

*Scientific Instruments*

*and*



*Laboratory Supplies*

*for Physics*

*Chemistry*

*the Biological Sciences*

*and Industrial Testing*

**catalog J-150**

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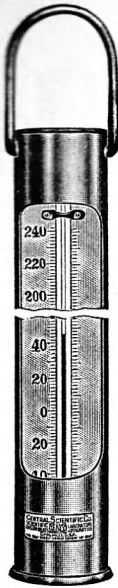
**CENTRAL SCIENTIFIC COMPANY OF CANADA, LIMITED**

(And Hendry Division)

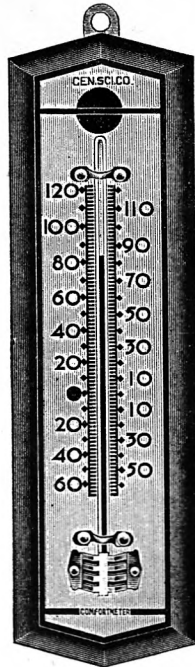
146 Kendal Avenue, Toronto 4, Ontario

7275 St. Urbain St., Montreal 14, Quebec

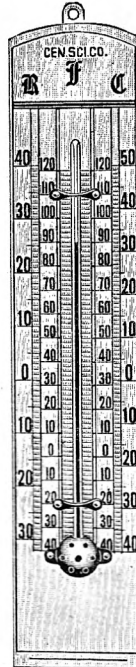
**THERMOMETERS**  
Special Purpose  
Weather



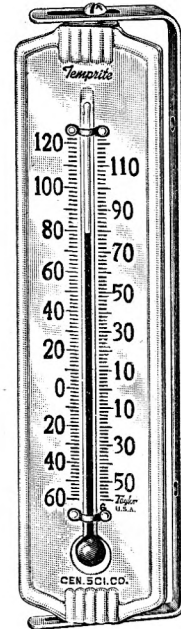
27715



19450



19455



19470

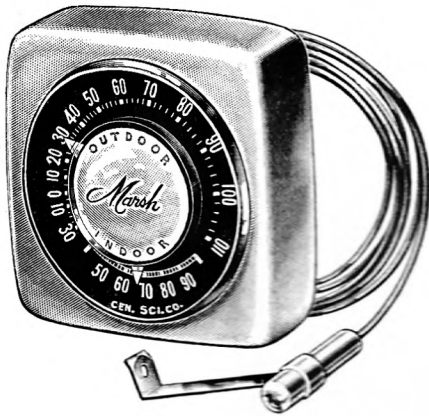
**SPECIAL PURPOSE THERMOMETERS**

- 27715 SAMPLING THERMOMETER, Fahrenheit, Tank Car Thermometer**, for determining the temperature of oils, etc., in tanks, etc. Consists of a lens-front, mercury thermometer with graduated metal scale enclosed in a copper protecting case. Range,  $-20^{\circ}$  to  $220^{\circ}$  F in  $2^{\circ}$  divisions. A copper cup on the bottom of the case surrounding the thermometer bulb retains a sample of the oil. Length, 12 inches (305 mm).....Each \$3.50
- 27716 SAMPLING THERMOMETER, Fahrenheit**, with graduated metal scale, for replacement in No. 27715 Thermometer. Slides into grooves in the copper protecting case.....Each 1.75
- 77007 SLING PSYCHROMETER THERMOMETER, Fahrenheit**, for use either as the wet or dry bulb thermometer on No. 77005 Sling Psychrometer. Engraved scale graduated from  $0^{\circ}$  to  $120^{\circ}$  F in  $1^{\circ}$  divisions. Length, 275 mm.....Each 2.00
- 10% discount in lots of 6*
- 70724 VISCOSIMETER THERMOMETER, Centigrade, Stormer**, for determining the temperature of the liquid in the test cup. Range,  $0^{\circ}$  to  $105^{\circ}$  C in  $1^{\circ}$  divisions. Scaled for total immersion. Length, 240 mm.....Each 2.75

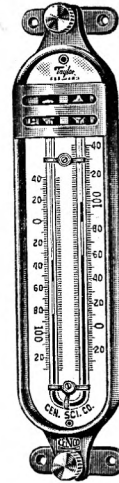
**WEATHER THERMOMETERS**

- 19450 WALL THERMOMETER, Fahrenheit**, for indicating air temperatures. An excellent household thermometer with adequate range for outdoor temperatures. Consists of a magnifying, permanent red-liquid thermometer with black lettering on an ivory-lacquered scale, mounted on a hardwood back. The open graduations and large figures are easily read. The bulb is protected by a metal guard. Range,  $-60^{\circ}$  F to  $120^{\circ}$  F in  $2^{\circ}$  divisions. Length, over-all, approximately 8 inches.....Each .85
- 10% discount for Cenco Package of 12*
- 19455 WALL THERMOMETER, Triple Scale, Centigrade-Fahrenheit-Reaumur**, for indicating air temperatures in all three temperature systems. Excellent for demonstrating relationships between these systems. Consists of a lens-front, permanent red-liquid thermometer mounted on a lacquered wood back upon which the scales and figures are printed. The bulb is protected by a metal guard. Range,  $-30^{\circ}$  F to  $120^{\circ}$  F ( $-28^{\circ}$  R to  $40^{\circ}$  R and  $-35^{\circ}$  C to  $50^{\circ}$  C) in  $2^{\circ}$  divisions. Length, over all, 10 inches.....Each .85
- 10% discount in lots of 12*
- 19470 WEATHER THERMOMETER, Fahrenheit, Window Type, Taylor Temprite**, for mounting on a window frame to permit observation of outdoor temperature from the inside. Consists of a lens-front, permanent red-liquid thermometer mounted upon a white vitreous-enameled metal back with fired-in black figures and graduations. Simple brackets are provided for attachment to the window frame. Length, over all,  $8\frac{1}{2}$  inches.....Each 1.75
- 10% discount in lots of 12*

**THERMOMETERS**  
Weather



19472

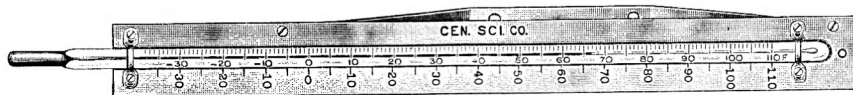


19485

**19472 WEATHER THERMOMETER, Fahrenheit, Outdoor-Indoor, Duo-Temp**, for indicating both outdoor and indoor air temperatures on separate scales on one instrument. May also be used for comparing temperatures within and without incubators, ovens, hot houses, etc. The case is of light gray plastics; dial is deep wine color, with gold characters and pointers. The thermometer is mounted on an inside wall; five feet of capillary tubing are furnished to connect the outside bulb with the instrument.

The indoor scale reads from 40° to 100° F and the outdoor scale from -30° to 110° F. The accuracy is one scale division (2° F) on both scales. The movement incorporates the Bourdon tube principle which reduces error in outdoor readings due to the expansion effect of inside temperature. There is no glass to break or mercury column to separate. Brackets are furnished to mount the thermometer and the outside bulb. The instrument is approximately 3¾ inches square and 1½ inches deep.....**Each \$7.50**

*10% discount in lots of 6*

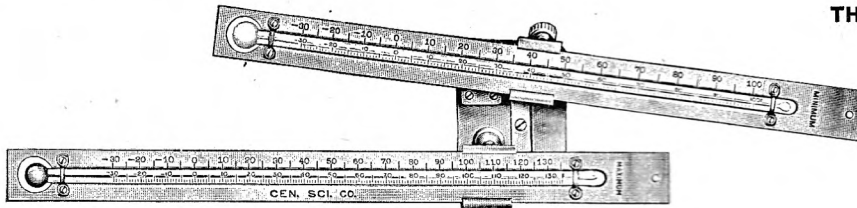


19480

**19480 WEATHER THERMOMETER, Fahrenheit, U. S. Weather Bureau**, for accurate measurements of air temperature and for use as a standard for checking other weather thermometers. Consists of an engraved stem mercury thermometer, accurately graduated, mounted upon a stainless steel back which is marked at 5° intervals and numbered at 10° intervals corresponding to the same graduation marks on the thermometer. Range, -25° to about 120° F in 2° divisions. Length of thermometer, 10½ inches. With brass insulating supports and manufacturer's certificate of accuracy.....**Each 7.50**

