

G. H. GILBERT.
 TRANSFERRER FOR KNITTED FABRIC.
 APPLICATION FILED FEB. 10, 1908.

1,003,447.

Patented Sept. 19, 1911.

5 SHEETS—SHEET 1.

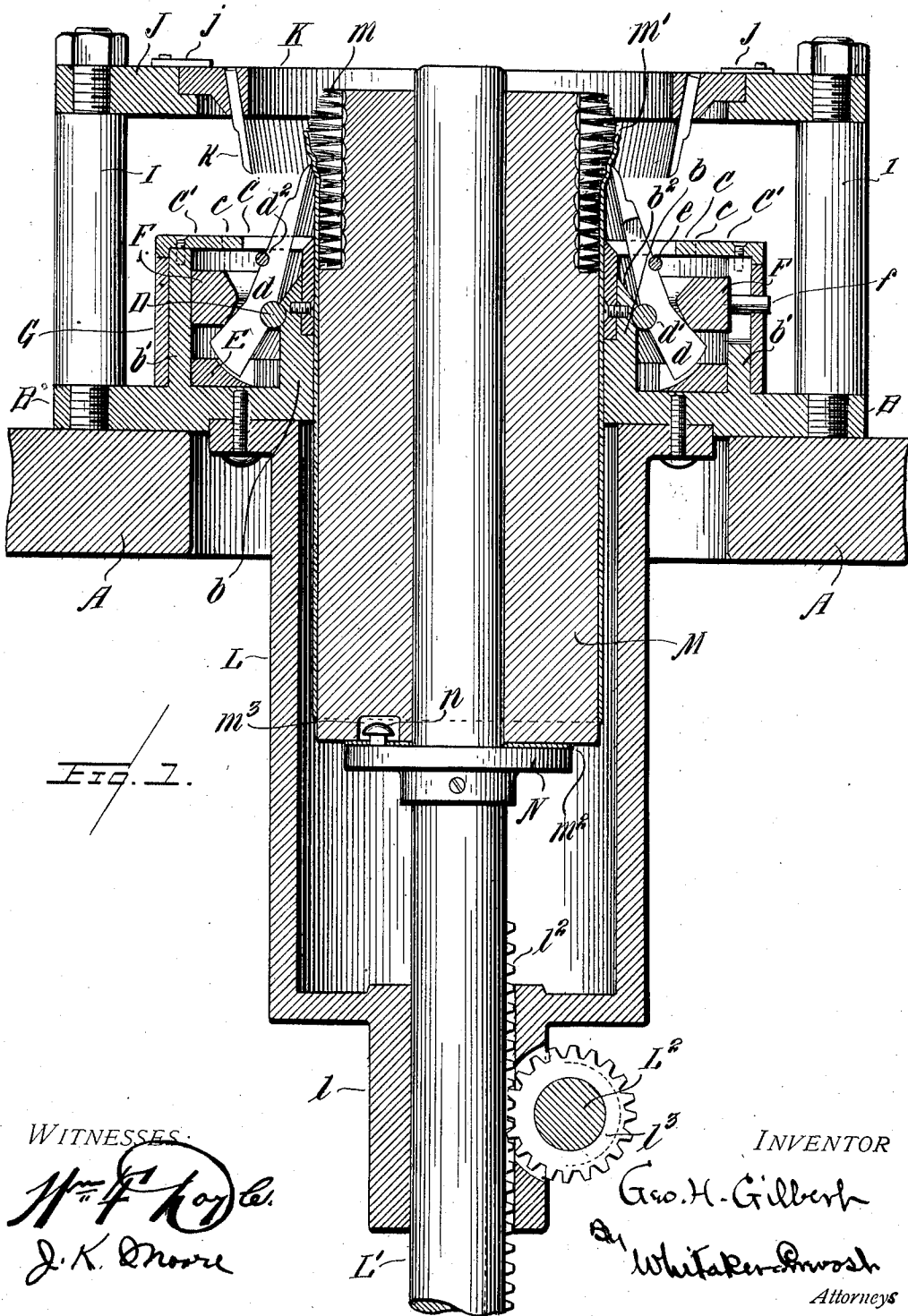


FIG. 1.

WITNESSES:

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J. K. Moore

INVENTOR

Geo. H. Gilbert

Whitaker & Trenchard

Attorneys

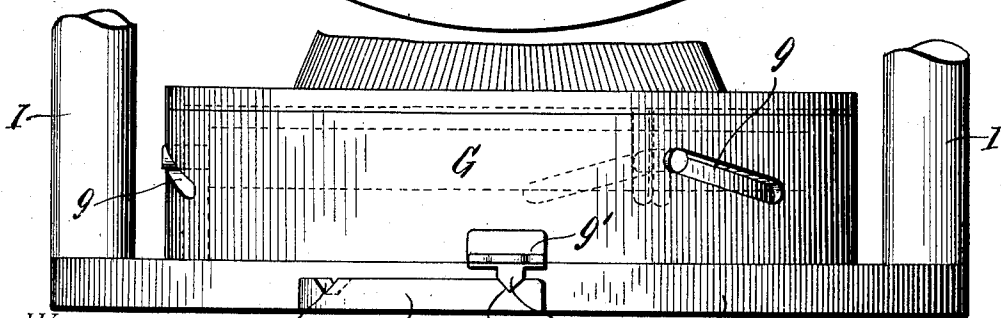
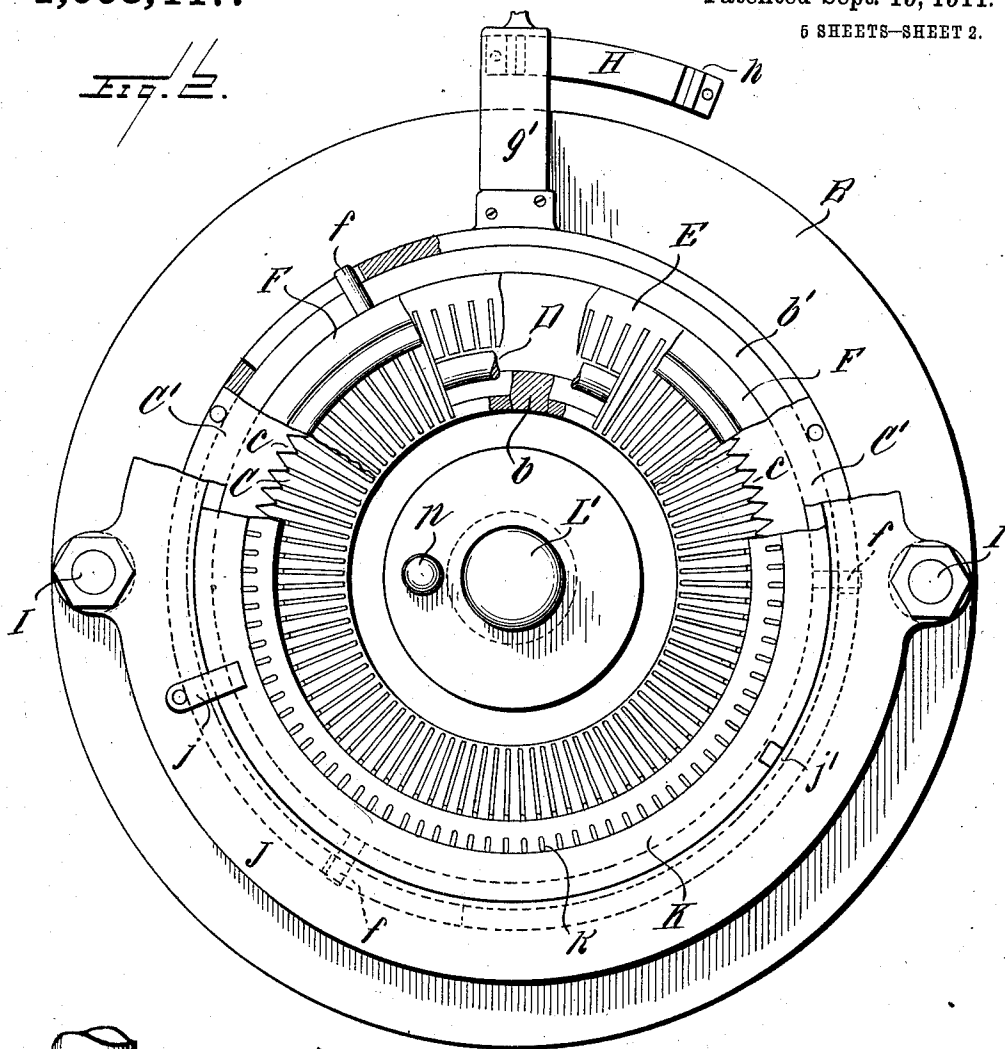
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6 SHEETS—SHEET 2.

FIG. 2.



WITNESSES
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FIG. 2.

