

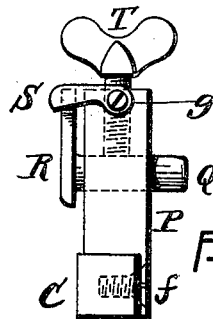
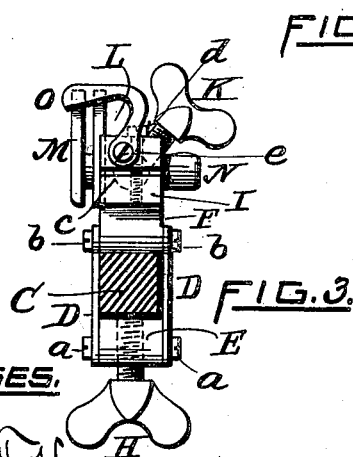
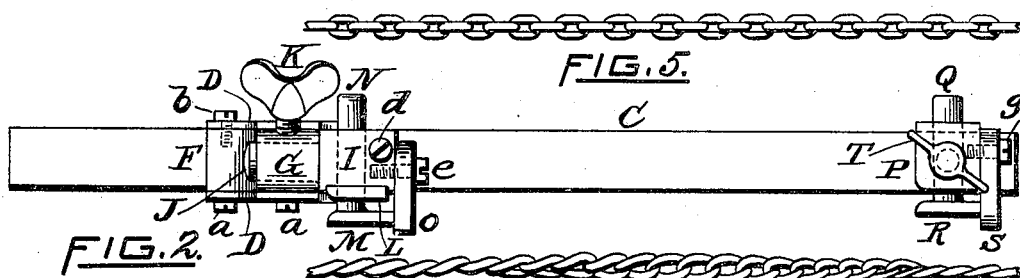
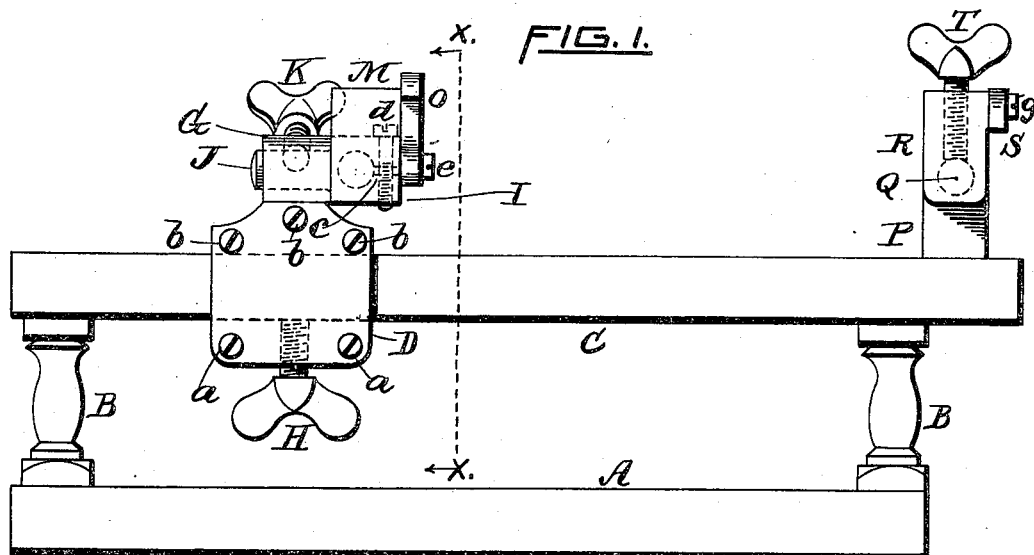
No. 649,091.

Patented May 8, 1900.

H. F. WILLIAMS.
CHAIN CURBING MACHINE.

(Application filed June 14, 1899.)

(No Model.)



WITNESSES.

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UNITED STATES PATENT OFFICE.

HENRY F. WILLIAMS, OF PROVIDENCE, RHODE ISLAND.

CHAIN-CURBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 649,091, dated May 8, 1900.