**19485 WEATHER THERMOMETER, Fahrenheit, Maximum-Minimum, Two-leg Type**, for indicating the highest and lowest temperatures reached in the interval between settings. Consists of a U-shaped thermometer with a bulb at each end, mounted in a plastics frame with individually graduated, enameled brass scales; the cold scale is along the left tube, and the hot scale along the right tube. The lower part of the thermometer contains mercury, while the upper part, including the bulbs, contains a colorless liquid. Metal indicators on each side above the mercury indicate the high and low temperatures attained since the last setting of the instrument. Setting is accomplished by moving the indicators with a magnet supplied with the thermometer. Range: Minimum, -40° to 120° F in 2° divisions; maximum, -20° to 140° F in 2° divisions. Length, over all, 7½ inches. With magnet and directions.....**Each 7.50**

THERMOMETERS  
Weather



19490

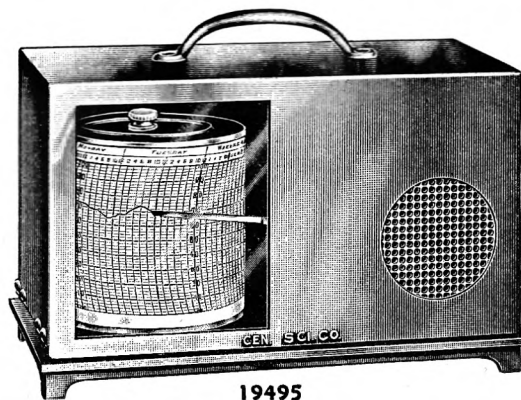
**19490 WEATHER THERMOMETER SET, Fahrenheit, Maximum-Minimum, U. S. Weather Bureau, Townsend Support**, for use same as No. 19485 Thermometers, but made according to the U. S. Weather Bureau specifications for greater accuracy of measurement, and provided with a Townsend support, which holds the thermometers in the positions necessary for minimum error of registration.

Consists of a pair of engraved stem thermometers similar to No. 19480 Thermometers, mounted upon stainless steel backs and attached to the Townsend support. The mercury maximum thermometer has a constriction in the stem above the bulb, which breaks the mercury thread with the slightest drop in temperature, the maximum temperature being indicated by the meniscus farthest from the bulb. The spirit-filled minimum thermometer contains a black index within the liquid in the capillary stem. As the meniscus moves to the lower temperatures, the index moves with it, remaining at its lowest position when the temperature rises. The metal support permits quick resetting; the maximum thermometer rotates freely to rejoin the mercury thread by centrifugal force; and the minimum thermometer rotates a quarter turn to allow the index to return to the meniscus. Range: minimum,  $-60^{\circ}$  to  $100^{\circ}$  F in  $1^{\circ}$  divisions; maximum,  $-30^{\circ}$  to  $120^{\circ}$  F in  $1^{\circ}$  divisions. Length of thermometers, over all, 11 inches. With metal Townsend support and manufacturer's certificates of accuracy.....

Per set \$22.50

**19492 WEATHER THERMOMETER, Fahrenheit, Maximum Registering, U. S. Weather Bureau**, for indicating maximum temperature attained between settings. Same as the mercury maximum thermometer of No. 19490 Thermometer Set. With manufacturer's certificate of accuracy, but without support ..... Each 7.50

**19494 WEATHER THERMOMETER, Fahrenheit, Minimum Registering, U. S. Weather Bureau**, for indicating minimum temperature attained between settings. Same as spirit-filled thermometers of No. 19490 Thermometer Set. With manufacturer's certificate of accuracy, but without support. .... Each 7.50



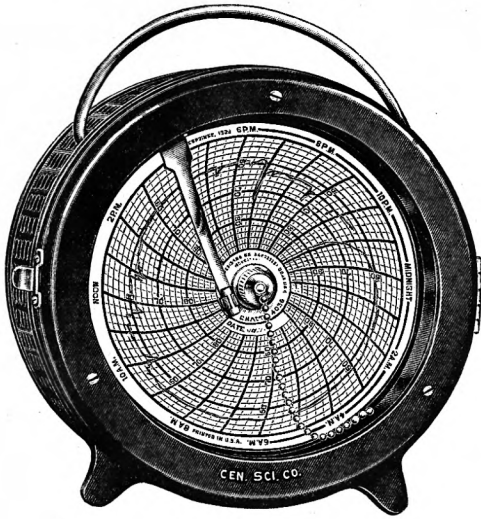
19495

**19495 WEATHER THERMOMETER, Recording Thermograph, Air Type, Taylor**, for accurately measuring and recording room temperatures by means of a pen on a printed chart. A complete record is made for one week. The charts may be retained as a record.

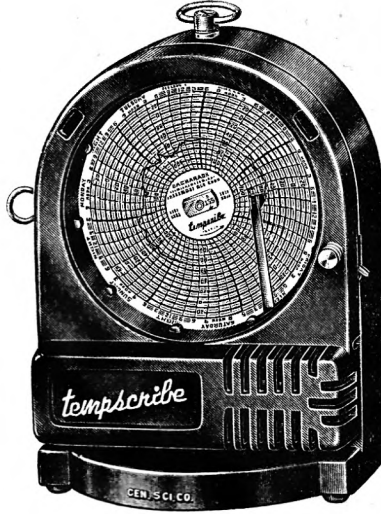
Consists of a bimetallic coil of non-rusting material, exposed to the atmosphere at the end of the ventilated metal case, and connected to the recording pen. As the temperature rises and falls, the coil unwinds or winds, causing the arm to move vertically across the chart which is attached to a metal drum with a 7-day, fully-jeweled clock movement. The charts are divided horizontally into days and into two hour subdivisions of a day, and vertically into degrees covering a range of  $0^{\circ}$  to  $100^{\circ}$  F. The top of the case is hinged at one end and is fastened at the opposite end by a metal hasp provided with small padlock with key. The case is finished in dark gray and has a clear glass window for observing the temperature chart. Complete with 1 box of charts (1 year's supply), bottle of ink with dropper stopper, padlock with two keys, and directions for use..... Each 93.75

**19496 Thermograph Charts**, for replacement on No. 19495 Recording Thermometer. Length,  $12\frac{1}{4}$  inches; width,  $3-11/16$  inches. Supplied in boxes containing a year's supply with directions for installation ..... Per box 2.85

THERMOMETERS  
Weather



19498



19501



19515

**19498 WEATHER THERMOMETER, Recording, Circular Type**, an accurate, convenient, portable instrument with circular chart for use in recording room temperatures. Consists of a metallic thermometer and a specially designed Seth Thomas clock for rotating the disk, mounted in a perforated cylindrical metal case. The thermometer is of the helical bimetallic type to one end of which is directly attached the pen arm. A frictionless glass fountain pen, clipped in the end of the pen arm, holds sufficient ink for a 24 hour chart. The charts regularly supplied with the thermometer are graduated circularly in single hour intervals with every second hour numbered. From outside to center, the chart is divided from 50° to 90° F in 2° divisions. The metal case is made of aluminum, finished in gloss-black baked enamel. The face is hinged and provided with a catch. Dimensions: Height, over-all, 6<sup>3</sup>/<sub>16</sub> inches; diameter of case, 6 inches; diameter of face, 4<sup>1</sup>/<sub>2</sub> inches; diameter of chart, 3<sup>7</sup>/<sub>8</sub> inches. Complete with 100 Charts and bottle of recording ink.....**Each \$34.00**

**19499 Charts, Circular**, for replacement in No. 19498 Recording Thermometer; 24-hour charts covering a range of 50° to 90° F. Supplied in packages of 100 charts.....**Per package 1.50**

**19501 THERMOMETERS, Recording, "Tempscribe,"** for automatic recording of temperatures over a period of seven days on a replaceable chart. The low range model, No. A, may be used to check the performance of refrigeration equipment or to record outdoor winter temperatures; the high range model, No. B, to keep records of indoor temperatures, study the effectiveness of heating equipment, and detect heat losses. A permanent record may be kept of every degree of change, as well as maximum and minimum temperatures. Charts are numbered at 10° intervals and graduated in 2<sup>1</sup>/<sub>2</sub>° divisions. Additional models are available on special order to cover a range of time intervals as short as 24 hours. A model is also available to cover a wide range of temperature changes with slightly lower accuracy. To keep a continuous weekly record of weather conditions, one may use a "Tempscribe" with the No. 76915 Recording Barometer.

Each thermometer consists of a spring-driven clock mechanism, a rotating dial with reset knob, and a movable pointer carrying the inked needle. The dial is protected by a glass face set in the door, which is hinged and provided with a metal latch. The instrument is enclosed in a walnut-colored plastics case, 7<sup>1</sup>/<sub>2</sub> inches high, 5<sup>1</sup>/<sub>4</sub> inches wide and 4<sup>1</sup>/<sub>2</sub> inches deep. Complete with two years' supply of charts, instruction booklet, and a bottle of recording ink.

