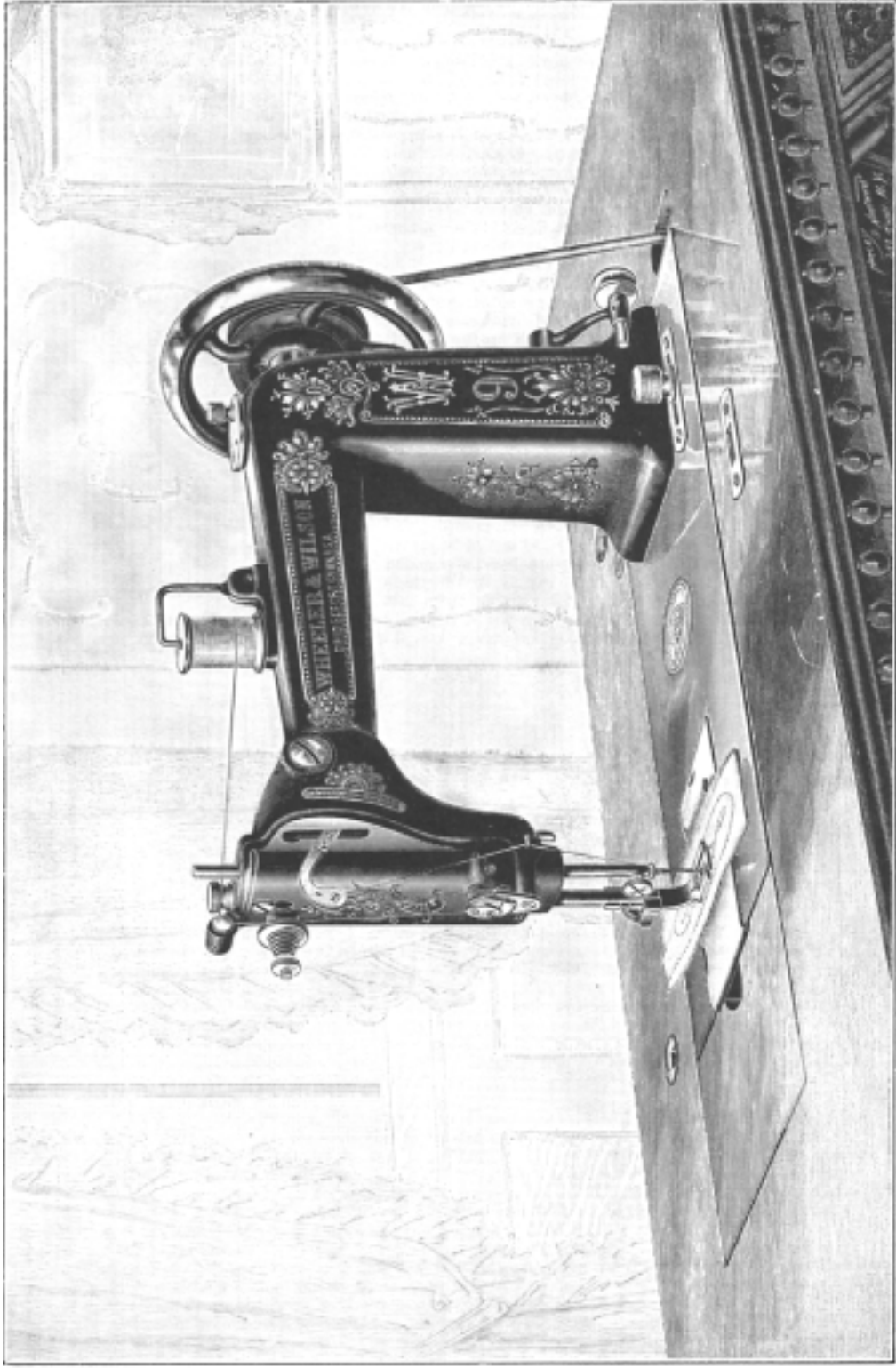


SEWING MACHINES. I. MACHINES FOR DOMESTIC USE.—Lock-stitch Machines. The Wheeler & Wilson Machines.—In the latest forms of machines of this manufacture the principal improvements consist in the extension of the rotary mode of motion to every part of the mechanism which does not require a different movement; in devices for interlocking the threads, and for securing uniform feed and exact tension, and also for producing ornamental stitchings. The newest family machine (No. 9) is represented in Fig. 1. Motion is transmitted from the upper to the lower shaft by a crank and sliding connection; a pin at the lower end of the latter, working in a slotted crank arm, gives the necessary variable motion to the lower revolving shaft, and consequently to the rotating hook, thus affording sufficient time for the take-up to draw up the loop of upper thread between the casting-off of the loop from the hook and the descent of the needle to form the next stitch. Fig. 2 shows the bobbin of under thread in its case, and the tension spring on the latter. The amount of tension may be regulated when necessary by turning the screw, *R*, but when once properly set the tension is substantially automatic, adapting itself to the different sizes of thread. Fig. 3 shows the relations of the bobbin and case to the holder and the



THE WHEELER AND WILSON SEWING-MACHINE.

