(No Model.) 3 Sheets—Sheet 1.

A. LAMBERT.

SEWING MACHINE.

No. 262,437 Patented Aug. 8, 1882.

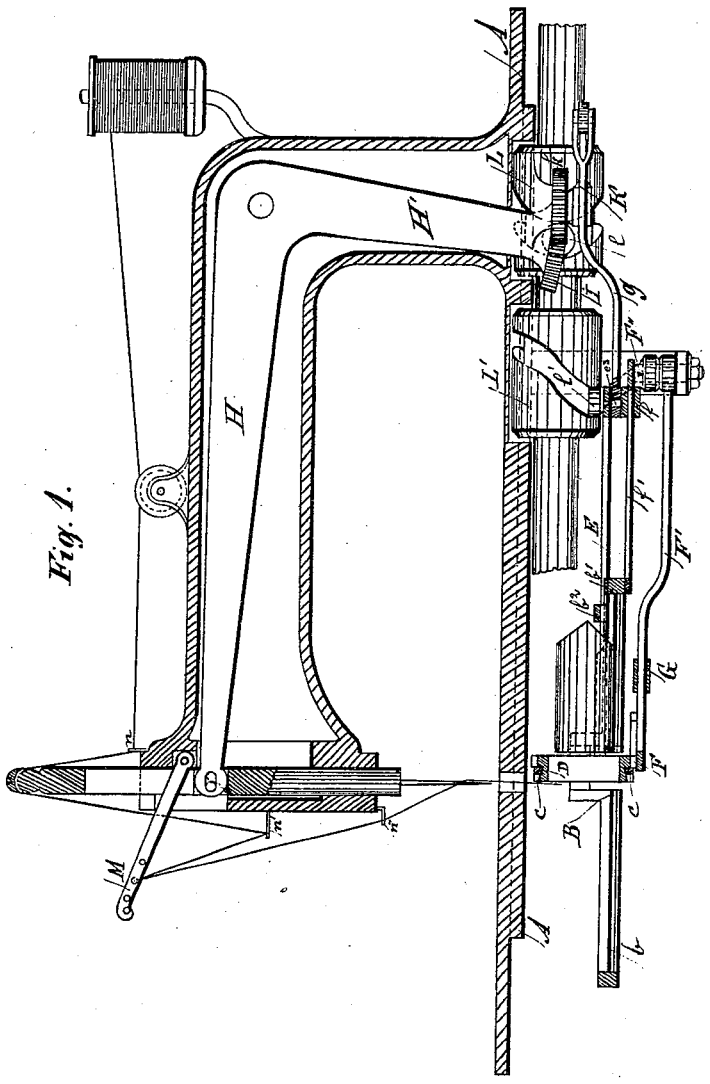

Fig. 1.

Witnesses.
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Fig. 2.

