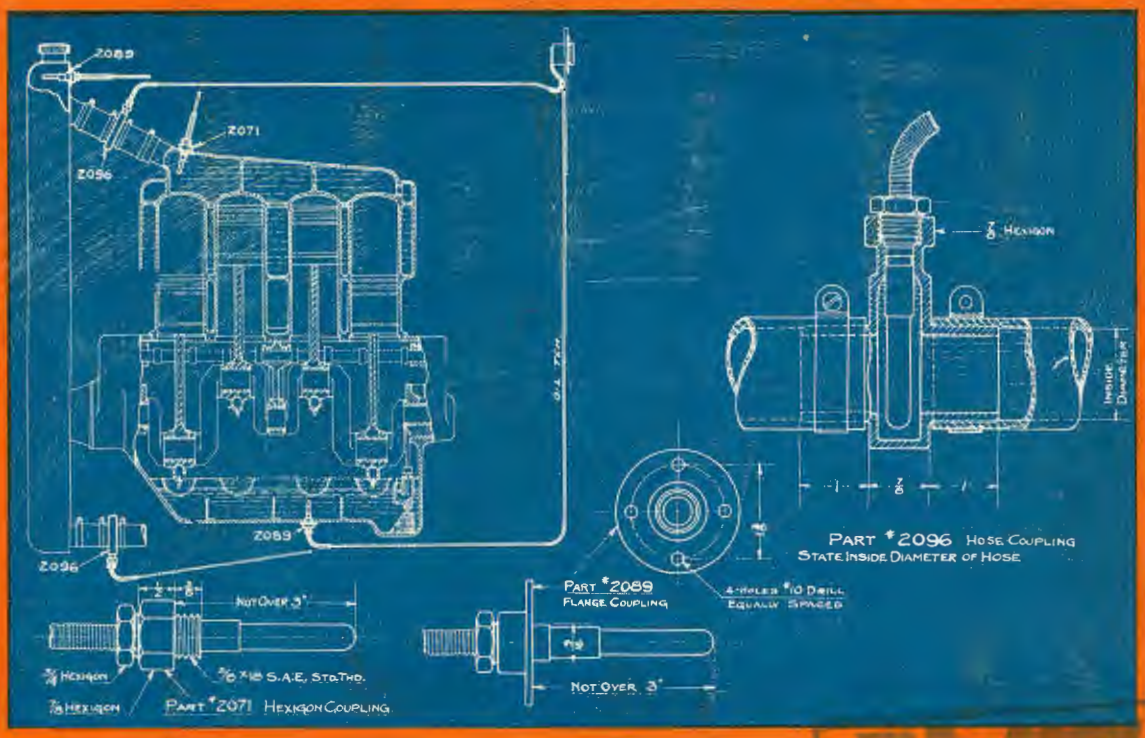


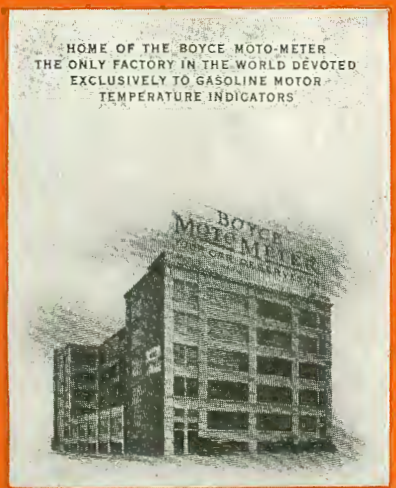
WHEN ORDERING BULB CONNECTIONS, SPECIFY PART NUMBER AS SHOWN ON ABOVE [illegible]

BOYCE MOTO METER

DISTANCE TYPE

Motor Heat Indicator

THE Boyce Moto-Meter is the pioneer motor heat indicator, and is to-day to be seen on the radiator caps of over 2,000,000 motor cars. There are, however, many installations where a motor heat indicator is desirable, yet where the radiator type used on automobiles is not practical. Such installations include the airplane, the motor boat, the stationary engine, etc., and the Boyce Moto-Meter, Distance Type, is our answer to this problem.



