(No Model.) 4 Sheets—Sheet 1.

L. P. SHERMAN.

THREAD SELECTING DEVICE FOR MACHINES FOR DRAWING IN WARP THREADS.

No. 500,966. Patented July 4, 1893.

FIG. 13.

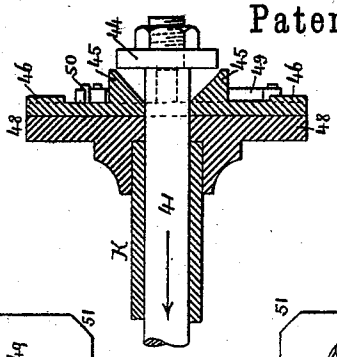


FIG. 12.

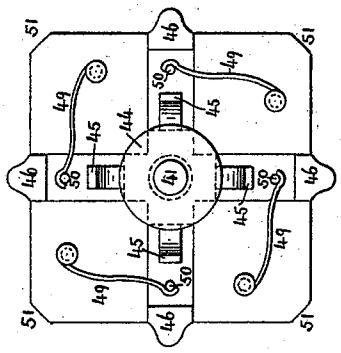


FIG. 11.

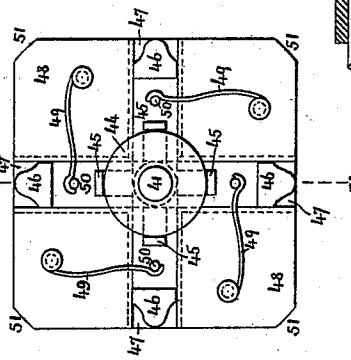
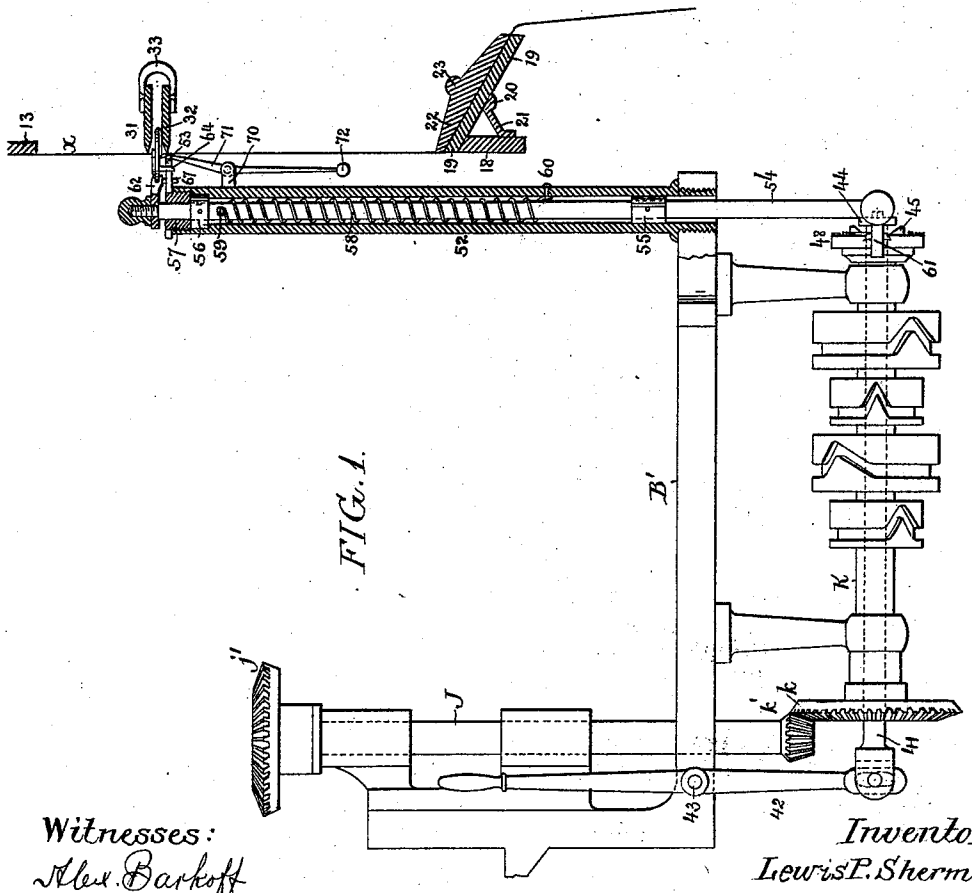


FIG. 1.



