

(No Model.)

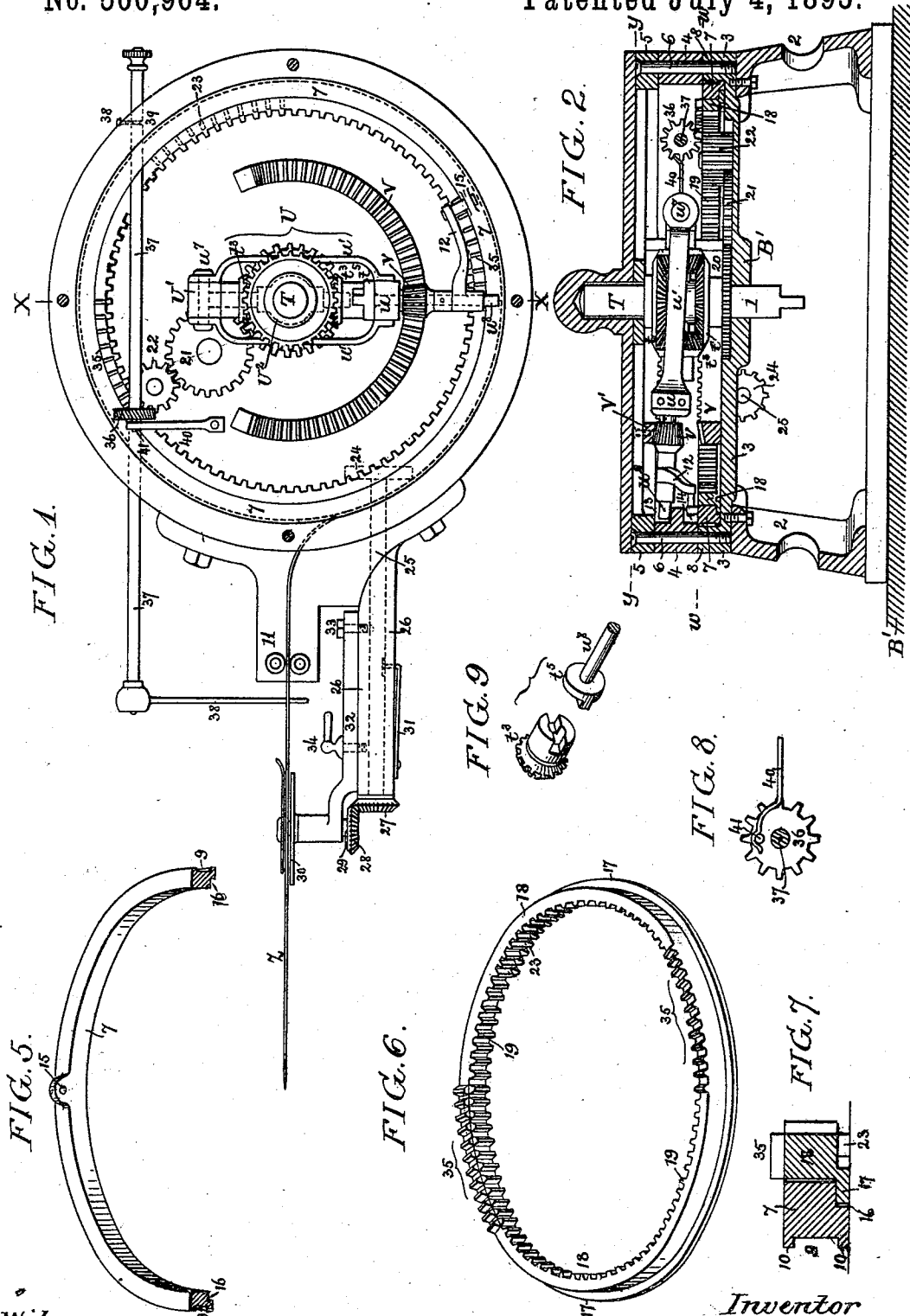
2 Sheets—Sheet 1.

L. P. SHERMAN.

NEEDLE OPERATING AND REED DENT SEPARATING DEVICE FOR
MACHINES FOR DRAWING IN WARP THREADS.

No. 500,964.

Patented July 4, 1893.



