

June 9, 1931.

N. A. JENNINGS

1,809,241

FANCY WORK MACHINE

Filed Aug. 11, 1927

3 Sheets-Sheet 1

Fig. 1

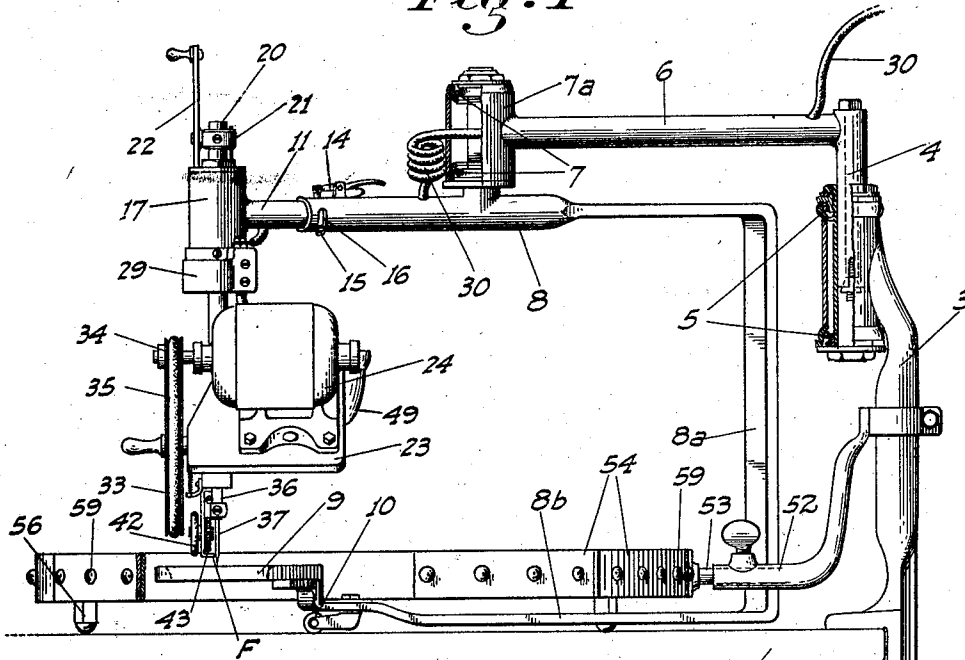


Fig. 4

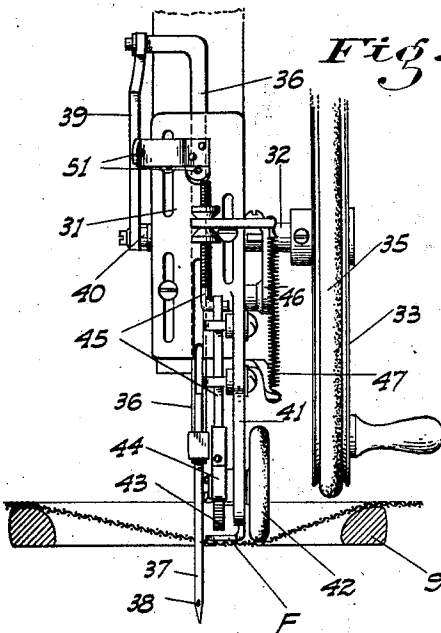
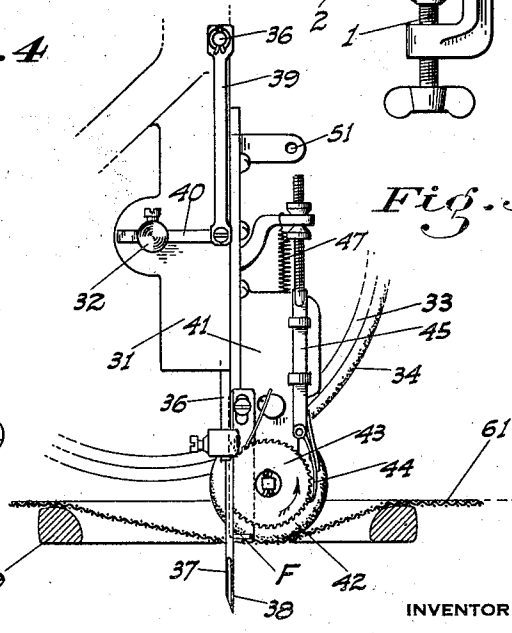


