

W. W. BURSON.
KNITTING MACHINE.
APPLICATION FILED SEPT. 10, 1908.

944,011.

Patented Dec. 21, 1909.

2 SHEETS—SHEET 1.

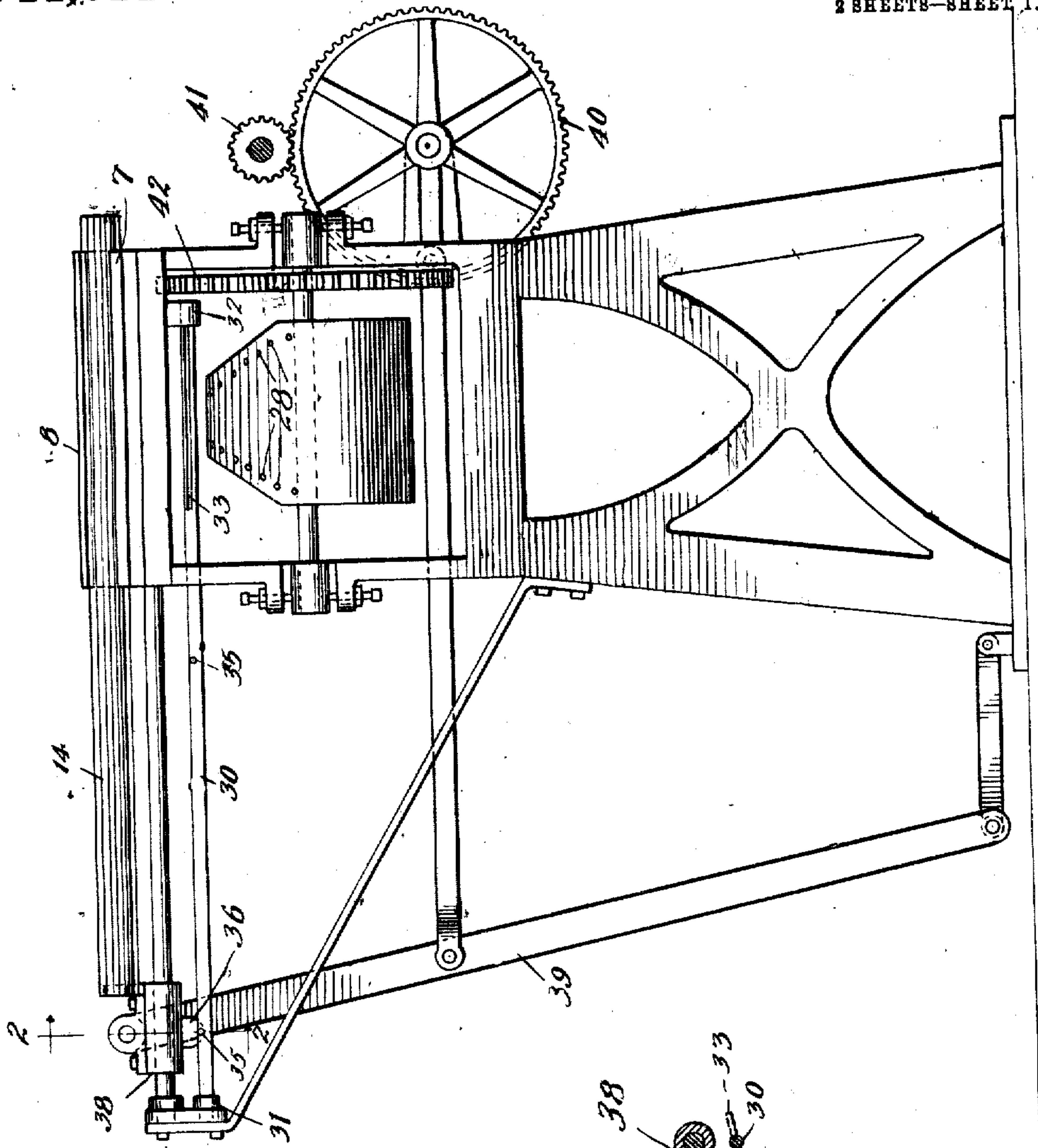


Fig. 1

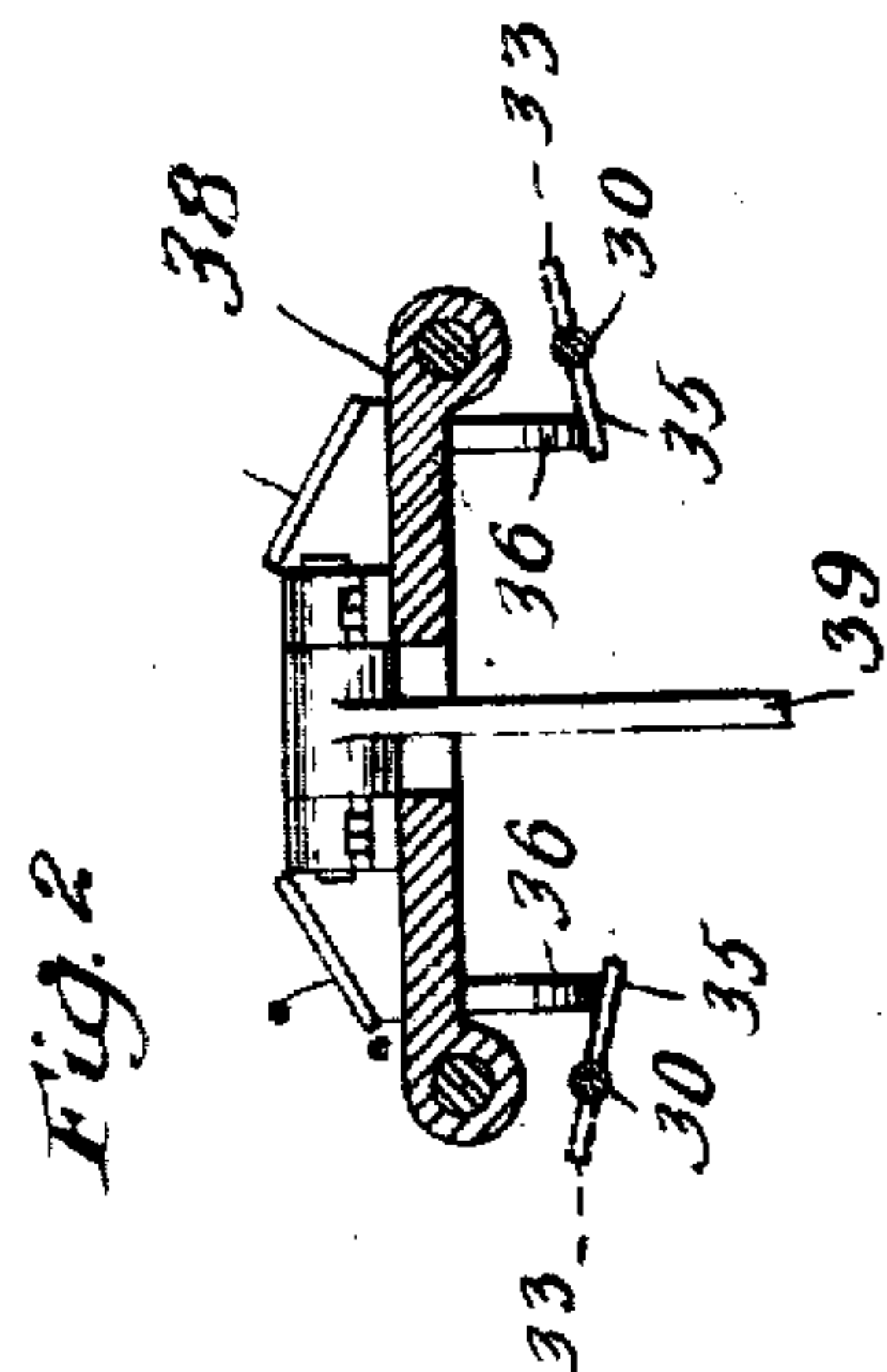


Fig. 2

Witnesses:

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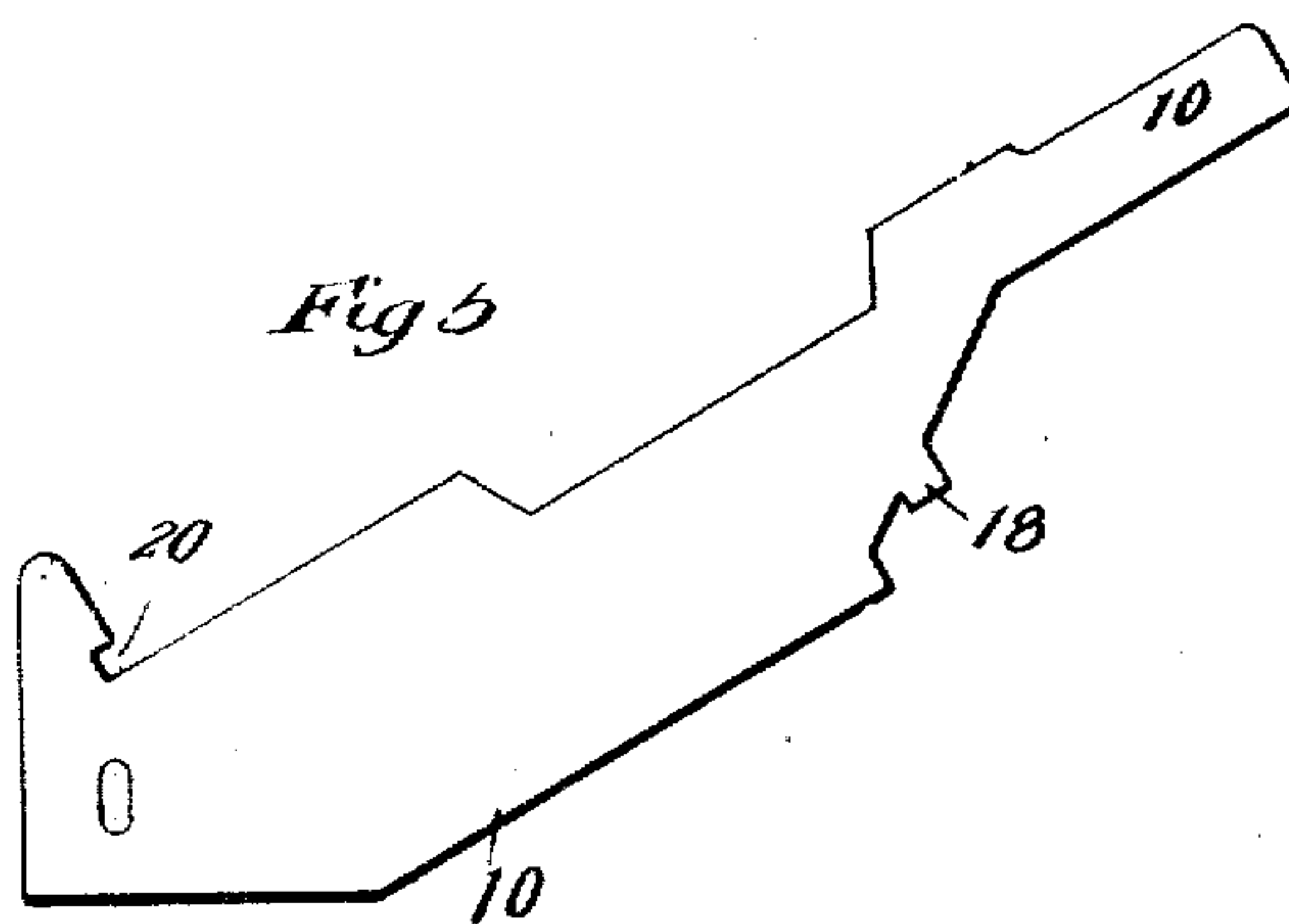