Witnesses
Alex. Barkoff
A. V. Groupe

Inventor
Lewis P. Sherman
by his Attorneys
Howe & Howe

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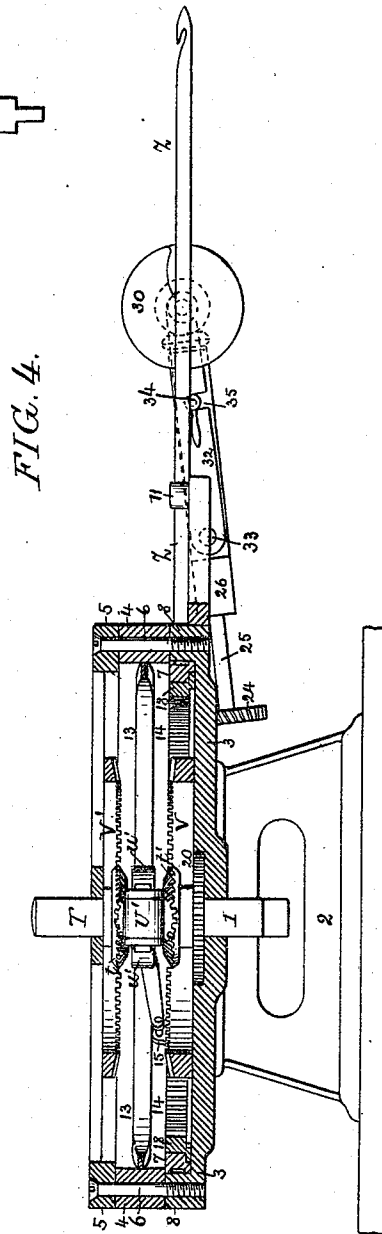
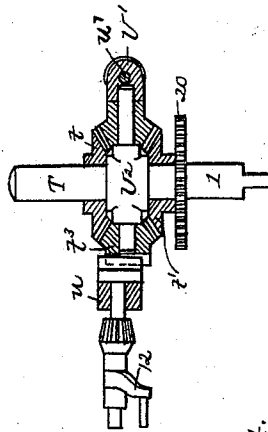
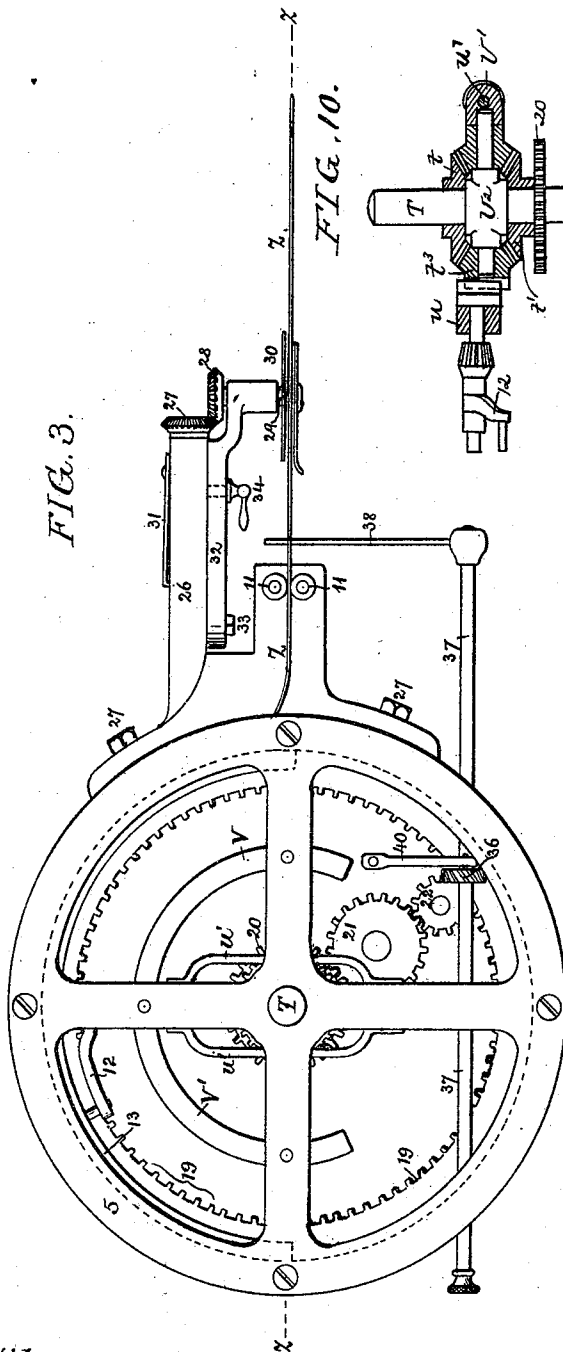
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UNITED STATES PATENT OFFICE.

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

NEEDLE-OPERATING AND REED-DENT-SEPARATING DEVICE FOR MACHINES FOR DRAWING IN WARP-THREADS.

SPECIFICATION forming part of Letters Patent No. 500,964, dated July 4, 1893.