rotating hook. These parts are brought into proper position by closing the drop, *a*, which is firmly held upright by the catch-spring, *b*. Fig. 4 shows the face-plate of the machine and the passage of the upper thread through the thread check, tension pulley, thread controller, and take-up, which last is provided with a roller to reduce friction on the thread, and to facilitate sewing with threads of poor quality.

In the "variety-stitch machine" the loop-taker (or rotary hook) is set with its axis of rotation at right angles to that of the main lower shaft of the machine; the needle-bar is carried in a swinging gate connected with a segment lever, which is actuated by a cam on

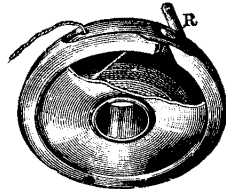


FIG. 2.—Bobbin.

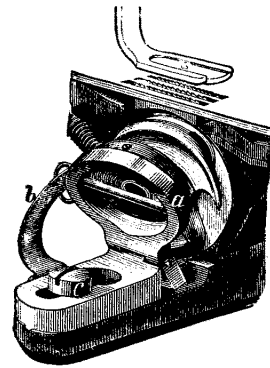


FIG. 3.—Bobbin case.

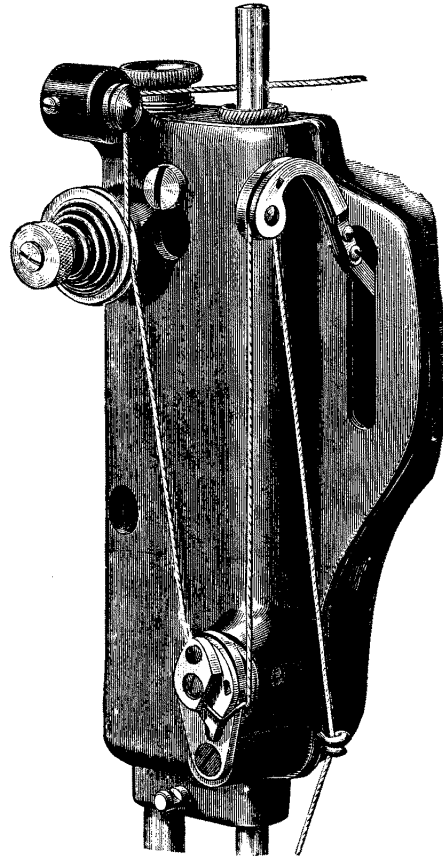


FIG. 4.—Face plate.

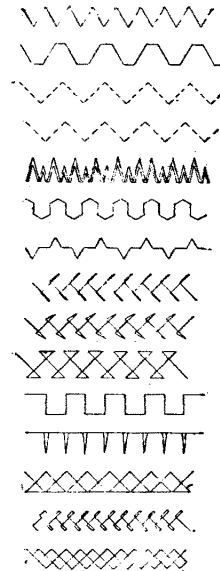


FIG. 5.—Figure stitching.

the upper shaft, and causes the needle to vibrate laterally one or more times, and to a greater or less distance during each revolution of the shaft, and the feed, by special devices, is made to move forward or backward, to the right or left, or to stand still at each stitch, as may be required. The machine may be used with either one or two needles. By combining different numbers and lengths of transverse vibrations of the needle or needles, and different movements of the feed, an almost endless variety of figures may be automatically stitched, a few of which are represented in Fig. 5.

