Feb 4, 1930. J. A. BICKEL ET AL 1,745,471

APPARATUS FOR ASSEMBLING FABRICATED STRUCTURES

Filed Aug. 4, 1927 4 Sheets-Sheet 1

Fig. 2.

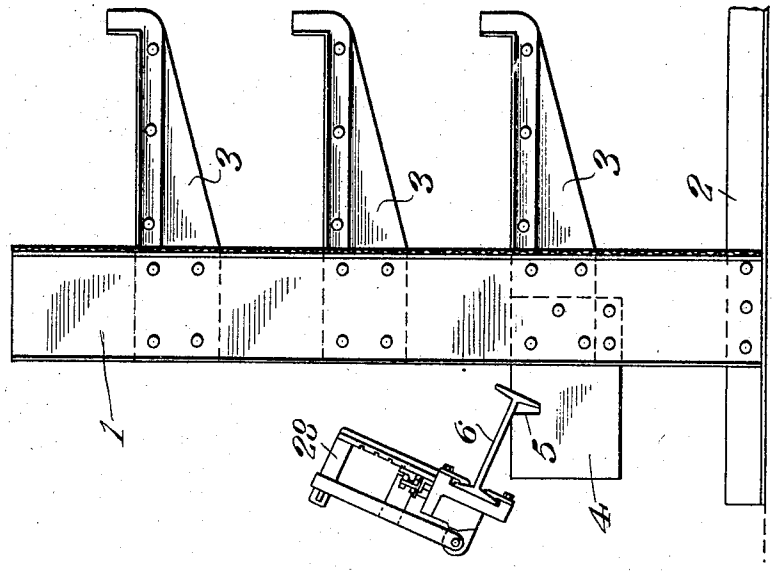
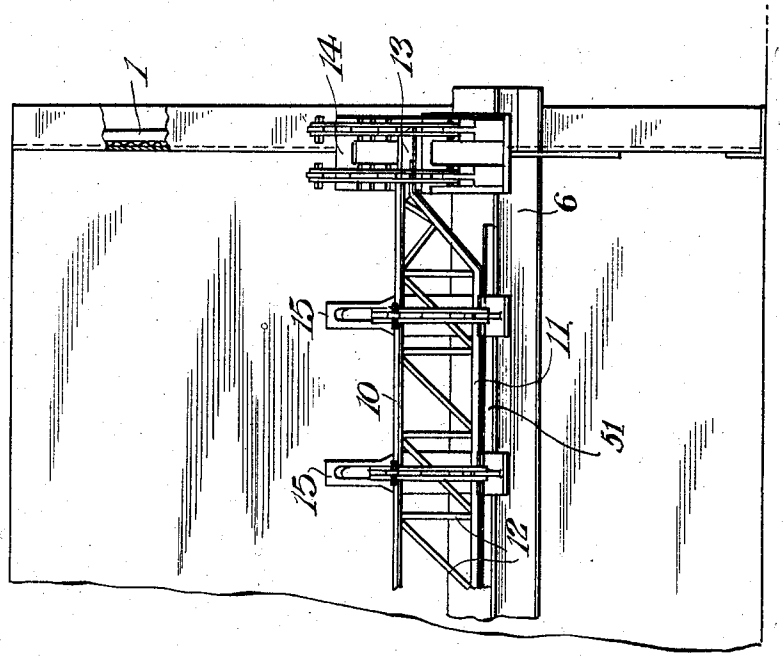


Fig. 1.



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Feb. 4, 1930. J. A. BICKEL ET AL 1,745,471

APPARATUS FOR ASSEMBLING FABRICATED STRUCTURES

Filed Aug. 4, 1927 4 Sheets-Sheet 2

Fig. 5.

