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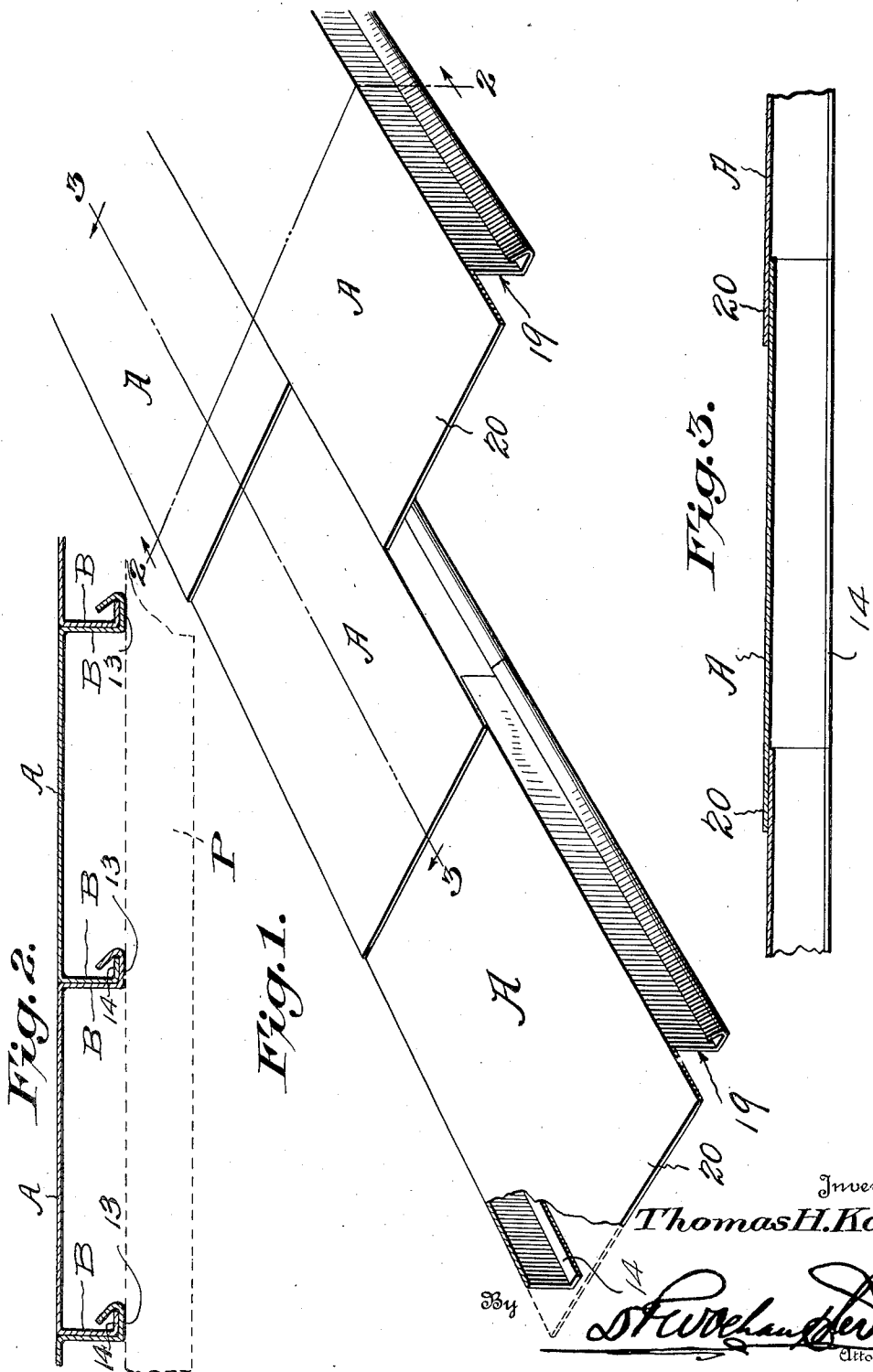
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1,706,924

