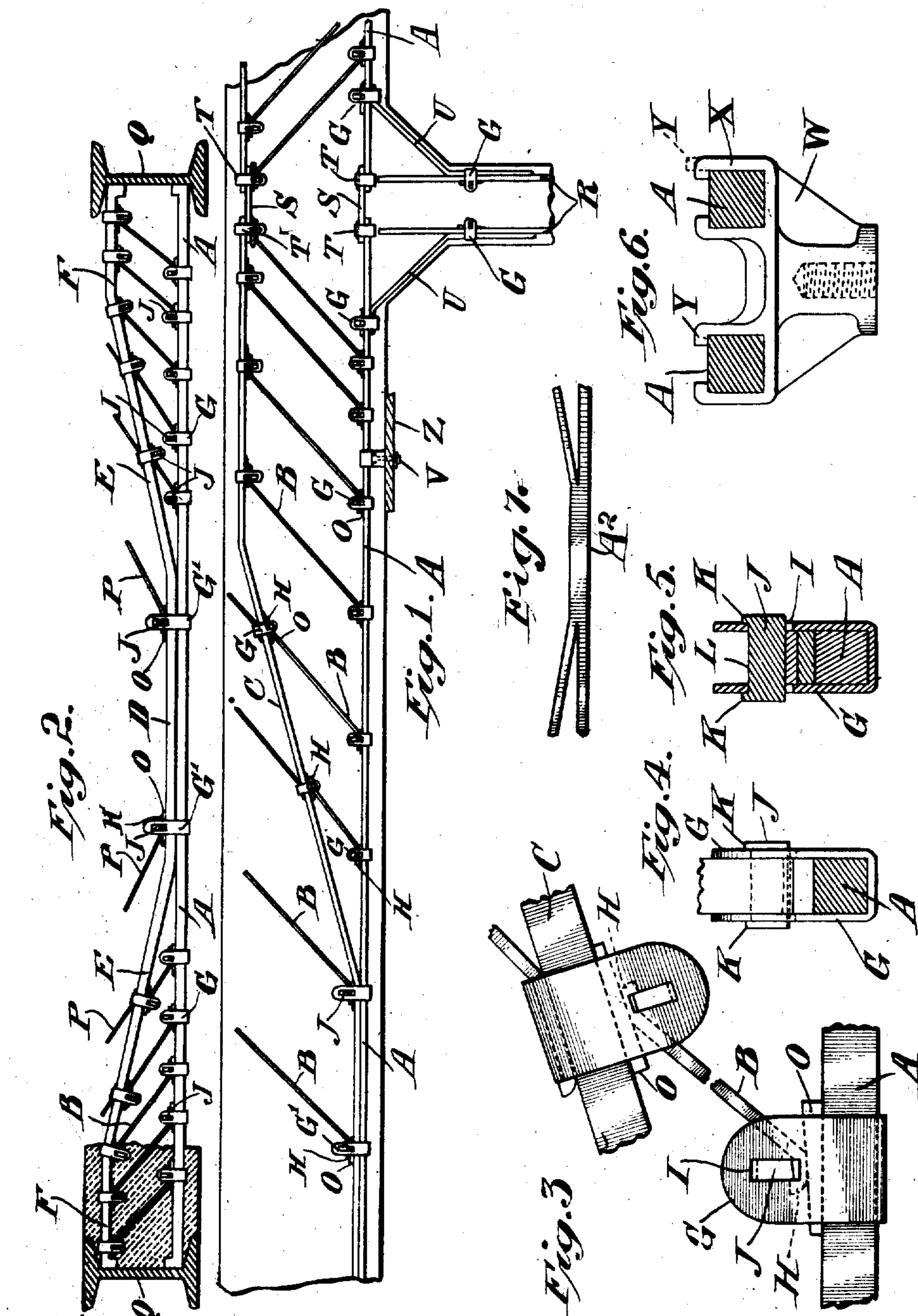


No. 896,963.

PATENTED AUG. 25, 1908.

H. E. WHITE.
REINFORCING FRAME.
APPLICATION FILED AUG. 14, 1906.



Attest:
A. L. O'Brien
A. L. O'Brien

Inventor:
Herbert E. White
by Lickerson, Brower,
Raeger & Birney Attys.