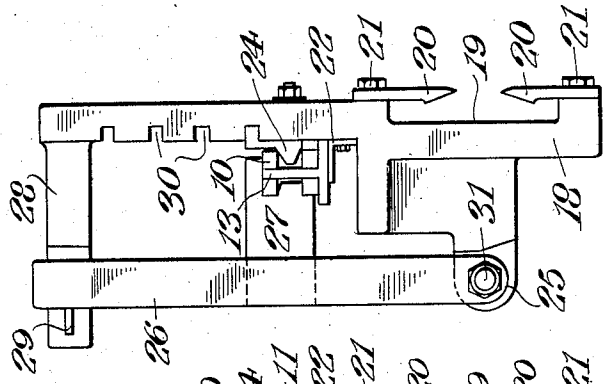


Fig. 4.

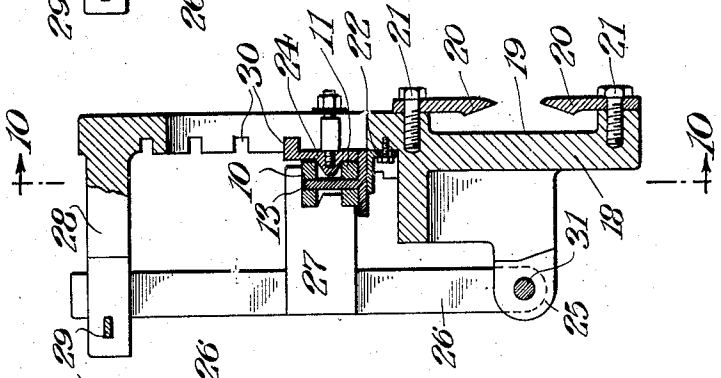
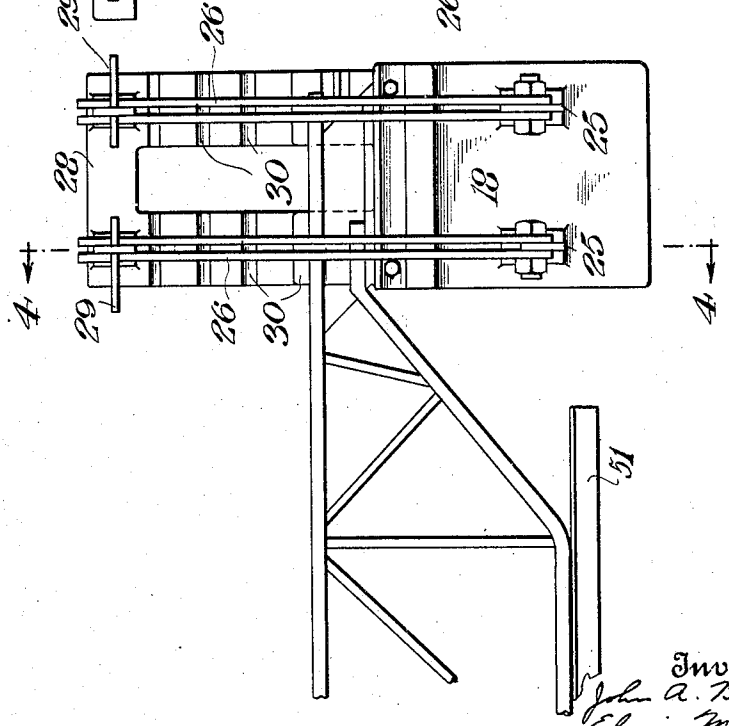


Fig. 3.



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Filed Aug. 4, 1927 4 Sheets-Sheet 3

Fig. 8.

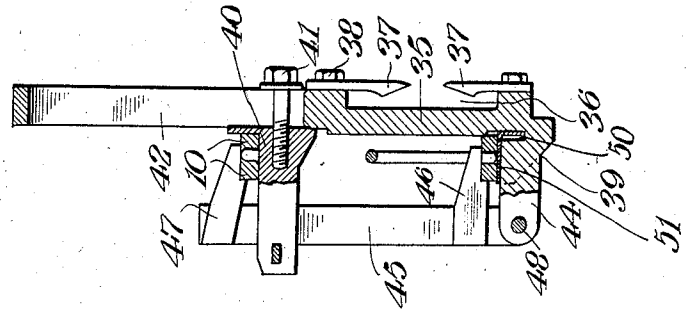


Fig. 7.

