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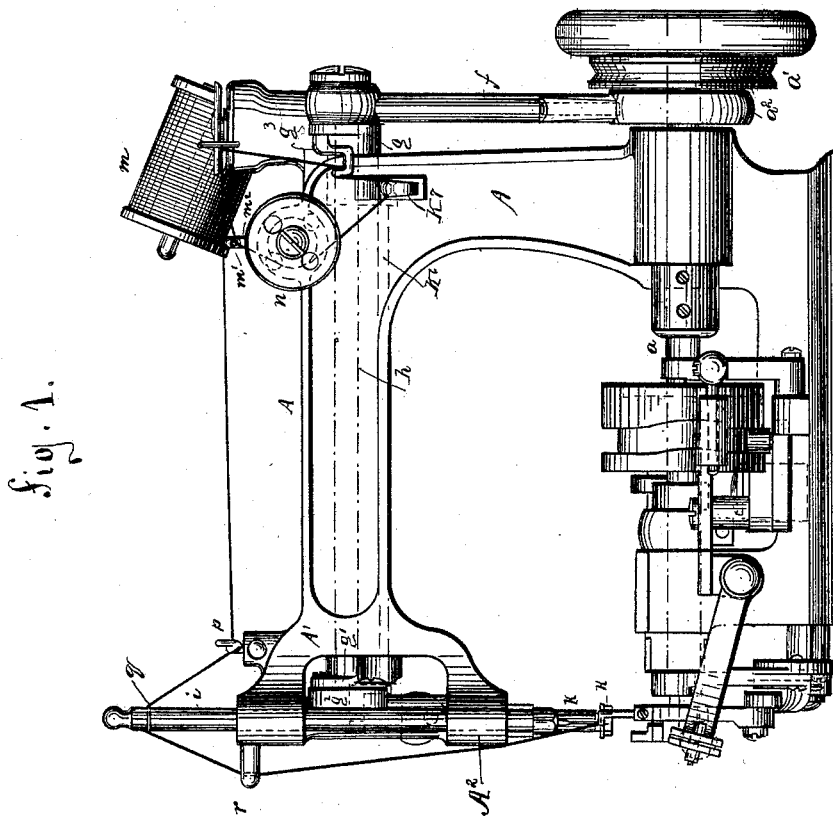
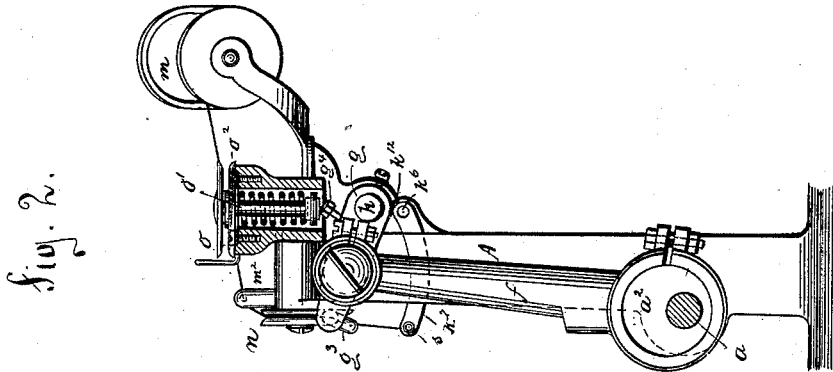
2 Sheets—Sheet 1.

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THREAD TENSION MECHANISM FOR SEWING MACHINES.

No. 422,691.

Patented Mar. 4, 1890.



WITNESSES:

Henry Huber.
Carl Kump

INVENTOR

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Julius Angermann
BY
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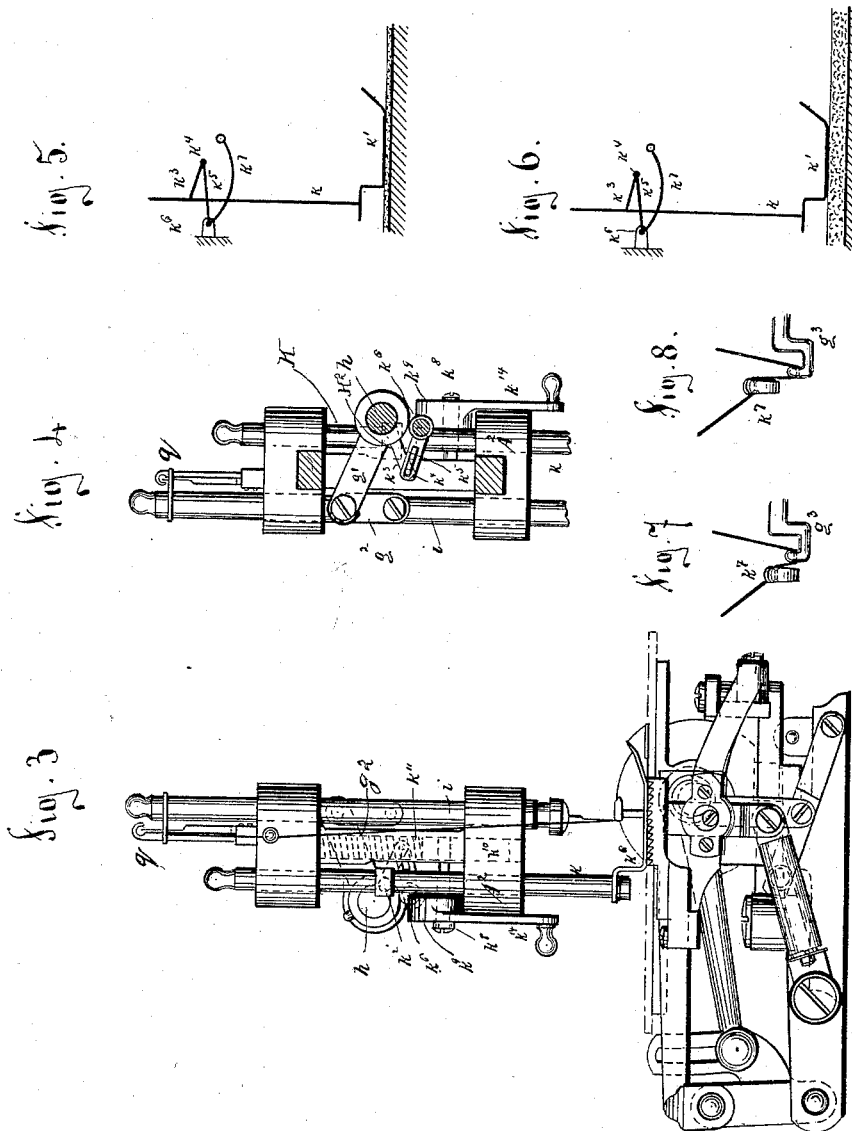
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UNITED STATES PATENT OFFICE.

JULIUS ANGERMANN, OF BERLIN, GERMANY.

THREAD-TENSION MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 422,691, dated March 4, 1890.

Application filed February 9, 1888. Serial No. 263,514. (No model.) Patented in England January 14, 1888, No. 619, and in Austria-Hungary April 13, 1888, No. 9,673 and No. 2,568.

To all whom it may concern:

Be it known that I, JULIUS ANGERMANN, a subject of the King of Prussia, residing at the city of Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Sewing-Machines, (for which I have obtained Letters Patent in England, No. 619, dated January 14, 1888, and in Austria-Hungary, No. 9,673 and No. 2,568, dated April 13, 1888,) of which the following is a specification.

This invention relates to improvements in sewing-machines, and especially to the devices for delivering the thread.

The object of my invention is to provide a thread-feeding attachment of such a construction that when a thicker piece of fabric is under the presser-foot a greater quantity of thread will be fed for each stitch than when a thin piece of fabric is under the presser-foot.

In the accompanying drawings, Figure 1 is a side view of a sewing-machine provided with my improvement, the sewing-plate being removed. Fig. 2 is a rear end view of the same, parts being in section. Fig. 3 is a front end view of the same, parts being omitted. Fig. 4 is a vertical sectional view through the head of the supporting-arm. Figs. 5 and 6 are diagrammatical views showing the different positions of the presser-foot and thread-guide. Figs. 7 and 8 are detail views of two thread-guides in different positions.

Similar letters of reference indicate corresponding parts.

The main shaft *a* is provided with the driving-pulley *a'* and an eccentric *a''*, from which motion is transmitted by the rod *f* to the rocking lever *g*, fixed by a screw to one end of the rocking shaft *h* in the horizontal arm of the frame *A* of the sewing-machine. At the head *A'* of the arm *A* the rocking shaft *h* is provided with a crank *g'*, which by a suitable link *g''* transmits motion to the vertically-reciprocating needle-bar *i* in the head *A'*. The lever *g* is provided on its swinging end with a hook-arm *g''*, provided with an eye through which the thread can be passed. Said rocking lever *g* is also provided on its top with a screw *g'''*, having a suitable head that can strike against the bottom end of a spring-

pressed spindle *o'* of the disk *o*, resting on a disk *o''*, between which disks the thread passes, said disks forming an automatic tension device.