Application filed April 26, 1892. Serial No. 430,786. (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 Needle-Operating and Reed-Dent-Separating Devices for Machines for Drawing in Warp-Threads, of which the following is a specification.

My invention relates mainly to certain improvements in needle operating mechanism for machines for drawing in warp threads of the character set forth in Letters Patent granted to me on the 28th day of December, 1886, No. 355,221.

The main object of the present invention is to improve and simplify the construction of the device, illustrated in said patent, for operating the needle, and further objects being to simplify the operative devices for the reed dent separating disk and the finger for removing the warp threads from the path of the needle, as more fully set forth hereinafter.

In the accompanying drawings:—Figure 1, is a sectional plan view on the line *w—w*, Fig. 2, of a needle case and other mechanism connected therewith constructed in accordance with my invention. Fig. 2, is a sectional elevation of the same on the line *x—x*, Fig. 1. Fig. 3, is a sectional plan view on the line *y—y*, Fig. 2. Fig. 4, is a transverse section on the line *z—z*, Fig. 3; and Figs. 5, 6, 7, 8, 9 and 10 are views of details.

The needle case is mounted in any suitable manner upon the reciprocating carriage *B'*, such for instance as that described in the above mentioned Letters Patent, and any suitable mechanism may be employed to transmit the necessary driving motion from the main driving shaft to the primary shaft 1 of the operating mechanism. The framework and casing comprise a number of sections including a base 2, a base plate 3, a grooved guiding ring 4, and a top plate or ring 5, the portions 3, 4 and 5 being secured together in any suitable manner after the parts have been adjusted in proper relation to each other preferably by bolts 6 and the whole structure being secured to the base 2. Within the base plate 3 is a needle operating ring 7, of the character more clearly shown in Figs. 5 and 7, fitting snugly within the annular flange 8

of the base plate. The periphery of the ring is grooved at 9 and secured in said groove is the end of the flexible metallic needle *Z*. This ring 7 is given a rotary or oscillating movement alternately in opposite directions to project and retract the needle which is contained in the groove, and the flanges 10 on either side of the groove fit snugly against the interior face of the flange 8 of the base plate 3 and form a channel which guides the needle accurately. This ring 7 is held down into its proper position by means of the grooved guiding ring 4, the inner diameter of which is somewhat less than the diameter of the ring 7 and projects over said ring 7 in such manner as to form an upper guide therefor.

The loose end of the needle is guided at the outer end of the casing by antifriction rolls 11, placed on each side of the guiding slot through which the needle passes.

The devices for effecting the projection and retraction of the needle are only described in a general way, as they are substantially the same as illustrated in my above-mentioned Letters Patent to which reference is to be had for details of the construction and operation of this portion of the device.

The ring 7 is secured by a link 12 to a shaft *w*³ projecting from a frame *U* which consists of a block *u* and opposite side bars *u'* pivoted at *u'* to the block *U'* secured to a sleeve *U*² upon the shaft *T*. This sleeve *U*² carries two small studs or shafts, on which are bevel pinions *t*³, *t*³, (Fig. 10) the hub of one of the pinions being slotted as shown in Fig. 9 for the reception of a tongue projecting from a collar *t*⁵ secured to the shaft *w*³ which is journaled in the block *u* of the frame *U*, this connection permitting the swing of the frame *U* to enable the pinion *v* to engage with an endless duplex segmental rack comprising the segmental racks *V V'* secured respectively to the base plate 2 and the top plate 5 and the short semi-circular racks which connect the ends of said rack *V* to the ends of the rack *V'*, a portion of the semi-circular rack being shown in plan in Fig. 1. The shaft *w*³ projects alternately into the guiding grooves 13, 14 formed by the parts 4 and 5 of the casing and by the ring 7. The outer end of the shaft *w*³ has an arm 12, the outer end of which is connected

to a projection 15 on the needle operating ring 7. As the frame U is connected to the needle operating ring 7 the needle carried by said ring will first be projected from the casing to its full extent and then retracted into the casing as will be readily understood on reference to Fig. 1, the stroke being rapid but steady and at a uniform speed with a slight delay at the limit of each stroke.

