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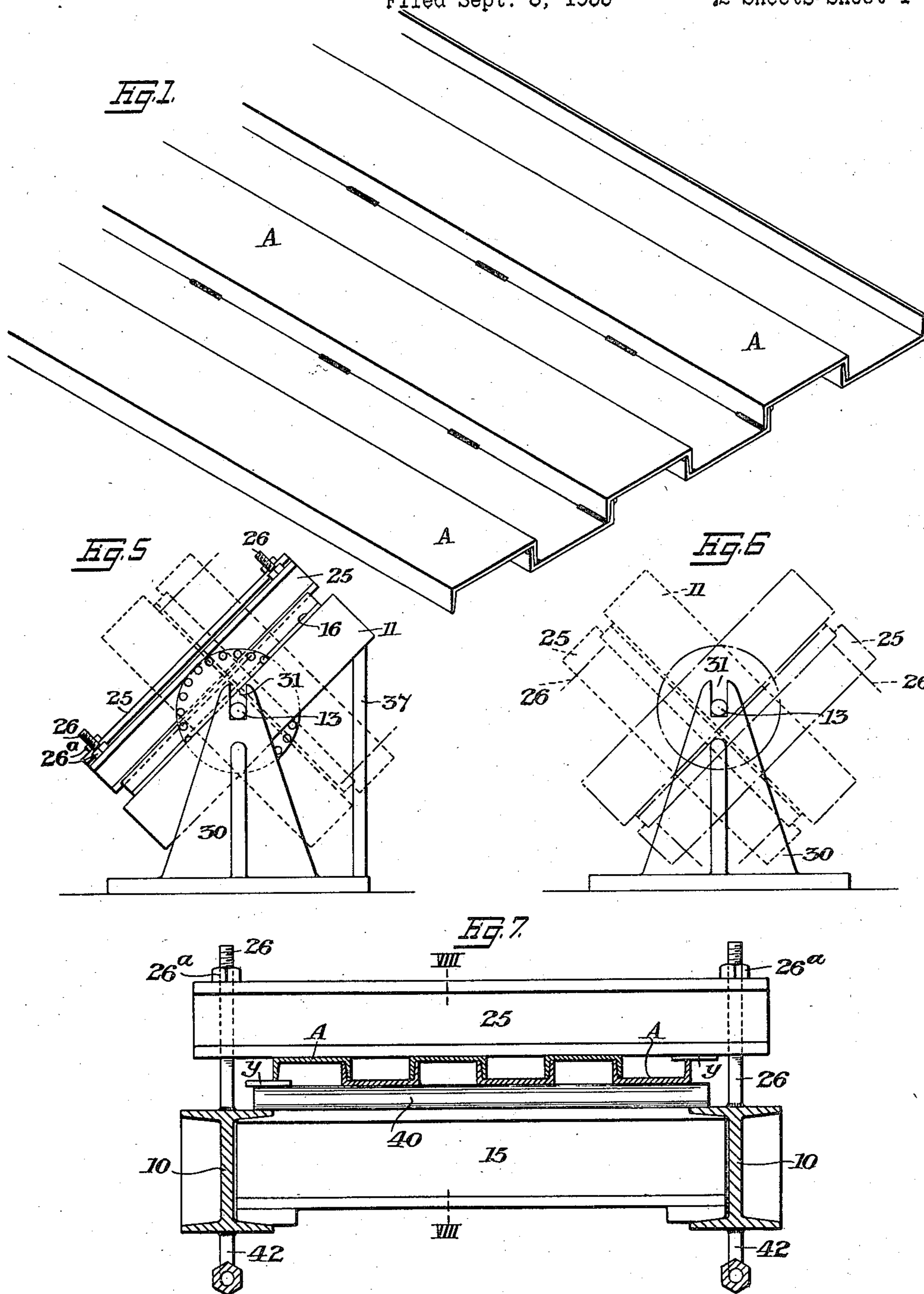
J. A. MITCHELL