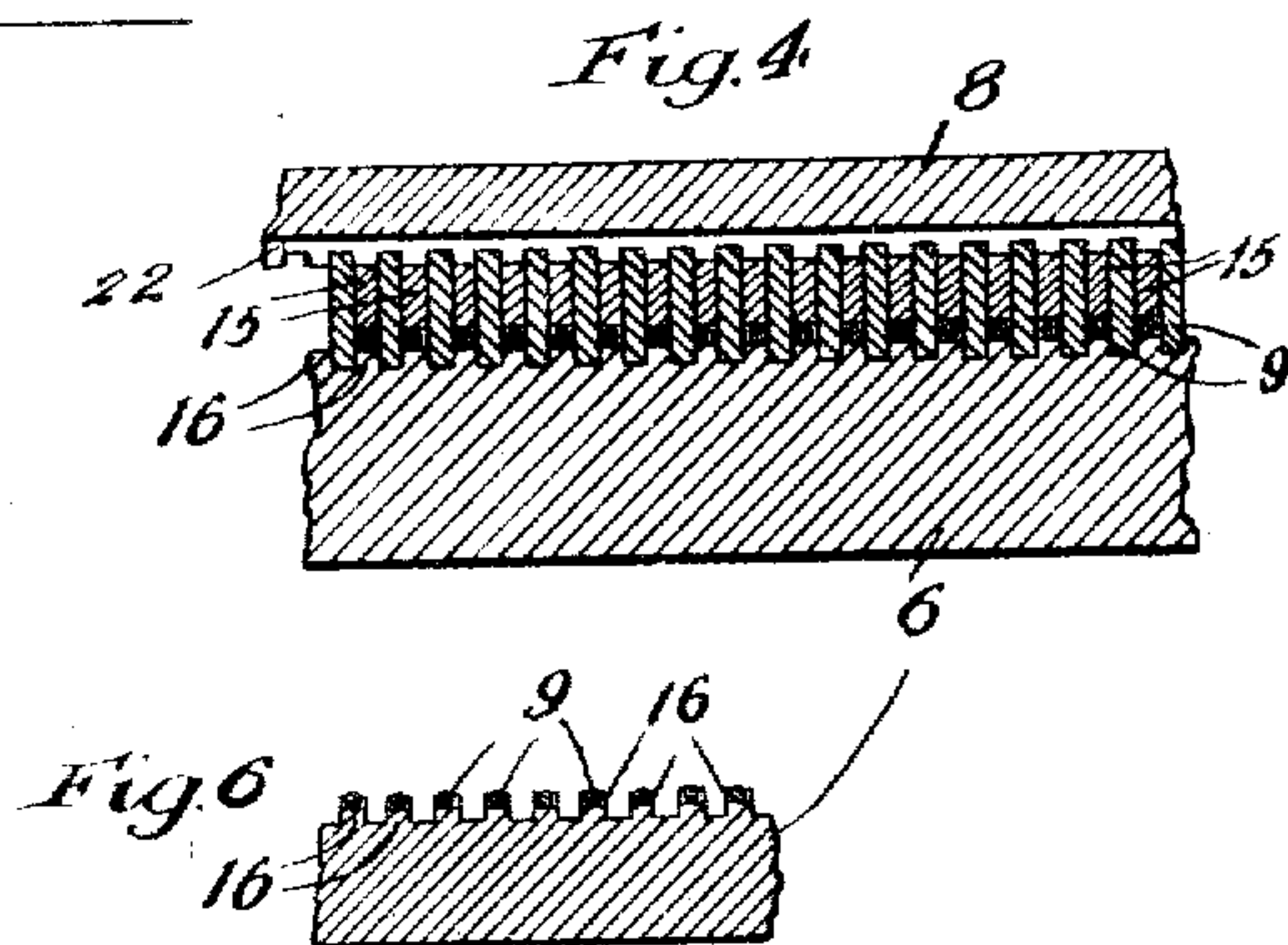
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2 SHEETS—SHEET 2.