The Domestic Machine, Fig. 6, has an improved feed mechanism. The lever, *A*, imparts horizontal vibrating motion to the feed-bar, and receives its motion through the stirrup, *B*, an eccentric on the shaft and the stitch-regulating mechanism, the lower end of which latter is seen in the form of a groove at *C*. A projection from *B* plays vertically in this channel-way,

which is so pivoted that an arm from it extending up through the bed, and connected with a scale of distances, may be moved in either direction, thus giving any desired throw to the feed, and in either direction. The feed-dog is regulated in height by the nut, *D*. *E* is a thumb-nut to secure the arm wherever located. *F* is a thumb-nut to fasten the stop, which secures uniformity of stitch, whether feeding forward or backward.

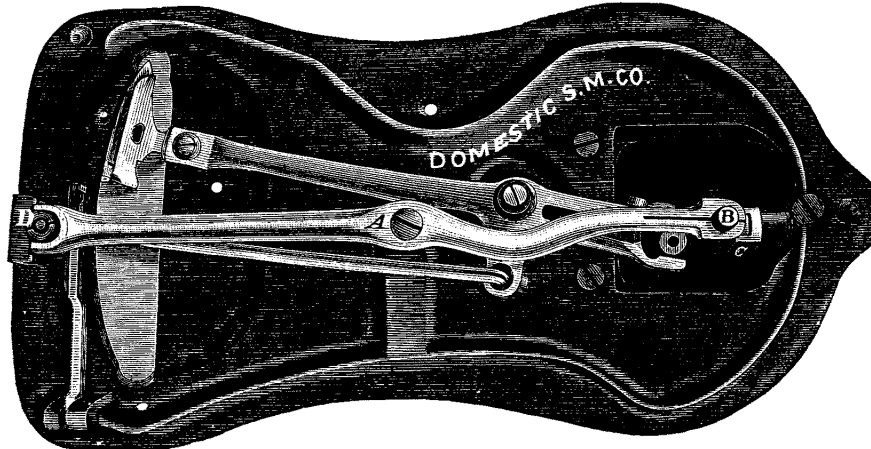


FIG. 6.—“Domestic” machine.

The *Willcox & Gibbs Machine* in its latest form is represented in Fig. 7. As the parts are all named on the engraving, detailed reference is unnecessary. It has novel means for regulating the tension and the pressure on the material, and for altering the length of stitch.

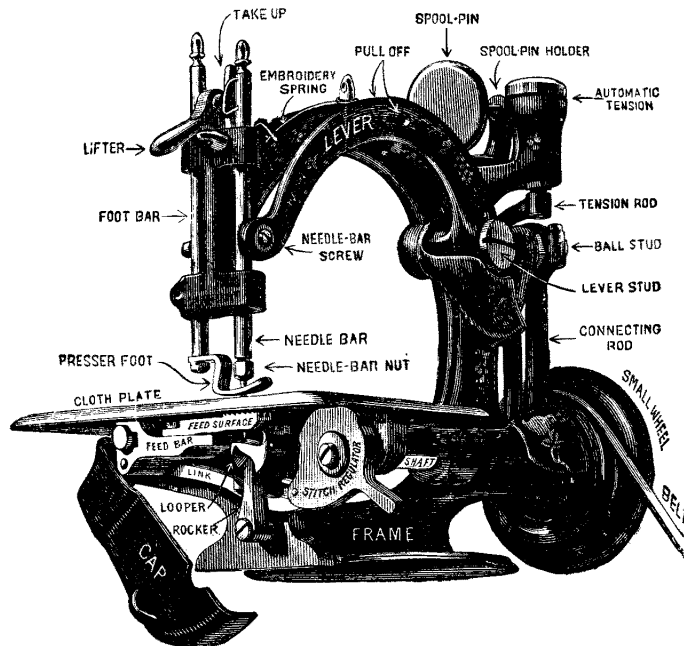


FIG. 7.—Willcox & Gibbs machine.

Combined Lock and Chain-stitch Machines.—A novel machine of this class, illustrated in Fig. 8, is made by the Domestic Sewing Machine Co. A chain stitch looper is substituted for the shuttle, and is attached to the carrier. The second loop is carried around the hook and upon the arm of the looper device, where it is slightly retarded by the tension spring. As it passes off the arm it forms the stitch.