BY

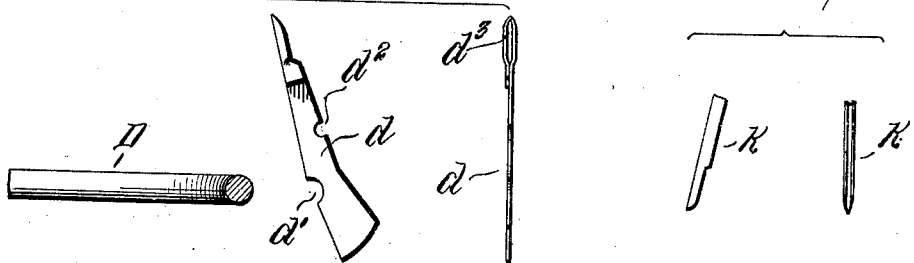
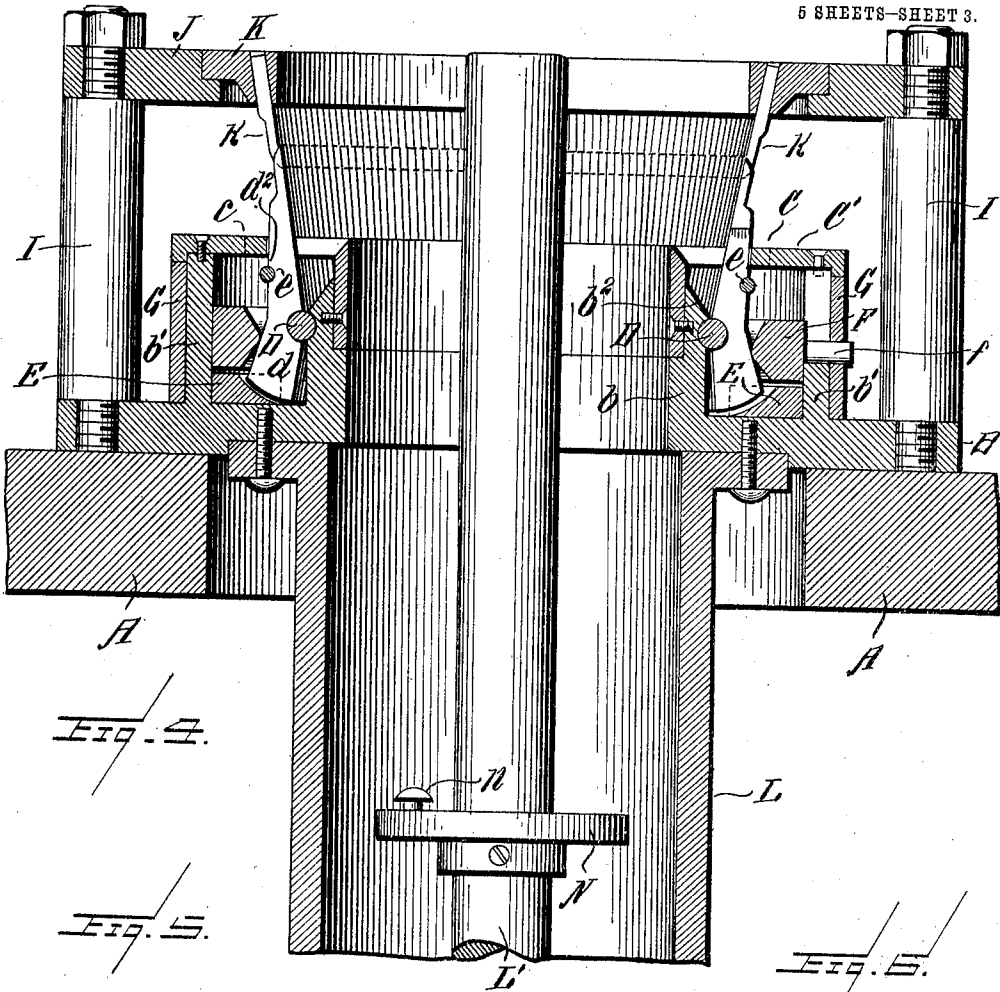
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5 SHEETS-SHEET 3.



WITNESSES:
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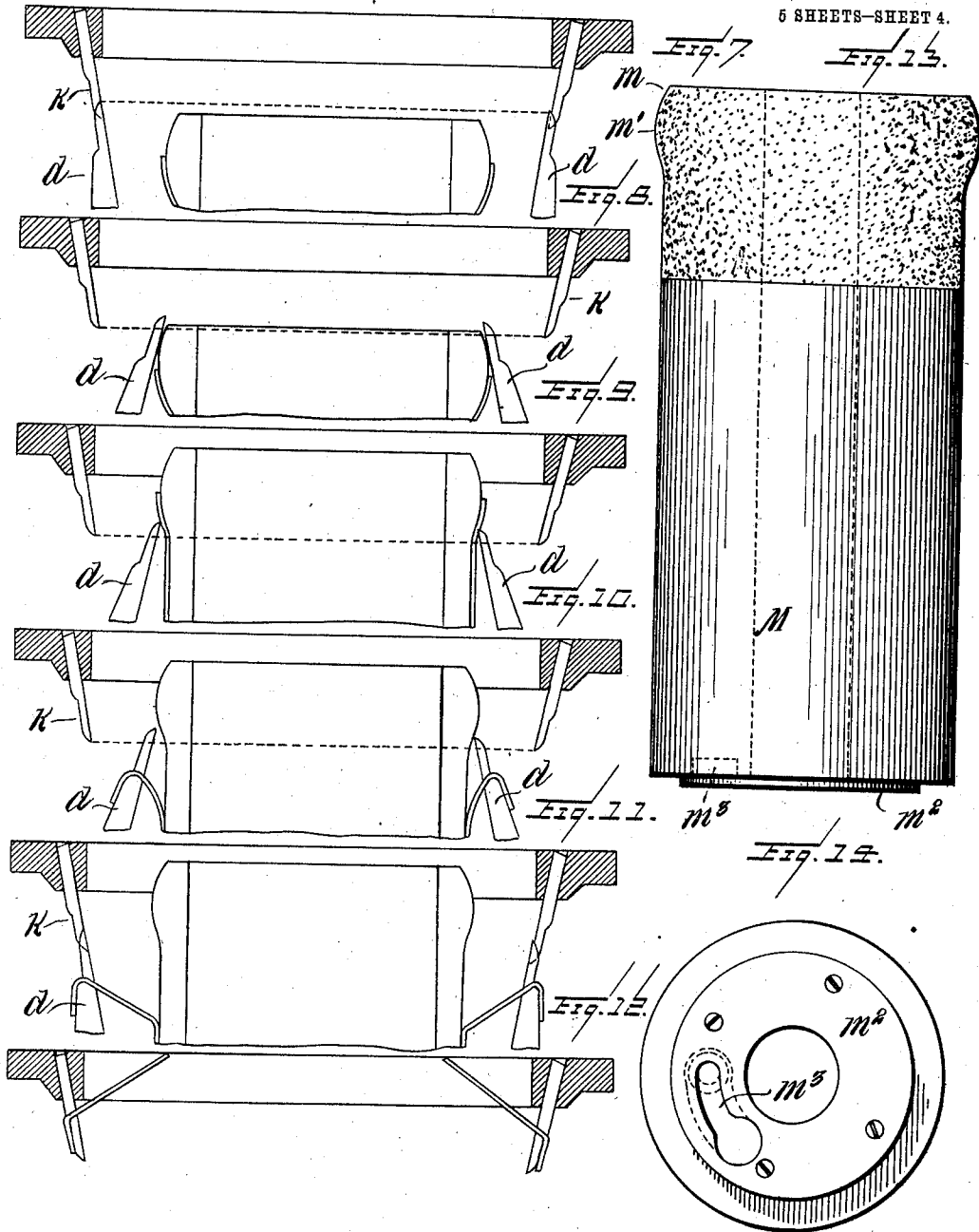
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5 SHEETS—SHEET 4.