No.....	A	B
Range, degrees F.....	-10 to +50	+40 to 100
Each.....	44.00	44.00

**19510 Ink, Recorder, Red**, for use with any recording thermometer or barograph. Supplied in 2-dram bottles .....**Each .60**

10% discount in lots of 12

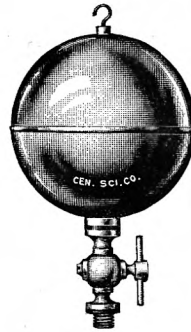
**19515 THERMOMETER PIGMENT, Black**, for restoring the filling in the etched graduations and figures on etched stem thermometers, when they become dull or have been removed. The pigment is not affected by common dilute chemical solutions, or sterilizing agents, and is practically indelible. A standard tube will fill markings in several gross of thermometers. In 1<sup>1</sup>/<sub>2</sub>-oz. screw-cap tube and with directions for use.....**Each 1.60**

10% discount in lots of 12

**PNEUMATICS**  
Weight of Air Globe  
Anemometers



76755



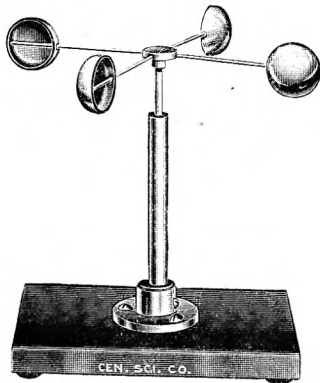
76760

**76750 WASHERS, Air Pump**, as used on stopcocks and other air pump accessories. Outside diameter, 11/16 in., hole, 7/16 in. In packages of 12.....Per package \$0.10  
*10% discount in lots of 50 packages*

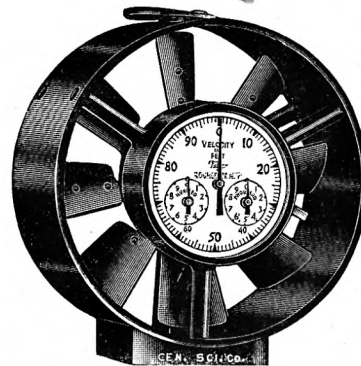
**76755 WATER HAMMER**, all glass, one bulb, length 25 cm. For illustrating that water enclosed in vacuum falls as if solid, and on striking the bottom of the glass tube, emits a click as if the glass had been struck with a solid substance.....Each 1.50  
*10% discount in lots of 12*

**Note:** Because of the likelihood of breakage due to freezing of the water in No. 76755 Water Hammer, it cannot be shipped during the winter months. Orders for it should be placed during the spring, summer or early fall. Otherwise we shall ask the privilege of cancelling No. 76755 from the order, advising that it be ordered later.

**76760 WEIGHT OF AIR GLOBE**, of copper, finished in copper bronze lacquer, 10 cm in diameter, with stop-cock and hook.....Each 4.50  
*10% discount in lots of 6*



76800



76805

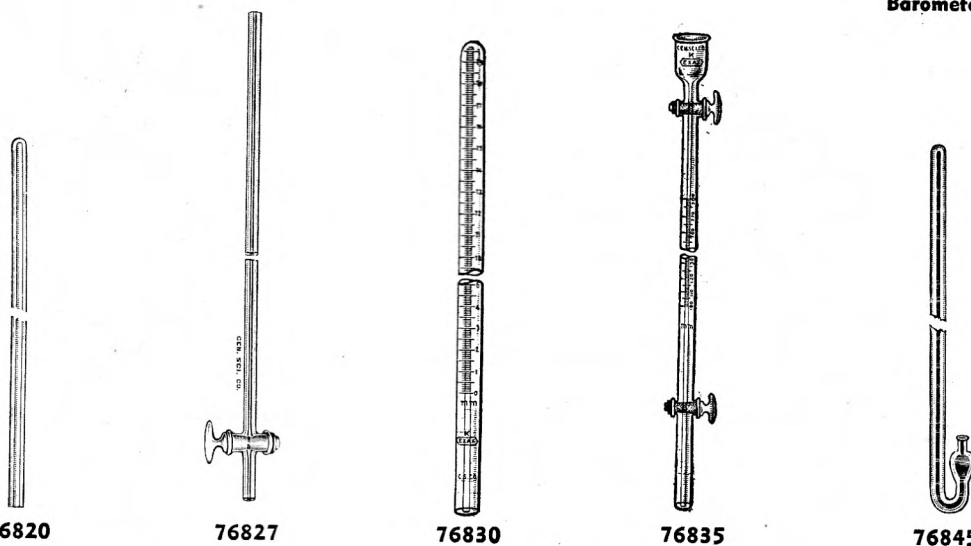
**AIR VELOCITY MEASUREMENTS**

**76800 ANEMOMETER, Working Model**, to illustrate the principles involved in the measurement of wind velocity. Four metal cups at the ends of arms about 9 cm long mounted on a vertical axle make up the rotating member, which is supported free to rotate at the top of an upright metal rod. The upright is mounted on a wood base, 10 by 15 cm. Height over all about 17 cm .....Each 6.10  
*10% discount in lots of 6*

**76805 ANEMOMETER, Biram's**, for the measurement of velocity of air currents in schools, public buildings, mines, tunnels, flues, and sewers. Especially useful in studying the ventilating systems in schools, hospitals and other public buildings. Widely used in meteorological work for determining velocity of surface winds. The instrument is direct reading from 0 to 10,000 linear feet of total air passing in a given period. The readings are indicated by means of three registering dials, the largest of which reads from 0 to 100 feet.

The instrument is suitable for measuring air speeds from 75 to 2000 feet per minute. A zero setting device permits instant return of all pointers to zero. The anemometer is accurately made, with straight, tubular brass spokes and adjustable hubs. Diameter, 4 1/4 inches; weight, 1 lb. Complete with correction table, threaded socket for attaching to foot, and metal case .....Each 39.20

METEOROLOGY  
Barometer Tubes



76820

76827

76830

76835

76845

76820 **BAROMETER TUBE, Plain**, of large bore, heavy wall lime glass tubing with one end sealed round. Length, 86 cm.....**Each \$0.60**

10% discount for Cenco Package of 12

76825 **BAROMETER TUBE, Plain**, same as No. 76820 Barometer Tube, but supplied with glass mercury well and pipette for filling.....**Each 1.20**

10% discount in lots of 12

76827 **BAROMETER TUBE, Stopcock**, similar to No. 76820 Barometer Tube, but with stopcock at top and with bottom flared to form a funnel for ease in filling.....**Each 4.25**

10% discount in lots of 6

76830 **BAROMETER TUBE, <sup>EXAX</sup> Blue Line**, unfiled. Made of large bore, heavy wall lime glass tubing. Graduated from 0 to 800 mm in 1 mm divisions, and numbered each centimeter. Length, over all, 86 cm. Number in original case, 12.....**Each 4.24**

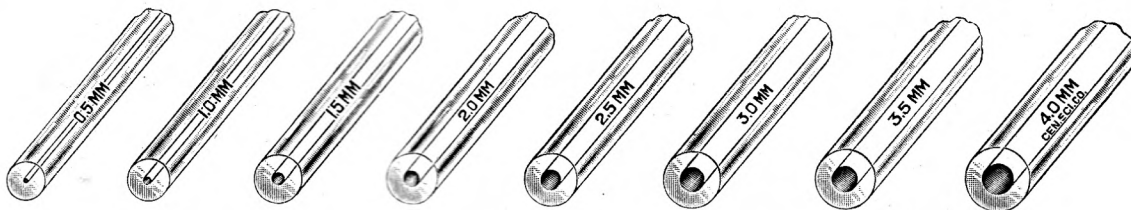
76835 **BAROMETER TUBE, Demonstration Form, <sup>EXAX</sup> Stopcock, <sup>EXAX</sup> Blue Line**, unfiled, with funnel top and stopcocks at top and bottom for ease in filling and emptying. Graduated from 100 to 800 mm in 1 mm divisions, and numbered each 20 mm. Length, 104 cm. See No. 15412 Stopcock Plugs, <sup>EXAX</sup> size No. 2, for replacement. Number in original case, 6.....**Each 9.08**

