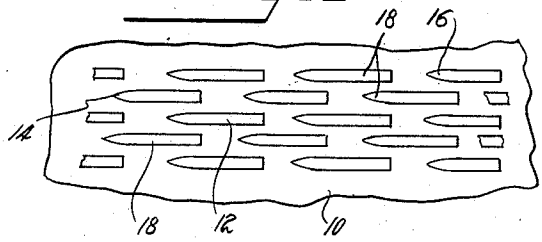
May 12, 1959 J. C. JUREIT 2,885,749

CONNECTOR

Filed Sept. 29, 1955

Fig. 1



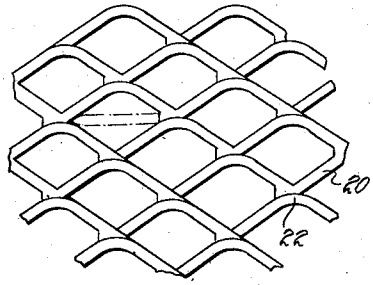


Fig. 2

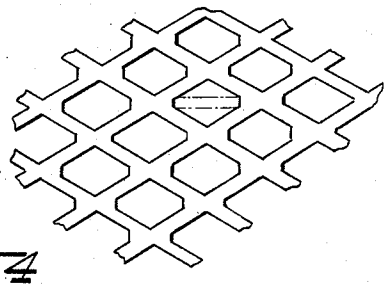


Fig. 4

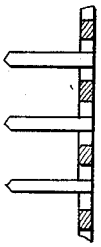


Fig. 5

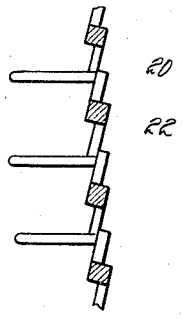
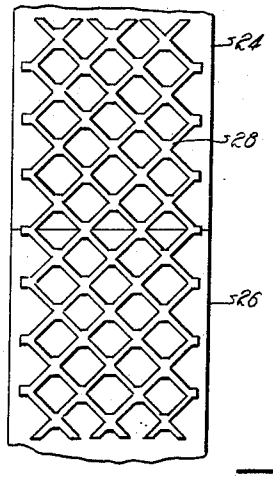


Fig. 3

Fig. 6



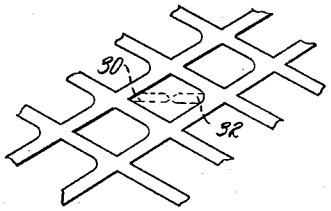
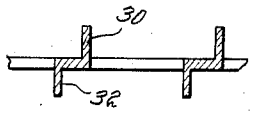


Fig. 7

Fig. 8



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United States Patent Office 2,885,749 Patented May 12, 1959

2,885,749

CONNECTOR

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Application September 29, 1955, Serial No. 537,336

5 Claims. (Cl. 20—92)

This invention relates to metal connectors and more particularly relates to metal connectors for connecting and joining timber and other wooden beams or framing.

The problem of joining timbers in the construction of wooden frame members of various types has received continuous and active attention since well prior to the advent of nails. The object of this activity has been the production of a timber connector which is at one time low in cost, mountable with a minimum of labor, and productive of a strong joint. Various types of specialized metal connectors have been utilized, such as truss shoes, and channel shaped members, and each of these has utilized nails driven into the wood from the outside of the metal connector. These connectors are relatively high in cost and require the manual driving of a large plurality of nails in the formation of each joint. This latter feature requires a large amount of manual labor, thereby substantially increasing the finished cost of the frame structure. The cost of this nailing operation was recognized, however, and the next advance in the art resulted in the use of plates having prongs or spikes projecting therefrom. Such plates were either of cast construction or the spikes were simply struck from the plates and, generally speaking, were not sufficiently long to allow such connectors to serve as the sole joining means between heavy structural beams. In addition to this these plate type connectors utilize a large amount of metal and are relatively expensive.

It is accordingly a primary object of the present invention to provide an improved metal timber connector.

It is another object of the invention to provide an improved metal timber connector which is low in price, applied with a minimum of labor, and productive of a strong joint.

It is another object of the invention to provide an improved metal timber connector having a unitary skeletal structure utilizing a minimum of metal wherein the connectors may be manufactured without metal wastage.

It is another object of the invention to provide an improved timber connector which may be produced by a metal stamping and expanding process and consequently is exceedingly inexpensive to produce.

It is another object of the invention to provide an improved metal timber connector which affords a maximum of joint strength for a minimum of metal used in making the connector.

It is still a further object of the invention to provide a method of manufacturing connectors of the foregoing type.