Witnesses:
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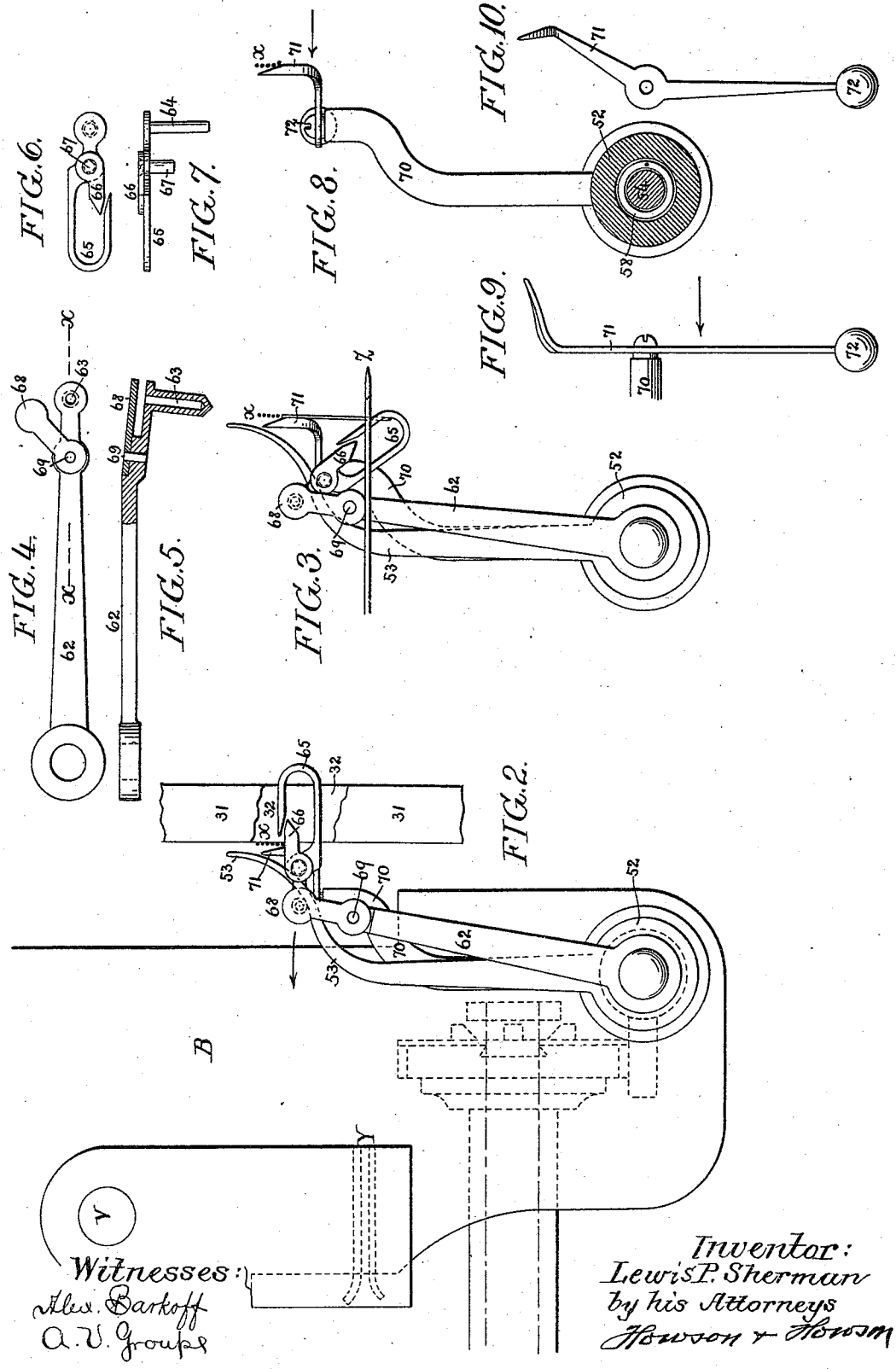
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(No Model.) 4 Sheets—Sheet 2.