WITNESSES:

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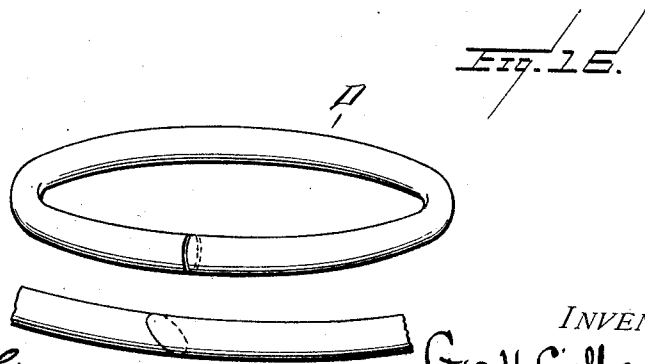
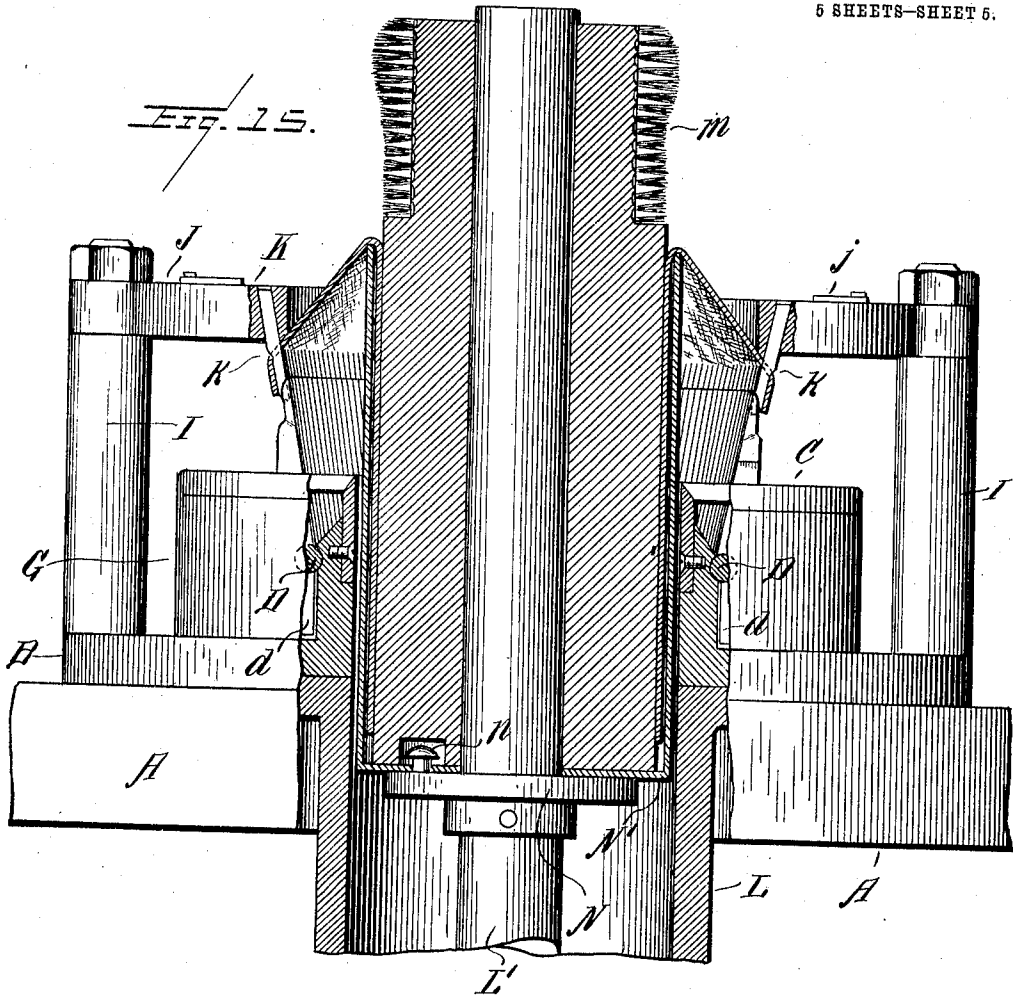
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1,003,447.

