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2,624,429

METAL CONNECTION FOR BUILDING FRAMES

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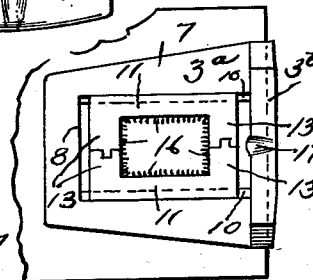
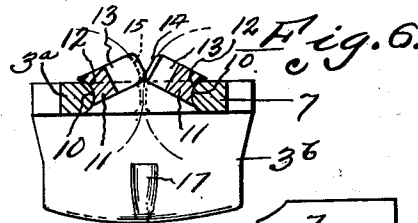
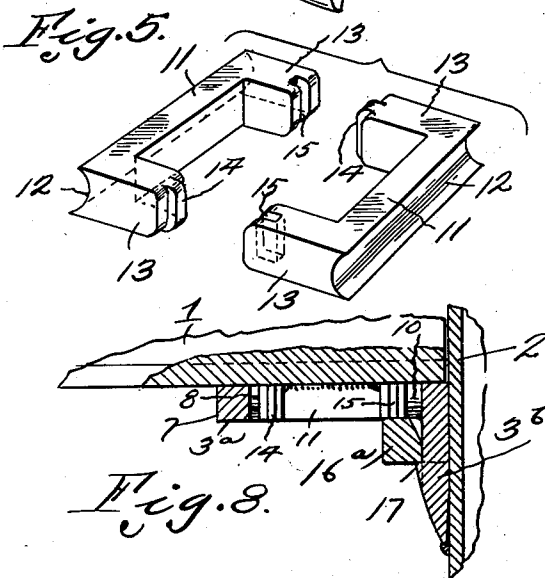
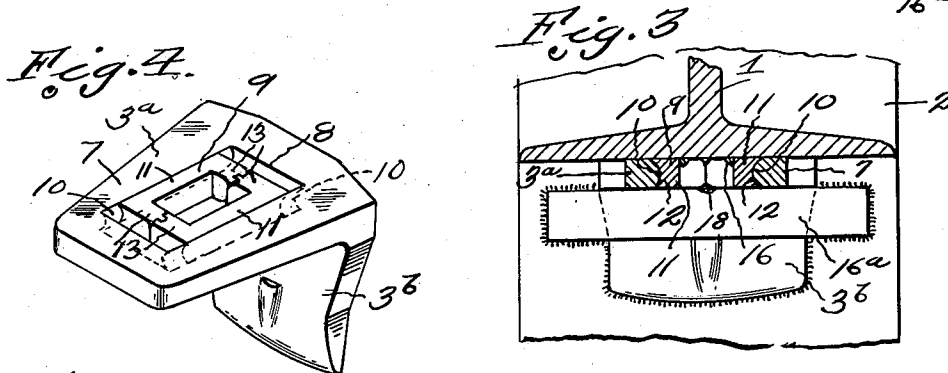
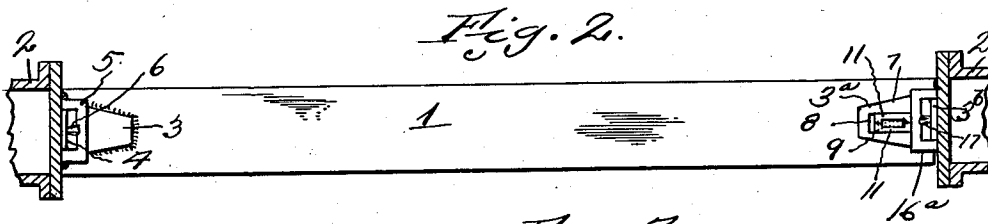
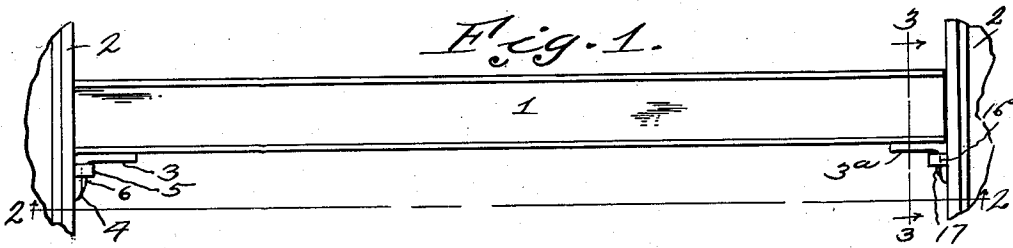


Fig. 7.

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METAL CONNECTION FOR BUILDING FRAMES

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4 Claims. (Cl. 189—36)

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The invention relates to metal connections for building frames, particularly adapted for connecting metal building elements disposed at an angle to each other. The connection comprising a U-shaped yoke carried by one of the building elements, and an angular bracket carried by the other building element, and means whereby the angular bracket may have limited longitudinal movement on its building element thereby allowing automatic adjustment of the bracket where the bracket is carried by a building element disposed between other building elements and at an angle thereto. The limited play allows the bracket to adjust itself incident to variations in the manufacture and fabrication of building elements, particularly columns and beams, and obviates the necessity of the beam being cut to exact longitudinal dimension.

A further object is to provide one of the arms of the angular bracket with an insert longitudinally movable in an opening through the arm, and which insert is adapted to be welded to the beam end after the other arm of the bracket has been forced to seated position through a yoke carried by an adjacent building element.

A further object is to form the insert from reversely positioned U-shaped members having their connecting portions longitudinally channeled to transversely ride over longitudinal ribs or curved beads forming the inner opposite sides of the opening through the arm of the bracket.

