

M. DEERING.

Machines for Forming Spring-Keys.

No. 143,226.

Patented September 30, 1873.

FIG. 1.

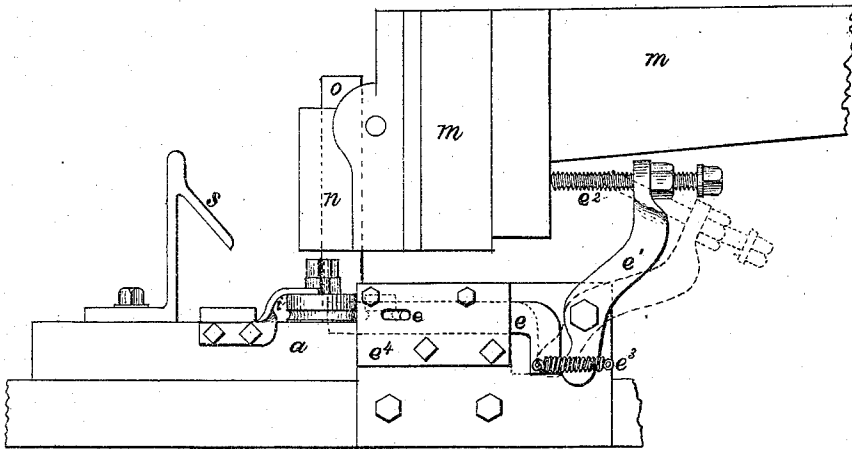
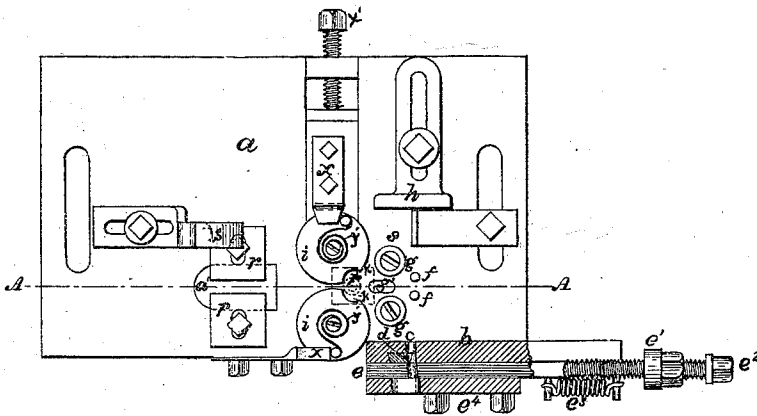


FIG. 2.



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Witnesses

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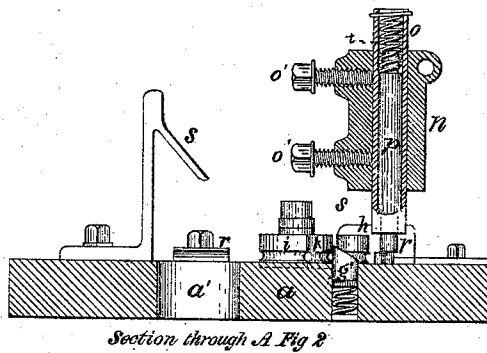
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FIG. 3.



Section through A Fig 2

FIG. 5.

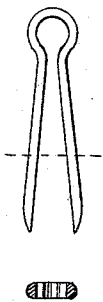
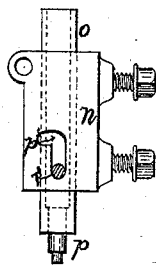


FIG. 4.



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MICHAEL DEERING, OF SYRACUSE, NEW YORK, ASSIGNOR TO SWEET, BARNES & CO., OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR FORMING SPRING-KEYS.

Specification forming part of Letters Patent No. 143,226, dated September 30, 1873; application filed May 24, 1873.

To all whom it may concern:

Be it known that I, MICHAEL DEERING, of Syracuse, Onondaga county, New York, have invented certain Improved Machinery for Making Spring-Keys, called a Spring-Key Bender, of which the following is a specification:

This device is for the purpose of shaping a spring-key from a strip of metal rod or drawn wire at a single operation. It consists of the parts shown in the accompanying drawing, in which—

Figure 1 is a side elevation; Fig. 2, a plan of the bed-plate with the fixtures thereon; Fig. 3, section on line A A, Fig. 2; Fig. 4, the sliding pin detached that forms the eye; Fig. 5, a spring-key formed in the machine.

Like parts in the several figures are indicated by the same letters of reference.