Fig. 5



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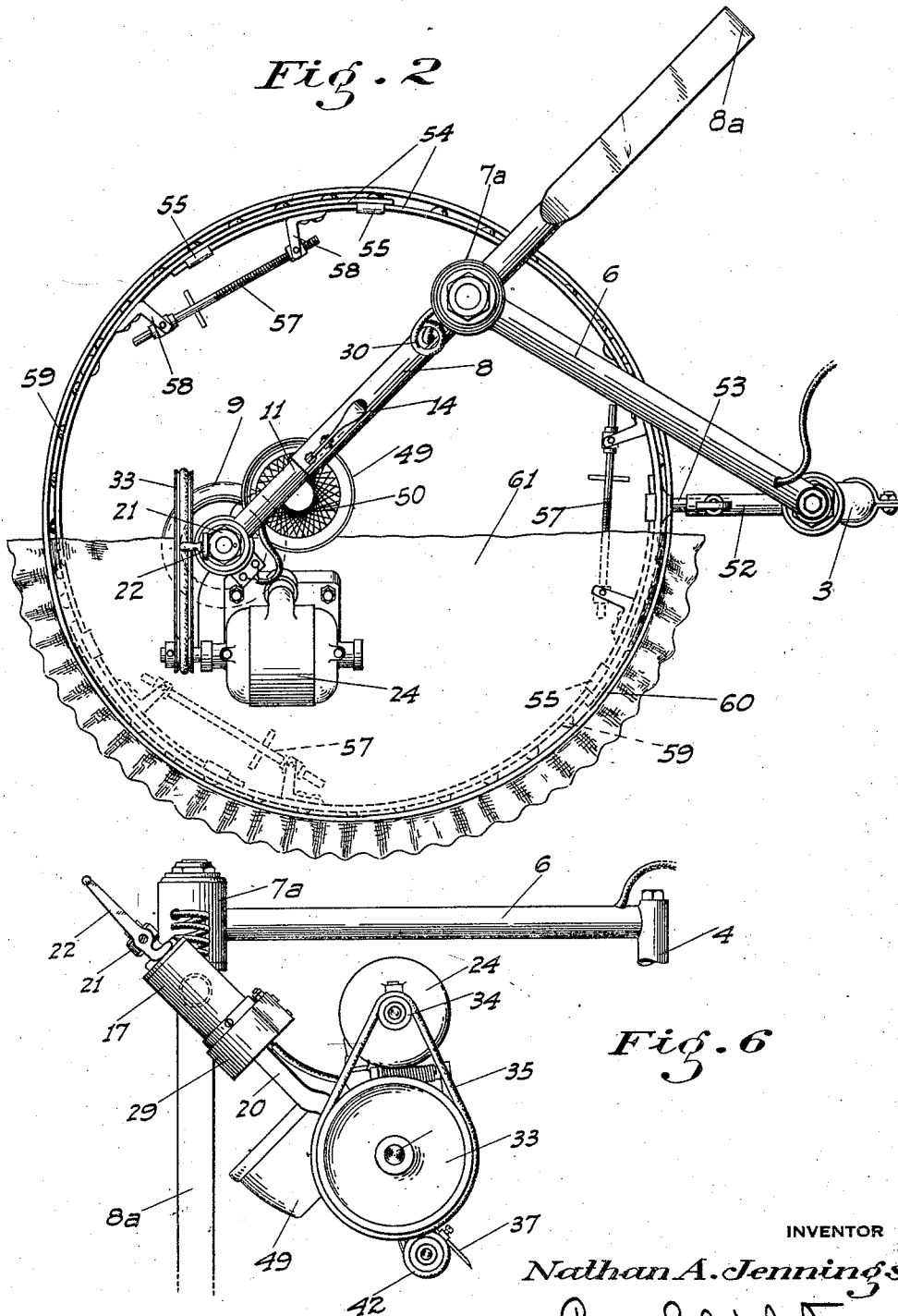
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3 Sheets-Sheet 2



