(No Model.) 3 Sheets—Sheet 1.

W. CUTTS.

WARP FRAME ATTACHMENT FOR KNITTING MACHINES.

No. 520,303. Patented May 22, 1894.

Fig: 1.

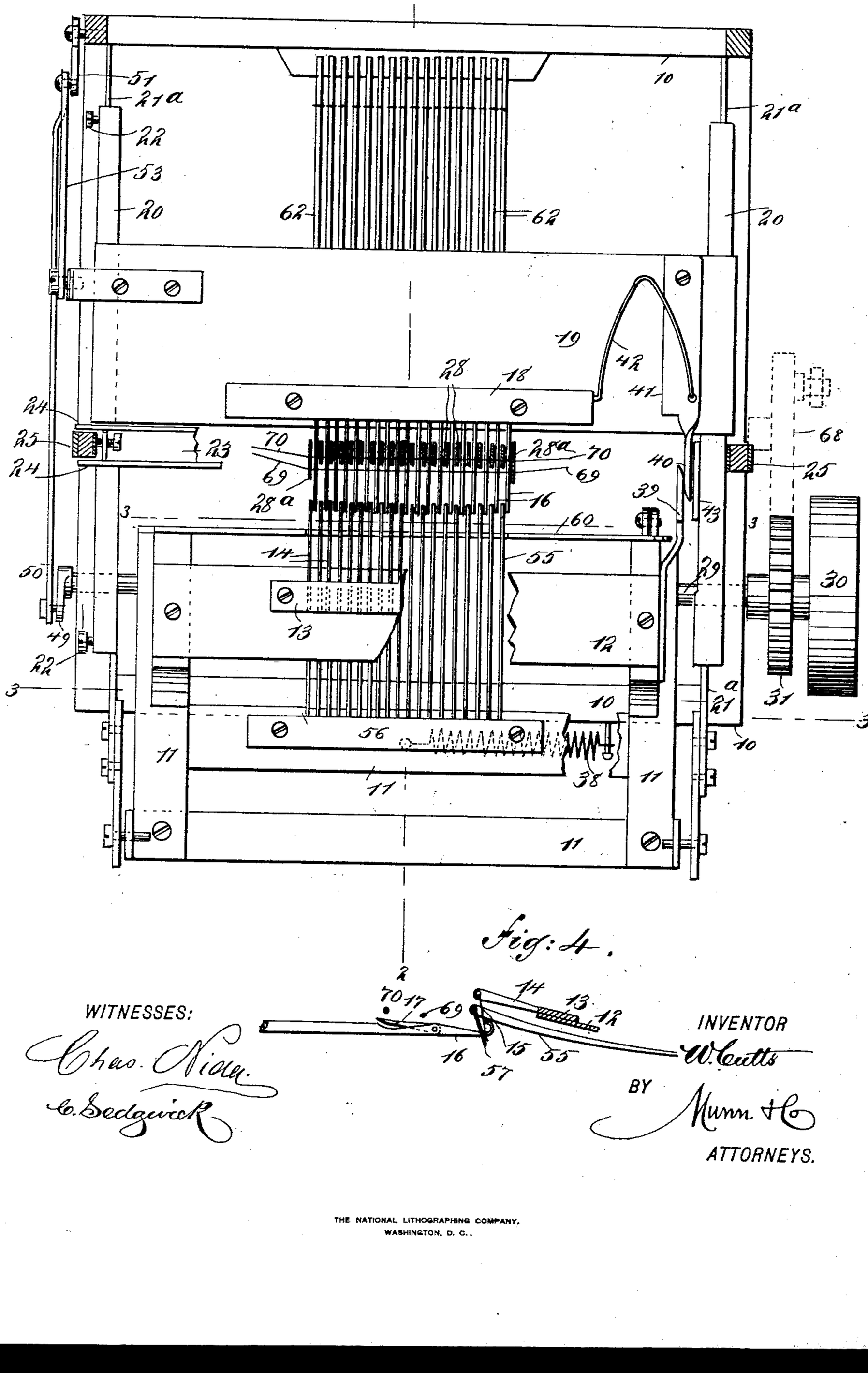

Fig: 4.

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Fig: 2.

