No. 671,536. Patented Apr. 9, 1901.

T. E. CARLISS.

METHOD OF MAKING METALLIC BRAKE BEAMS.

(Application filed Apr. 30, 1900. Renewed Feb. 5, 1901.)

(No Model.)

Fig. 1

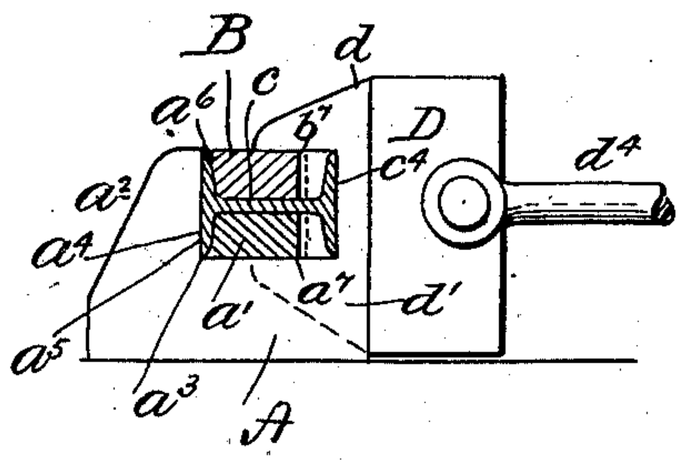


Fig. 2.

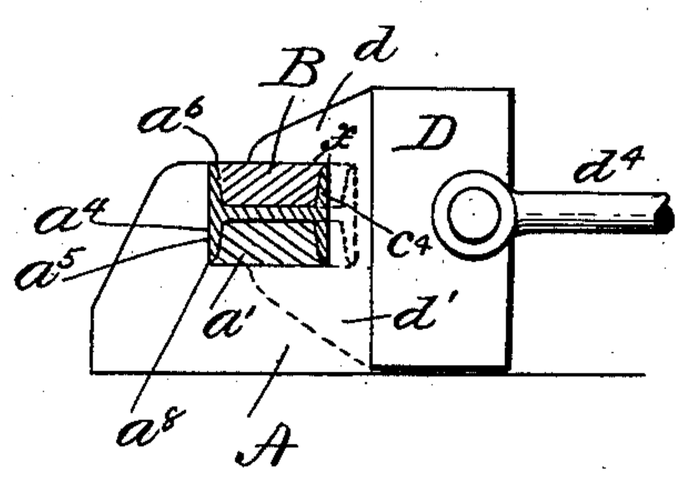


Fig. 4.

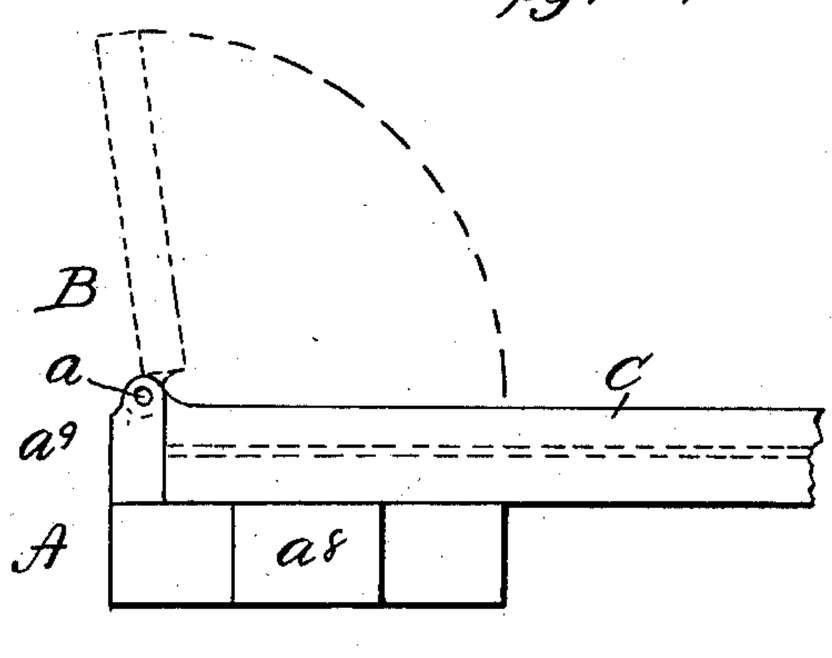


Fig. 3.

