List No. 586

CASELLA
LONDON

INDUSTRIAL
THERMOMETERS
HYGROMETERS
PRESSURE GAUGES

C. F. CASELLA & CO. LTD.
Regent House, Fitzroy Square
LONDON, W.1

Telephone: MUSEUM 8084

List No. 586

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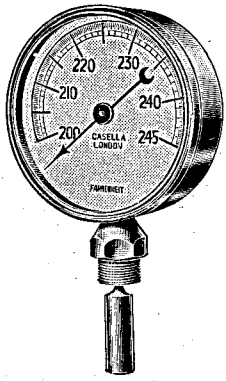
INDUSTRIAL
THERMOMETERS
HYGROMETERS
PRESSURE GAUGES



C. F. CASELLA & CO. LTD.
Regent House, Fitzroy Square
LONDON, W. 1

JOHN BELLOWS, GLOUCESTER 63327

THIS Catalogue cancels previous issues, and is subject to alteration without notice.

Carriage is paid in Great Britain on all orders of the value of £2 and upwards.

Insurance. Goods despatched by post or rail to addresses in Great Britain are insured under a floating policy against loss $\frac{\text{or}}{\text{and}}$ breakage. We make a trifling charge for this insurance (about 3d. in the £ for small amounts) and make good without further expense to the customer any damage or loss sustained. Exceptionally fragile articles, such as mercury barometers, long glass thermometers, etc., are insured at a rather higher rate.

Foreign consignments are usually insured against loss $\frac{\text{or}}{\text{and}}$ breakage, unless instructions are sent to the contrary, and the cost is charged to the customer; the rates vary greatly, according to the destination and to the nature of the consignment.

Packing Cases are charged extra, but are allowed for in full when returned carriage paid and in good condition.

New Customers are requested to send remittance with order, or to furnish the usual references; in the case of foreign shipments, arrangements should be made for payment in London against shipping documents.

C. F. CASELLA & Co. Ltd.
REGENT HOUSE, FITZROY SQUARE
LONDON, W.1

Established in London in 1810

Telegrams:
ESCUTCHEON,
EUSROAD-LONDON

Telephone:
MUSEUM 8084

Cables:
ESCUTCHEON, LONDON
Usual Codes

THERMOGRAPHS, HYGROGRAPHS, ETC.

Distance Thermographs and Thermometers

THE principle on which these distance recorders and indicators are based is the effect on a Bourdon tube of vapour pressure in the bulb transmitted by a liquid in the capillary tube, or, for high temperatures, of a gas in the bulb and capillary.

Atmospheric pressure has no effect on the readings, nor has the temperature surrounding the capillary tubing.

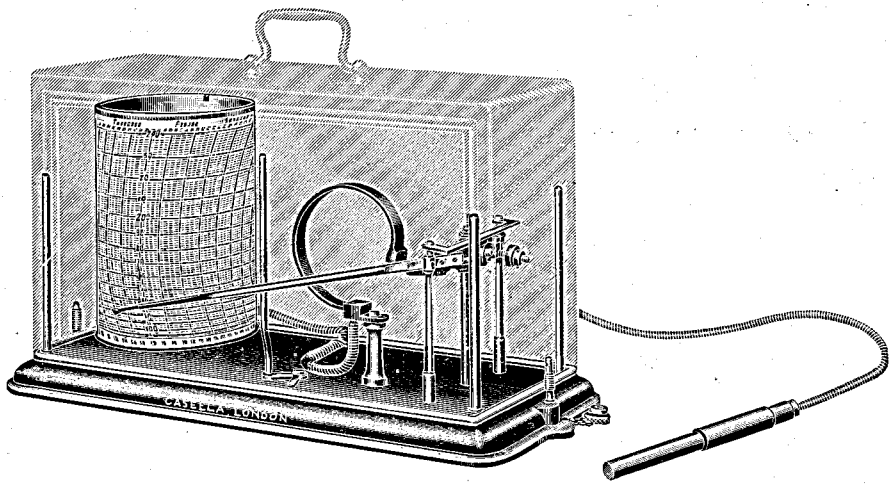
Gravity affects the results slightly and if the bulb is placed more than about 3 feet higher or lower than the pen a small adjustment becomes necessary unless this has already been made by ourselves on information supplied by our customer. It consists merely in turning a small screw.

These instruments are sensitive, accurate, constant and reliable, and require no skilled knowledge or attention.

They are guaranteed for a year and will give good service for many years.

Distance Thermographs

Recording Pattern, Rectangular Chart



H 500-2

With each recorder are provided 55 charts, ink and pen; the price includes 10 ft. (3 m.) of copper capillary tubing with flexible brass protection, but any length can be supplied, beyond the 10 ft., at **1/9** per foot

Additional charts, per series of 55, **8/6**; per 100, **15/–**.

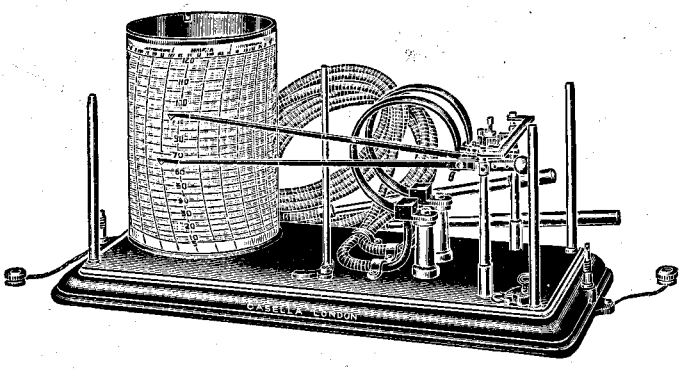
	Any suitable range up to			
H500.	1000° F. or 500° C.	..	AKACO ..	**£12 15 0**

State whether Fahrenheit or Centigrade readings are required, and whether daily or weekly clock.
(A daily clock is wound once a week.)

