THE ASKANIA PATENTED TELECOMPASS

The Askania-Werke A. G., Bambergwerk, at Berlin, Friedenau, 87 and 88, Kaiser-Allee has kindly sent to the International Hydrographic Bureau information concerning the newly devised Telecompass with distance transmitter, just patented, particularly for the use of air craft.

The following is extracted therefrom :-

If the spirit compass ever does fail to act, this will nearly always be due to its position on board the aeroplane. Since the compass has to be well within the pilot's range of vision, it is nearly always impossible to avoid fitting it in a place where magnetic influence will interfere with its action, often very seriously. The iron and steel parts of the engine etc., which may be anywhere near the compass, will affect it A further disadvantage inherent in every compass of the ordinary type is that the pilot has to perform constant mental work when steering by means of a compass card. Furthermore, the pilot has to keep his eye on other instruments at the same time ; in short, the whole task of flying places the greatest strain upon his faculties. The size of the division marks on the compass card, which in the ordinary type of aircraft compass must perforce be kept small, is another circumstance which increases the difficulty of steering by that instrument. The ASKANIA Telecompass obviates all these familiar drawbacks inherent in the spirit compass, and has the following advantages :

1. The actual compass remains out of sight and can be placed in any part of the aeroplane where magnetic influences are least likely to interfere with it — say in the after part of the cockpit. Compensation therefore becomes unnecessary. The action of the compass being free from disturbing influences, the indications given will be highly accurate and reliable.

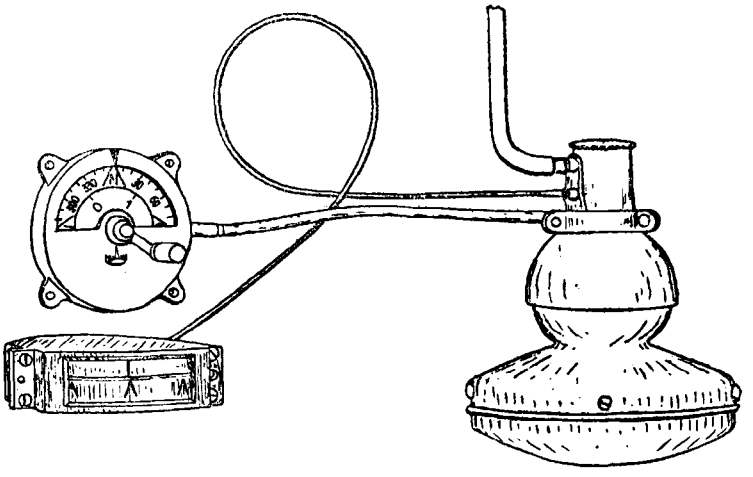
2. The space at the pilot's disposal is no longer limited by the presence of an unwieldy instrument which, at best, fails to work entirely satisfactorily. The extra space available can be put to other uses. The compass itself, being out of the way, is less liable to be tampered with, besides being protected from external influences or accidental damage.

3. The *indicating apparatus* which is not magnetically sensitive, can be fitted immediately in front of the pilot thus very considerably facilitating navigation.

4. The course decided upon by calculation before the commencement of the flight is set on a *course-setter dial,* in full view from the pilot's seat. The indicator will remain at zero so long as the proper course is being steered. This simplifies steering enormously, because all that the pilot has to do is to adjust his controls so that the pointer of the indicator remains at zero. In other words, the pilot holds his course mechanically by keeping his attention on a pointer which oscillates on a scale placed immediately in front of him. If any alteration of the course is called for the pilot has only to alter the course-setter, and to continue steering so that the indicator remains at zero.

The simplicity and accuracy of this apparatus relieves the strain on the pilot very considerably, at the same time ensuring correct steering under all conditions. In aerial transport this means increased security and less flying time, both factors of supreme importance to improve air traffic.

Description of the Telecompass.



