

No. 774,299.

PATENTED NOV. 8, 1904.

A. WOLLER.
STRAIGHT BAR KNITTING MACHINE.

APPLICATION FILED JAN. 2, 1903.

NO MODEL.

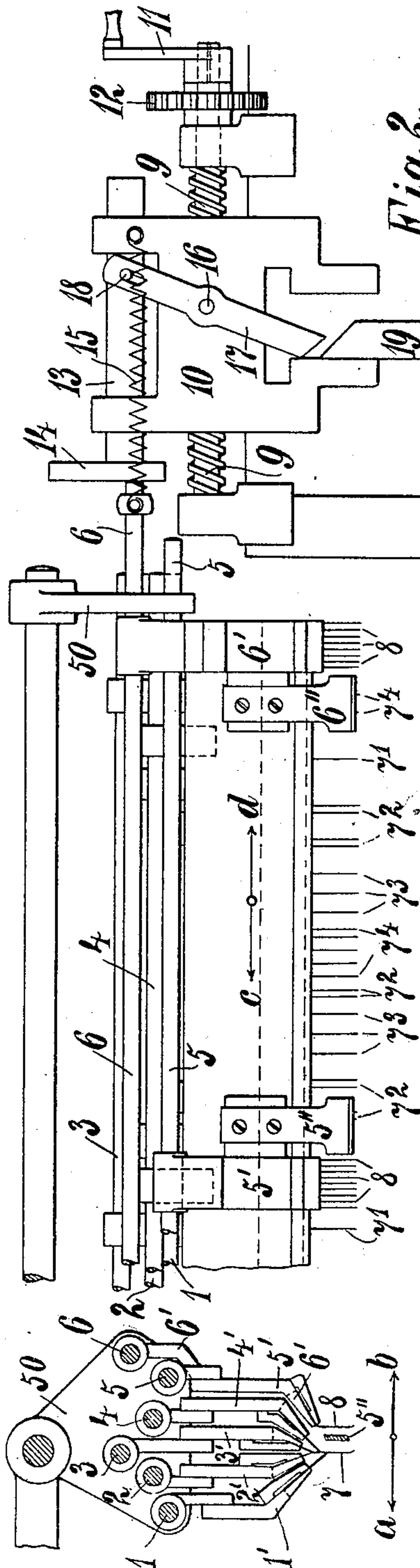


Fig. 1.

Witnesses:
G. S. Noble
L. Waldman

Fig. 2.