Distance Thermographs

Recording Pattern, Rectangular Charts

(continued)

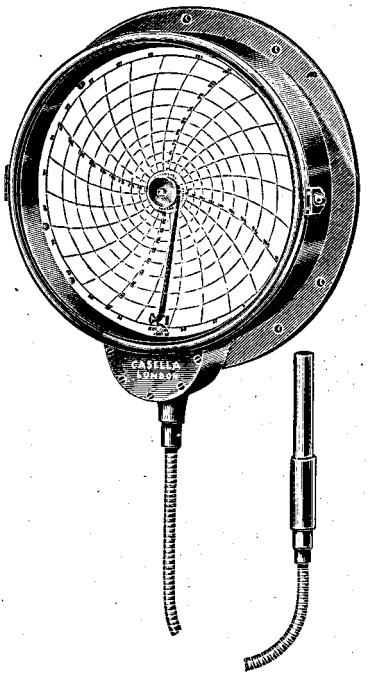


Distance Recorder with two pens (Cover removed)

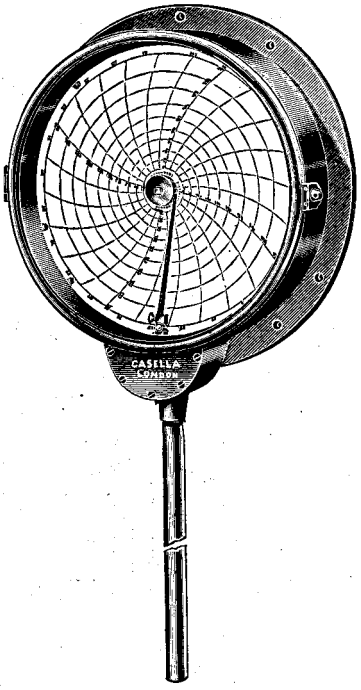
Additional Bulbs can be fitted as shown in the above illustration, the prices of bulbs, each with 10 ft. of tubing and pen, being as follows :—

	Any suitable range up to			
H504.	1000° F. or 500° C. . .	AKAFA	..	£4 10 0
H505.	**Electric Alarm Pointer,** adjustable, up to 10 volts ..	AKADU	..	£1 0 0
H506.	**Ditto,** higher than 10 volts.	AKAGE	..	£1 10 0

Distance Thermographs
Recording Pattern, Circular Chart



With Flexible Tubing



With Rigid Stem

These recorders are similar in principle and in accuracy to those with rectangular charts. The price includes 55 charts, ink, etc. The diameter of the chart is $9\frac{1}{4}$ inches.

Any suitable range up to	Prices		
	With 10 ft. of Flexible Tubing		**With Rigid Stem** up to 24 ins., 1 Pen only
	With 1 Pen and 1 Bulb	With 2 Pens and 2 Bulbs	
1000° F. or 500° C.	H508. **£12 10 0**	H510. **£16 15 0**	H512. **£11 5 0**

Code Words :

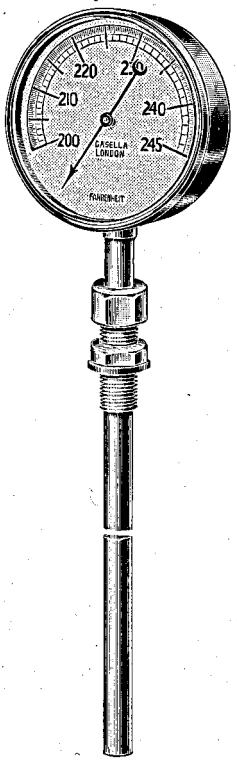
H508. AKAHI H510. ACAJO H512. AKAKU

State whether Fahrenheit or Centigrade readings are required, and whether daily or weekly clock.

Extra capillary tubing, beyond 10 feet, per foot **1/9**

Additional charts, per series of 55, **8/6**; per 100, **15/–**.

Dial Thermometers
Indicating Pattern, Rigid Stem



H520–4

Any length of stem up to 24 ins.

(Union extra, see p. 9).

Range, up to—

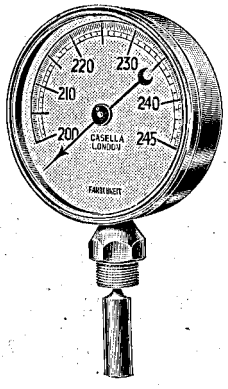
400° F. or 200° C.

Diameter of Dial—

5 in.	6 in.	7 in.
H520. **£4 10**	H522. **£5**	H524. **£5 10**
AKEFO	AKEGU	AKIBE

Extra length of stem .. per foot, **3/6**

H526. **Jam Boiler's Thermometer,** 5 in. dial, similar to the above, but with lifting handle at top and adjustable hook ; length of stem, 3 ft. 6 in. .. AKICI .. **£4 15 0**

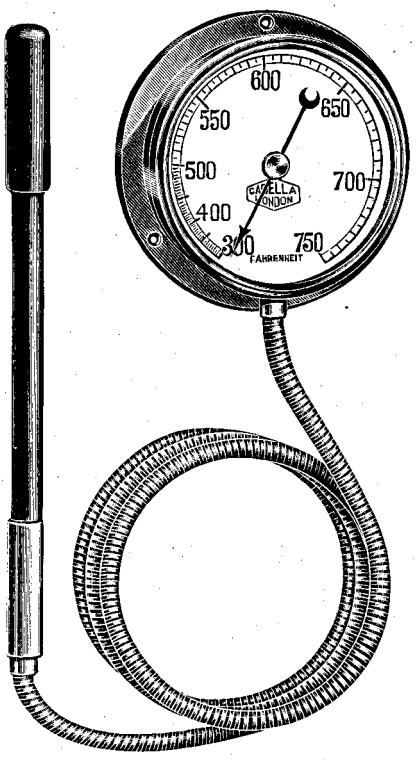


H528

H528. **Indicating Thermometer,** with short stem for use as a pipe thermometer, 5 in. dial **£4 0 0**

AKIDO

Dial Thermometers
Indicating Pattern, Flexible Tubing



Any suitable range up to	Diameter of Dial 5 in.	6 in.	7 in.
1000° F. or 500° C.	H530. £5 10 0	H532. £6	H534. £6 10 0

State range required and whether Fahrenheit or Centigrade.

