subsequent stud 20. When the reciprocating bar 22 has returned to its normal position, a stud 21 on the disk 19 is brought into contact with the finger 38^x of the reciprocating bar 23 and causes said finger 38^x, the bar 23, and the presser-wheel 44 to advance, so as to produce the same results as those described in connection with the presser-wheel 42.

In Fig. 7 the presser-wheel 44 and needles 37 are shown in their normal positions, and when said presser-wheel is advanced and moved in the direction indicated by the arrow in said figure the needles 37 which register with the slots 61 will enter the same, as shown in Fig. 9, and will remain in their vertical positions, so as to permit the yarn fed to them to enter their beards and be formed into loops in the usual manner in the process of knitting. The needle 37 which registers with the slot 60 will be deflected or bent by

the same, due to the forward movement of the wheel 44, and the upper portion of said needle will be moved from its original position (seen at *e* in Fig. 9) to that shown at *f* in said figure. The needle 37 thus deflected will have its beard closed, so as to permit the yarn fed to said needle to slip off the same and form a float in the fabric, the length of said float corresponding to the number of consecutive slots 60 in the wheel 44. When the bar 23 is returned to its normal position by the spring 49 and the finger 38^x on said bar occupies a space between two adjacent studs 21, the bar 22 is again advanced by a stud 20, so as to cause the presser-wheel 42 therein to again deflect certain needles 37 for the purpose hereinbefore described, it being noted that when the bar 22 is advancing the bar 23 is receding, and vice versa.

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

1. In an attachment for a knitting-machine, a bed-plate with a depending hanger having a slot therein, a stud-shaft adjustable in said slot, a sprocket-wheel mounted on said shaft, a bracket secured to said shaft and provided with a slot near its outer end, a stud-shaft adjustable in said slot, an arm loosely mounted on said shaft, a roller carried by said arm, a spring-operated dog mounted on said arm and means actuated by said dog.

2. An attachment for knitting-machines having a bed with a depending hanger, a stud in said hanger, a bracket secured to said stud, an adjustable stud-shaft secured to said bracket, an arm mounted on said stud-shaft and carrying a pawl, a rotatable disk provided with a ratchet and projecting pins, sliding bars having fingers engaged by said pins and presser-wheels carried by said sliding bars and adapted to engage needles on the knitting-machine.

3. In an attachment for a knitting-machine, a bed-plate, a support adjustable thereon, upper and lower sliding bars guided laterally in said support, cross-pieces secured to one end of said bars and having arms with presser-wheels mounted thereon, fingers adjustable on the other ends of said bars, disks or plates having pins thereon adapted to contact with said fingers and mechanism substantially as described connected with and actuating said disks for imparting an alternating and reciprocating motion to said bars.

4. In an attachment for a knitting-machine, a bed-plate with a depending hanger, a support adjustable on said bed-plate, horizontal sliding bars guided in said support having presser-wheels on one end and adjustable fingers on the other, an upright disk provided with concentric rows of staggered pins engaging said fingers and mechanism connected with and supported on said hanger for imparting an intermittent motion to said disk.

5. In an attachment for knitting-machines, a ratchet-wheel suitably supported, a sprock-

et-wheel rotatable in unison with said ratchet-wheel and adapted to have a pattern-chain passing therearound, a bearing for said ratchet-wheel and sprocket-wheel, an arm bearing a roller, a bracket extending from said bearing and having one end pivotally attached to said arm, said roller being adapted to be intermittently raised and lowered by means of said pattern-chain, a pawl supported on said arm and adapted to engage a ratchet-wheel, a disk adapted to rotate in unison with said ratchet-wheel, and a series of peripherally-recessed presser-wheels, in proximity to the needles of a knitting-machine, in combination with mechanism intermediate said wheels and disks for imparting a reciprocating motion to said wheels.

6. In an attachment for a knitting-machine, a bed-plate with a depending hanger, a support on said bed-plate provided with horizontally-sliding bars guided therein, presser-wheels and adjustable fingers on said bars, an upright disk provided with pins engaging said fingers, a block on said support carrying vertically-adjustable posts, rods adjustable in said posts having yarn-wheels mounted thereon, yarn-guides on said rods, and mechanism connected with and supported on said hanger for imparting an intermittent motion to said disk.

7. In an attachment for knitting-machines, a bed having sleeves supported thereupon, a body portion 26 carried by said sleeves, an adjusting-screw supported upon said bed and adapted to raise and lower said body portion, a plurality of sets of reciprocating bars supported on said body portion, fingers adjustably attached to said bars, a plurality of recessed presser-wheels carried by the latter, and means for reciprocating said fingers, bars and wheels.

8. An attachment for a knitting-machine having a bed with a depending hanger, a stud on said hanger, a rotatable sprocket-wheel mounted on said stud, a bracket secured to the latter, an adjustable stud-shaft on said bracket, an arm loosely mounted on said stud-shaft, a roller on said arm adapted to work on a pattern-chain on said sprocket-wheel, a spring-pressed pawl adjustable on said arm, a rotatable disk with a ratchet engaged by said pawl, pins projecting from said disk and sliding bars actuated by contact with said pins and carrying presser-wheels adapted to engage needles on a knitting-machine.

9. In an attachment for a knitting-machine, a bed-plate with a depending hanger, a support on said plate, sliding bars guided in said support each having a cross-piece provided with presser-wheels on one end and each having an adjustable finger on its other end, a plate or disk with inner and outer concentric rows of staggered pins engaging said fingers respectively, and mechanism connected with and supported by said hanger for imparting an intermittent motion to said disk.

10. An attachment for a knitting-machine

having a bed adapted to be secured to a knitting-machine, a support adjustable on said bed and having sliding bars guided therein, presser-wheels on said bars, yarn-wheels having supporting-rods adjustable on said support, a rotatable disk mounted on a shaft connected with said support and having pins engaging said sliding bars, springs for returning said bars, a pattern-chain and mechanism operated by contact with said pattern-chain for rotating said disk.

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Witnesses:

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