

(No Model.)

N. H. DAVIS

METHOD OF AND APPARATUS FOR FORMING TRUSSES.

No. 574,886.

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Fig. 1.

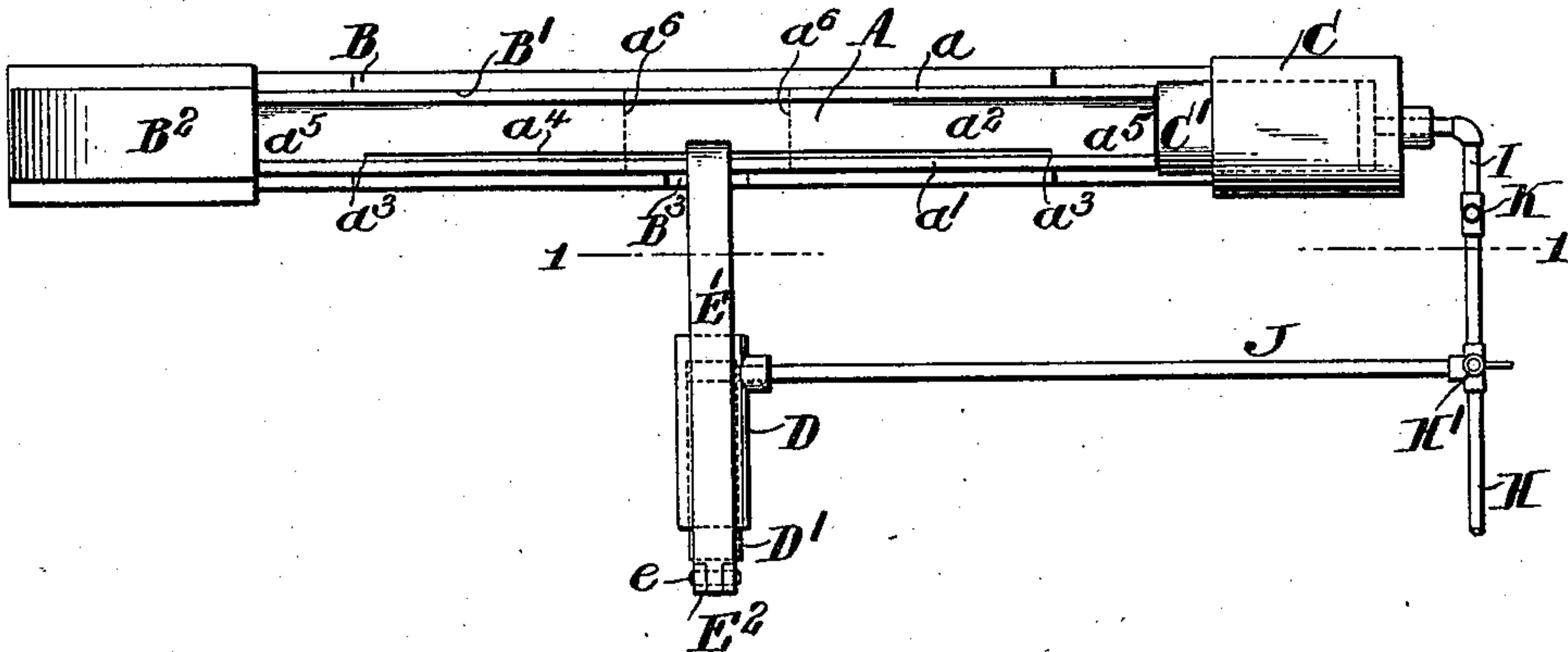


Fig. 2.

