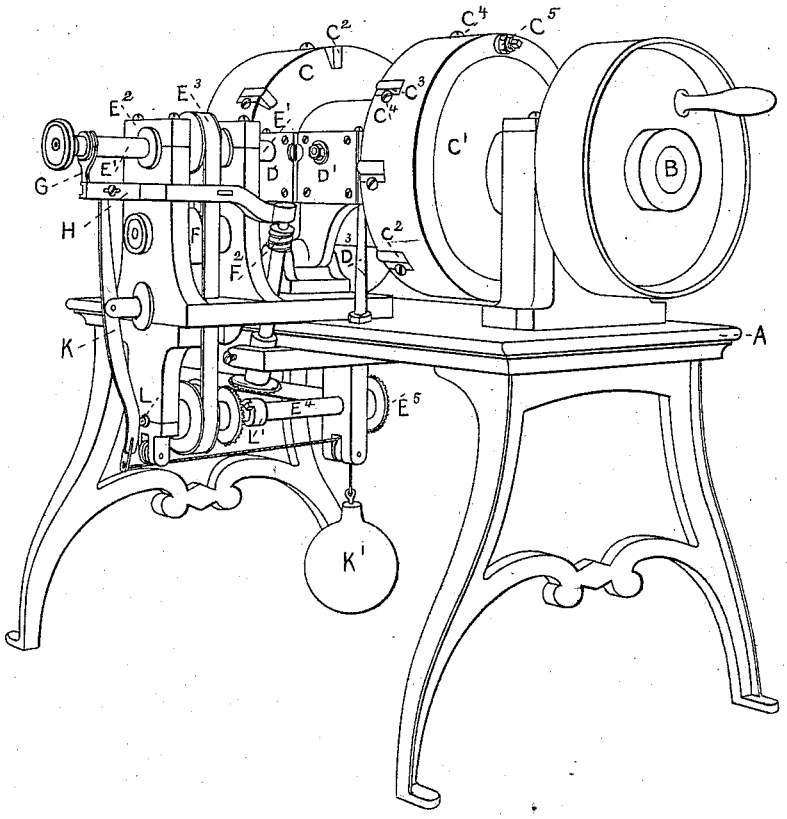
2 Sheets--Sheet 1.

P. M. BEERS.

Machine for Swaging Needle-Blanks.

No. 165,976. Patented July 27, 1875.

FIG. 1.



WITNESSES.

Boyd Eliot

J. Wm. Ripley

Phila. M. Beers.

INVENTOR.

2 Sheets--Sheet 2.

P. M. BEERS.
Machine for Swaging Needle Blanks.

No. 165,976. Patented July 27, 1875.

FIG. 2.

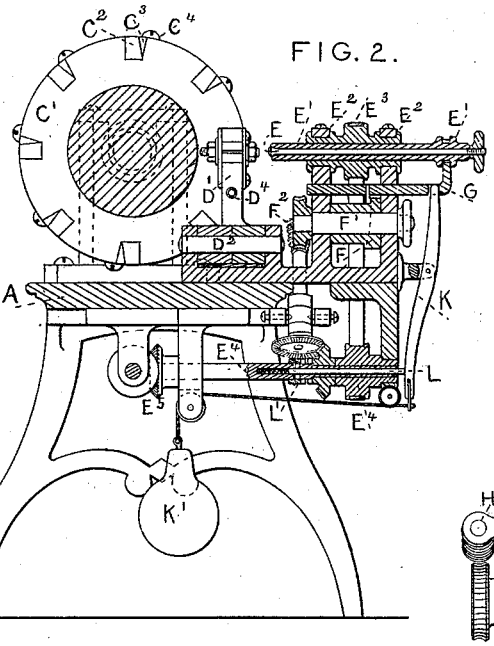


FIG. 4.

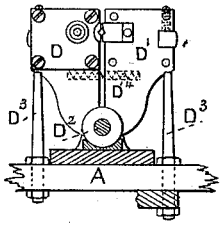


FIG. 5.

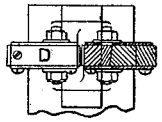


FIG. 6.

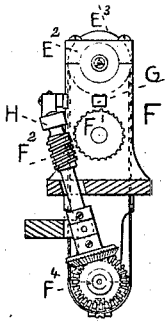


FIG. 7.