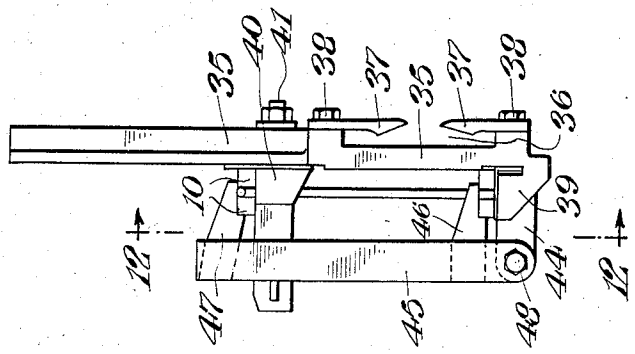
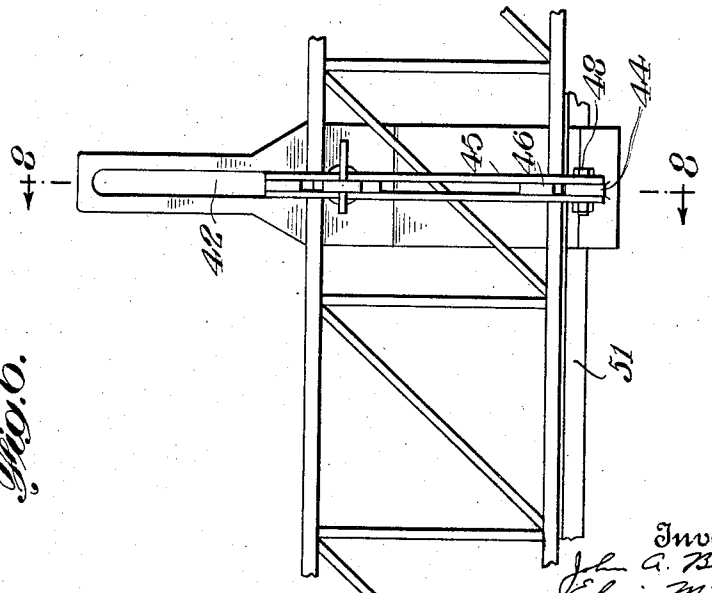


Fig. 6.



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APPARATUS FOR ASSEMBLING FABRICATED STRUCTURES

Filed Aug. 4, 1927 4 Sheets-Sheet 4

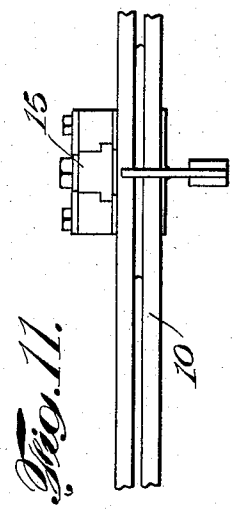


Fig. 11.

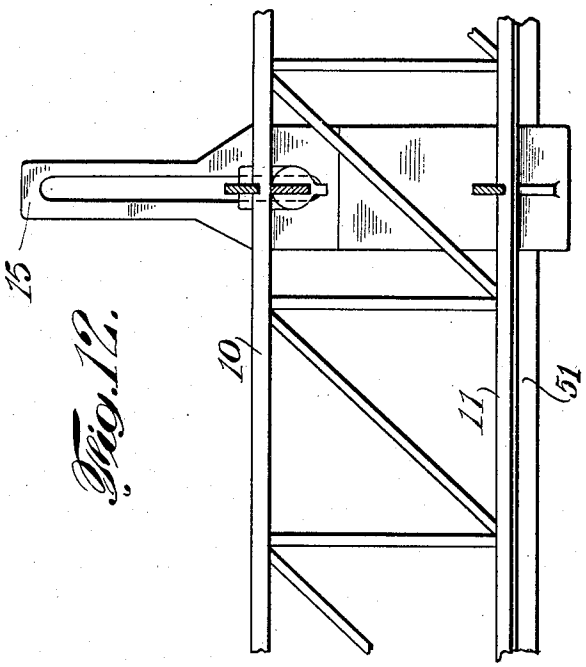


Fig. 12.