All of the instruments described herein are constructed on identically the same principles, and with identically the same materials as were approved by the U. S. Bureau of Standards at Washington; and during the War, over 20,000 instruments of this construction were produced, accepted, and rendered unfailing service on our War planes for both Army and Navy use, including all the famous NC transatlantic flyers.

Extreme accuracy — long life — the smooth unbroken movement of the pointer, and the elimination of all gears and other delicate parts, are characteristic features responsible for the universal use of this reliable instrument.

THE MOTO-METER COMPANY, INC.

Creators of Motor Temperature Indicators

Exclusive Licensee of the "Boyce" Fundamental Patents

LONG ISLAND CITY : : : : NEW YORK

Model "A"

RECOMMENDED for marine motors, stationery engines, tractors or automobiles where an instrument board installation is desirable.

Temperature Range—32 degrees to 212 degrees.

Finish—Black enamel case, nickel-plated retaining ring, heavy beveled crystal, black dial with white figures and red and white pointer.

Size—Diameter of head—3 5/16 inches.

Weight—Head of instrument 16 ounces (add ½ ounce for each foot of tube length)

Standard Length of Tubing*—5 feet of 3/16 inch copper tubing heavily nickel-plated.

Price—Model "A" with standard length of tubing complete with radiator flange No. 2089, or hose fitting No. 2096 (recommended)

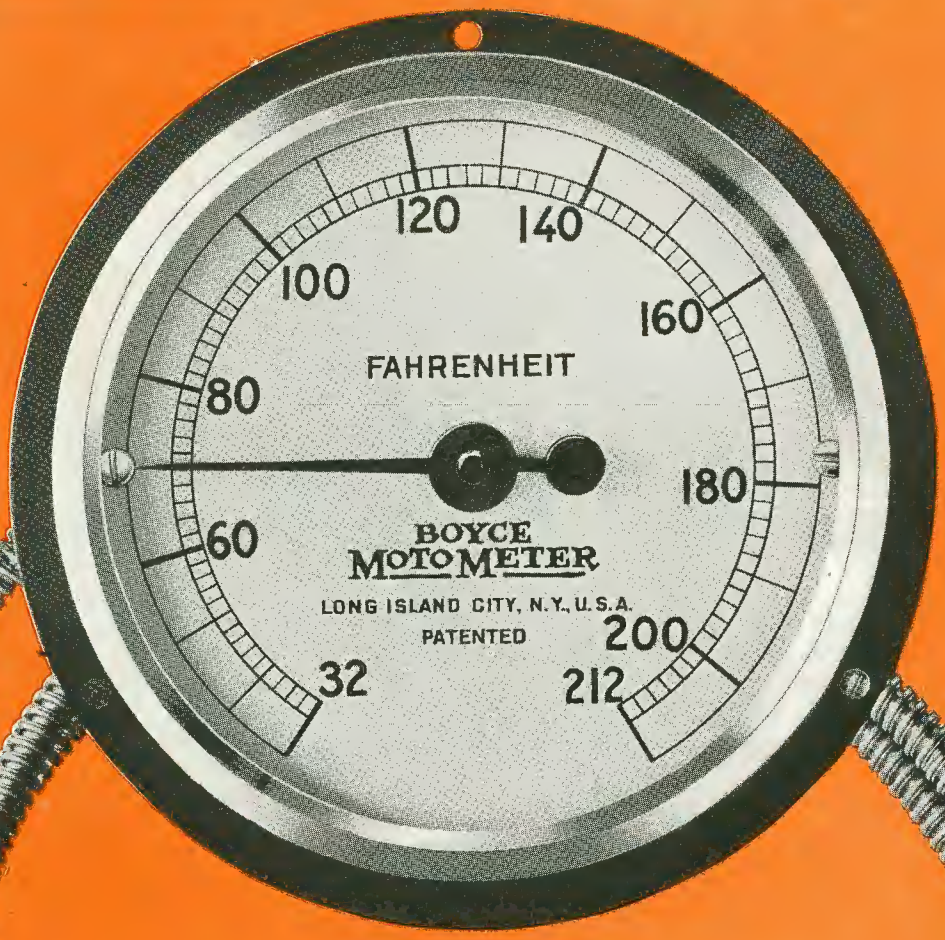
$18.00

* Standard length is always recommended, as the surplus tubing can be coiled in a convenient out of the way place and the instrument will register just as accurately.

