

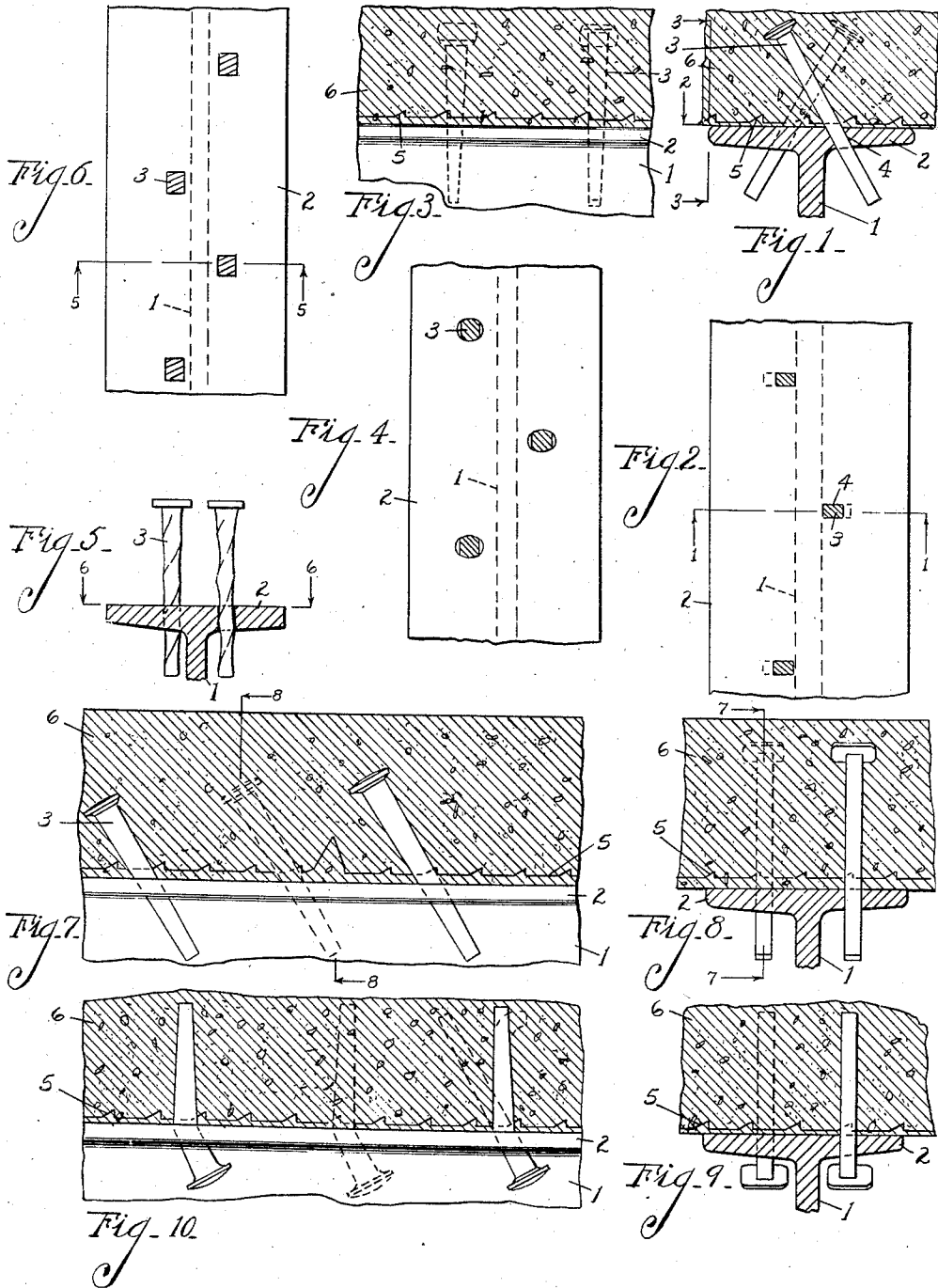
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CONCRETE CONSTRUCTION

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CONCRETE CONSTRUCTION

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Serial No. 483,440

12 Claims. (Cl. 72-70)

This invention relates to a detailed improvement in the structure appearing in my patent application Serial No. 472,828, filed August 4, 1930.