Fig. 3



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UNITED STATES PATENT OFFICE.

WILSON WORTH BURSON, OF ROCKFORD, ILLINOIS.

KNITTING-MACHINE.

Specification of Letters Patent.

Patented Dec. 21, 1909.

944,011.

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To all whom it may concern:

Be it known that I, WILSON WORTH BURSON, a citizen of the United States, residing in Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Knitting-Machines, of which the following is a specification.

This invention relates to that class of knitting machines known as straight knitting machines, the same having two parallel rows of needles mounted on suitable frames, with an opening between them for the knit fabric to pass through.

My object in the invention has been to provide an improved and quick acting mechanism whereby the pattern cylinders may control the positioning of the needles, and its nature is fully disclosed in the description thereof given below and illustrated in the accompanying drawing forming a part of the description, and in said drawings, Figure 1 is a partial side elevation of the machine embodying my invention. Fig. 2 is a section thereof on the line 2-2 of Fig. 1. Fig. 3 is a partial cross section of the machine showing the needle mechanism and a portion of the pattern cylinder, and Fig. 4 is a section on the line 4-4 of Fig. 3. Fig. 5 is an elevation of one of the division plates, and Fig. 6 a section on the line 6-6 of Fig. 3.

In said drawing, 5, 5 represent portions of the frame of the machine, and 6 represents the base bar and 7 and 8 the spacing bars forming the needle beds.

9 is one of the needles, the series of which are supported in the beds between what are known as division plates 10, and are projected into acting position and withdrawn therefrom by jacks 11, the upper ends of which have notches adapted to engage the turned up lower ends of the needles, as shown at Fig. 3. The jacks upon their upper edges have lugs 12 which are engaged by the cam devices 13 of longitudinally movable cam bars 14, traveling in ways formed in the spacing bars and by these cam bars the jacks are slid in and out so that they carry the needles longitudinally into and out of their acting positions. The cam devices of the bars 14 will be understood from my application No. 408,902 filed January 2nd, 1908. Above each needle is a filler plate 15 arranged endwise between the wall plates and preventing vertical movement by the

needles. The division plates are stayed in position by their entrance in transverse grooves formed in the base and spacing bars in the manner usual in these machines.

The upper surfaces of the base bars 6 at their front edges are provided with raised surfaces 16. This surface has grooves cut in it in proper position relative to the needles to enable them to hold the needles equidistant from each other, and to guide the needles after they have been projected beyond the division plates. The grooves also assist in shedding the loop over the needles in knitting. The inclined surfaces at the rear of said base bars are also provided with grooves 17 running longitudinally as plainly shown, adapted to engage the lugs 18 formed on the under and corresponding edges of the division plates. The division plates are further secured in position by guide rods 19 extending through the series of plates, and by notching the rear end of the plates, as seen at 20 and entering such notches over the rib 21 of the spacing bar 7, this construction supporting the rear end of the plates vertically and preventing horizontal movement. The spacing bar 8 is recessed longitudinally as at 22, to give room to the jack when it is tipped to its non-acting position.

The jacks are lifted to the position shown in Fig. 3 to cause their engagement with the cam bars 14 by controllers 23 having a vertical sliding movement between bars 24 and 25 located below the needle beds, and the jacks are depressed from the position shown in order to destroy such engagement by the downward movement of said controllers caused by individual springs 26. The controllers are guided in their vertical movements by the guide rods 19 which pass through elongated openings in them, and are like the vibrating levers heretofore employed in which they have large openings into which the jacks enter and which allows them all necessary freedom of longitudinal movement and at the same time the projections at the mouth of the openings are adapted to rise and depress the jacks when the controllers are raised and depressed. The controllers all have feet 27 adapted to enter the openings 28 in the pattern cylinder 29 and are actuated when vertically raised by rock shafts 30 having stationary bearings at 31 and 32, and also having laterally projecting wings 33 adapted to engage should-

