

(No Model.)

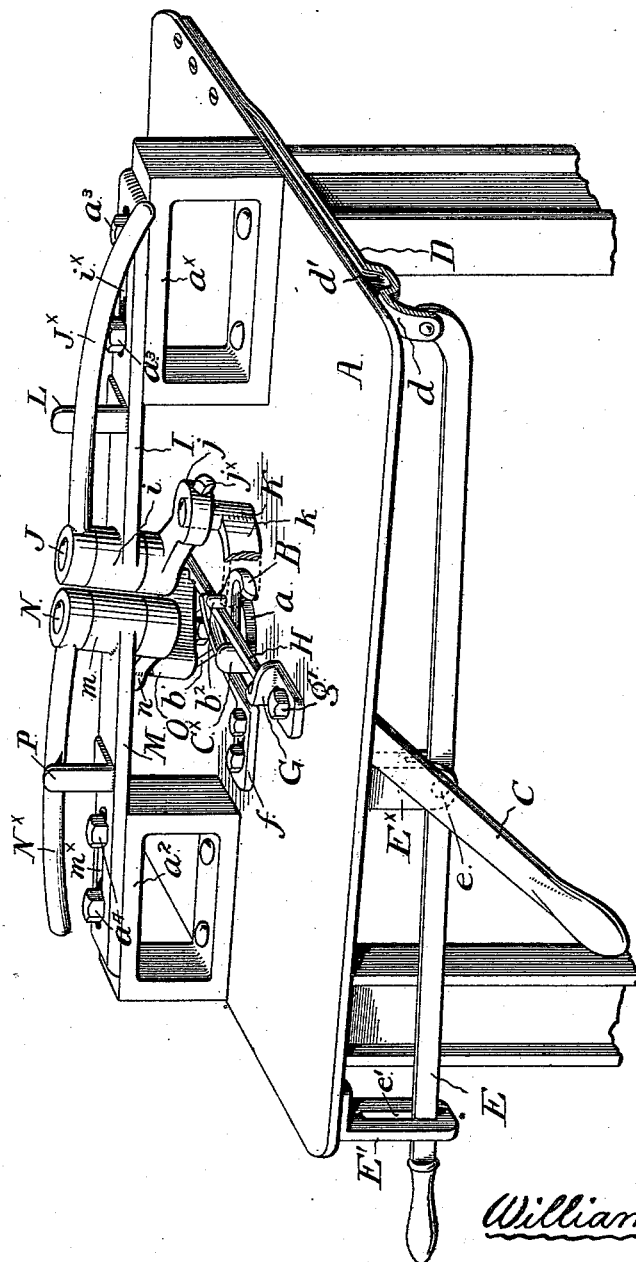
2 Sheets—Sheet 1.

W. DUNN.  
MACHINE FOR MAKING NUT LOCKS.

No. 420,266.

Patented Jan. 28, 1890.

Fig. 1.



WITNESSES:

