

### *Making the Wings*

When the frame of the wing is completed it is trued up and braced by means of steel piano wires of great tensile strength. The wing then has to have the fabric sewn on. The fabric is made in the form of a huge envelop. This must fit the frame perfectly. The fabric is of cotton or linen and is pulled on over the frame. A large number of women are employed in this department. They do the sewing.

After an inspection the wing goes to the paint shop. Here the fabric is given several coats of dope to preserve it and two coats of varnish. In the case of the flying boat the wings are painted naval grey instead of being varnished. The completed wing then goes to the stockroom.

One of the most important parts of the aeroplane is the propeller. In Canada the propeller is made of white oak. Birch is being used to some extent but has not yet been generally adopted. In England a great deal of walnut is used in making propellers.

The propellers differ in size according to the type of machine for which they are designed. The first step in the construction is to glue together the laminations which are pieces of wood an inch thick and slightly longer than the propeller in order to allow for shaping. When the laminations are properly glued they are put in a huge press which is then tightly screwed down. They remain until the glue is perfectly dry. They are then put on a lathe and roughly cut to shape. After this they are allowed to stand for six days in order that all strain due to cutting away portions and gluing, may be relieved. They are then placed upon an upright frame on which is a model propeller. The operator in charge of this machine runs his cutter over the model and the cutters on the machine follow his guidance. The process is repeated several times, each time cutting over the entire surface of the blade.

The propeller is sent to the benches where it is accurately clamped to

metal surface plates, similar to surface plates used in tool rooms, roughly balanced and after final sandpapering it is finally balanced. Expert workmen hand carve it to exact pitch. At the different points in its construction it undergoes very rigid inspections. At the final inspection it is tested for pitch, which is the angle of the flat side of the blade upon which the greatest strain is laid. The track is taken, that is to say the set of the blade from the centre of the hub to stations near the end of the blade. It must balance horizontally and vertically. The last step in the construction is the varnishing. After being varnished it undergoes the final inspection and balancing. A drop of varnish would throw it out of balance.

Once in a while a propeller gets as far as the final inspection only to be rejected for some flaw in the wood that cannot be detected from the exterior. The inspector pointed out one that to the inexperienced of the writer looked perfect. There was, however, a short dark streak in the wood which the inspector said was rot. This is one example of how minutely the parts of an aeroplane are inspected.

### *Care with the fusilage.*

In the construction of the fusilage of an aeroplane, the longerons, or the beams which stretch from the head to the tail of the machine, are of white ash. It is impossible to get the wood in sufficient lengths with a straight grain to make the longerons out of one piece of wood. On this account they are spliced together. This is done by gluing the pieces together and bolting them, after which the joint is wrapped with cotton. These joints are so arranged that they come at the points in the fusilage where the least strain is brought to bear. The longerons are supported by several struts of white ash, although spruce is used wherever possible as it is much lighter. The fusilage is trued and braced by steel piano wires in the same manner as the wings. It is covered with fabric, doped and varnished.

In the construction of the flying