DESIGN AND GRAPHIC METHOD FOR CALCULATING A STEEL TRUSS.

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IT is very well known by engineers that the graphic method is the best, quickest and most practical way for calculating the various stresses on the different members in steel work, etc., the diagram showing at a glance what the actual stress is on each strut or tie. The following is for a truss which was calculated some years back for the roof of a gymnasium built for the accommodation of 1,600 naval cadets. The building is 136 ft. 6 ins. by 60 ft. in the clear, the trusses being placed 10 ft. 6 ins. apart, so that there are 12 trusses in all. Fig. 1 shows details of design for one half span, and also stress diagram.

Starting with the weight on the truss, and taking the wind into account, dead weight, when worked out, equals 55.8172 lbs. per sq. ft. Superficial area equals 10.5 × 35.125, or 368.85 sq. ft., from which the total weight is found to be 9.20 tons. The truss is of the Warren type, and the distributed weight equals 0.92 tons at each end of half span, and 1.84 tons on each apex.

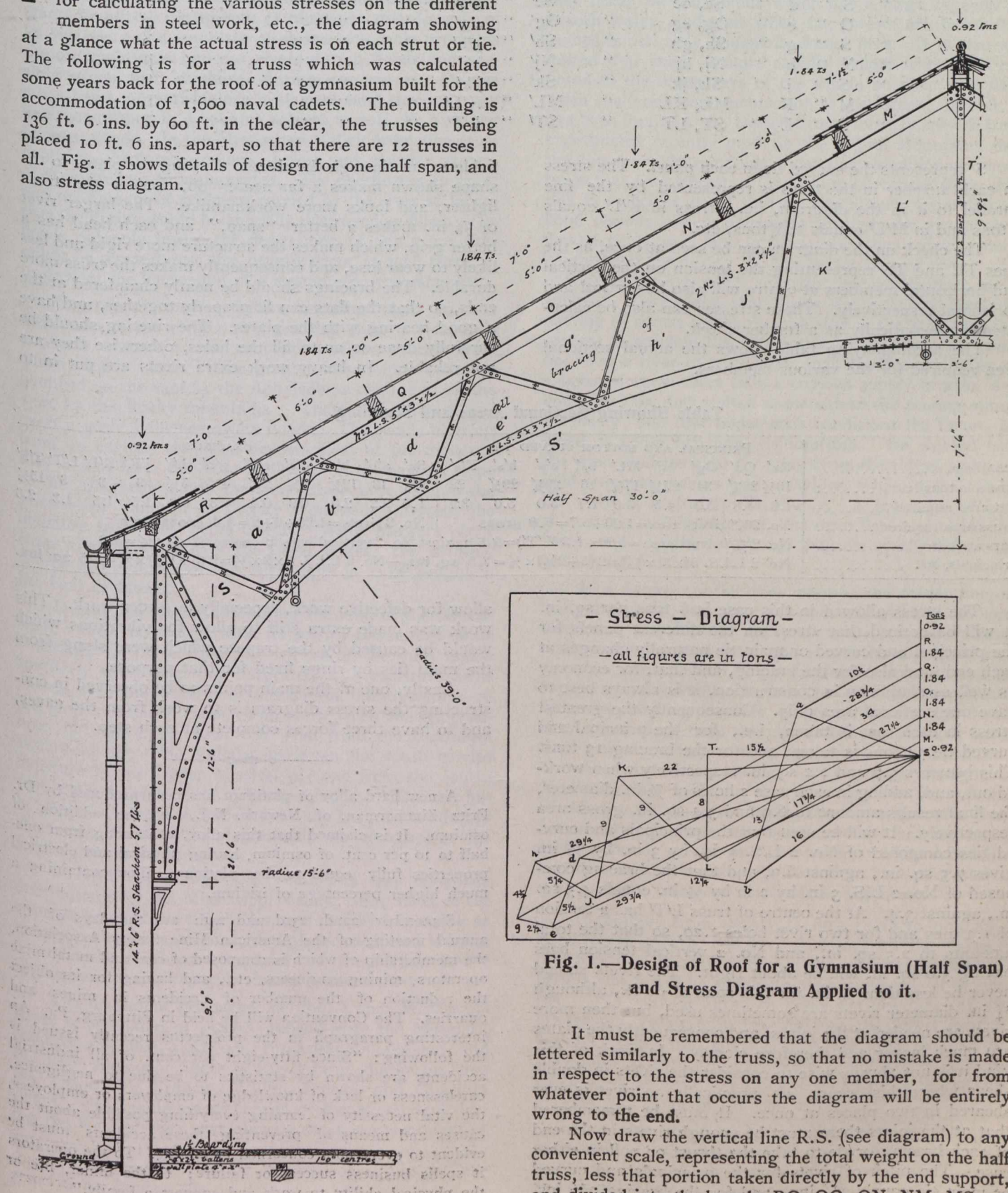

Fig. 1.—Design of Roof for a Gymnasium (Half Span) and Stress Diagram Applied to it.

It must be remembered that the diagram should be lettered similarly to the truss, so that no mistake is made in respect to the stress on any one member, for from whatever point that occurs the diagram will be entirely wrong to the end.

Now draw the vertical line R.S. (see diagram) to any convenient scale, representing the total weight on the half truss, less that portion taken directly by the end support, and divided into the lengths RQ, QO, ON, NM, MS, re-