METAL ROOF DECK CONSTRUCTION

Filed June 12, 1926

3 Sheets-Sheet 1



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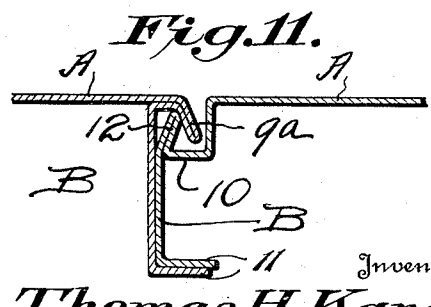
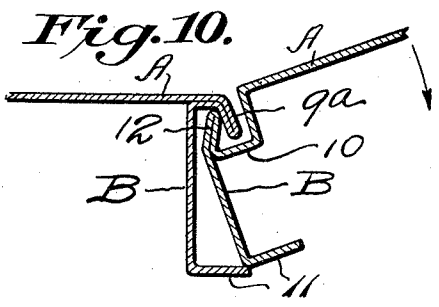
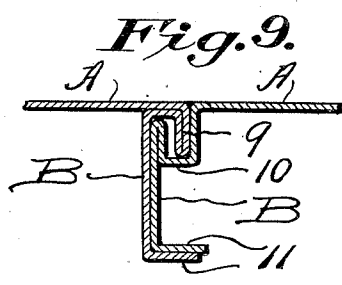
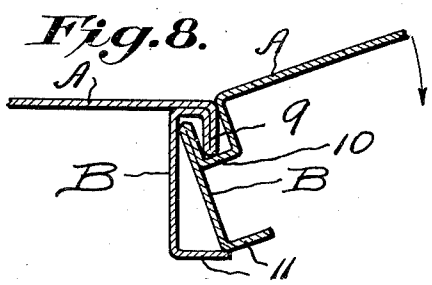
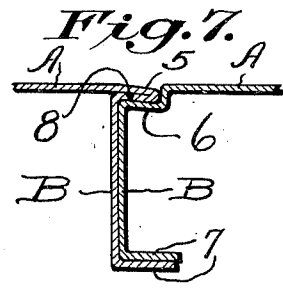
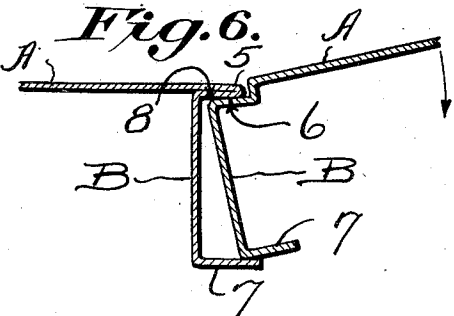
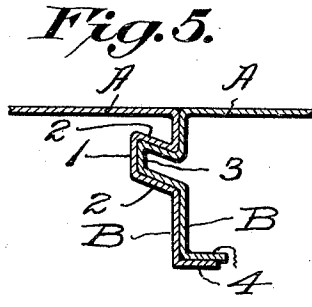
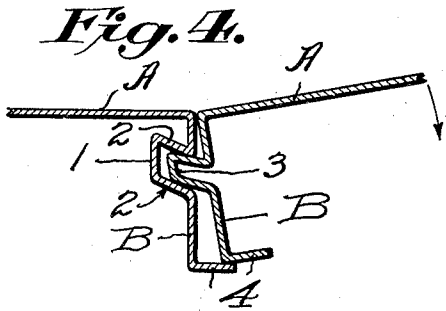
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METAL ROOF DECK CONSTRUCTION

Filed June 12, 1926

3 Sheets-Sheet 2



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METAL ROOF DECK CONSTRUCTION

Filed June 12, 1926

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Fig. 12.

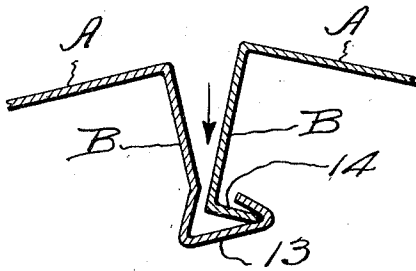


Fig. 13.