Application filed June 14, 1899. Serial No. 720,584. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. WILLIAMS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Chain-Curbing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a front elevation of my invention. Fig. 2 is a top plan of the same. Fig. 3 is a view, partly in section, on line $x x$ of Fig. 1 and partly in elevation as seen in the direction of the arrows there. Fig. 4 is an end elevation of my invention. Fig. 5 is a view in elevation of a common chain whose links are at right angles to each other alternately. Fig. 6 is a view showing the chain in the process of curbing and moving in the direction of the arrow there.

My invention is an apparatus or machine adapted to develop the bends of the links of a chain which have been initially curbed by a lathe or otherwise; and it consists in the novel construction and combination of the several elements or parts hereinafter particularly specified, and as set forth in the claims.

In the drawings, A represents a bar rectangular in cross-section and constituting the base of the machine.

B B are posts extending up from the base-bar A and held to the base-bar by screws. (Not shown.)

C is the guide-bar, which has mortises to receive tenons from the upper end of the posts B. Said mortises and tenons are not, however, shown, as being well understood as one of various fastening devices adapted for the purpose.

The guide-bar C is square in cross-section.

On the guide-bar C is a movable box made up of two plates D D, a bottom portion E, and a top portion F, the latter having integral therewith an upward extension or post G. Screws $a a$ pass through the plates D D and bottom portion E, and screws $b b$ pass through the plates D D and top portion F. The upper surface of the bottom piece E is in contact with the adjacent portion of the lower surface of the guide-bar C. The lower surface of the top portion F is in contact with

the adjacent portion of the upper surface of the guide-bar C, and the inner surfaces of the plates D D are in contact, respectively, with the sides of the guide-bar C, as is fully shown in Fig. 3. The bottom piece E is tapped, as indicated in Fig. 3, for the reception of the thumb set-screw H. Said box is movable along the guide-bar C and is fastened thereon in any desired position by means of the thumb set-screw H.

The post G has a circular aperture through it near the top thereof. A cubical head or block I has a cylindrical stem J, which passes through the aperture of the post G, so that said head or block has a limited rotation, and a thumb set-screw K, passing through a tapped hole in the post G, extends into forcible contact with the stem J of the head or block I. This head or block I has a transverse circular aperture and a slot c , which extends from the outer end of the head or block into said circular aperture. An upright fixed guide-plate L, held by a screw or otherwise, extends upwardly from the head or block I. A movable guide M has a cylindrical stem N, which passes through the circular aperture of the head or block I, and a screw d , by drawing together the slotted portions of the head or block I, holds securely said stem N by pinching and so aids to prevent rotation of said stem. The straight part of the movable guide M lies parallel to the guide-plate L of the head or block I. A bent lever O is screwed at its lower end, as seen at e , to the head or block I, and its outer end extends beyond the top end of the movable guide M.

At the end of the guide-bar C is the fixed post P, fastened, as shown in Fig. 4, by means of the screw f . It has a circular transverse aperture through which passes the cylindrical stem Q of the movable guide R. The guide R has its upwardly-extending portion parallel with the contiguous surface of the fixed post P. A thumb set-screw T through a tapped hole in said fixed post has its end in forcible contact with the stem Q. A stop or lever S is screwed at one end to the post P, as shown at g , and its outer end passes against and beyond the upper end of the guide R.

The sliding box is movable along the guide-bar C toward and from the fixed post P and is secured in the desired position by the thumb

set-screw H. The distance of the guide M from the plate L is adjusted, by means of the stem N, in the aperture of the head or block I, and the guide M is held in adjustment by the set-screw *d*. The distance of the guide R from the fixed post P is adjusted, by means of the stem Q, in the aperture of the post, and said guide is held in adjustment by the thumb set-screw T. The angular direction of the parallel guides L M relatively to the guide-bar C and fixed post P is adjusted by the rotation of the stem N in the aperture of the post G, and the thumb set-screw K holds said guides in such adjusted position.

Having thus described the parts of my machine, I will proceed to explain its purpose and mode of operation.

