Methods of repairing wooden machines are well explained, and there is a chapter on glueing; and it is interesting to learn that wood construction is still used for most of the best American aircraft.

A chapter is given on doping and finishing, where the strange mistake is made of stating that cellulose nitrate is produced by "dissolving" cotton in nitric acid, but which is otherwise full of valuable practical hints.

The various methods of welding, either by oxy-acetylene or oxy-hydrogen blow-pipes and by the various electrical methods are well dealt with. While a reference is made to the fact that acetylene gas produced in generators often contains undesirable impurities it is curious to find no reference made to purifiers.

Thin sheet metal is discussed, and the methods used for the repair of parts made from this material are described, and there are final chapters on cleaning, oiling and adjusting aircraft and assembling rigging and inspecting.

The book contains an immense amount of practical information, most of which has not, I believe, been previously published—at any rate, in so convenient a form—but the reader should remember that in certain instances American practice would not be accepted in this country. The very bad design for an elevator control stick connecting link given on page 27 is a case in point.

The book can be thoroughly recommended to those interested in the repair and maintenance of aircraft, with the reservations that have been given, as those who desire to be abreast of their subject cannot afford to ignore the practice of other countries. Its chief value is its detailed description of American practice in the matters with which it deals.

CORRESPONDENCE

To the Editor of the Journal of the R.Ae.S.

Ingleston, Osborne Road,
East Cowes, I.W.,
November 20th, 1931.

Re The Method of Least Work

Dear Sir,—With reference to the stressing of self-strained redundant structures, it has occurred to me that the difficulty mentioned in my paper on the Method of Least Work (July Journal, p. 662, line 20) can easily be dealt with as follows:—

Consider the case where there are two redundant members with known initial loads P_{01} and P_{02} respectively. The unknown amounts by which these members are short when all the members are unstrained are λ_1 and λ_2 respectively.

When the members are strained into position in the structure, the relative deflections of the ends of the members and their points of attachment, namely, λ_1 and λ_2, are given by $\partial U_0/\partial P_{01}$ and $\partial U_0/\partial P_{02}$, where U_0 is the initial strain energy of the complete structure (including the redundant members).

Now the final load in each member can be expressed in the form $\alpha+\beta P_1+\gamma P_2$, where α, β and γ are constants for each member. The initial load in each member is then of the form $\beta P_{01}+\gamma P_{02}$, so that

$$\lambda_1=\partial U_0/\partial P_{01}=\Sigma\,(l\beta/EA)\,(\beta P_{01}+\gamma P_{02}) \qquad (1)$$

$$\text{and } \lambda_2=\partial U_0/\partial P_{02}=\Sigma\,(l\gamma/EA)\,(\beta P_{01}+\gamma P_{02}) \qquad (2)$$

When the external loading is applied, the respective values of the loads in the redundant members become P_1 and P_2, which may be found from the equations

$$\partial U/\partial P_1 = \Sigma\,(l\beta/EA)\,(\alpha + \beta P_1 + \gamma P_2) = \lambda_1 \quad . \quad . \quad . \quad (3)$$
$$\partial U/\partial P_2 = \Sigma\,(l\gamma/EA)\,(\alpha + \beta P_1 + \gamma P_2) = \lambda_2 \quad . \quad . \quad . \quad (4)$$

Although the same general expression $\partial U/\partial P = x$ has been used twice over for each member, the particular form is different in each case. In the initial case, $\alpha = 0$ and P_{01} and P_{02} are known; hence the values of λ are determined. In the final case, α is known and P_1 and P_2, which are unknown, can be found.

Instead of working out the values of λ from (1) and (2) and using these in (3) and (4), we can equate (1) to (3) and (2) to (4), giving

$$\Sigma\,(l\beta/EA)\,[\alpha + \beta\,(P_1 - P_{01}) + \gamma\,(P_2 - P_{02})] = 0$$
$$\text{and } \Sigma\,(l\gamma/EA)\,[\alpha + \beta\,(P_1 - P_{01}) + \gamma\,(P_2 - P_{02})] = 0$$

from which values of $(P_1 - P_{01})$ and $(P_2 - P_{02})$, and hence P_1 and P_2, can be found; and similarly for any number of redundant members. It will be seen that this simply amounts to another way of stating the method dealt with in remark (6), p. 655; *i.e.*, finding the loads due to the external loading by the method of Least Work, and adding the initial loads. Thus, unless the self-straining is given in the form of values of λ, there is no point in introducing λ into the calculation, though there is no difficulty in so doing if desired.

Yours faithfully,

FRANK G. EVANS.

To the Editor of the Journal of the R.Ae.S.

11th January, 1932.

Dear Sir,—I was interested to note in this month's issue of your journal the review of the second edition of my book on "Stainless Iron and Steel."

May I refer to the last paragraph of the review and suggest to the writer of it that if he will turn to pages 529 and 530 of the book he will find given thereon the information which he deems omitted? He will also find reference to this page number in the index under the word "Seizing." The data regarding seizing was placed in the position it occupies (namely, in that part of the book dealing with the engineering applications of stainless steels) because the phenomenon of seizing is not confined to high chromium steels as your review writer suggests, but is a characteristic of all types of stainless steel.

Yours faithfully,

J. H. G. MONYPENNY.

https://doi.org/10.1017/S0368393100112003 Published online by Cambridge University Press