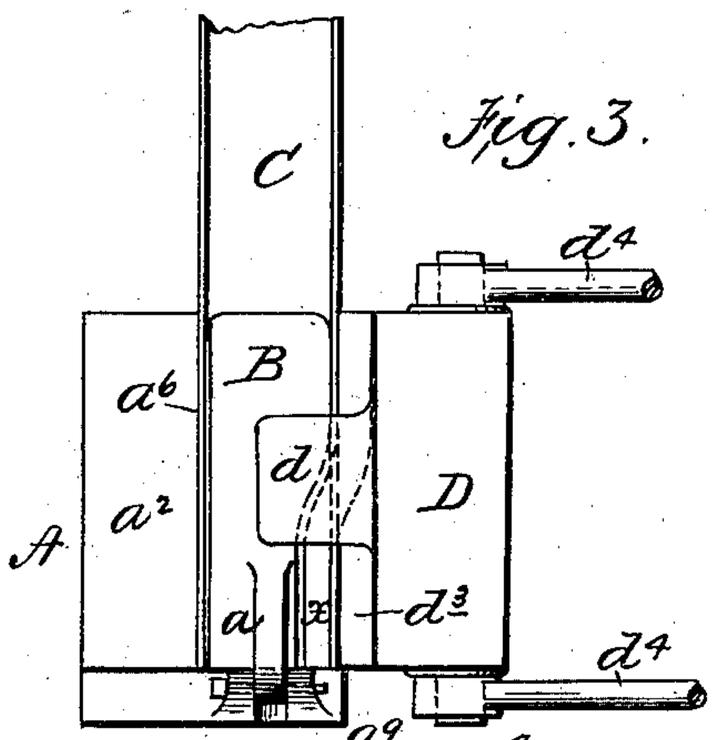


Fig. 6.

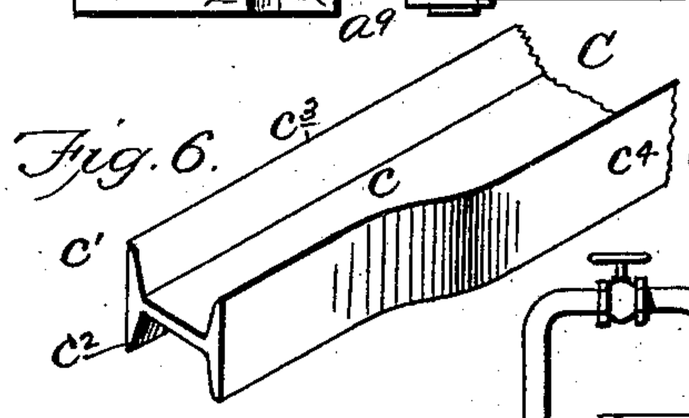
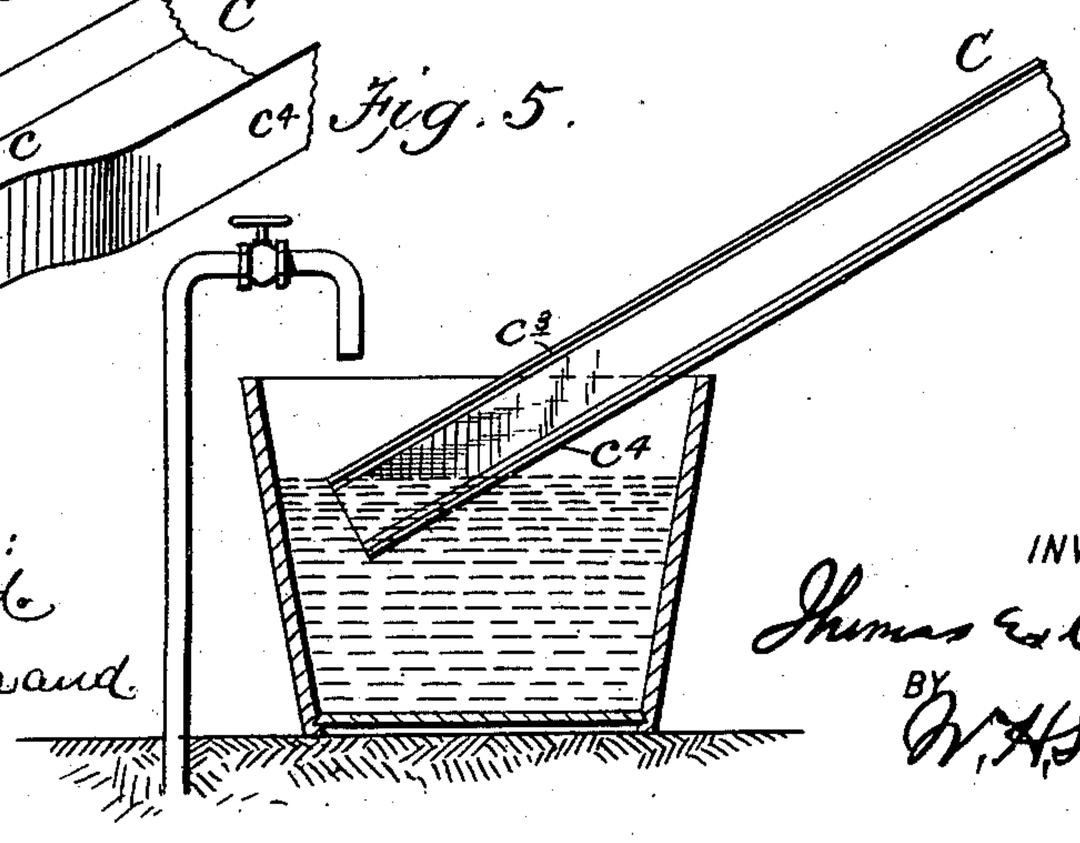