76840 **BAROMETER WELL, Iron**, for holding mercury and for use with Nos. 76820, 76830, and 76835 Barometer Tubes. It consists of a heavy cast iron well, conical on the inside and having a flat depression for the glass tube. Top diameter, 3 inches; height, outside, 1½ inches.....**Each .85**

10% discount in lots of 12

76845 **BAROMETER TUBE, Siphon Form, Plain**, of large bore, heavy wall lime glass tubing with a bulb on the short arm. Length, 80 cm. Unfiled.....**Each 1.55**

10% discount in lots of 12



14081

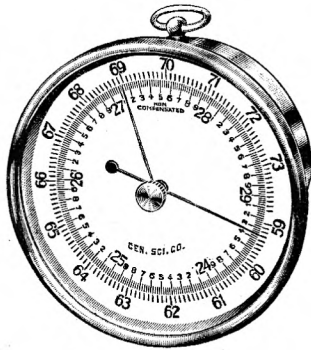
14081 **GLASS TUBING, Capillary, Lime, Machine-made**, same as No. 14076 Tubing, but in heavy wall capillary sizes. The larger sizes are suitable for use as barometer tubes. The allowable variation on inside diameters is ± 0.25 mm. Wall thickness of all sizes up to 2.5 mm is 2.25 mm, and for sizes above 2.5 is 3.00 mm. Stocked in 4-foot lengths. Packed in Cenco packages of 30 lbs. of one size.

Diameter, inside, mm.....	0.5	1	1.5	2	2.5	3	3.5	4
Feet per lb, approx.....	30	26	23	20	18	16	15	13
Per lb.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

10% discount for Cenco Packages

"Exax" Case and Case Assortment Discounts, See Front of Catalog, Page VIII.

METEOROLOGY  
Barometers



76865



76870

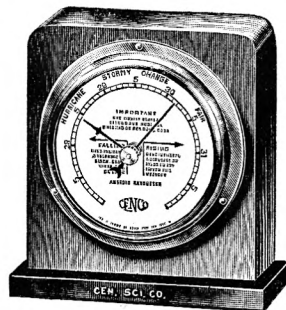
ANEROID BAROMETERS

**76865 BAROMETER, Aneroid, Dial Type**, an excellent barometer for either educational or private use. Quality precision and mechanical action plus closely graduated dials (to 0.02 inch) insure instant response to and accurate readings of the slightest changes in atmospheric pressure.

Consists of a brass case 5" in diameter with white enameled dial and black numerals and graduations. The dial has an open center. The movement is lacquered. Graduated in both English and metric systems. For use between 2900 and 7100 feet.....**Each \$18.75**

**76870 BAROMETER, Aneroid, Temperature Compensated Navy Type, English and Metric**, a high grade barometer suitable for practically any use in which an aneroid is found preferable to a mercurial barometer, with a further advantage over No. 76865 for educational purposes in the fact that the dial is cut away in the center to form an opening 55 mm in diameter through which its movement and its various parts are plainly visible. Practically all parts of this barometer are constructed of nickel-silver or phosphor bronze, rendering it practically non-corrosive in the presence of moisture. Its readings are accurate at all ordinary temperatures because of the compensated movement.

The diameter of the dial is 5 inches. It is made of silvered metal with graduations lithographed. The instrument is compensated for temperature changes. It has a hook for suspension and a stationary hand for comparison with previous readings. With metric and English scales. It is intended for use in altitudes up to 3,500 feet.....**Each 25.50**



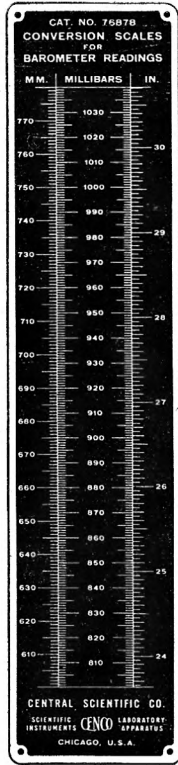
76871

**76871 BAROMETER, Aneroid, Dial Type, Metric and English**, for reading barometric pressures at altitudes from 0 to 5000 feet. The dial shows mercury pressure equivalents in both English and metric scales. In brass case with glass front. Weather forecast indications are shown. The red index pointer is provided with a knob for resetting. The barometer is housed in a mahogany-finished wood frame with black base for use on a desk or table top. Dimensions, over-all height, 4 7/8 inches; width, 4 inches; depth, 1 1/2 inches.....**Each 8.50**

10% discount in lots of 6



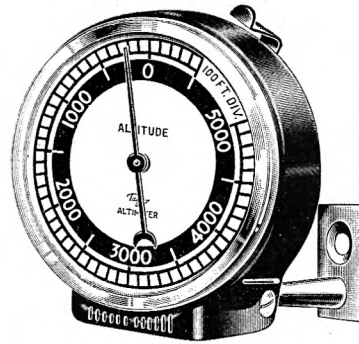
METEOROLOGY  
Altimeters



76878



76880



76887A

**76878 BAROMETER CONVERSION SCALES, Cenco**, for readily converting barometric pressures in inches or millimeters to the new official standard of pressure, the millibar, adopted by the U. S. Weather Bureau. The millibar is equal to 1000 dynes per square centimeter and one thousand of these equal a height of 750 mm of mercury.

Consists of a metal plate, 22.5 cm by 5 cm, with reversed etched graduation and figures against a black enameled background. The scale divisions cover a range from 600 to 780 mm which corresponds to a range of approximately 800 to 1070 millibars, or to a range of approximately 23.6 inches to 30.7 inches. The scale is suitable for mounting on the wall near the barometer or to the backboard on which the barometer is mounted.

The use of this unit by the U. S. Weather Bureau is another step toward the adoption of the metric system for all units of measurement. Pressures in millibars are now included on the weather forecast maps published by the U. S. Weather Bureau.....**Each \$0.35**

*10% discount in lots of 36*

**76880 ALTIMETER, Pocket Type**, for determination of atmospheric pressures and altitudes up to 8000 feet.

Consists of a precision grade movement compensated for ordinary temperatures and mounted in a gilt case similar to a watch. The dial of 1 1/4 inch diameter carries two scales. The inner scale is graduated from 23 to 31 inches in .05 inch divisions. The outer scale which can be revolved by means of a milled ring is the altitude scale, reading from 0 to 8000 feet in 100-foot divisions. The needle is provided with a fine pointer, making it possible to estimate altitudes within 10 feet. An adjustment screw, accessible through an opening in back of the case, permits setting correctly with a standard barometer. The readings are as reliable as those of the best aneroid barometers. Convenient to carry in the pocket on field trips. With soft leather case.....**Each 20.65**

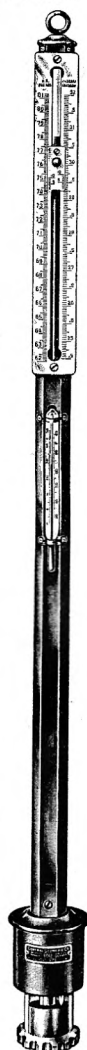
**76885 ALTIMETER, High Altitude, Pocket Type**, identical with No. 76880 Barometer, but with altitude scale reading from 0 to 12,000 feet in 100-foot divisions .....**Each 30.00**

**76887 ALTIMETERS, Auto-Type**, for indicating altitude, measuring height of hills and depth of valleys, etc. Excellent for field trips and exploring parties. May be attached by means of ball bracket in a convenient position on an automobile windshield centerpost or molding.

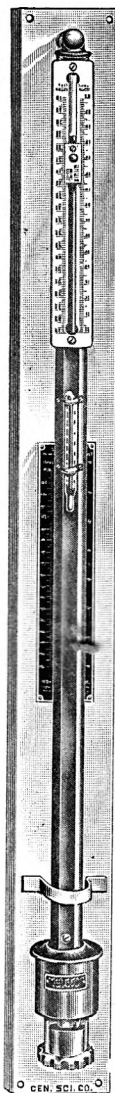
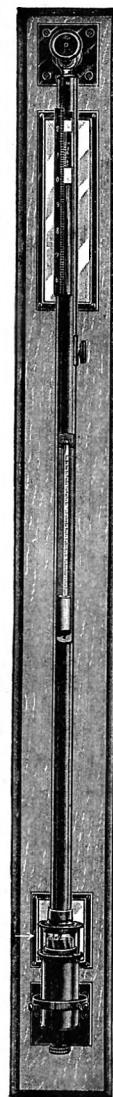
Consists of an aneroid movement in a brown molded plastic case with dial showing altitude in feet. A socket with set-screw in the back permits attachment to a chromium-plated bracket supplied with the instrument for permanent attachment in the conveyance used on the trip. A finger-lever at the top of the case permits setting the indicating needle at the starting elevation. Subsequent indications will be actual elevations in feet.