The Telecompass equipment, as shown in fig., consists of 3 principal parts, viz :

1. The compass which gives the direction.
2. The Direction or Course Indicator.
3. The Course-Setter.

The compass is fixed in the after part of the cockpit. Its system of magnets is attached to a fixed perpendicular axis and oscillates between two copper discs. The axis is extended upwards into a separate chamber and has a circular disc (shutter) excentrically mounted upon it. This disc moves between the orifices of two pairs of nozzles situated opposite to one another and so arranged that when the compass points to zero, both of the pairs of nozzles are partially uncovered, whereas whenever the compass points furthest away from zero, one of the pairs is entirely uncovered and the pair directly opposite to it is covered. An air current of constant strength flows from the two lower nozzles. The strength of these air currents is determined by measurement of the airspeed pressure in the upper nozzles. Each of the two upper nozzles is connected by a separate pipe to a differential pressure gauge (course indicator) so that they impinge on either side of the pressure indicating diaphragm. When the pressure of both currents of air is equal, the instrument stands at zero. This is the position when the excentric disc stands at zero between the two pairs of nozzles, so that its throttling action upon the air currents proceeding from the two lower blast nozzles is exactly equal.

Both pairs of nozzles are attached to the compass bowl, which is suspended so that it can be rotated. When the compass bowl is rotated out of the zero position by the aeroplane deviating from its course, the shutter which is held in place by the magnet system will give freer passage to the air current proceeding from one of the lower blast nozzles and will throttle the air current from the other. The air pressure in one measuring nozzle will increase, and that in the other will decrease. The course indicator, which measures the difference in pressure between the two nozzles now gets an unevenly balanced load and the pointer will move to an extent which corresponds to the deviation from the course. This state of affairs will continue until the compass bowl, and thus the aeroplane, has returned to its original flying position, and until the shutter lying between the two pairs of nozzles returns to the zero position. Every deflection of the pointer of the course indicator tells the pilot in what direction and to what extent he must move his lateral steering controls in order to bring the machine back to its proper course.

The course-setter is the instrument which enables the equipment to be set for any given course. It has a fixed pointer, and a movable card which is inseparably connected to the compass body, through a flexible shaft. By means of a crank, the card of the course-setter and with it the compass body can be rotated so that any desired course is brought underneath the pointer. As soon as that is done, the shutter is automatically brought into its normal position (where it throttles the two air currents equally) for that particular course.

The air current required to work the compass is obtained by inserting a VENTURI tube in the wind-stream caused by the actual flight; there is no need for any auxiliary such as electric current.

Method of using the Telecompass.

The pilot is advised to use the equipment as follows: Having calculated the allowance necessary for wind, he should turn the course-setter to the desired course. Once he has started his flight, he then works the rudder until the shutter held in position by the system of magnets intercepts the air currents from the two blast nozzles to an equal extent, causing the pointer on the course indicator to come to zero. The steering of the aeroplane on the required course then becomes the easiest thing imaginable. It is only necessary to work the rudder sufficiently to keep the pointer of the indicator constantly at zero. So long as this is done, the pilot knows, without any mental calculation, that he is flying on the right course. If the pointer deviates, the indicator will at once tell him how he must steer to get back on his proper course. He can make any corrections necessitated by alterations in the velocity or direction of the wind on the course-setter during flight with the minimum of trouble.

Characteristics of the Askania Compass

Compass : 1,300 Kg. (2 lb. 14 oz.) :
Diameter 140 m/m (5.5 ins) — Height 175 m/m (6.9 ins.).

Course Setter : 0,500 Kg. (1 lb. 2 oz) :
Diameter 90 m/m (3.5 ins.) — Depth 85 m/m (3.3 ins.).

Course-indicator : 0,500 Kg. (1 lb. 2 oz) :
Height 36 m/m (1.4 ins.) — Width 124 m/m (4.9 ins.) — Depth 138 m/m (5.4 ins.).