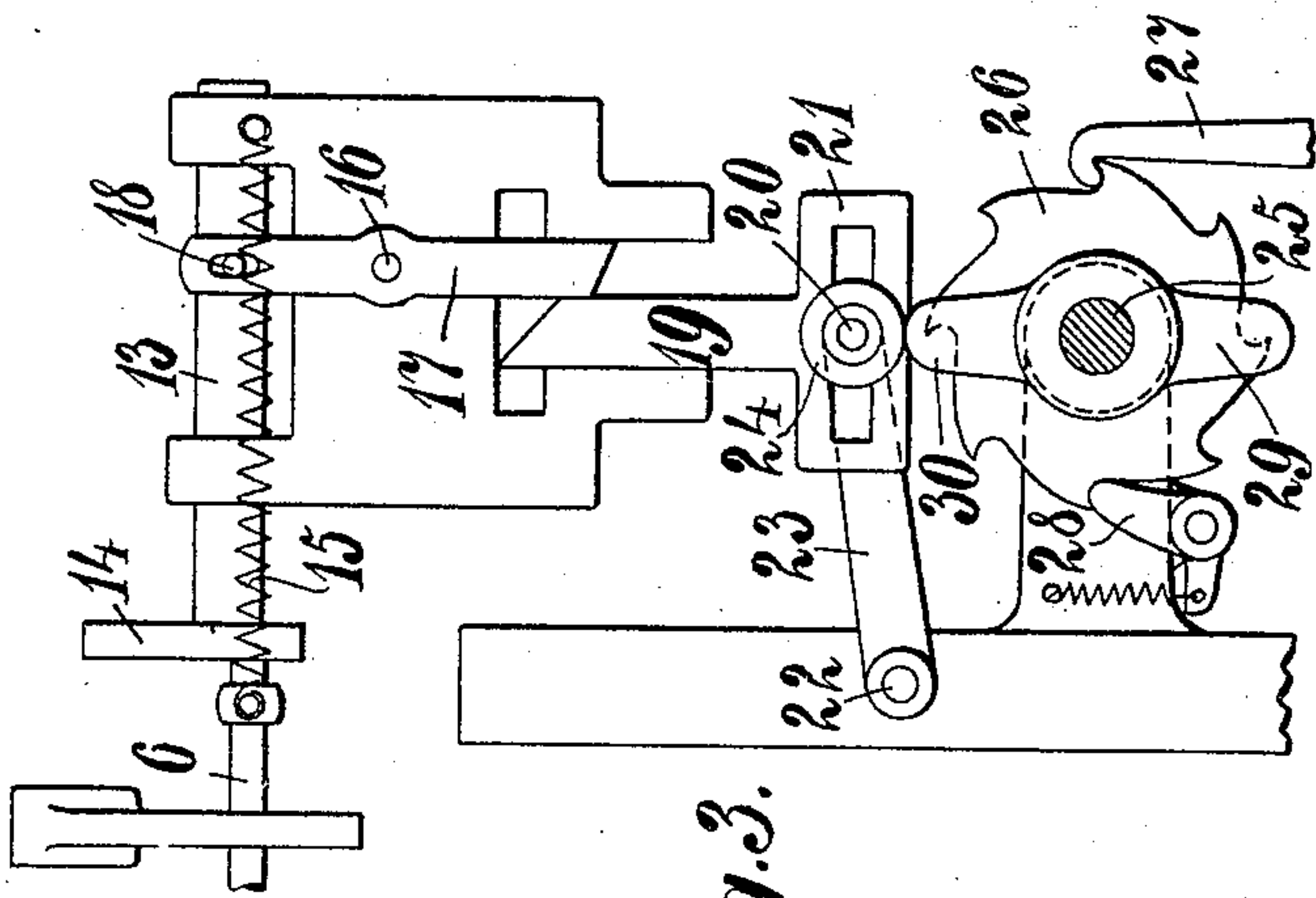
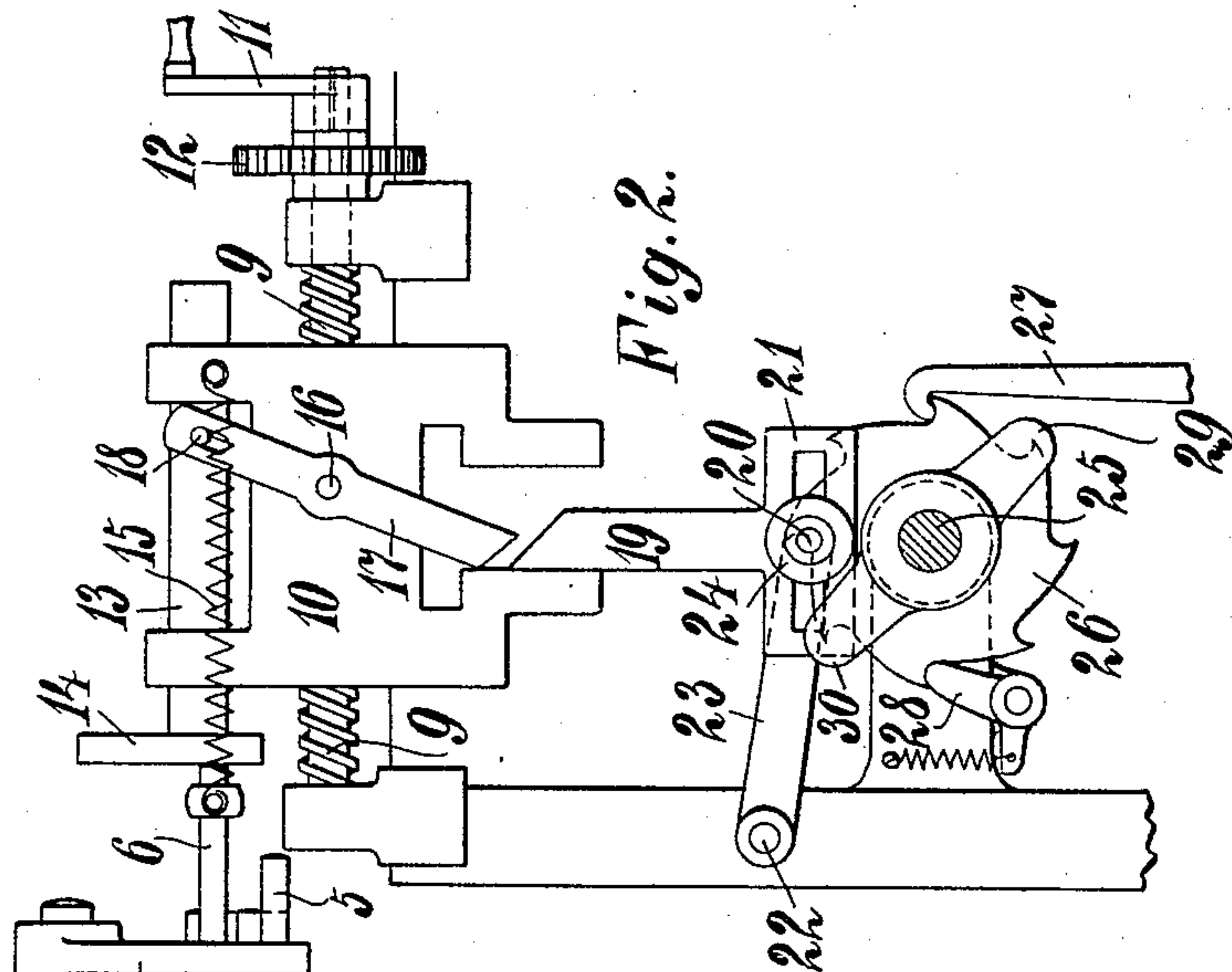