ders 34 formed in the controllers. These wings are each long enough to engage all the controllers upon one side of the machine at the same time. The shafts also have on the opposite side from the wings 33, horizontally projecting pins 35 which are engaged by rounded cams 36 depending from the cross head 38 which is actuated by the swinging lever 39 and operates the yarn guides. There are two of the pins 35, and they are located as shown so that they rock the shaft at each end of the stroke of the cross head, the rocking of the shaft causing the lifting of the controllers so that they are all freed from the pattern cylinder. As the cross head reverses its motion almost immediately after lifting the controllers, the rock shaft will then be free to rock back to its normal position, and allow the controllers to fall back, such of them as are over openings 28 in the pattern cylinder entering the same and carrying their corresponding jacks down out of engagement with the cams 13, and the others resting upon the surface of the cylinder and continuing their corresponding jacks in service. By this construction the controllers are rendered quick in their movements so that the needles are correspondingly quickened, and the machine is rendered capable of more work than machines previously used. The openings 28 can be made smaller than heretofore, and be arranged in such close proximity to each other as to permit a material reduction in the size and weight of the pattern cylinder.

The lever 39 is joined to a crank gear wheel 40 receiving power from a pinion 41, and the pattern cylinder is driven by a gear 42 on the same shaft therewith.

It will be understood that mechanism such as that described for controlling and actuating the needles is employed upon both sides of the work.

The recess 22 in addition to giving room to the front ends of the jacks when they are depressed, serves the further and very useful purpose of preventing the needles from being drawn forward by the yarn, when the jacks are out of action.

I claim:—

1. In a straight knitting machine, the combination with the needles, the jacks and the pattern cylinder, of controllers normally in contact with the pattern cylinder and into which controllers the jacks enter and by which they are positioned, and means independent of the pattern cylinder for lifting said controllers vertically from the cylinder at each stroke of the yarn guides.

2. In a straight knitting machine, the combination with the needles, the jacks and the pattern cylinder, of controllers normally in contact with the pattern cylinder and into

which controllers the jacks enter and by which they are positioned, and means independent of the pattern cylinder for lifting said controllers vertically from the cylinder at each stroke of the yarn guides, the controllers having springs for forcing them to the cylinder.

3. The combination with the needles, the jacks, and the pattern cylinder adapted to be engaged by the controllers, of vertically moving controllers receiving the jacks and positioning them, means other than the cylinder for lifting the series of controllers vertically from the cylinder, and individual springs for forcing the controllers to the cylinder.

4. The combination with the needles, the jacks, and the pattern cylinder adapted to be engaged by the controllers, of vertically moving controllers receiving the jacks and positioning them, a rock shaft operated intermittently and independently of the cylinder, and adapted to lift the controllers vertically from the cylinder, and individual springs for forcing the controllers to the cylinder.

5. The combination with the needles, the jacks and a pattern cylinder adapted to be engaged by controllers having a vertical movement and acting to receive the jacks and to position them by such vertical movement, of said controllers, means other than the cylinder for momentarily lifting all of the controllers vertically to free them from the cylinder, and means for retracting them toward the cylinder.

6. The combination with the needles and the pattern cylinder, of the jacks operating the needles, the vertically sliding controllers normally in contact with the pattern cylinder and causing the engagement of the jacks with the actuating cam and their release therefrom, said cam, and means independent of the cylinder for lifting the controllers vertically from the cylinder at the conclusion of the yarn guide's stroke.

7. In a knitting machine needle bed, the base bar and the spacing bars, in combination with division plates stationarily secured in the spacing bars, and the controllers movably positioned between the division plates, and guide rods passing through both the plates and the controllers.

8. The combination with the jacks of the spacing bars located over the forward ends of the jacks and having longitudinal grooves giving room to the jacks in their changing positions, and holding the needles from being drawn forward by the yarn.

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Witnesses:

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