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5 SHEETS—SHEET 5.



WITNESSES:

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INVENTOR

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UNITED STATES PATENT OFFICE.

GEORGE H. GILBERT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE KILBOURN KNITTING MACHINE COMPANY, OF NEW BRUNSWICK, NEW JERSEY.

TRANSFERRER FOR KNITTED FABRIC.

1,003,447.

Specification of Letters Patent. Patented Sept. 19, 1911.

Application filed February 10, 1908. Serial No. 415,201.

To all whom it may concern:

Be it known that I, GEORGE H. GILBERT, a citizen of the United States, residing at Germantown, in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Transferrers for Knitted Fabric; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention is an improved automatic transferring device for transferring tubular fabrics knit on one machine to the needles of another machine on which the article to be made is completed.

The object of my invention is to produce a machine which will be simple in construction and effective and certain in its operation.

In the drawings accompanying this specification I have illustrated one form in which I have contemplated embodying my invention and said invention is disclosed in the following description and claims.

In the said drawings, Figure 1 is a vertical sectional view of my device, parts being shown in elevation. Fig. 2 is a top or plan view with parts broken away to show constructions beneath them. Fig. 3 is a side elevation of the bed plate and parts secured thereto, the transfer ring and the ring support being omitted. Fig. 4 is a sectional view of the upper part of my device showing the transfer levers in a different position. Fig. 5 is a side and back view of a transfer lever and a section of the rod on which such levers are fulcrumed. Fig. 6 is a side and back view of the transfer points. Figs. 7, 8, 9, 10, 11 and 12 are views showing the different positions of the web carrying cylinder and the transfer ring. Fig. 13 is a view in elevation of the web carrying cylinder, and Fig. 14 is a bottom view of the lower end of said cylinder. Fig. 15 is a vertical sectional view of a modification, and Fig. 16 is a view in perspective of the fulcrum ring.

In these drawings, A is the table or support to which the device is secured.

B is the bed plate of the machine. This bed plate is provided with a circular open-

ing in the center, with a circular or annular upwardly extending wall or flange b surrounding the circular opening and another upwardly extending annular flange b' . The upper portion of the flange b is rabbeted or cut away on the inside as at b^2 , and to the reduced portion thus produced is secured the vertical depending wall of the flat ring C. This ring is composed of two walls joined to form a right angle in cross section. The outer edge of the horizontal portion of this ring is preferably of a complete series of serrations c and from the bottom of each indentation a narrow radial slit or slot extends inward radially. A flat ring C' having corresponding serrations, is secured to the top of the wall or flange b' with its serrations meshing with the serrations of the ring C, thus covering the space between the two walls or flanges b b' .

The flange or wall b , on its outer side or the side facing the wall b' is provided with a shallow curved groove in which a curved rod or fulcrum bar D is secured. In this instance the fulcrum bar is formed from a rod made into a complete ring with the ends fitting closely together. This ring is made of such size as to encircle the flange b when the ring is forced into the curved recess of the flange. In placing it in position the rod or ring is forced downward until it engages the recess. The ring is sufficiently elastic to expand to the extent necessary to pass to its seat, then it contracts to firmly engage the recess and hold it in position. Although it is shown in one form as though severed by a direct transverse cut, I prefer to have the ends inclined so as to have one end lap over the other as also shown in Fig. 16. While I prefer this construction, this fulcrum may be made integral with the flange b or may be secured thereto in any other way. On this fulcrum bar are fulcrumed the transfer levers d , each of said levers being provided with a curved recess d' for engaging said rod. These transfer levers are also preferably provided with a notch d^2 to receive the elastic band or small coiled spring e , which tends at all times to draw the upper ends of the transfer levers inward. These transfer levers d are of the form shown at the right in Fig. 5, the lower part being of a single thickness of metal. The lower part is

broader than the upper part and that portion below the fulcrum recess d' is at an inclination to the part above it. Its extreme upper end is formed by having the metal of which it is composed of double width folded to form a groove d^3 on the back of the lever. The transfer ring and the levers are so located relatively that the said levers can be swung outwardly to engage the inner side of the points of the transfer ring. This grooved construction is to enable the levers to partly surround and cover the ends of the points of the transfer ring so that there will be no obstruction to the stitches when moving them from the levers to the points.

On the inside of the wall or flange b' and resting on the bed plate of the machine is a flat ring E secured in position in any preferred manner. The inner edge of this ring is provided with narrow slits or guide ways for the lower ends of the transfer levers d , the lower ends of such levers, being made of such a width that the fullest extent of movement that can be given them will not cause them to leave these guide ways.

Within the space between the two walls or flanges $b b'$ is a ring F having its outer side fitting closely, but movably against the inner side of the wall or flange b' . To this ring are secured three pins f projecting outwardly through vertical slots in the wall or flange b' . A vertically disposed ring G is movably fitted to the outside of the wall or flange b' and is provided with three inclined slots g through which the pins also pass. To this ring G is secured the arm g' by which the ring G can be moved to right or left to raise or lower the ring F.