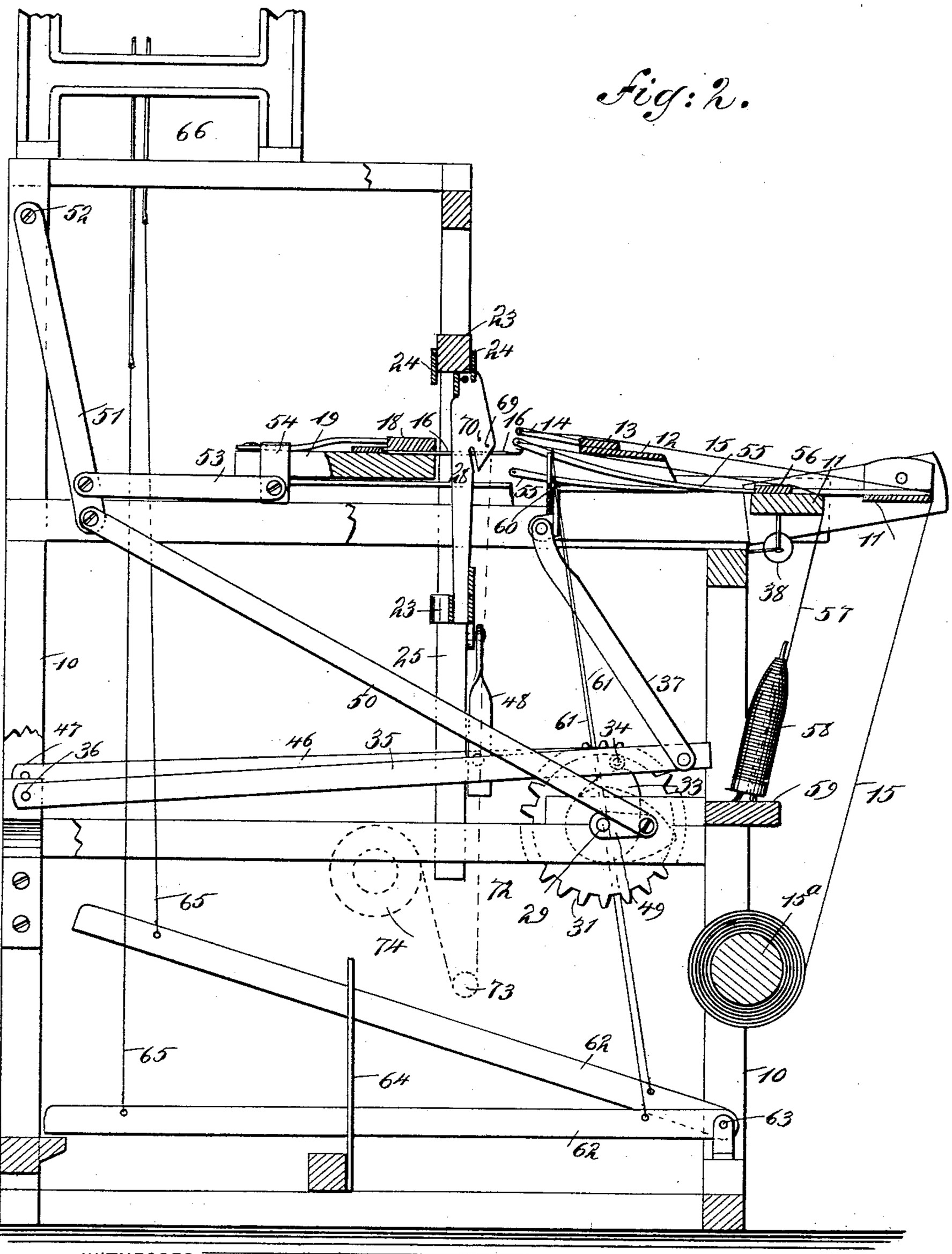

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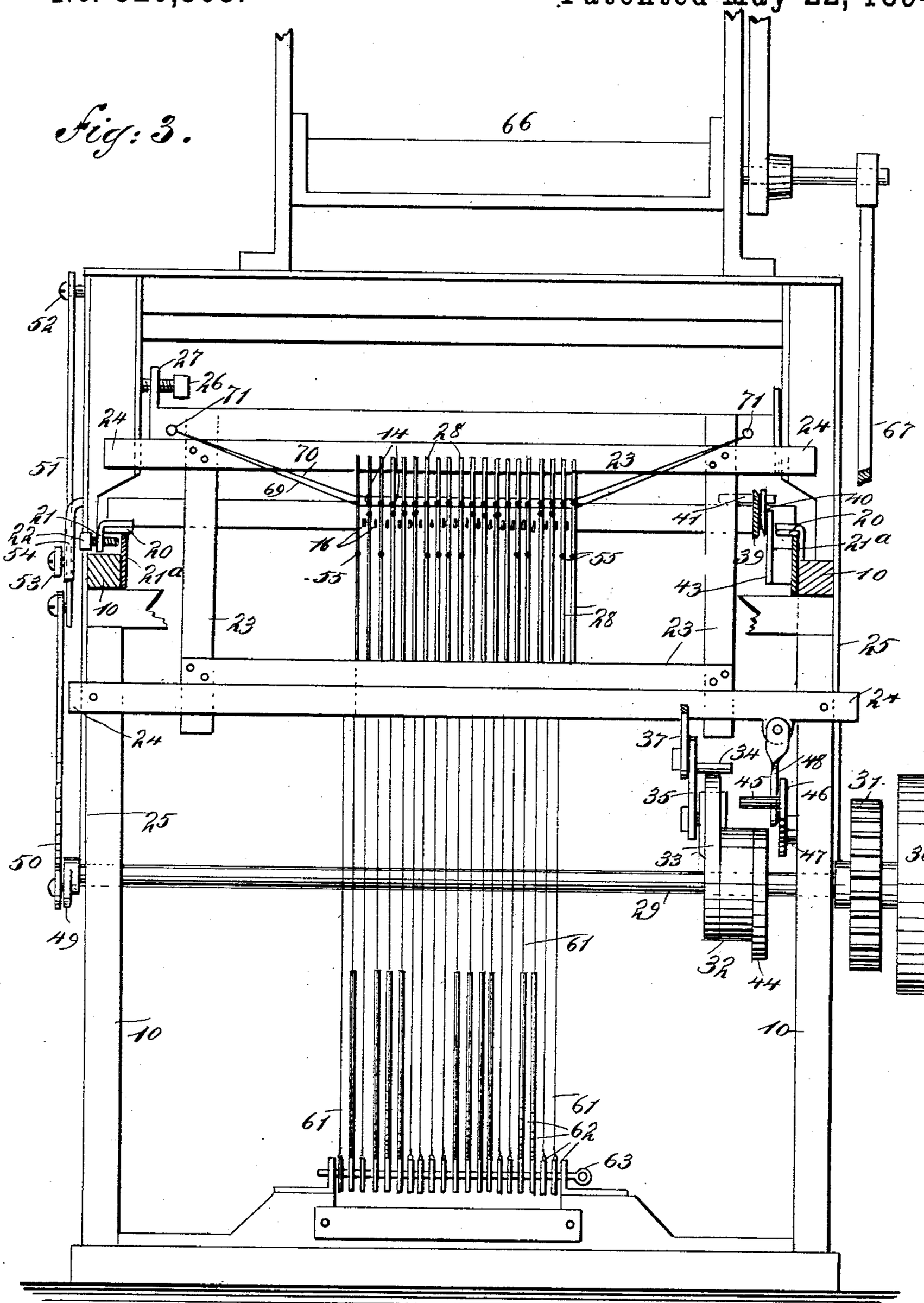
Fig: 3.



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UNITED STATES PATENT OFFICE.

WILLIAM CUTTS, OF TABERNACLE, NEW JERSEY.

WARP-FRAME ATTACHMENT FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 520,303, dated May 22, 1894.

Application filed October 20, 1893. Serial No. 488,671. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CUTTS, of Tabernacle, in the county of Burlington and State of New Jersey, have invented a new and Improved Warp-Frame Attachment for Knitting-Machines, of which the following is a full, clear, and exact description.

My invention relates to that class of machines known as knitting looms or embroidering machines, which are used for manufacturing gauze and similar fabrics; and the object of my invention is to produce a very simple attachment by means of which threads may, at any time, be thrown into the work and made to produce ornamental figures on the fabric.