Said device is adapted to curb the links of chains, particularly watch chains, guards, and similar chains made of gold, silver, or plated stock. Chains as commonly made of oblong rounded links have said links engaged with each other at right angles alternately, as shown in Fig. 5. In order that the links shall all lie substantially in the same plane, they require to be curbed, as indicated at the right-hand end of Fig. 6. This is done by giving a twist bend to each link to place them in proper relation to each other. It has been usual heretofore to curb such chains by taking them when in the shape shown in Fig. 5 and placing them in a lathe, one end of the chain being held by hand and pincers and the other end secured to the chuck of the lathe. By revolving said chuck several times as far as may be required the chain is twisted, and the links being comparatively soft and yielding bend each other into a somewhat-spiral twist until they all lie practically in the same plane; but such twisting cannot be absolutely uniform, especially when a considerable length of chain is thus operated upon in a lathe. It is therefore a common practice to do this curbing by hand upon very short portions of the chain by means of pliers; but such work requires considerable time and the results are not uniform. It is the purpose of my improved apparatus to do this work rapidly and uniformly upon long sections of chain, and this I accomplish as follows: I give to the chain, Fig. 5, a slight initial twist or bend in a lathe from end to end in the manner above described just sufficient to start and determine the curbing. The subsequent draft upon the chain, as hereinafter described, will cause the links of the chain to be further bent or twisted; but the twists or bends are in the places thus initially determined and cannot be elsewhere. In this manner the preliminary twists or bends are developed to the desired degree. I place the base-bar A in the jaws of a vise which is mounted on a bench or other suitable support. The guides M R are adjusted so as to be the desired distance away from the plate L and the post P, respectively, and held in place by the screws *d* K T. The sliding box

carrying the guide M is moved along the guide-bar C to the desired position and there fastened by the screw H. The bent lever O is swung back clear of the aperture between the guide M and plate L, and the lever S is also swung back clear of the aperture between the guide R and post P. I place the left-hand portion of the chain, Fig. 6, which has been initially bent, as above described, edgewise down into the space between the guide-plate L and guide M, which have been adjusted, as aforesaid, to provide a space between them wide enough to receive said chain edgewise. The extreme right-hand end of the chain, Fig. 6, I turn over edgewise one hundred and eighty degrees—that is, I bring what was the upper edge of the chain half-way over, so that it shall be the lower edge, and insert said lower edge of the chain down into the space between the guide R and the fixed post P. This placing of the chain between the guides L M and P R gives a loose half-twist to it, as illustrated in Fig. 6. The levers O S are then moved into the position shown in Figs. 3 and 4. After the chain has been so placed I then draw by the forward (right-hand) end with sufficient force in the direction indicated by the arrow in Fig. 6. It will be seen that during this drawing operation the contiguous surfaces of the guide M and plate L furnish opposite bearing-surfaces to the portion of the chain which is passing between them, and in like manner the contiguous surfaces of the guide R and post P provide opposite bearing-surfaces to the portion of the chain which is passing between them and that the portions of the chain between said bearing-surfaces, respectively, cannot rotate at all, but are confined to a direct linear travel. These bearings-surfaces serve not only to support the chain in position therein, as stated, but also constitute friction-surfaces to somewhat resist the pull on the chain while the drawing operation continues. In this way the forcible pulling of the chain between the bearings L M and R P develops the twist or bend of each link of that portion of the chain within the space intervening between said bearings or guides L M and R P and so completes the curbing of the chain with an absolutely-uniform bending of the links throughout the chain.

The distance of the guides L M and P R from each other determines the pitch of the half-twist of the chain between them. The nearer they are together the finer the pitch; the farther they are apart the coarser the pitch. If it is not desired to give the chain between said guides so much as a half-twist, the screw K can be loosened, whereupon the block or head I, with its guide-plate L and guide M, can be partially rotated and set at an angle and there secured in position again by the screw K, so that the upper (left-hand) edge of the chain, Fig. 6, will not be at an angle of one hundred and eighty degrees from

the lower (right-hand) edge of said chain, but at an angle of less than one hundred and eighty degrees.

As the guides M and R are rotatable when free upon their cylindrical stems N and Q, respectively, the pull of the chain in being drawn through the guides, as described, has a tendency to overcome or impair the hold on said stems by the screws K and T and to oscillate said guides M and R toward the right. This tendency is guarded against by the stop-levers O and S, respectively.

