No. 689,112. Patented Dec. 17, 1901.

A. J. A. OESTERREICH.

HEMSTITCH SEWING MACHINE.

(Application filed Apr. 22, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 2.

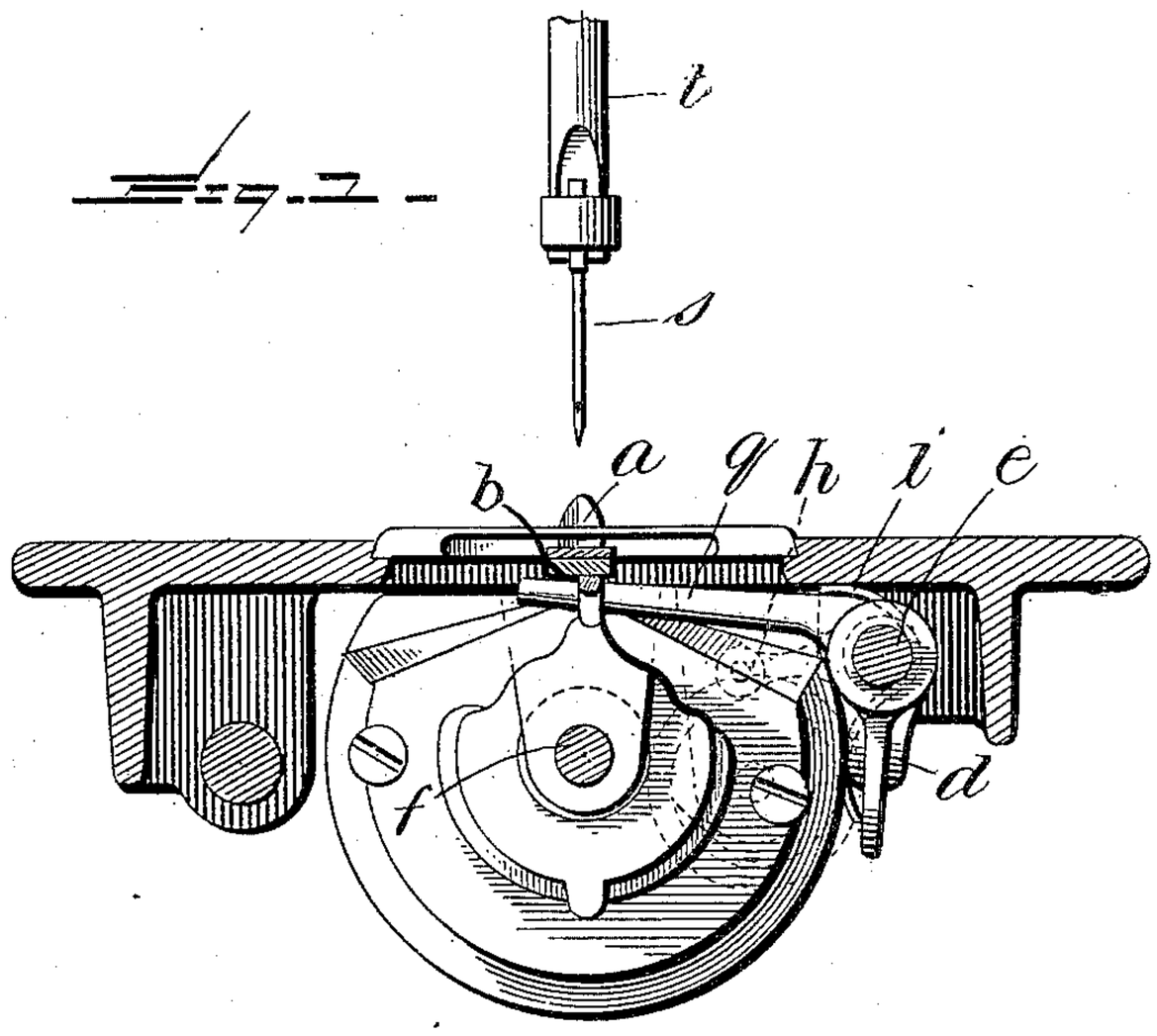
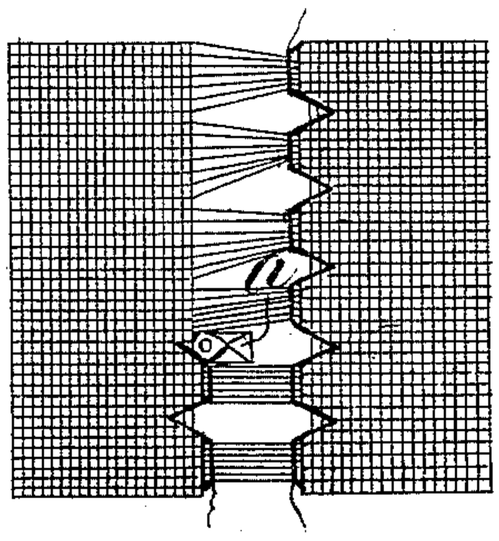


