that the point of connection to weight-arm need not be on the line $B\,C$. It may be anywhere on the weight-arm, as at J, provided a new zero line $G\,C$ be drawn angularly the same distance and direction from $A\,C$ as the line $F\,C$ from $E\,C$.

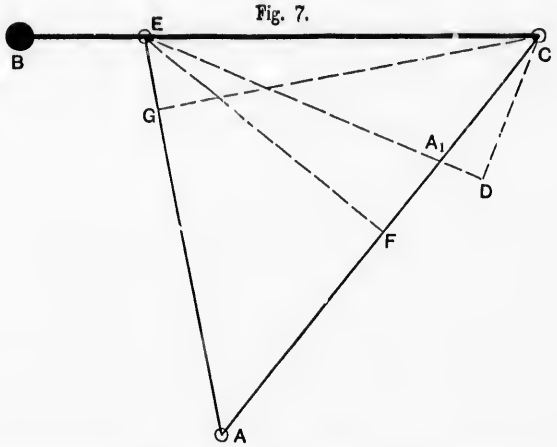
It follows that the point of connection of spring to weight-arm, and the direction of action of spring, *may be selected entirely at random*, or for convenience, provided only that the length between pivots and the tension of spring be fixed according to the principles laid down.

The conclusions arrived at by the preceding reasoning may be expressed in the form of a second

Theorem: The combined zero and fixed pivotal point of a spring, arranged to act isochronously on any point of the line of weight-arm from weight pivot through centre of gravity of weight, may be taken at any point on the line from weight pivot through centre of shaft. Moreover, the spring force required will be inversely as the distance of the fixed pivot from the weight-arm pivot.

In Fig. 7, letters $A\,A_1\,B\,C\,E$ represent the same parts as in Fig. 5. Drop perpendiculars $C\,G$ and $C\,D$ from C on lines $A\,E$

Fig. 7.



and $E\,A_1$ respectively; also from E drop the perpendicular $E\,F$ on line $A\,C$. Then similar triangles $A_1\,E\,F$ and $A_1\,C\,D$, as well as $A\,F\,E$ and $A\,C\,G$, are formed, from which proportions may be made as follows:

$$A\,E\ :\ E\,F = A\,C\ :\ C\,G,$$
$$A_1\,C\ :\ C\,D = A_1\,E\ :\ E\,F.$$