F. Norman Dixon  
Lewis Altman.

William Dunn,  
INVENTOR

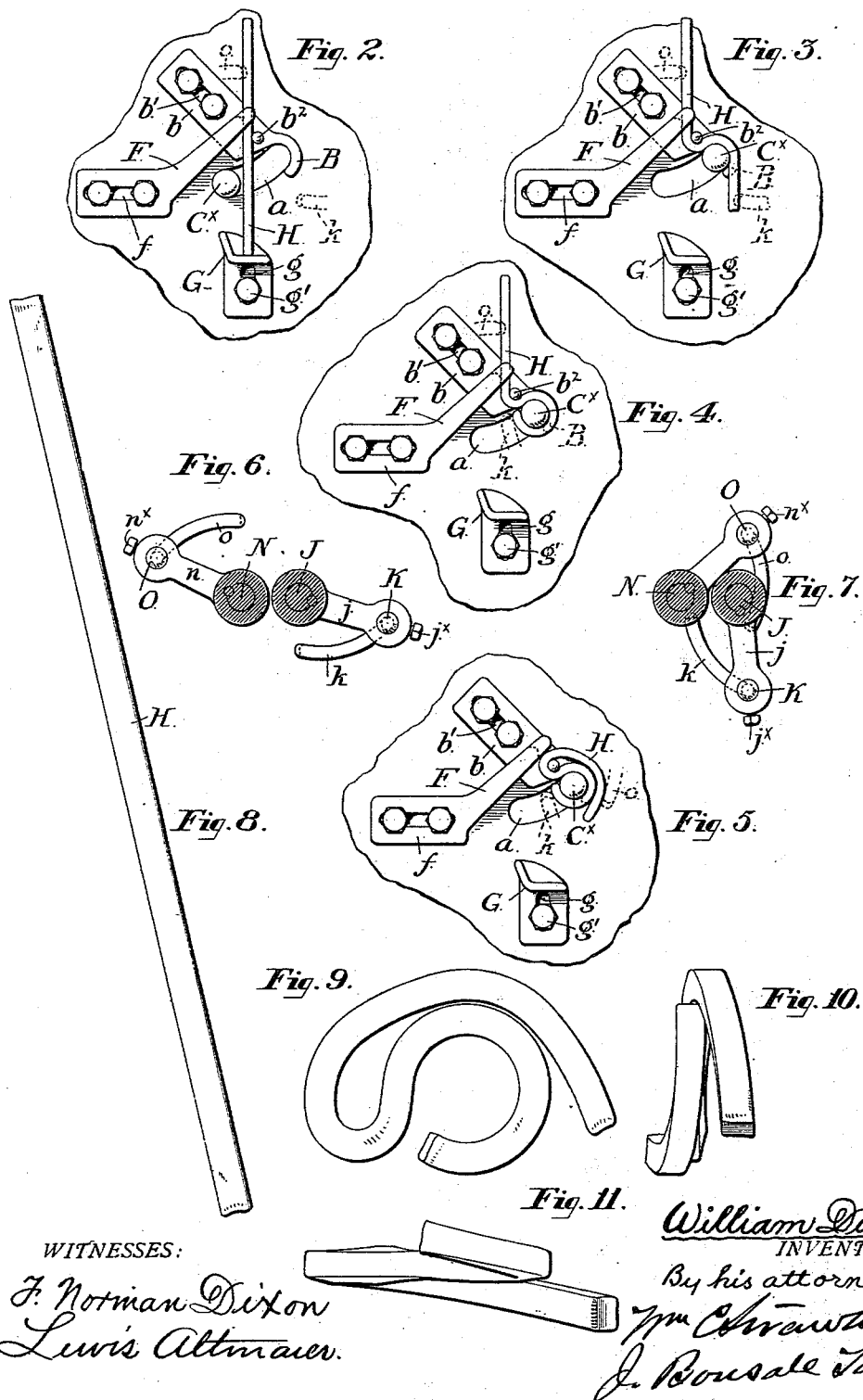
By his attorney  
J. C. Crawford  
J. Bonnell Taylor.

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# UNITED STATES PATENT OFFICE.

WILLIAM DUNN, OF PHILADELPHIA, PENNSYLVANIA.

## MACHINE FOR MAKING NUT-LOCKS.

SPECIFICATION forming part of Letters Patent No. 420,266, dated January 28, 1890.

Application filed June 28, 1889. Serial No. 315,907. (No model.)

### *To all whom it may concern:*

Be it known that I, WILLIAM DUNN, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making Nut Locks, of which the following is a specification.

In Letters Patent of the United States No. 382,078, granted May 1, 1888, there is shown described and claimed a nut fastener invented by me, and consisting of a single strip of material having one end coiled, forming a spring and an eye, and the other end portion bent around the said eye, and having a spring portion adjacent to the said eye, the ends of the fastener being set out in opposite directions.

The object of my present invention is the construction of a simple and efficient machine for the manufacture, in various sizes, of nut locks of the character described in the Letters Patent above referred to.

In the drawings, Figure 1 is a perspective view of a machine embodying my invention. Figs. 2, 3, 4, and 5, are fragmentary top plan views of a portion of the table of the machine, showing the curved slot, the doubling stud, the former and anchor pin, the holder F, and the stop G, and also a metal blank and illustrating the successive bends which are imparted to it,—in Fig. 2 showing the blank in the position it occupies when first placed in the machine, in Fig. 3 the form it is then caused to assume by the throw of the doubling lever, in Fig. 4 the form it is then caused to assume by the throw of the finger K, and in Fig. 5 the form, being a completed nut lock, which it is finally caused to assume by the throw of the finger O. Figs. 6 and 7 are top plan views of the fingers K and O, illustrating the open and closed position of said fingers respectively. Fig. 8 is a view of a straight blank of metal to be formed into a nut lock, and Figs. 9, 10, and 11, are various views illustrative of the completed nut lock formed by my machine.

In the drawings, A is the table of the machine, conveniently embodying near its center an arc-shaped slot *a* having rounded ends. At that end of this slot which in Fig. 1 is farthest from the eye, and which I denomi-

nate the inner end, is located and secured to the table, a former, B, consisting of a semi-annular piece of metal which extends around the end of the slot and as to its inner edge conveniently coincides with the margin thereof. The top of the former is made to incline downward from one end to the other. The former is provided with a shank *b*, embodying a longitudinal slot, *b'*, through which bolts are passed to secure said shank and former to the table in any desired position of adjustment. A vertical pin or post which I term the anchor post *b''*, is, for a purpose hereinafter explained, formed as a part of or rigidly secured to the former, or if desired to the table.