The ring F, when depressed, comes in contact with the lower outwardly inclined ends of the transfer levers forcing them inwardly and causing them to turn on the fulcrum rod and throw their upper ends outwardly against the tension of the elastic band e . When the ring F is raised this elastic band draws the upper ends of said levers inwardly.

The ring G is held from vertical movement by any preferred means. In this instance, it is held in position by resting upon the bed plate of the machine and by a downwardly extending flange of the ring C'.

The arm g' is preferably slightly elastic and is provided on its under side with a knife edge g^2 which engages notches h in a retainer bar H, secured to the bed plate or table. The notches being located so as to be engaged by the knife edge when the ring F is at the upper or lower limit of its movement. By this means the ring F when moved to one position is held from accidental displacement.

To the bed plate of the machine are secured two standards I, I, and to the upper ends of these standards are secured a flat

ring J, having a central opening larger than, but concentric with, the opening in the bed plate. The inner edge of this ring is rabbeted or recessed to receive the transfer ring K, and is provided with devices j for holding the transfer ring in place when it has been placed in position. The transfer ring K is provided with the usual transfer points k conforming to the size and gage of the knitting machine to which the knitted web is to be transferred. The ring J at one point of the recessed or babbeted portion is provided with a projection j' extending into the recess and the transfer ring is provided with a notch or recess to engage the same to secure the proper alinement of the points of the transfer ring with the transfer levers.

To the underside of the bed plate B, a hollow cylinder L is secured in any preferred manner. In this instance it is secured by an outwardly extending flange secured to the underside of the bed plate. The lower end of this cylinder is provided with the elongated boss l through which passes a shaft L^2 is provided with a crank or hand in vertical direction, and the opening is enlarged on one side to receive the teeth of a rack l^2 secured to or formed on the shaft. A horizontal shaft L^2 is provided with a spur gear l^3 meshing with the rack l^2 . The shaft L^2 is provided with a crank or hand wheel (not shown) by which the shaft can be turned in either direction to raise or lower the shaft L' .

M is a cylinder adapted to be placed on the upper end of the shaft L' , and at its upper end is a brush portion m . The lower part of this brush portion is of the same size exteriorly as the cylinder but near the top the diameter is increased to form the expanded portion m' (see Figs. 1 and 13). To the bottom of the cylinder M is secured the plate m^2 provided with the curved key hole slot m^3 .

Upon the shaft L' is secured the collar or disk N which is provided with the headed pin or screw n . When it is desired to apply the cylinder M to the shaft L' the cylinder is dropped down upon the shaft until it rests upon the collar N. The enlarged portion of the key hole slot is passed over the head of the pin or screw n and the cylinder turned to bring the pin to the opposite end of the slot when the cylinder will be held upon the shaft against displacement from a rising or falling movement.

The cylinder M has its main portion of a size to fit within the tubular web to be transferred without materially stretching the same, but it will be seen that the expanded part m' of the brush portion will slightly stretch or expand the web when drawn over it.

In operating the device, a web to be transferred is placed upon the cylinder with the

upper end of the same in about the position shown in Figs. 1, 8, 9 and 10. In doing this, care is to be taken to see that the web at the point that the upper ends of the transfer levers will engage it when in the position shown in Fig. 9, shall be so drawn or expanded that the spaces between the wales shall be substantially of the same width as the wales themselves. The ring F will then be depressed to throw the transfer levers into the position shown in Figs. 4 and 7. The cylinder will then be moved to the position shown in Fig. 8, and the transfer levers thrown into the position shown in Fig. 9 against the expanded portion of the brush part of the cylinder. The cylinder is then raised slowly until the upper ends of the transfer levers *d* rest upon the web at the point where the wales and the spaces between them are of equal width, see Fig. 10. As the transfer levers are drawn toward the center of the machine by elastic or spring pressure and as the number of levers are equal to the number of wales and the spaces between them taken together, on this movement of the cylinder, every alternate lever will naturally fall into the spaces between the wales, leaving the remaining levers with their points upon the tops of the intervening wales. The cylinder M is now depressed causing the upper ends of the transfer levers to pass through the loops opposed to the ends of the same, as shown in Fig. 11. The brush holds the web from being forced inwardly by the points of the levers in passing through the fabric to take the loops. Were the web carrier of continuous solid material the levers would not pass far enough through the web to securely engage the loops, and dropped stitches would result. The brush also protects the points of the levers as it provides a space back of the web into which the points may pass without engaging the solid portion of the web carrier, thus preventing the dulling of the points and the buckling or bending of the levers. As the transfer levers are now in a position inclining outwardly, the web as it passes over the upper ends of these levers is further stretched at this point causing the upper end of the web to bend or curl over outwardly upon the outer side of the levers, as is also shown in the same figure. The transfer ring being now in position the ring F is depressed throwing the transfer levers outwardly until the upper end of each lever engages its corresponding point on the transfer ring. In this movement the grooved back of the transfer lever passes over and covers the extreme end of the transfer points of the transfer ring.

