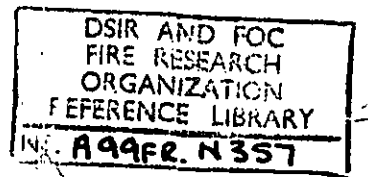


27 APR 1959



F.R. Note No. 357/1959
• Research Programme
Objective

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE
JOINT FIRE RESEARCH ORGANIZATION

EXPANDING GAUGE FOR ACCURATE MEASUREMENT OF THE DIAMETER OF FIRE HOSE

by

J. A. Gordon

Summary

When examining fire hose of different manufacture to ascertain whether it is within the permissible manufacturing limits, it was necessary to devise a quick, simple and accurate method of measurement.

The expanding plug gauge described in this report was designed to measure accurately the diameter of various sizes of hose with a wide tolerance on their manufacturing limits.

F.1061/1/21

April, 1959.

Fire Research Station,
Boreham Wood,
Herts.

EXPANDING GAUGE FOR ACCURATE MEASUREMENT OF THE DIAMETER OF FIRE HOSE

by

J. A. Gordon

Introduction

When measuring the diameter of hose specimens for selection or test purposes, it has been found difficult without the provision of a large number of metal plug gauges of different sizes to obtain accurate measurements, owing to the flexible nature of the hose.

This has been simplified by the use of the expanding plug gauge, illustrated in Plate 1. It is only necessary to insert this gauge in the hose and tighten by means of the screwed handle until the gauge will just slide in the hose. If the external diameter is required, this can be measured by means of a micrometer over the outside of the hose with the gauge in position. If the internal diameter is required it is only necessary to remove the gauge from the hose and measure the gauge diameter.

Description

The gauge consists of a soft rubber plug slightly less in size than the minimum limit to which it is likely to be used. This is clamped between two mild steel sandwich plates, one of which is screwed with a $\frac{1}{2}$ in. Whitworth thread and attached to one end of a $\frac{1}{2}$ in. diameter spindle. The other plate is free to slide on the spindle the opposite end of which is screwed $\frac{1}{2}$ in. x 26 threads per inch to fit the handle.

Tightening of the handle will expand the rubber radially by squeezing it between the two sandwich plates until it fits the hose.

The gauge may also be used as a normal plug gauge by setting it to a pre-determined size with the aid of a micrometer.

A further use for the gauge is the measurement of an irregular or slightly oval bore in pipes. The gauge can be expanded until the rubber conforms to the slightly irregular shape. On removal of the gauge the rubber will relax into an even diameter giving the approximate mean diameter of the bore.

The rubber and sandwich plates have been manufactured to fit three sizes of hose, $2\frac{3}{4}$, $2\frac{1}{2}$ and $1\frac{3}{4}$ in., the same spindle and handle being used for all sizes of gauge. The rubber used was similar to that used for stoppers on chemical jars.

Remarks

The expanding rubber plug gauge, in conjunction with a micrometer, is suitable for quick and accurate measurement of the internal and external diameters of flexible hose or other tubing which would not normally retain a rigid shape.