For instruments where non-standard length of tubing is required, regardless of whether longer or shorter than standard, an extra charge of Five Dollars ($5.00) is added to the list price. This extra charge of $5.00 is made because where the tubing length is other than standard, the entire instrument-bulb, tubing, coil spring and compensating spring—must be made up special.

In addition to the $5.00 mentioned, an extra charge of fifty cents (50c) per foot or fraction thereof is made when length of tubing is required longer than standard. For example, for 6 feet of tubing the list price would be $23.50; for 4 feet, 6 inches, the list price would be $23.00, etc. (maximum length, 30 feet). At least three weeks must be allowed—dating from the receipt of order—to manufacture, test and deliver instruments of non-standard length.

The use of hose fitting No. 2096 is recommended wherever possible, on account of ease of installation. When ordering hose fitting No. 2096 *do not fail to specify the inside diameter of hose to which same is to be applied.* Radiator flange No. 2089 is only recommended where instrument is to be installed on V type motors having twin water outlets as radiator hose fitting No. 2096 attached to either water outlet would give the temperature of that one block of cylinders only.



Model "B"

RECOMMENDED for test work, vats, ovens, electric transformers or any use requiring extreme accuracy of temperature readings at any point within 30 feet of the bulb. This instrument is built on order to meet the exact requirements of the purchaser.

Temperature Range—This instrument is furnished with any temperature scale within a range of 200 degrees F., and within limits of 40 degrees below zero to 400 degrees above zero. For example, dial may be designed with a scale reading 20 degrees to 220 degrees; 100 degrees to 300 degrees; 200 degrees to 400 degrees, etc., at option of purchaser. It cannot be supplied with a scale recording over 400 degrees F., or lower than minus 40 degrees F. Temperature scale with centigrade reading can be furnished but never of a temperature over 200 degrees C. or lower than minus 40 degrees C.

Finish—Black enamel case with nickel-plated bezel ring, 4-inch dial with black pointer.

Size—Diameter of head—5 inches; dial—4 inches.

Weight—Head of instrument, 14 ounces (add ½ ounce for each additional foot of tube length).