Chain-stitch Machines.—The mechanism of a new machine of this class made by the Singer Co. is shown in Fig. 9. The stitch is formed from a single thread which is inter-

woven into a chain upon the under surface of the goods, and the tension is capable of adjustment so that the thread will be drawn closely to the fabric, forming a tight and flat seam, or left in an elastic chain suitable for knit goods. A beautiful ornamental stitch, resembling braid, is produced by the use of coarse silk or thread.

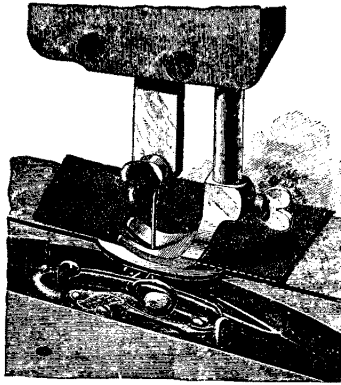


FIG. 8.—Lock and chain stitch machine.

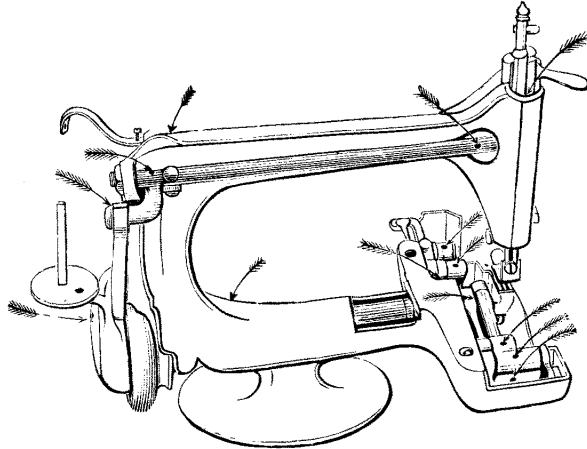


FIG. 9.—Singer chain-stitch machine.

II. MACHINES FOR MANUFACTURING PURPOSES AND HEAVY WORK.—*The Wheeler & Wilson No. 12 Machine*, Fig. 10.—In this machine the moving power is applied to the upper revolving shaft, which communicates a uniform rotary motion to the lower main shaft by means of two connections and double quartering cranks. The loop-taker (which takes the place of the ordinary rotating hook, such as is used in the No. 9 machine) passes through the

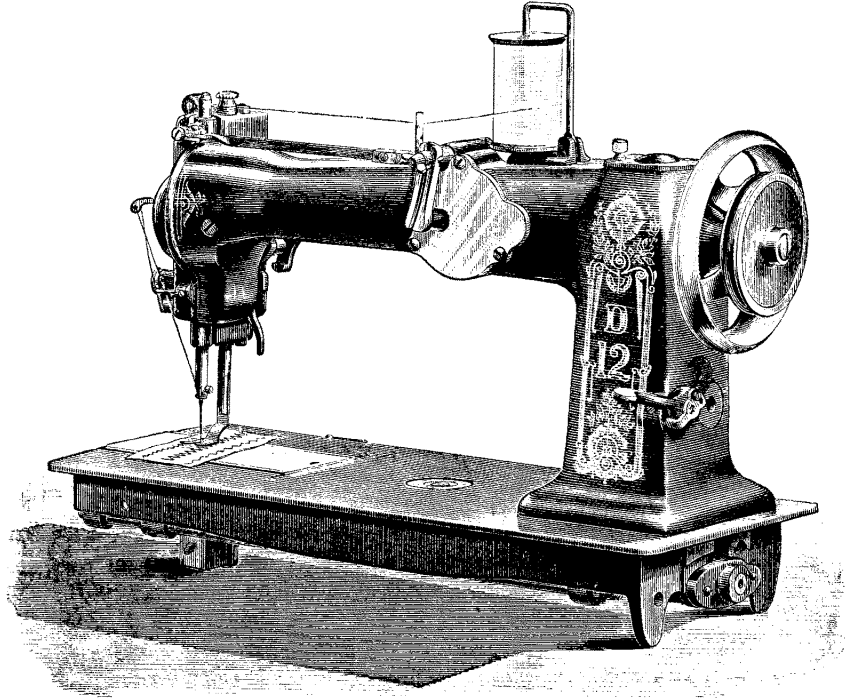


FIG. 10.—Wheeler & Wilson heavy work machine.