Price includes 10 feet of capillary tubing. Extra tubing, per foot 1/9.

Code Words:

H530. AKIDOB H532. AKIDUC H534. AKIEB

EXTRAS

H554.	**Unions,** $\frac{1}{2}$ in. gas thread ..	**Brass**	8/–	**Steel**	9/–
H 556.	,, $\frac{3}{4}$ in. ,, ..	,,	9/–	,,	10/–
H558.	,, 1 in. ,, ..	,,	10/–	,,	11/–
H560.	**Brass Flange**				7/–
H562.	**Maximum Hand** for indicating pattern ..				10/–
H564.	**Electric Alarm Pointer,** up to 10 volts...				10/–
H566.	,, ,, ,, more than 10 volts.				17/6

Pockets or Oil Cups

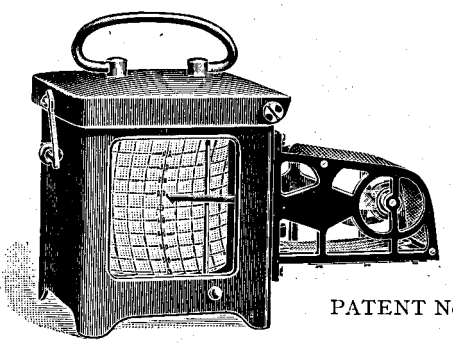
H568.	**Brass,** up to 12 inches in length ..	AKIGO	10/–
H570.	**Steel,** up to 12 inches ,, ..	AKIHU	12/6

Pockets can also be supplied in stainless steel, Monel and other metals, and bulbs can be in spiral form and tinned or lead coated, at an extra cost.

The use of a pocket may be a convenience as when it is desired to remove the thermometer without shutting down the plant, but the sensitivity of the instrument is lowered to some extent when a pocket is used.

CASELLA LONDON

Thermographs, etc.



PATENT No. 185965/22

H618 **The Thermograph** illustrated above is the result of experiments made with a form of bi-metallic strip which has given very satisfactory results in respect of accuracy and sensitivity over a long period.

The design enables the instrument to be manufactured in an inexpensive manner in large quantities and provides a robust, accurate thermograph suitable for all purposes where temperatures are required to be known up to about 250° F., or 120° C.

Price, with 55 charts, ink, etc. AKIJE **£7 0 0**

Additional charts, per series of 55, **5/9** ; per 100, **11/–**.

A special feature of this recorder and of recorders 620 *and* 622, *distinguishing them from others on the market, is that they can easily be corrected by the user if they should get out of adjustment in transit or from any other cause.*

SPECIFICATION

Clock revolving once in $7\frac{1}{2}$ days or once in 26 hours ; both run for a week without re-winding. Please state which is required.

Stock Ranges : 0° to 100°F., 10° to 110°F., 30° to 130°F., —10° to +90°F., —15° to +40°C., 0° to 55°C.

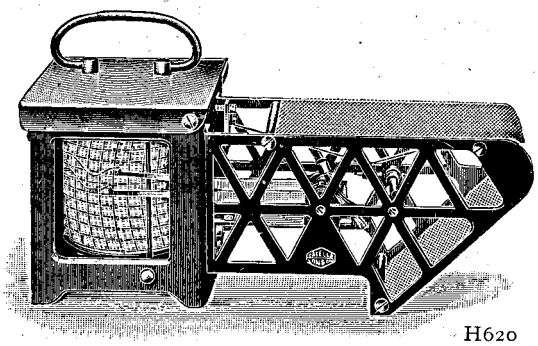
Overall Dimensions : $10 \times 6 \times 6\frac{1}{2}$ in. Weight : 6 lb. 2 oz

Instructions for Use

1. The gauze covering is hinged and can be raised when required.

2. If the instrument does not record the correct temperature it can be adjusted by means of the large flat-headed screw at the end of the thermometric strip nearest to the clock. Turning this screw will raise or lower the thermograph pen.

3. If by any chance the range of the thermograph requires adjusting, that is, if the instrument should be reading, say, 0°–98° or 0°–102° instead of 0°–100°, the error can be corrected by removing the small pin attached to the vertical lever above the thermograph element and then turning the split pin half a revolution one way or the other. Turning it to the right increases the magnification and therefore increases the amount of travel of the pen for a given change of temperature.



H620

H620. **Thermo-Hygrograph.** Temperature and percentage of humidity are both recorded on the chart of this instrument, different coloured inks being used for the two pens. It is in common use in cotton mills, tobacco factories, etc., in all parts of the world, and is one of our most popular recorders.

Price, with 55 charts, ink, etc. AKIKA **£13 10 0**

Overall Dimensions : $14 \times 6 \times 6\frac{1}{2}$ in. Weight : 8 lb. 4 oz.

Additional charts, per series of 55, **5/9** ; per 100, **11/–** ; (overprinted charts for different ranges of humidity temperature, **8/6** and **15/–** respectively).

Instructions for Use

1. The gauze covering the temperature and humidity elements is hinged and can be raised when required.

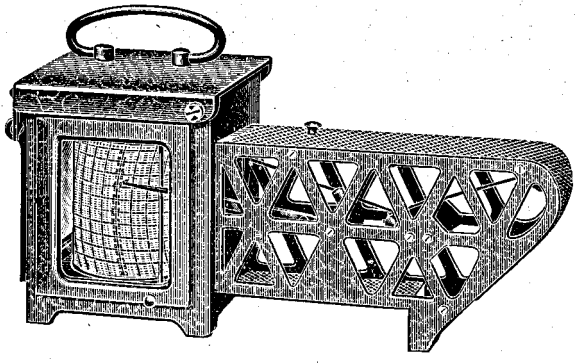
2 and 3. **Temperature.** Instructions same as for No. 618, page 10.

4. **Humidity.** The hygrograph element consists of a bundle of hairs which contract or expand according to the humidity. These are rather liable to be put out of adjustment on a journey, and it is possible that some of them may slip off the hook.