A lever C, adapted to have movement in a horizontal plane, and which I term the doubling lever, is situated beneath the table, has its fulcrum so located as to be concentric with the slot *a* of the table, and is provided with a vertical stud or finger, termed herein the doubling stud C<sup>x</sup> which projects upwardly through the slot *a* in the table and is carried backward and forward therein by the movement of the lever.

When the doubling lever is thrown inward as far as it is permitted to move, I arrange for retaining it in such position, by providing a catch, such, for instance, as the spring latch D. This latch is, as shown, a bar of spring metal, one end of which is secured beneath the table, and the other or free end of which, embodies an inclined plane, *d*, and a notch or recess, *d'*. The doubling lever in its inward throw encounters and slides upon the inclined plane and drops into the recess, by which it is held against movement until released. I find it convenient to employ, as a device to release said doubling lever, a releasing bar E, being a lever attached at its inner extremity to the nose or outer extremity of the latch D, fulcrumed intermediately of its length by a pivot pin *e* in supports E<sup>x</sup> depending from the table, and at its outer end passed through a vertical slot *e'* formed in a depending support E', whereby its movement is limited, and beyond which it is provided with a suitable handle.

The arrangement of latch and releasing bar shown, while convenient and well answering

the purpose of its provision, is simply one of many well known devices to which resort may be had to accomplish the same result.

Upon the table A, to the left of the shank 5 of the former, is secured a holder F, the base *f* of which is adjustably secured to the table and the upper part of which is arched over the shank of the former B and terminates at a point near the pin *b*<sup>2</sup>. Upon the table A is 10 also secured an abutment or stop, G, the base of which is formed with a longitudinal slot *g*, through which a bolt *g'* passes to secure said stop in any desired position of adjustment.

The operation of so much of the machine 15 as has been described is as follows:—A blank H, being a straight bar of metal, is heated to the proper temperature, and, the doubling lever being in its outer position as shown in Fig. 1, is passed through between the holder 20 F and doubling stud *C*<sup>x</sup> on the one side, and the anchor post *b*<sup>3</sup> on the other, until it encounters the abutment G which stops it and serves as a gage by which it is retained in position to be acted upon. The doubling lever 25 is then thrown from its outer to its inner position and until its handle becomes engaged in the latch, with the result that the doubling stud, which is in such throw carried along the curved slot *a*, encounters that end 30 of the blank nearest the eye in Fig. 1, and carries it around until the stud reaches the end of the slot and the bent end of the blank is placed just in front of the finger K, whereof hereinafter.

In the foregoing operation the rear end of the blank is held in place against lateral movement by the holder F. The blank will now have been given the shape shown in Fig. 3; the anchor pin around which the blank 40 has been bent, will project through the central bend of the blank and serve to hold said blank in place during the further operation of the machine; and the doubling stud will be in position against the outside of one of 45 the legs of said blank.

To complete the formation of the nut lock, the legs of the blank are to be bent about the former and the doubling pin, one leg with a downward and the other with an upward trend, and, to accomplish this, I resort to bending fingers, supporting devices therefor, and operating levers, which are of the following construction:—

I is a bracket plate, supported upon a table 55 pedestal *a*<sup>x</sup>, and secured to said pedestal by means of pedestal bolts *a*<sup>3</sup> which pass through longitudinal slots *i*<sup>x</sup> in said bracket, and with said slots render said bracket longitudinally adjustable.

60 J is a pivot pin, mounted for rotation in a sleeve or bearing *i* attached to or formed as a part of the inner end of the bracket I. To the upper portion of this pin is secured an operating or finger handle *J*<sup>x</sup>, and to its lower 65 portion is attached, or as a part of said lower portion is formed, a projecting arm *j*. In the outer portion of said projecting arm is se-

cured the finger K, the same being formed as a vertical stem, mounted in a bearing in the arm and adapted to be secured in various po- 70 sitions of adjustment therein by means of a set screw *j*<sup>x</sup>,—the lower portion of which is provided with a horizontal projection *k*.

When the machine is in readiness to be operated, the finger is out, that is to say, lies 75 in such position that when the doubling stud has made its throw the blank end which it pushes before it, will be placed just in front of such finger. To cause this finger to be al- 80 ways stopped accurately in the proper position, I limit the throw of its handle by providing a stop L, secured in suitable position upon the bracket plate I. When the leg of a blank is, as stated, brought just in front of the said finger, an operator, grasping the 85 handle *J*<sup>x</sup>, swings it around, and in so doing the finger, carrying before it said blank leg, describes a partial circle, and causes said leg to partially encircle the doubling post, and to lie upon the upper face of the former, to the 90 inclination of which it conforms.

The bearing or sleeve *i* on the bracket plate and the pivot pin mounted therein, are inclined sufficiently from the vertical to cause the finger to move in a plane having the nec- 95 essary inclination from the horizon.