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IMPROVEMENTS IN APPARATUS FOR MAKING METAL FLOOR PANELS

Filed Sept. 8, 1933

2 Sheets-Sheet 1



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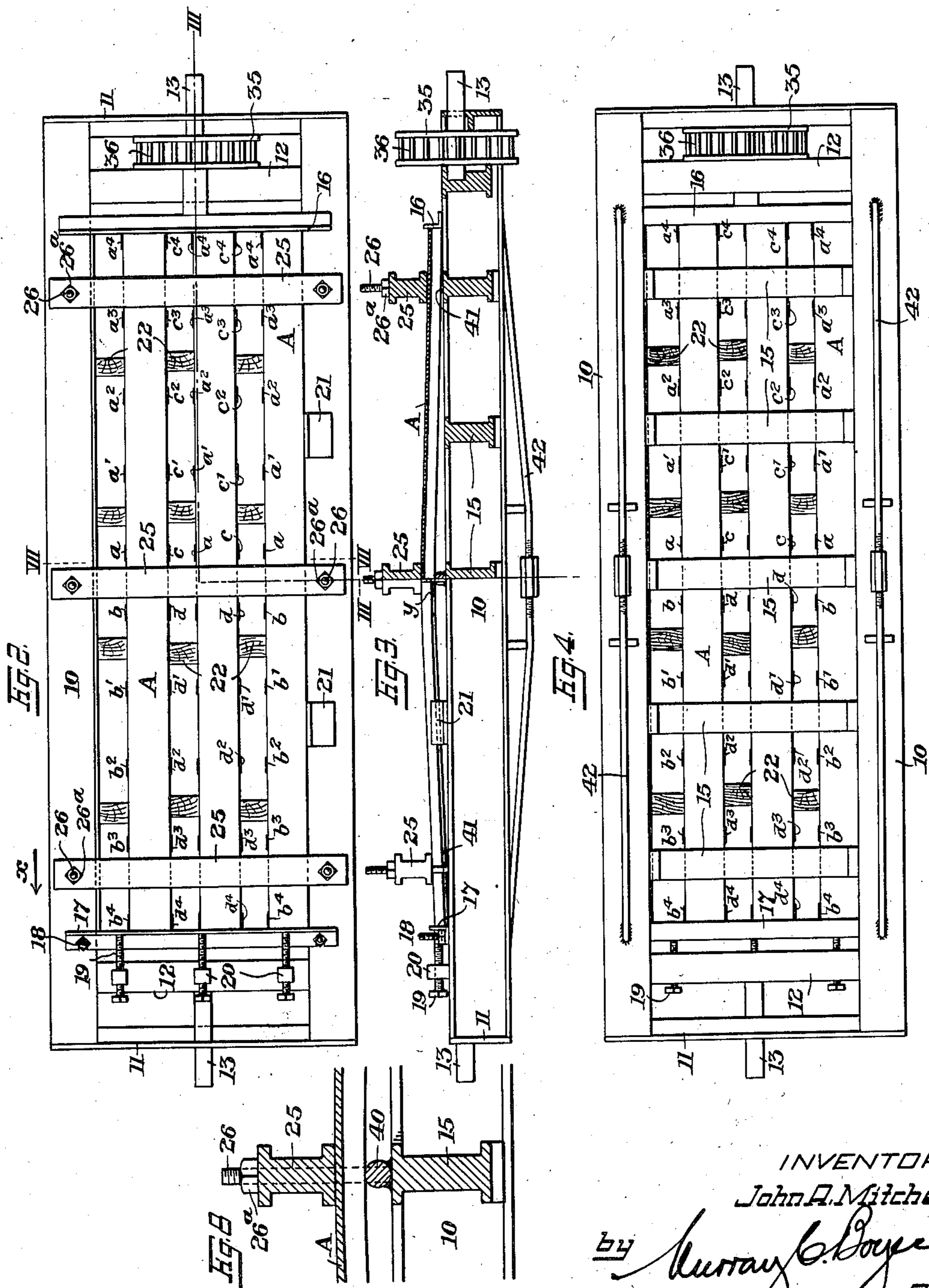
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UNITED STATES PATENT OFFICE