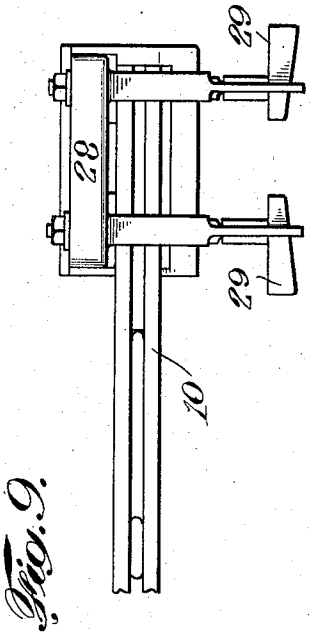


Fig. 9.

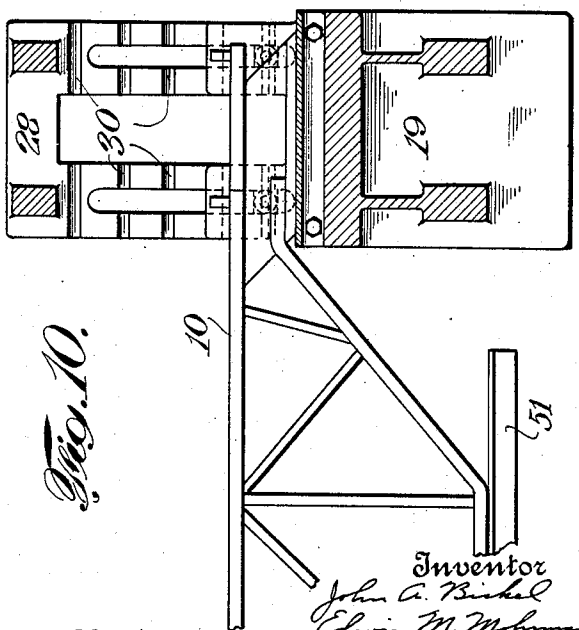


Fig. 10.

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Patented Feb. 4, 1930 1,745,471

UNITED STATES PATENT OFFICE

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APPARATUS FOR ASSEMBLING FABRICATED STRUCTURES

Application filed August 4, 1927. Serial No. 210,553.

This invention relates to apparatus for assembling and holding bars in position to form a truss or other fabricated structure in preparation for the welding operation which permanently joins the bars to hold them in desired position.

It is an object of the invention to provide apparatus in which the truss or other structure may be rapidly assembled, and from which the completed structure may be rapidly and easily removed, and an apparatus which shall permit ready accessibility to the joints to be welded.

It is a further object of the invention to provide apparatus which shall be easily and quickly adjustable to receive and hold work of different sizes.

Other objects and advantages of the invention will appear hereinafter.

A preferred embodiment of the invention selected for purposes of illustration is shown in the accompanying drawing, in which,

Figure 1 is a front elevation.

Figure 2 is an end elevation

Figure 3 is an enlarged front elevation of one of the end jigs.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is an end elevation of one of the end jigs.

Figure 6 is a front elevation of one of the intermediate jigs.

Figure 7 is a side elevation of one of the intermediate jigs.

Figure 8 is a section on the line 8—8 of Figure 6.

Figure 9 is a plan view of one of the end jigs.

Figure 10 is a section on the line 10—10 of Figure 4.

Figure 11 is a plan view of one of the intermediate jigs, and

Figure 12 is a section on the line 12—12 of Figure 7.

Referring to the drawings, the apparatus may be conveniently supported upon a plurality of vertical members, as for example, the vertical angle bars 1 which may be secured to the horizontal angle bars 2 which may rest on the floor or other supporting surface. Secured to the angle bars 1 and projecting horizontally from one side thereof are a plurality of supporting members 3 which may serve as racks or shelves to support the bars or other material which are to be used in fabricating the truss.

