No. 793,564. PATENTED JUNE 27, 1905.

G. L. BUZEK.

BENDING OR SHAPING MACHINE.

APPLICATION FILED MAR. 10, 1904.

3 SHEETS—SHEET 1.

Fig. 1

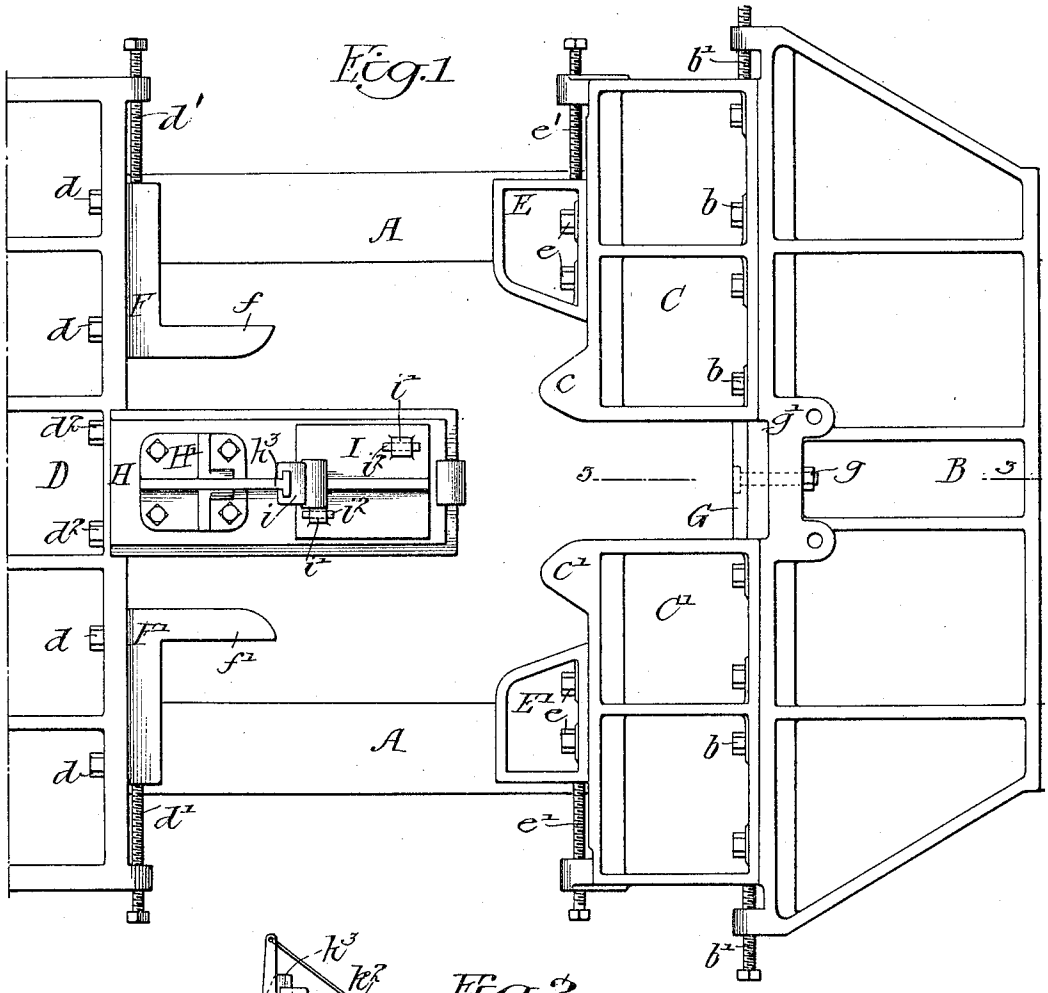
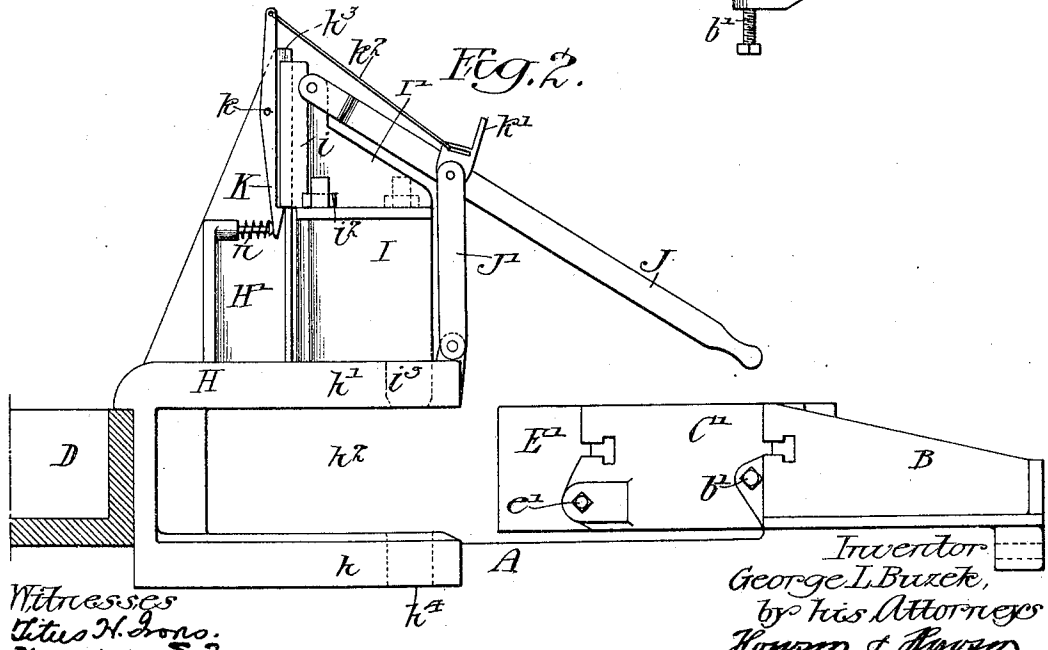