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IMPROVEMENTS IN APPARATUS FOR
MAKING METAL FLOOR PANELSJohn A. Mitchell, Ridley Park, Pa., assignor to
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6 Claims. (Cl. 113—99)

My invention relates to the construction and/or erection of metal flooring and comprises an improved method of securing together, by welding or otherwise, the sections making up such metal flooring to form panels, and apparatus for supporting such sections during the securing operation.

One object of my invention is to provide a simple and efficient support for the sections whereby the welding or other operation for connecting the sections together may be readily carried out.

A further object of my invention is to provide means whereby the metal sections may be given an arch or camber when assembled in said support and held in such position for the welding or other securing operation whereby the arch or camber will be maintained after the floor panel structure is completed.

These and other features of my invention are more fully described hereinafter, reference being had to the accompanying drawings, more or less diagrammatic in character, in which:

Figure 1 is a fragmentary perspective view of a plurality of interconnected metal members, in the present instance, channel sections, connected together to form a floor panel.

Fig. 2 is a plan view of a frame which I employ to support the metal sections in the development of metal floor panels in accordance with my invention.

Fig. 3 is an edge view of the frame shown in Fig. 2, partly in section, on the line III—III.

Fig. 4 is an inverted plan view of the frame shown in Fig. 2.

Fig. 5 is an end elevation of a supporting structure in which the frame shown in Figs. 2, 3, and 4 may be mounted for rotative movement.

Fig. 6 is a similar view, diagrammatic in character illustrating other positions of the frame in its support.

Fig. 7 is an enlarged sectional view taken on the line VII—VII, Fig. 2, looking in the direction of the arrow x, and

Fig. 8 is a sectional view on the line VIII—VIII, Fig. 7, illustrating a detail of my invention.

The application of Joseph G. Shryock for patent for Improvements in floor construction, filed August 1, 1931, Serial No. 554,531, (now Patent No. 1,933,394, dated October 31, 1933) describes an improved type of metal floor construction involving the employment of a series of interconnected metallic members—usually channel sections—which may be and preferably are prepared for erection or use in the form of panels.

In preparing this type of metal flooring for

use in the field, for instance for use as a bridge decking, the practice is to provide what may be termed a floor panel, which may consist of a plurality of these interconnected metallic members of a length that will span the width of the road or a predetermined portion of the same. The several channel or other members making up this panel are secured together and the preferred method is to connect them by welding the flange of one section to the web of another, in their interconnected relation.

It is further desired to impart a curvature or camber to these sections lengthwise of the same, which curvature or camber is that desired for the roadway provided by the bridge decking.

The object of my invention is to provide an improved method of assembling these metal floor sections whereby they may be properly supported during the connecting operation, which may be the welding step referred to, and at the same time provide means whereby a camber or arch may be imparted to said sections.

In preparing these panels from a group of assembled metal sections, such as those indicated at A, for instance, I provide a table or support which may comprise a frame made up of longitudinal members 10, which may be I-beams, and cross-members 11 and 12, disposed at the ends of the same and suitably secured together as by welding. The end cross-members carry trunnions 13 whereby the frame may be pivotally mounted in suitable supports or bearings so that it may be disposed in angular positions, as hereinafter described.

This frame is of sturdy construction and is adapted to receive between the longitudinal members 10 a plurality of adjustable cross-members 15 which may rest on the flanges of the I-beams and which serve as a support for the several sections of metal channel sections, or the like, to make up the floor panel, which sections are laid upon the frame lengthwise of the same. The frame or table may be provided with a fixed stop 16 at one end of the same against which one end of each of the metal sections is abutted. At the opposite end, an adjustable abutment 17 is provided which may be disposed in relatively fixed position by bolts 18. This member may be brought against the ends of the channel members and held in the desired position by means of screw bolts 19 which may pass through fixed nuts 20 carried by one of the fixed cross-members 12. The frame also carries stops 21 against which one of the channel members may be laid when they

are assembled upon the frame in the production of a panel.

