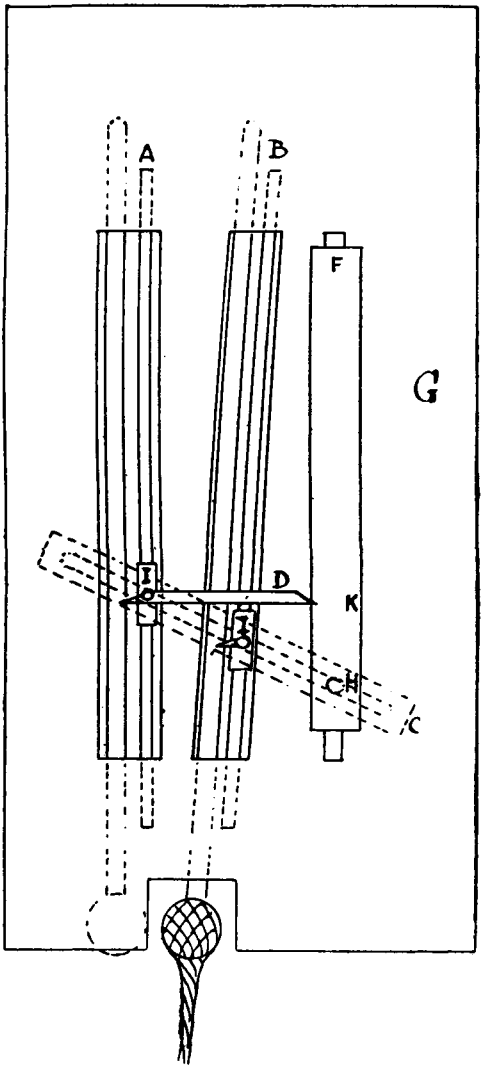
Then $$\frac{EF}{a}=\frac{EF}{EC}\cdot\frac{EC}{a}=\frac{\sin ECF}{\sin EFC}\cdot\frac{\sin EBC}{\sin BEC}=\frac{\cos A}{\cos C}\cdot\frac{\cos C}{1}.$$

or $$EF=a\cos A=-a\cos(B+C).$$

P. PINKERTON.

A Direct Reading Hygrometer.—The instrument is an ordinary dry and wet bulb hygrometer adapted to give a direct



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reading of the percentage humidity. I, I are pointers set at the dry and wet bulb readings by means of pieces sliding on the rods A, B and joined together by a link C, which actuates by a slot the scale F (movable in the vertical) on which the percentage humidity is read at the pointer D.

Let t_1, t_2 be the temperatures of the dry and wet bulbs respectively, t_3 the dew point; let v_1, v_3 be the vapour tensions of saturated air at t_1, t_3 and H the percentage humidity. Then the approximate theory is as follows:

$$t_3 = t_1 - c(t_2 - t_1) \quad (c \text{ constant})$$

(According to Glaisher c varies with t_1: this is taken into account by the inclination of the rods).

Experiment gives

$$v_1 = a10^{t_1} \text{ and } v_3 = a10^{t_3}$$

also by definition

$$H = 100 v_3/v_1$$

so that

$$H = 100 \,.\, 10^{-c(t_2 - t_1)}$$

$$\log H = 2 - c(t_2 - t_1)$$

$$= 2 - HK.$$

This relation shows that the humidity scale is that of an inverted slide rule.

WALTER JAMIESON.

Geometrical Illustrations of a Formula in the Differential Calculus.—In this note the formula

$$\frac{1}{PT} = \frac{d}{ds}(\log y)$$

is illustrated for a few curves.

For any curve

$$PT = y \operatorname{cosec} PTN = y\frac{ds}{dy}$$

from which the above formula follows. Only two variables are involved: the y axis may be excluded. Also the formula holds for oblique axes.

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