Fig. 3.

Inventor
Alban Woller
by B. Singer.
Att'y.

UNITED STATES PATENT OFFICE.

ALBAN WOLLER, OF HORMERSDORF, GERMANY.

STRAIGHT-BAR KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 774,299, dated November 8, 1904.

Application filed January 2, 1903. Serial No. 137,556. (No model.)

To all whom it may concern:

Be it known that I, ALBAN WOLLER, a subject of the German Emperor, and a resident of Hormersdorf, near Thalheim, in the Kingdom of Saxony and Empire of Germany, have invented certain new and useful Improvements in Straight-Bar Knitting-Machines, of which the following is a specification.

This invention relates to a mechanical arrangement on straight-bar knitting-machines for the manufacture of regular stocking and glove goods with open-work patterns which cover the entire breadth of the goods also at the narrowed parts and the upper wider part of the fabric, extending close to the two lateral seam edges. For this purpose an open-work knitting-machine is employed with two or more pattern-needle systems, the operating mechanisms of which are adapted to work independently from each other.

Those parts of a straight-bar knitting-machine which come more particularly into consideration in connection with this invention are shown in the annexed drawings, in which—

Figure 1 is a vertical cross-section through that part of the straight-bar knitting-machine called the "open-work" machine. Fig. 2 is a front view thereof with the mechanism for operating the narrowing mechanism, and Fig. 3 shows part of Fig. 2 during another moment of action.

Figs. 1 and 2 represent as an example an arrangement in which a number of point-bars 1' 2' 3' 4' are fastened to four rods 1 2 3 4, the said bars having the open-work points 7' 7² 7³ 7⁴ at their lower ends. From Fig. 1 it is visible that the needles 7 are arranged in one row; but they are distributed over four different point-bars 1' 2' 3' 4', as indicated in Fig. 2. All points 7' are fixed to the bar 1', all points 7² to the bar 2', all points 7³ to 3', and all points 7⁴ to 4'. The points 7' 7² 7³ 7⁴ are always moved together in the direction of the arrows *a b*, Fig. 1; but they have any desired different movements in the directions of the arrows *c* and *d*, Fig. 2, since the rods 1 2 3 4 are driven by mechanisms (not shown) independent from each other. The object of this is to produce four-fold varying pattern—that is to say, loops may be transferred to the