After these channel sections have been laid upon the frame, they are brought into such position that their adjacent flanges are in close relation, such flanges having beveled contacting faces at the same angle, and wedging blocks 22, of metal, wood, or the like, may be employed to hold them in this position during the securing or welding operation.

After the group of channel or other metal members to form the panel are finally positioned, they are clamped to the pivotal bed or table. For this purpose, I provide a series of cross-members 25 which may be mounted on bolts 26 carried by the I-beams 10, such members 25 being clamped to the frame by nuts 25^a on said bolts 26. The cross-members 25 overlie the cross-members 15 and insure that the several channel members making up the floor panel are held rigidly to the frame.

In order that the frame with the assembled sections in position to be secured together as welding or otherwise may be mounted for angular positioning to facilitate the securing of such sections, preferably by welding, I provide a frame or support consisting of end members 30, having notches 31 in their upper ends adapted to receive the trunnions 13. These notches may be squared, as indicated in the drawings.

After the several sections making up a panel have been mounted upon the carrying frame and clamped thereto, such frame may be picked up by a traveling crane hoist or the like, and its trunnions disposed in the notched portions of the members 30. In such mounting, the frame may be turned to any desired angular position to facilitate the welding operation. As shown in Fig. 5, the frame has been tilted to present to the left the upper surface of the assembled metal sections making up the floor panel, and this will permit the operator to weld the sections together at the most convenient points.

These welds, which are preferably made at intervals, are shown at *a, a'*; *b, b'*; *c, c'*; *d, d'*; et seq. in Figs. 1, 2, and 4. In making these welds, the operator starts at or approximately the centre of the panel, at *a*, for instance, and works toward the end of the sections making up the panel, the welds *a', a''*, et seq., being made successively. The welds *b, b'*, et seq., are then made successively toward the opposite end of the panel, and each group of welds is made in this manner. This method of execution makes it possible to follow a definite procedure in placing the welds so that the locked up stresses produced by welding are kept to a minimum.

When one set of welds has been effected, the frame may be turned to the position shown by dotted lines, Fig. 5, and the other welds, indicated at *c, c'*; *d, d'*, upon the same side or face of the panel may be effected. After this welding operation on one side or face of the panel has been completed, the frame may be turned, as indicated by the broken lines, Fig. 6, to bring the other or what may be termed the "under" side of the panel into the proper position for welding, and the necessary welds may be made on the under side of the panel in the same manner as those made upon the upper side or face of the same, the frame being subsequently tilted to the position indicated by dotted lines, Fig. 6, to complete the welds on this under side or face of the panel.

To facilitate the turning movement of the frame

to the desired angular positions, it may carry at one end a fixed wheel 35 having spoke teeth 36 to be engaged by the hook at the end of a crane hoist.

When the desired angular position has been determined, the frame may be supported in such position by suitable struts 37.

When it is desired to produce a camber or arch in the length of the floor panel, the central support of the frame is provided with a cross-piece disposed the desired distance above the plane of the frame, which may be a rounded bar 40, welded in place, as shown in Figs. 3, 7 and 8. The metal sections are laid over this projecting portion and additional supports 41 at proper heights are carried by the other cross-members so that the camber or arch can be calculated to a desired nicety. At the sides of the panel where the outer flange of the metal section is spaced from the contacting part, filling members *y* may be employed, as indicated in Fig. 7. The clamping cross pieces 25 are held down against the metal sections over the projections 40 and 41 to produce the camber or arch, and when the sections have been welded in the manner described while in this position, a panel with the desired camber or arch will have been produced.

The skeleton frame or table upon which the sections making up the panel are mounted and assembled is subject to severe stress, especially when a camber or arch is being produced, and to insure against the distortion of the longitudinal members 10, I provide the tension bars 42 which may have their ends welded to the under side of said members 10.