The ring 7 has its under surface cut away and forms with the upper surface of the base plate 3 a groove 16 within which is guided a projecting flange 17 forming part of a toothed ring 18, which serves as a medium for imparting motion to a reed dent separating disk, such for instance as that described in Letters Patent granted to me on the 24th day of May, 1887, No. 363,689, and to an oscillated finger for removing the thread from the hook of the needle Z, in a manner somewhat similar to that set forth in the first mentioned Letters Patent. The construction of this ring 18 is more clearly shown in Figs. 6 and 7, its inner face forming a circular rack 19 to which a continuous rotative movement is imparted from the primary shaft 1 through a series of gears 20, 21 and 22, the wheels 20 being secured to the shaft 1 and meshing with the idler 21 mounted on a stud projecting from the base plate 3 and the movement of the idler being transmitted to the ring 18 through the pinion 22, also mounted on the stud projecting from the base plate 3.

On the lower face of the ring 18 is cut a series of teeth 23, which project from the main body of the ring and mesh with a pinion 24 (the teeth of which are inclined) and imparting through the pinion an intermittent rotary movement to a shaft 25 carried in the frame 26 which is secured to the main casing by suitable bolts. The outer end of the shaft 25 is provided with a bevel wheel 27 meshing with a bevel pinion 28 carried upon the shaft 29 mounted in a movable portion of the frame 26, the opposite end of the shaft 29 being provided with a reed dent separating disk 30 which may be of the character shown in my above mentioned Letters Patent.

In order that the disk 30 may be stopped at the same point each time I provide a locking device for the shaft 25 comprising a spring plate 31 having one of its ends bent at a right angle and passing through an opening in the frame 26 and engaging with a flattened portion of the shaft 25. The movable portion 32 of the frame 26 which carries the reed dent separator is pivoted at 33 to the main frame 26 and is locked in working position by means of a handled screw 34 projecting from the frame 26 and adapted to a slot 35 in the frame 32. This pivoting of the frame permits the adjustment of the parts when starting to work and also permits the reed disk to be thrown up out of operative position when required.

The upper surface of the ring 18 is provided with two series of teeth 35 forming dia-

metrically opposed racks, which engage alternately with a pinion 36 carried by a shaft 37 projecting through the casing and having on one of its ends a finger 38 projecting into the path of the needle Z and being operated at such times as the needle is entirely retracted and acting to catch the thread last operated upon by the needle and lift it out of the way of said needle. This shaft 37 is held in proper longitudinal position by means of a set screw or pin 38 projecting through the casing into an annular groove 39 in the shaft and the rotative movement of the shaft is stopped at the proper time by the action of the spring 40 carried by the casing and adapted to act upon a pin 41 projecting from the pinion 36.

The construction of the device above described is such that all of the operating parts mentioned are combined in a single structure, simplifying the apparatus and materially reducing the cost of manufacturing the same.

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

1. The combination of the casing comprising a base plate, a grooved guiding ring 4, a grooved ring confined between the guiding ring 4 and the base plate, a flexible needle carried by said grooved ring and an oscillated arm guided by said guiding ring and connected to the grooved ring, substantially as specified.

2. The combination of the needle case, a needle and its operating mechanism contained therein a toothed ring guided in said needle case, mechanism for rotating said toothed ring, a reed dent separating disk, and a rack carried by said toothed ring and operatively connected to said reed dent separating disk, substantially as specified.

3. The combination of the needle casing, a toothed ring guided therein, a rack 23 carried by said toothed ring, a reed dent separating disk, a shaft carrying the same, a shaft 25, bevel gears connecting the shaft of the reed dent separator to the shaft 25, and a pinion carried by said shaft 25 engaging with the rack 23, substantially as specified.

4. The combination of the needle case, a frame 26 secured thereto, a rotated shaft 25 carried by said frame, a reed dent separating disk, a shaft 29 carrying the same, bevel gears connecting said shaft 29 to the shaft 25, and a frame 32 carrying said shaft 29 and pivoted to the frame 26, substantially as specified.

5. The combination of the needle case, a frame 26 secured thereto, a rotated shaft 25 carried by said frame, a reed dent separating disk, a shaft 29 carrying the same, bevel gears connecting said shaft 29 to the shaft 25, and a frame 32 carrying said shaft 29 and pivoted to the frame 26, with mechanism for locking said frame in operative position, substantially as specified.

6. The combination of the needle case, the needle and its operating devices contained

therein a toothed ring guided therein, mechanism for rotating said ring a shaft 37 mounted in said case, a finger 38 carried by said shaft, a pinion 36 mounted on said shaft, and a rack carried by said toothed ring and adapted to engage with said pinion, substantially as specified.

7. The combination of the casing, a toothed ring guided therein, mechanism for rotating said ring, a shaft 37 carried by the casing, a finger secured to said shaft 37, a pinion 36 mounted on said shaft, a rack carried by said

toothed ring, and engaging with said pinion, and a locking device comprising a pin projecting from said pinion and a spring engaging with said pin, 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.