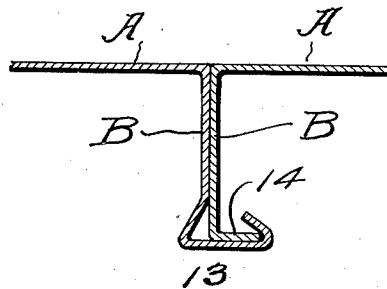


Fig. 14.

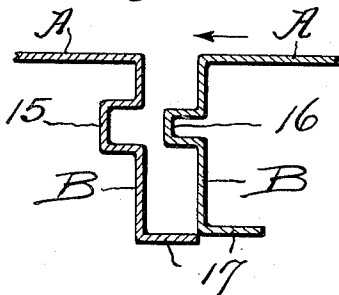


Fig. 15.

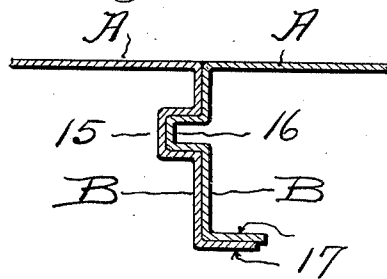


Fig. 16.

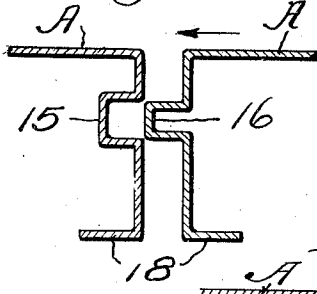


Fig. 17.

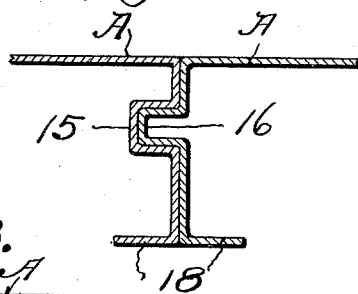
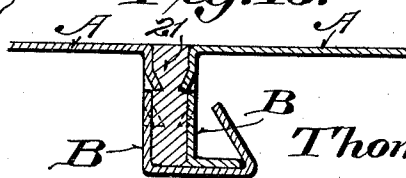


Fig. 18.



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# UNITED STATES PATENT OFFICE.

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## METAL ROOF-DECK CONSTRUCTION.

Application filed June 12, 1926. Serial No. 115,576.

This invention relates to fireproof building construction and more particularly to a metal roof decking, the units of which can be completely fabricated at the factory and which are adaptable for ready and permanent assembly when making the roof of the building.

Primarily the invention contemplates a fireproof metal roof-deck for buildings of a reinforced construction and easily manufactured and assembled. To that end it is the purpose of the invention to provide a fabricated metal roof-deck built up of relatively narrow strips or sheets of metal, in a manner analogous to the laying of a board flooring, and to form strong reinforced or stiffened joints throughout the underside of the decking by the act of the workmen in fitting together the metal strips and placing them in the common roofing plane.

A further object of the invention is to provide the metal roof-deck with sufficient reinforcement or stiffening throughout the underside thereof, longitudinally of all joints or seams, in order that the decking will be sufficiently strong to resist and sustain the ordinary loads imposed thereon, such as the load of the workmen in walking over the roof during fabrication and when applying the surfacing material thereto, and also the load of snow and wind pressure.

Another object of the invention is to provide a metal roof-deck, which, when completely fabricated in situ, presents a smooth exterior surface that can be readily insulated and waterproofed by any of the materials which may be selected for that purpose.

With these and other objects in view which will more readily appear as the nature of the invention is more fully understood the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

While susceptible of structural modification in a variety of forms certain preferred and practical embodiments of the invention are shown in the accompanying drawings, in which:—

Figure 1 is a perspective view of a section of a metal roof-deck, embodying the features of the present invention, and illustrating a preferable way of forming the end-lap

joint between the ends of adjoining strips or sheets in the same longitudinal row.

Figure 2 is a cross-sectional view of the structure shown in Fig. 1 on the line of section 2—2 of such figure.

Figure 3 is a sectional view longitudinally of a row of metal strips on the line 3—3 of Fig. 1.

Figure 4 is a detail view of one form of reinforcing side connecting joint between the side edges of adjoining metal strips, the view illustrating the relative positions of the parts to indicate the act of the workmen in rotating or rocking the same into jointed and interlocked relation.