The finger when in its open position is at the lowest point of its path of movement, and when said finger moves forward it gradu- 100 ally rises. To the leg of the blank which it bends, and which is the inner leg or member of the completed nut lock, is consequently imparted the necessary upward trend, as described in my Letters Patent referred to.

M is a second bracket plate, secured upon 105 a table pedestal *a*<sup>2</sup> by means of the pedestal bolts *a*<sup>4</sup> which pass through longitudinal slots *m*<sup>x</sup> in said bracket, so that the plate may be longitudinally adjusted.

N is a second pivot pin, mounted for rota- 110 tion in a sleeve or bearing *m* attached to or formed as a part of the inner end of said bracket M.

To the upper portion of the pin N is secured a second finger handle *N*<sup>x</sup>, and to its lower 115 portion is attached, or as a part of said lower portion is formed, a projecting arm *n*. In the outer portion of said projecting arm is secured the finger O, formed as a vertical stem, mounted in a bearing in the projecting 120 arm *n* and adapted to be secured in various positions of adjustment therein by means of a set-screw *n*<sup>x</sup>, and provided as to its lower portion with a horizontal projection *o*.

When the machine is in readiness for op- 125 eration the finger O will be in its open position, and, to cause said finger to be always stopped accurately in said open position, I limit the throw of its handle by providing a stop P, secured in suitable position upon the 130 bracket plate M.

When a blank has been fed to the machine its rear leg or end will lie just in front of the finger O, so that after the throw of the doub-

ling lever and the first finger handle J<sup>x</sup>, when the second finger handle N<sup>x</sup> is thrown the finger O will carry said leg before it. The finger O describes a partial circle, and causes  
5 said leg to partially encircle the former.

The bearing or sleeve *m* on the bracket plate and the pivot pin mounted therein are inclined sufficiently from the vertical to cause the finger to move in a plane having the necessary inclination from the horizon. The  
10 finger O when in its open position is at an elevated point in its path of movement, and, in consequence of the inclination of its pivot pin, when the finger moves forward, it will  
15 gradually descend. To the leg of the blank which the finger O bends, and which is the outer leg or member of the completed nut lock, is consequently imparted a downward trend, as described in my Letters Patent referred to.  
20

The organization and operation of the machine having now been fully described, it is obvious that it is capable of such adjustment as enables it to manufacture nut locks of various sizes. To make nut locks of a size larger than those which the machine happens to be making when at a given adjustment, the bracket plates I and M are drawn away from each other whereby the radii of the arcs described by their fingers are lengthened, and  
30 a former of a larger size is substituted for the one then on the machine,—or, when it is desired to make nut locks of a size smaller than those made by a machine at a given adjustment, the bracket plates are caused to more nearly approach each other, and a former of smaller size is substituted. When the machine is adjusted to make larger or smaller sizes of nut locks, the set of the fingers in  
35 their bearings is also to be readjusted.

Having thus described my invention, I claim:—

1. In a machine for making nut locks, in combination, the doubling lever and pin, fingers, each connected with a separate pivot pin, and each capable of moving independently of the other, and independent movable bearings for said pivot pins, substantially as set forth.  
45

2. In a machine for making nut locks, in combination, the doubling lever and pin, the fingers connected with independent inclined pivot pins, and independent bearings, adjustable to different positions, for said pivot pins, substantially as set forth.  
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3. In a machine for making nut locks, in combination, the removable former, the fingers, and the swinging arms in which said fingers are mounted, the movements of which arms carry the fingers partially about the former, substantially as set forth.  
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4. In a machine for making nut locks, in combination, a former, two independent fingers, two inclined swinging arms in which said fingers are respectively mounted, two independent pivots to which said arms are respectively connected, and two independent brackets each embodying a bearing for one of said pivots and each embodying a longitudinal slot in its body, and by means of bolts  
60 passing through said slot and secured to the table, said brackets are capable of being set in different positions, substantially as set forth.

5. In a machine for making nut locks, in combination, the doubling lever and pin, the former, the fingers, arms in which said fingers are mounted, independent pivot pins to which said arms are connected, bearings in independent movable brackets for said pivot pins, and independent finger handles by which said pivots are rotated, substantially as set forth.  
75

6. In a machine for making nut locks, in combination, the doubling lever and pin, the former, the fingers, arms in which said fingers are mounted, independent inclined pivot pins to which said arms are connected, independent inclined bearings in independent movable brackets for said pivot pins, and independent finger handles by which said pivots  
80 are rotated, substantially as set forth.

In testimony that I claim the foregoing as my invention, I hereunto sign my name this 1st day of June, A. D. 1889.

WILLIAM DUNN.

Witnesses:

J. BONSALE TAYLOR,  
WM. C. STRAWBRIDGE.