The objects of the invention are:

First, to provide such a structure with prongs that may be readily inserted and assembled on the job.

Second, to provide such a structure which is available for the application of lath to a joist in the usual way and the prongs thereafter inserted.

Third, to provide such a structure with wedging prongs which may be driven into place.

Fourth, to provide such a structure in which the slab itself is utilized as a compression member.

Further objects, and objects pertaining to details and economies of my invention will definitely appear from the description to follow.

Preferred embodiments of my invention are illustrated in the accompanying drawing, in which:

Fig. 1 is a cross section through the upper chord of a floor joist and floor slab construction on line 1-1 of Fig. 2.

Fig. 2 is a sectional view on line 2-2 of Fig. 1 of a section of joist showing the alternate perforations for receiving the prongs which are preferably ordinary cut nails.

Fig. 3 is a sectional view on line 3-3 of Fig. 1.

Fig. 4 is a plan view of a section of joist comparable to that appearing in Fig. 2 in which deformed round nails or spikes are made use of for the prongs.

Fig. 5 is a sectional view on line 5-5 of Fig. 6 showing the top cord of a joist with twisted tapered pins in place of the cut nails.

Fig. 6 is a plan of the section on line 6-6 of the structure seen in Fig. 5.

Fig. 7 is a section on line 7-7 of Fig. 8 showing a modification of the structure seen in Fig. 1 in which cut nails have their top ends inclined inwardly toward the center from each end of the joist.

Fig. 8 is a longitudinal section on line 8-8 of Fig. 7 of a completed slab.

Fig. 9 is an end view of a modification of the structure appearing in Fig. 7 in which cut nails are driven upwardly through the top flanges of the joist.

Fig. 10 is a section of a complete slab of the structure of Fig. 9 showing the projecting ends of the nails bent to the vertical and hooked at their tips, if required.

The parts will be identified by their numerals

of reference which are the same in all the views.

1 is a portion of the web of a metal floor joist having a T shaped top cord 2. In the flanges of this top cord are inserted the prongs 3 in alternately arranged oblique holes 4 so that the nails forming the prongs are disposed in staggered relation crosswise to each other so that they act similar to nails in toe-nailing.

5 is a metal lathing of any description. It may be rib lath or a lathing with a paper support.

6 is the concrete slab formed thereon.

It will be noted that owing to the angular position of the prongs 3 when they are incorporated in the slab they positively lock the slab to the top cord of the joist. The prongs 3, being tapered cut nails, are of such dimension in relation to the holes 4 that they drive to a very tight fit on the two wedging surfaces when the tip of the nail projects but a small distance below the flange of the joist. This insures the complete effective engagement of the slab to the top cord of the joist and insures complete and effective resistance to the shearing stresses between the two, up to the full strength of the prongs made use of. The stresses are carefully calculated in each case and a sufficient number of prongs provided for the service required.

In Fig. 4 round nails are made use of, going into round holes, and the nails are deformed by swaging their sides to expand to elliptical form to secure the wedge action required.

In Figs. 5 and 6 pins comparable to nails of angular cross section are twisted. The fact that they are twisted insures complete tying between the slab and the joist as soon as the concrete has set.

In Figs. 7 and 8 the prongs are inclined toward the center of the joist from each end and are driven into wedging contact sufficient, preferably, to some extent to swage the metal to insure a perfect fit. Because the prongs are thus inclined, when the concrete is set, they are completely effective and firmly unite the joist with the slab.

In the structure appearing in Figs. 9 and 10 the bond of the concrete on the prongs and the fact that the prongs are driven upwardly into wedging action insure the complete union of the slab with the joist. The tips of the prongs can be upset to one side or the other to secure deformation if that is desired or required.

