

(No Model.)

2 Sheets—Sheet 1.

J. BERRY.
NEEDLE MACHINE.

No. 404,337.

Patented May 28, 1889.

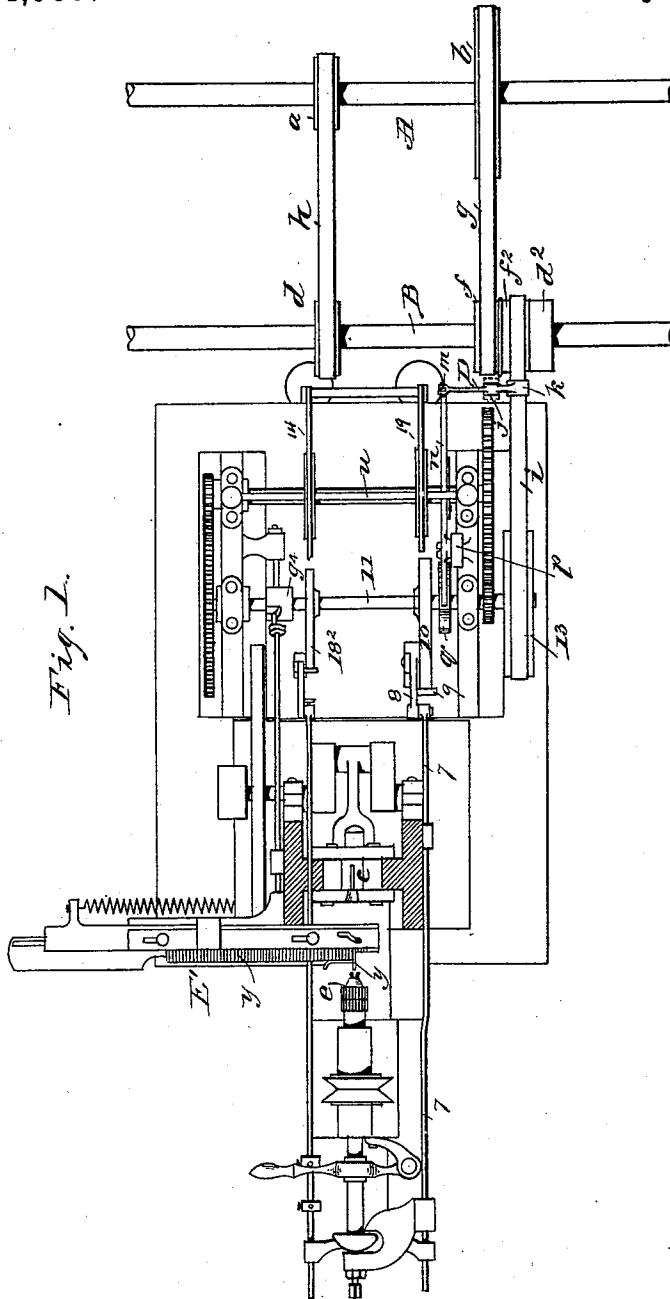


Fig. 1.

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John Berry,
Inventor.