5. The bundle of hairs should be wetted once a week with a camel-hair brush. When they are thoroughly wet the pen should read 95% ; if it does not, adjustment may be made by means of the capstan screw at one end of the bundle.

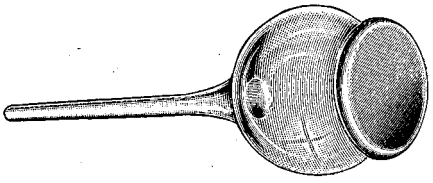
6. The hygrograph may also be adjusted by comparing its readings with a whirling or fan-type hygrometer.

H622. **Hair Hygrograph** This recorder is similar to No. 620 except that there is no thermograph element. The curve indicates percentage of relative humidity on an equal scale and the instrument is suitable for works' and general laboratories, mines, textile mills, hospitals, etc. Overall dimensions : 14×6×6½ in.



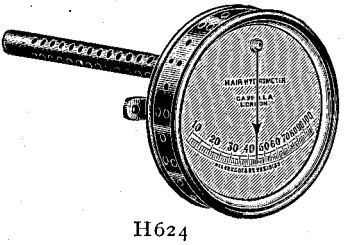
H622

Weight : 7lb. 8oz. **Price,** with 55 charts, ink, etc. AKILL **£10 10 0**
Additional charts, per series of 55, **5/9** ; per 100, **11/–.**



H623. **Pen Filler** for recording instruments AKILTA **£0 0 6**

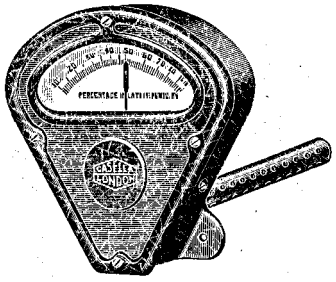
Hair Hygroscope, indicating on a dial the percentage of humidity ; made in two forms, with **horizontal stem** as in illustration or with **vertical stem ;** 5 in. dial (12½ cm.)



H624

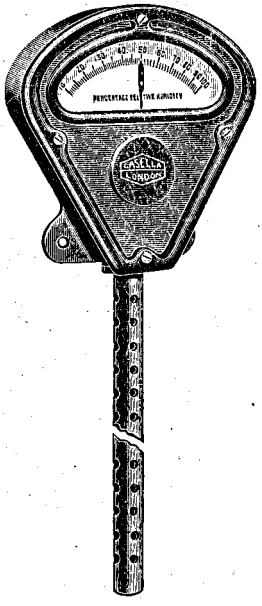
(Accuracy about 90 per cent.)

H624. **Horizontal stem** .. .. AKIMY .. **£2 15 0**
H626. **Vertical** stem .. .. .. AKINT .. **£2 15 0**



H648

H648. **Hair Hygroscope, horizontal** stem, better quality than the above, more sensitive, more robust and more accurate; overall length 12½ in. (32 cm.) (Accuracy about 95%.)
AKIOR **£5 0 0**

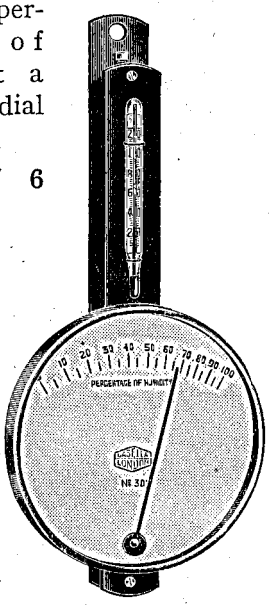


H650

H650. **Ditto,** as H648, but **vertical** stem, overall height 17½ in. (44 cm.) AKOBE **£5 0 0**

See also No. H658.

H652. **Hair Hygroscope with Thermometer,** or Polymeter, giving temperature and percentage of humidity at a glance, 4 in. dial (10 cm.)
AKOCI **£2 7 6**



H652

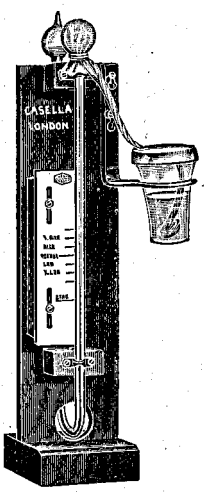
H654

H654. **Pocket Hygroscope,** 2 in. dial
AKODA
£2 0 0

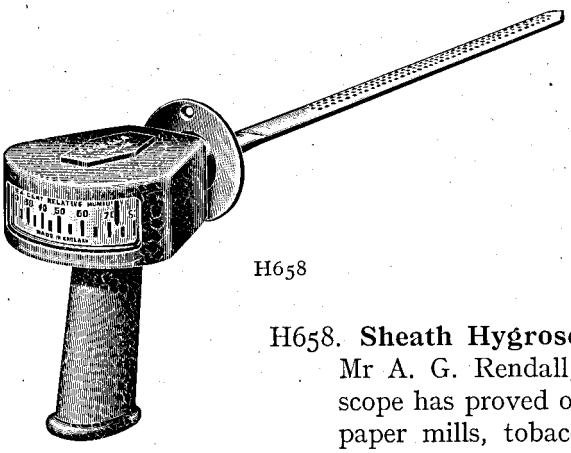
H656. **Rendall's Rate-of-Drying Meter,** gives the "drying potential" of the air, which depends on three factors: (1) the actual amount of moisture in the air, (2) the temperature, (3) the amount of air movement. The effects of all three are combined in this instrument

AKOFY **£1 13 0**

Pamphlet on application



H656



H658

H658. **Sheath Hygroscope.** Designed by Mr A. G. Rendall, B.Sc., this hygroscope has proved of great assistance to paper mills, tobacco factories, textile and other works. It can be inserted between sheets of paper, etc., or pushed into bales of material. It measures the percentage of humidity without reference to tables or calculations.

Before being put into use for the first time, and afterwards at frequent intervals, it should be compared with a whirling hygrometer or with an ordinary wet and dry bulb hygrometer provided this is placed in a strong current of air (not less than 10 foot per second). The pointer is set to the correct reading by turning the small screw under the body of the instrument.