A further object of my invention is to make the attachments for throwing in the ornamental threads extremely simple and cheap, and to construct the said parts in such a manner that they may be conveniently applied to any ordinary machine, and operated by the customary jacquard to produce the desired figures or patterns on the fabric which is being made.

To these ends my invention consists of certain features of construction and combinations of parts, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken sectional plan of the machine constructed in the usual manner, except for my improved attachments which are applied to it. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is a cross section on the line 3—3 of Fig. 1; and Fig. 4 is an enlarged detail view, showing how the ornamental threads are thrown into the work to produce the ornamental figures on the fabric which is being made.

In the accompanying drawings I have shown an ordinary knitting loom for making gauze fabrics, and it is necessary to show the general arrangement of the parts of the machine in order that the working of my improved attachments may be understood, and for this reason the complete machine is shown, but its operative parts will only be described in sufficient detail to render its operation comprehensible.

The machine has the customary frame 10 on the upper, front portion of which is arranged the usual tilting warp frame 11 which has a cross bar 12 thereon to which are secured, by means of a plate 13, the warp guides 14, which are of the usual kind and need no detail description. The warp 15 passes through the eyes of these guides in the customary way, the warp being held on the warp beam 15ª which is arranged in the lower front portion of the main frame. The machine is provided with the usual needles 16 which are carried forward and backward to engage the warp in the guides 14, these needles having the customary tongues 17, see Fig. 4, and the needles are held by means of a plate 18 to the reciprocating needle frame 19, this carrying the needles backward and forward as specified and having, at its opposite ends, slide plates 20 with lugs 21 thereon, which move on the tracks or plates 21ª fastened to the main frame; and the needle frame is adjusted in the tracks by means of set screws 22 which project through the lugs and impinge on one of the tracks.

The machine has also the customary reed frame 23 which reciprocates vertically in the machine at a point between the needles 16 and the warp guides 14, and the frame 23 has guide plates 24 which slide on the uprights 25 on opposite sides of the machine. The reed frame is adjusted so as to move without too much play by means of the set screw 26, see Fig. 3, which projects through a lug 27 on the frame and impinges against a plate on an adjacent post of the main frame. The reed frame carries the usual reeds 28 for pulling back and carrying down the fabric as fast as it is made.

The warp frame, the needle frame and reed frame are all operated from the driving shaft 29, which is provided with a suitable pulley 30 and with a gear wheel 31 which is adapted to connect with the jacquard, as hereinafter described. The driving shaft is provided with a cam wheel 32 on which is a projecting cam 33 which engages, at every revolution, a stud 34 on a swinging lever 35, this extending rearwardly through the machine and being

pivoted at its rear end, as shown at 36 in Fig. 2, while its free end connects by means of a pitman 37 with the inner end of the warp frame 11 so that every revolution of the driving shaft raises and lowers the warp frame.

The warp frame is pulled normally to one side of the machine by a spring 38 and it is moved sidewise against the tension of the spring by a cam arm 39 which rides over the end 40 of a spring plate 41, see Fig. 1, this plate being secured to the top of the needle frame 19 at one end of the frame and being pressed by a spring 42 against an abutment plate 43 on one side of the main frame. When the warp frame is raised, the cam arm 39 holds it to one side of the machine, and when the guides 14 are lifted above the needle hooks the cam arm 39 will pass the end 40 of the spring plate so that the spring 38 pulls the warp frame laterally, thus carrying the guides over the needles, when the warp frame drops and the warp is left in engagement with the needles; all this is exactly as in the ordinary machine so that it is not necessary to describe it in further detail. The reed frame is also moved from the cam wheel 32, which has on one side a projecting cam 44 and this is adapted to strike a stud 45 on a lever 46, which lever lies parallel, or substantially so, with the lever 35, being pivoted at its rear end, as shown at 47, while near its free end it connects by a pitman 48 with the reed frame, so that at every revolution of the driving shaft the reed frame is vertically reciprocated.