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THREAD SELECTING DEVICE FOR MACHINES FOR DRAWING IN WARP THREADS.

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(No Model.) 4 Sheets—Sheet 3.

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FIG. 14.

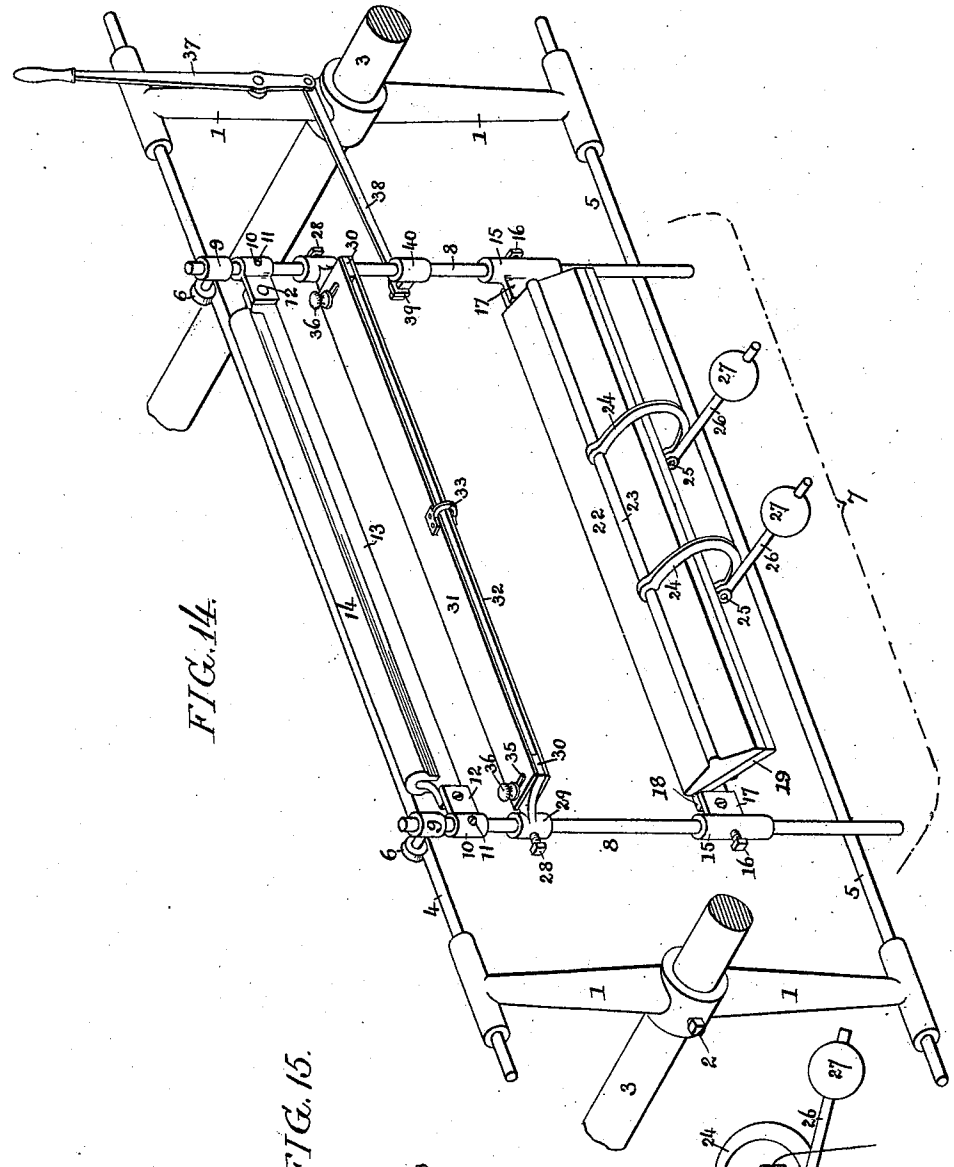
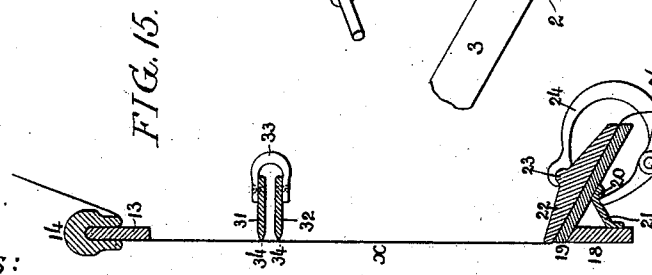


FIG. 15.