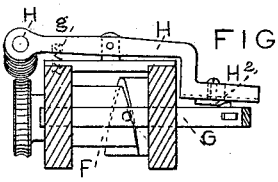
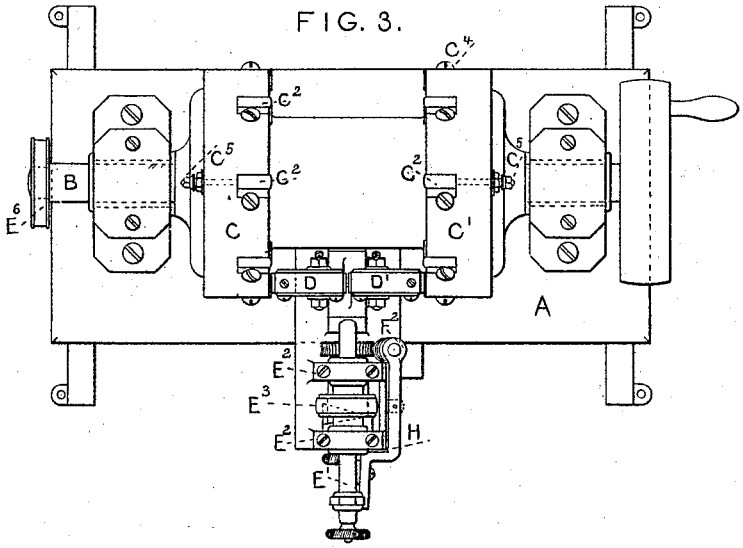


FIG. 3.



WITNESSES.

Boyd. Eliot

J. Mc Ripley

Philo M. Beers

INVENTOR.

UNITED STATES PATENT OFFICE.

PHILO M. BEERS, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR SWAGING NEEDLE-BLANKS.

Specification forming part of Letters Patent No. **165,976**, dated July 27, 1875; application filed December 3, 1874.

CASE B.

To all whom it may concern:

Be it known that I, PHILO M. BEERS, of Bridgeport, State of Connecticut, have invented certain Improvements in Swaging-Machines for Making Needles, &c., of which the following is a specification:

This invention pertains to the class of machines used chiefly for the manufacture of needles, but may be applied to the use of all such articles as require reduction by swaging in a cylindrical form from a wire or rod; and the invention consists, first, in the use of a double tappet-cylinder for operating two opposing dies simultaneously, in combination with an automatic guide-stem, in such a manner that a blank may be presented to the dies and reduced by hammering, as will hereinafter appear; second, in combining suitable mechanism with said guide, so that the blank may be automatically revolved while between the swaging-dies, and when finished the feeding mechanism will be stopped, as will hereinafter appear.

Figure 1 is a perspective view of the machine, as seen from the front side. Fig. 2 is a transverse section through the center. Fig. 3 is a plan, as seen from above the machine. Figs. 4, 5, 6, and 7 are detail views of the parts for a complete explanation.

At A is shown the frame mounted upon suitable supports or feet, as shown in the perspective view at Fig. 1. Upon said frame are two bearings for supporting the main axis B, upon which are mounted the tappet disks or heads C C^1, and said disks are provided with tappets, as at C^2, which are simply blocks of hardened steel, or their equivalent, inserted into or near the circumferences of said disks, and parallel to the axis, so that their inner ends oppose each other, as best seen in Fig. 3. Said tappets are also made with a dovetailed cross-section, as shown at Fig. 2, so that when inserted into their disks wedges or keys, as C^3, are driven in alongside of the tappets to hold them in place laterally, and said keys are held therein by binding-screws, as at C^4, which are driven radially into the tappet-disks. Said tappets are also set endwise to compensate for any wear or for proper adjustment by set-screws, as at C^5, which extend through the disks from the back, and are provided with check-nuts, as seen in Figs. 1 and 3. The swaging-dies are set in heads, as at D and D^1, which are pivoted at a common axis or center, as at D^2, and they are supported by the standards, as at D^3, which serve to hold the heads in a vertical position between the tappets in their revolution. Said dies have their faces made to conform to the shape to be produced, and in the case of making needles a groove is formed in each of a half circle, or a segment of the same corresponding to the size of the needle required, and they are let into recesses formed in the heads D and D^1, and are held therein by a plate covering the recess, and they are forced out toward each other by wedges at their near ends, which are adjusted by set-screws on the outside of the head similar to crank-keys. The heads and dies are held apart or open by a spring, as at D^6, which keeps them open only when struck by the tappets. Power is applied by a belt upon the pulley on the main shaft shown in Fig. 1, upon which the handle is represented for turning it. The guide-stem for holding the blank between the dies, and rotating it while being hammered or swaged, is shown at E, and consists of a tube split at the ends next to the dies to receive the blank which is clamped therein by the tube being drawn back into an exterior tube, as E^1, which is mounted in bearings, as at E^2, to carry the blank back and forth and to rotate it. The guide-stem is swelled at its split end, as shown in section at Fig. 2, and upon the other end is a screw and a milled nut by which it is drawn back into the exterior tube, and thereby closes its split end upon the blank inserted therein similar to a conical chuck or a crayon-holder. Upon the exterior tube E^1 is a pulley, as at E^3, which is driven by a belt from a pulley below, at E^4, which is on a shaft that receives motion by a bevel-gear at E^5, which is driven by a belt from a pulley on the main shaft, as shown at E^6 in Fig. 3.