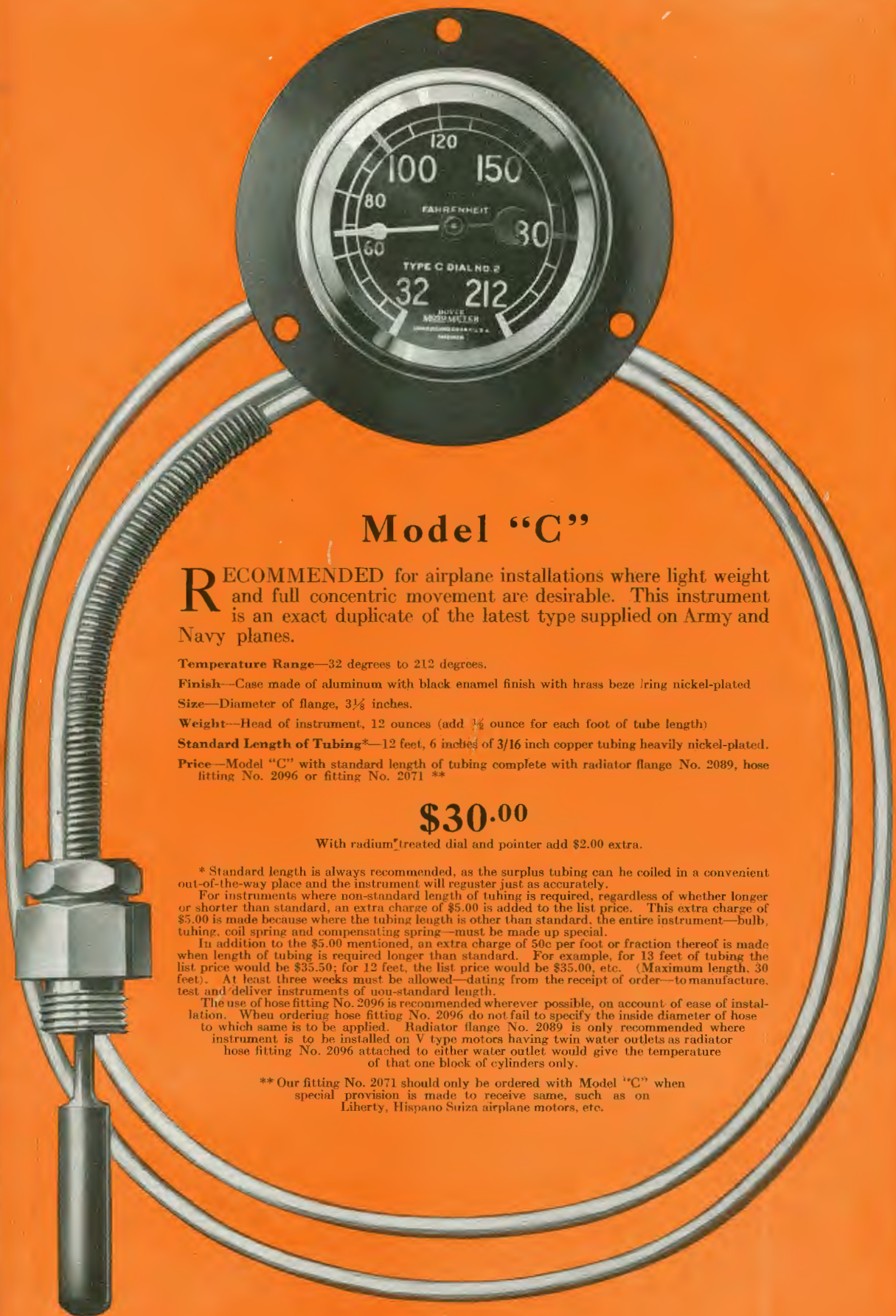
Standard Length of Tubing—Any length of tubing up to 12 feet is supplied at no additional cost. For longer lengths, add $1.00 to the list price for each additional foot or fraction thereof. All tubing used on this model is protected throughout its entire length with flexible tubing.

Price—Model "B" with tubing up to 12 feet and either radiator flange No. 2089 or hose fitting No. 2096

$50.00

In view of the fact that these instruments are made up to order, at least three weeks must be allowed—dating from receipt of order, to manufacture, test and deliver instruments of non-standard length.

The use of hose fitting No. 2096 is recommended wherever possible, on account of ease of installation. When ordering hose fitting No. 2096 do not fail to specify the inside diameter of hose to which same is to be applied. Radiator flange No. 2089 is only recommended where instrument is to be installed on V type motors having twin water outlets as radiator hose fitting No. 2096 attached to either water outlet would give the temperature of that one block of cylinders only.



Model "C"

RECOMMENDED for airplane installations where light weight and full concentric movement are desirable. This instrument is an exact duplicate of the latest type supplied on Army and Navy planes.

Temperature Range—32 degrees to 212 degrees.

Finish—Case made of aluminum with black enamel finish with brass beze lring nickel-plated

Size—Diameter of flange, 3⅛ inches.

Weight—Head of instrument, 12 ounces (add ½ ounce for each foot of tube length)

Standard Length of Tubing*—12 feet, 6 inches of 3/16 inch copper tubing heavily nickel-plated.

Price—Model "C" with standard length of tubing complete with radiator flange No. 2089, hose fitting No. 2096 or fitting No. 2071 **

$30.00

With radium treated dial and pointer add $2.00 extra.

* Standard length is always recommended, as the surplus tubing can he coiled in a convenient out-of-the-way place and the instrument will reguster just as accurately.

For instruments where non-standard length of tubing is required, regardless of whether longer or shorter than standard, an extra charge of $5.00 is added to the list price. This extra charge of $5.00 is made because where the tubing length is other than standard. the entire instrument—bulb, tubing, coil spring and compensating spring—must be made up special.