Fig. 2.



Witnesses
Titus H. Sono.
Hamilton D. Turner

Inventor
George L. Buzek,
by his Attorneys
Howson & Howson

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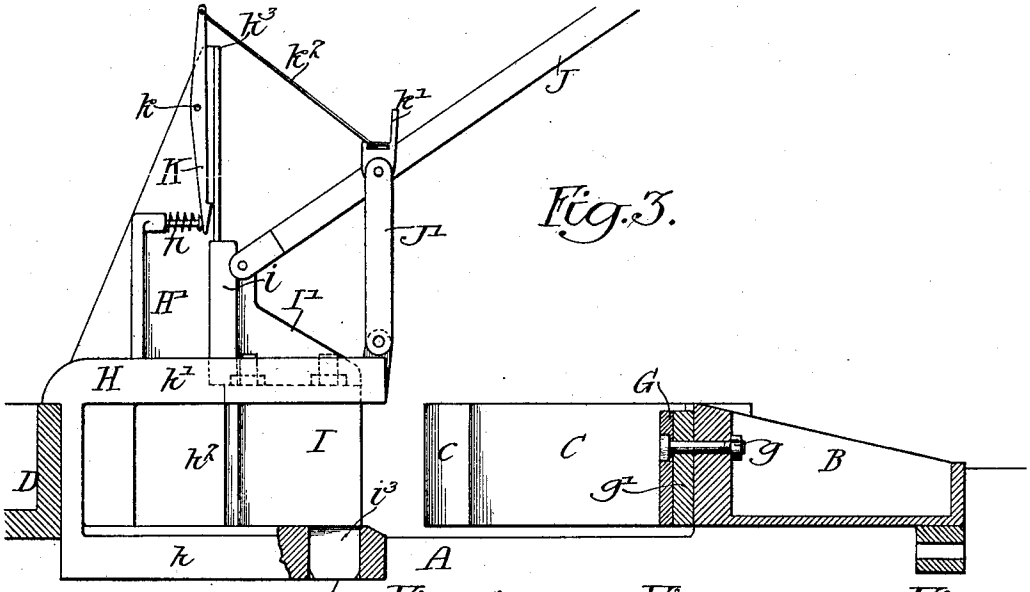


Fig. 3.

Fig. 4.

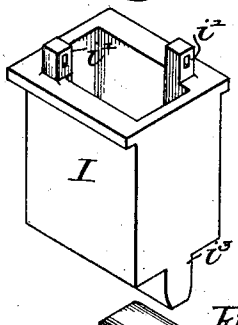


Fig. 5.