The presser-bar *k*, to the lower end of which the presser-foot *k'* is secured, is provided with a transverse pin *k''*, on which an eccentric *k'''*, having a handle *k''''*, is mounted to turn, the rim of the eccentric resting on the part *A''* of the head *A'*. The pin *k''* also passes into a vertically-movable spindle *k''''* in the head *A'*, which spindle *k''''* is pressed downward by a spring *k'''''*. A collar *k''''''* is clamped on the presser-bar *k* and is provided with an arm *k''''''''*, from the free end of which a pin *k''''''''''* passes through a longitudinal slot in an arm *k'''''''''* on a rocking shaft *k''''''''''*, mounted in the horizontal arm of the frame *A* below the shaft *h*. At that end of the arm on the frame *A* opposite the one having the head *A'* the shaft *k''''''''''* is provided with an arm *k'''''''''''*, which is held in position on said shaft by a screw *k''''''''''''*, and in its free or swinging end the arm *k'''''''''''* is provided with an eye *s*. The thread from the spool *m* is passed through the eye *m'* in the standard *m''* on the top of the frame, then between the two tension-disks *n* on the side of the frame, then through the eye in the end of the arm *k''''*, then through the eye in the end of the hook-arm *g''*, then between the tension-disks *o* and *o''*, then through the eye *p* and the eye *q*, then through the eye *r*, and finally through the eye of the needle.

The operation is as follows: When the sewing-machine is in operation, the rocking arm *g* swings up and down, as does also the hook-arm *g''* on the same. If the thread is not passed through the eye in the end of the arm *k''''*, the hook-arm *g''* will draw a certain quantity of thread from the spool *m* for each stitch independent of the thickness of the material to be sewed, and if the material is very thick it is evident that the quantity of the thread will not be sufficient and it will break sooner or later. If the thread is passed through the eye *s* in the end of the arm *k''''*, the quantity of the thread delivered from each stitch will always be in proportion to the thickness of the material. The screw *k''''''''''''* is loosened and the arm *g''* brought in its lowest position, and then the arm *k''''* is so ad-

justed that its eye *s* will be from the eye in the hook-arm *g*³ a distance equal to the greatest length of thread required for any one stitch.

- 5 If a thick piece of fabric is placed under the presser-foot, it keeps the presser-foot raised, and as the presser-foot is raised the arm *k*³, attached thereto, lifts the free end of the slotted arm *k*⁵ by the action of the stud
- 10 *k*⁴ and rocks the shaft *k*⁶, whereby the swinging end of the arm *k*⁷ is raised, and as the arm *g*³ descends and passes said arm *k*⁷ the distance between the eye *s* in the arm *k*⁷ and the eye in the arm *g*³ will be equal to the length of
- 15 thread required for the stitch in the material under the presser-foot. (See Figs. 6 and 8.) If the thicker material under the presser-foot is replaced by thinner material, as in Fig. 5, the swinging end of the arm *k*⁷ descends with
- 20 the presser-foot, and the distance that the hook-arm *g*³ moves past the end of the arm *k*⁷ will be decreased, as shown in Fig. 7, or, in other words, when the arm *k*⁷ is raised the hook-arm *g*³ begins to draw the thread from
- 25 the spool sometime before it has completed its downstroke—that is, as soon as it passes the end of the arm *k*⁷. It is evident that when said arm *k*⁷ is raised the hook-arm *g*³ will pass its end sooner than when said arm is lowered,
- 30 for when said arm *k*⁷ is lowered the hook-arm *g*³ only passes the end of said arm *k*⁷ a very short time before said hook-arm has completed its downstroke. It thus follows that less thread will be drawn off the spool for
- 35 each stitch when thin material is under the presser-foot than will be drawn off when thicker material is under the presser-foot, for the reason that as the thickness of material increases the distance that the end of the arm
- 40 *g*³ moves past the end of the arm *k*⁷ also increases. At each upstroke of the rocking le-

ver *g* its screw *g*⁴ strikes the bottom of the spring-spindle *o*¹ and moves the same upward, thereby releasing the tension device, so as to permit the thread that has been drawn from the spool by the downward movement of the arm *g*³ and become slack by the upward movement of said arm to be drawn into the fabric.

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

1. The combination of a sewing-machine frame, two parallel rock-shafts, two arms attached, respectively, to said shafts adjacent to each other and provided with thread-eyes which move past each other in the oscillation of the shafts, a presser-bar, an arm attached to said presser-bar, provided with a pin, a slotted arm on one of said rock-shafts engaged by said pin for oscillating said shaft, and adjunctive mechanism connected with the driving-shaft for oscillating the other rock-shaft.

2. The combination of a sewing-machine frame, two parallel rock-shafts, two arms attached, respectively, to said shafts adjacent to each other and provided with thread-eyes which move past each other in the oscillation of the shafts, a presser-bar, adjunctive mechanism connecting said presser-bar with and operating one of said rock-shafts, a tension device, and a stud on the arm of one of said rock-shafts for automatically releasing said tension device.

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

JULIUS ANGERMANN.

Witnesses:

HANS BÖTTCHER,
HEINRICH BÖTTCHER.