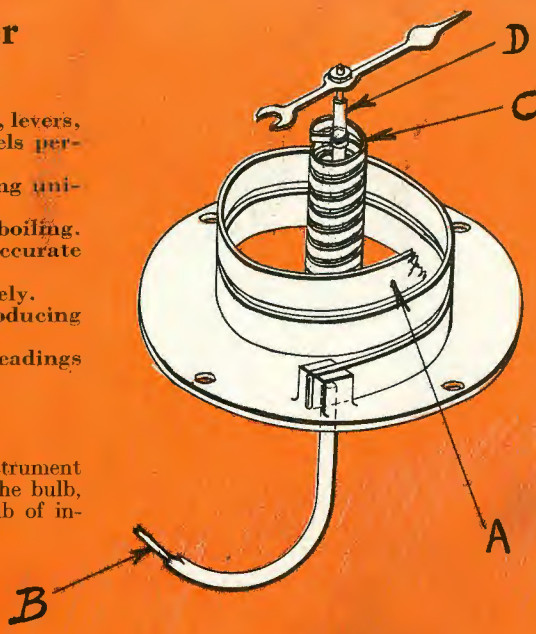
In addition to the $5.00 mentioned, an extra charge of 50c per foot or fraction thereof is made when length of tubing is required longer than standard. For example, for 13 feet of tubing the list price would be $35.50; for 12 feet, the list price would be $35.00, etc. (Maximum length, 30 feet). At least three weeks must be allowed—dating from the receipt of order—to manufacture, test and deliver instruments of uou-standard length.

The use of hose fitting No. 2096 is recommended wherever possible, on account of ease of installation. Wheu ordering hose fitting No. 2096 do not fail to specify the inside diameter of hose to which same is to be applied. Radiator flange No. 2089 is only recommended where instrument is to be installed on V type motors having twin water outlets as radiator hose fitting No. 2096 attached to either water outlet would give the temperature of that one block of cylinders only.

** Our fitting No. 2071 should only be ordered with Model "C" when special provision is made to receive same, such as on Liberty, Hispano Suiza airplane motors, etc.

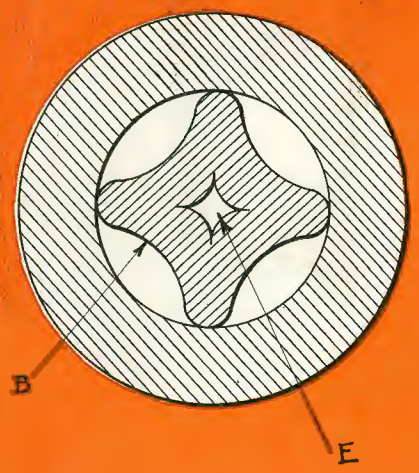
Why the Boyce Moto-Meter is Superior

(1) The elimination of all adjustments, all screws, levers, gears, hair-springs, and all but two bearings, compels permanent accuracy.
(2) All dial divisions are evenly spaced, accuracy being uniform throughout the entire range.
(3) Full range thermometer reading. Freezing to boiling.
(4) The only motor heat indicator which remains accurate at any altitude.
(5) Schlaich's "Star" shaped capillary used exclusively.
(6) Double protection for the capillary tubing, producing freedom from the liability of damage.
(7) Will stand 20% over or under temperature readings without affecting accuracy.



Principle of Operation

The hollow coiled spring A (See Diagram) in the head of instrument together with the small capillary copper tubing (B) and the bulb, are filled with treated alcohol under pressure. When bulb of instrument is subjected to changing temperatures, the alcohol in it expands or contracts moving the minute column of alcohol forward and backward in the entire length of tubing. The hollow spring (A) in the instrument head immediately expands or contracts uniformly moving the pointer on the dial. The dial is calibrated to the exact temperature of the bulb proper.



Compensating Spring

To eliminate all possibility of incorrect registration on the dial caused by the instrument head and tubing being subjected to extreme temperatures, either hot or cold, thus contracting or expanding the minute quantity of alcohol in the tubing and spring to an abnormal degree, a secondary thermostatic correction spring (C) (See Diagram) is used. This spring is attached to the floating pointer shaft (D) and automatically resets the pointer so a true bulb temperature is always shown on the dial regardless of the length or diameter of the tubing and instrument head. The instrument thus registers true and exact temperature of the bulb only.