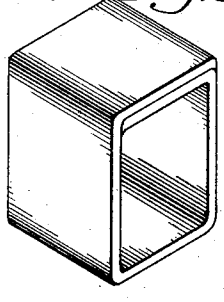


Fig. 6.

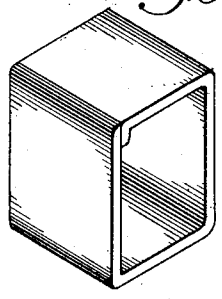


Fig. 7.

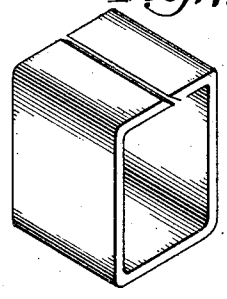


Fig. 8.

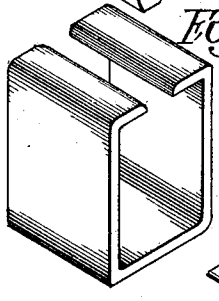


Fig. 9.

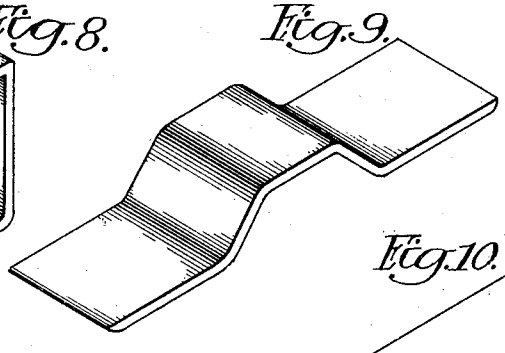
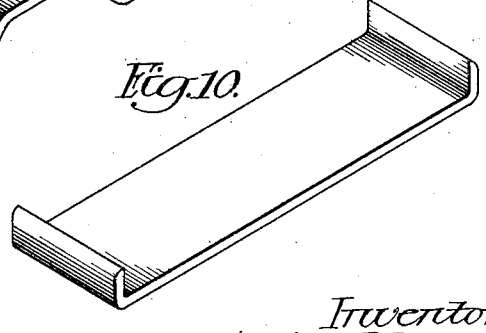


Fig. 10.



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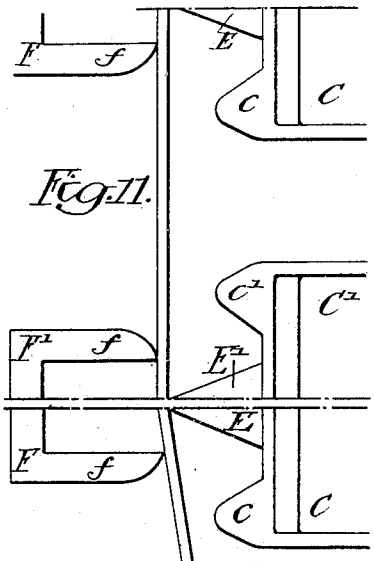


Fig. 11.

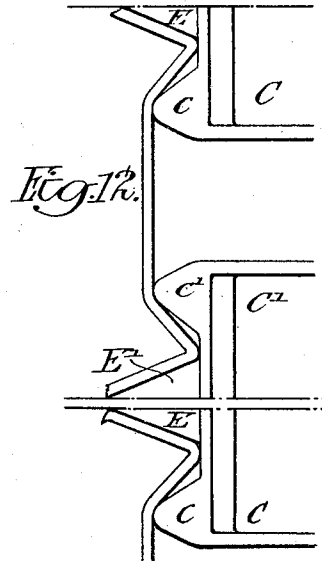


Fig. 12.

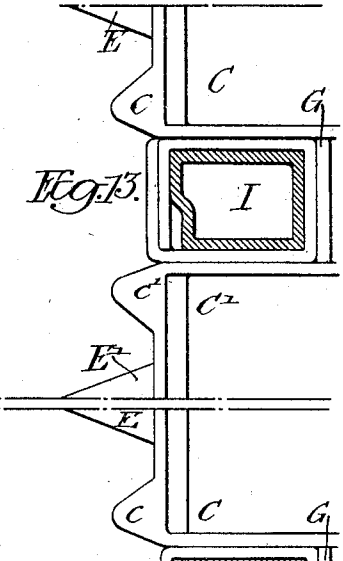


Fig. 13.