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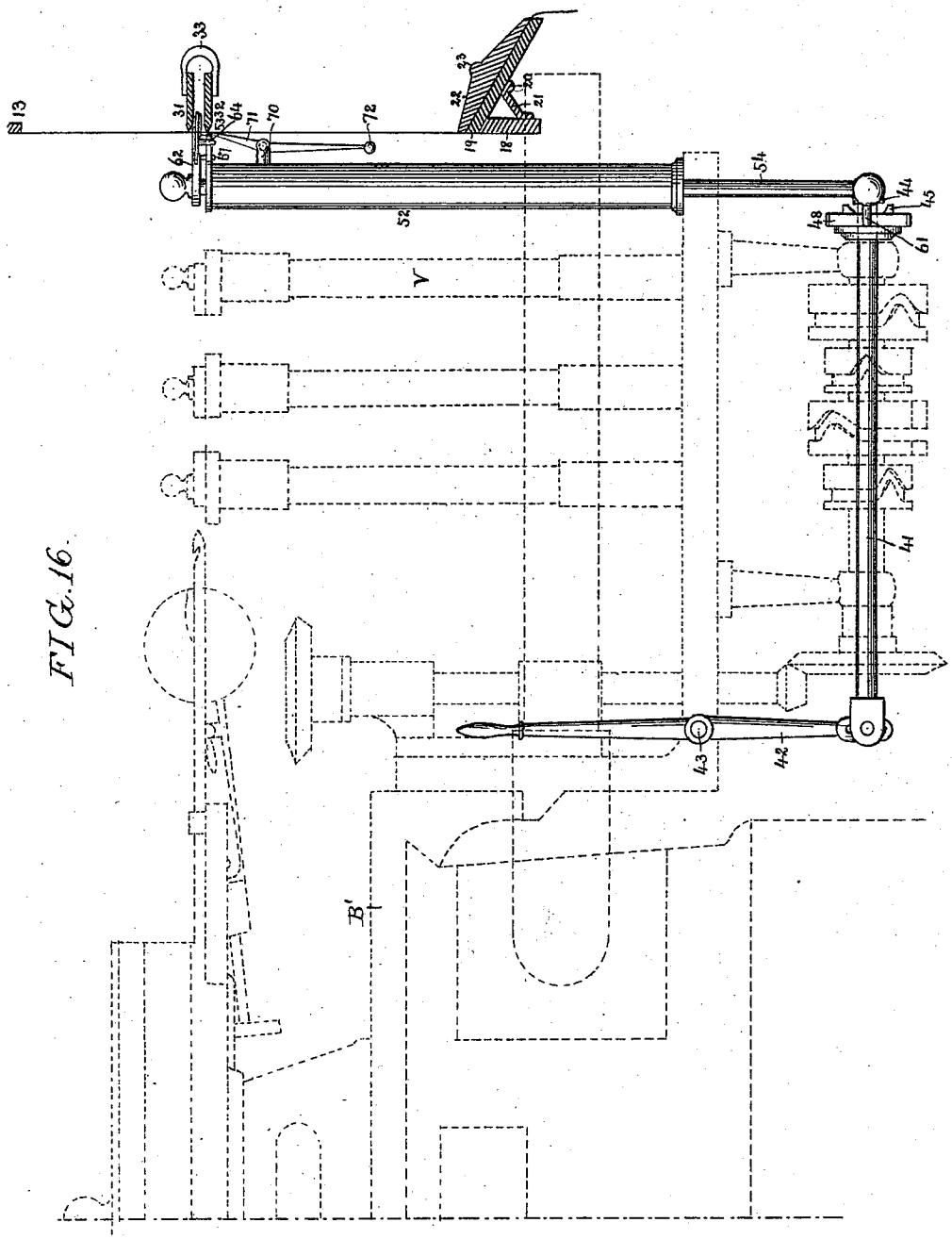


FIG. 16.