The blank when inserted in the guide-stem is first introduced between the dies at the point, and, as the swaging operation proceeds,

is forced forward toward the shank of the needle until completed, and this is accomplished by a scroll-cam, as at F, upon a shaft, F^1, which receives motion from a worm on a shaft, F^2, the lower end of which gears into a bevel-wheel on the shaft at E^4. Said cam F operates a sliding bar, as at G, the outer end of which is turned up and works in a groove on the tube or axis E^1, which controls the guide-stem that holds the blank and, therefore, as the cam F is revolved the blank is forced forward between the dies. But the upper end of the worm-shaft F^2 is supported in a lever, as at H, which is pivoted to the side of the frame that supports the feeding-gear, and it is arranged so as to vibrate to throw the worm out of gear with the cam-shaft at F^1. An enlarged view of these parts is shown at Fig. 7, and in that view a spring is shown, as at *g*, between the lever and the frame, to hold the worm out of gear. But at the other end of the lever H is an adjustable guide, as seen at H^2, which presses against a stud upon the sliding bar G, and thereby holds the worm in gear during the time that the said guide H^2 and the stud are in contact, or during the time that the stud on the sliding bar is traversing the distance on the guide from the part where it is started to the end, and this determines the length the blank shall be driven inward between the dies; therefore any desired distance may be given to this part of the operation by adjusting the guide H^2 on the lever H. When a blank is first inserted in the stem the lever H and the sliding bar G will be in the position shown at Fig. 7, but to start it in rotation between the dies, and also to force it forward between the dies, the cam-wheel must be rotated to its proper starting-point; then the bar G must be shoved forward, which will press the lever out and thereby throw the worm in gear, and so continue until the scroll-cam has terminated, when a pivoted lever, as at K, the upper end of which engages with the sliding bar G, is caused to react by a weight, as at K′, and cord attached at the opposite end of the said lever, and instantly withdraws the blank from between the dies. At the same time the lower end of the lever K strikes a rod, as at L, in the shaft at E^4 and opens a clutch at L′, which drives the pulley at E^4, and thereby stops the rotation of the guide-stem and also the blank. There is a spring in the shaft at E^4, which reacts to close the clutch when the action of the weight at W is overcome by the cam upon the sliding bar, which is engaged with the upper end of the lever K. The guide at H^2 on the lever H is beveled at the outer end to correspond with a similar bevel on the stud which is on the bar G, so that the sliding bar may be the more easily shoved forward toward the dies whenever the cam-wheel at F is in proper position for carrying the blank the required distance to complete the operation. This, of course, will vary with the size of the needle, as it is evident that if the shanks are all the same size, as is the case of sewing-machine needles, less length of stock will be required to make a smaller than a larger one.

It is evident that a similar set of dies and feeding and holding mechanism may be mounted upon the opposite side of the main frame and be operated by the same set of tappets, so that the capacity of them may be doubled.

It is also evident that such mechanism may be used for various other purposes, as shaping drills, awls, &c.

Various modifications of the devices may also be varied without departing from the nature of my invention; but

I claim—

1. In a machine for swaging or shaping needle-blanks, &c., the combination of a double tappet-cylinder operating two opposing dies and an automatic guide, substantially as described.

2. The combination of the rotating mandrel E^1, the sliding bar G with its connecting-yoke, the cam F, lever K, and cord and weight for moving said bar, substantially as described.

3. The combination of the mandrel with the lever H, bar G, lever K, gear mechanism and cam F, substantially as described.

4. The combination of the vibrating-lever H with the sliding bar G, the cam F, the worm and screw, and an adjustable guide, H^2, between the lever H and bar G, by which the blank is held between the dies the required length of time to complete the operation of shaping the article desired, substantially as described.

PHILO M. BEERS.

Witnesses:
BOYD ELIOT,
J. WM. RIPLEY.