UNITED STATES PATENT OFFICE.

HERBERT E. WHITE, OF YOUNGSTOWN, OHIO.

REINFORCING-FRAME.

No. 896,963.

Specification of Letters Patent.

Patented Aug. 25, 1908.

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To all whom it may concern:

Be it known that I, HERBERT E. WHITE, a citizen of the United States, and resident of Youngstown, Ohio, have invented certain new and useful Improvements in Reinforcing-Frames, of which the following is a specification accompanied by drawings.

This invention relates to reinforcing frames suitable for embodiment in concrete and other masonry constructions, and the objects of the invention are to improve upon the construction of such reinforcing frames and render them more suitably adapted to meet the special requirements of different constructions.

Further objects of the invention will hereinafter appear and to these ends the invention consists of a reinforcing frame substantially as hereinafter more fully described and claimed in this specification and shown in the accompanying drawings, in which,—

Figure 1 is a side elevation of a portion of a column and reinforcing frames embodying the invention connected thereto and to each other; Fig. 2 is a side elevation partly in section of a frame embodying the invention supported between two beams or girders; Fig. 3 is an enlarged detail side view, partly broken away, illustrating the means for connecting the slats or tie pieces to the longitudinal members of the frame; Fig. 4 is an enlarged detail view, partly in transverse section, showing one of the clamps; Fig. 5 is a transverse sectional detail view, taken through one of the clamps; Fig. 6 is a detail view partly in transverse section, showing one of the anchor blocks for the frames. Fig. 7 is a detail view of a modification of a portion of the frame.

It is well known that the stresses in a concrete beam or girder follow certain lines. Particularly the tensile strains beginning at the top end of a girder or beam will follow a line descending as it approaches the center of the beam or girder and then ascending as it approaches the opposite end. It thus follows that the greatest tensile strain is at the bottom of the central or middle portion of the beam or girder, and hence it is desirable and necessary to place in central section or at the bottom of the central section of the beam a greater body of metal. I propose to obtain these desired ends by making a proper distribution of the metal by means of truss-

like structures made by bending or deforming and fastening together the ordinary commercial shapes of iron or steel.

Referring to the drawings A represents a longitudinal base member, which may be a metallic rod or bar of any suitable cross section. In this instance a bar square in cross section being shown by way of illustration. Connected to the base member A by means of longitudinal slats or tie pieces B is another or upper longitudinal member C, which is preferably one of the commercial shapes used in the construction of reinforcing members, and as shown, comprises a central portion D, outwardly extending portions E which extend from each end of the central portion D and diverge from the base member A so that the distance between the base member and the portions E continuously increases as the outer ends of the reinforcing frame are approached. Preferably the extreme ends F of the upper member C extend substantially parallel to the base A.

In constructing the beam, the central portion D of the member C is placed upon the central portion of the base member A, and the two members are tied together by sets of slats B, the slats in each set being arranged preferably substantially parallel to each other, although the arrangement may be varied as desired. These slats as shown are preferably of much lighter stock than the longitudinal members A and C, and are detachably secured to said members by means of clamps, comprising the straps G, each formed of a continuous piece of metal bent into U-shaped form and adapted to slip over the members A and C at the desired points. Each slat or tie piece B is provided with a foot H bent at an angle to the tie piece, and adapted to lie within a strap G and substantially parallel to one of the members A or C. Means are provided for securely holding the bent ends H of the tie pieces, in this instance, each strap being provided with apertures I, into which are adapted to be slipped plugs or blocks J recessed at L to receive the straps and provided with shoulders K which are arranged outside of the straps so that the blocks are prevented from longitudinal movement when the ties are clamped in place. As shown, the ends of the tie pieces or slats B are placed between the plugs or blocks J and the longitudinal members of the

frame, and wedges O are forced into place between the feet H of the slats and the longitudinal members A and C, thereby securely clamping the ends of the tie pieces between the said longitudinal members and the blocks J.

Straps G' constructed like those described are also provided for clamping the portion D of member C against the base member A, and if desired reinforcing slats or ribs P may be provided extending outwardly from the upper member C, and these additional ribs P may be secured by the same straps which clamp the members A and C together, and which clamp the ends of the tie pieces or slats B to the member C.