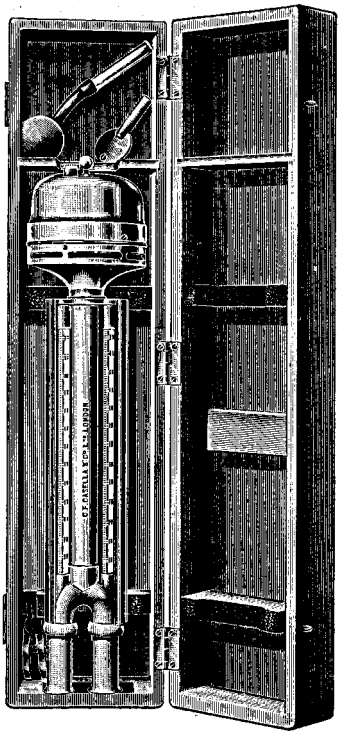
Code Word: AKOGI **Price, £9 11 6**

Overall dimensions: 20 × 4 × 6 in. (51 × 10 × 15 cm.) Weight 2 lbs.

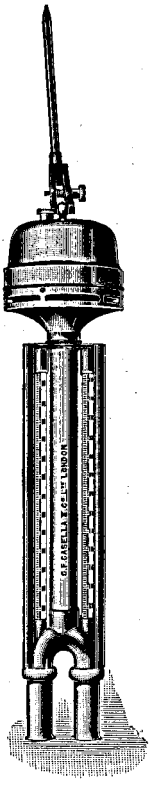
ASSMANN'S HYGROMETERS

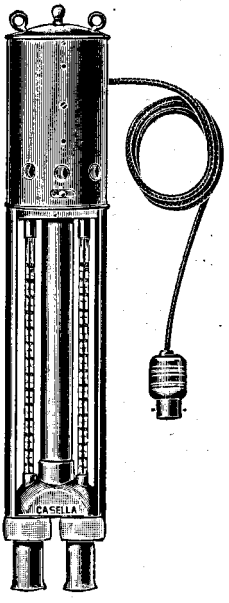
FOR DETERMINING HUMIDITY

Best-Casella pattern, as supplied to the British and other Meteorological Offices



With Clock Drive





With Motor Drive

Assmann's Hygrometer is a special form of wet and dry bulb hygrometer. It consists of two mercury thermometers, of which one has the bulb kept moist by means of a muslin sheath soaked in water. A clockwork or motor-driven fan draws air over the two bulbs at a suitable speed and causes evaporation to take place from the muslin which has the effect of lowering the temperature of the mercury in the wet bulb. The bulbs of both thermometers are protected from radiation by highly polished metal tubes, so that the instrument can be used in bright sunshine without fear of the readings being affected by solar radiation. It will give

correct results when used on aircraft at a great height, and for meteorological observations no Stevenson screen is necessary.

The dry bulb reading gives the true temperature of the air, and the difference between that and the reading of the wet bulb enables one, by means of tables, to obtain the percentage of humidity, the dewpoint and the vapour pressure of the air.

The muslin covering the wet bulb is moistened before each observation by means of the tube and rubber bulb provided; distilled water should be used. The muslin must be kept clean and renewed when necessary.

The instrument has been re-designed in order to meet certain criticisms which have been made by users of the original Assmann hygrometers; the diameter of the air passages has been increased, more powerful clockwork has been fitted to the clock driven pattern, and we now supply it with electric motor drive at the same price as the clock drive; this is a great convenience where electric current is available. The apparatus is provided with **insulated thermometers** to reduce parallax errors and give clearer readings than the thermometers previously supplied with this instrument.

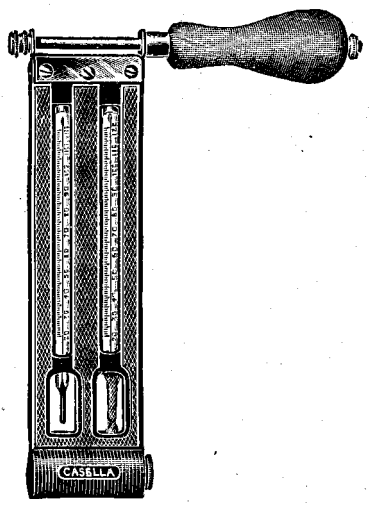
PRICES

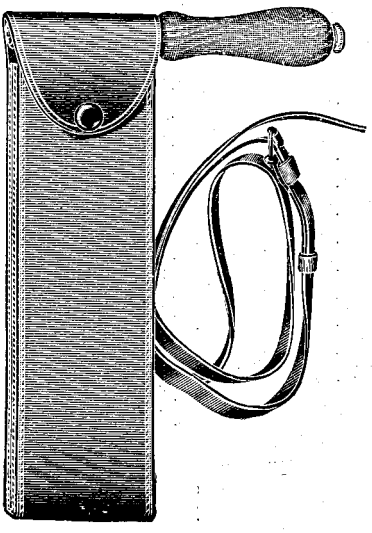
Assmann Hygrometer, complete with all accessories, in polished mahogany case, with lock and key.

	No.	Clock Drive	No.	Electric Drive (State Voltage)
Fahrenheit ..	H660	**£17 10 0** AKOKO	H662	**£17 10 0** AKOLU
Centigrade ..	H664	**£17 10 0** AKUMA	H666	**£17 10 0** AKUNE

H668.	**Spare Thermometers,** insulated pattern, Fahrenheit, each	AKUPI	**£0 18 6**
H670.	**Ditto, Centigrade,** each ..	AKURO	**£0 18 6**
H672.	**N.P.L. Certificates,** each. (Add "Y" to Code Word), from		**£0 5 6**
H674.	**Tables,** Fahrenheit	AKUSU	**£0 1 6**
H676.	**Ditto,** Centigrade	AKYBA	**£0 0 8**
H678.	**Spare Wicks, 1d.** each; **1/–** a yard.		

WHIRLING HYGROMETER





This pattern is recommended by the Hot and Deep Mines Temperature Committee, for whom we have made a large number.