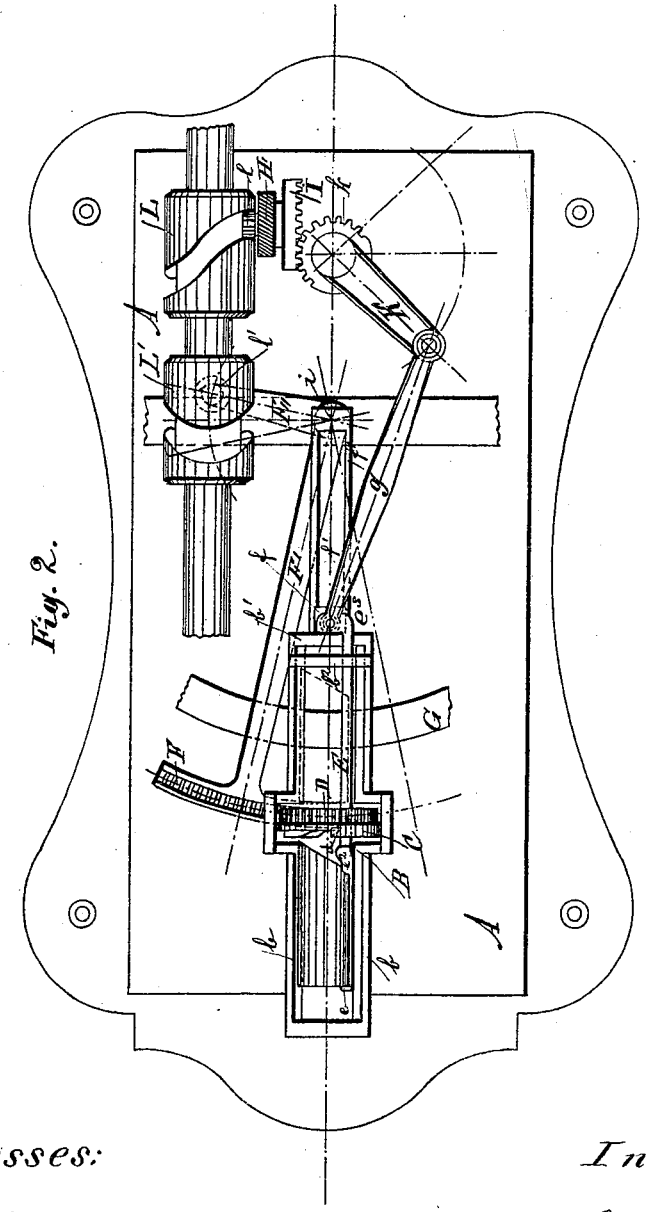

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Fig. 3.

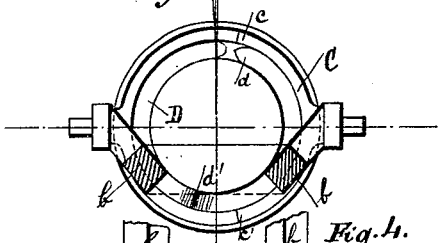


Fig. 4.

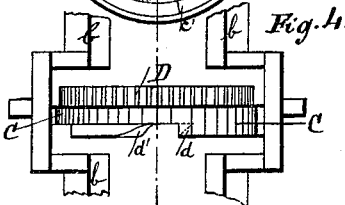


Fig. 5.

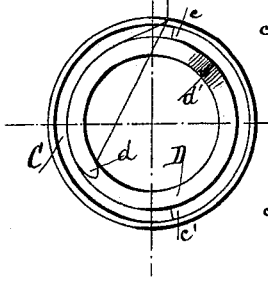


Fig. 6.

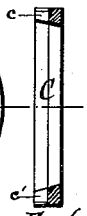


Fig. 7.

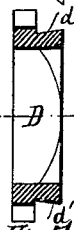


Fig. 8.

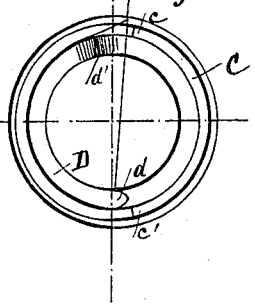


Fig. 9.

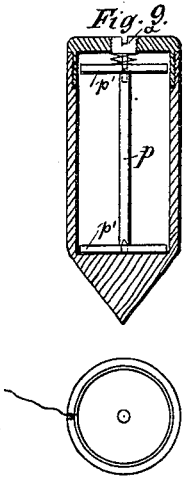


Fig. 10

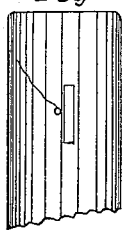
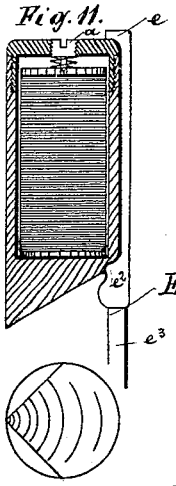


Fig. 11.



Witnesses:
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Edgar Tate

Inventor:
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UNITED STATES PATENT OFFICE.

AUGUSTE LAMBERT, OF FOSSES-NAMUR, BELGIUM.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,437, dated August 8, 1882.

Application filed May 16, 1882. (No model.) Patented in Belgium April 8, 1882, in France April 11, 1882, in England April 12, 1882, and in Italy April 18, 1882.

To all whom it may concern:

Be it known that I, AUGUSTE LAMBERT, residing in Fosses-Namur, Belgium, have invented Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to improvements in sewing-machines; and it consists in the peculiar construction and arrangement of parts, as hereinafter fully described, and pointed out in the claims.

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

Figure 1 is a longitudinal section of a machine containing my improvements, showing the mechanism partly in elevation in the position in which the needle is at the highest part of its movement. Fig. 2 is a plan view in which the mechanism is at the lowest part of the needle movement. Figs. 3, 4, 5, 6, 7, and 8 represent detached parts, on a larger scale, of the mechanism for forming the stitch. Figs. 9, 10, and 11 show the bobbin-carrier or shuttle.

The principal parts of my invention are shown in Figs. 1, 2, 3, 4, 5, 6, 7, and 8, and it is by these parts that the stitch is formed so as to allow of employing large shuttles containing a large quantity of cotton or thread.

