

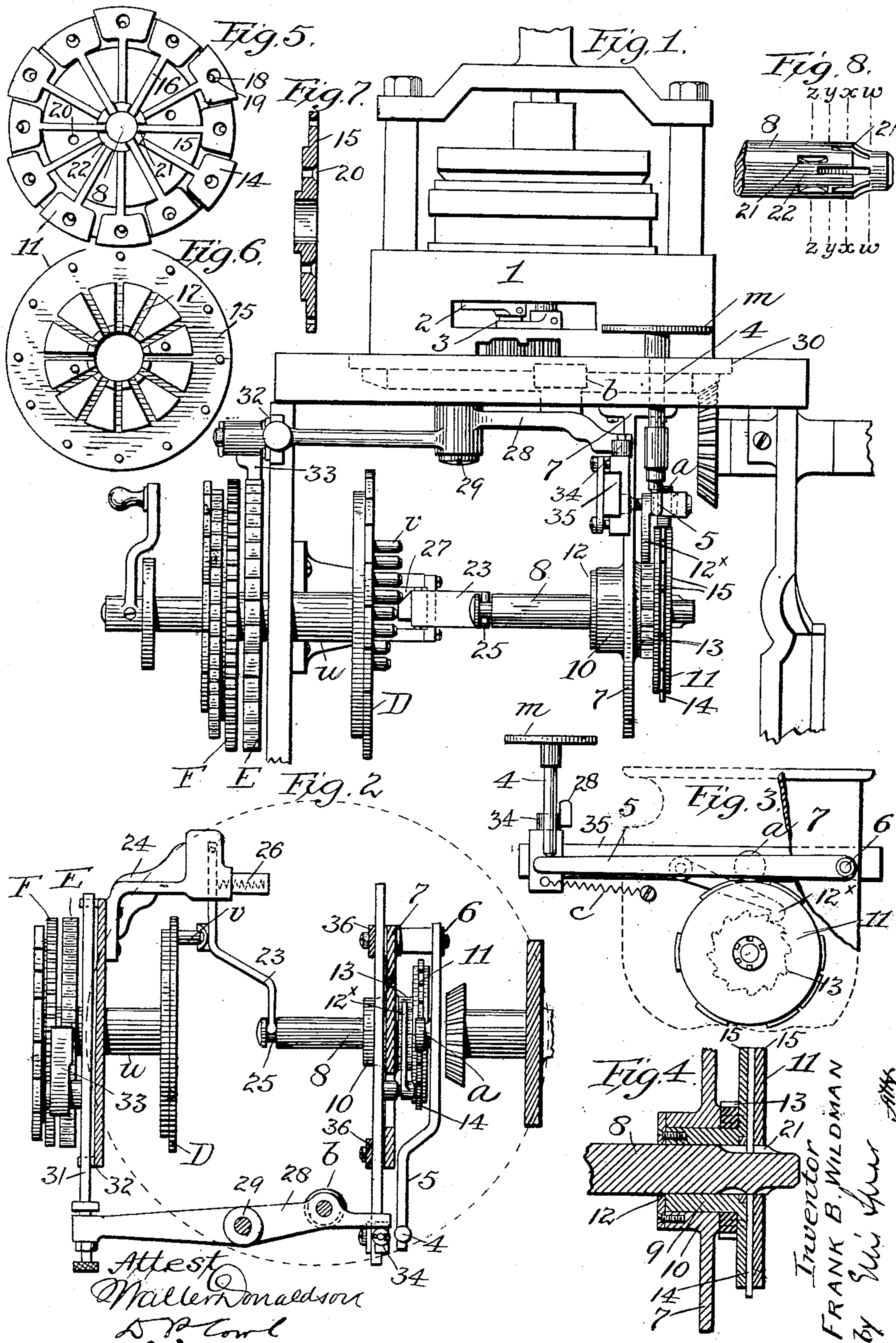
No. 703,028.

Patented June 24, 1902.

F. B. WILDMAN.
KNITTING MACHINE.

(Application filed Nov. 6, 1901.)

(No Model.)



UNITED STATES PATENT OFFICE.

FRANK B. WILDMAN, OF NORRISTOWN, PENNSYLVANIA.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 703,028, dated June 24, 1902.

Application filed November 6, 1901. Serial No. 81,290. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. WILDMAN, a citizen of the United States, residing at Norristown, Montgomery county, Pennsylvania, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a specification.

My attachment is designed to control the operation of the knitting devices to produce various kinds of knitting—such as welts, imitation lacework—or to effect any of the changes in the pattern which are to occur intermittingly.

I have shown my invention in connection with that type of knitting-machine shown in Letters Patent of the United States granted to me November 1, 1898, No. 613,346. I do not, of course, limit my invention to this style of machine, as it may be applied to other forms of machines.