It will be understood that the adjustable abutment 17 permits various length sections to be properly assembled upon the frame. If necessary, filling blocks or plates may be employed between the abutments and the ends of the assembled channel members.

In practice, it is desirable to have a number of frames in use upon which the metal sections to form floor panels may be assembled. These frames are then lifted into and out of the supports 30 as fast as the welder can secure together the sections making up each panel.

While I have shown more or less specific embodiments of my invention, it will be understood that changes may be made therein without departing from the spirit and scope of the same as defined by the appended claims.

I claim:

1. The combination of a reversible supporting frame adapted to receive a plurality of metal channel sections in interconnected relation means independent of the frame for holding the flanges of said channel sections in close engagement, clamping means for holding said metal sections to one face of the frame in assembled condition preliminary to an operation for permanently securing said metal sections into a floor panel unit, trunnions carried by the ends of the frame, and a support in which the trunnions of said frame may be rotatably mounted.

2. The combination of a reversible supporting frame adapted to receive a plurality of metal channel sections in interconnected relation, means independent of the frame for holding the flanges of said channel sections in close engagement, clamping means for holding said metal sections to one face of the frame in assembled condition, and means carried by the frame and cooperating with the clamping means for spring-

ing said metal sections intermediate their ends to impart a bend or camber thereto preliminary to an operation for permanently securing said metal sections into a floor panel unit.

5 3. The combination of a support, a skeleton frame having end trunnions mounted therein for movement with respect to the same and adapted to receive a plurality of metal channel sections in interconnected relation, means independent
10 of the frame for holding the flanges of said channel sections in close engagement, clamping means for holding said metal sections to one face of the frame in assembled condition, and means carried by the frame and cooperating with the clamping
15 means for springing said metal sections intermediate their ends to impart a bend or camber thereto preliminary to a welding operation for permanently securing said metal sections into a floor panel unit.

20 4. The combination of a support or horse comprising a plurality of spaced A-frames, a skeleton table made up of longitudinal and cross-members, trunnions carried by the ends of said table and adapted to be mounted in said A-frames
25 whereby said table may be movably mounted with respect thereto, means for holding said table in adjusted positions, clamping means for holding a plurality of metal sections to said table in assembled position, and means carried by the
30 table and cooperating with the clamping means for bending said sections longitudinally thereof and holding them in bent position preliminary to connecting said sections in permanent relation.

35 5. The combination of a supporting frame comprising longitudinal side members, cross members permanently connecting the ends of said longitudinal side members, independent cross members adjustably mounted with respect to said side members to form a skeleton table; said cross
40 members having an upper surface in the plane of

the upper surface of the side members, a fixed stop at one end of said frame, an adjustable stop at the opposite end of said frame; said frame being adapted to receive a plurality of independent channel members in interconnected
5 relation, clamping means overlying said channel members whereby they may be held in predetermined position on the frame, means independent of the frame for holding the flanges of said channel members in close abutting relation,
10 and means carried by the frame and cooperating with the clamping means for imparting a curvature to said channel members longitudinally of the same.

6. The combination of a supporting frame 15 comprising longitudinal side members, cross members permanently connecting the ends of said longitudinal side members, independent cross members adjustably mounted with respect to said side members to form a skeleton table; said cross
20 members having an upper surface in the plane of the upper surface of the side members, a fixed stop at one end of said frame, an adjustable stop at the opposite end of said frame; said frame being adapted to receive a plurality of independent channel members in interconnected
25 relation, clamping means overlying said channel members whereby they may be held in predetermined position on the frame, means independent of the frame for holding the flanges of said channel members in close abutting relation, means
30 carried by the frame and cooperating with the clamping means for imparting a curvature to said channel members longitudinally of the same, and tension means carried by the longitudinal
35 side members of the frame for maintaining them in alignment under the stress of the clamping and curve-imparting means.

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