W. BRANDT.

IRON STRUCTURE.

APPLICATION FILED OCT. 22, 1913

1,166,399. Patented Dec. 28, 1915.

Fig. 1.

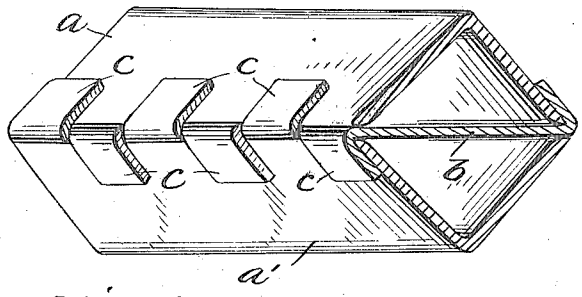


Fig. 2.

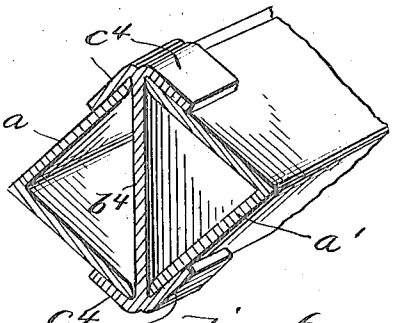


Fig. 3.

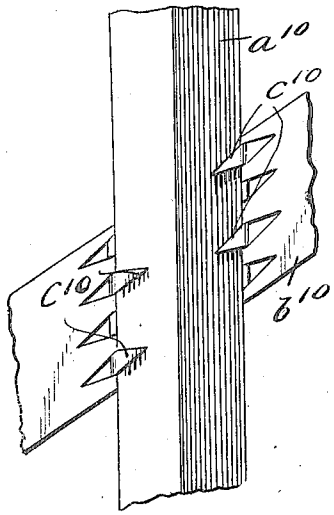


Fig. 5.

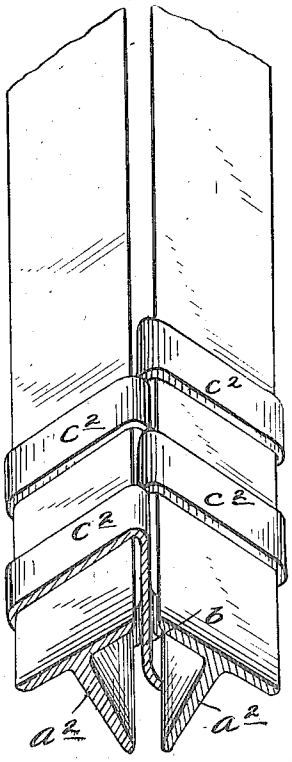


Fig. 6.

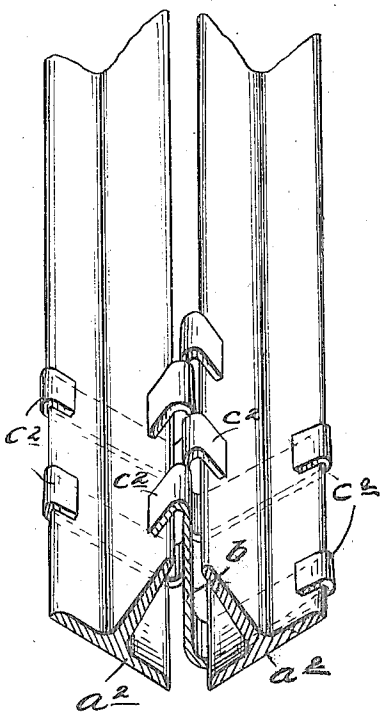
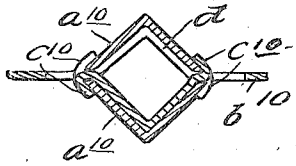


Fig. 4.



Witnesses:

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IRON STRUCTURE.

1,166,399. Specification of Letters Patent. Patented Dec. 28, 1915.

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To all whom it may concern:

Be it known that I, WILHELM BRANDT, manufacturer, citizen of the Kingdom of Prussia, Empire of Germany, residing at Osterode, East Prussia, Germany, have invented certain new and useful Improvements in Iron Structures, of which the following is a specification.

My invention relates to improvements in iron structures made from bars or plates of various cross-sections and designed for use in the construction of gates, masts, beams, and the like.

As now practised such bars are combined into hollow bodies by connecting two or more of such bars with each other by riveting or by clamps. While by riveting a rigid connection is obtained, yet the method of construction is objectionable, because the cross-sections of the bars are materially reduced at such places where the holes are made for the rivets. This objection is avoided when connecting the bars by clamps. However the connection of the bars by clamps is not in any way reliable, because the clamps and other connecting members are gradually loosened.

The object of the improvements is to provide structures in which these objections are avoided, and to provide joints for variously shaped bars, metal strips having various sections in longitudinal and transverse directions, bands, metal plates, and the like, by means of which joints a reliable connection between the parts of the construction is secured in a simple way.

