No. 618,372. Patented Jan. 24, 1899.

J. E. BERTRAND.

THREAD CONTROLLING MECHANISM FOR SEWING MACHINES.

(Application filed June 8, 1898.)

(No Model.)

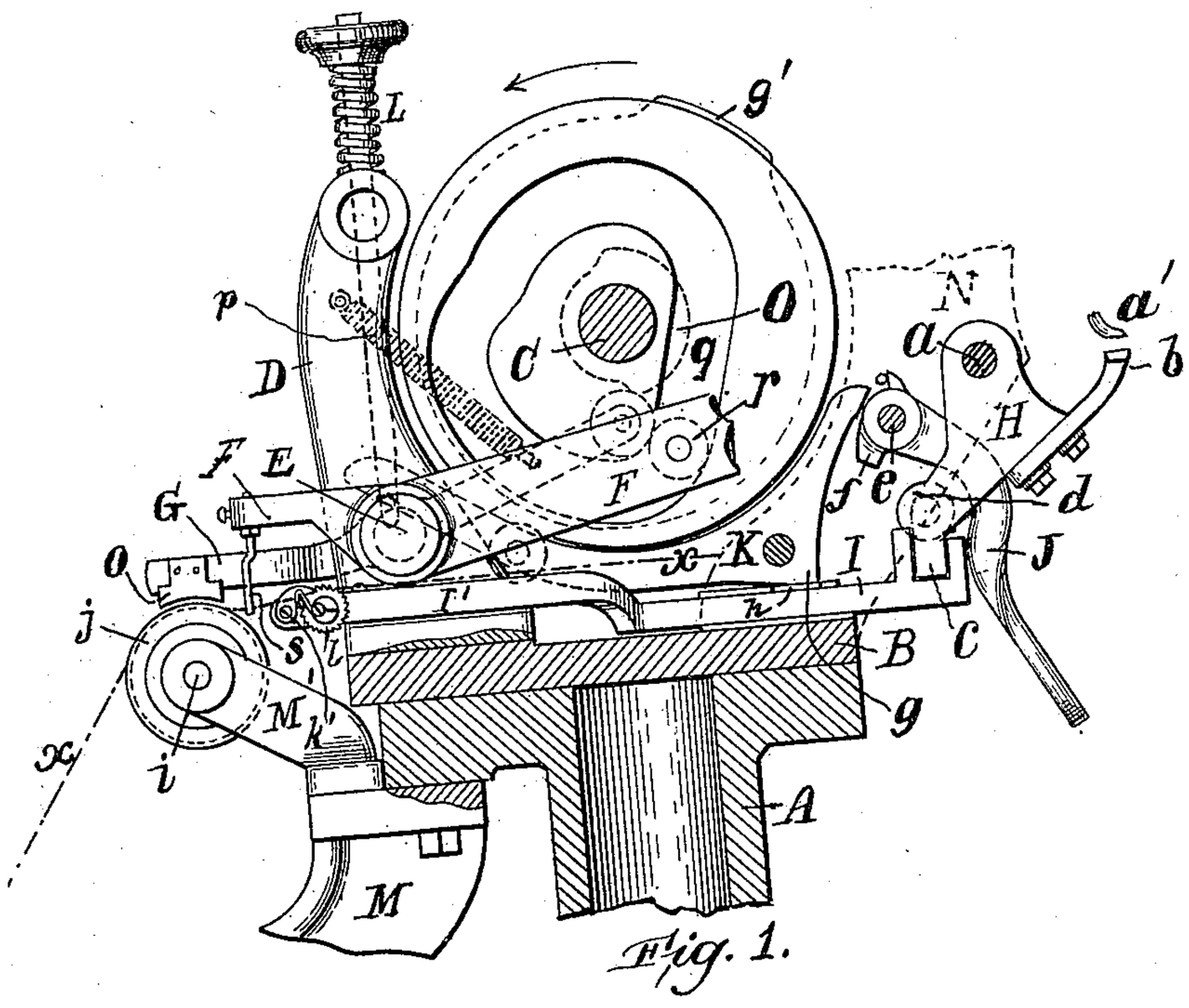

Fig. 1.