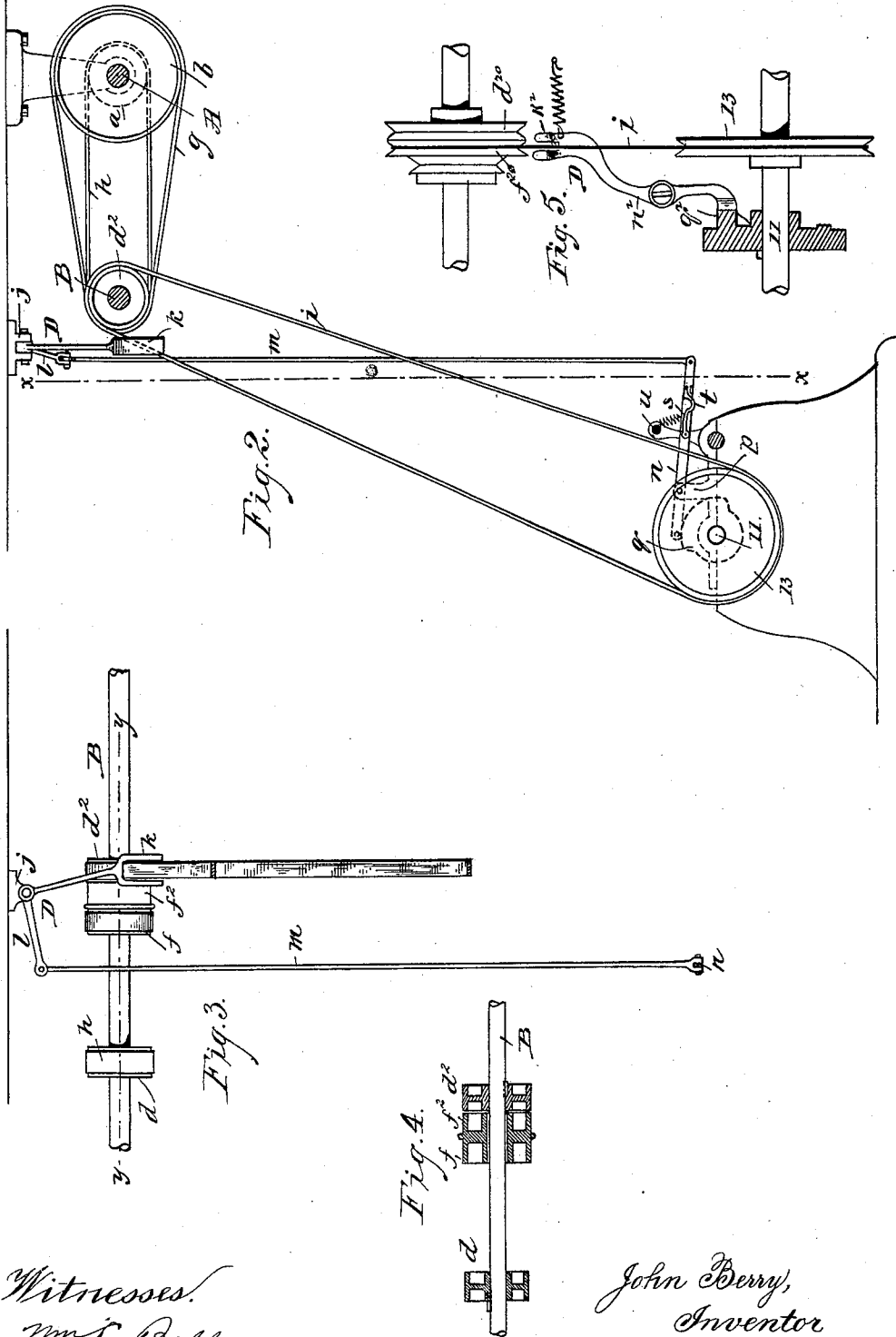
per

Chapin & Co.
Attys.

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 Wm. J. Fellows
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John Berry,
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UNITED STATES PATENT OFFICE.

JOHN BERRY, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO THE
NATIONAL NEEDLE COMPANY, OF SAME PLACE.

NEEDLE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 404,837, dated May 28, 1889.

Application filed February 8, 1889. Serial No. 299,207. (No model.)

To all whom it may concern:

Be it known that I, JOHN BERRY, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Needle-Machines, of which the following is a specification.

This invention relates to that class of needle-machines in which needle-blanks are automatically fed and presented one by one to the action of a clamping or chucking device, which device then moves forward to carry the needle-blank to the action of devices or mechanism for performing the desired operation thereon, and for then withdrawing said blank from such mechanism and discharging same from the machine.

The object of the invention is to provide automatically-operating mechanism in needle-machines comprised in the class referred to—such, for instance, as blank-swaging machines or needle-grooving machines—whereby, at the time of the action directly upon the needle-blank by the swaging-dies or grooving mechanism of the machine, the reciprocating movement of the needle-carrier will be comparatively slow, as necessarily required at such time; but at the time of the movement of the needle-carrier to withdraw the needle-blank from the mechanism for operating thereon, for receiving and clamping or chucking a new blank and carrying same forward to the essential operating mechanism, the movements of the needle-carrier will be accelerated, such latter movements, of course, occupying much less time than if their speed were uniform, the capacity of the machine being therefore greatly increased.