Fig. 3.

Fig. 4.



WITNESSES:
Wm. F. Doyle.
C. M. Sweeney.

BY

INVENTOR:
A. J. A. Oesterreich
Henry Calvert
Attorney.

No. 689,112. Patented Dec. 17, 1901.

A. J. A. OESTERREICH.

HEMSTITCH SEWING MACHINE.

(Application filed Apr. 22, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

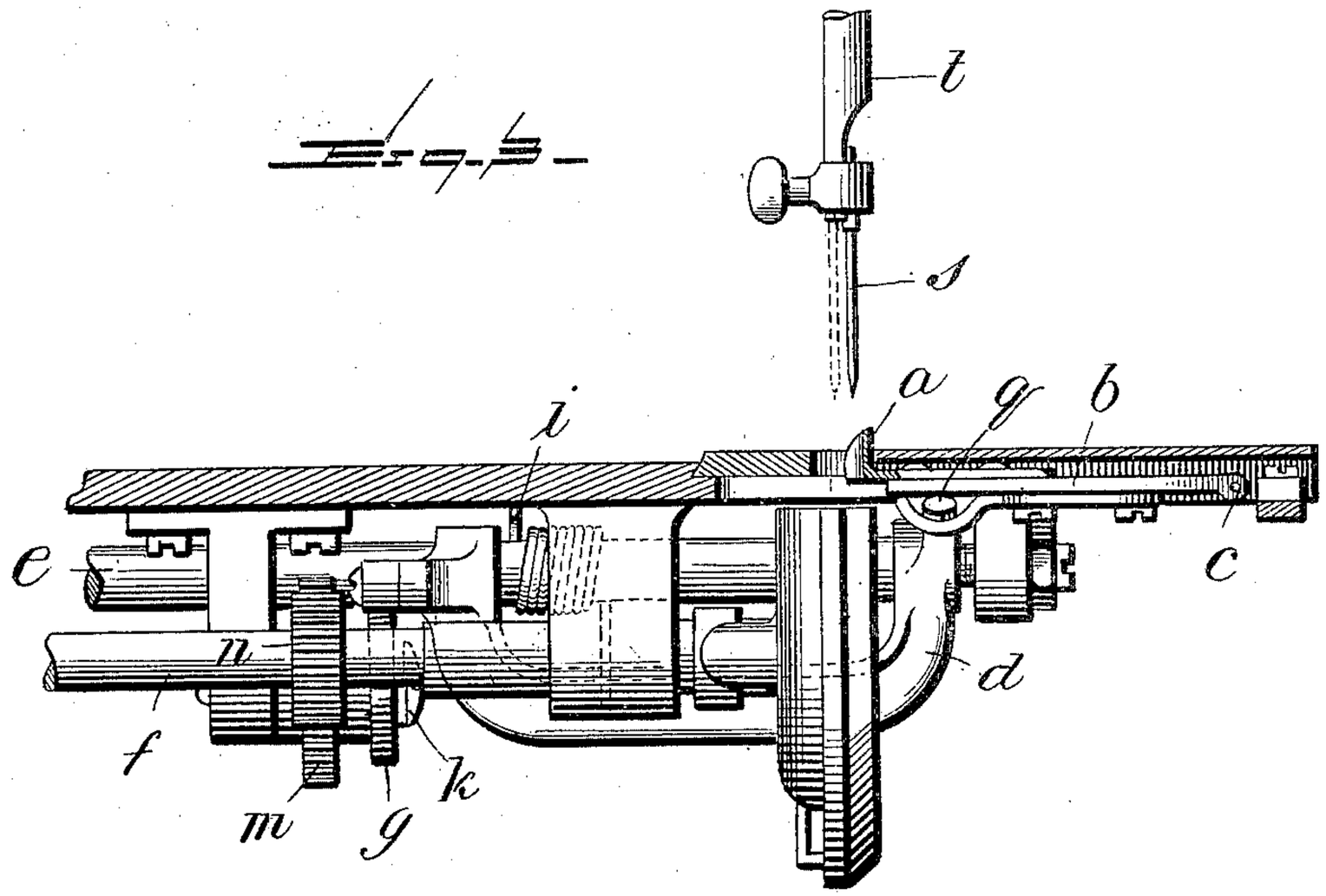


Fig. 6.