Whirling a wet bulb and a dry bulb thermometer through the air has the same effect as placing the two thermometers, in a strong current, and the readings obtained are accurate and trustworthy.

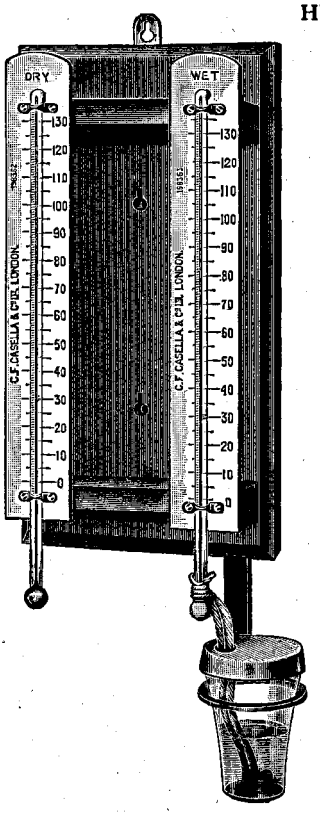
Distilled water should be used, the wet bulb thermometer should be read first, and the wick should be changed frequently—say once a fortnight in a town or once a month in a country district.

The thermometers have lens fronts, and are divided on the stem and mounted in a convenient boxwood frame.

PRICES

H680.	**Range** 20° to 120°F.	AKYCE	£1	10 0
H682.	**Range** −5° to +50°C.	AKYDO	£1	10 0
H684.	**Leather Sling Case,** extra ..	AKYFU	£0	4 6
H686.	**Tables,** Fahrenheit	ALABA	£0	1 6
H688.	**Ditto,** Centigrade	ALACE	£0	0 8
H690	**N.P.L. Certificates,** Add "o" to Code Word	per pair	£0	5 0
H692.	**Spare Thermometer** ..	ALADO	£0	6 0

H694. **Spare Wicks, 1d.** each; 1/- a yard.

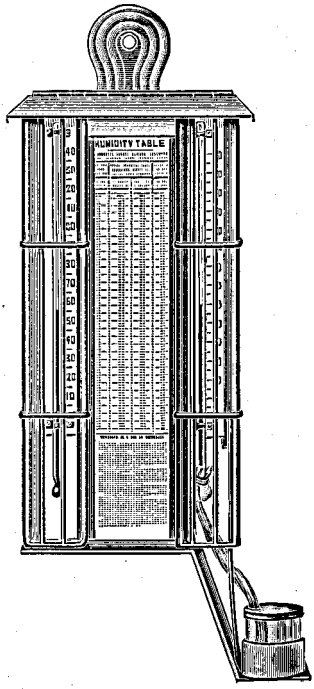


Mason's Hygrometer, Kew Pattern, mounted on polished mahogany board, porcelain scales 10 in. (25 cm.)

H702. **Fahrenheit Scales,**
ALAFU **£2 10 0**

H704. **Centigrade Scales,**
ALEGA **£2 10 0**

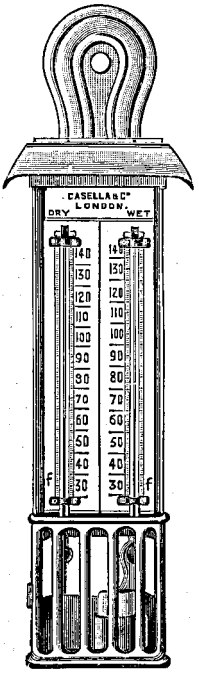
H706. **N.P.L. Certificates,** per pair. Add "T" to Code Word **£0 6 0**



Factory Hygrometer, Home Office pattern, Fahrenheit thermometers divided on the stem, porcelain scales; with tables.

H708. In copper case ALEHA **£1 16 0**

H710. In japanned case ALEJI **£1 12 0**

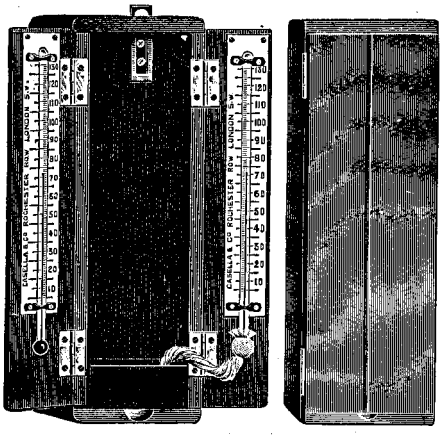


Mason's Hygrometer, in japanned metal case, with screen to protect the bulbs and reservoir ; best quality.

Length of scale,	7½ in.	10 in.
Overall height,	14 in.	16 in.
H712. **Opal glass scale**	£0 15 6	H714. £1 4 6
H716. **Boxwood scale**	£0 12 6	H718. £0 16 6
H720. **Zinc scale** ..	£0 12 6	H722. £0 17 6

Copper case, *in place of japanned iron, small size* 4/6 *extra, large size* 5/-.

Glaisher's Tables for use with Mason's hygrometers £0 3 6

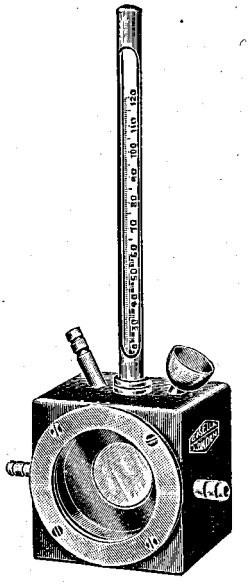


Mason's Hygrometer, pocket form, in polished mahogany case with hinged doors. Very compact, and suitable for travellers and exploring expeditions.

H726. Range 0° to 115°F.
ALELO £1 15 0

H728. Range 15° to +45°C.
ALEMU £1 15 0

DEW POINT APPARATUS



This hygrometer has been designed to meet a growing demand from entomologists and botanists, and is suitable also for use in connexion with stored products and materials. It is compact, robust and convenient.