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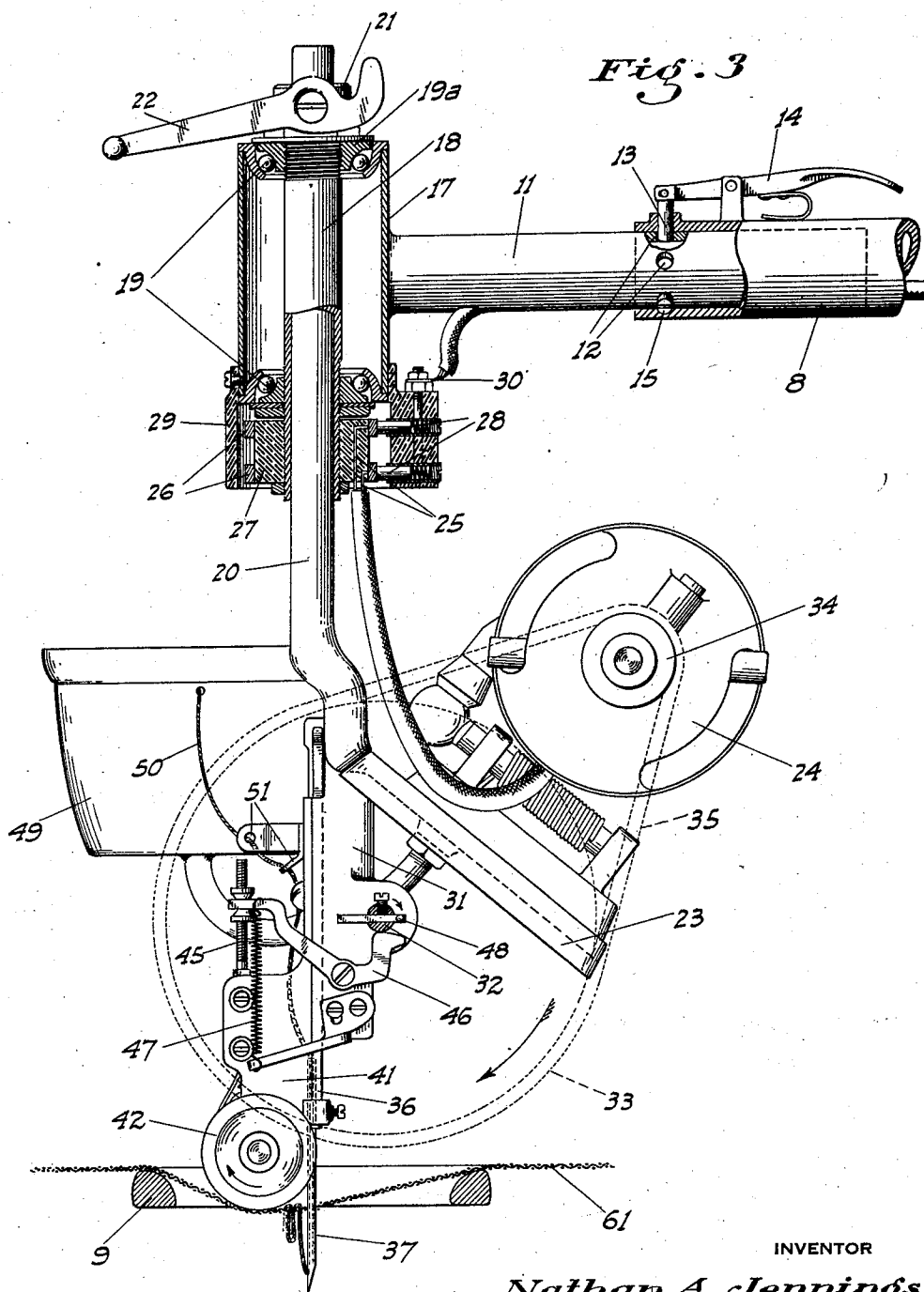
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FANCY WORK MACHINE

Filed Aug. 11, 1927 3 Sheets-Sheet 3



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FANCY WORK MACHINE

Application filed August 11, 1927. Serial No. 212,293.