In the accompanying drawings this invention is illustrated and is shown as applied on and with relation to a needle-swaging machine, by the use of which pieces of wire cut into proper lengths for blanks from which to make sewing-machine needles are successively and automatically fed to a position to be chucked by a carrier chuck or clamp, after which chucking they are carried to and forced through an opening in a separable swaging die-block, and the swaged and attenuated needle-blanks are then retired from the dies and discharged from the chuck and from

the machine, and such machine and the operation thereof are fully described and shown in Letters Patent of the United States granted to me, dated November 22, 1881, numbered 249,822.

Figure 1 is a plan view and partial longitudinal section of the needle-swaging machine, substantially as illustrated in said Letters Patent, with the automatic mechanism of this invention applied thereon. Fig. 2 is a view in side elevation of the said improved mechanism and as much of the machine in connection with which it operates as will clearly show its operative connection and arrangement. Fig. 3 is an elevation at right angles to the one Fig. 2, as seen to the right of the line *x x*. Fig. 4 is a sectional view in detail, as indicated by the line *y y*, Fig. 3, of a counter-shaft and fixed and loose pulleys thereon; and Fig. 5 is a plan and partial sectional view of a modified form of mechanism, to be hereinafter referred to.

The needle-blanks *y* are guided by the mechanism indicated at *E'*, to be presented one by one to the clamping action of the chuck *e*, the movement of which chuck from its position shown in Fig. 1 is next forward to clamp the blank, then rearward, resuming its position shown in said Fig. 1, permitting the needle sustaining and guiding devices *E'* to be moved laterally out of the line of travel of the chuck, when the needle is conveyed to and forced into the opening of the swaging-dies *c*. The needle is then, by the chuck, withdrawn to or about the said position shown in the drawings, being then ejected from the chuck, completing one operation of the machine. The needle supporting and guiding devices *E'* are then rearwardly moved to position shown, as the first step of another operation.

11 represents the main shaft of the machine, on which is a driving-pulley, 13, and there are cams 10, 18², and *g'*, and weighted cords 14 19, which, through suitable connections with the main operating parts of the machine, impart thereto the movements mentioned, and all as fully described in said Letters Patent hereinbefore referred to, to which reference may be had.

A represents an overhead shafting, having

thereon for each needle-machine pulleys *a* and *b*, of large and small diameters; and B represents an overhead counter-shaft, having thereon for each needle-machine a fixed pulley, *d*, by which, through belt *h*, said pulley *d* and counter-shaft B are driven from the smaller pulley, *a*, at, comparatively speaking, a moderate rate of speed. A pulley, *f*, rotating on said counter-shaft loosely and independently thereof, is driven by the belt *g* from the larger pulley, *b*, on the driving-shaft A. Said loose pulley *f* has an extended periphery, *f*², adjacent to which and of uniform size therewith is a pulley, *d*², secured on the counter-shaft. A belt, *i*, passes around the driving-pulley 13 of the needle-machine and one or the other of the pulleys *d*² or *f*², and when the said belt *i* is around the pulley *d*² the machine is moving at its slower speed, but when the belt is around the pulley *f*² the speed of the machine is accelerated.

Mechanism for automatically effecting the shifting of the belt *i* from the slow to the speedier pulleys *d*² *f*², or vice versa, under my invention, is provided in needle-machines of the character hereinbefore mentioned, and consists, broadly, in providing a belt-shifter lever in proximity to the said fast and slow pulleys *f*² *d*², and providing on a driving or driven shaft of the machine a cam for acting directly upon or through suitable interposed connections upon said belt-shifter lever for swinging it to effect the shifting of the belt.

As particularly shown in the drawings, Figs. 1, 2, and 3, the belt-shifter D is comprised in an angular lever intermediately pivoted in overhead hanger-lugs *j*, one leg thereof being bifurcated, as at *k*, to embrace the belt, and to the other belt-shifter leg, *l*, is secured one end of a vertical connecting-rod, *m*, to the other of which is connected one end of a horizontal lever, *n*, intermediately pivoted on a lug, *p*, of the needle-machine frame, and said lever *n* bears by its free end upon the edge of a peripheral cam, *q*, on the driving and cam shaft 11 of the needle-blank-swaging machine, said lever being held to its cam-bearing by a spring suitably applied or its equivalent.