Figure 5 is a view of the complete reinforced joint produced by the act of connecting the parts in the manner shown in Fig. 4.

Figures 6 and 7, 8 and 9, 10 and 11, 12 and 13, 14 and 15 and 16 and 17 respectively are paired views similar to the pair of views 4 and 5 showing other forms of reinforced connecting joints, and the manner of making such joints when the decking is being laid.

Figure 18 is a detail view showing a form of construction wherein sufficient space is permitted at the top of the side joint to receive a nailing strip of wood or other material to facilitate fastening down a covering material.

The present invention primarily consists of a metal roof-deck comprising a plurality of relatively narrow flat metal strips or plates A, as distinguished from wide sheets or plates of metal, and which flat metal strips are adapted to be assembled in jointed relation over the supporting purlins or beams P usually employed in the roof structure of buildings. The relatively narrow flat metal strips or plates A are adapted to be laid in jointed relation in a manner similar to the laying of a floor with tongue and groove floor strips or boards. To provide for the jointed connection between the side edges of the metal strips the said strips are formed at their side edges with depending stiffening flanges B. Each of these stiffening flanges is provided with a joint forming element mating or registering with a complementary joint forming element on the flange of the adjoining strip, the joint being made and locked by the act of the workman

in fitting together the metal strips and placing the same in the common roofing plane.

The joint construction between adjoining or contiguous metal strips A may assume a variety of forms, but in all constructions it is desirable to provide a joint that will not interfere with the facile assembly of the metal strips or plates by merely the act of hooking or sliding the same together in contiguous or close fitting relation, and it is also desirable to provide joints which are locked against lateral separation and which in addition to serving as joints or seams provide a strong depending stiffening rib throughout the entire deck along the line of the joint connection between adjoining plates.

For illustrative purposes several types of connecting joints between the edges of the metal strips or plates A are shown in the drawings. In the examples illustrated in Figs. 4 to 9 inclusive of the drawings the types there shown involve a rocking or rotary movement to bring the adjoining metal strips into interlocked jointed relation. For instance, in Figs. 4 and 5 of the drawings the depending stiffening flange B at one edge of each metal strip is shown as formed with a groove or channel 1 having inclined upper and lower walls 2—2, and the flange B at the opposite longitudinal edge of each metal strip is provided with an off-standing inclined joint-tongue 3 which is disposed at an inclination to the horizontal plane and is adapted to be rocked or rotated into the angularly disposed groove or channel 1 of the adjacent strip in the manner indicated in Fig. 4 of the drawings. Thus, when the joint is made or completed by bringing both metal strips into the common roofing plane, as shown in Fig. 5, the strips will be firmly locked against lateral separation and the joint forming elements interlocked in the manner described will produce a stiffening rib lengthwise of the roof deck. In the form of construction just described the parts may be additionally strengthened or stiffened by forming at the lower edges of the depending flanges B the lateral supplemental stiffening flanges 4.

Another type of joint wherein the joint is made by a relative rotary or rocking movement of the adjoining strips is shown in Figs. 6 and 7 of the drawings, wherein each metal strip A is formed at one longitudinal edge with an overhanging joint lip 5, and at its corresponding opposite longitudinal edge with a complementary seat or rabbet 6, the lower edges of both of the depending side flanges B being formed with lateral supplemental stiffening flanges 7. In this form of construction, that is, the one shown in Figs. 6 and 7 of the drawings it is preferable to provide a slight incline 8 at the underside of the joint lip 5 so that when the parts are

rocked or rotated, as indicated in Fig. 6, into the matching or registering relation, as shown in Fig. 7, the joint parts will be firmly held together and locked against ready lateral separation.

In the embodiment of the invention shown in Figs. 8 and 9 of the drawings each metal strip A is provided at one longitudinal edge with a downturned joint hook 9 spaced from the adjacent main depending flange B and at its opposite edge with a depressed channel 10 adapted to receive the joint hook 9 of the adjoining metal strip. Also, in the form of construction shown in Figs. 8 and 9 both of the main depending flanges B are formed with lateral supplemental stiffening flanges 11, and it is necessary in assembling the parts shown in these figures to bring the joint hook 9 of one metal strip over the depressed channel 10 at the edge of the adjoining strip and then relatively rotate the strips into the flat roofing plane to complete the joint and interlock the parts together as shown in Fig. 9.