A rectangular frame, B, composed of two longitudinal bars, *b*, inclined at a suitable angle, and of two transverse bars of suitable form, by which they are connected, is fixed at a suitable distance below the base-plate A of the machine. At the middle of these longitudinal bars, where they are interrupted, are two other rectangular frames, one projecting laterally beyond the first frame where interrupted and the other having its longitudinal sides parallel with those of the first frame. These latter frames are made of one piece, with longitudinal bars, in which a ring, C, of particular form, is fixed vertically, Figs. 1, 2, 3, 4, 5, 6, and 8. One of the faces of this ring C is straight or smooth, while the opposite face is unequal—that is to say, about half of the ring on one side is thicker in such a manner that the ends of this part form projections *c c'*. The inner circular face of the ring is conical or beveled, so that its diameter is smaller or larger on one side than the other. In this ring and on its inner face is adjusted freely the part which may be termed the "middle" or "hub" of a toothed ring, D, fitted with exactness but so that it can turn freely in the ring C, and whose outer periphery has the same conical shape as the inner face of the ring C, in such a manner that the middle, after having been fixed to the toothed ring D on the side where the latter is fixed against the smooth face of the ring C, forms but one piece with the toothed ring and cannot leave the ring C. The face of the middle piece, which is opposite to that soldered or otherwise fixed to the ring D, is also of unequal surface, and is notched in the following manner: At two points diametrically opposite terminate two helical notches, one of which forms on the face of such middle piece a hook, *d*, and the other forms a rounded or inclined projection, *d'*, the object of which will be presently described.

On one of the sides of the frame B is a guide, E, which receives the shuttle-carrier, which has a reciprocatory or to-and-fro motion imparted to it from the mechanism connected with the main shaft to cause the guide E, with the shuttle, to pass alternately through the ring-shaped looper C, and the rim D adjusted to it in such a manner that the shuttle is at one time on one side of the looper and then passes to the other side. The main shaft is adjusted in bearings at a suitable distance from the plate A.

The shuttle, Figs. 9, 10, and 11, which replaces the shuttle of ordinary machines, is of hollow cylindrical form, and it is closed at one end by a cover screwed or otherwise secured to it, and at the other end it is provided with a cone or taper whose point or apex is at one side of the center of the cylinder, as shown. This shuttle contains the bobbin, the cotton or thread from which is drawn through an opening in the side of the shuttle.

The bobbin, Fig. 9, is composed simply of a thin metal rod, *p*, with a thin disk, *p'*, at each end, and on this bobbin, in the smallest size machine, four hundred and fifty-five meters or five hundred yards of cotton may be wound, so that the shuttle contains an enormous quantity in contrast to the shuttles in use in ordi-

nary machines. The bobbin revolves on two pivots in the interior of the shuttle, one of which is fixed to a screw, *a*, passing through the cover, with a sunken head. This pivot is encircled with a spiral spring, which presses against the bobbin and the screw *a*, the tension of the spring pressing the bobbin up against the opposite end of the shuttle, where the other pivot is fixed, for the purpose of tightening the cotton when it unwinds too freely. This tension of the spring may be adjusted my means of the screw *a*. When the bobbin has been properly adjusted in the shuttle the latter is placed on the front part of the rod E, the end *e* of which is bent at right angles and takes against the cover of the shuttle. (See Figs. 2 and 11.) In the front of the shuttle is a notch or indentation to receive a projection, e^2, from the rod E. The opposite side of the shuttle rests against the longitudinal bar *b* of the frame B. The back portion, e^3, of the rod E is guided in its sliding motion between the transverse bar *b'* of the frame and a transverse bar, b^2, placed on it and at e^3, to which is attached the connecting-rod *g*, which transmits the alternate movement. The rod E is fixed to a slide, *f*, which is guided in a slotted bar, *f'*, Figs. 1 and 2. The connecting-rod *g*, attached at one end at e^3, is connected at the other end to an oscillating lever, K, attached to the base-plate A, and this lever is provided with a segmental wheel, *k*, engaging in the teeth of a rack, I, which is on the lower end of an elbow-lever, H H', by which the needle is operated.

Upon the lower end of the lever H H', but on the opposite side of the rack I, is a roller, *l*, fitted in a return spiral groove, forming a cam in a collar, L, fixed to the main shaft, so that when the latter turns with the collar L the cam causes the roller *l* to move alternately from right to left and from left to right, and thus oscillates the lever H H' and the lever K, for the purposes above described. The rack F, which works the hook *d* by gearing into the toothed ring D, is shaped in the arc of a circle having its center at a point, *i*, whereat the bent lever F' F'' is pivoted to a support suitably fixed to the base-plate A or otherwise.