A further object is to provide the outer ends of the arms of the U-shaped insert members with interengaging means, whereby the U-shaped members may rock to the same plane within the opening through the arm of the bracket for the insertion operation, and at the same time preventing longitudinal displacement of the U-shaped members in relation to each other after the insertion operation.

A further object is to provide the yoke receiving flange with a lug which positively engages the under side of the yoke and prevents rocking of the beam within the yoke when the other end of the beam is being forced to seated position in the opposite yoke.

With the above and other objects in view the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawing, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawing:

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Figure 1 is a side elevation of a beam connecting spaced columns, showing the connections applied thereto.

Figure 2 is a bottom plan view of the beam and sections through the columns taken on line 2—2 of Figure 1.

Figure 3 is a vertical transverse sectional view taken on line 3—3 of Figure 1.

Figure 4 is a perspective view of the self-adjusting bracket.

Figure 5 is a detail collective view of the insert members.

Figure 6 is a vertical transverse sectional view through one end of the bracket and the insert, showing the insert members in position to be inserted in the opening of the bracket arm.

Figure 7 is a bottom plan view of the bracket and the end of a beam, showing the bracket attached to beam by welding within the opening of the insert.

Figure 8 is a vertical longitudinal sectional view through the adjustable bracket, a portion of a beam and a portion of a column.

The invention is an improvement on the device shown in my application, Serial Number 691,105, filed August 16, 1946, now Patent No. 2,540,408 and my prior Patents Numbers 1,824,631 and 2,231,297.

Referring to the drawing, the numeral 1 designates a conventional form of building beam disposed at a right angle between vertical columns 2. One end of the beam 1 has secured thereto by welding an angle bracket 3, and which bracket is provided with an arm 4, which arm extends downwardly through a yoke 5 secured to an adjacent column. This bracket is of the same construction set forth in the application and patent referred to above, with one variation, a shouldered lug 6 very shallow, which lug engages under the yoke 5 for preventing the end from rocking out when the other end of the beam is rocked for engaging within the other yoke on the other column. It has been found, that with a very shallow lug 6, there is enough spring to the weld and yoke to allow the passage of the lug through the yoke. In actual practice, if the workmen are careful in driving each bracket to its proper seat, there would be no necessity for the lugs, however it has been found that this care does not prevail at all times.

Beams and columns vary slightly in dimension and extreme care must be exercised in the cutting of the beam lengths for the seating of rigidly fixed brackets. It has also been found that there is a variation in the manufacture of the columns

between which the beams extend, therefore it is desirable to apply at least one bracket to the under side of the beam in a manner where it will have limited longitudinal movement, and to accomplish this result the bracket 3a has its arm 7 provided with a longitudinally extending rectangular shaped opening 8 therethrough, and to provide an insert 9 slidably mounted in the opening which can be welded to the under side of the beam in position. Any insert necessarily has to be interlocked within the longitudinal opening 8, and to accomplish this result the opposite longitudinal sides of the opening 8 are transversely rounded, as shown at 10, and the insert 9 is formed from reversely positioned U-shaped members 11. The outer sides of the U-shaped members 11 are longitudinally concaved as shown at 12 so that when the U-shaped members 11 are angularly positioned, as shown in Figure 6, with their arms 13 in interengagement through the means of ribs 14 and slots 15 they can be rocked to a position within the opening 8 and to the plane of the arm 7, after which they can be tack welded together where their arms engage for permanently holding the insert within the opening 8. When applying the bracket to the beam end the insert is welded to the under side of the beam at 16 through the opening through the insert to the under side of the beam, as shown in Figure 7. This can be done before the beam is placed in position or after, if desired, and after the erection operation, if desired, the marginal edges of the arm 7 may be welded to the under side of the beam. It will be seen, that after the bracket 3 has been forced to position, the bracket 3a may longitudinally adjust itself when its flange 3b is forced through the column carried yoke 16a. Flange 3b is also provided with a slight angular shoulder 17 engaging the under side of the yoke 16a and prevents rocking or displacement of the bracket within the yoke. The tacking operation of the insert members simply maintain the insert in proper position within the opening 8 until the final welding operation at 16. The tacking weld is shown at 18 in Figure 3.

From the above it will be seen that an erection bracket connection between a beam and a column is provided which will adjust itself to proper position to accommodate the bracket to overcome variations in dimensions of beam and column incident to manufacture. It will also be seen that the insert can be easily and quickly inserted in the opening of the bracket arm and be inter-

locked within the opening 8 in a manner whereby it will have longitudinal movement in the plane of the bracket arm.

The invention having been set forth what is claimed as new and useful is:

1. A bracket connection between a bracket and a structural element, said connection comprising an arm carried by the bracket and engaging the structural element, said bracket arm having an opening entirely therethrough, opposite sides of the opening in the bracket arm being straight and substantially parallel, insert members disposed in the opening of the bracket arm, said insert members being U-shaped and in opposed position with arms extending towards each other, interengaging means between the arms of the U-shaped members and slidable interengaging means between the transverse portions of the U-shaped members and opposite sides of the opening through the bracket arm, said U-shaped members being welded to the structural element thereby forming means whereby the structural element and bracket may move in relation to each other.

2. A device as set forth in claim 1 wherein the interengagement between the transverse portion of the U-shaped members and opposite sides of the bracket arm are arcuate, thereby allowing the U-shaped members to be rocked into the plane of the bracket arm for positioning them in the welding position.

3. A device as set forth in claim 1 wherein the interengaging of the arms of the U-shaped members comprises ribs and grooves carried by the ends of the arms.

4. A device as set forth in claim 1, including welding of the interengaged arms of the U-shaped members to the structural element and to each other.

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