The needle frame is horizontally reciprocated and operated from the driving shaft 29, which shaft has at one end a crank 49 to which is pivoted the connecting rod 50, this rod extending rearward and having its rear end pivoted to a swinging arm 51 which is pivoted at its upper end to the main frame 10 at 52, see Fig. 2, and the lower end of the arm 51 connects by a rod 53 with an arm 54 on the needle frame 19, and consequently the turning of the crank 49 causes the rod 50 and arm 51 to swing back and forth, carrying with them the rod 53 and the needle frame.

All or substantially all the mechanism described above is old, and forms no part of my invention, but it is thought necessary to show it in order that the working of the improved attachments may be clearly understood.

The mechanism to be described I claim as novel: Beneath the cross bar 12 of the warp frame are secured a plurality of spring guides 55, which are fastened to the warp frame by means of a plate 56, or equivalent means, and the tension of these spring guides 55 is upward, so that when the inner end of the warp frame is raised the tendency of the spring guides is to rise and bring their inner ends parallel with the inner ends of the stationary guides 14. The spring guides 55 carry the thread which is to be thrown into the work to form ornamental figures thereon, and to this end the guides have eyes at their free ends, through which the threads 57 pass, these threads being arranged on spools 58 carried on the cross bar 59 of the main frame, the threads extending upward over one of the cross bars of the warp frame. The spring guides 55 move in a slotted plate 60, which is secured to the inner end of the warp frame, and the guides are severally connected by wires 61, or equivalent devices, with levers 62 which lie normally in a horizontal position in the bottom of the machine, being pivoted at their front ends, as shown at 63, and the weight of the levers is such as to overcome the tension of the spring guides 55 and hold the guides in a depressed position in the slots of the plate 60, so that they are out of the way of the needles 16 and consequently out of the work. The levers 62 move between vertical guides 64, and the free ends of the levers are connected by means of wires 65 with an ordinary jacquard 66, which is not shown in detail but which is provided with an operating pitman 67, having a crank connection with a gear wheel 68, shown by dotted lines in Fig. 1, and connecting with the gear wheel 31 on the driving shaft 29.

The jacquard is operated in exactly the usual way to pick up the several designs to be made, and when the jacquard is operated it lifts certain of the levers 62, and whenever one of these levers is raised it relieves the spring guide 55, connected with it, of its weight, and the guide springs up, as shown in Fig. 4, so as to carry its thread 57 above the hook of the adjacent needle 16, as shown clearly in Fig. 4, and the lateral movement of the warp frame then carries the thread into engagement with the needle, together with the warp thread 15, and in this way the ornamental thread is thrown into the needle at the same time as the warp thread, and the operation of making the fabric is exactly as usual.

The needles 16 are arranged horizontally, as already described, and this arrangement is slightly different from the usual plan, and the arrangement is such that without a preventative the tongues 17 of the needles would fly forward when the needle frame was pulled back, so as to permit the work to slide off the needles, and to prevent this guard wires 69 and 70 are used, these being stretched just above the needles and through the reeds 28, the outer ones 28^a of which are made slightly wider than the rest to offer a good bearing for the outer and lower wire 69.

The guard wires 69 and 70 are secured to the reed frame, near its ends, as shown at 71 in Fig. 3, and thus the wires are kept constantly above the needles and in close proximity thereto. The fabric 72, as fast as it is made by the needles, passes down in the usual way, as shown in Fig. 2, beneath a tension roller 73 and is wound in a roll 74.

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

1. In a machine of the kind described, the

combination with the needles and the stationary guides on the warp frame, of spring guides supported below the stationary guides and adapted to rise upward, and a series of levers connected with the spring guides to depress them, substantially as described.

2. The combination, with the reciprocating needles and the warp frame having the usual warp guides, of the spring guides arranged below the warp guides and adapted to spring upward, and a series of levers arranged below the spring guides and connected therewith, so that the weight of the levers depresses the guides, substantially as described.

3. The combination, with the reciprocating needles, the warp frame and the warp guides thereof, of a slotted plate arranged at the inner end of the warp frame, spring guides held in the slots of the frame and adapted to move upward, and a series of levers beneath the spring guides, the levers being suspended from the guides so as to depress the latter, substantially as described.

4. The combination, with the reciprocating needles, the warp frame and the guides carried by the warp frame, of the spring guides held below the warp guides and adapted to spring upward, and means for holding the spring guides depressed, substantially as described.

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Witnesses:
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RICHARD H. HAINES.