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UNITED STATES PATENT OFFICE.

LEWIS P. SHERMAN, OF BIDDEFORD, ASSIGNOR TO GEORGE MOORE, OF BERWICK, MAINE.

THREAD-SELECTING DEVICE FOR MACHINES FOR DRAWING IN WARP-THREADS.

SPECIFICATION forming part of Letters Patent No. 500,966, dated July 4, 1893.

Application filed April 26, 1892. Serial No. 430,788. (No model.)

To all whom it may concern:

Be it known that I, LEWIS P. SHERMAN, a citizen of the United States, and a resident of Biddeford, York county, Maine, have invented certain Improvements in Thread-Selecting Devices for Machines for Drawing in Warp-Threads, of which the following is a specification.

My invention consists of certain improvements in mechanism for selecting warp threads and holding them in position to be engaged by the threading needle, in machines for drawing in warp threads, such for instance as that illustrated in Letters Patent dated the 28th day of December, 1886, No. 355,221, the object of the invention being to produce a selecting device, simple and compact in form, and economical in construction, as more fully set forth hereinafter.

In the accompanying drawings:—Figure 1, represents an elevation partly in section, of the reciprocated carriage B′ of the patent hereinabove referred to and the thread selecting mechanism carried thereby. Fig. 2, is a plan view of the selecting hook and its operating mechanism. Fig. 3, is a similar view of a portion of the same showing the parts in a different position. Fig. 4, is a plan view of the hook carrying arm. Fig. 5, is a sectional view in elevation of the same on the line *x*—*x* Fig. 4. Figs. 6 and 7, are respectively views in plan and elevation of the selecting hook. Figs. 8, 9 and 10, are views of a device for taking up the slack of threads. Figs. 11 and 12, are face views of a cam (showing the parts in different positions) for effecting the movement of the selecting hook. Fig. 13, is a view in transverse section on the line *y*—*y*, Fig. 11. Fig. 14, is a perspective view of the warp thread carrying frame. Fig. 15, is a sectional view of the same; and Fig. 16, is a view corresponding to Fig. 1, showing the general arrangement of the parts with relation to the general structure.

The device forming the subject of this application may be employed in connection with the needle operating mechanism and the heddle eye selecting mechanism shown in my said former Letters Patent, or may be used in connection with the needle operating mechanisms or the heddle eye selecting mechanisms, shown in the applications for Letters Patent filed by me of even date herewith, Serial Nos. 430,786 and 430,787.

The purpose of the invention is to dispense with the complicated mechanism shown in my former patent and to provide a simple thread selecting hook, with comparatively few operating parts, to effect the selecting and presentation to the needle, of one or more of the warp threads.

The construction of the warp holding frame is clearly illustrated in Figs. 14 and 15 and comprises opposite vertical bars 1, 1 adjustably secured by means of set screws 2 to the side bars 3 of the fixed frame of the machine and connecting the upper and lower portions of these bars and extending transversely across the machine are upper and lower rods 4 and 5. On the upper rod 4 is hung, by means of anti-friction rollers 6, 6, the warp thread carrying frame 7. This frame 7 comprises opposite vertical bars 8, 8, on which are secured collars 9, 9 carrying the grooved rollers 6, and immediately below these collars are collars 10, adjustably secured to the rods 8, by set screws 11 and having projections 12 between which is secured a wooden clamping bar 13. The warp threads pass over this bar 13 and are clamped by a grooved bar 14 extending over said bar 13, the two bars being preferably lined with felt or similar substance, as described in my former patent.

Near the lower end of the rods 8 are collars 15, adjustably secured in position by set screws 16 and having projections 17 between which is secured a bar 18, and forming part of, or secured to, this bar 18 is an inclined clamping jaw 19, which may also be covered with felt and beneath this bar 19 is a rib 20 which may form part of an inclined brace 21 extending between the bar 18 and the clamp bar 19.