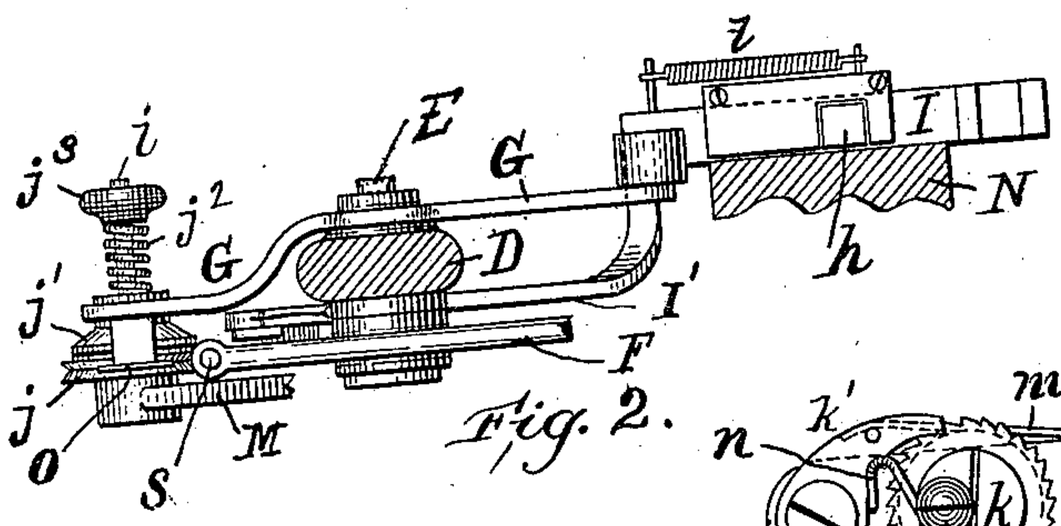

Fig. 2.

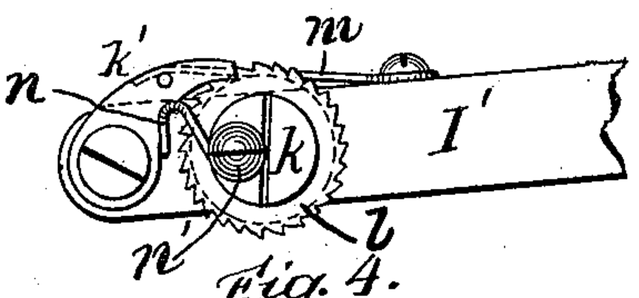

Fig. 4.

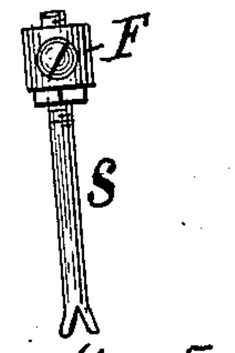

Fig. 5.

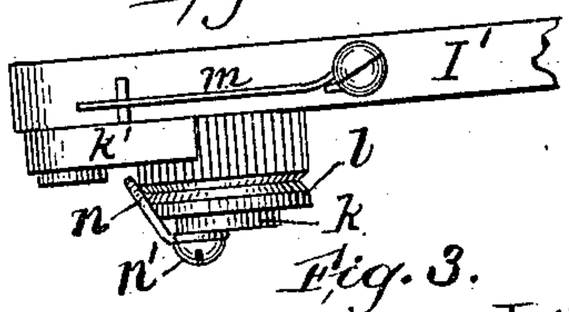

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOSEPH ELI BERTRAND, OF BOSTON, MASSACHUSETTS.

THREAD-CONTROLLING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 618,372, dated January 24, 1899.

Application filed June 8, 1898. Serial No. 682,927. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ELI BERTRAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Thread Measuring and Locking Devices for Sewing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to thread measuring and locking devices for sewing-machines; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended and in which my invention is clearly pointed out.

Figure 1 of the drawings is a sectional elevation of so much of a sewing-machine as is necessary to illustrate my invention. Fig. 2 is a sectional plan showing the novel features of my invention. Figs. 3 and 4 are respectively a plan and an elevation of the adjustable thread-guiding sheave, its locking-pawl, and a portion of its carrying-arm; and Fig. 5 is an elevation of the thread-measuring finger. Figs. 3, 4, and 5 are drawn to an enlarged scale.

In the drawings, A is a portion of the column upon which the machine-head is mounted, and B the base of the head-frame.

C is the cam-shaft, mounted in suitable bearings in columns carried by said base-plate, but not shown.

D is a stand secured upon the base-plate B at the rear of the cam-shaft and cams, and having set therein the stud E, upon which are mounted upon opposite sides of said stand D the levers F and G, only a portion of the former being shown.

H is a lever fulcrumed at *a* and having secured thereto the work support or table *b* and provided at its lower end with a lug *c*, which engages the slotted front end of the sliding bar I and has mounted upon a stud set therein a roll *d*, as shown, and *a'* is the presser-foot.

