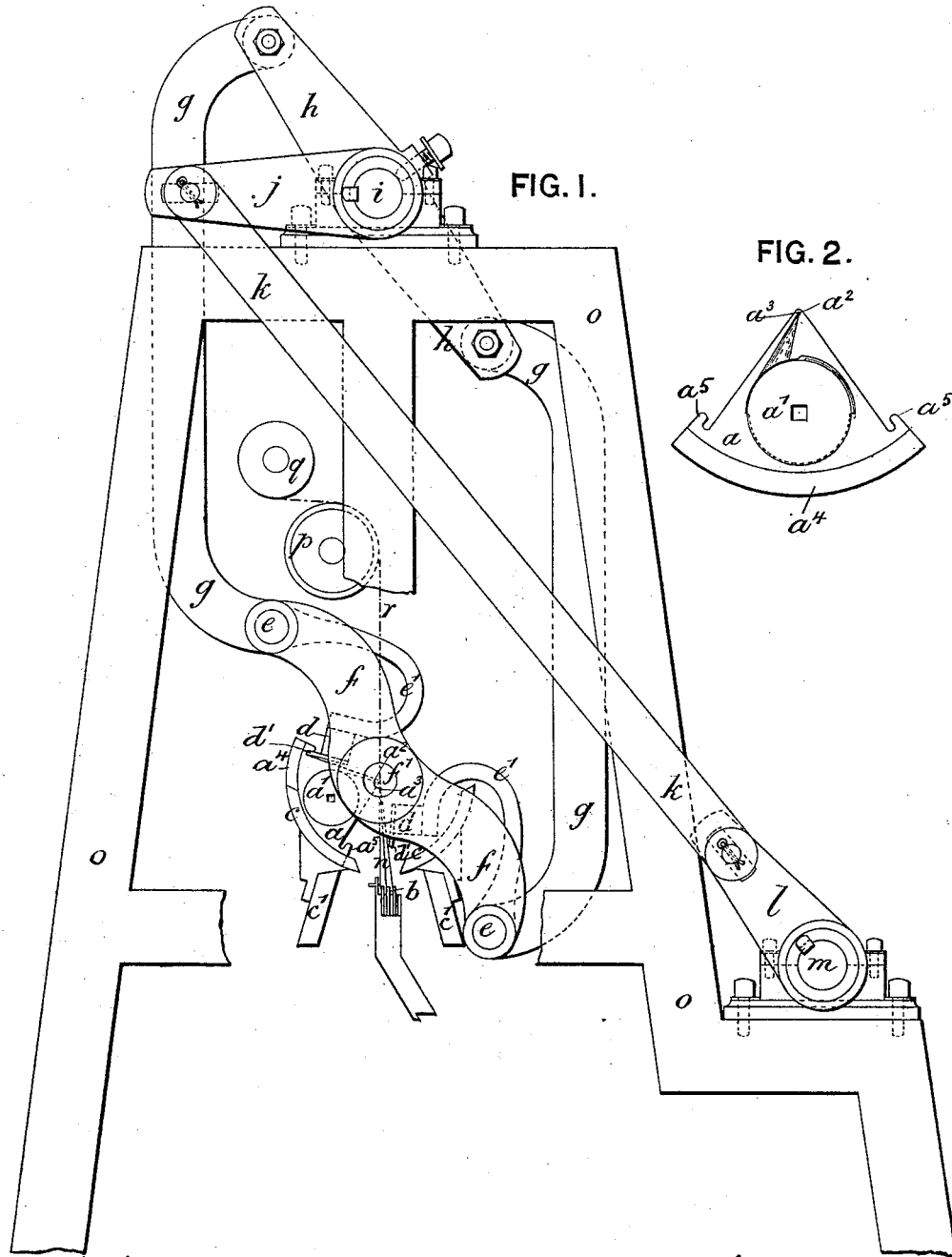


(No Model.)

H. REDGATE.
TWIST LACE MACHINE.

No. 435,321.

Patented Aug. 26, 1890.



Attest:
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UNITED STATES PATENT OFFICE.

HERBERT REDGATE, OF NOTTINGHAM, ENGLAND.

TWIST-LACE MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,321, dated August 26, 1890.

Application filed October 12, 1889. Serial No. 326,797. (No model.)

To all whom it may concern:

Be it known that I, HERBERT REDGATE, lace-manufacturer, a subject of the Queen of Great Britain, residing at 134^a Queen's Walk, in the town and county of Nottingham, England, have invented certain new and useful Improvements in Twist-Lace Machines, of which the following is a specification.

The object of my invention is to make twist-lace upon the tops of the carriages instead of on the points ordinarily employed, the carriage being so shaped and formed as to beat up the threads which the point-bars now do in levers and curtain-twist-lace machines.