Projecting from the other side of the angle bars 1 and secured thereto are plates 4 having a notch 5 formed therein to support a longitudinally extending member, herein an I beam 6 upon which are mounted a plurality of jigs which serve to hold the parts which are to be secured together in their desired relative positions.

For convenience, the apparatus has been illustrated and will be described as employed in the connection with the manufacture of fabricated bar truss structures and particularly such structures having end bearing sections of less depth than the main portion of the truss. The particular truss illustrated in the drawings comprises the upper compression chord members 10 and lower tension chord members 11 and intermediate web members 12. At the ends of the truss the chord members 10 and 11 converge for connection to an end bearing member 13 of inverted T shape in cross section. According to the present invention, in the process of manufacturing such trusses, the bars which form the same are assembled and held together in proper relationship by means of jigs which will be described in detail hereinafter, end jigs 14 being provided to hold the end bearing sections of the truss, while the intermediate jigs 15 are provided to hold the bars forming the central portion of the truss.

Referring to Figures 3, 4, 5, 9 and 10, the end jigs comprise a base member 18 having a recess 19 formed therein which fits over the outer flanges of the I beam 6, and is rigidly secured thereto by means of the clamps 20 which may be set up by means of bolts 21. Secured to the base 18 is an angle bar 22 having a horizontal flange forming a supporting surface for the under side of the end bearing member 13 of the truss. Also secured to the base 18 is a wedge member 24 which projects between the upper and lower chord members

10 and 11 and serves to maintain the same in proper spaced relationship.

Projecting forwardly from the base 18 are bearing members 25 upon which are pivotally mounted arms 26 carrying blocks 27 which extend horizontally to engage the upper surface of the end bearing member 13, and the upper surfaces and the sides of the outer chord members 10 and 11 to hold the same in proper position. The said arms 26 extend upwardly into engagement with the arm 28 and are held in place thereon by means of the pins 29.

As will be observed, the end jigs previously described may be easily and quickly adjusted to support end bearing members of trusses of different dimensions. The supporting flange 22 may be adjusted vertically, the wedge 24 may be adjusted vertically by causing it to engage different ones of the notches 30, and the arm 26 may be quickly removed by removing the bolt 31 and a different arm carrying a block 27 of proper dimensions may be easily substituted. Furthermore, it will be observed that by loosening the bolts 21 the end jigs may be adjusted along the I beam 6 to any desired position.

Referring to Figures 6, 7, 8, 11 and 12, the intermediate jigs comprise a base member 35 having a recess 36 formed therein which fits over the outer flanges of the I beam 6 and is adapted to be secured thereto by means of clamps 37 which may be set up by means of bolts 38. The base member 35 is provided with a flange 39 which is adapted to support the bottom chord members of the truss and carries a lug 40 which supports the upper chord members 10 of the truss, the said lug being provided with a bolt 41 which projects through the slot 42 in order that the lugs 40 may be adjusted vertically with respect to the base 35. Pivotally mounted on the arm 44 of the base is an arm 45 carrying a block 46 to engage and hold the forward members 11 against the flange 39 and a block 47 to engage and hold the chord members 10 against the lug 40.

As in the case of the end jigs, the intermediate jigs are quickly and easily adjustable to receive and hold trusses of different sizes and shapes. The lug 40 may be adjusted vertically in the slot 42 and the arm 45 may be removed by removing the bolt 48 and may be replaced by a different arm having blocks 46 and 47 suitably shaped and positioned. Likewise the intermediate jigs may be adjusted laterally along the I beam 6 by loosening the bolts 38 which hold the clamps 37.

Each of the intermediate jigs is provided with a notch 50 adapted to receive and hold one flange of the angle bar 51, the other flange of which extends outwardly above the flanges 39 so as to support the chord members between the jigs and to prevent the web members from projecting below the lower surfaces of the chord members. As illustrated in the drawings, the angle bar 51 fits loosely in the notches 50 so that the intermediate jigs can be moved easily along the bar. The said angle bar 51 extends only through the intermediate jigs and need only be of sufficient length to support the bottom chord members to the point where they bend upwardly for connection with the end bearing member 13.