It will be noted with reference to the relative positions of the parts in Fig. 1 that they are in their positions for presenting needle-blanks and chucking same, at which period of the operation of the machine the lever *n* is in bearing on the least-extended portion of the cam *q* and the belt-shifter caused to assume a position to place the belt upon the pulley *f*² having the greatest speed, and until the parts have been moved and the needle carried to the swaging-dies such relation of the driving-connection is maintained; but immediately the needle by its end is brought to the dies, and before being further longitudinally moved thereinto, the cam *q* has turned to tilt by its extended edge the lever operating the belt-shifter, carrying the belt onto the slowly-driven pulley, whereupon the motion of the machine will be retarded, and will so

continue on the slower speed during the swaging and attenuating operation upon the blank, which being completed the accelerated speed is again resumed, and obviously the machine will be run at a maximum speed—as it is capable of doing without disadvantageous results—at all times except during the period of the actual swaging, and thus the capacity of the machine is increased to a considerable and important extent.

s, Fig. 2, represents a latch-arm pivoted by one end on the lever *n*, and adapted, when the lever is tilted to effect the retarded driving of the machine, to be swung to engage by its bowed or hooked portion *t* the stationary horizontal brace-rod *u*, confining the lever against tilting motion, and then the machine will be run at its slower speed, as in some classes of work may be deemed most desirable.

In the drawings, Fig. 5 is a plan view of a modified form of devices for carrying out the spirit of my invention for needle-machines, in which, as shown, the main-shaft cam *q*² is an inclined-face cam on the side of a rotating disk, the lever *n*² moving in a horizontal plane and extended into proximity with the variably-speeded pulleys *d*²⁰ *f*²⁰, having the belt-shifter legs *k*² formed thereon, and thus intervening connections between the lever *n*² and the belt-shifter are unnecessary, such an arrangement being in many instances advantageous; but, to the end that an overhead disposition of the shafting may be made, it obviously is no departure from the invention to form the belt-shifter and the cam-actuated lever separately, interposing a connecting-rod, as particularly shown in Figs. 1, 2, and 3.

In an application for Letters Patent of the United States filed by me October 29, 1888, Serial No. 289,430, devices in accordance with my said invention as hereinbefore recited are illustrated and claimed, as in an arrangement upon and with relation to specific parts of a needle-grooving machine, and on reference to the said description it will be apparent that the present invention embraces within its scope the application of automatically-operating devices, in substance as described, upon machines for performing various operations on needle-blanks, whether swaging, grooving, or other work, wherein the needles are clamped and carried to the devices for directly operating thereon and then conveyed therefrom.

What I claim as my invention is—

1. The combination, with a needle-machine comprising a main shaft and driving-pulley, devices for feeding and presenting needle-blanks to be clamped, a carrier-chuck for clamping said needle-blanks, and devices, as swaging-dies or grooving-cutters, for acting on said needle-blanks conveyed thereto by said carrier, of the pair of pulleys having variable speeds, the belt between and around one of said pulleys and the driving-pulley of the said needle-machine, the belt-shifter engaging said belt, and the cam for actuating

said belt-shifter, whereby the belt may be automatically moved from one to the other of said variably-speeded pulleys, substantially as and for the purpose described.

5 2. The combination, with the driving-shaft of a needle-machine having the cam *q* and a driving-pulley for said shaft, and with fast and slow speed pulleys and a belt between one thereof and said driving-pulley of the
10 machine, of an intermediately-pivoted belt-shifter engaging said belt, a pivoted lever, *n*, actuated by said cam, and a connecting-rod between said lever and shifter, substantially
15 as and for the purpose described.

3. The combination, with the driving-shaft of a needle-machine having the cam *q* and a driving-pulley, 13, of a primary driving-shaft, A, having large and small pulleys *b* and *a* fixed thereon, a counter-shaft having fixed

pulleys *d* *d*² and the loose pulleys *f* *f*² 20 thereon, and the belts *e* and *g*, a belt, *i*, between and around one of said pulleys *f*² *d*² and said driving-pulley 13, an intermediately-pivoted belt-shifter, D, engaging said belt *i*,
25 a lever, *n*, intermediately pivoted by one end bearing on said cam, and a connecting-rod, *m*, between the other end of said lever and said belt-shifter, substantially as described.

4. In combination, the main shaft having a cam thereon and the driving-pulley, the
30 stationary rod *u*, the belt-shifter D, the pivoted lever *n*, provided with the latching-arm *s*, and the connecting-rod, substantially as and for the purpose described.

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Witnesses:

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