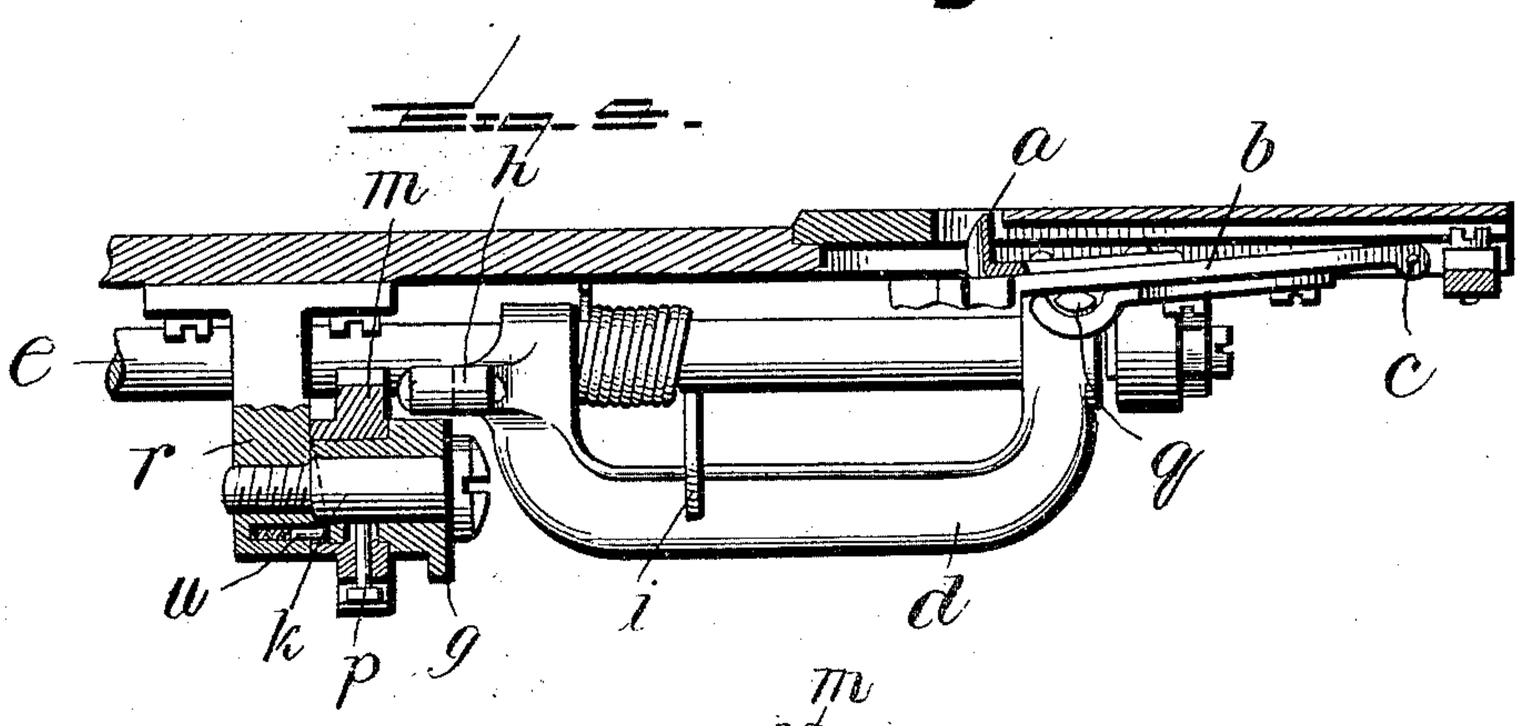
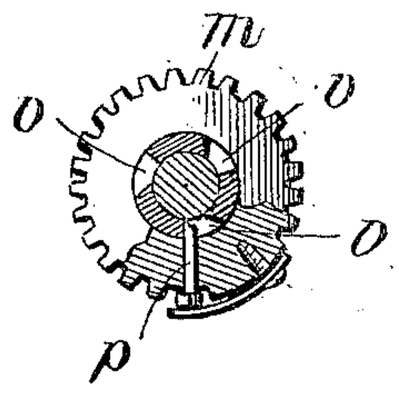


Fig. 5.