The bed-plate *a* is an oblong flat plate of sufficient strength to sustain the devices thereon. To this bed-plate *a* is affixed a cutting-block, *b*. (Shown in section, Fig. 2.) Through this block there is a horizontal hole, *c*, of proper shape to receive the material from which the keys are to be made. The drawing, Fig. 1, shows a round hole for a wire. A steel cutter, *d*, is affixed in a proper recess in this block on the front side of the hole, and a sliding piece, *e*, having a similar hole through its sides, moves forward past the cutter to cut off the piece when fed in. The slide-piece *e* is forced forward by a lever, *e*¹, having a set-screw, *e*², through its upper end, that is struck by the main slide as it recedes to actuate the lever and cut off the piece that has been fed in. This movement is shown by the dotted lines in Fig. 1. The slide is drawn back by a spring, *e*³, and is held in place by cap *e*⁴. On a line with openings *c* are two studs or pins, *f*, projecting up from the bed-plate *a*, to guide the key-blank, and on the opposite side, facing pins *f*, are two stud-rollers, *g*. The length of the blank for a key is determined by a gage, *h*. In front of the stud-rollers *g* forming-rollers *i* are placed, having recesses *k* on their peripheries to shape the eye of the key and straighten the shanks. To these rollers are affixed springs *g'*, that, after a key has passed through between them,

cause the rollers to return to their position, Fig. 2, where they are stopped by brackets *x*, ready for another blank. Just in front of rollers *g* a spring-holder, *g'*, is sunk in the bed-plate, which is depressed by the pin *p* as it passes over it, but springs up and holds the halves of the shank apart while the eye of the key is formed. Beyond the forming-rollers *i* there is an opening, *a'*, in the plate *a*, through which the finished keys are discharged. At a proper distance above plate *a* is a horizontally-sliding arm, *m*, on the front end of which a tool-holder, *n*, is affixed. (See Figs. 3 and 4.) This tool-holder *n* has a sleeve, *o*, in it, held by set-screws *o'*; or it may be made in one piece with the tool-holder. In this sleeve *o* a pin, *p*, fits and slides up and down, and is constructed as seen in Fig. 3. This pin *p* should be as large as the outside of the eye of the key, and its lower end turned down to the size of the interior of the eye of the key that is to be formed. This is important, giving a large part, which just fits the recess *k* formed by the rollers *i*, and causes them to revolve as it passes through between them, while the blank out of which the key is formed is bent around the reduced portion of pin *p* without any strain being brought upon the smaller part to turn the rollers *i*.

The operation is as follows: The blank from which the key is made is fed in a sufficient distance, regulated by the gage *h*, and is then cut off by the slide-cutter *e*. The pin *p* drops into place, and is forced forward against the center of the blank, which it bends into a loop and carries forward between the stud-rollers *g*, which are grooved to the figure of the blank, the ends of which are held apart by the studs or pins *f* until the spring-holder *g'* rises up, after pin *p* has passed over it, between the two parts of the shank, while the bight enters the recess *k* in the forming-rollers, which are caused to turn by the enlarged part of pin *p*, so as to allow the said pin to pass through between them, which bends the blank close around the reduced part of pin *p*, and crimps the two sides close in contact at the neck of the shank, which result is aided by the spring-holder *g'*, that keeps the ends of the shank apart until the eye is formed, after which, as

the pin *p* advances beyond the forming-rollers *i i*, the shank is drawn through and straightened. When the finished key thus formed leaves the forming-rollers it is brought over the opening *a'* in the plate *a*, and the pin *p* is drawn out of the eye of the key, which is prevented from rising by the clearers *r*, and then falls out of the machine. The pin *p* is drawn up out of the eye of the key by means of an arm, *p'*, affixed to it, which projects through a slot in the side of the sleeve *o*, and strikes a stationary incline, *s*, that raises it. When the arm *p'* reaches the upper end of the slot in sleeve *o* it is held by a bayonet-catch, onto which it is turned, and where it remains until the slide *m* recedes, carrying the pin *p* back into the first position, where the arm *p'* is thrown off and the pin drops into place, aided by a spring, *t*, in the sleeve *o*, ready for a second operation.

The main slide *m*, from which all the other parts receive their motion, is made to slide forward and back by any convenient moving power and mechanical device. The rollers *i i*

can be relatively adjusted to compensate for wear or varying sizes of the blanks by a slide and set-screw, *x'*, as seen in Fig. 2. The sides of the shank of the pin *p* in that case are reduced somewhat, leaving the front full size, which does not interfere with the adjustment.

In the invention herein described, I claim—

1. The combination, as herein described and shown, of the notched rollers *i i* and the mandrel *p* and the springs *y' y'*, the rollers being moved in one direction by the mandrel *p*, and in the opposite direction by the springs *y' y'*, as and for the purposes herein set forth.

2. The combination of the spring-holder *g'* and rollers *i i*, for forming the crimp in the eye of the key.

3. The combination of the stud-rollers *g*, spring-holder *g'*, and forming-rollers *i i*, as and for the purposes specified.

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Witnesses:

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