This invention relates to improvements in machines for producing fancy work designs on cloth, the particular work for which this machine is intended being of that type known as "punch work" or "hooked embroidery".

At present, as far as I am aware, the only way in which such work can be done is by means of punch needles held in the hand. As is well known to those who have used such needles, the production of a design thereby is a very slow and laborious task.

The principal object of my invention therefore is to provide as a complete operating unit, a hoop over which the cloth to be worked on is stretched, and an electric or hand operated machine mounted in direct connection with the hoop and arranged so that the needle of the machine can be quickly and easily moved over the entire area of the cloth in any direction without any disassociation of the machine relative to the hoop being had. By means of this machine any design may be worked on the goods much quicker than is at present possible, and with which the only physical effort necessary is that used in guiding the needle over the goods.

A further object of the invention is to provide adjustable means for enabling the depth of the stitch, and consequently the thickness of the mat or nap of the design, to be readily altered to suit; and also to enable the distance between stitches to be also readily adjusted.

Another object is to provide means for enabling the machine to be tilted upwardly to one side without disassociating the same from the hoop and the work, so as to clear the needle and adjacent parts a considerable distance from the work and so facilitate rethreading operations.

Other features of advantage and novelty will be apparent from a perusal of the following specifications.

These and other objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of the complete apparatus partly broken out.

Fig. 2 is a top plan view of the same.

Fig. 3 is an elevation of one side of the machine proper partly broken out.

Fig. 4 is a fragmentary elevation of the machine looking at another side.

Fig. 5 is a similar view of the machine looking at the side thereof opposite to that shown in Fig. 3.

Fig. 6 is a fragmentary elevation of the apparatus showing the machine in the position occupied when tilted for rethreading operations.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes a clamp for engagement with a supporting table 2, said clamp being formed on the lower end of a rigid vertical post 3. Turnable in the upper end of the post is a spindle 4, ball bearings 5 being disposed between the post and the spindle to facilitate turning of the latter.

Projecting horizontally from and rigidly secured to the top of the spindle is an arm 6 depending from and turnably mounted on the outer end of which is a rigid frame. Ball bearings 7 are disposed between the frame and the arm to promote ease of turning, and are mounted in a housing 7a secured to said arm 6. The frame consists of an upper horizontal tubular member 8 formed at one end with a downwardly depending extension 8a, the distance from the axis of turning of the frame and the arm to the extension being less than the distance from said axis to the spindle 4, so that the extension is free to pass inside the spindle and post. At the bottom of the extension near the table the frame is formed with a horizontal arm 8b, which is disposed directly under and parallel to the upper frame member 8. Said lower arm terminates in a rigid ring 9 which is raised somewhat from said arm. Adjacent the ring the frame arm is provided with a caster roller 10 which rides on the table.

A stem 11 is turnably mounted in the end of the frame member 8 opposite to the extension 8a, said stem being provided with holes 12 set 45° or thereabouts apart, which holes

are adapted to alternately receive a stop pin 13 which is attached to one end of a control lever 14 mounted on the member 8. The stem is thus normally held against rotation from one or the other of the two possible positions to which it may be turned. A pin 15 fixed in the stem rides in an arcuate slot formed in the member 8 to limit rotation of the stem and prevent longitudinal movement thereof. The stem while separate from the frame actually forms a portion of the same, as will be evident.

Secured to the outer end of the stem is a vertical tubular housing 17 in which is turnably mounted a sleeve 18, ball bearings 19 between the housing and sleeve facilitating the rotation of the latter. Slidable through but turning with the sleeve is a post 20 on which, above the member 17, is fixed a collar 21. The post tends to drop of its own weight so that the collar rides on the race 19a of the upper ball bearing, and is raised from such position when desired by a cam lever 22 which is pivoted onto the collar and is adapted to ride on said race when turned to a vertical position. These parts are so disposed that when said lever occupies such vertical position the post is then raised approximately one half inch from its lowered position.