No. ....	A	B	C
Range, feet .....	-500 to +5000	-1000 to +10,000	-1000 to +15,000
Divisions, feet .....	100	100	200
<b>Each</b> .....	<b>8.00</b>	<b>10.00</b>	<b>12.00</b>

METEOROLOGY  
Mercurial Barometers



76890

76892 shown  
with barometer.

76894

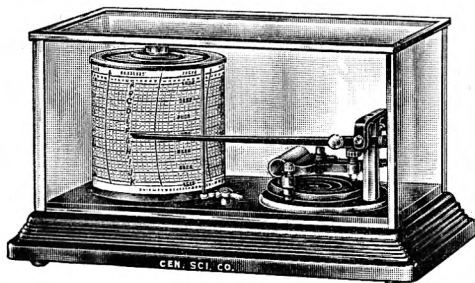
**76890 BAROMETER, Mercurial, Cenco-Improved Design** (Patent No. 1,632,084). Before the Cenco Mercurial Barometer appeared on the market all low-priced barometers consisted essentially of a wooden back to which was rigidly secured the barometer cistern, tube and scale, and the thermometer when this was provided. In such instruments the risk of breakage is great, and the accuracy of reading is doubtful since changes in humidity cause shifting of the scale relative to the zero point of the mercury column.

The Cenco-improved design, in its general lines, resembles the U. S. Weather Bureau type. The barometer tube is completely enclosed in hexagonal brass tubing, to which are attached the metric and English scales. At the upper end of the barometer there is a substantial ring which permits free suspension. The construction of the cistern eliminates the usual leather bag used in Fortin style barometers, but permits fine adjustments of the mercury level. The thermometer is secured to the brass case.

Some of the resulting advantages of this design over the obsolete wood-backed form are: (1) Freedom from error due to warping of wood, and permanent adjustment of scale relative to the celluloid zero index; (2) greater protection to barometer tube, minimizing the likelihood of breakage; (3) possibility of making temperature corrections, since brass, glass and mercury are the substances involved, to which instructions in the manuals are directly applicable. Location of the thermometer directly on brass tube is an aid to accuracy; (4) the instrument automatically hangs plumb.

In addition to these points, the elimination of the leather bag does away with the annoyance of loss of mercury by leakage when the leather becomes old. This feature is patented, and is found only in the Cenco-improved design.

*(Continued on next page)*

METEOROLOGY  
Barograph

76908

**76890 BAROMETER, Mercurial, Cenco-Improved Design (Patented) (continued from preceding page).**

**Specifications:** Tube: Full 4 mm bore, filled with redistilled mercury by a special process. Scale: Range 600 to 800 mm, or 24.5 to 31.5 inches, for altitudes from 0 to 4000 feet; verniers read 0.1 mm and 5/1000 inch; scale and verniers of stainless steel. Thermometer: Graduated both Centigrade and Fahrenheit. Finish: Oxidized and lacquered.

Complete with hook screw for suspending barometer and a U-shaped metal holder, with wood screws, for attachment to wall at a point slightly above the mercury well to prevent swinging of barometer. (Can be shipped by express only)..... **Each \$34.00**

10% discount in lots of 3

**76891 BAROMETER, Mercurial, Cenco-Improved Design (Patent No. 1,632,084), for high altitudes, from 1,500 up to 10,000 feet. Similar to No. 76890 Barometer, but with range of scale 500 to 700 mm or 19.5 to 27.5 inches. (Can be shipped by express only)..... **Each 41.00****

10% discount in lots of 3

**76892 Barometer Mounting, to provide a substantial support for Nos. 76890 and 76891 Cenco-Improved Mercurial Barometers. The use of the mounting prevents removal of the barometer from its place of suspension or other tampering which might be detrimental to its accuracy.**

Consists of a substantial sheet metal back finished in white enamel, providing a light background for adjusting the zero index to the mercury surface and the vernier to the top of the mercury column. Suspension holes are provided at the four corners. Length, 37½ inches; width, 3½ inches. A Metal Conversion Scale, No. 76878, is securely fastened to the mounting. **Without barometer. (Illustrated on preceding page).**..... **Each 5.75**

10% discount in lots of 6

**76894 BAROMETER, Standard Mercurial, United States Weather Bureau Type, Fortin principle. This barometer is of the highest type of excellence, endorsed by the United States Weather Bureau, and fully warranted by the manufacturer. The mercury tube is enclosed in a brass body with gunmetal finish. The vernier is operated by a rack-and-pinion movement. The scale is graduated on one side in inches and 10ths, on the other in centimeters and millimeters, the vernier reading to one-hundredths of an inch and one-tenth of a millimeter. Reads down to 25½ inches for use in altitudes up to 3,000 feet. Complete with hardwood back and thermometer with both Centigrade and Fahrenheit scales. (Can be shipped by express only.) (Illustrated on preceding page)..... **Each 80.00******76908 BAROMETER, Recording Barograph, for recording variations in atmospheric pressure from 28 to 31 inches by tenths inches in intervals of two hours through seven days. May be used at any altitude from 0 to 3500 feet. Excellent for forecast of weather from an analysis of an accurate and continuous record for periods of 12 to 24 hours in the future.**

Consists of a high-grade seven day clock movement for operating the recording drum and an exceedingly sensitive temperature-compensated aneroid mechanism mounted on a polished mahogany-finished wood base and enclosed within a plate glass case. The aneroid mechanism controls a long lever pen through a temperature-compensated system. The clock movement, located within the drum, is spring driven and wound by a key at the top of the drum. The charts are lithographed in green ink and gummed at one end for easy attachment and rouletted for easy removal. The horizontal divisions cover a period of seven days in two-hour intervals; the vertical divisions indicate tenth inches from 28 to 31 inches. A weather forecast card 6¾ by 10¾ inches is supplied which carries statements of the probable weather conditions 12 to 24 hours ahead that are based on the observed conditions recorded by the instrument. In addition a special display card is also furnished for posting the forecast.

Complete with forecast cards, a year's supply of charts, and a bottle of special ink. Over-all dimensions: width, 17½ inches; length, 12¾ inches; height, 7 inches..... **Each 112.50**

**76909 Barograph Charts, for No. 76908 Barograph. In ordering, send in a sample of the kind in use to assure proper fit. In packages containing one year's supply..... **Per package 3.25****

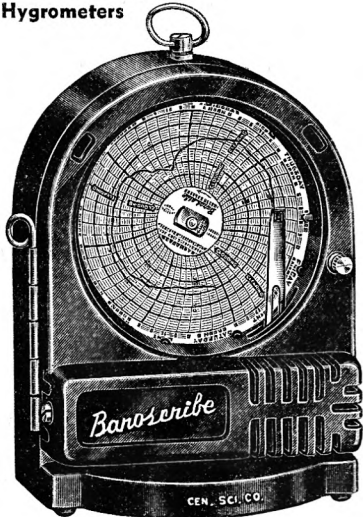
10% discount in lots of 6 packages

**76911 Barograph Charts, for use with No. 76908 Barograph at pressures of 28 to 31 inches. In packages containing one year's supply..... **Per package 3.25****

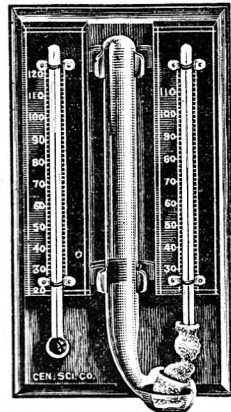
10% discount in lots of 6 packages

**19510 INK, Recording, Red, for use in No. 76908 Recording Barometer. Supplied in 2-dram bottles..... **Each .60****

METEOROLOGY  
Hygrometers



76915



76970



76980

**76915 BAROMETER, Recording, "Baroscribe,"** for automatic recording of barometric pressure over a period of seven days on a replaceable chart. The record will show the magnitude of rise or fall in atmospheric pressure, when changes occur, and how rapidly they take place. This type of record is used by weather stations for making accurate predictions. Knowledge of the barometric trend for several hours previous to the forecast greatly enhances its accuracy. To assist in interpreting the readings, each chart is printed on the reverse side with detailed weather forecasting information. Low cost of the instrument will enable educational and industrial laboratories, as well as meteorologists, to keep continuous seven-day records of changes of barometric pressure. By using No. 19501 A or B Recording Thermometers in connection with the "Baroscribe", the observer may keep a continuous week-to-week record of weather conditions.