The cylinder is now raised carrying the web with it, and drawing the loops of the web upward onto the fingers or points of

the transfer ring. This movement is continued until the cylinder can be removed. The transfer levers are then thrown inward, and the transfer ring removed to a knitting machine when it is placed in position with a point above each needle in a well known way and the loops placed upon the needles by moving the ring downward to carry the loops below the hooks of the needles and then withdrawing it, or they may be taken by the needles from the points of the ring by a single revolution of the cam cylinder, as sometimes done heretofore.

The parts may be placed in the position shown in Fig. 1 before inserting the cylinder and web and the operation otherwise varied.

There may be a considerable number of cylinders M for each machine and also considerable numbers of transfer rings K. A number of the cylinders may be prepared with web so that as soon as one is removed from the machine, another can be applied and so too there may be a number of the transfer rings, some of which may be filled and held in readiness for the knitting machine.

In Fig. 15 I have shown a modification. In this figure the collar N is shown provided with the upwardly extending tube N' within which the lower end of the web carrier is placed. When the loops have been forced upward onto the points of the transfer ring, the further upward movement of the web carrier turns the web the other side out at the same time effectually drawing the loops to their proper position on the transfer points.

What I claim and desire to secure by Letters Patent is:—

1. A transferrer for knit fabrics comprising among its members a series of transfer levers and a web carrier movable past the said transfer levers for applying the web thereto.

2. A transferrer for knit fabrics comprising among its members a series of transfer levers and a web carrier movable to and fro past said levers for applying the web thereto and removing it therefrom.

3. A transferrer for knit fabrics comprising among its members a circular series of transferring levers, and a cylindrical web carrier movable within the circle of levers for applying the web thereto.

4. A transferrer for knit fabrics comprising a series of transfer levers, a web carrier movable to and fro past said levers for applying the web thereto and removing it therefrom, and means for moving the said levers toward and from the said web carrier.

5. A transferrer for knitted fabric comprising among its members a series of transfer levers, a web carrier movable past said

- levers, a device for moving the free ends of said levers away from said web carrier by a positive movement, and means for moving said levers into contact with the web by an elastic or yielding force.
- 5 6. In a transferrer for knit fabric, the combination with the cylindrical web carrier, of the circular series of transfer levers, a vertically movable ring for moving said levers away from said web carrier and means for moving said levers toward said web carrier by a yielding or elastic force, substantially as described.
- 10 7. In a transferrer for knit fabric, the combination with a circular series of transfer levers, of a shaft mounted within said circle of levers, a web carrier adapted to be mounted on said shaft and means for moving said shaft and web carrier in one direction through the circle of levers and backward through the circle in the opposite direction, substantially as set forth.
- 15 8. A web carrier for a machine for transferring knit fabric having a plain portion for receiving the main portion of the fabric and a brush portion for receiving the edge to be applied to a knitting machine, said brush portion having a part of its surface raised above the plane of the surface of the main portion of the brush.
- 20 9. A web carrier for a machine for transferring tubular knit fabric, consisting of a plain cylindrical body having at one end a brush portion, said brush portion having an expanded part of a larger diameter, substantially as and for the purpose set forth.
- 25 10. A web carrier for a machine for transferring tubular knit fabric, consisting of a cylindrical body, and means for mounting it upon a shaft for moving it in the directions desired, substantially as described.
- 30 11. In a machine for transferring knit fabrics, the combination with a transfer ring, of a circular series of transfer levers, and a web carrier movable in both directions through said ring and series of levers, substantially as described.
- 35 12. In a machine for transferring knit fabric, the combination with a transfer ring having a circle of transfer points, of a circular series of transfer levers, and a cylindrical web carrier, said levers being located between the path of the web carrier and the points of the transfer ring and movable in one direction toward the path of the web carrier and in the opposite direction to engage the points of the transfer ring, substantially as described.
- 40 13. In a machine for transferring knit fabric, the combination with a transfer ring having a circle of transfer points, of a circular series of transfer levers, a web carrier movable within the circle of levers and points, and means for moving said levers in one direction toward said web carrier and in the opposite direction toward the transfer points, substantially as described.
- 45 14. In a machine for transferring tubular knit fabric, the combination with a circular series of transfer levers having the outwardly inclined portions near their lower ends of a vertically movable ring for engaging the inclined portions of said levers to move them in one direction and the spring or elastic means for moving them in the opposite direction, substantially as described.
- 50 15. In a machine for transferring tubular knit fabric, the combination with a circular series of transfer levers, of a circular series of transfer points, the said transfer levers having a groove on the back adapted to cover the points of the transfer ring when moved into engagement therewith, substantially as described.
- 55 16. In combination with the transfer levers, of the fulcrum bar for said levers and its supporting means, said fulcrum bar consisting of a divided ring engaging a curved seat on its support by the elasticity of the ring, substantially as described.
- 60 17. In a machine for transferring tubular knit fabrics, the combination with the cylindrical web carrier, and transfer ring, means for transferring the loops of the web to the transfer ring, said web carrier being provided with a tube within which the web is carried, substantially as described.
- 65 18. The herein described transfer lever consisting of the main body of a single thickness of metal and the doubled point, whereby the point of the lever is provided with a groove on the back of the same.
- 70 19. The herein described transfer lever having a groove on the back of the same adjacent to the point, as and for the purpose specified.
- 75 20. The combination with means for supporting a transfer ring, of a web supporting device within the circle of the points of said ring, a series of transfer levers, means for effecting a relative movement between the transfer levers, and the web-supporting device, to cause the levers to engage stitches in the web, and means for swinging said transfer levers into engagement with the points of the transfer ring.
- 80 21. The combination with means for supporting a transfer ring, of a carrier for a knitted web, a series of transfer levers normally out of engagement with said carrier and web, means for moving said levers into contact with said web, means for causing said levers to pass through said web and means for moving said levers into engagement with the points of the said transfer ring.
- 85 22. The combination with means for supporting a transfer ring, of a carrier for a knitted web, a series of pivotally mounted transfer levers, means for moving said levers
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into contact with the web, means for causing said levers to pass through the stitches of the web and means for moving said levers into engagement with the points of the transfer ring.