A thermometer passes into an ether chamber in front of which is a compartment for holding the sample of air under examination. Air is drawn into the sample chamber by means of a rubber bulb or by sucking the end of a rubber tube, and the temperature is lowered to the dew point by evaporating ether in the usual way. The use of a flat mirror in front of the thermometer bulb in place of the customary curved thimble adds greatly to the ease and accuracy of the dew point observations.

Overall dimensions $6\frac{3}{4} \times 3 \times 1\frac{3}{4}$ in.
$7 \times 7\frac{1}{2} \times 4\frac{1}{2}$ cm.

Weight 7 oz.

H730.	**With Fahrenheit Thermometer**	ALFAB	£4 10 0
H731.	**With Centigrade Thermometer**	ALFEC	£4 10 0
H732.	**Spare Thermometer, Fahr.** ..	ALFID	£0 5 0
H733.	,, ,, **Cent.** ..	ALFOA	£0 5 0
H734.	**Rubber Aspirator** for use with the above	ALFUG	£0 2 0

THERMOMETERS, GLASS

DIRECTIONS FOR USE AND HINTS ON MANAGEMENT

Column Divided. When a thermometer is sent any distance by post or rail it is liable to arrive with the column of mercury or alcohol divided into several portions. It can usually be put right by swinging it bulb downwards or by tapping it carefully on one's knee or on a suitable pad. Spirit thermometers when thus corrected must be allowed to hang vertical for five or ten minutes in order to let the alcohol drain down the walls of the tube. They should also be examined after being used at temperatures near the top of the scale, to make sure that no alcohol has condensed in the upper part of the tube and remains detached from the main column. This applies more particularly to spirit thermometers used in a horizontal position. Occasionally, when the column cannot be reunited in the way described above, it is necessary to heat the tube carefully till the mercury or alcohol occupies most of the space in the tube. Great care must be exercised in doing this, especially if the thermometer is not provided with a safety chamber at the top.

In the case of a chemical thermometer, or any mercury thermometer which is not mounted in a sheath or frame, the easiest way to correct it is to hold it bulb uppermost and tap the end of the bulb lightly with, say, a pocket rule or pencil. This causes the mercury to run down the vacuum part of the bore and the column reunites.

Nitrogen-filled thermometers cannot be treated in this way, as the presence of the gas prevents the mercury from falling;

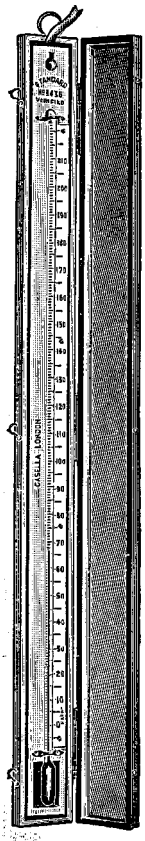
they are rather more troublesome to correct than ordinary thermometers, but can often be put right by dipping the bulb into ice and water or ice and salt.

Scale Indistinct. A thermometer etched on the stem whose figures and divisions have become indistinct can be put right by rubbing in a little Brunswick black, or lamp black or graphite moistened with oil, the excess being removed by wiping lightly with a cloth or the finger.

Depth of Immersion of Thermometers. In the case of chemical thermometers, especially those reading above about 150°C. (say, 300°F.), the depth of immersion affects the readings considerably. Where nothing is stated to the contrary it is assumed that the thermometer will be immersed " to the reading," that is to say that the whole of the mercury in the capillary, as well as in the bulb, will be subjected to the temperature under observation. It is, however, often convenient to have a thermometer graduated so as to be correct at a fixed immersion. When this is done, a note of the depth it is to be immersed is etched on the stem of the thermometer.

CASELLA LONDON

THERMOMETERS



H850

H850. **Standard Thermometer,** tube 15 inches long, engine-divided on the stem and figured on raised metal scale, 0° to 220° Fahr., in maroon case; outside dimensions, $17\frac{5}{8} \times 1\frac{5}{8} \times \frac{7}{8}$in.

ALFYS

With N.P.L. Certificate .. **£3 7 6**

H851. **Ditto,** but range −20° to +105° C., with Certificate **£3 7 6**

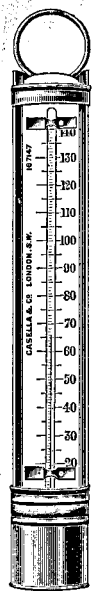
ALGAS

H854. **Standard Thermometer,** as No. 350, but with opal glass scale on mahogany, range about 0° to 160° F. ALGEA

With N.P.L. Certificate.. **£3 7 6**

H855. **Ditto,** but range about −20° to +70° C., with Certificate ALGIO **£3 7 6**

H854



H858

H858. **Kew Observatory Thermometer,** 12 inches long, with divisions etched on the stem, and the figures fired on to the porcelain scale, range about 0° to 130°F. In copper case **£0 18 6**

ALGOR

Without Case **12/-**

H859. **Ditto,** but range −20°to+60°C. **£0 18 6**

ALGUF

Without Case **12/-**

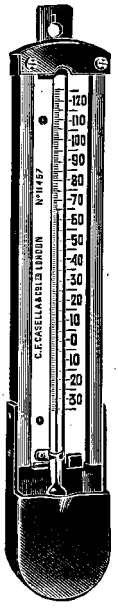
H861. **Ditto,** as No. H858 but mounted in improved case as supplied to the British Meteorological Office Fahr. **£1 2 6**

ALHAB

H862. **Ditto,** as H861, but Cent. **£1 2 6**

ALHEC

H863. **N.P.L. Certificates** for thermometers H858 to H862, Add "Y" to Code Word .. .. each **£0 3 0**