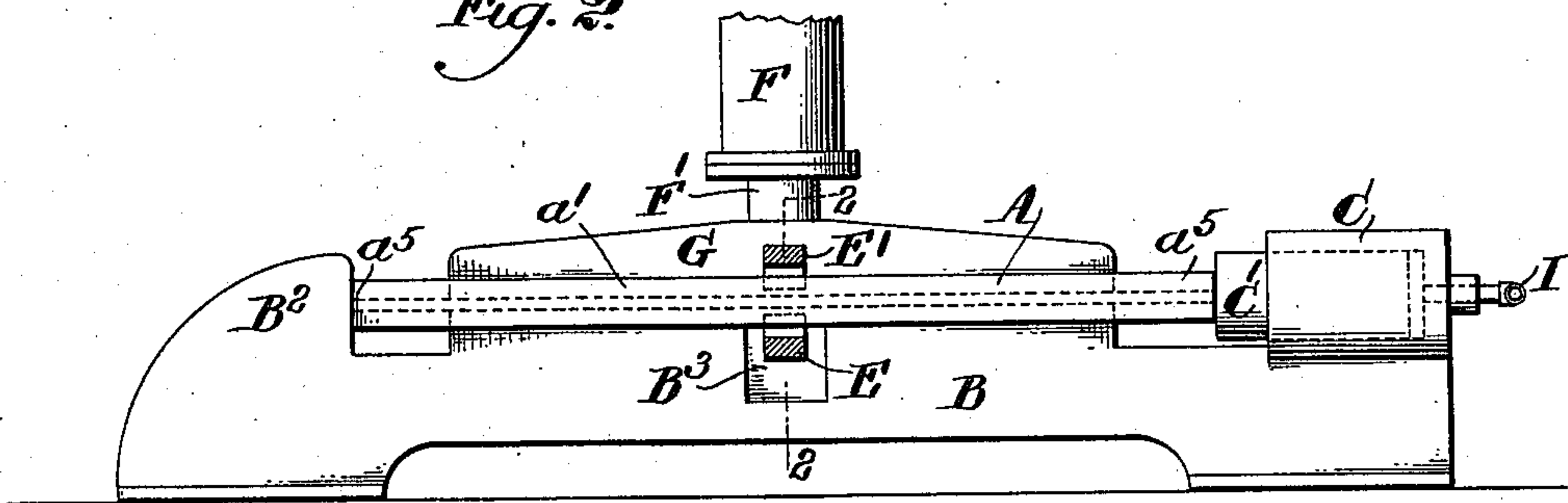


Fig. 3.

