The Savage-Bramson Anti-Stall Gear.

By " Test Pilot "

(*The following article by a well-known Test Pilot is of considerable interest, as the inventor of the Anti-Stall Gear described below has been awarded the Sir Charles Wakefield Medal*)

THE Secretary of State recently stated in Parliament that during the year 1926 there were 81 deaths in the Royal Air Force, and 231 Aeroplanes damaged beyond repair

He further stated that a large majority of these accidents were ascribed as " an error of judgment on the part of the pilot " Now it is well-known to everyone connected with aviation that somewhere between 80 and 90 per cent of the accidents under this heading are really caused by the pilot accidentally " stalling " his machine

With the above facts present to my mind, I readily accepted an invitation of the British Instrument Co , Ltd , to test the Savage-Bramson Anti-Stall Gear

For the benefit of any of my readers who may not be conversant with the principle of this gear, I will try to briefly explain it, only I do not claim to be able to do so in a manner which might meet with the approval of Aeronautical Engineers

The apparatus consists chiefly of two parts

(1) The Stall Detector

(2) The actual warning or operating unit

Apart from these two, there is a small air-pump and air reservoir

The Stall Detector consists of an aerodynamically unstable vane fitted on a bracket attached to one of the interplane struts, as far removed from the slipstream as possible This vane has only two possible positions, that is on one or other of the stops, which limit its movement The angle of the vane is so set that it normally rests on the bottom stop with the air stream holding it down, consequently when the angle of incidence of the machine increases to such an extent that the air pressure acts on the bottom of the vane, it is moved up against the top stop, which in turn operates a valve from the air reservoir, thereby releasing air (at a pressure of 10 to 15 lbs) into the Warning Unit

The Warning Unit consists of a cylinder and piston coupled on to the bottom of the "Joy Stick " (or as our scientists call it " Control Column ")

The air pump, which can either be operated by a small propellor in the slipstream, or mechanically off the cam-shaft, provides the necessary air pressure

There is also fitted on the joy-stick a small trigger which on very slight pressure cuts the whole Anti-Stall Gear out of use

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From the above it will be seen that the principle involved in the Savage-Bramson Anti-Stall Gear is to give the pilot a warning of the imminence of a " stall," and to convey that warning to him through his sense of touch , it then requires no rapid reflex on his part to enable him to take the correct action, on the contrary, I found that it will require a rapid reflex to prevent him acting on the warning given As the type of warning given is the same as that employed by Instructors on dual controlled machines (that is a tap on the joy-stick) it is a warning with which all pilots are familiar, and in the case of actual instruction on machines fitted with this gear, it should in my opinion do much to give the pupil added confidence, and this will be especially the case when he is launched on his first solo

I will now describe one's actual impression in the air with a machine fitted with this apparatus

The machine on which I tested the Anti-Stall Gear was an "Amiot," fitted with an Hispano-Suiza engine This machine has side by side seating arrangements and when flying in a machine of this type one realises the great advantage the seating arrangement has over the more orthodox tandem type, for instructional purposes

I found that the air pressure gauge registered zero and that the " lightness " of the " stick " had not been diminished owing to the addition of the Anti-Stall Gear

While taxying, it was interesting to watch the behaviour of the vane , it was seen that until the speed of the machine reached about 45 miles an hour that the vane was held against the top stop, when flying speed was attained the vane immediately moved to its other position In this connection I found that should a pilot endeavour to take off with the tail of his machine too low, the warning will be given before he has left the ground (this is, of course, assuming that there exists a certain pressure in the air reservoir, which of course, would be the case when the gear is fitted with a mechanically-driven air pump, or provided that a sufficiently long run has been made to have enabled the propellor pump to raise the requisite pressure)

I climbed the machine to about 700 feet, during which time no attempt was made to " stall " the machine

Having noted that the air pressure gauge now registered 12-lbs per sq inch, I gradually pulled back the " stick " while the " Pitot " slowly crept downwards, when the speed had fallen to approximately 45 miles per hour, the " stick " was snatched out of my hand and the machine put her nose down

After flattening out, I climbed again—considerably higher this time—I repeated the experiment, and each time on approaching " stalling " speed, the gear swiftly and surely came into operation

I also made tests while the machine was sharply banked in each direction, and found that the gear was just as efficient in this position as when on a lateral plane These experiments were carried out both with the engine " on " and " off "

My next objective was to watch the vane in action To do this I closed the throttle and held the " stick " back and waited As the angle of incidence reached the " stalling " angle, or rather slightly before it, the vane with a click was forced

up against the top stop and the " stick " attempted to go forward, but being prepared for this, I overcame the air pressure and opened up the engine (I did this to see whether, when one was prepared for it, it would be possible to resist the action of the gear, although when fitted with the trigger release, I cannot see that it would ever be necessary for one to do so)

On landing, when about to touch the ground, I cut off the gear and, as explained above, I found that the addition of the gear did not in anyway affect the " Touch " of the stick, or the pilot's control of the machine in any way

In conclusion, I was very impressed with the result of my flight, and in my opinion, the Savage-Bramson Anti-Stall Gear is the only serious attempt that has been made to minimise or prevent stalling accidents One of its greatest advantages is that it can be fitted easily to all existing types of aircraft, in the space of a few hours, and on account of no constructional alterations being necessary, the cost of fitting is very low, and the total weight of the whole apparatus is not 7 lbs

One cannot help thinking that the time has now arrived when the authorities should equip one or two Squadrons with the Gear, and so give it a fair trial under service conditions

I believe that up to the present, the British Air Ministry have only ordered about ten, and that not all of these have actually been fitted into machines

In contrast to this, I am told that in France the manufacture is being seriously taken up, and that in the very near future large quantities of the Gear will be produced

Altogether I had a very interesting day, and I take this opportunity of extending to the British Instrument Co , my sincere thanks for the opportunity they gave me of testing the Anti-Stall Gear, and also for the great courtesy they showed me during my visit