23. The combination with means for supporting a transfer ring, of a web carrier, a series of transfer levers pivotally mounted and capable of swinging into and out of engagement with the points of the transfer ring, means for swinging them into engagement with said points and independent means for swinging them out of engagement therewith.

24. In a transferrer for knitted fabrics, the combination with means for supporting a transfer ring, of a series of transfer levers, a web carrier movable within the ring of transfer levers, means for moving said transfer levers into contact with the web upon the said web carrier, means for moving the web carrier to cause the transfer levers to pass through stitches of the web, and means for swinging the transfer levers into contact with the points of the transfer ring.

25. In a transferrer for knitted fabrics, the combination with means for supporting a transfer ring, of a series of transfer levers, a web carrier within the ring of transfer levers, means for moving the transfer levers into contact with the web on the said web carrier, means for moving said transfer levers into contact with the points of a transfer ring, and means for moving the web carrier to cause the levers to pass through stitches of the web when the said levers are in contact with the web and for moving the web carrier to cause the stitches to pass from the levers to the points of the transfer ring.

26. In a machine for running on knitted fabric, the combination of means for receiving the stitches of the knitted web, means for engaging the stitches of the web pivoted on a stationary part of the machine and movable into and out of engagement with the stitch receiving means actuating mechanism therefor, and means for moving the web to engage the stitches and to move the web to apply them to the stitch receiving means.

27. In a machine for running on knitted fabric, the combination of means for receiving the stitches of the web, means for engaging the stitches of the web pivoted upon a stationary part of the machine, means for moving the web to cause the engagement of the stitches, and means for moving the stitch engaging means into engagement with the stitch receiving means.

28. A machine for running on knitted web having means for engaging the stitches to be transferred, located at one fixed point and a movable web carrier for causing the stitches to engage the stitch engaging means.

29. In a transferrer for knitted fabrics,

the combination with means to removably support a transfer ring, of transfer levers having a fixed pivot, actuating mechanism therefor, means to removably support a web carrier, and means to move the said web carrier to pass the said transfer levers through the web and to move it in the opposite direction to pass the stitches from the levers to the points of the transfer ring.

30. In a transferrer for knitted fabrics, the combination with transfer levers, having a fixed pivot, of a movable support for a web carrier, a web carrier and means for detachably securing said web carrier to said movable support.

31. In a transferrer for knitted fabrics, the combination with a series of transfer levers having a fixed pivot, actuating mechanism therefor, stitch receiving means to receive the stitches from said levers, and a movable web carrier to move in one direction to force the stitches of the web on said levers and to move in the opposite direction to force the stitches from the lever onto the stitch receiving means.

32. In a transferrer for knitted fabrics, the combination with a series of levers to take and transfer the stitches of the web, of a web carrier to receive and carry the web and means for moving the web to force the stitches of the web upon the said levers.

33. In a transferrer for knitted fabrics, the combination with means for receiving the stitches of the web, of a series of transfer levers, having a fixed pivotal point, to engage the stitches of the web, the pivotal point of said levers being located to permit the levers to swing into engagement with the stitch receiving means.

34. In a machine for running on knitted web, the combination with means for receiving the stitches of knitted web of a size greater than the normal size of the web, levers having a fixed pivotal mounting to engage the stitches of the web and to stretch or expand the web to the size of the stitch receiving means, and means for moving the web and applying the stitches to the stitch receiving means.

35. A machine for running on knitted web having means for engaging the stitches to be transferred and expanding the web, a movable web carrier for moving the web to cause the stitches to be engaged and to move the web after it has been expanded.

36. A machine for running on knit fabrics having means for receiving and supporting a transfer ring, of a series of transfer levers to engage the stitches of the web and means for moving the said levers outwardly to engage the inner sides of the points of the transfer ring.

37. A machine for running on knit fabrics having means for receiving and supporting a transfer ring, of a series of transfer levers

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each having a groove on the back adjacent to the point, said levers being movable outwardly to cause the said grooves to engage the inner side of the ends of the points of
5 the transfer ring.

38. A machine for running on knit fabrics, having means for receiving and supporting a transfer ring, a series of transfer levers, a web carrier movable to force the
10 stitches of the web upon the transfer levers and means to cause said levers to engage the

inner sides of the points of the transfer ring, said transfer levers being adapted to cover the points of the transfer ring when brought into such contact.

In testimony whereof I affix my signature, in the presence of two witnesses.

GEORGE H. GILBERT.

Witnesses:

J. H. WHITAKER,
C. M. FORREST.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents
Washington, D. C."