Secured to the post on one side of the same below the housing is a bracket 23 on which is mounted an electric motor 24 of the type commonly used for sewing machines. To enable the current to be readily conveyed to the motor without the possibility of the wires becoming entangled with the operator or the work, the wires 25 from the motor lead to circular and vertically spaced contact strips 26 mounted in an insulation block 27 secured to the lower end of the sleeve 18. Spring pressed contact pins 28 engage said strips, these pins being mounted in a hood 29 secured to the housing 17 and depending about the strips 26 so as to enclose the same throughout their extent. Wires 30 from the pins lead through or alongside the supporting structure of the machine to a point near the spindle 4, as shown in Fig. 1, then forming an extension cord which leads thence for connection to a light or outlet socket.

Fixed to and depending from the post 20 is a block 31 in which is mounted a horizontal shaft 32 parallel to the motor 24. This shaft has a pulley 33 thereon which is driven from the motor pulley 34 by a belt 35. Slidable in the block is a needle supporting bar 36, arranged to detachably support a hollow needle 37 of a character suitable for this work, and having a hole 38 in one side thereof near the bottom. At its upper end the bar is attached to one end of a connecting rod 39, the other end of which is pivoted onto a crank 40. This crank projects from and is radially adjustable in the shaft 32, so that the

length of throw of the crank and consequently the vertical movement of the bar and needle may be altered at will. The needle is disposed so as to be in direct axial alinement with the post 20.

Supported from a bracket 41 which depends from the block 31 is a feed wheel 42 which is covered with friction material and is disposed to one side and rearwardly of the needle. Mounted axially in connection with this wheel is a ratchet wheel 43 (see Fig. 5) which is engaged by a pawl 44 depending from a vertical stem 45 slidably mounted on the bracket 41. At its upper end this stem is connected to one end of a lever 46 which is pivoted intermediate its ends onto the block 31 (see Fig. 3); the end of the lever opposite to its connection with said stem passing under the shaft 32 and being pressed thereagainst by a spring 47. Said lever end is positioned to be engaged, once with every revolution of the shaft 32 and when the needle is raised to the top of its stroke, by a radial adjustable pin or cam 48 mounted in the shaft 32. This engagement of said end of the lever causes the opposite end thereof to be raised, pulling up on the pawl 44 and causing the ratchet wheel and consequently the feed wheel to be rotated. The extent to which the lever is moved, and consequently the extent to which the wheel will be rotated depends on the distance of the pin 48 from the shaft, as will be evident. Since the forward movement of the needle is governed by the rotation of the wheel, it will be seen that the rate of feed, or the spacing of the needle between its projections through the cloth, may be adjusted according to requirements.

A bowl or cup 49 to support a ball of thread is supported from the bracket 23 to one side of the block 41; the thread 50 passing from the ball through a hole in the side of the cup and thence through guide eyes 51 down through the needle from the top thereof and out through the bottom hole 38 therein as shown in Fig. 3. A presser foot F is disposed at about the same level as the bottom of the feed wheel, and is located between the wheel and the needle just behind the latter relative to the direction of movement thereof. The ring 9 is disposed so as to be concentric with the needle and is of sufficient diameter to avoid contact with the wheel 42.

In order to support the cloth to be worked on in proper relationship to the needle the post 3 is provided with a socket 52 projecting radially therefrom. This socket receives a stem 53 projecting radially from a hoop structure which comprises a plurality of relatively slidable segments 54 connected together to form a unitary structure by bands 55. The segments are supported from the table 2 by feet 56. The different segments are expanded or contracted so as to alter the diameter of the hoop by means of screws 57 dis-

posed inside the hoop area and threaded through lugs 58 projecting inwardly of the segments near their adjacent ends. On the outside of the hoop rubber or similar pads 59 are disposed at intervals. A continuous band 60 is arranged to surround the hoop on the outside of the same.