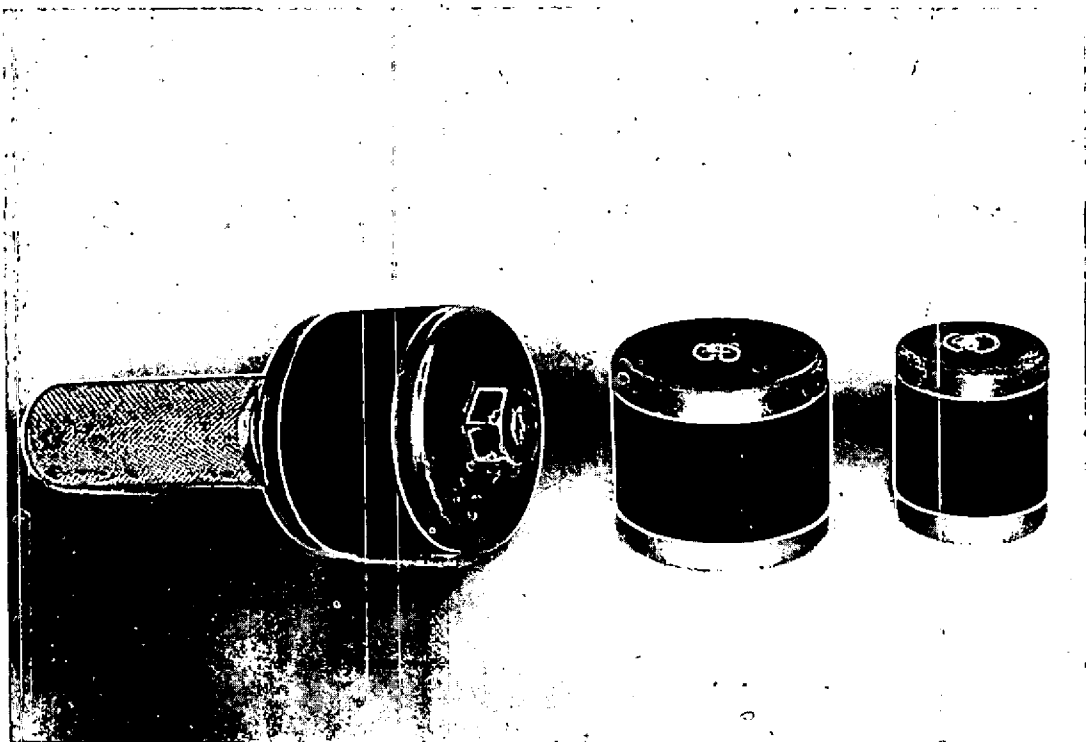
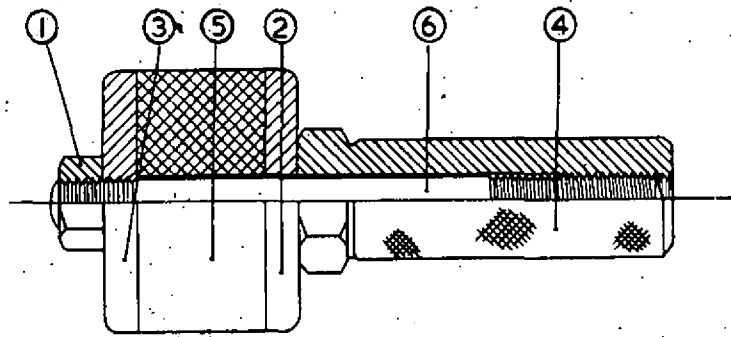


