2 Sheets—Sheet 1.

J. E. BATES.

Formation of Carriage-Spring Clips.

No. 217,852. Patented July 29, 1879.

Fig. 1.

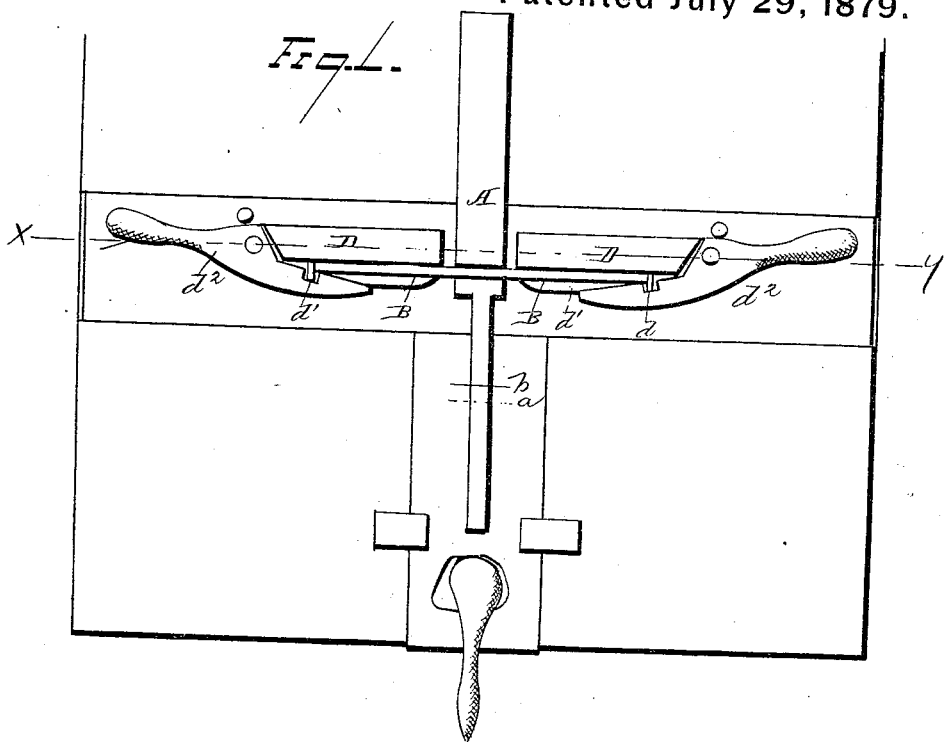
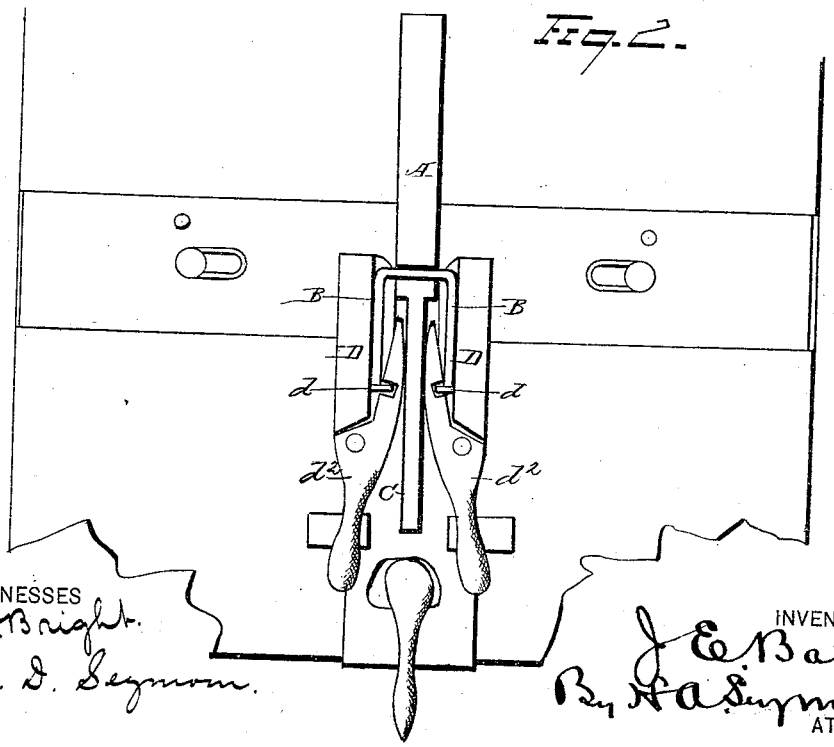


Fig. 2.