The instrument consists of a spring-driven clock mechanism, a rotating dial with reset knob, and a movable pointer carrying the needle with ink reservoir. The pointer is actuated by a barometer set in the base of the door. A glass face to protect the dial and pointer, a removable hinge, and a metal door latch are also provided. Charts are graduated at every three hours, and show from 28 to 31 inches of mercury in divisions of  $\frac{1}{10}$  inch. The "Baroscribe" is enclosed in a walnut-colored plastics case,  $7\frac{1}{2}$  inches high,  $5\frac{1}{4}$  inches wide and  $4\frac{1}{2}$  inches deep. Complete with two years' supply of charts, instruction booklet, and a bottle of recording ink. **Each \$58.00**

**76970 HYGROMETER, Mason,** for determining both relative humidity and dew point. Glass magnifying thermometers of approximate range from  $30^{\circ}$  to  $120^{\circ}$  F. are mounted on a metal scale with insulating support and attached to a mahogany finished panel  $8\frac{1}{2}$  by  $4\frac{1}{2}$  inches. With glass cistern and spare wicks, humidity tables and directions for use. **Each 7.50**

10% discount in lots of 6

For experiments employing this or similar apparatus see T. W. & H. Exp. 24, p. 64; Z. & E. Exp. 12, p. 70. See list of Manual References, page 1000.

**76972 Cistern, only,** of No. 76970 Hygrometer. **Each .75**

**76974 Thermometer, only,** of No. 76970 Hygrometer. With graduated metal scale. **Each 3.00**

10% discount in lots of 6

**76976 Hygrometer Wick, Cotton,** for replacement on wet bulb thermometer of No. 76970 and No. 76990 Hygrometers or No. 77005 Sling Psychrometer. Should be ordered with Nos. 76974, 77007 Thermometers when they are to be used as wet bulb thermometers. In packages of 12. **Per package .25**

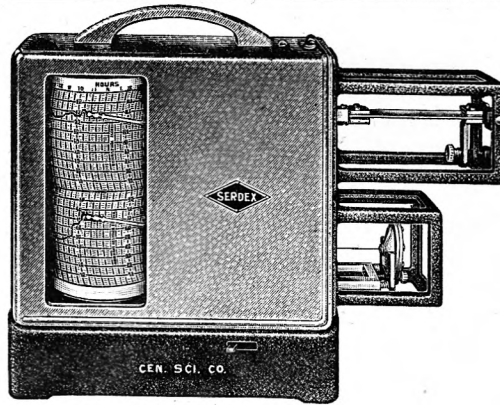
10% discount in lots of 50 packages

**76980 HYGROMETER, Laboratory Standard, Serdex,** for accurate measurement of relative humidity in the laboratory or in small, partially enclosed spaces. Accuracy of the instrument is  $\pm 1.5$  per cent within the range of 15 to 95% at temperatures from  $+32^{\circ}$  to  $130^{\circ}$  F. For operation at lower temperatures (to  $-10^{\circ}$  F), a correction chart will be furnished on request. The dial is calibrated from 1 to 100 per cent relative humidity in divisions of 1%. For the most rapid measurements of relative humidity, it is necessary to maintain a minimum ventilation rate of approximately 100 feet per minute. The time lag constant of the indicating element is less than 6.5 seconds for 90 per cent of the range covered. A decrease in the ventilation rate will cause the time lag constant to increase by a small percentage.

Three screened openings in the case permit adequate ventilation for normal use. If the instrument is used to measure relative humidity around a small object, the back of the case may be removed. Thus, minute changes in relative humidity may be measured, even where the air circulation is almost negligible. If the ventilation rate falls below 100 feet per minute, it is recommended that the back cover be removed. The dial has white figures on a dark background and a red pointer. Height, 4 inches; width,  $4\frac{1}{2}$  inches; depth, 3 inches. Weight, 10 oz. Complete with instruction sheet. **Each 45.00**

10% discount in lots of 6

METEOROLOGY  
Hygrothermograph



76982

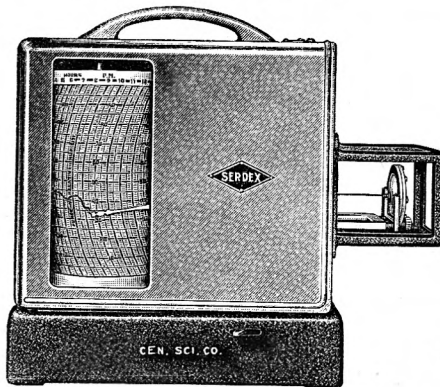
**76982 HYGROMETER, Hygrothermograph, Recording, Serdex**, for providing an accurate 24-hour record of relative humidity and temperature. The instrument gives relative humidity measurements within an accuracy of  $\pm 5$  per cent over the range from 15 to 95 per cent; temperature measurements within an accuracy of  $\pm 1^\circ$  F over the range from 0 to  $100^\circ$  F. The Hygrothermograph may be used in the temperature range of  $+32^\circ$  to  $130^\circ$  F; for use at lower temperatures (to  $-10^\circ$  F), a correction chart will be furnished on request.

The hygrometric sensitive element has a time lag constant of approximately 50 seconds at a ventilation velocity of 500 feet per minute or greater. The lag constant is defined as the time in seconds the element requires to cover 63.21% of the relative humidity range, 90 to 40%, when subjected to sudden exposure at 40% starting from equilibrium at 90%. Zero adjustment can be made by the user.

The drum is gear driven by a 30-hour clock which is mounted in the base of the instrument. The chart provides two full-scale records of relative humidity and temperature. Three inches are for humidity; three inches, temperature. No. 76983 Chart covers 29 hours of operation. The pen and linkage parts are of stainless steel. The base, drum and case are of aluminum. Dimensions, over-all: height, 12 inches; length, 15 inches; width, 6 inches. Weight, 11 lbs., 4 oz. Complete with 3 months' supply of charts and recording ink.....**Each \$250.00**  
*5% discount in lots of 3*

**76983 Charts, Hygrothermograph**, for replacement in No. 76982 Hygrothermograph. In packages containing 100 charts.....**Per package 5.00**  
*10% discount in lots of 6 packages*

**76984 Ink, Recording**, for use with No. 76982 Hygrothermograph and No. 76985 Microhygrograph.....**Per bottle 1.00**  
*10% discount in lots of 12*



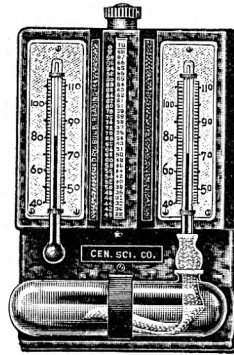
76985

**76985 HYGROMETER, Microhygrograph, Recording, Serdex**, similar to No. 76982 Hygrometer, but designed for critical study of fluctuations in relative humidity in controlled areas either indoors or outdoors. The Microhygrograph may be used in the temperature range of  $+32^\circ$  to  $+130^\circ$  F; for operation at lower temperatures (to  $-10^\circ$  F), a correction chart will be furnished on request. The sensitive element is the same as the type used in No. 76982. The chart provides a 6-inch, full-scale record for the range from 0 to 100 per cent relative humidity. No. 76986 Chart covers 29 hours of operation and is readable to 1%. Dimensions, over-all: height, 12 inches; length, 12 inches; width, 6 inches. Weight,  $10\frac{1}{4}$  lbs. Complete with charts for three months and instruction sheet.....**Each 200.00**  
*5% discount in lots of 3*

**76986 Charts, Microhygrograph**, for use with No. 76985 Microhygrograph. Numbered at 1-hour intervals with subdivisions of  $\frac{1}{2}$  hour, and at 10% intervals with subdivisions of 1% relative humidity. Printed on special paper which has low moisture absorbence to prevent ink from blotting. In packages containing 100 charts.....**Per package 5.00**  
*10% discount in lots of 6 packages*

METEOROLOGY  
Hygrograph

76987



76990

- 76987 HYGROMETER, Certified, Serdex**, for measurement of relative humidity in general purpose work requiring half the accuracy of No. 76980 Hygrometer. Employs the same type of sensitive element as used in the laboratory standard instrument. Accuracy of the Certified Hygrometer is  $\pm 3$  per cent relative humidity over the range from 15 to 95 per cent; temperature range, from  $32^{\circ}$  to  $130^{\circ}$  F. Zero adjustment can be made by the operator. Dimensions, overall: height,  $3\frac{1}{4}$  inches; width,  $3\frac{1}{4}$  inches; depth,  $3\frac{1}{8}$  inches. In black plastics case. Weight,  $4\frac{5}{8}$  oz. .... **Each \$15.00**