22 is the upper removable clamp bar also lined with felt or similar material and having a rib 23, the inclined faces of the clamps 19 and 22 fitting closely together and being adapted to receive and clamp the warp threads. These two clamps are held together in proper position by means of yokes 24 having one arm embracing the rib 23 and provided at the opposite end with a fulcrum pin 25 for the

weighted lever 26, the inner end of which engages with the rib 20 on the clamping jaw 19. The weight 27 of the lever 26 is adjustable in order to adjust the amount of force with which the threads are clamped between the bars 19 and 22.

At a point between the upper and lower clamping jaws are secured to the rods 8, by set screws 28, collars 29 having projections 30 of suitable thickness, and extending between these projections are upper and lower blades 31 and 32 united by a yoke 33 and having comparatively sharp edges 34, as shown in Fig. 15, against which the warp threads are pressed when stretched between the upper and lower clamps. These blades 31 and 32 are slotted at their opposite ends at 35 and through these slots and through similar slots in the projections 30 extend clamping screws 36, so that when necessary the loosening of the screws will enable the operator to withdraw the blades 31 and 32 away from the line of warp threads and permit the adjustment of the warp threads in position so that after the warp threads have all been clamped the blades may be pushed back until the edges 34 are in contact with such threads and the threads are stretched taut over such edges.

To effect the lateral adjustment of the frame I fulcrum to one of the side bars 1, a hand lever 37 the lower end of which is connected by a rod 38 to a projecting stud 39 on the collar 40 secured to one of the bars 8, so that the movement of the lever will effect the adjustment of the entire frame and the warp threads which it carries.

The construction of the warp holding frame having been described I will now proceed to describe the devices for selecting one or more warp threads from the frame and presenting such thread or threads to the needle (shown at *z* in Fig. 3).

Referring to Figs. 1 and 2, B′ represents the carriage carrying the heddle mechanism and the thread selecting mechanism, as described in the patent above referred to and V represents one of the posts or standards carrying a base plate on which is guided a portion of the mechanism for selecting the heddle cords and clamping the eyes of the heddles, Y representing a needle guide secured to said base plate.

K is a hollow shaft, supported on hangers depending from the reciprocated carriage B′, and carrying between such hangers, the cams for operating the heddle selecting mechanism and motion is imparted to said shaft by means of bevel gears *k* connecting the shaft to a vertical shaft J which is given a rotary motion through a bevel gear *j*′. The shaft K is hollow in the present instance and extending therethrough is a rod 41 connected at one end to a hand lever 42 fulcrumed at 43 to the carriage so that by operating said lever a longitudinal movement of the rod 41 may be effected; at its opposite end this rod carries a spreading disk 44 adapted to engage with the inclined faces of studs 45 secured to or forming part of, radial slides 46, guided in ways 47 in the cam block 48 which is secured to, and rotated by, the shaft K as shown in Figs. 11, 12 and 13. On this cam block is a series of springs 49, one for each slide 46, and the springs engage with pins 50 projecting from said slides and tending to keep the slides 46 in the position shown in Figs. 11 and 13, the outer ends of the slides, when in this position, being on the same line with the sides of the cam block 48. When necessary, however, and for a purpose hereinafter described the lever 42 may be operated to draw the rod 41 in the direction of the arrow Fig. 13, and by effecting the engagement of the spreader disk 44 with the operating lugs 45 the slides 46 are forced out until they assume the position shown in Fig. 12, that is to say, until the outer ends of the slides are at a point just half-way between the distance from the center of the cam block to its straight sides, and the distance from the center of the cam block in a radial line, to the corners 51 of such cam block.

At the outer end of the carriage B′ is secured a hollow standard 52 and on the upper end of this hollow standard is secured a stationary arm 53, forming a guiding finger for the selecting hook. This arm 53 is securely held in position and its outer end is curved as shown in Figs. 2 and 3, the extreme end of the arm being at a comparatively short distance from the warp threads *x* held on the frame 7 and being on a line just below the two blades 31 and 32.

Within the hollow standard 52 is a shaft 54 on which are permanently secured a lower collar 55, of a diameter just equal to the inner diameter of the hollow standard 52, and an upper collar 56 which rests in a counter-sunk recess at the top of the hollow standard, the diameter of the recess being a trifle greater than the main portion of the inner diameter of the standard so as to form a shoulder on which the collar rests and supports the shaft 54 in vertical position. The shaft is locked in this position by means of a hollow block 57 which is screwed in the upper portion of the standard, surrounding the shaft 52 and its lower end bears upon the collar 56.

