FINK TRUSS WEB STRESS ANALYSIS BY NEW METHOD.

By Harry B. Wrigley.*

THE graphic analysis of web stresses in Fink trusses presents, according to writers upon this subject, a difficulty at joints 4 and 5, Fig. 1. This difficulty results from three unknown forces at each of the joints named for, in a system of forces in equilibrium, acting through the same point, in the same plane, at least all conditions but two must be known in order to construct a force polygon.

In "Roof and Bridges" (Merriman and Jacoby) there is presented a solution by Willett, and described at a meeting of the Chicago Chapter, American Institute of Architects, in 1888.

Goodman, in his "Mechanics Applied to Engineering," gives a solution by Professor Barr, Glasgow University, identical with Willett's solution, requiring the substitution of an imaginary member connecting joints 4 and 6 to replace members N-O and O-P, Fig. 1.

Other writers, who have not adopted the above method, suggest a solution which fails under certain conditions of roof loading, consequently I have developed a new and logical solution to be employed regardless of roof loading conditions.

To illustrate, consider Fig. 2 (part of Fig. 1). Lay off the load line a—e_1 and reactions e_1—y_1 and y_1—a, Fig. 3, then construct the stress diagram for the web members as shown in dotted lines, taking the joints in numerical order. It is evident from Fig. 1 that panel loads to the right of E-F do not affect the web members to the left, and vice versâ. Hence, having determined the web stresses, complete the load line a—j and reactions j—y and y—a, Fig. 3, to obtain the stresses in the chord members. The web stresses in the final diagram are identical with those in the dotted diagram.

Similarly, in the compound Fink truss (Fig. 4) the web stresses are easily obtained. Keeping in mind that stress m_2—n_2 is the same as m_1—n_1, the stresses for joint 4 (Fig. 5) are indicated by the polygon y_2—m_2—n_2—q_2—y_2, Fig. 6. Having thus determined q_2—y_2, the remaining web stresses are obtained by taking the joints in numerical order, as shown, from whence the complete stress diagram is drawn, as was done in Fig. 3.

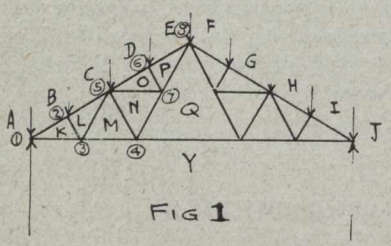

Fig 1

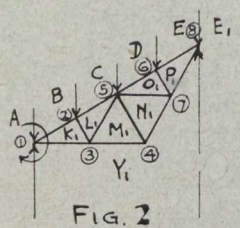

Fig. 2

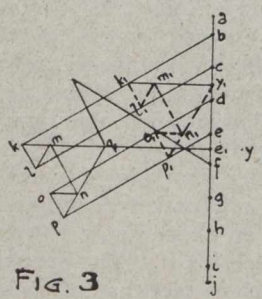

Fig. 3

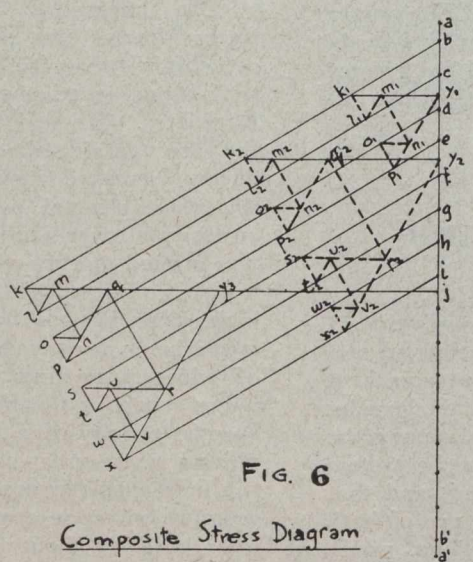

Fig. 6

Composite Stress Diagram

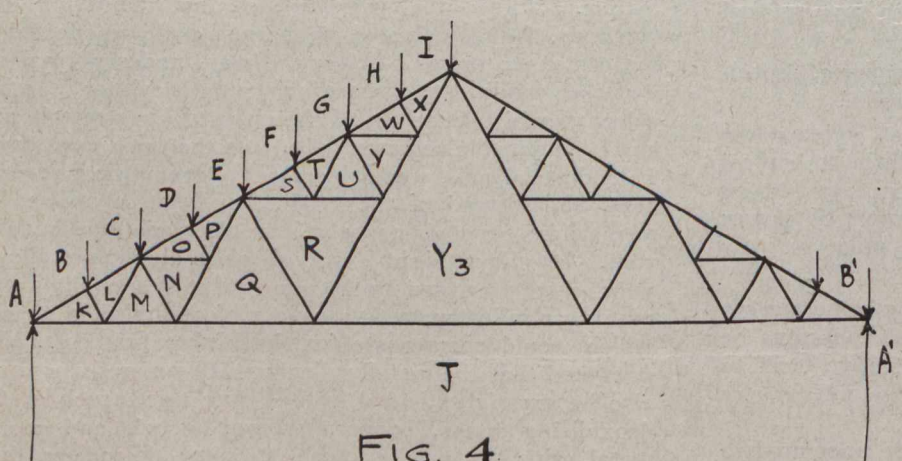

Fig. 4

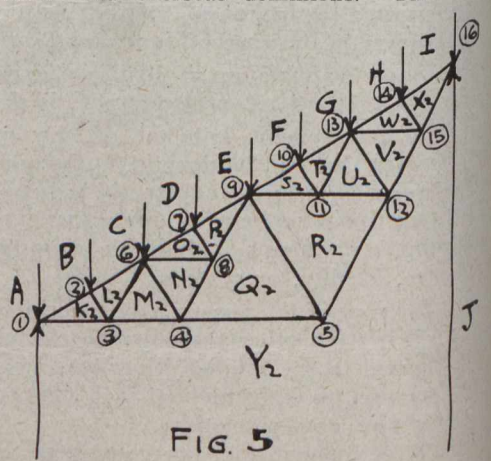

Fig. 5

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NICKEL COMPANY'S PLANS.

The International Nickel Company will spend about $2,000,000 on the proposed new refinery which the company is to erect in Canada to produce all nickel needed by Great Britain and overseas dominions. This expenditure will be met from the company's treasury funds which approximate $8,500,000.

A subsidiary concern has been formed in Canada to own and operate the new plant, and its $5,000,000 capital stock will be owned by the International Nickel Company.

Under the agreement entered into between the company and the Canadian government officials, British nickel requirements will be made in Canada, the balance at the New Jersey refinery. It is estimated that the cost of producing refined nickel in Canada will be but little higher than in the older plant in the United States. Arrangements have already been entered into whereby the company will secure its power from the government at but little over the actual cost price.