In the accompanying drawings, Figure 1 is a front view of a knitting-machine with my improvement attached. Fig. 2 is a plan view of my improvements, parts being in section. Fig. 3 is a detail side view. Fig. 4 is a detail sectional view through the variable cam-wheel and cam shaft or pin. Fig. 5 is a detail side view of part of the cam-wheel. Figs. 6 and 7 are further details of the cam-wheel, and Fig. 8 is a detail side view of part of the adjustable cam shaft or pin.

In the drawings, 1 is a knitting-head having levers 2 3, which, as fully set forth in my patent above mentioned, are arranged to control the knitting devices to change the character of the knitting when either one or the other of said levers is operated through contact with a disk *m*, which is raised and lowered to aline with first one and then the other of said levers, so that in the rotation of the head the levers will be operated by the disk and the knitting devices changed according to the vertical position of the disk and its alinement with one or the other of the levers. The shaft 4 of the disk is journaled in the fixed base ring or flange of the knitting-head and rests upon a lever 5, pivoted at 6 to a bracket 7, fixed to the stationary base-ring of the machine. This lever carries a roller *a*, which rests on a cam-wheel 11, forming part of my present improvement, said cam-wheel being supported in the

bracket 7 and being connected with a shaft or pin 8, arranged to slide through the cam-wheel and also to rotate therewith. The cam-wheel has a hub 9, which is journaled in a bearing 10, formed in the bracket 7, being held therein by a plate 12, screwed to the end of the hub and fitting against the bearing.

The cam-wheel 11 is turned step by step by a pawl 12^x, operated as hereinafter described and engaging a ratchet-wheel 13, fixed to the cam-wheel. The cam-wheel is variable or adjustable as to its shape, and the changes in its shape occur automatically, according to the demands of the pattern. For this purpose I employ a series of cam-blocks 14, arranged to be adjusted radially to alter the cam surface or edge which controls the lever 5 and the roller *m*. These blocks are arranged between the two sections or disks 15 of the cam-wheel, and their stems 16 slide in ways or grooves 17, formed in the face of one of the disks or sections, Fig. 6. The enlarged heads of the cam-pieces have their edges curved to form segments of the circumference of the cam-wheel, and when in their innermost position these curved edges lie flush with the edges of the disks, and when thrust out they provide the high parts or cam-surfaces for operating the roller of this lever 5 to control the pattern. The cam-blocks are limited in their outward movement by pins 18, passing through openings 19 in the cam-blocks. The sections or disks of the cam-wheel are held together by pins or screws at 20.

For adjusting the cam-blocks the sliding shaft or pin 8, before mentioned, is used. This is provided with a cam formation consisting of grooves 21, extending longitudinally thereof and disposed at different points about the circumference. These grooves, with the intermediate cylindrical portions 22, provide the low and high parts of the cam. When the stem of a cam-block rests on the periphery of the pin or shaft, said block will be in its extreme outward position and will operate the lever 5 to raise the disk *m* into line with the upper lever 2, and thus change the knitting devices to alter the pattern.

When the stem of a cam-block rests in one of the grooves of the pin or shaft, the cam-block will be in with its edge flush with the

periphery of the disks forming the body of the cam-wheel; and the disk *m* will then be down in line with the lower lever, and the knitting devices will be changed accordingly.

5 From an inspection of Fig. 8 it will be seen that the cam or pattern shaft is provided with a plurality of series of high and low parts formed by the intact and cut-away portions. For instance, one series may be said to consist of the intact and cut-away parts which
10 lie in the plane of the dotted line *xx*, another series of cam or pattern surfaces consists of those lying in the plane of the line *yy*, and still another set is made up of the high and
15 low or pattern surfaces lying in the plane *zz*. These different sets of cam or pattern surfaces, it will be seen, are disposed at different points along the pattern or cam pin or shaft, and by shifting said pin or shaft longitudinally the
20 different sets may be brought into action and the cam-blocks will be adjusted in respect to each other, thus altering the periphery of the cam or pattern wheel to suit the particular pattern desired in the knitted fabric.

25 The pattern-pin has its end tapered, so that it may be readily thrust into place in the wheel or pattern member, and all the inclines of the cam or pattern surface are directed longitudinally of the pin so that the stems of the
30 blocks will easily move up and down the same. When the pin is adjusted, so that the stems of the pattern-blocks lie in the plane *ww*, they are all out of action, as they will have no effect on the roller *a*, but will be free to
35 occupy their innermost position.

