DESCRIPTION OF A FLYING MACHINE MOTOR.

By Lawrence Hargrave.

The exhibit consisted of an engine and compressed air receiver for a screw-driven flying machine.

The receiver is made of tinned-iron plate ·013 inches thick, with a breaking strength of 62,000 lb. per square inch section of metal; the diameter of the receiver is 3 inches; content, ·18 cubic feet; and weight, 29 ounces. The longitudinal seams are 5-16th inch lap, soft solder joints, which have more than 100 per cent strength; it has been tested to 250 lb. per square inch with water; 150 lb. is to be the working pressure.

The engine has three single-acting cylinders, ·89 inches diameter and 1·29 inches stroke; the air is cut off at $\frac{3}{4}$ stroke. Two novel features are introduced, which are, that the crank-pin is fixed and the valve-face is the thrust-block. There are 43 metal pieces in the engine; 19 are all that are necessary; the rest are for convenience of manufacture. The weight of the engine is $7\frac{1}{2}$ ozs., and its I.H.P. is ·29; the first one made of this type weighed 12 ozs.

A diagram was also exhibited which showed the thrust, time and revolutions; with 150 lb. initial pressure in the receiver, the thrust is as high as $1\frac{1}{2}$ lb.; coupling this with what is already known, viz., that $\frac{1}{2}$ lb. thrust will drive a machine weighing 2·09 lb. a distance of 90 yards, when supported by 2,130 square inches of surface, the author does not think he is over sanguine to expect this machine to have a range of 115 yards, after allowing for a slip of 20 per cent.

The blades of the screw are set at 20 degrees, giving a pitch 44·4 inches; the diameter of the screw is $36\frac{1}{4}$ inches; the area of each blade is 32·7 square inches; it acts on an annular column of air 6·1 square feet cross section.