In operation the hoop is first removed from the holding socket, the cloth 61 to be worked on is stretched over the hoop and bent down over the sides to engage the pads, and the band 60 is then applied over the cloth. The hoop screws 57 are then tightened up to stretch the hoop segments and place the cloth under the necessary tension. The hoop is then connected to the socket 52 and work may be commenced.

Owing to the numerous swivel connections between the machine and the fixed supporting post 3, it will be evident that the needle may be easily moved to any position on the cloth. When thus moving the machine to a starting position it is held raised by raising the post 20 by manipulation of the lever 22 so that the forward wheel and other parts are held clear of the cloth. When the needle is located at the starting point, said post 20 is lowered so that the feed wheel and presser foot firmly engage the cloth, depressing the same inside the ring 9 owing to the weight of the machine parts, and as plainly shown in certain of the views of the drawings. The motor is then started up and it is only necessary for the operator to guide the machine along the outline of the design imprinted on the cloth, since the needle will be reciprocated and will feed forward of itself as long as the motor is in operation. When it is desired to cause the needle to travel in a reverse direction, it is only necessary to rotate the post 20 through a half turn without disturbing the hoop or cloth.

As is the case with work of this character done by hand the thread initially assumes the form of loops depending from the under side of the cloth, as shown in Fig. 3, the length of the loops and the spacing depending on the stroke allowed the needle and the extent of feed of the feed wheel—both of which may be controlled at will as previously explained. To complete the work the loops are cut through by shears to present the desired mat-like or thick nap surface after the cloth has been removed from the hoop. Since the cloth tension ring 9 is mounted on the same frame on which the machine is mounted, any movement of the machine causes a like movement of the ring, so that the latter is always concentric with the needle and always follows up the travel of the latter across the cloth. When it is desired to rethread the machine it is tilted to one side as shown in Fig. 6 by release of the pin 13 and manual movement of the machine to the desired position, when the pin 13 is again permitted to drop into the

other one of the holes 12 which will then be alined with said pin. This holds the machine in the tilted position as long as may be desired. This operation raises the needle some distance above the work without disturbing the latter, so that threading operations may be very quickly and easily accomplished.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A fancy work machine including a vertical post, means for supporting said post in a fixed position, a horizontal arm turnably mounted on the post, a frame structure turnably mounted onto and under said arm, and a machine structure turnably supported by and depending from the frame structure; said machine structure including a vertical needle disposed concentric with the axis of turning of the machine structure.

2. A fancy work machine including a frame having a horizontal member, means supporting the frame, a stem turnably supported in one end of said member, a machine structure supported by and depending from the stem, and means between the frame member and stem for holding the stem against rotation from either of two selective positions.

3. A fancy work machine including a frame having vertically spaced horizontal members, means supporting the frame to enable the horizontal members to swing in horizontal planes, a machine structure supported by and depending from the upper frame member, said machine including a vertical needle, and a ring secured to the lower frame member; the needle being disposed centrally of the ring and means enabling the machine to turn about the axis of the needle.

4. A fancy work machine including a goods support, a machine unit above the support having a needle for operation on the goods, and supporting means for the machine including a vertical and turntable post on the lower end of which the machine is directly mounted to turn therewith, the axis of turning of the post being vertically alined with the needle.

5. A fancy work machine including a vertical tubular member, means supporting said member at a fixed level, a post turnably and slidably mounted in said member, a machine

unit mounted on the post below the member,
and a hand cam means mounted in connec-
tion with the post above said member to en-
able the post to be raised and held raised rel-
ative to the member.

6 6. A fancy work machine including a ver-
tical tubular member, means supporting said
member at a fixed level, a post turnably and
slidably mounted in said member, a machine
10 unit mounted on the post below the member,
a bearing between the member and post and
turnable with the post, said post being slid-
able through the bearing, a collar on the post
above the bearing to normally rest thereon,
15 and a cam lever pivoted on said collar and
adapted when turned to engage the bearing
to cause the post to be raised relative thereto.

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