*10% discount in lots of 6*

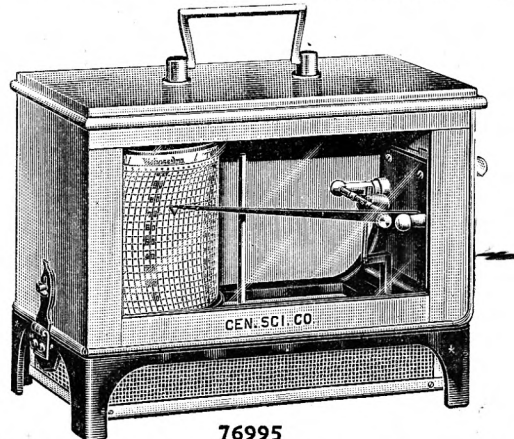
- 76988 HYGROMETER, Utility, Serdex**, similar to No. 76987 Hygrometer, but with a lower degree of accuracy. Temperature range,  $32^{\circ}$  to  $130^{\circ}$  F; accuracy,  $\pm 5\%$  relative humidity over the range from 15 to 95% ..... **Each 10.00**

*10% discount in lots of 6*

- 76990 HYGROMETER, Mason Type, Humidiguide, Tycos**, for determining conveniently the percentage of humidity in a room or enclosure. Consists of wet and dry bulb thermometers mounted on a molded Bakelite frame; between them is a cylinder bearing on its surface a table of percentages of humidity. The cylinder is behind a longitudinal slot of such width as to expose to view only one column of humidity figures. A knurled head at the top provides means for turning the cylinder. From the vertical column of figures corresponding to the difference in readings between the wet and dry bulb thermometers, can be read directly the relative humidity. There are 20 columns of humidities for differences by single degrees from 5 to 24. The graduations and figures are large and distinct. A glass cistern at the bottom of the bakelite frame keeps the wick for the wet bulb moist. Directions are on an etched metal plate on the back of the instrument. Humidity range is 1% to 83%. Dimensions: Length, 15 cm (6 in.); width, 9.5 cm ( $3\frac{3}{4}$  in.); thickness, 3.0 cm ( $1\frac{1}{4}$  in.); range of temperature,  $40^{\circ}$  to  $116^{\circ}$  F. Designed for wall mounting. Complete as described. **Each 6.50**

*10% discount in lots of 6*

- 76991 Glass Cistern, only**, for replacement on No. 76990 Hygrometer. .... **Each .75**



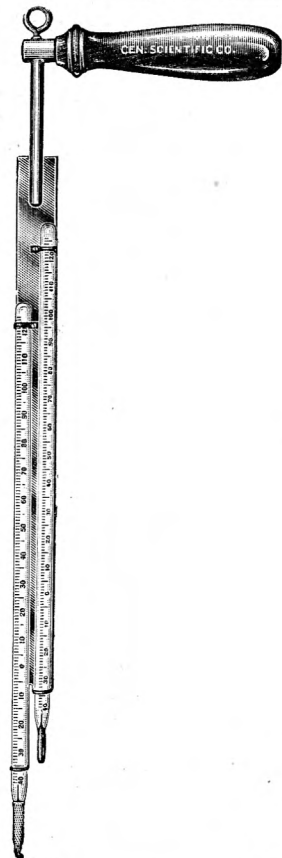
76995

- 76995 HYGROMETER, Recording Hygrograph**, for furnishing a continuous record of humidity over a period of seven days. Consists of a multiple hair unit exposed to the atmosphere in a well-ventilated screen protective covering and connected to a recording pen through a sensitive multiplying system. As the humidity changes, the recording pen moves across the chart which is attached to a metal drum with a 7-day clock movement. This gives a continuous relative humidity record over a range from 0 to 100% for seven days. The working mechanism is mounted in a metal case hinged at one end to the base, providing access to the recording drum and pointer. The base is finished in gloss black enamel and the case in light gray enamel with a clear glass window for observing the chart. Case is 12.5 cm wide, 25 cm long, and 18 cm high. Complete with charts for one year. .... **Each 127.75**

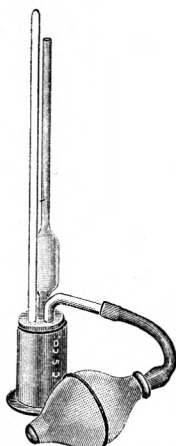
- 76997 Hygrograph Charts**, for No. 76995 Hygrograph. In packages of 55. .... **Per package 3.40**

*10% discount in lots of 6 packages*

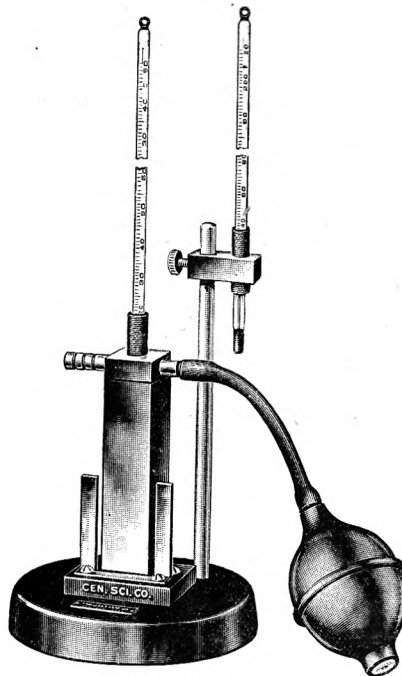
METEOROLOGY  
Dew Point Apparatus



77005



77015 shown in use



77020 shown in use

**77005 HYGROMETER, Sling Psychrometer**, for obtaining quicker and more accurate results than are possible with the stationary wet-and-dry bulb instruments. Two special thermometers, carefully selected, are mounted on a metal plate provided with a wood handle and swivel. No. 77007 Thermometer is used for both the dry and wet bulb. No. 76976 Wick is used on the wet bulb. Approximate range, 0° to 120° F. in 1° divisions. Complete with wick, humidity tables and directions for use. Each \$6.75

*10% discount in lots of 6*

*For experiments employing this or similar apparatus see I. & M. Exp. 35, p. 127; Ham. Exp. 212, p. 77; White Exp. 26, p. 153; Z. & E. Exp. 12, p. 70; Min. Exp. 40, p. 138; D. C. M. Exp. 86, p. 200; M. G. & E. Exp. 25, p. 96; S. E. P. H91b. See list of Manual References, page 1000.*

**77007 Psychrometer Thermometers, only**, of No. 77005 Hygrometer. No. 76976 Wick should be ordered also when a wet bulb thermometer is desired. Each 2.00

*10% discount in lots of 6*

**77015 DEW POINT APPARATUS** according to Millikan, Gale and Davis, Exp. 28. By means of a bulb, air is blown through ether contained in a small nickel-plated brass vessel, 28 by 54 mm. Complete with glass reservoir tube and No. 18080 Rubber Bulb, but **without** thermometer. Each 1.80

*10% discount in lots of 6*

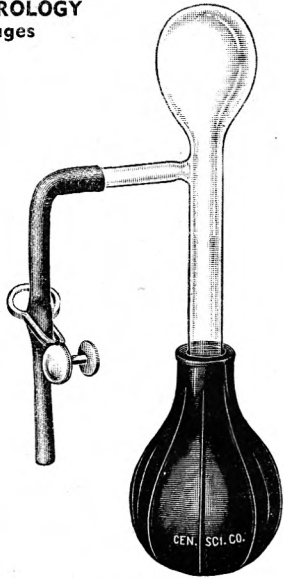
**77020 DEW POINT HYGROMETER, Alluard's Form**, for precise determination of the temperature of the dew point. A square nickel-plated and highly polished container for ether or other volatile liquid is mounted on a heat insulating support. In use, a stream of air is bubbled through the liquid to produce cooling. The temperature of the highly polished surface is thus lowered to the point at which the water vapor of the air begins to condense. To facilitate accurate determination of the temperature at which condensation begins, there is mounted on each side of the front surface of the tube, but not in thermal contact with the latter, a strip of highly polished nickel-plated brass. By observing the adjacent surfaces simultaneously the formation of the mist is very readily perceived. As soon as this occurs the temperature of the liquid is read on a thermometer inserted in the tube. Another thermometer, mounted on the same base with the apparatus, but with its bulb sufficiently removed from the tube so that room temperature will be correctly indicated, completes the equipment necessary for determining the humidity. For greatest accuracy of measurement the instrument should be protected from air currents, and the observer should stand several meters away, noting the formation of cloudiness and reading the thermometers with a telescope to avoid error due to body heat.