It is evident that if the guides M and R are not adjustable, but are fixed in position relatively to the near surfaces of the plate L and post P, respectively, parallel bearing-surfaces are formed, which are serviceable for the purpose of curbing chains, the adjustability not changing at all the principle or mode of operation of the device, but only increasing its capacity to curb chains of different sizes.

I am aware that machines have been used for curbing link chains in which the chain is intermittently moved between vibrating dies which by their periodical closing flatten such links as are between them at the time of said operation; but my device differs from such machines in that in my invention the chain is not acted upon by any dies, but the links bend each other into the desired twist when the chain has been placed in the two guides, as described, and the chain is drawn forcibly through them, the twisting being initially determined before the operation, but developed in the open space between said guides by the draft of the chain through them, as specified.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. In a machine for developing the initial curbing of the links of a chain, the combination of a fixed support and two guides mounted thereon, each guide being provided with a rectangular aperture and said apertures being in the same plane, substantially as and for the purpose specified.

2. In a machine for developing the initially-curved links of a chain, the combination of a fixed support and two guides mounted thereon, each guide being provided with a straight rectangular aperture whose opposite longitudinal sides are parallel to each other and separated a distance apart approximately equal to the minor diameter of said chain, and having their said apertures in the same plane, substantially as shown.

3. The combination of a guide-bar provided with a proper support, a post secured to said guide-bar, a guide extending parallel to one side of said post and movable and adjustable on said post with means of holding it in position upon said post, a slide upon the guide-bar having a post extending therefrom, means of holding said slide adjustably on said bar, a head-block rotatably mounted on the post of said slide, with means of holding said head-

block adjustably thereon, a guide-plate carried by said head-block, a guide extending parallel to said guide-plate and movable and adjustable on said head-block, with means to secure the guide last named in position on said head-block, substantially as specified.

4. The combination of the guide-bar C, properly supported, the post P mounted on said bar and having a parallel guide, the sliding box, held adjustably upon said bar by the thumb set-screw H and comprising the plates D D, bottom piece E, and top piece F, held together by screws *a a b b*, the post G extending from the top piece F and carrying a guide-plate L and a guide M, arranged parallel with each other, substantially as described.

5. The combination of the guide-bar C, properly supported, the post P mounted on said bar and having a parallel guide, the sliding box held adjustably upon said bar by the thumb set-screw H, and comprising the plates D D, bottom piece E and top piece F, held together by screws *a a b b*, the post G extending from the top piece F and having a circular aperture extending in a direction parallel to the bar C, a head-block I having a circular aperture extending in a direction at a right angle with the bar C and also having a slot *c* from one side thereof and opening into the aperture last mentioned, a cylindrical stem J extending from the head-block I and passing through the aperture of the post G, a thumb set-screw K passing through the post G and bearing against said stem J, a guide-plate L extending from the head-block I, the guide M extending parallel with the guide-plate L and having a cylindrical stem O, which passes through the aperture of the head-block and the set-screw *d* through the slotted portions of the head-block, substantially as shown.

6. The combination of the guide-bar C, properly supported, a sliding box movable and adjustable thereon and carrying a parallel guide, the post P fixed upon the bar C and having a circular aperture, a guide R arranged parallel with one side of said post and having a cylindrical stem Q, which passes through the aperture of said post, and a thumb set-screw T passing through the top of said post into forcible contact with said stem, substantially as set forth.

7. In combination with the guide-bar C, properly supported, the post P having a circular aperture, a guide R rotatably mounted on said post by a cylindrical stem Q passing through said aperture, and a stop bar or lever S, pivoted at one end to said post and movable into contact with the edge of said guide R, substantially as and for the purpose specified.

8. The combination with the guide-bar C, properly supported, of a sliding box movable thereon, the post G extending from said box, the head-block I carried by said post and having a circular aperture, the guide-plate L ex-

tending from said head-block I, the guide M
having the stem N, which passes through
said aperture, and the bent lever O pivoted
at its lower end to the head-block I and hav-
5 ing its upper end movable into contact with
the edge of the guide M, substantially as
shown and for the purpose specified.

In testimony whereof I affix my signature
in presence of two witnesses.

HENRY F. WILLIAMS.

Witnesses:

ALFRED S. JOHNSON,
WARREN R. PERCE.