loop of upper thread. It moves in a circular guide with a motion alternately accelerated and retarded. It is rotated by means of a driver attached to a short shaft, the axis of which is eccentric to that of the main lower shaft, and which in consequence of the eccentricity receives a variable motion from the motive lower shaft by a link connection, as shown in

the figure. The axis of the driver is also eccentric to that of the loop-taker, so that, by reason of this eccentricity, the necessary openings for the free passage of thread between the

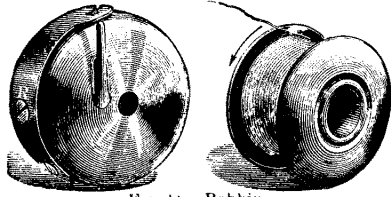


FIG. 11.—Bobbin.

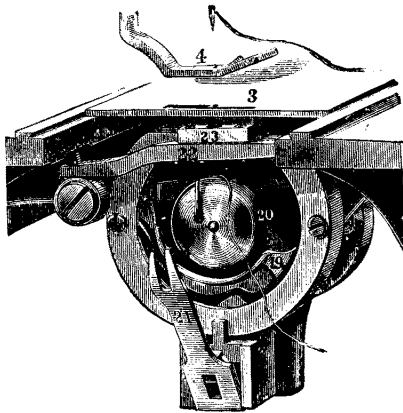


FIG. 12.—Bobbin case.

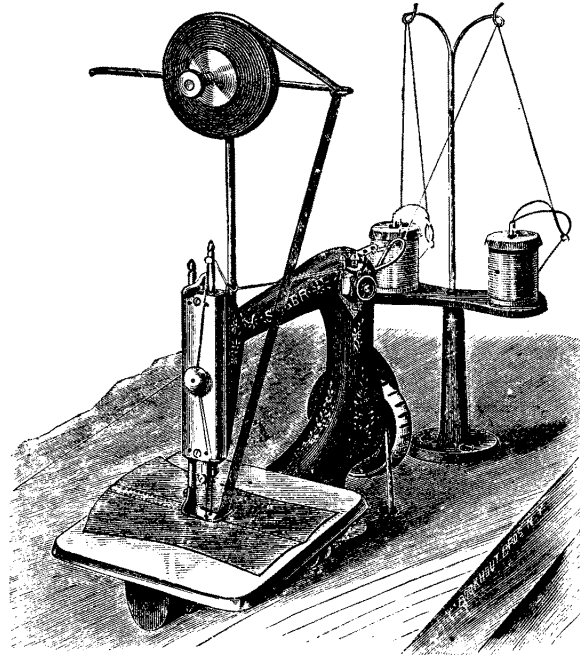


FIG. 13.—Two-needle machine.

driver and the loop-taker are alternately formed at either end of the driver. By this arrangement the loop of upper thread is carried around the bobbin of lower thread without meeting with any resistance. Fig. 11 shows the large bobbin of this machine, and its case, with adjustable tension spring. Fig. 12 shows the bobbin case in the loop-taker, with the bobbin-holder thrown open. The automatic thread controller is actuated by the presser-foot through the medium of the presser-bar, so that the controller gives automatically more or less spread, according to the varying thickness of the goods. This machine is provided with a knee presser-lifter, by means of which the operator can at any time raise and lower the presser-foot by a movement of the knee, leaving both hands free for manipulating the work.

The Willcox & Gibbs Straw-hat Machine makes practically a concealed stitch. It has a claimed capacity of 1,000 hand stitches per minute. It produces all sorts of plaits, from the coarsest "rough-and-ready" to the finest "Florence Milans." This is secured by compensating action between the threader, looper, and presser-foot, whereby the needle automatically adapts itself to the thick-