**Without aspirator bulb or thermometers**. Each 16.00

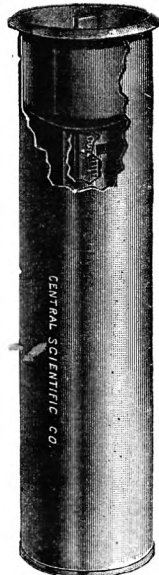
*10% discount in lots of 6*

*For experiments employing this or similar apparatus see White Exp. 26, p. 153; T. W. & H. Exp. 24, p. 64; D. & S. Exp. 108, p. 461; Z. & E. Exp. 12, p. 70; Min. Exp. 40, p. 138; D. C. M. Exp. 86, p. 198; M. G. & E. Exp. 25, p. 97; S. E. P. H91b.*

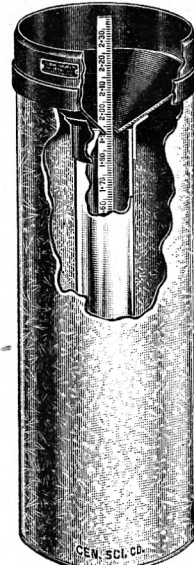
METEOROLOGY  
Rain Gages



77022



77025



77035

18080 Rubber Bulb, with metal valves, for pressure only, with connecting tube. For use in blowing air through the ether tube of No. 77015 Dew Point Apparatus or No. 77020 Dew Point Hygrometer. Capacity, about 50 ml. Each \$0.45

*10% discount for Cenco Packages of 24*

**77022 CLOUD APPARATUS**, for demonstrating the production of clouds. This simple apparatus is used to perform the famous experiment of Professor C. T. R. Wilson.

Consists of a glass bulb with an ungraduated tube, having two openings. To the larger opening is attached a stiff rubber bulb; to the other, a nipple such as a rubber tube and pinch clamp for the introduction of the gases to be investigated. When the rubber bulb is filled with water, compressed moderately, and then released suddenly, a dense cloud will be formed in the glass bulb. The effect of dust particles and ionized air on the formation of this cloud can also be shown. Diameter of tube, about 2 cm; over-all length, about 21 cm. Each 2.25

*10% discount in lots of 6*

**77025 RAIN GAGE**, similar to United States Weather Bureau type, but smaller and therefore not so accurate. The receiver is a zinc vessel 3 inches in diameter by 13 inches long, in the top of which is placed a copper cup having an open top exactly 3 inches in diameter with sharp edge and projecting rim. The bottom of this copper cup is open and fits in the top of a brass tube 1 inch in diameter in which the amount of rain is measured. This tube is provided with an overflow opening and a measuring stick graduated for reading the rainfall directly to 0.01 inch. Each 7.60

*10% discount in lots of 6*

**77027 Measuring Stick**, only, of No. 77025 Rain Gage. Each .60

*10% discount in lots of 24*

**77035 STANDARD RAIN GAGE, U. S. Weather Bureau Type**, for accurately determining the amount of rainfall. Consists of a receiver vessel 8 inches in diameter with a funnel-shaped bottom to conduct precipitation into the tall brass measuring tube which is 20 inches high and has a diameter of 2.53 inches. The receiver and measuring tube are mounted in a galvanized iron outer tube which also acts as an overflow can when there is an excess amount of rainfall. A wood measuring stick, graduated to read from 0.01 inch to 2.0 inches of rain, is furnished. The receiver is finished in dull black enamel; the measuring tube in polished brass.

In use, the gage is placed in the open, free from interference. The amount of rainfall caught in the funnel top is measured in the inner tube by the wood measuring stick. The size of the inner tube in relation to the receiver is such that one inch of water in the tube means 0.1 inch on the surface of the receiver. The outer case also serves as a snow gage when the inside container is removed. Over-all height, about 25½ inches; outside diameter, about 8 inches. Each 32.50

*10% discount in lots of 6*

**77037 Measuring Stick**, only, of No. 77035 Rain Gage. Each 2.80

*10% discount in lots of 6*

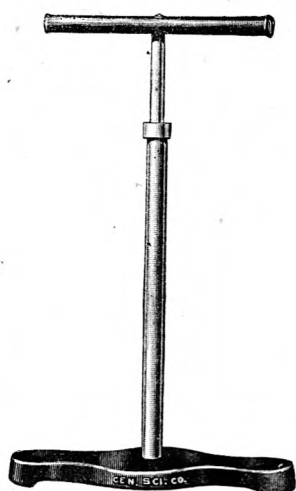
**77180 WEATHER FORECAST CHART**, or Key to Barometer Readings and Chart for Aneroid Barometer, for aiding in the intelligent interpretation of barometer readings and in forecasting weather for twenty-four hours.

Consists of a barometric dial and chart printed on a heavy card 5½ by 5½ inches which bears a movable reference pointer. The dial is numbered in tenth inches from 29 to 30.9 inches, approximately, in each of two quadrants, the left with weather indications for falling barometer readings, the right for rising barometer readings. The card carries complete directions for use. Each .75

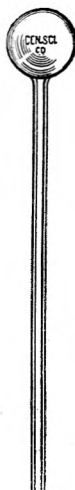
Weather thermometers for meteorological work: see Nos. 19450 to 19498, pages 370 to 374.



HEAT  
Fire Syringe



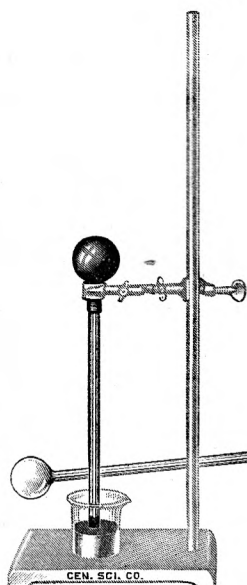
77250



77300



77305



77310 shown in use

77182 **WEATHER MAP, U. S., Blank**, for student tests in plotting weather data. Consists of the printed map used by the U. S. Weather Bureau for publishing daily graphic reports of weather conditions to show storm areas and their progress across the country. In packages of 100 sheets. **Per package \$0.60**

*10% discount in lots of 10 packages*

77185 **"WEATHER AND WEATHER INSTRUMENTS."** This book describes the mechanism of the many instruments and in addition gives in concrete and simplified form the practical uses of the different instruments. The tables of classified data recommend it particularly to teachers. Pasteboard covers. **Each 1.50**

77190 **"PRACTICAL HINTS FOR AMATEUR WEATHER FORECASTERS."** Information on the care and exposure of barometers. A booklet of 24 pages, illustrated. **Each .25**

77250 **FIRE SYRINGE, Cenco-Improved Form**, for demonstrating in a striking manner the conversion of molecular kinetic energy into heat. In the Cenco-Improved form, the piston fits snugly but without sticking on the down-thrust. The bottom of the piston is formed into a cup in which the tinder is placed. The outfit is mounted on a stable base and the handle is made large for comfort and convenience of operation. In use, some dry tinder is placed in the cup at the bottom of the piston. The piston is started gradually into the cylinder and then suddenly and vigorously forced down as far as it will go. When quickly withdrawn, the tinder will be found burning, having been kindled by the heat developed by compression of the air in the cylinder. Dimensions: length of cylinder, 30 cm; diameter, 17 mm. Complete with piece of tinder **Each 8.35**

*10% discount in lots of 6*

77300 **AIR THERMOMETER TUBE, Glass**, with stem 30 cm long. Diameter of bulb 50 mm. **Each .25**

*10% discount for Cenco Package of 50*

77305 **AIR THERMOMETER TUBE, Glass, Capillary Stem**, same as No. 77300 Air Thermometer, but with capillary stem. Diameter of bulb 50 mm. **Each .30**

*10% discount in lots of 36*

77310 **AIR THERMOMETER SET, Absorption Demonstration**, for demonstrating the effect of the type of surface on heat radiation and absorption. Two No. 77305 Air Thermometers are supplied, one with bulb painted dull black. By using a radiant heater, the different rates of expansion of either air or liquid in the two thermometers may be shown. **Per set 1.00**

*10% discount in lots of 12*

77320 **UNGRADUATED THERMOMETER**, for student use in thermometry. With translucent back, and stem for graduation from 0° to 100° C., filled with mercury, but with no graduations. **Each .70**

*10% discount in lots of 12*

**Thermometers, Chemical and Miscellaneous, See Pages 357 to 374.**