J is a hand-lever fulcrumed at *e* and arranged to act upon the roll *d* on the lever H to move said lever H around its fulcrum and move the sliding bar I to the rear and provided with the lifter-toe *f* to act upon the short arm of the locking-lever K to lift its heel *g* from contact with the plate *h* and unlock the bar I against the tension of the spring L, mounted upon the upper end of the rod *p* between the tension-adjusting nut at the upper end of said rods, and the bearing of said rod in the hub of the stand D, the lower end of said rod being connected to the rear end of said lever K, said heel *g* also being raised once in each revolution of the shaft C by the cam *g'* acting upon a truck mounted upon the lever K between said rod *p* and the heel *g* of said lever, as shown in dotted lines in Fig. 1.

M is a portion of a bracket for supporting the wax-pot, (not shown,) and M' is a smaller bracket carrying at its rear end a spindle *i*, upon which is mounted the tension-wheel *j*, the friction-disk *j'*, the spring j^2, and the tension-adjusting nut j^3, all of well-known construction.

The levers H, J, and K are fulcrumed upon studs set in a standard N, projecting upward from the base-plate B, the outline of a portion of which is shown in dotted lines in Fig. 1 and in full lines in Fig. 2.

The sliding bar I has formed in one piece therewith or secured thereto the rearward extension I', having set therein near its rear end a fixed stud *k*, upon which is mounted the thread-guiding sheave *l*, upon one side of the groove in which is formed a series of ratchet-teeth, with which the stop-pawl *k'* engages to prevent a backward rotation of said shield, said pawl being pressed into engagement with said teeth by the spring *m*, and *n* is a wire guard secured to the stud *k* by the screw *n'* to prevent displacement of the thread on said sheave.

The needle-thread *x* in passing from the wax-pot or the source of supply to the work on the work-support passes once around the tension-wheel *j*, thence to and once around the sheave *l*, and thence in any well-known manner to the work.

The lever G has secured to its rear end the brake-shoe *o*, which when the rear end of said lever is depressed bears upon the thread on the tension-wheel and clamps it thereto, so as to prevent said thread being drawn from said wheel or the source of supply when the

needle is pulling the loop through the work, when the shuttle is passing through and expanding said loop, or when the stitch is being set. The forward end of said lever G carries a cam-truck, which is acted upon by the cam O to move said lever in one direction, it being moved in the opposite direction by the tension of the spring *p*, said cam O and spring *p* being shown only in dotted lines in Fig. 1.

The lever F is vibrated by the action of the cam-path *q* upon a cam-truck *r*, carried by said lever, and indicated by a dotted circle in Fig. 1. The forward end of said lever (which is omitted from the drawings) is connected to and imparts motion to the awl-segment (not shown) in a well-known manner, and said lever has a rearwardly-projecting arm, in which is set the pendent finger *s*, the lower end of which is forked, as shown in Fig. 5, to engage the thread *x*, between the tension-wheel *j* and the sheave *l*, when the rear end of the lever F is moved downward, and depress it, thereby drawing from said tension-wheel and the source of supply the necessary amount of thread to form a stitch. said downward movement of the finger *s* taking place when the brake-shoe *o* is raised from contact with the thread on the tension-wheel.

The remaining parts of the sewing-machine to which the parts herein described appertain and with which they coöperate are shown and described in another application of mine, filed June 8, 1898, Serial No. 682,928, and the parts herein described and claimed are shown and described, but not claimed, except in special combinations, in said other application.

The operation of my invention is as follows: The needle-thread *x* being drawn from the source of supply through the wax-pot (not shown) to and once around the tension-wheel *j*, thence to and once around the sheave *l*, and thence to the work in any well-known manner, as hereinbefore described, and the machine being in operation sewing work placed between the presser-foot and the work-support, at the proper time in each revolution of the shaft C in the direction indicated by the arrow on Fig. 1 the brake-shoe *o* is raised from contact with the thread on the tension-wheel, and at the proper time after said brake-shoe has been raised the measuring-finger *s* is moved downward by the action of the cam-path *q* upon the lever F and engages the thread *x* between the tension-wheel and the sheave *l* and depresses it to a sufficient distance to draw from said tension-wheel and the source of supply an amount of thread sufficient for the formation of a stitch, the sheave *l* being locked against rearward revolution by the pawl *k'* engaging the ratchet-teeth on the sheave, and thus preventing any thread being drawn from in front of said sheave. Later in the revolution of the shaft C and while the needle is drawing the loop of thread through the work the brake-shoe *o* descends upon the thread in the groove of the tension-wheel and locks the thread against being drawn from said tension-wheel and source of supply while the shuttle is passing through said loop and while the stitch is being set, as fully described in said before-cited other application.