For moving the pattern shaft or pin longitudinally I employ a pattern-wheel D, supported on a shaft *u* and carrying a measuring-wheel and ratchet E F, similar to said
40 parts as disclosed in my patent before mentioned. This pattern-wheel D has pegs V thereon of different heights to operate to different degrees a lever 23, pivoted in a bracket 24 and having its end engaging the grooved
45 end 25 of the sliding pattern pin or shaft 8. A spring 26 presses the lever 23 to retract the pattern or cam pin when a low-pattern peg comes opposite the lever 23. The pattern-pegs engage an inclined surface 27 on the lever 23. For turning both the peg-wheel D and the variable cam or pattern wheel I employ a lever 28, pivoted to the base-ring of the machine at 29 and operated from any
50 suitable cam-surface on the rotary knitting-head, such as is indicated at 30 by a roller *b* on the lever bearing against the cam. The lever at one end is connected with a slide 31, moving in a guideway 32 on the frame and carrying a pawl 33 to operate the wheel
60 E, and through it and the shaft *u* the peg-wheel is operated. At its other end the lever 28 bears against a roller 34, carried by a slide 35, supported in guides 36 on the bracket 7. This slide has pivotally connected therewith the pawl 12^x, before mentioned,
65 which through the ratchet turns the pattern

or cam wheel. A spring *c* operates the slide in a direction opposite to that of the lever 28.

By reason of supporting the cam or pattern wheel in the bracket independently of
70 the pattern shaft or pin the latter may be removed and changed, if desired, without disturbing the relation between the wheel and its support.

I claim as my invention—

1. In combination in a knitting-machine, a pattern or cam wheel, an adjustable block carried thereby, means movable in a direction axially of the wheel for adjusting the
80 said block, and means operated by the edge of the block according to the changes in its position, substantially as described.

2. In combination, in a knitting-machine, a pattern or cam wheel, a plurality of radially-adjustable blocks carried thereby and a pattern pin or shaft adjustable in a direction
85 axially of the wheel and having a plurality of cam-surfaces for adjusting the blocks, substantially as described.

3. In combination in a knitting-machine, a
90 cam or pattern member having an adjustable block and a pin having a pattern-surface and projecting through said member for holding the block in place, and means operated by the peripheral edge of said block substantially
95 as described.

4. In combination in a knitting-machine, a pattern or cam member having an adjustable block and a pattern-pin grooved longitudinally and arranged to control the said block
100 substantially as described.

5. In combination in a knitting-machine, an adjustable pattern member and a pattern or cam pin having cam-surfaces, said pin being thrust longitudinally into operative position to cause its cam-surfaces to change the
105 shape of the pattern member, substantially as described.

6. In combination in a knitting-machine, an adjustable pattern member and a pattern
110 or cam pin having a plurality of series of cam-surfaces arranged at different points along the pin to be brought into play by a longitudinal adjustment of the pin, substantially as described.

7. In combination with a pattern or cam member, a pattern or cam pin to alter the shape of said member, said pin being grooved longitudinally and having a plurality of sets
115 of high and low parts disposed at different points along the pin, substantially as described.

8. A pattern or cam wheel having a plurality of radially-adjustable blocks and a pattern-pin grooved longitudinally, axially arranged in respect to the wheel, said pin being removable, substantially as described.

9. A pattern or cam wheel having an adjustable block variable as to shape by the adjustment of the block and an axially-
120 ranged pattern-pin having a cam-surface extending longitudinally, with means for auto-

5 matically adjusting the relation of the parts in a direction longitudinally of the pin, substantially as described.

10. In combination, the pattern-wheel variable as to shape, a pattern-pin at the center of the wheel, means for turning the wheel and pattern mechanism for controlling the pin, substantially as described.

11. In combination, a pattern-wheel adjustable as to shape, a longitudinally-movable pattern-pin for altering said shape, a pattern-wheel with connections for operating the pin, and means for operating the pattern-wheels consisting of the lever with pawls and a cam on the knitting-head for operating the lever, substantially as described.

12. An adjustable pattern-wheel having a hub, a bearing in which the said hub turns, said pattern-wheel having an opening at its center and a pin removably held in said opening and having a pattern-surface to change the relation between the high and the low parts of the pattern-wheel, substantially as described.

13. A pattern-wheel adjustable as to shape, and a pattern-pin to change the relation between the high and the low parts of said wheel and removably connected therewith, substantially as described.

14. In combination, the adjustable pattern

member and a pattern-pin to determine the shape of said member, said pin being tapered at its end and having its inclines running longitudinally thereof and of different forms, substantially as described.

15. In combination, a pattern-wheel comprising two disks or sections, blocks arranged to slide between said sections, and a pattern-pin at the center of the wheel to determine the position of said blocks at different distances from the center, substantially as described.

16. A pattern-wheel having a radially-adjustable block and an axially-located pattern-pin to determine the position of said block and means operated by the peripheral edge of said block, substantially as described.

17. In combination, a pattern-wheel variable as to shape and means for varying the shape of said wheel automatically comprising an axially-arranged pattern-pin with means for moving the same automatically in relation to the wheel, substantially as described.

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

FRANK B. WILDMAN.

Witnesses:

MAGGIE POTTER,

CARRIE U. CAMPBELL.