Fig. 5.



WITNESSES:
F. L. Durand
Wm. H. Durand.

INVENTOR
Thomas E. Carliss,
BY
W. H. Singleton
ATTORNEY

UNITED STATES PATENT OFFICE.

THOMAS E. CARLISS, OF DETROIT, MICHIGAN, ASSIGNOR TO THE MONARCH BRAKE BEAM COMPANY, LIMITED, OF SAME PLACE.

METHOD OF MAKING METALLIC BRAKE-BEAMS.

SPECIFICATION forming part of Letters Patent No. 671,536, dated April 9, 1901.

Application filed April 30, 1900. Renewed February 5, 1901. Serial No. 46,157. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. CARLISS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Methods of Making Metallic Brake-Beams; 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 appertains to make and use the same.

This invention relates to an improvement in methods of making metallic brake-beams, and more especially a brake-beam the ends of which are reduced in size.

The invention consists in the method hereinafter set forth.

In the annexed drawings, Figure 1 represents a partial end and partial transverse section of so much of an apparatus as is essential to the production of the brake-beam, the operative parts not being shown in the drawings, as they may be of any well-known construction. This figure shows the apparatus just before beginning to reduce the end of the beam, such end being shown full size. Fig. 2 shows a similar view after the end of the beam has been reduced or compressed, the full width of the beam being represented by dotted lines. Fig. 3 represents a top view. Fig. 4 represents a side view of the dies, the top die being represented in dotted lines as swung open. Fig. 5 represents one step in the process when the metal is temporarily hardened. Fig. 6 represents in enlarged size a portion of the complete beam after reduction or compression.

In the drawings, A and B represent bottom and top dies hinged together at a. The present apparatus being intended for manipulation of an I-beam, the construction of the die adapted to such a beam is shown and will be described. The lower die A is formed upon its top with a longitudinal strip or bearing-piece a' of sufficient length to support the web c of the beam C. This bottom die A also has a back vertical extension a^2, extending upward above the top of the longitudinal strip or bearing-piece a'. Between the edge a^3 of the bearing-piece and the edge a^4 of the extension a^2 there is left a space a^5 of sufficient dimensions to take one extension c^2 of the flange c' of the brake-beam C. The upper die B is the complement of the strip or bearing-piece a' and is adapted to bear upon the upper part of the web c of the beam C. There is a space a^6 similar to the space a^5 between the vertical extension a^2 and the upper or top die B when the latter is down, such space a^6 being adapted to receive the other extension c^3 of the flange c' of the brake-beam C. Both dies A and B are chamfered off at their corners a^7 and b^7, having the shape adapted to the resultant curvature which is to be given to the end of the brake-beam. The die A is provided at or near its middle with a recess a^8.