These and further objects and advantages of my invention will become apparent upon reference to the following description and claims and appended drawings wherein:

Figure 1 is a plan view showing a metal plate having spikes struck therefrom according to my invention;

Figure 2 is a plan view of an expanded metal connector according to one embodiment of my invention;

Figure 3 is a vertical cross section of the connector shown in Figure 2;

Figure 4 is a plan view of an expanded metal connector according to another embodiment of my invention;

Figure 5 is a vertical section of the connector shown in Figure 4;

Figure 6 is a plan view showing a connector joining a pair of timbers;

Figure 7 is a plan view of an expanded metal connector according to another embodiment of my invention; and

Figure 8 is a vertical cross section of the connector of Figure 7.

I have found that satisfactory metal timber connectors may be produced at a low cost if an absolute maximum use is made of the metal from which such connectors are produced. According to my invention I strike metal spikes or fingers from a sheet of metal in such a configuration that the metal may subsequently be expanded without wastage of any metal and without producing weak bond areas between the various spikes thus struck out. The configuration which I utilize is such that the length of the spikes may be varied at will without weakening either the bond areas or the connecting strips between such bond areas.

Referring to Figure 1 there is shown a sheet of metal **10** having a plurality of rows **12, 14** and **16** of spikes or fingers **18** struck therefrom in a staggered fashion such that the centers of spikes in one row are opposite bonding areas in adjacent rows. This first step in the formation of a connector according to my invention may involve a shearing and bending of the spikes in one operation, or may involve two separate steps of shearing the spikes free and then bending them into position in a separate step. Following the shearing of the spikes **18**, the metal is expanded as shown in Figure 2 to form a grid work consisting of connecting elements **20** which join connector members or areas **22**. The grid work may be of the type in which the expanded metal mesh is offset and does not lay flat, as shown in Figure 2, or it may be of the type where the expanded metal is flattened or is expanded in a flat condition, as shown in Figures 4 and 5.

It will be noted that this type of construction does not require the removal of any metal from the bond areas and that the gross bond area may be made as large as desired without limiting the length of the teeth. In addition to this the teeth may be made of any suitable length without either weakening the connecting elements **20** or diminishing the gross area of the bond area **22**. It will also be appreciated that with this type of construction absolutely all of the metal plate is utilized in the connector with a concomitant substantial saving in cost.

Generally speaking the metal is not expanded as much as is permitted by its elastic limit since it is desired to space the spikes only sufficiently to prevent splitting of the wood. This is a function of spike size, length and point design as well as spike spacing. The expansion of the metal may take place either row by row or in a single operation and may be carried out through any of several processes, such as through the use of lugs or dowel pins which engage the slots left by the sheared and bent spikes and which are then moved apart to cause the expansion.

Referring to Figure 6 there is shown a pair of timber beams **24** and **26** which are joined in a butt connection by means of a connector **28** formed according to my invention. This type of connector results in a maximum joint strength for a minimum amount of original joint metal. That is to say, the maximum joint strength is obtained for a minimum amount of metal used in manufacturing the connector, since there is no metal wastage and the spikes are so spaced as to perform a maximum connecting function.

In addition to the embodiment of my invention heretofore discussed wherein the connector is applied to the outside of adjoining timbers, it is also contemplated that my connectors may be manufactured to be used between timbers and a connector of this type is shown in Figures 7 and 8. According to this embodiment of my invention spikes **30** and **32** are struck from the original metal in juxtaposed positions in opposite directions as is clearly seen in Figure 8. This construction provides the equivalent of a single elongated spike passing from one timber to another at each bond area and, since the expanded metal is relatively thin, it is not necessary to provide the timbers with cut-away offsets in order to receive the connector. In attaching all of my connectors it is possible to utilize stamping machines to attach the connectors so that there is no necessity for separately pounding individual spikes into the wood.

It will be apparent from the foregoing that I have provided an improved metal connector for wooden frame construction which provides a maximum connection strength with a minimum of metal. It will further be apparent that this connector may be manufactured at a relatively low cost and that it may be applied in a manner extremely economical of labor. Spike widths and lengths may be varied without diminishing the strength of the connector and the connectors may be manufactured either in large sheets which are cut to size for each individual job, or may be manufactured as individual small fixtures for specialized purposes.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A structural joint for transmitting a structural load comprising a pair of elongated wooden members, at least one metal plate having substantially parallel faces joining said members, at least three substantially parallel rows of elongated teeth struck from said plate to leave three rows of slots, a first pair of sides of each said tooth being formed by said faces of said plate, a second pair of substantially parallel sides of each said tooth joining said first pair of sides, said teeth terminating in pointed ends and extending away from said plate and being embedded in said wooden members, said plate being expanded transverse of said slots to form substantially diamond shaped apertures with the center line of each tooth lying on the longitudinal axis of the aperture formed from its slot, the longitudinal axis of at least one of said wooden members being parallel to said rows.

2. A joint as set out in claim 1 wherein the length of each tooth is greater than the length of its aperture along its largest dimension.

3. A joint as set out in claim 1 wherein one tooth is formed from each slot.

4. A joint as set out in claim 1 wherein two teeth are formed from each slot.

5. A connector as set out in claim 2 wherein one tooth from each slot is bent in the opposite direction from the other tooth from the same slot.

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