Fig. 14.

Fig. 15.

Fig. 16.

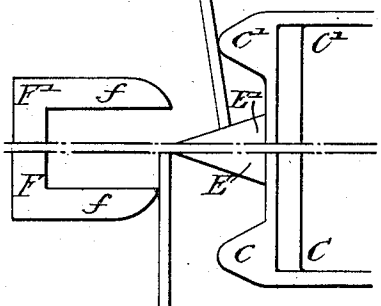


Fig. 17.

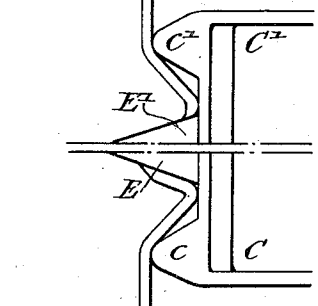


Fig. 18.

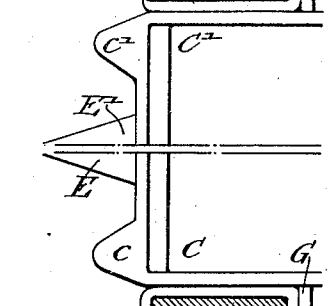


Fig. 19.

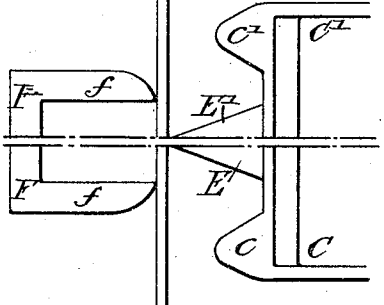


Fig. 20.

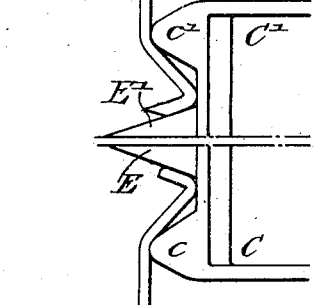


Fig. 21.

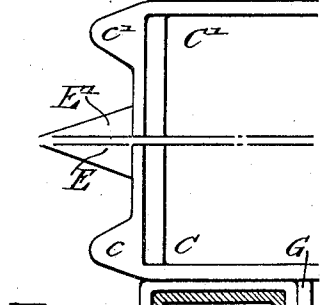


Fig. 22.

Witnesses:
Titus H. Sons.
H. D. Turner

Inventor,
George L. Buzek
by his Attorneys,
Howson & Howson

No. 793,564. Patented June 27, 1905.

UNITED STATES PATENT OFFICE.

GEORGE LOUIS BUZEK, OF LEWISTOWN, PENNSYLVANIA.

BENDING OR SHAPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 793,564, dated June 27, 1905.

Application filed March 10, 1904. Serial No. 197,413.

To all whom it may concern:

Be it known that I, GEORGE LOUIS BUZEK, a citizen of the United States, residing in Lewistown, Mifflin county, Pennsylvania, have invented certain Improvements in Bending or Shaping Machines, of which the following is a specification.

The object of my invention is to construct a machine by which metallic plates—such, for instance, as spring-bands—can be readily and accurately shaped by a simple operation. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my improved shaping-machine. Fig. 2 is a side view showing the former raised. Fig. 3 is a view similar to Fig. 2 with the former in position. Fig. 4 is a perspective view of the former. Figs. 5, 6, 7, 8, 9, and 10 are views of different shapes of bands that can be made by my improved machine. Figs. 11, 12, and 13 are diagrams illustrating the method of making the band shown in Fig. 5. Figs. 14, 15, and 16 are diagram views showing the method of making the band shown in Fig. 6. Figs. 17, 18, and 19 are diagram views showing the method of making the band shown in Fig. 7; and Figs. 20, 21, and 22 are diagram views showing the method of making the band shown in Fig. 8.

A is the base in the present instance, upon which are mounted the two heads B and D, one of which is movable in respect to the other. In the present instance I will describe the head B as fixed and the head D as movable toward and from the head B.