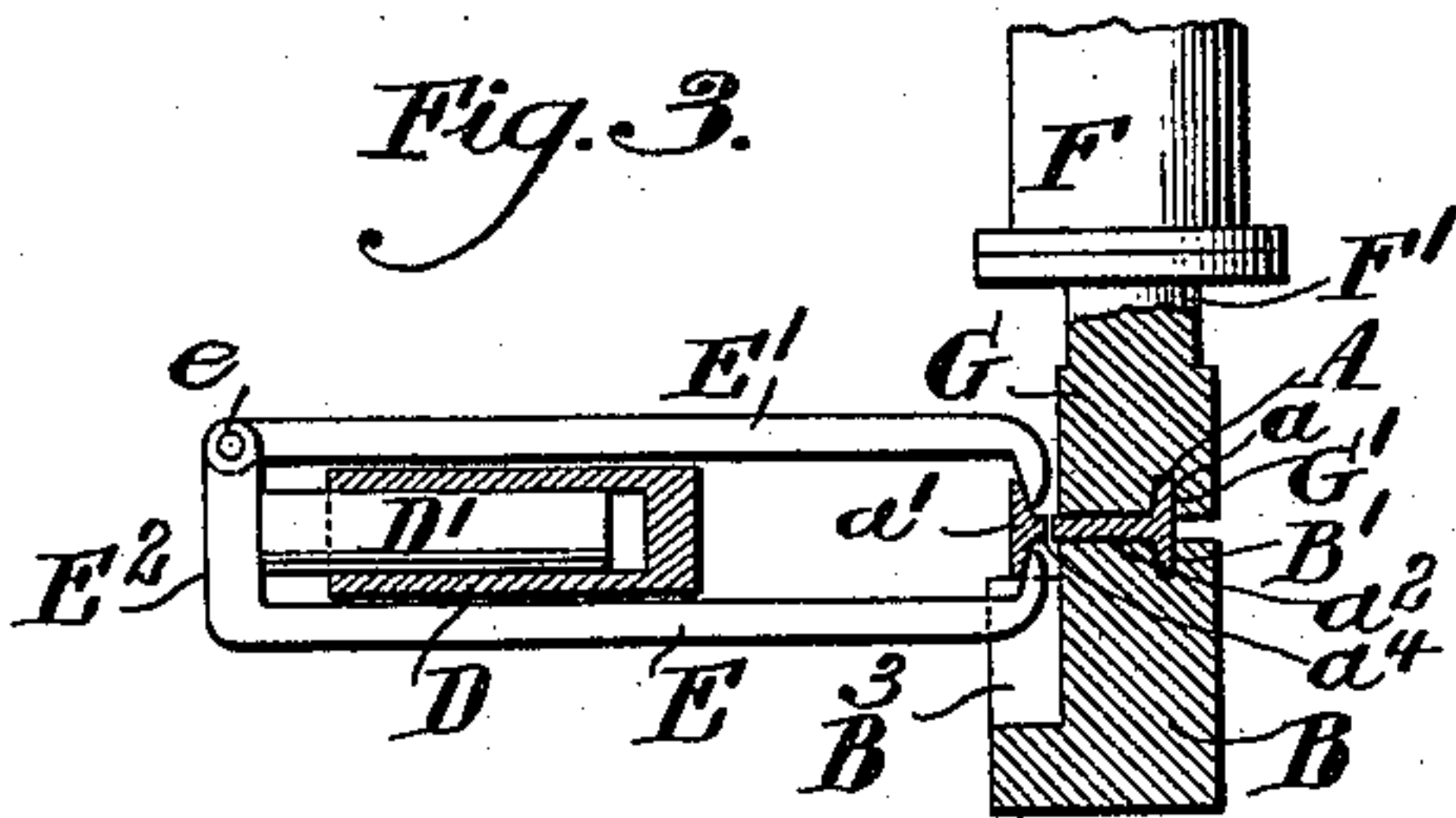


Fig. 4.



Fig. 5.

Witnesses.

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METHOD OF AND APPARATUS FOR FORMING TRUSSES.

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To all whom it may concern:

Be it known that I, NATHAN H. DAVIS, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and Improved Method of and Apparatus for Forming Trusses, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the manufacture of trusses or of truss members out of iron or steel beams.

Trusses have heretofore been made by splitting a rolled iron or steel bar longitudinally, leaving its ends unsevered, and then distending the split bar into the form of a diamond or half a diamond, but in the latter case and by methods heretofore practiced it has been necessary either to cut and piece out a part of the beam, which is drawn into angular shape, or else to stretch and elongate this part of the beam to a dangerous extent; and the object of my invention is to provide a mode of treatment as well as convenient apparatus whereby the split bar may be brought to the truss form desired without requiring any portion of it to be cut or pieced or any portion of it to be elongated and weakened; and my new method consists in first longitudinally slitting an iron or steel bar, leaving it unsevered at the ends, then heating a portion of the bar on one side of the slit, or the whole beam, if desired, to a temperature which will permit of the upsetting of the metal, and then shortening this portion of the bar by pressure upon its ends and drawing the other portion of the bar out away from the shortened portion into the form of a truss. Preferably I form my truss out of a rolled beam of the form known as an "I-beam," in such case slitting the beam through the web at or adjacent to its junction with one flange or head, and I heat and upset that portion of the beam having the greater sectional area, drawing out the portion having the least area to give the desired shape to the truss.

The nature of my apparatus for conveniently practicing my improved method will be best described in connection with the drawings, in which it is illustrated, and in which—

Figure 1 is a plan view showing my appa-

ratus for forming a truss with a beam in position to be operated upon, but with the upper pressing-die removed. Fig. 2 is an elevation of my apparatus, taken on the section-line 1 1 of Fig. 1 and showing the upper or pressure die in place. Fig. 3 is a cross-sectional view on the line 2 2 of Fig. 2. Fig. 4 is a view of a truss or a truss member produced by the practice of my process and the use of my mechanism, and Fig. 5 is a view of the slitted bar from which the truss shown in Fig. 4 is made.