To the open side of the dies and alined with their chamfered corners is a compressor or "bulldog" D. This bulldog has two lips d d', having between them a space d^2, the depth of which is about that of the thickness of the longitudinal strip or bearing-piece a', the top die B, and the space between them occupied by the web c of the beam C. The lower lip d' is alined with and adapted to fit a recess a^8 of the lower die A. Adapted to and alined with the chamfered corners of the dies the compressor D is provided with an extension d^3. This extension d^3 has a shape and size complementary to that of the chamfered corners of the two dies. This compressor D is connected by rods d^4 with any suitable means for operating the said compressor or bulldog.

Operation: In carrying out the method described for the reduction or compression of the brake-beam the brake-beam, such as indicated in Fig. 3, is placed in the apparatus with the web c of the beam lying on top of the bearing-piece a' of the bottom die A and the top die B is turned down on top of such web, the flange c' resting in the spaces a^5 and a^6 between the vertical extension a^2 and the longitudinal strip or bearing-piece a' and the top die B. The end of the other flange c^4 extends out beyond the chamfered portion or corners a^7 and b^7 of the two dies, there being a space between such flange and such chamfered corners. The object of the apparatus is to force this end of the flange c^4 back against the chamfered corners of the dies, so as to give the end of the beam the configuration of the dies. To accomplish this purpose,

the end of the brake-beam to be affected by the apparatus must be heated to a swaging heat or to such a degree of heat that the end may be reduced by compression. Before placing the end of the beam in the dies the corner of the beam which is to be acted on by the compressor is dipped into water, as shown at Fig. 5, so that one end of the flange c^4 is placed in the water. This hardens that portion of the flange c^4 which is to be forced back under compression. This compression is effectuated by forcing up the compressor or bulldog D. As the compressor is forced up against the end of the beam the end c^4 of the latter is forced back against the chamfered end of the die. As this action is accomplished the lips d d' of the compressor D embrace the top and bottom dies, and therefore effectually prevent separation as compression takes place. Preferably the extension a^9 of the lower die A, to which the upper die B is hinged, is made solid, so that the extreme end of the beam C shall abut against it. It is thus manifest that the affected end of the beam is completely inclosed as the compression is effected. The result is that in reducing the end of the beam according to the herein-described method the metal is compressed, there remaining in the compressed end the same amount of metal, though the end of the beam is changed. Also the cross-section of this reduced end is of the same shape. After the end of the beam is reduced and the beam is taken from the dies it is found that the heat from the other portion will flow to that portion of the flange c^4 which has been hardened and that the hardening is only temporary and in no wise permanently affects the metal, but by this temporary hardening a most valuable and important quality has been imparted to the end of the flange c^4. As the compressor D forces the end of the flange c^4 of the beam C up against the dies the temporary hardened end of the flange c^4, unsupported at the back, resists in itself the pressure of the compressor and does not break down, but retains its shape.

A brake-beam constructed according to the above operation and by the herein-described method is provided with reduced or compressed ends, to which the brake-heads are to be attached. Such a beam is adapted to be used with that class of cars in which there is not sufficient space between the tread of the wheels and the sand-board to use a beam having an end of the full size, and yet a beam made according to the present invention has all the strength and efficiency of the beam having the same cross-section its entire length.

Having thus described my invention, what I claim is—

1. The method of reducing a portion of a beam which consists: first, heating the portion to be reduced to a swaging heat; second, temporarily hardening a part of such portion; third, compressing such portion to the desired reduced form.

2. That step in the method of mechanically reducing metal, which consists in temporarily hardening a part of the metal which is to undergo reduction.

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

THOMAS E. CARLISS.

Witnesses:
F. B. JOY,
HARRY U. FROST.