Coiled around the shaft 54 within the hollow standard is a torsion spring 58, one end of which is secured at 59 to the shaft, and the opposite end being secured at 60 to the standard 52, the tendency of the spring being to keep the arm 61 secured to the lower end of the shaft 54, in contact with the edge of the cam 48 and the operation of the cam tending to give the shaft a partial rotation on its axis while the spring 58 effects the return of the shaft after each movement.

Secured to the upper end of the shaft 54 and moving therewith is an arm 62, the outer end of which is inclined as shown more clearly in Fig. 5, and is provided at its extreme outer end with a recessed stud 63 within which is swiveled the pivot pin 64 of the hook 65.

The hook 65 is perfectly flat as shown in Fig. 7, the end of the hook, however, being sharpened so as to catch a single thread; and to the upper surface of the hook is secured a guard 66, the securing pin of which 67, extends for some distance through the body of the hook, as shown in Fig. 7, the guard itself, being stationary and its operating edge running parallel with the bend of the hook and leaving a passage between such operating face and the hook sufficient for the passage of a thread and this distance being adjustable by the loosening of the pin 67 in order to permit the entrance of threads of varying thickness. The hook swivels on its pin 64 in the recessed stud 63 and is held therein by a cover plate 68 pivoted at 69 to the arm 62 so that when necessary the cover plate may be swung out of the way, as shown in Fig. 4, to remove and examine or repair the hook.

The stud 63 is adapted to travel on one side of the curved end of the arm 53 and the fastening pin 67 of the guard 66 is adapted to travel on the opposite side thereof so that the oscillations of the arm 63 will effect a movement of the hook from the position shown in Fig. 2, to the position shown in Fig. 3, and back again, the movement of the hook being aided by gravity owing to the inclined position in which it is swiveled in the stud 63, as described, and the hook is adapted to travel between blades 31 and 32 so that it may select a thread which is stretched taut across the sharpened edges of such blades.

In operation, considering the parts to be in the position shown in Fig. 2, the hook 65 being between the blades 31 and 32 and the guard 66 resting against the first thread of the series, the first movement of the arm 62, caused by the action of the cam 48 on the arm 61, will be in the direction of the arrow, Fig. 2, and will move the hook slightly forward beyond its pivot point 64 causing it to engage with the first thread of the series, the space between the hook and the cord being sufficient to permit the entrance of only one of the threads and this thread will be drawn back as the movement of the pin 67 striking against the guide 53 and moving the hook around the arm 62 continues, until the hook reaches the position shown in Fig. 3; and at the same time the needle Z has reached the limit of its forward movement. The needle Z will then be retracted and will draw the thread from the hook and clamps 19 and 22 and through the eye of the heddle which has been selected by any of the mechanisms described in my former patent. The return movement of the hook is effected by the spring 58 and another thread is selected by the time the needle has returned.

In threading the heddle eyes for the selvage edge of the cloth it is desirable to place two warp threads through the eye in order to strengthen the selvage edge and this is accomplished by the operation of the lever 42, which in drawing back the spreader disk 44 causes the outward movement of the slides 46 so that the end of the slide 46 will engage the arm 61 and will cause two movements of the selecting hook and cause two threads to be selected and drawn back to the proper position during a single reciprocation of the needle Z, which, when it comes forward to the position shown in Fig. 3, will then receive two threads from the hook instead of one, as usual. This lever 42 is only operated, however, at the starting and stopping of the operation and the necessary number of heddle eyes on each end of the heddle are threaded with two threads to strengthen the selvage edge.

It may sometimes happen that in securing the warp threads in position some of the threads may slacken, and in order to keep all of the threads taut against the edges 34 of the blades 31 and 32, I provide upon a projection 70, on the standard 52, a pivoted arm 71, one end of which is curved as shown in Figs. 8, 9 and 10; Fig. 8, representing a plan view and illustrating the action of the curved end of the lever 71 on the warp threads x, the action of the weight 72 of the lever causing the threads to be pressed backward and keeping them taut, and a comparatively small number of the threads being engaged at a time so that the action will be more perfect. Fig. 9 represents a side view looking in the direction of the arrow Fig. 8; and Fig. 10 is a face view looking in the direction of the arrow Fig. 9.