With this object in view my invention consists in connecting bars of different cross-sections by teeth or tongues which are provided at the margins of the bars and are so bent as to overlap the same. In the preferred form I provide core pieces between the bars of different cross-sections, which core pieces are formed with teeth which project beyond the edges of the bars and are bent so as to overlap the bars.

A further object of the improvements is to provide sectional structures which can be assembled in a simple way into gates, masts, pillars, iron structures, reinforcing members for reinforced concrete, and the like.

With this object in view my invention consists in so constructing the core pieces, that they project with their ends beyond the edges of the bars, and forming the same between the bars with bent portions corresponding to the inner forms of the bars, which bent portions determine the position of the bars, the said bars being secured in their positions by means of tongues which are bent outward from the core pieces and embrace the edges of the bars.

For the purpose of explaining the invention several examples embodying the same have been shown in the accompanying drawings in which the same letters of reference have been used in all the views to indicate corresponding parts.

In said drawings—Figure 1 is a perspective view of a composite unit embodying the present invention. Fig. 2 is a perspective view similar to Fig. 1 showing another type of core piece for uniting the two angle bars. Fig. 3 is an elevation and Fig. 4 a cross-section of a member of a mast or pillar constructed in accordance with the invention. Figs. 5 and 6 are perspective views showing a structure composed of two T-bars united by core pieces in accordance with the present invention.

Referring now to the example illustrated in Fig. 1 of the drawings, a pair of angle bars a and a^1 are connected with each other by tongues provided at the margins of a core, which tongues are so bent as to interlock the bars, the parts being arranged in such a way that a hollow structure of rectangular section is produced. In the construction shown in Fig. 1, the said tongues are provided on a core piece b whose margins c project beyond the edges of the angle bars, and the said projecting margins are alternately bent over the adjacent margins of the angle bars a and a^1. In the manufacture of the members, the tongues may either be bent by hand or, preferably, by mechanical means, such as a press, in which case the angle bars are likewise somewhat pressed together during the pressing operation and allowed to spring back after the pressure is removed. Thereby a rigid and durable joint is produced between the bars and the core element.

In the modification shown in Fig. 2, the tongues c^4 at the margins of the core pieces b^4 are provided by splitting the core pieces at their margins. This method of jointing the bars is particularly useful where comparatively thick and short core elements are used. The structure is assembled in the same way as has been described with reference to Fig. 1.

In Figs. 3 and 4, I have shown an example illustrating how a sectional structure may be combined into iron structures of different forms. In the example shown, one of the corner posts of a pillar or mast is shown. In addition to the function of holding the bars a^{10} together, the core pieces b^{10} have the function of connecting the different corner posts together by the alternating tongues c^{10}, so that the said core pieces on the one hand bind pairs of bars together into a post, and on the other hand connect the posts into a mast. The portions d of the core pieces which are located internally of the pillars may be so bent that they are in contact with the inner walls of the pillars, as is shown in Fig. 4. Thereby the said bent portions determine the relative positions of the bars and provide a strong connection. The tongues of the core pieces alternately overlap the edges of the bars on the exterior of the latter.

In the example shown in Figs. 5 and 6, a pair of T-bars a^2 are united in a manner similar to that employed in the preceding instances, a core element b being employed which is interposed between the bars and is formed on its marginal edges with tongues c^2 which are bent over the margins or edges of the flanges and webs of the bars and overlap the outer sides of the bars.

While in describing the invention reference has been made to particular examples embodying the same, I wish it to be understood, that my invention is not limited to the examples shown in the drawings, and that various changes may be made in the general arrangement and construction of the parts.

I claim herein as my invention:

1. A composite unit for building structures comprising a plurality of channeled bars of like angular cross-section juxtaposed with their channeled sides facing one another and with the edges of one bar registering with the corresponding edges of the other bar, and a core piece interposed between said bars and having tongues struck therefrom engaging the edges of the bars and lapping the exterior thereof to rigidly unite the bars to form a hollow body.

2. A composite unit for building structures comprising a plurality of angle bars of like cross-section juxtaposed with their channeled sides facing one another and their edges in register, and a core piece interposed between said bars and having alternatingly arranged tongues struck therefrom and engaging the edges of the bars from the exterior thereof to rigidly unite the bars to form a hollow body.

3. A composite unit for building structures comprising a plurality of channeled bars of like angular cross-section arranged with their corresponding edges in register and their hollow sides adjacent to one another, and a core piece arranged between said bars and having tongues gripping the registering edges of the bars at the outer sides of the latter to rigidly unite the bars into a hollow unit, portions of the core piece projecting outwardly beyond the edges of the bars to provide connecting or attaching means for the unit, and portions of the core piece fitting within and conforming to the interior shape of the bars to relatively position them.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILHELM BRANDT.

Witnesses:
T. London,
Adam Burdinski.