Mounted on the head B are dies C C′, which are secured to the head B by bolts b, and they can be adjusted toward and from each other by set-screws b'.

c c' are horns forming part of the dies C C′, respectively, and mounted on the dies back of the horns are blocks E E′. These blocks are secured to the dies C C′ by bolts e and can be adjusted toward each other by set-screws e'.

G is a plate for varying the depth of the recess between the dies C C′. This plate is held in place by a bolt g, passing through a flange of the head B and secured either by a nut or key. Filling-plates g' can be used in adjusting the plate G, or there may be a series of plates G of varying thickness, according to the size of the band or other shape desired.

Carried by the head D are two shaping-dies F F′, which have horns f, preferably arranged on the inner end in the present instance to act with the dies C C′ to properly bend the plate. The bending-dies F F′ are held to the head D by bolts d d and can be adjusted toward each other by set-screws d', similar to the method of holding and adjusting the dies on the head B.

Mounted between the two dies F F′ is a mandrel-carrier H, firmly secured to the head D by bolts d^2. This carrier is U-shaped, as shown in Fig. 2, having a lower member h and an upper member h', forming a throat h^2, into which the mandrel I can be inserted, but which when the mandrel is raised gives a clear space to allow it to pass over the metallic blank being bent by the forming-dies F F′ in the first operation. The mandrel-carrier has an extension H′, on which is a slideway h^3 for the guides i of the mandrel-holder I′, to which the mandrel I is secured. In the present instance the mandrel I, as shown in Fig. 4, is provided with slotted lugs i' i', which extend through openings in the mandrel-holder I, and keys or wedges i^2 are preferably used to fasten the mandrel to the holder. By this arrangement the holder and mandrel work as one piece, but allow enough play or freedom of movement for any wear on the mandrel or carrier, but not enough to allow strains to be transmitted to the guides. I form on the under side of the mandrel I a projection i^3, which when the mandrel is lowered enters a recess h^4 in the lower member h of the carrier H. By this means I support the mandrel when it is lowered at both ends, making it perfectly rigid and relieving the guides of the strain.

J is a lever pivoted to a link J′, which in turn is pivoted to the outer end of the carrier H. The inner end of the lever is pivoted to the mandrel-holder I′, so that on depressing the lever the holder and the mandrel can be raised to open the throat in the carrier H. In order to retain the mandrel in its raised position, I provide a latch K, which engages

the holder I'. This latch is pivoted at k and is connected to a hand-lever k' by a rod k^2. n is a spring which presses against the latch to force it into engagement with the holder when the holder is raised.

The operating-faces of the blocks E E' are beveled, as shown clearly in Fig. 1, while the back of the blocks are at right angles to the face of the dies, so that the blocks can be reversed when it is desired to make a form such as shown in Fig. 10. The shape of the blocks may vary according to the form to be produced.

I will describe the operation of my invention when it is used for forming metallic bands for springs, in which the ends of the band-blank are scarfed and bent over each other, as shown in Fig. 5.

Referring now to the diagrams, Figs. 11, 12, and 13, the mandrel is raised, as shown in Fig. 2. The flat blank shown in Fig. 11 is placed in position and the head D moved forward, pressing the blank against the dies C C', bending it in the form shown in Fig. 12 over the horns and against the blocks E E'. The head D is then withdrawn and the mandrel lowered, as in Fig. 3. Then the head is moved forward again, and the mandrel forces the blank into the space between the dies C C' and against the plate G. The ends of the blank being bent in the first operation will lap over each other, as shown in Fig. 13. When the head is again withdrawn, the blank is carried with the head, and when the mandrel is raised the blank will be stripped and can be removed to be welded and finished, if desired. If a spring-band of the form shown in Fig. 6 is to be made where the ends are joined at one corner, then the blank is placed between the dies as shown in Fig. 14 and bent as shown in Fig. 15 in the first operation and then shaped as shown in Fig. 16 in the final operation. If the band is to be made as shown in Fig. 7, with the scarfed edges slightly overlapping at the center, then the blank is placed in the machine as shown in Fig. 17, bent in the first operation as shown in Fig. 18, and in the second operation completely formed as shown in Fig. 19, with the scarfed edges overlapping. If an open band is to be made, as shown in Fig. 8, then the blank is placed in the machine as shown in Fig. 20 and bent in the first operation as shown in Fig. 21, and finally bent by means of the mandrel as shown in Fig. 22. If the form shown in Fig. 9 is to be made, the blocks E and E' can be removed from the dies C C'. If the blank shown in Fig. 10 is to be used, the blocks E E' are reversed.

