

An Audible Speed Indicator

by HERBERT L. PROUT

Describing some novel experiments made by the author with a new instrument designed by him. This scheme presents some valuable pointers to the lightplane pilot.

THE one thing of supreme importance in flying is to maintain flying speed, for once flying speed is lost, control is lost and the plane becomes in effect a "run-away horse."

Always the nose goes down and it begins a precipitous plunge toward the earth. This plunge as a rule is further complicated by a twisting or spiral movement known as a "spin."

Ordinarily, when sufficient downward speed has been attained, control may be regained; but if the beginning of this spin takes place within two or three hundred feet of the ground the chances are that contact with the earth, with its disastrous consequences, will result before complete recovery can be attained.

All pilots understand this perfectly, and the first instruction a student ever receives is to always maintain flying speed. Yet, strange as it may seem, while the cockpit of a plane is equipped with all manner of instruments, there is no instrument to warn the pilot that he is losing flying speed, or approaching a stall.



The author's Curtiss-Wright Junior equipped with the new indicator which can be seen projecting from the nose of the ship.

spring, but is bent backward by the force of the wind according to the speed of the plane.

This in turn is indicated on the instrument panel by a pointer which moves downward as the speed of the plane increases. Flying speed is indicated on a white background but when

minimum. When coming in low over an obstruction it is a positive check whether one has sufficient speed to clear the object without danger of settling.

The writer formerly flew an American Eagle biplane of the conventional type, and in this plane some idea of the

stall.

We have the altimeter to indicate the height above the ground, the bank and turn indicator, the climb indicator and the airspeed indicator which, of course, would give warning of an impending stall provided it is watched continually, but the accidental stall as a rule occurs when the pilot's attention is diverted elsewhere than the instrument panel.

In addition to all these instruments we have a complete set for the engine, the tachometer to show its R.P.M., the oil pressure gage, the oil temperature gage and also the compass to hold the plane on its course. These instruments are all considered quite necessary and though some are very expensive, they are regular equipment on most planes. Yet nothing is ever provided to give warning of the treacherous condition which is responsible for three-fourths of all serious airplane accidents.

Every year dozens of very good flyers succumb to this treacherous stall and spin. In a moment of carelessness they are caught off guard and, doubtless to their own great surprise and consternation, find their plane has gone out of control and they have not sufficient altitude to recover. With an instrument to shout its warning in time, the story might have been different.

The nearest approach to such an instrument which the writer has seen is furnished as regular equipment on his own plane, the "Curtiss-Wright Jr." This instrument is simplicity itself, and consists of a wind vane which stands in a vertical position just in front of the windshield, being held upright by a

cat on a white background but when stalling speed is approached the pointer goes into the red. This instrument is far easier to read at a glance than is the dial of the usual airspeed indicator.

Unfortunately, this instrument cannot be easily adapted to other planes for the reason that the propeller blast would destroy its accuracy, whereas, the Curtiss-Wright, being a pusher-plane with the propeller behind, the slipstream has no effect whatever upon it.

This instrument is so useful that, having once become accustomed to its use, one wonders how pilots in other planes manage to get along without it.

For example, on the take-off, it shows when to begin the climb, and just how steep a climb may safely be made, especially in the climbing turn, which is always a rather hazardous maneuver. On a day of poor visibility when the horizon cannot be seen, or when flying through a cloud, it gives a very sensitive check on the attitude of the ship, whether ascending or descending, for if the motor speed is constant, any change in the flying attitude of the plane is accompanied by a change in air speed.

In making turns or steep banks, one constantly refers to it as a check on his speed, for more speed is required on a turn than in straight flight; especially is this true in gliding turns. In making long glides with the engine off it is useful in adjusting the ship to the most efficient gliding angle; especially is this true when the horizon is not visible.

When coming in for a landing it aids the pilot in adjusting his speed to a safe

speed when coming in on a glide could be had from the whistling of the wires; but in a cabin plane, or a monoplane without external wire bracing, this whistling is entirely lacking, and the pilot's knowledge of his speed is mostly guesswork.

And here we come to the crux of the whole matter, the purpose of this article. If the whistling of the wires serves the very useful purpose of indicating the speed of the plane, why cannot all planes be equipped with an instrument which would whistle continuously while the plane had flying speed, changing its note according to the speed of the plane, and going out entirely just before stalling speed is reached.

This audible speed indicator would have the very great advantage of keeping the pilot informed at all times as to his speed without necessitating his continual dodging into the cockpit to scrutinize an instrument board. There is enough for the pilot's eyes to watch outside of the cockpit.

Why not let the ears keep him informed at all times if he has a sufficient margin of flying speed? A whistling note has another advantage, that it can be easily heard above the noise of the motor, as it has a very penetrating quality. The exact form of the instrument requires some ingenuity and experiment to work out, but it can be done.

The windshield of the writer's car, when open in a certain position, whistles in this very way, changing its note

according to the speed of the car. And we all know how a high wind will whistle or howl around a building, changing its note with the velocity. Another variation of this instrument would be a siren such as boys have on their bicycles and which could be driven by a small windmill.

About two years ago the writer wrote a letter outlining this idea to the "Aeronautical Patents and Design Board," and suggested that experiments be undertaken to develop such an instrument. We received a gentle slap on the wrist for our trouble. We were told by that august body that the idea was neither new nor useful; that a good pilot could "feel" an approaching stall without any warning device, and the conventional speed indicator was all that was needed.

The reasoning seems to be that no red light should be put at a railroad crossing for the reason that a good driver will always stop and look both ways anyway; therefore a red light is superfluous. Let us grant for a moment that a "good" pilot can "feel" an approaching stall.

Is that any reason why those of us who are not so "good" should be denied an instrument which positively will give warning of a loss of speed in time to make correction, even though our "feeling" or "guessing" apparatus is not working 100 percent. efficient.

We know from actual experience that the stall indicating device on the Curtiss-Wright Jr. is an extremely useful and practical device, even though it has to be watched. It is unfortunate that it cannot be applied to other planes because of the propeller blast. We have also used the familiar indicating device which is often clamped to a wing strut of a bi-plane, and though it works on the same principle, there is simply no comparison between them; the latter is too hard to read and too inconvenient to look at.

However, the whistling device described above could be adapted to any plane by leading the air stream into the cockpit by means of a funnel and tube, or by clamping the instrument itself out on the wing. Think of the immense help it would be to a pilot to have his exact speed transmitted to him every instant while going through a difficult maneuver, by means of the changing note of a whistle.

This is more or less along the same line as the speed-trap devices once applied to automobiles as a warning when the car exceeded the legal speed limits. An air-blast siren mounted at the front of the car, started to blow at the then top traffic speed limits of 25 miles per hour so that the officer on the corner and all others who chose to hear, were appraised of the speed violation.

We are convinced the time will come when this instrument will be considered the most indispensable piece of equipment on every airplane. And the persons or company who first perfect and market same will reap the financial benefits.