right or left from predetermined knitting-needles to four different extents or in four different ways in each course of knitting. To the rods 5 and 6 the point-bars 5' 6' are attached, and the latter carry at their lower ends the narrowing-needles 8, and at their sides the known press-off plates 5¹¹ and 6¹¹. At each side of the machine is one mechanism for narrowing of the kind shown in Figs. 2 and 3, its purpose being, as is known, to displace the rods 5 and 6 in the direction of the arrows *c d*, Fig. 2. The worm 9 has bearing in the machine-frame and engages a female screw fixed to the support 10. When the said worm is rotated by means of the crank 11 or the ratchet-wheel 12, the support 10 is therefore moved to the right or the left. If moved to the left, it displaces the bar 6 in the direction of the arrow *c*, since the head-plate 14 of the slide 13 on said support abuts against the end of the rod 6. If the support 10 is moved to the right, the rod 6 moves in the direction of the arrow *d*, since one end of the spring 15 is fastened to the support and the other end to the rod 6. Around a pin 16, fixed to the support 10, swings a lever 17, the upper end of which by means of a groove engages a pin 18, fixed to the slide 13. The lower beveled end of the said lever extends into an aperture in the support 10 toward the beveled end of a bolt 19. The latter is adapted to be moved into the position in Fig. 3, and by this means the lever 17 is compelled to rotate into a vertical position. In consequence thereof the slide 13 is moved to the left, and its plate 14 moves the rod 6, to which is fixed the bar 6', with the narrowing-needles 8 to the left in the direction of the arrow *c*. The bolt 19 by means of its frame-like lower part 21 is adapted to slide horizontally on a pin 20, which carries a roller 24 and is fixed to the end of a lever 23, pivoted at 22. Mounted on a pin 25, fixed to the machine-frame, is a ratchet-wheel 26. This wheel is provided with eight teeth and is operated by a pawl 27, which performs one stroke during each revolution of the main shaft, and thereby rotates the ratchet for the distance of one tooth. A resilient pawl 28 serves to hold the ratchet-wheel 26 in the position into which it

is moved by the pawl 27. Rigidly connected to the ratchet-wheel 26 is a pair of cams 29 30, adapted to engage the roller 20 and to lift same with the lever 23 and slide 19 21 when 5 rotated about the pin 25.

The process of working takes place in two stages—namely, the production of the pattern, for which purpose the needles 7 are operated while the needles 8 remain at rest and 10 the narrowing during which the needles 8 are operative and the needles 7 inoperative. For forming the pattern the mechanism has the position shown in Fig. 2, while for narrowing the position is that shown in Fig. 3. 5 These two positions differ from each other in the fact that in Fig. 2 the narrowing point-bar 6 is so far displaced toward the right in the direction of the arrow *d* and the bar 5' so far displaced to the left in the direction 20 of the arrow *c* that the narrowing-needles 8 are quite outside the fabric and cannot therefore project into and damage the latter. In Fig. 3, on the other hand, the slide 19 is moved upward and has displaced the lower 25 end of the lever 17 toward the right. The slide 13 is therefore displaced toward the left hand and has moved the bar 6 and narrowing point-bar 6' in the direction of the arrow *c* toward the place where the narrowing- 30 needles are to take effect, the object of the invention being to remove the narrowing-needles 8 sufficiently from the fabric when they are not required, so that they cannot damage the fabric, and to bring the said needles 35 very rapidly to their operative position when they are required.

Having now fully described my invention, I declare that what I claim is—

1. An open-work and narrowing mechanism for flat-bar knitting-machines, comprising a 40 narrowing-point-bar support, a screw for moving said support, a slide mounted in said support, a head-plate mounted on said slide and adapted to engage with the narrowing point-bars, and means for reciprocating said 45 slide, comprising a spring or the like, a pivoted lever having one end in engagement with said slide, and having the other end beveled, a bolt adapted to engage with the beveled end of said lever to swing said lever to a vertical 50 position, and means for operating said bolt.

2. An open-work and narrowing mechanism for flat-bar knitting-machines, comprising a narrowing-point-bar support, means for moving said support, a slide mounted in said support, having one end adapted to engage with 55 the narrowing point-bars, a spring for holding said slide in normally retracted position, a lever pivoted to said support having one end engaging with said slide, a bolt for swinging said lever to throw the slide into a forward or projected position, said bolt being provided with a slot in its lower end, a pivoted arm having its free end in engagement 60 with said slot, a roller on said arm, a ratchet-wheel, a cam on said ratchet-wheel adapted to engage with said roller to operate the bolt, and a pawl for turning said ratchet-wheel, substantially as described. 65

In testimony whereof I affix my signature in 70 presence of two witnesses.

ALBAN WOLLER.

Witnesses:

MORRIS LIPMAN,
FREDERICK J. SIETZMAN.