A indicates the bar, here shown as an I-beam, a indicating one flange or head of the beam, a' the other flange or head, and a^2 the web. The first operation performed upon the beam is the slitting of it, the slit being shown between the points $a^3 a^3$, a^4 indicating the slit itself and $a^5 a^5$ the unsevered ends of the beam. The next operation performed upon the bar is the heating of it upon one side of the slit to a temperature which will permit of the upsetting of the metal. This heating may be at any point between the ends $a^3 a^3$ of the slit a^4 , but preferably is in the center of the beam, as, for instance, between the dotted lines $a^6 a^6$.

Referring now to the mechanism, B is the bed-plate of the machine, upon which the beam is placed, a groove B' being conveniently provided for one side of the head a to rest in, and the front of the bed-plate being cut away so as to permit the head a' of the beam to be drawn out away from the rest of the beam. At one end of the bed-plate I provide a stationary abutment B², against which one of the ends a^5 of the beam rests, and at B³, I cut away a portion of the bed-plate to permit the entrance of the device for engaging the head a' of the beam.

C indicates a hydraulic cylinder placed opposite to the abutment B², and C' a piston or plunger working in the cylinder C and which is adapted to rest against and to press upon the other end a^5 of the beam.

D is another hydraulic cylinder placed at right angles to the bed B of the machine, D' being a plunger working in this cylinder.

E and E' are "tongues," so to speak, the hooked ends of which are adapted to engage the flange or head a' . As shown in Fig. 3, they are hinged together, as indicated at e, so as

to permit them to engage with and be withdrawn from the bottom, and are provided with a shoulder, as E^2 , against which the plunger D' is adapted to press.

5 II indicates a pipe for water under pressure, I a branch leading to the cylinder C, and J a branch leading to the cylinder D, II' indicating a cock by which the water under pressure is admitted to the two cylinders,
10 and, as will be readily seen, the result of admitting pressure to these cylinders, the beam being in position upon the bed and engaged by the tongues, will be to upset and shorten the web a^2 of the flange a , the upsetting occurring between lines $a^6 a^6$, while at the same
15 time the head or flange a' will be drawn out to the position indicated in Fig. 4.

In order to avoid the risk of the metal of the bar buckling or bending during the upsetting operation, I provide a short hydraulic
20 cylinder F, the plunger F' of which is connected to a die G, grooved at G' , and adapted to come down upon the beam, as indicated in Fig. 3. The pressure of this die upon the
25 bar will prevent its bending, while at the same time it will yield sufficient to permit the desired upsetting action to take place.

Instead of hydraulic apparatus, which I have indicated because it is well adapted for
30 the purpose, any convenient means for applying the desired pressures to the bar may be used.

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

1. The method of making a truss member which consists in slitting longitudinally an iron or steel beam leaving it unsevered at its ends, then heating the beam on one side of

the cut to a temperature which will permit 40 of the upsetting of the metal, and then shortening the heated side of the slit beam by pressure on its ends and drawing the other unshortened side away from the shortened side as described.

2. The method of making a truss member 45 which consists in slitting longitudinally an iron or steel I-beam at or near the junction of the web with one flange thereof leaving it unsevered at its ends, then heating the beam 50 on the side of the cut upon which the most metal lies to a temperature which will permit of the upsetting of the metal, and then shortening the heated side of the slit beam by pressure on its ends and drawing the other 55 unshortened side away from the shortened side as described.

3. An apparatus for forming truss members out of longitudinally-slit beams comprising means for compressing and upsetting 60 the beam longitudinally, and means for simultaneously drawing away from the upset portion one side of the slit beam substantially as specified.

4. An apparatus for forming truss members 65 out of longitudinally-slit beams comprising means for compressing and upsetting the beam longitudinally, means for simultaneously drawing away from the upset portion one side of the slit beam and means for 70 clamping the beam where it is upset with a yielding pressure to prevent the buckling of the metal.

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Witnesses:

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