And every hour or every half hour depending on the model of the barograph there appears imprinted directly on the barogram the number of the barograph. In this way no confusion can result.

The method of recording the trace is extremely ingenious. Instead of ink or a smoked drum the Peravia barograph uses a method of puncturing the paper by means of a stylus hit by a clock driven hammer. A record of the altitude is taken every six seconds. Between hammer blows the stylus is perfectly free to move under the influence of the altimeter mechanism. In this way the effects of friction and hysterisis are reduced to a minimum. Since six punctures are made every minute and since the paper moves about one eighth of an inch per minute the punctures appear so close together as to appear as a continuous line. However, for very precise measurements it is possible to read under a magnifier the spacing of the individual punctures.

On all but the least expensive model of the Peravia barographs there is another device installed for putting controlled punctures over the base of the barogram. These punctures may be used to record additional data by utilizing a code. This control puncturing device is operated by pressing the push button marked "P" in Fig. 2. The switch marked "H" controls a heater in the barograph. This heater is used at very high altitudes to maintain the mechanism at a temperature where the oils do not freeze and thus stop the mechanism.

In Fig. 3 is shown the Model B139 with outer case removed. The linear altitude scale is seen on the right. The paper feeds around the large drum on the left and onto a take up spool seen toward the left rear. The paper comes on a roll of thirty hours recording length. This is a beautiful feature of the Peravia that the trace appears as a continuous line without a lot of intersections and possible ambiguities.

Referring again to Fig. 1, it is easily seen that one can read the rates of climb or descent directly from the chart. One can make up a transparent scale having scribed on it different slopes. By superposing this upon the barogram one reads directly the vertical velocity. When one has such a simple method for studyig a soaring flight there is no reason why we cannot learn more about the precision of our cross-country flying. As an example of the use of the Peravia barograph in cross-country soaring flight evaluation let us look at the barogram Fig. 4 of Dick Johnson's record flight from Grand Prairie to a destination Odessa, Texas 336 miles. In itself the barogram shows directly the altitude reached and the times at which these altitudes were reached. However, by reading the vertical velocities on the climbing portions of the barogram one can see how the thermals varied in strength during the day. In Fig. 5 is shown the distribution of thermal strength durng Dick Johnson's flight. It can be seen that a maximum was reached at about 15:50. The steep rise at the beginning of the flight shows that he could have taken off perhaps thirty minutes earlier. We actually need more such studies correlated with local meteorological information before we can efficiently exploit the full day for cross-country soaring.

Now that we know what Johnson had to work with we can ask, "Did he utilize the available energy efficiently?" This question can be easily answered if we take the cross-country cruising formula of Kalle Tem-

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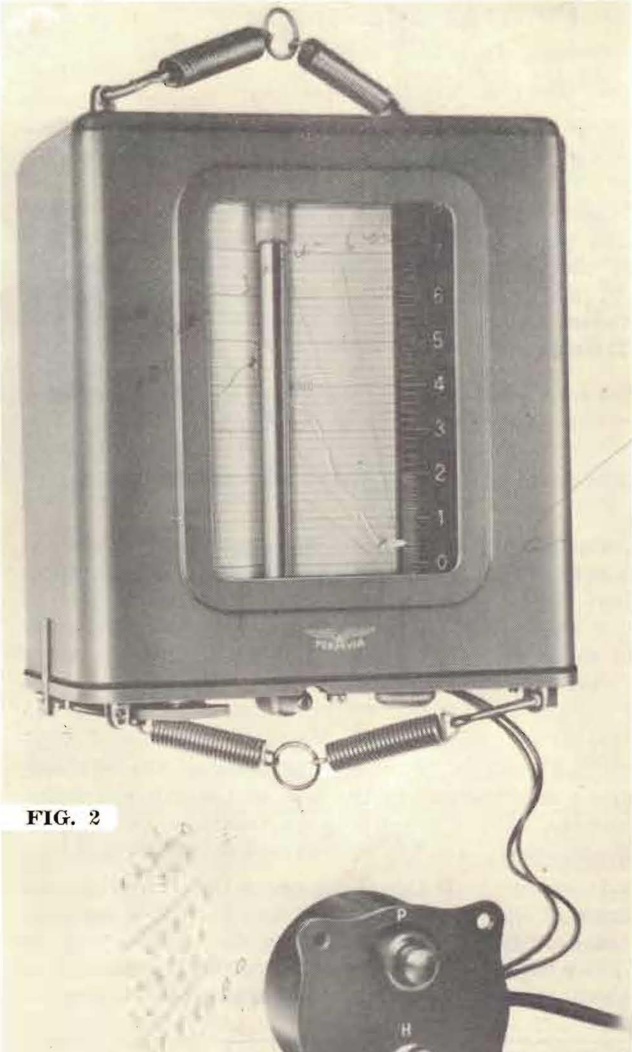

FIG. 2

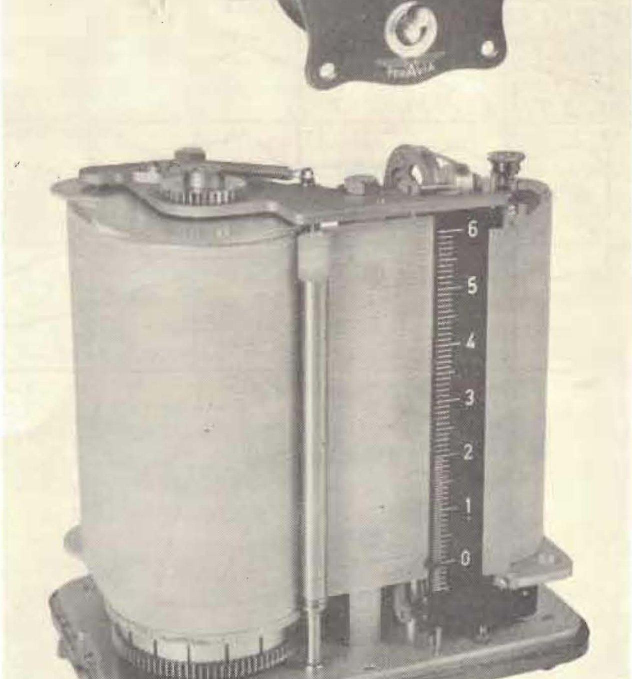

FIG. 3