PLATE I. EXPANDING PLUG GAUGES FOR
MEASURING $2\frac{3}{4}$ " $2\frac{1}{2}$ " AND $1\frac{3}{4}$ "
DIAMETER HOSE



ASSEMBLY

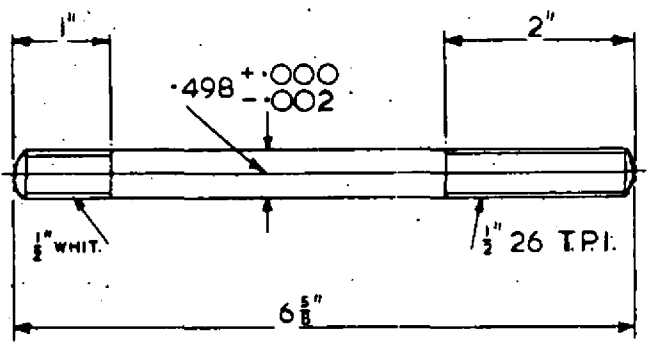
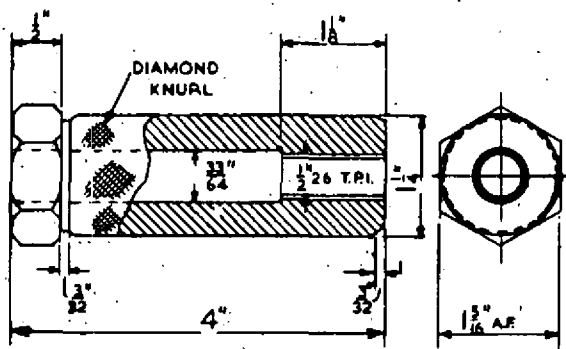
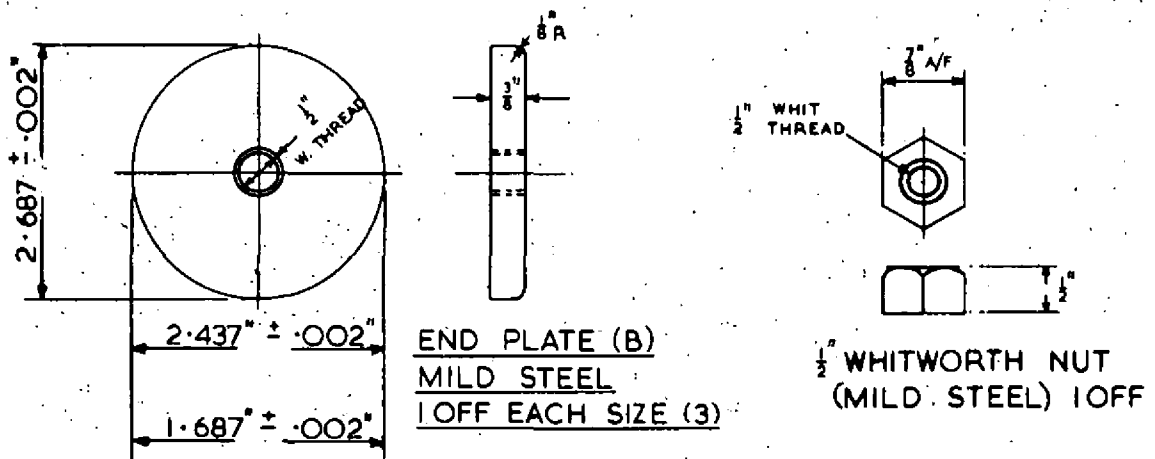
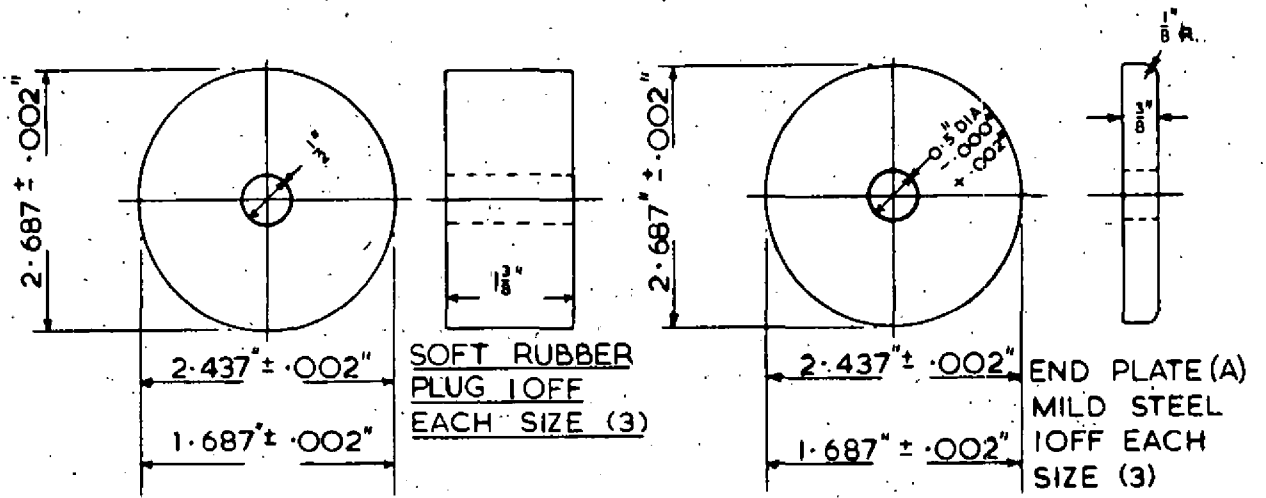


FIG 1 EXPANDING PLUG GAUGE FOR MEASURING FIRE HOSE OF 1 3/4", 2 1/2" & 2 3/4" dia.