In using the apparatus, the vertical supporting members 1 may be conveniently arranged in parallel rows to form stalls in which the work may be conveniently carried on, the projecting racks 3 of one set of members being located opposite the I beam 6 of the next set of members, so that the material held on the racks 3 may be conveniently located for use in forming the truss. In the process of manufacture, the bars which form the truss are secured in place in the jigs, the intermediate jigs and the end jigs being adjusted along the I beam 6 in such manner that they are located between the joints to be welded, and so that they do not interfere with the welding operation. After the parts are properly assembled and held securely in the jigs, the welding operation is performed and the truss may then be removed from the jigs. It will be observed that as the arms of the intermediate and end jigs are dropped to release the completed truss, the jaws of the blocks rotate away from the bars of the truss and permit the truss to be removed easily and quickly from the jigs. After one truss is completed, if another truss of the same dimensions is to be manufactured, the operation may be repeated as before. If, however, a truss of different dimensions is to be manufactured, the jigs may be adjusted to the proper size and may be adjusted laterally along the I beam to the proper position and the new truss may then be formed.

It is to be understood that the invention may be variously modified and embodied within the scope of the subjoined claims.

We claim as our invention:

1. In an apparatus of the class described, in combination, a longitudinally extending I beam, a plurality of intermediate jigs mounted thereon and secured to the flanges of said beam, and a plurality of end jigs also secured to the flanges of said beam, said jigs being adjustable along said beam to permit them to engage the work at points removed from the joints to be secured.

2. In an apparatus of the class described, in combination, a longitudinally extending I beam, and a plurality of jigs secured to one flange thereof, each of said jigs being separately and individually adjustable along said member to permit engagement of the work at points removed from the joints to be secured.

3. In an apparatus of the class described, in combination, a longitudinally extending structural shape, a plurality of intermediate jigs mounted thereon, a plurality of end jigs mounted thereon, each of said jigs being separately and individually adjustable along said structural shape to permit engagement of the work at points removed from the joints to be secured, and a longitudinally extending member supported upon a plurality of said jigs for supporting the work at points therebetween.

4. A jig comprising a base, a flange projecting therefrom to receive and support one side of the work to be held, a lug projecting therefrom to receive and support another side of the work, and an arm pivotally mounted on said base and carrying blocks which cooperate with said flange and lug to secure the work with respect thereto, said lug being adjustable longitudinally of said base.

5. A jig comprising a base, a flange projecting therefrom to receive and support one side of the work to be held, a lug projecting therefrom to receive and support another side of the work, and an arm pivotally mounted on said base and carrying blocks which cooperate with said flange and lug to secure the work with respect thereto, said arm being secured to said base by means of a removable bolt, whereby said arm may be easily removed and replaced.

6. In an apparatus of the class described, in combination, a longitudinally extending structural shape, a plurality of end jigs mounted thereon, a plurality of intermediate jigs mounted thereon and a longitudinally extending member supported upon said intermediate jigs for supporting the work at points between said intermediate jigs.

7. A jig comprising a base, a flange projecting therefrom and adjustable along said base to receive and support the work to be held, an arm pivotally mounted on said base, and a block carried by said arm and adapted to cooperate with said flange to secure the work with respect thereto.

8. A jig comprising a base, a flange projecting therefrom to receive and support the work to be held, an arm pivotally mounted on said base, a block carried by said arm and adapted to cooperate with said flange to secure the work with respect thereto, and means for securing said arm with respect to said base to clamp the work between the flange and the block.

9. A jig comprising a base, a flange projecting therefrom to receive and support the work to be held, an arm pivotally mounted on said base, and a block carried by said arm and adapted to cooperate with said flange to secure the work with respect thereto, said arm being removably secured to said base whereby said arm may be easily removed and replaced.

In testimony whereof, I have signed my name to this specification this 1st day of August, 1927.

JOHN A. BICKEL.
EDWIN M. MOHRMAN.