I claim as my invention—

1. The combination in a bending-machine, of two heads, one head movable in respect to the other, dies mounted on one head spaced apart and adjustable, a mandrel carried by the other head and forming dies also carried by said head, horns on the inner corner of each of the first-mentioned dies, and blocks adjustable on said dies and extending beyond the horns, substantially as described.

2. The combination in a bending-machine, of two heads, one movable in respect to the other, dies carried by one head, said dies being adjustable toward and from each other, horns on each die, adjustable blocks mounted on the dies back of the horns, and forming-dies carried by the other head, said forming-dies being adjustable toward and from each other, substantially as described.

3. The combination in a bending-machine, of two heads, one movable in respect to the other, dies carried by one head, said dies being adjustable toward and from each other, horns on each die, adjustable blocks mounted on the dies back of the horns, forming-dies carried by the other head, said forming-dies being adjustable toward and from each other, a carrier mounted on the said head between the forming-dies, and a mandrel mounted on the carrier, substantially as described.

4. The combination in a bending-machine, of two heads, one movable in respect to the other, dies carried by one head, horns on said dies, blocks mounted on the dies, a mandrel-carrier secured to the other head in alinement with the space between the said dies, a mandrel mounted on the carrier, and forming-dies on the said head on each side of the mandrel, substantially as described.

5. The combination in a bending-machine, of two heads, one movable in respect to the other, two dies carried by one head, means for adjusting said dies toward and from each other, an adjustable filling-plate secured to the head and mounted between the dies, said dies carrying horns, adjustable blocks mounted on the dies back of the horns, a carrier mounted on the other head, said carrier having a throat, a mandrel arranged to slide in said carrier and to be moved into and out of the throat, with forming-dies on each side of the carrier, substantially as described.

6. The combination in a bending-machine, of two heads, one movable in respect to the other, dies carried by one of said heads and spaced apart for the reception of a mandrel and blank, a carrier mounted on the other die in alinement with the space between the aforementioned dies, said carrier having a throat, a mandrel movable into and out of the throat, a holder for the mandrel having guides, guideways on the carrier, and means for raising and lowering the holder and mandrel, substantially as described.

7. The combination in a bending-machine, of two heads, one movable in respect to the other, dies carried by one of said heads and spaced apart for the reception of a mandrel and blank, a carrier mounted on the other die in alinement with the space between the aforementioned dies, said carrier having a throat, a mandrel movable into and out of the throat,

a holder for the mandrel having guides, guideways on the carrier, means for raising and lowering the holder and mandrel, a latch for retaining the mandrel in its raised position, and lever mechanism for releasing the latch, substantially as described.

8. The combination in a bending-machine, of two heads, one head movable in respect to the other, two dies spaced apart for the reception of a mandrel and the bent blank, bolts securing the dies to the head, set-screws for adjusting the said dies toward each other, each die provided with a horn at one corner, blocks bolted to the face of the dies back of the horns, set-screws for adjusting the blocks, a mandrel-carrier mounted on the other head directly opposite the opening between the aforementioned dies, a holder arranged to slide on the carrier, a mandrel coupled to the holder, means for raising the holder and its mandrel, forming-dies carried by the head on each side of the mandrel-carrier, and means for adjusting the said forming-dies, substantially as described.

9. The combination in a bending-machine, of two heads, one movable in respect to the other, dies carried by one head, a mandrel-carrier mounted on the other head, a holder arranged to slide on the mandrel-carrier, means for raising and lowering the holder, a mandrel having lugs extending through openings in the holder, and wedges passing through the lugs and securing the mandrel to the holder, substantially as described.

10. The combination in a bending-machine, of two heads, one movable in respect to the other, dies carried by one head spaced apart to receive a mandrel and the bent blank, a carrier mounted on the other head in line with the space between the said dies, said carrier having a throat, a mandrel mounted on the carrier and arranged to be moved into and out of the throat, a projection on the mandrel arranged to enter a recess in the lower member of the carrier so that the mandrel will be supported at both ends by the carrier, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE LOUIS BUZEK.

Witnesses:
WM. H. WREN,
WM. F. ECKBERT, Jr.