WITNESSES:
Wm. F. Doyle.
C. M. Sweeney.

INVENTOR:
A. J. A. Oesterreich
BY Henry Calvert,
Attorney.

UNITED STATES PATENT OFFICE.

AMANDUS JOHANN AUGUST OESTERREICH, OF HAMBURG, GERMANY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

HEMSTITCH SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 689,112, dated December 17, 1901.

Application filed April 22, 1901. Serial No. 56,861. (No model.)

To all whom it may concern:

Be it known that I, AMANDUS JOHANN AUGUST OESTERREICH, a subject of the German Emperor, residing at Hamburg, Germany, have invented certain new and useful Improvements in Hemstitch Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in the form of hemstitching mechanism shown by United States Patent No. 537,846, dated April 23, 1895, and in which a vertically-reciprocating thread-dividing prong or spur arranged beneath the work-plate of the machine is employed, and which prong or spur is lifted at intervals for the purpose of separating the threads of the fabric to be hemstitched into groups to be tied together by the sewing-threads. In the machine shown by the patent referred to the mechanism for actuating the thread-dividing prong or spur is so constructed and timed as to lift the said prong or spur just before each descent of the needle, the said prong or spur being lowered out of engagement with the work each time the needle rises. As each hemstitch-pattern comprises several stitches (usually three) formed during several descents of the needle, the said thread-dividing prong or spur in the machine referred to will be introduced several times into the same open space between two groups of threads, thereby endangering entangling or crossing of threads between adjacent groups. In the machine constructed according to the present invention, however, the thread-dividing prong or spur when lifted to form an open space between groups of threads will be held in its raised position until the three stitches completing the hemstitch-pattern have been formed, when it will be lowered to permit the work to be fed for the formation of the next group of stitches, and by thus being retained in its raised position during the formation of the hemstitch-pattern it will hold the threads of the fabric properly separated with certainty, so that entangling or crossing of threads of the separated groups will be avoided.

In the accompanying drawings, Figures 1 and 2 are cross-sections of the lower part of a sewing-machine embodying the present invention, the parts being in different positions in the two views and the shuttle-race shown in Fig. 1 being omitted from Fig. 2 to show the mechanism behind it. Figs. 3 and 4 are longitudinal sectional elevations of the forward part of the lower portion of a sewing-machine embodying the invention, some of the parts shown in Fig. 3 being omitted from or being shown in section in Fig. 4 for clearness of illustration and the thread-dividing prong or spur being represented in different positions in the two views. Fig. 5 is a detail view illustrating the mechanism employed for imparting an intermittent rotary movement to the prong-lifting cam-wheel. Fig. 6 is a diagrammatic plan view illustrating the operation of the invention.

Referring to the drawings, *a* denotes the vertically-reciprocating thread-dividing spur or prong, which is provided with a shank mounted on an arm or lever *b*, pivoted at *c* to a suitable support beneath the work-plate of the machine. The said thread-dividing prong or spur *a* has its point adjacent to the line of descent of the needle *s*, carried by the needle-bar *t*, and said prong or spur is notched or recessed for the reception of said needle, and the said needle-bar will have the usual vertical and horizontal reciprocating movements imparted to it, as is common in hemstitch sewing-machines. Pivotally supported by the shaft *e* beneath the work-plate of the machine is a rocker *d*, having an arm *q*, which engages the arm or lever *b* to impart vertical movements to the prong or spur carried by said arm or lever *b*, the said rocker *d* having a second arm *h* pressed against an intermittingly-rotating cam-wheel *g* by a spring *i*, engaging the said rocker and connected with the work-plate or any suitable fixed part of the machine. The cam *g* rotates on a stud *k*, supported by a lug or hanger *r*, depending from the work-plate.