In carrying my invention into effect I dispense with the points and the point-leads, point-bars, cams, levers, springs, and toothed gearing used for working the same, and I employ in lieu thereof a newly-shaped carriage, to which the necessary motions are imparted to make the twist-lace upon their tops by the usual method of moving the warp with guide-bars, jacks, stump-bars, steel bars, and jacquard.

My invention is represented in the accompanying drawings, in which—

Figure 1 is an end elevation of parts of a twist-lace machine with my improvements applied thereto, and Fig. 2 is a face view of one of the carriages separate.

My new-shaped carriage *a* is in the form of a triangle, the bottom part being in the form of a segment *a*¹ of a circle extending about a quarter of a circle or thereabout. It is provided with a bobbin *a*¹, as usual, and the upper part of the carriage is brought to a point *a*², which is at the center of motion of the carriage, and on which the fabric is formed by the aid of guide-bars *b* and other parts, operated in the same way as in machines hitherto in use, a guide-hole *a*³ being formed at the point *a*² for the passage there-through of the thread from the bobbin *a*¹. The carriages *a* move backward and forward between combs *c*, which form the segments of a circle, and this movement of the carriages *a* is obtained by means of catch-bars *d*, having catches *d*¹ and carried by arms *e*¹, fixed to round bars *e*, which at their ends are carried by double-ended levers *f*, whose centers of motion *f*¹ are coincident with the center

of motion or points of the carriages. The bars *e*, carrying the catch-bars *d*, are connected by links or connecting-rods *g* with double-ended levers *h*, mounted upon the top center shaft *i*, and this shaft has fixed on the end thereof a lever *j*, which by a rod *k* is connected to a crank *l* upon the front revolving shaft *m*, which is the prime mover.

The catch-bars *d* are similar to those now in use; but the operating devices above described, and which form part of the new construction, are different. The catch-bars *d* by falling into the ribs *a*⁵ of the carriages *a* and by the motion given to them pull the carriages *a* to either one or the other extremity of the comb-segments *c*. When in that position, the threads *n* in the guide-bars *b* are moved, as required, to the right or to the left. These movements of the threads *n* and the combined transverse backward and forward movement of the carriages *a* and their bobbins *a*¹ form the fabric or twist-lace on the tops of the carriages *a*.

*c*¹ *c*¹ are the comb-bars, and *s* is part of the end framing of the machine.

The object gained by forming the carriage with nibs *a*⁵, and operating them by catch-bars in contradistinction to the method of drawing them by means of pushers, as described in English Patent No. 2,630 of 1854, is as follows: By means of the nibs and catch-bars the carriages can be moved to and fro and yet leave a clear space in the center of the machine for the free movement of the guide-bar threads, as the catch-bar on one side is not then in contact with the carriages, while when operating the carriages by pushers the latter remain in contact with the carriages when the guide-bar threads are being moved, and consequently interfere with the free motion of such threads.

In carrying my invention into effect I also dispense with the facing-bar; but I use a porcupine-roller *p* and a work-roller *q* in the position shown in the drawings, a portion of the periphery of the porcupine-roller *p* being vertically over the point where the work is made, or, in other words, over the center of motion of the carriages. The fabric *r*, after traversing a portion of the circumference of the porcupine-roller *p*, passes to the work-roller *q*, onto which it is wound in the ordinary man-

ner. Motion is communicated to the rollers *p* and *q* by the well-known means.

Having fully described my invention, what I desire to claim, and secure by Letters Patent, is—

1. A triangular carriage constructed with a segment a^4 at the base, with nibs a^5 at the ends of the segment, with a point a^2 at the center of motion of the carriage and on the top of which the fabric is formed, and with a thread-guide hole in the extremity of the point and provided with a bobbin a' , substantially as described.

2. The combination of a triangular carriage constructed with a segment a^4 at the base, with nibs a^5 at the ends of the segment, with a point a^2 at the center of motion of the carriage and on the top of which the fabric is formed, and with a thread-guide hole in the extremity of the point and provided with a bobbin a' , guide-bars, catch-bars, and mech-

anism for operating the latter, substantially as described.

3. A carriage-shifting device consisting of the bars d , having each a catch d' , arms e' , shafts e , carrying said arms, levers f , links g , levers h , shaft i , arm j , and means for actuating the latter arm, substantially as described and shown.

4. The combination of the bobbin-carriage a , segmental combs c therefor, and the catch-bars d , arms e' , shafts e , carrying said arms, levers f , links g , levers h , shaft i , arm j , and means for actuating the latter arm, substantially as described and shown.

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