A modification of the construction shown in Figs. 8 and 9 of the drawings, which is intended to produce a very tight joint is shown in Figs. 10 and 11. Therein the outer wall of the depressed channel 10 at one edge of the strip is illustrated as being inclined or deflected inwardly as indicated at 12 thereby causing the said inclined or deflected wall 12 to firmly press or bind against the inner side of the joint hook 9<sup>a</sup>, also slightly inclined, of the adjoining metal strip when the two strips are forced into the common roofing plane.

In all forms of the invention so far described the relative rotary or rocking action is involved to bring the joint forming elements into matching and interlocking relation. A similar action is involved in the form shown in Figs. 12 and 13 of the drawings wherein the main depending flange B at one edge of each strip A is formed at its bottom edge with an out-turned channeled foot 13 and at the lower edge of its opposite flange B with an inturned locking and stiffening lip 14 adapted to be engaged in the channel of the foot 13 of the adjoining metal strip and to hook behind the inclined outer flange 14 of the said foot. In this construction the flanges B—B of adjoining metal strips A—A are brought flatly together by the act of rotating the adjoining edges of both of the strips A downward to provide for bringing said strips into the flat roofing plane, as may be readily seen from Figs. 12 and 13 of the drawings.

As distinguished from the forms of the invention involving the rotative or rocking action Figs. 14 and 15 and 16 and 17 illustrate joint constructions wherein the strips are brought together and the joint made by a simple relative lateral movement of the

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parts. For instance, as shown in Figs. 14 to 17 the depending flange B at one edge of each strip has formed at an intermediate point therein a longitudinally extending inset groove or channel 15 having its upper and lower walls substantially parallel with the flat plane of the strip A and the opposite flange B of the strip is formed with an outstanding joint tongue 16 having upper and lower walls substantially parallel with the flat plane of the strip A so that the joint parts can be brought together and the joint made by the simple act of moving one strip laterally into matching relation with the adjoining strip. In the form of construction shown in Figs. 14 and 15 of the drawings the flanges B—B of the strips A are shown provided with stiffening flanges 17 respectively projecting inwardly and outwardly, while in the construction shown in Figs. 16 and 17 the flanges B of each strip are shown provided with stiffening flanges 18 both facing or pointing inwardly.

In carrying forward the invention it is desirable to provide adequate means for covering the joints at the ends of contiguous metal strips or plates and this may be accomplished by an end-lap of suitable form. A preferable construction for that purpose is shown in the group of Figures 1, 2 and 3, which consists in cutting back the depending main side flanges B of each strip, at one end thereof, as indicated at 19, thereby forming or leaving at one end of the strip a projecting joint apron 20 that overlaps, for a substantial distance, one end of the next adjoining metal strip in the same longitudinal row of said strips. This is plainly shown in Figs. 1 and 3 of the drawings and

provides an end-lap joint which effectively covers and closes the end joint between the strips.

It has already been pointed out that any suitable surfacing or covering may be placed over the metal roof-deck for waterproofing and insulating purposes and it may be found desirable in some cases to use nailing strips 21 of wood or other suitable material inserted at the top of the side joints as shown in Fig. 18 of the drawings.

From the foregoing it is thought that the construction and important features of the invention have been pointed out and it will be understood that various changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

I claim:—

A metal roof-deck construction including adjoining metal plates formed at their side edges with depending flanges, the flange of one plate being adapted to flatly abut against the flange of an adjoining plate when in the common roofing plane, and the said depending abutting flanges respectively including an inclined overhanging shoulder portion and an inclined rib surface adapted to engage beneath said overhanging shoulder when the plates are assembled by a rocking or rotary movement, and whereby lateral separation of the plates at right angles to the depending flanges will be resisted.

In testimony whereof I hereunto affix my signature.

THOMAS H. KANE.