In Fig. 2 one mode of using the reinforcing frame is illustrated, the ends of the frame being placed between the flanges of the eye beams or girders Q and the whole embedded in concrete. In Fig. 1 another and preferable mode of utilizing reinforcing frames is illustrated, in which R represents the upright metal members of a concrete column, and two reinforcing frames constructed in accordance with this invention are shown joined together above the column by means of the connecting pieces S, which are suitably clamped in position by means of the straps T constructed like the clamps already described. The base members A of the reinforcing frames are also secured to the uprights R of the column by means of the struts U, which struts are fastened to the base members A and to the uprights by means of the straps G.

If desired, two or more reinforcing frames may be arranged side by side and secured together by means of the anchor block W, which also serves the purpose of fastening a suspended ceiling to the frames, or for fastening parts of machinery or other fixtures to the ceiling. In this instance the anchor block W is provided with jaws X, within which the base members A of the beams are placed, and then the ends Y of the jaws are bent over to clamp the anchor block upon the frames. In Fig. 1 Z represents a fixture of any suitable character secured to the anchor block as by means of the bolt V.

One of the particular advantages of this invention resides in the fact that the subordinate members of the reinforcing frame can be made of small pieces of stock ordinarily thrown into the waste. Another advantage resides in the fact that the parts forming the reinforcing frame can be shipped to the market in knocked down form, and may then be readily assembled at the place of using without more than the ordinary skill of the mechanic because the parts are connected in a very simple and efficient manner, and the junction members or clamps are all interchangeable, that is, any one clamp or strap may be placed in any desired position

to hold two or more parts together. Another advantage is the fact that the different parts, including both the longitudinal main members and the subordinate members can be readily cut after shipment to the scene of use and before assembling, and thus adapted to meet special requirements.

It is of great importance that the reinforcing frames be capable of being connected with the vertical reinforcing members of a column, for instance, which object is readily accomplished in accordance with this invention. Furthermore when the truss-like structure or reinforcing frame is embedded in concrete it may be connected not only with the beam or girder intersecting it at right angles, but it may be connected with the corresponding beam or girder extending in the same direction as the frame in the contiguous division of the building in order to provide a continuous reinforcement from one side of the building to the other. The deformed upper member of the truss-like reinforcing frame provides for the tensile strain, and the other parts of the frame provide for the various stresses to which concrete bodies are subjected when heavily loaded.

In Fig. 7 a modification of the main members of the frame is shown, in which the upper and lower members are integral instead of separate. A solid bar A² is split at each end to form the base member and the upper members.

Obviously some features of this invention may be used without others and the invention may be embodied in widely varying forms.

Therefore, without limiting the invention to the devices shown and described, and without enumerating equivalents, I claim and desire to obtain by Letters Patent the following:

1. In a reinforcing frame, the combination with a straight longitudinal member, of a longitudinal slat or tie piece having a foot bent at an angle to the body of the tie piece and adapted to lie along the length of the longitudinal member, a U shaped strap arranged over said foot and provided with apertures in its legs, a block adapted to be inserted in said apertures transversely of the longitudinal member and bear upon the foot of the tie piece, and a wedge adapted to be inserted transversely to the block and along the length of the longitudinal member between the foot and the longitudinal member.

2. In a reinforcing frame, the combination with a straight longitudinal member, of a longitudinal slat or tie piece having a foot bent at an angle to the body of the tie piece and provided with an outwardly turned toe, said foot being adapted to lie along the length of the longitudinal member, a U-shaped strap arranged over said foot and provided with apertures in its legs, a recessed block

adapted to be inserted in said apertures transversely of the longitudinal member and provided with ears for clasping the strap, said block being adapted to bear upon the
5 foot of the tie piece, and a wedge adapted to be inserted transversely to the block and along the length of the longitudinal member between the foot and the longitudinal member.

In testimony whereof I have signed this specification in the presence of two subscrib- 10
ing witnesses.

HERBERT E. WHITE.

Witnesses:

B. C. FAGLEY,
ORSON D. KAISER.