Of course, a structure like that appearing in Figs. 1, 2 and 3 can be provided in which the nails or prongs are driven up from the bottom and the upwardly projecting ends can be deflected to any relation desired. However, when that is done,

the advantage of inserting the prongs through the lath after it is placed is lost.

From the description it will be observed that so long as the prongs have a wedge portion which enables them to be swaged into suitable apertures in the joists, the objects of my invention are effectively accomplished because the prongs can be bent and disposed in any position required.

The invention is especially well adapted to a joist construction, but is also available for girders or beams of any description where a concrete slab or structure is bonded to a head of the beam.

I desire to claim the invention in the specific forms illustrated and also broadly as pointed out in the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. The combination in a metal joist having a T head, wedge-shaped prongs comprising cut nails inclined laterally and alternately in planes crossing each other inserted into corresponding apertures in the flanges of the said T head and wedging in longitudinal relation thereto, lath retained by said prongs, and a concrete slab embracing said prongs and incorporating the said prongs and head into a unitary bonded structure utilizing the slab as a compression member and as a bond uniting said prongs.

2. The combination in a metal joist having a T head, wedge-shaped prongs inserted into corresponding apertures in the flanges of the said T head and wedging in longitudinal relation thereto, lath retained by said prongs, and a concrete slab embracing said prongs and incorporating the said prongs and head into a unitary bonded structure utilizing the slab as a compression member and as a bond uniting said prongs.

3. The combination in a metal joist having a T head, wedge-shaped prongs comprising twisted angular pins inserted into corresponding apertures in the flanges of the said T head and wedging in longitudinal relation thereto, lath retained by said prongs, and a concrete slab embracing said prongs and incorporating the said prongs and head into a unitary bonded structure utilizing the slab as a compression member and as a bond uniting said prongs.

4. The combination in a metal joist having a T head, wedge-shaped prongs comprising cut nails inclined laterally and alternately in planes crossing each other inserted into corresponding apertures in the flanges of the said T head and wedging thereunto, lath retained by said prongs,

and a concrete slab embracing said prongs and incorporating the said prongs and head into a unitary bonded structure utilizing the slab as a compression member and as a bond uniting said prongs.

5. The combination in a metal joist having a T head, wedge-shaped prongs inserted into corresponding apertures in the flanges of the said T head and wedging thereunto, lath retained by said prongs, and a concrete slab embracing said prongs and incorporating the said prongs and head into a unitary bonded structure utilizing the slab as a compression member and as a bond uniting said prongs.

6. The combination in a metal joist having a T head, wedge-shaped prongs comprising twisted angular pins inserted into corresponding apertures in the flanges of the said T head and wedging thereunto, lath retained by said prongs, and a concrete slab embracing said prongs and incorporating the said prongs and head into a unitary bonded structure utilizing the slab as a compression member and as a bond uniting said prongs.

7. The combination in a metal joist having a T head, wedge-shaped prongs comprising cut nails inclined laterally and alternately in planes crossing each other inserted into corresponding apertures in the flanges of the said T head and wedging in longitudinal relation thereto.

8. The combination in a metal joist having a T head, wedge-shaped prongs inserted into corresponding apertures in the flanges of the said T head and wedging in longitudinal relation thereto.

9. The combination in a metal joist having a T head, wedge-shaped prongs comprising twisted angular pins inserted into corresponding apertures in the flanges of the said T head and wedging in longitudinal relation thereto.

10. The combination in a metal joist having a T head, wedge-shaped prongs comprising cut nails inclined laterally and alternately in planes crossing each other inserted into corresponding apertures in the flanges of the said T head and wedging thereunto.

11. The combination in a metal joist having a T head, wedge-shaped prongs inserted into corresponding apertures in the flanges of the said T head and wedging thereunto.

12. The combination in a metal joist having a T head, wedge-shaped prongs comprising twisted angular pins inserted into corresponding apertures in the flanges of the said T head and wedging thereunto.

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