The work-support *b* being secured to the pivoted lever H, one arm of which is connected to the bar I, which is pressed toward the front by the spring *t*, and the arm I', which carries the sheave *l*, being formed in one piece with or secured to and movable with the bar I, it follows that if the work being sewed varies in thickness the feeding of the work from a position with a thin portion thereof between the work-support and presser-foot to a position with a thicker portion between said parts will cause a depression of the work-support *b*, thereby moving the bar I I' and the sheave *l* toward the rear, the heel *g* of the locking-lever K being raised by the action of the cam *g'* upon said lever to release said bar and permit said rearward movement. The rearward movement of the sheave *l*, which shortens the distance between said sheave and the tension-wheel *j*, causes the downward movement of the measuring-finger *s* to draw an increased quantity of thread from the tension-wheel and the source of supply by virtue of the facts that the distance between the sheave *l* and the tension-wheel is lessened, while the downward movement of the measuring-finger is the same, and that the sheave *l* is locked against rearward revolution, and the thread being wound entirely around said sheave must cross on the top of the sheave, and when the finger *s* descends and presses upon said thread it is drawn closely into the angle of the groove of said sheave, causing the crossing portions of the thread to bind each other firmly against slipping, and as the brake at this time is removed from the tension-wheel the necessary thread is drawn from said tension-wheel and the source of supply.

If the work is fed from a thick to a thin portion, the reverse action takes place and a less length of thread is drawn from the tension-wheel and the source of supply, the forward movement of the bar I I' and the sheave *l* being effected by the reaction of the spring *t*, connected at one end to the bar I and at its other end to a fixed part of the machine.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a thread-measuring device for sewing-machines the combination with a frictional tension-wheel, of a thread-guiding sheave in near proximity to said tension-wheel; means for locking said sheave against backward revolution; a thread-engaging finger arranged above a line tangent to the tops of said sheave and tension-wheel, and having its lower end forked or notched to engage the thread between said sheave and tension-wheel in near proximity to said tension-wheel; and means for reciprocating said finger and causing it to engage and depress said thread below a line

tangent to said tension-wheel and sheave and thus draw thread from said tension-wheel and the source of supply.

2. In a thread measuring and locking device for sewing-machines the combination with a frictional tension-wheel, and a work-support and presser-foot coöperating to clamp the work, of a thread-guiding sheave in near proximity to said tension-wheel but between it and said work-support freely revoluble in a forward direction; means for locking said sheave against backward revolution; a thread-measuring finger arranged to engage the thread between said tension-wheel and sheave; means for reciprocating said finger and causing it to depress said thread to draw thread from the tension-wheel and the source of supply; and mechanism between the axis of said sheave and the work-support constructed and arranged to cause the downward and upward movements, respectively, of the work-support, due to varying thicknesses of the work, to move the axis of said sheave toward and from said tension-wheel, and thus cause the amount of thread drawn from said tension-wheel to correspond with the amount required to form a stitch.

3. The combination of the tension-wheel *j;* the pivoted lever G provided with a cam-truck; a cam constructed and arranged to act upon said truck to move said lever in one direction; the spring *p* arranged to move said lever in the opposite direction; the brake-shoe *o* carried by said lever and arranged to engage and clamp the thread on said tension-wheel; the reciprocating bar I′; the sheave *l* provided with ratchet-teeth and mounted upon a stud set in said bar I′; the pawl *k′* for locking said sheave against backward movement, and pivoted to said bar I′; the lever F provided with the cam-truck *r;* the measuring-finger *s* carried by said lever F and having its lower end forked or notched as set forth; and the cam-path *q* to act upon and vibrate said lever, all substantially as described.

4. The combination of the pivoted work-support *b* H; the sliding bar I and extension I′; the locking-lever K; the cam *g′* for operating said locking-lever; the sheave *l* provided with ratchet-teeth; the pawl *k′;* the tension-wheel *j;* the lever F; the measuring-finger *s* carried by said lever; and the cam-path *q* for operating said lever and finger.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 6th day of June, A. D. 1898.

JOSEPH ELI BERTRAND.

Witnesses:
N. C. LOMBARD,
E. H. TANSEY.