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

1. A warp frame comprising opposite standards 1, 1, rods 4 and 5 connecting such standards, and a warp frame 7 laterally adjustable on said rod 4, substantially as specified.

2. A warp frame, a transverse bar adjustably supporting said frame, a lever 37 fulcrumed to the stationary frame of the machine, and connected to said warp frame for effecting the lateral adjustment of the same, substantially as specified.

3. A frame for holding warp threads comprising upper and lower clamping bars, blades engaging with one side only of said warp threads with a thread selecting hook, and mechanism for operating said hook, substantially as specified.

4. The combination of the upper and lower thread clamps, blades 31 and 32 adapted to engage with one side only of said threads, and a thread selecting hook operating between said blades 31 and 32, substantially as specified.

5. A warp frame comprising opposite side bars, a clamping bar secured at its opposite ends to said side bars, a clamp 14 embracing said clamping bar, a lower clamp jaw 19 extending between said side bars, and a clamping jaw 22 acting therewith, and blades 31 and 32 adapted to engage with one side only of the warp threads, substantially as specified.

6. A thread clamp for warp holding frames

comprising a fixed clamp bar, a rib thereon, an upper movable clamp bar 22, a rib 23 thereon, and a clamping yoke comprising a curved bar 24 having one of its ends engaging with the rib 23, and a weighted lever 26 pivoted to said yoke and engaging with the rib 20, substantially as specified.

7. A frame for holding warp threads comprising upper and lower clamping bars, blades 31 and 32 adjustably secured to said frame and adapted to be moved into or out of contact with the warp threads carried by said frame, and a thread selecting hook with mechanism for operating said hook, substantially as specified.

8. The combination with a warp thread holding device, of a reciprocated arm inclined at its outer end, a selecting hook pivoted to the inclined portion of said arm, with devices for effecting the reciprocation of said arm, substantially as specified.

9. The combination with a warp holding frame of a selecting hook, a movable arm to which said hook is pivoted, a guiding stud 63 on said arm, a guide stud 67 projecting from said hook, and a fixed guide for altering the position of the hook during the reciprocation of the arm 62, substantially as specified.

10. The combination with a warp holding frame, of a reciprocated arm, a selecting hook pivoted thereto, a guard 66 carried by said hook, and devices for effecting the reciprocation of the arm 62, substantially as specified.

11. The combination with a warp holding frame of an arm 62 inclined at its outer end, and having a hollow stud 63, a selecting hook 65 pivoted in said hollow stud, a guard 66 on said hook, a pin 67 projecting therefrom, and a stationary guiding arm extending between the stud 63 and pin 67, substantially as specified.

12. The combination with a warp holding frame, of the arm 62 inclined at its outer end, a thread selecting hook swiveled thereto, and a covering plate 68 pivoted to said inclined arm and acting to hold said hook in position, substantially as specified.

13. The combination with a warp holding frame, of a thread tightening device comprising a pivoted arm having at its outer end an inclined face adapted to engage with the warp threads, substantially as specified.

14. The combination with a warp holding frame, of a thread tightening device comprising a weighted lever pivoted to the moving part of the frame and having an inclined face adapted to engage with the warp threads, substantially as specified.

15. The combination with a warp holding frame, of a thread selecting hook, a lever 62 carrying the same, a shaft on which said lever is mounted, and means for effecting the oscillation of said shaft, comprising the rotated cam block 48, and a spring 58 adapted to return the shaft to its normal position, substantially as specified.

16. The combination of a cam block, a series of movable operating slides carried thereby, projections 46 on each of said slides, and a spreading disk 44 adapted to engage with said projections and effect the movement of the slides, substantially as specified.

17. The combination of the cam block having a series of movable slides thereon, projections 46 having inclined faces secured to said slides, and a spreading disk 44 adapted to engage with the inclined faces of the said projections and springs acting on said slides, and tending to hold them in position, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEWIS P. SHERMAN.

Witnesses:
JOHN C. HURD,
ORIN Q. SHUPLEIGH.