WITNESSES
A. M. Bright.
Geo. D. Seymour.

INVENTOR
J. E. Bates.
By H. A. Seymour.
ATTORNEY

2 Sheets—Sheet 2.

J. E. BATES.

Formation of Carriage-Spring Clips.

No. 217,852. Patented July 29, 1879.

Fig. 4.

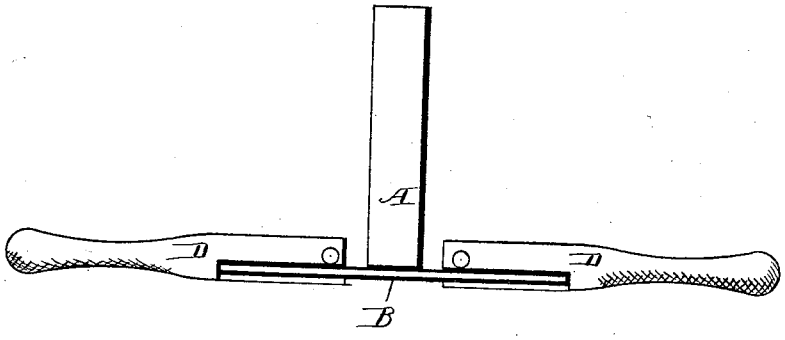
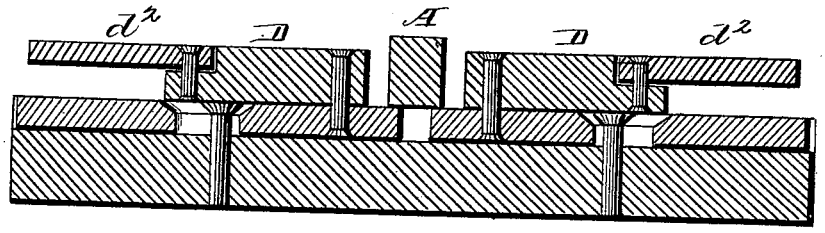


Fig. 3.



WITNESSES

A. M. Bright.

Geo. D. Seymour.

INVENTOR

J. E. Bates.

By H. A. Seymour.

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHNSON E. BATES, OF WATERTOWN, CONNECTICUT.

IMPROVEMENT IN THE FORMATION OF CARRIAGE-SPRING CLIPS.

Specification forming part of Letters Patent No. **217,852**, dated July 29, 1879; application filed December 30, 1878.

To all whom it may concern:

Be it known that I, JOHNSON E. BATES, of Watertown, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Formation of Carriage-Spring Clips; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to the formation of carriage-spring clips, and is designed to form the latter with upset corners which are strong and capable of resisting the strain imposed upon them in use.

It is well known that the point at which the most severe work is required of the clips, and which should, therefore, be the firmest, is at the respective corners thereof. Heretofore, in the various methods of formation, the extremities of the clip-blank have been left free to give or lengthen out correspondingly to the tendency of the metal as the latter is subjected to the bending treatment which forms it into the shape of clip required; and inasmuch as there has been no means by which the metal is prevented from elongating during the process of forming the corners of the clip, the result has been that the portion of metal constituting said corners is rendered weak and of slight relative strength to the work demanded of it in practical use. This objection applies equally well to those methods of formation which first bend the blank and afterward, by suitable mechanism, fill out the corners, so as to make them of same sectional dimension with the remaining portion of the clip, for the reason that though in such instances the corners are full, yet the fin or surplus metal which is crowded therein by said compacting process subsequent to the bending of the blank can only give shape to the corners, and does not re-enforce or impart additional strength to the strained or weakened metal at said points. To obviate this disadvantage, and to so form the clip that it may have no portion of the metal which is in the corners strained or wrenched in its fiber, is the object of my improvement, which results in compressing and strengthening the metal, as well as in shaping the same.