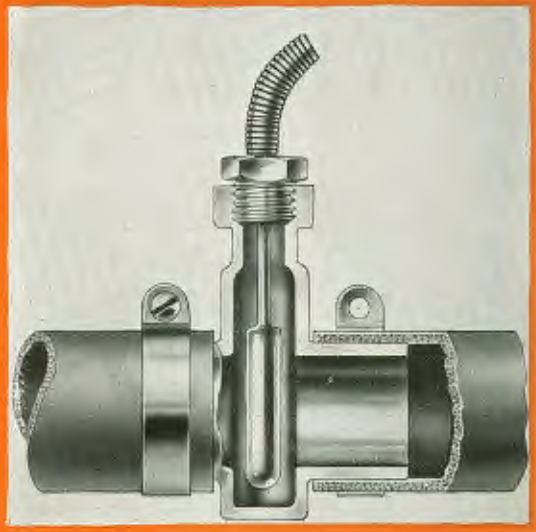
"Schlaich's" Star-Shaped Capillary Tubing

The key to the problem of registering temperature at a distant point was found when Schlaich invented the Star shaped capillary. This capillary tubing is rolled in such a manner that the column of alcohol (E) (See Diagram) is only one-third as large as heretofore used by any manufacturer, yet, this tubing is stronger and the passage is absolutely free. No other manufacturer can use this valuable feature.

Hose Connection

To facilitate ease of attaching the Distance Type BOYCE MOTO-METER to a water-cooled gasoline motor and similar installations, a special fitting has been designed which requires only the cutting away of one inch of the hose connection to install the bulb in the cooling system. No drilling nor tapping of either the radiator or the motor is necessary.

This fitting (made only to accommodate instruments of BOYCE MOTO-METER manufacture) is made for all sizes of hose. It is known as coupling No. 2096. When ordering, always specify the inside diameter of the hose to which it is to be applied.



THE MOTO-METER COMPANY, INC.
LONG ISLAND CITY, NEW YORK

A FEW OF THE MANY USES FOR THE

BOYCE MOTO METER

Distance Type

Aeroplane

On the perfect performance of the motor depends the entire life of the aeroplane and its occupants. The use of the BOYCE MOTO-METER gives to the pilot at all times unfailing indication of the motor's condition. Its accuracy is absolute. Its construction a masterpiece of scientific design.

Aviators understanding the vital importance of the BOYCE MOTO-METER find it indispensible. They are standard equipment on both Army and Navy aeroplanes. They are used by aeroplane mail-carriers, and on the famous Liberty motors. BOYCE MOTO-METER model "C" registers from *freezing* to boiling, and its action is unfailing. In temperatures above the clouds that's worth remembering.

Model "C" on account of the full thermometer scale, and light weight, is recommended for aeroplane installation.

Motor Boats

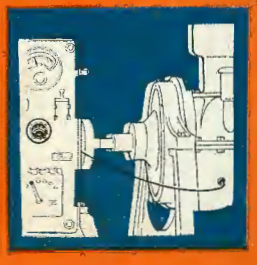
Many gallons of gasoline are wasted each year because the average motor-boat engine is always over-cooled.

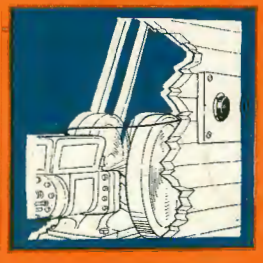
The Model "A" BOYCE MOTO-METER on the bridge or on the instrument board enables the operator to keep his motor running at the most efficient temperature, for it shows 212 degrees boiling instantly so that the motor damage from overheating may be prevented.

Write for our special booklet on motor-boat installations with complete designs by Gerald Taylor White, Naval Architect.

Factory Test of Motors

Many Motor and Carburetor Manfacturers have installed BOYCE MOTO-METERS on their motor-testing stands. The temperature may be taken at the outlet pipe from the waterjacket or from the lubricating system.





Stationary Engines

Bringing the temperature of the water-jackets of a gasoline stationary motor to a convenient point for observation has met with universal favor. Engineers agree that an enormous amount of fuel may be saved by regulating the water flow through the motor so that the water-jacket temperature is always approaching boiling, but never reaching it.

The Moto-Meter Company, Inc.

LONG ISLAND CITY, NEW YORK

Form No. 118-SM-9-19