The lever F' F'' may be composed of two parts, as shown in Figs. 1 and 2. The arm F' is fixed to the middle of the rack F, and the arm F'' has a roller, *l'*, on its end engaging with a return spiral groove on a collar, L', similar to that on the collar L. The collar L' also revolves with the main shaft, and is fixed on it in such a manner that the groove gives an oscillating motion to the lever F' F'' and an alternate movement to the rack F, which moves the hook *d* at the required moment. The arm F' is guided in a slide, G, suitably fixed to the base-plate A or otherwise.

The following is a description of the formation of the stitch: When the needle has reached the end of its descent the mechanism is in the position shown in Fig. 2. The rack F has placed the hook *d* of the toothed rim D just beneath the projection *c* of the ring-shaped looper C, as in Fig. 3. The shuttle is in the front part of the frame B, on the same side as the hook *d*, Fig. 2. The needle, which is at the side of the hook *d* and the ring-shaped looper C, has a sudden ascending movement at this moment, (transmitted to it by the action of the cam or groove on the collar L,) and the upper thread forms a loop, as in ordinary machines. The rack F then causes the hook *d* to turn or advance, taking up the loop of thread, and, carrying a part of it upon the middle of the ring D, passes the narrow part of the ring-looper C in front of the ring D in such a manner that the loop now forms an arc of a circle, growing larger and larger as the hook advances, as shown in Figs. 5 and 8. Just before the hook arrives in the position shown in Fig. 8 the shuttle, with the lower thread, has commenced to open the opening or loop of the upper thread, and the rounded projection *d'* has passed below the thread and pushes the circular part of the upper thread off the looper (and consequently out of the path of the hook) by means of its inclined portion. The thread, now being free, slips between the parts *e* e^2 of the rod E and the shuttle, where there is sufficient space for the purpose. The shuttle then advances, setting free the upper thread, and takes up the position on the other side of the ring-looper, as shown in Fig. 2 in dotted lines, and the stitch is thus formed. The needle rises or has commenced to rise and tightens the stitch by means of the take-up lever M acting in the following manner: Just above the point where the lever H is attached to the needle-carrier the latter has a rectangular longitudinal slot, as likewise has the front part of the slide in which the needle-carrier is guided. Through these two openings which coincide when the whole is adjusted, the take-up lever M passes, being pivoted in the back part of the slide, Fig. 1, in such manner that when the needle-carrier ascends or descends it slides on the lever M at the required moment, the lower end of the slot in the needle-carrier touches the lever M in rising and raises the latter, carrying the thread with it, thus tightening the stitch. The shuttle returns, the needle descends, and the movement is repeated.

In Fig. 1, which shows the mechanism in the opposite position to that of Fig. 2, will be seen how the upper thread is placed and threaded. From the bobbin it passes to any desired tension arrangement, from where it passes through a hole or loop, *n*, to the upper end of the needle-carrier, from thence to loop *n'*, thence through the take-up lever to loop *n''*, and thence to the needle. It will thus be seen that it is not the shuttle which opens the loop formed by the upper thread, that it may pass through it, but that it is the hook *d* which prepares the opening for the passage of the shuttle, so that shuttles of any size may be employed.

Any kind of suitable mechanism may be

worked by the main shaft or otherwise for advancing the work of the machine. The fabric-presser and other appliances may also be made and worked as on an ordinary machine.

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

1. The combination, with the circular ring C, having its inner face conical and provided with the projections c c', of the toothed ring D, fitted and adapted to turn freely in ring C, and provided with the hook d and the inclined projection d', substantially as and for the purpose set forth.

2. The combination, with the toothed looper C D, constructed as described, the frame B, and the drive-shaft provided with the grooved cam L′, of the bent lever F′ F″, provided with rack F on its outer end and with the roller l' on its inner end, substantially as and for the purpose set forth.

3. The combination, with the drive-shaft provided with the grooved cam L, the frame B, and the shuttle, of the rod E, provided with the hook e and projection e^2, the slide f, the slotted bar f', connecting-rod g, lever K, segment k, and elbow-lever H H′, provided with the rack I, substantially as and for the purpose set forth.

4. The combination, with the drive-shaft provided with the grooved cams L L′, the toothed looper C D, and the shuttle, of the bent lever F′ F″, having rack F at its outer end, the rod E, slotted bar f', connecting-rod g, lever K, segment k, rack I, and elbow-lever H H′, substantially as and for the purpose set forth.

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

AUGUSTE LAMBERT.

Witnesses:

AUG. FORISSUS,

FRANÇOIS DEBRUYN.