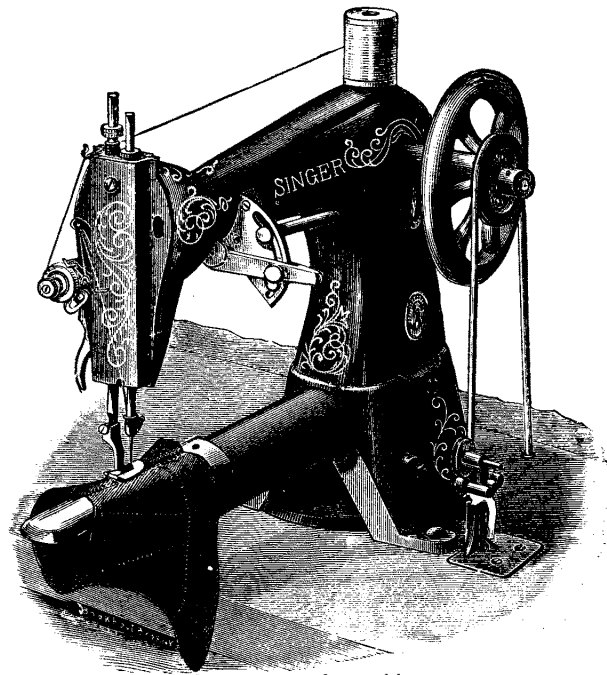


FIG. 14.—Cylinder machine.

ness of the plait operated upon. The double needles operate from below, and carrying the thread upward through the straw, a looper takes the thread from the threader, and passing over, a small double stitch is made on the upper side, almost invisible, and a long triple stitch on the under side. The hat can be shaped while being stitched.

Two-needle Machines.—A machine of this class, Fig. 13, made by the Singer Manufacturing Co., is a development of the regular automatic chain-stitch machine. It has two needles, and their stitch-forming mechanism, the hook being underneath, is so arranged as to pick up both threads. The gauge, or distance, from one needle to the other can be varied by intervals of $\frac{1}{2}$ in. from $\frac{1}{8}$ in. to $\frac{1}{2}$ in., by substituting feeds, throats, and needle clamps suitable for the required width between seams. These machines are used in corset work, for staying shoes, and for all manner of double seams. A reel is provided for carrying tape or staying material. The same result is obtained by having two chain-stitch machines attached to a base, one being adjustable in relation to the other, so that the width between seams can be varied from $2\frac{1}{2}$ to 16 in., and the length of stitch from 8 to 30 to the inch. Another form of two-needle machine, made by the Singer Co., called the "three-stitch zig-zag machine," makes two rows of stitching, and three lateral stitches in each direction before reversing, and can be fitted to make less or more stitches.

The Singer Two-needle, Two-shuttle Sewing Machine.

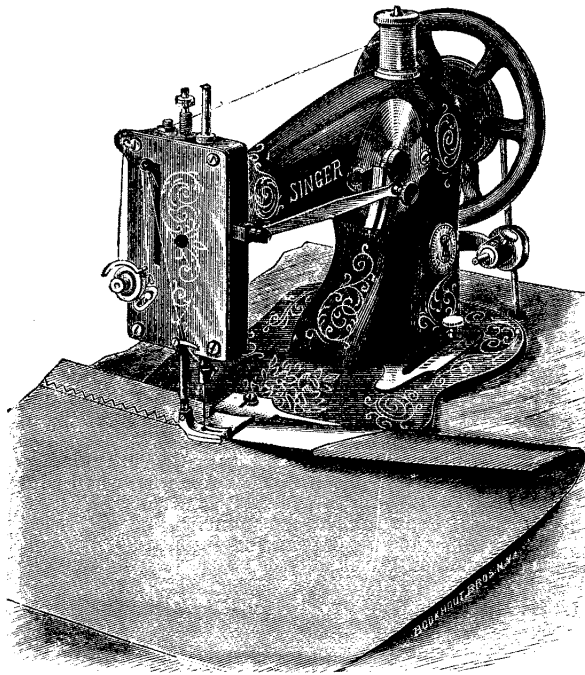


FIG. 15.—Over-seaming machine.

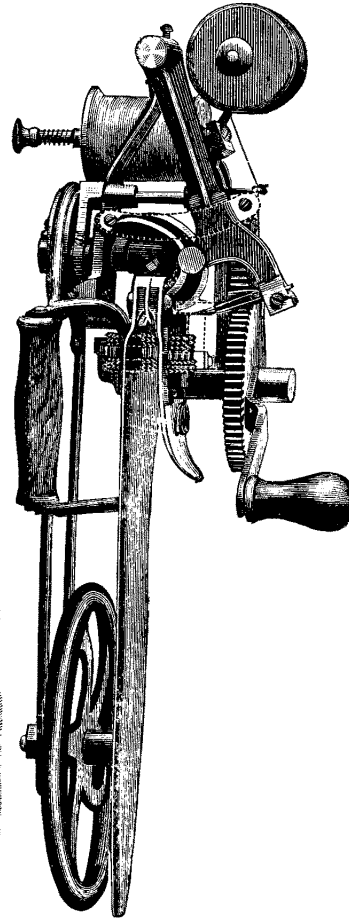


FIG. 16.—Carpet-sewing machine.