The improvement consists in placing the blank upon a suitable support and retaining the central portion thereof in a fixed position, and then subjecting the opposite ends of the blank to end compression simultaneously with bending it into the desired form.

Referring to the drawings, Figure 1 is a plan view of a machine illustrating one form of mechanism for carrying out the invention, the same having a clip-blank therein preparatory to being operated upon. Fig. 2 represents said machine and clip-blank in position when the latter has been bent with compacted corners. Fig. 3 is a sectional view through line *x y* of Fig. 1. Fig. 4 is a modification view.

The fixed jaw A, which serves as a rear lateral bearing for the longitudinal central portion of the clip-blank B, may be of any suitable form, as may also the adjustable jaw C, which serves as a forward lateral bearing for the said portion of the blank, and about which the same is bent into the desired formation.

The levers D are pivoted, respectively, on opposite sides of the forward end of said fixed jaw, and are made with abutments *d*, against which the extremities of the clip-blank fit when the latter is in position to be operated upon. These levers are both pivoted outside of the longitudinal axis of the clip-blank as the latter is placed in position in the machine to be operated upon. As the levers are moved forwardly upon their pivots these abutments not only prevent the fibers of the blank from distending in the direction of their length, but also compress the blank longitudinally, thus bending the blank into the desired shape, with upset corners, which are full in their sectional dimensions, and not strained or impaired in their fibrous formation.

The dotted line *a* in Fig. 1 shows to what point the extremities of the blank would have extended if the levers pivoted outside of the axis of the blank and adapted to subject the blank to end compression had not been employed, while the line *b* shows the point to which said extremities reach in consequence of the employment of my levers. Each of said

levers is made with a longitudinal recess, d^1, having an open front, and within which the corresponding extremity of the blank fits. They also are each provided with pivoted handles d^2, the inner portions, respectively, of which are adapted to fit against the front or exposed side of the clip-blank, and serve to retain the latter in position within the lever-recesses. These levers are adjustable to and from each other, so as to conform to the varying lengths of the clip-blanks which may be subjected to the operation of the machine. The mechanism shown in the drawings for thus adjusting said pivoted levers, as well as that for adjusting the forward movable jaw or anvil, is of the simplest order, and given merely as an illustration. Any other suitable mechanism may be substituted for either or both the same.

The foregoing description relates to my preferred manner of constructing a machine for carrying out the principle of my invention, and does not limit or restrict the latter in its scope and novelty.

The essential features of any mechanism capable of accomplishing the end in view consist simply of a suitable fixed jaw or support, against which the longitudinal central portion of the clip-blank may have rear lateral bearing, in combination with pivoted levers adapted, in connection therewith, to upset the corners of the clip simultaneously with the bending formation thereof.

The modification view in the drawings represents a machine having simply the rear fixed jaw or support, without a forward jaw, together with levers, which latter are not formed with longitudinal recesses, nor provided with pivoted handles to retain the clip-blank, but, on the contrary, have merely forward studs or lugs, which serve as abutments for the extremities of the blank.

It is apparent that I may make clips of any desired form, other than that shown in the drawings, by constructing a machine corresponding to the requirements of the same, and that such detail changes are fully comprehended in my invention. Thus clips known as "Gothic form," or any other style, may be produced by suitable machines embodying my improvement.

The changes in the mechanism necessary to thus produce the various forms of clips would only be such as could be readily made by one skilled in this art with the above invention made known to him, and therefore I do not consider it necessary to specifically refer to said mechanical changes.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The method of imparting the desired angular form to carriage-clips, substantially as hereinbefore described, the same consisting in placing the blank upon a suitable support and retaining the central portion thereof in a fixed position, and then subjecting the opposite ends of the blank to end compression simultaneously with bending it into the desired form.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of December, 1878.

JOHNSON E. BATES.

Witnesses:
G. H. WATERS,
B. G. BRYAN.