Mounted to rotate loosely on the hub of the cam *g* is a gear-wheel *m*, meshing with a smaller gear-wheel *n* on the oscillating shut-

tle-operating shaft *f*. The hub of the gear-wheel *g* is provided with three openings *o*, each having a radial and a tangential or inclined face, and mounted on the gear-wheel *m* is a spring-pressed pin *p*, one end of which is beveled off at its inner end, so that it will ride up the inclined or tangential walls of the openings *o* when the gear-wheel *m* is moved in one direction, so that said pin can be moved out of and away from one of said openings *o* to another when the gear-wheel *m* rocks in one direction, and when it snaps into a new opening it will engage the radial face of said opening when said gear-wheel *m* rocks in the other direction to impart a partial rotation to the cam *g*. To prevent backward rotation of the cam *g*, the hub of said cam is provided with a face-ratchet engaged by a spring-pressed detent-pin *u*, mounted in the hanger *r*.

The operation of the mechanism above described is as follows: When the machine is running, the oscillating gear-wheel *n*, secured to the shaft *f*, will impart an oscillating movement to the gear-wheel *m*, which in turn, through the pawl-and-ratchet device, consisting of the spring-pressed pin *p* and the notches or openings *o* in the hub of the cam *g*, will impart an intermittent rotary movement to the said cam. The said cam *g* is cut away at one portion only of its periphery, so that during the time the greater portion of the said cam is passing the arm *k* of the rocker *d* the thread-dividing prong or spur *a* will be retained in the raised position shown in Figs. 1 and 3 and to which position it is lifted just before the descent of the needle to form the first stitch of a hemstitch-pattern; but when the cut-away portion of the said cam is passing the said arm *k* the spring *i* will move the rocker *d*, so as to lower the said thread-dividing prong or spur beneath the work-plate to the position shown in Figs. 2 and 4, the said prong or spur being thus lowered during the time when the work is being fed or advanced for the next group of stitches. Thus when the full portion of the cam *g* engages the arm *h* of the rocker *d* the thread-dividing prong or spur *a* will be lifted to separate the threads of the fabric being hemstitched and will be retained in this lifted position until the hemstitched pattern, comprising first a stitch in the open-work portion of the fabric, then a stitch in the body of the fabric, and finally a second stitch in the open-work portion of the fabric, has been completed, when the said prong or spur will be lowered to enable the work to be fed for the next succeeding group of stitches. Owing to the fact that the said prong or spur is only raised and lowered once during the formation of each hemstitch-pattern, entangling or crossing of the threads of the separated groups of threads will be entirely avoided.

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

1. In a hemstitch sewing-machine, the combination with a thread-dividing prong or spur arranged beneath the work-plate of the machine and having its point adjacent to the line of descent of the needle, of mechanism arranged below the work-plate, and independent of the feeding mechanism of the machine and constructed and timed to lift said prong or spur just before a descent of the needle and hold it in its raised position during the formation of the several stitches of a hemstitch-pattern.

2. In a hemstitch sewing-machine, the combination with a thread-dividing prong or spur arranged beneath the work-plate of the machine, of an intermittingly-rotating cam constructed to lift the said prong or spur and to hold it in a raised position during the greater part of the rotation of the said cam, and connections between the said cam and the said prong or spur, whereby the latter is operated, as described.

3. In a hemstitch sewing-machine, the combination with a vertically-movable thread-dividing prong or spur *a*, of the oscillating gear-wheels *m* and *n*, the rotary cam *g*, a pawl-and-ratchet mechanism connecting said wheel *m* with said cam *g* to impart an intermittent rotary movement to said cam, a rocker *d* having arms *h* and *q*, the spring *i* coöperating with said rocker, and the pivoted arm or lever *b* carrying said prong or spur.

4. In a hemstitch sewing-machine, the combination with the vertically-movable thread-dividing prong or spur *a*, of the oscillating gear-wheels *m* and *n*, the rotary cam *g* having a hub provided with openings or notches and on which hub the said gear-wheel *m* is loosely mounted, the spring-pressed pin *p* carried by said gear-wheel *m* and arranged to engage said openings in said hub, a spring-pressed detent for preventing backward movement of said cam, the rocker *d* having arms *h* and *q*, the spring *i* coöperating with said rocker, and the pivoted arm or lever *b* carrying said prong or spur.

In testimony whereof I have affixed my signature in presence of two witnesses.

AMANDUS JOHANN AUGUST OESTERREICH.

Witnesses:

E. H. L. MUMMENHOFF,

OTTO W. HELLMRICH.