—This is a lock-stitch machine, having oscillating shuttle mechanism, and is fitted with two needles set to any desired gauge, with two shuttles (right and left) to correspond, and both actuated by the same shaft. It makes two complete and uniform rows of stitching, and is used in making shirts and corsets, India-rubber clothing, etc.

The Singer Cylinder Machines, Fig. 14, are used for stitching many articles which cannot be stitched upon a flat surface, as elastic gores and back seams in shoes, legs of trousers, and other work in which it is necessary that the thread should pass from and to the inside of a cylindrical or concave surface. They have the oscillating mechanism; are fitted with a reverse stitch regulator, so that the work is fed either up or off the arm, and are made with both wheel and drop feed for feeding around the arm, right or left.

Over-seaming Machines.—A machine of this class, for over-seaming hosiery, knit goods, etc., is manufactured by the Willcox & Gibbs Sewing Machine Co. It has a knife which trims in advance of the needle, which passes alternately through the fabric and over the edge. Two selvage edges can be united in this manner and afterward opened out, leaving a flat seam, without ridge, or two pieces of fabric may be laid flat and their edges joined by the alternate stitches as the needle passes from one to the other. Fig. 15 shows the over-seaming

machine made by the Singer Manufacturing Co. It has oscillating mechanism. On the front of the arm is a slotted lever, worked by a cam within the arm. Hinged to this lever is a pitman connected at the reverse end with a rocking frame, through which the needle-bar operates. The pitman communicates the to-and-fro movement of the lever to the rocking shaft, thus giving the needle-bar the same movement, which may be extended or entirely thrown off by altering the adjusting thumb-screw seen in the cut. This machine is used for sewing cloth, leather, carpet, or knit goods, binding, and especially for overcasting the raw edges, left over after seaming up.

Carpet-sewing Machines.—The machine shown in Fig. 16, and made by the Singer Co., comprises the latest improvements in machines used for this purpose. It is fitted with a saddle device, so that it rides upon the edges of the carpet. The carpet to be sewed is

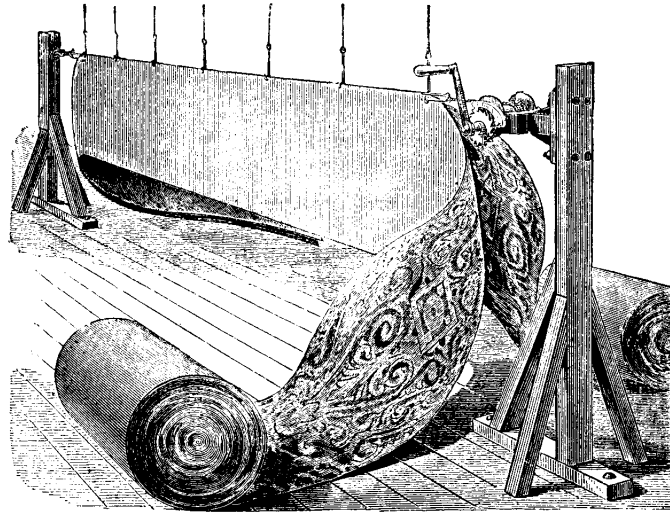


FIG. 17.—Two-needle carpet sewing.

suspended, edge up (Fig. 17), between two clamps attached to upright posts, one of which is stationary, and the other fastened to a windlass, by which the carpet is stretched taut. The saddle is placed on the tightly-drawn edges. With the left hand the operator grasps the handle shown in cut. The machine, as it is operated, feeds itself along the edges of the carpet. The character of the stitch permits the opening of the carpet flat while retaining a complete union of its edges.

The 16-ft. canvas and belting sewing machine, designed by the Singer Co., is probably the largest sewing machine ever built. It has an oscillating shuttle, two needles, and will stitch goods from $\frac{1}{8}$ in. to 1 in. in thickness, and any width to $7\frac{1}{2}$ ft. It is fitted with roller feed, and a guide adjustable for various widths, for making parallel seams.

See also BOOK-BINDING MACHINES and LEATHER-WORKING MACHINES.