H861

CHEMICAL THERMOMETERS

Engine-divided on the stem, in card cases

		Each	Per doz.
	12 inch, Centigrade		
H1000.	0° to 105° C. divided to 1° ..	4/–	£2 2 0
H1002.	0° „ 200° C. „ 1° ..	5/–	£2 15 0
H1004.	0° „ 300° C. „ 1°, nitrogen-filled	7/6	£3 17 6
H1006.	200° „ 400° C. „ 1° „	12/6	£7 0 0
	15 inch, Centigrade		
H1008.	0° to 500° C. in 2°, nitrogen-filled under high pressure, boro-silicate glass ..	Each	£1 5 0
H1010.	0° to 550° C. in 2°, nitrogen-filled under high pressure, combustion glass ..	„	£2 15 0
	12 inch, Fahrenheit	Each	Per doz.
H1012.	0° to 220° F. divided to 2° ..	4/–	£2 2 0
H1014.	0° „ 400° F. „ 2° ..	5/–	£2 15 0
H1016.	0° „ 600° F. „ 2°, nitrogen-filled	7/6	£3 17 6
H1018.	400° „ 750° F. „ 2° „	12/6	£7 0 0
	15 inch, Fahrenheit		
H1020.	30° to 950°F., in 5°, nitrogen-filled under high pressure, boro-silicate glass ..	Each	£1 5 0
H1022.	30° to 1050°F., in 5°, nitrogen-filled under high pressure, combustion glass ..	„	£2 15 0

Chemical Thermometers divided to tenths Cent. or fifths Fahr.

		Each
	15 inch	
H1026.	−5° to +55° Cent. divided to $\frac{1}{10}$°	9/6
H1028.	50° „ 105° „ „ $\frac{1}{10}$°	10/6
H1030.	100° „ 155° „ „ $\frac{1}{10}$°	11/6
H1032.	150° „ 205° „ „ $\frac{1}{10}$° nitrogen-filled	15/6
H1034.	200° „ 255° „ „ $\frac{1}{10}$° „ „	20/–
H1040.	20° „ 130° Fahr. „ $\frac{1}{5}$°	9/6
H1042.	120° „ 220° „ „ $\frac{1}{5}$°	10/6
H1044.	210° „ 310° „ „ $\frac{1}{5}$°	11/6
H1046.	300° „ 400° „ „ $\frac{1}{5}$° nitrogen-filled	15/6
H1048.	390° „ 490° „ „ $\frac{1}{5}$° „ „	20/–

Standard Chemical Thermometers

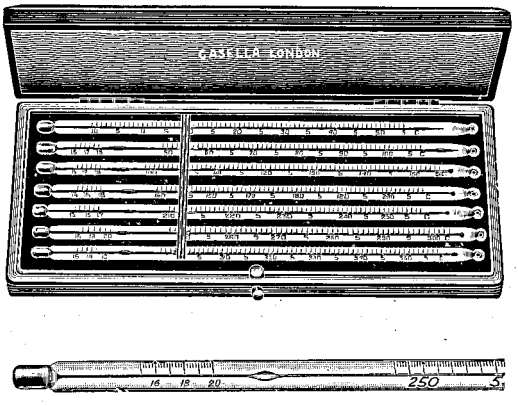
Engine-divided on the stem, in wooden cases, very accurately 'pointed' and divided

15 inch

H1054.	−5° to +55°	Cent.	divided to	$\frac{1}{10}$°	..	..	£1	1 0
H1055.	50° ,, 105°	,,	,,	$\frac{1}{10}$°	..	..	£1	2 6
H1056.	100° ,, 155°	,,	,,	$\frac{1}{10}$°	nitrogen-filled		£1	12 6
H1057.	150° ,, 205°	,,	,,	$\frac{1}{10}$°	,,	,,	£1	15 0
H1058.	200° ,, 255°	,,	,,	$\frac{1}{10}$°	,,	,,	£1	18 6
H1059.	250° ,, 305°	,,	,,	$\frac{1}{10}$°	,,	,,	£2	0 0
H1060.	300° ,, 355°	,,	,,	$\frac{1}{10}$°	,,	,,	£2	2 6
H1061.	350° ,, 405°	,,	,,	$\frac{1}{10}$°	nitrogen-filled under high pressure		£2	7 6
H1062.	400° ,, 455°	,,	,,	$\frac{1}{10}$°	,,	,,	£2	12 6

H1064. **Anschutz Set of Thermometers,** consisting of 7 thermometers, 6 inch, covering the range of about −10° to +360° C., each divided on the stem to $\frac{1}{5}$° C. and provided with an auxiliary scale 15° to 20° C. for checking purposes. The thermometers are fitted into a maroon case, velvet-lined, as shown in the illustration, and have the following individual ranges :—

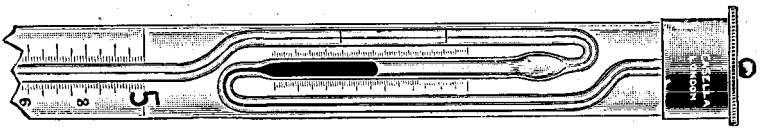
−10° to +55° C.
50° ,, 105° C.
100° ,, 155° C.
150° ,, 205° C.
200° ,, 255° C.
250° ,, 305° C.
300° ,, 355° C.



H1064

Price, per Set .. .. .. ALHIE .. £7 5 0

H1066. **N.P.L. Certificates,** Add 'T' to Code Word, per Set £4 0 0



H1068

H1068. **Beckmann Thermometer,** with a range of 5° C. divided to 0°.01 C., best quality, guaranteed to pass the N.P.L. test ALHOB **£3 3 0**

H1070. **N.P.L. Certificate** Add 'O' to Code Word **£1 8 6**

H1072. **Beckmann Thermometer** as No. 1068, but second quality, not guaranteed to pass the N.P.L. .. .. .. ALIBA **£2 7 6**

H1074. Tar Products Thermometers

The following thermometers are made to the specifications of the Standardization of Tar Products Tests Committee.

No. of Specification	Range	Divided to	Price	N.P.L. Certificate
	°C.			
T.1	−20 to +15	0·1	12/–	21/6
T.2	0 ,, 60	0·2	10/9	13/–
T.2a	−0·5 ,, 60	0·1	16/–	35/–
T.3	0 ,, 120	0·5	9/9	13/–
T.4	0 ,, 400	1·0	18/6	31/–
T.5	15 ,, 45	0·1	11/3	13/–
T.6	30 ,, 110	0·2	15/–	16/–
T.7	65 ,, 90	0·1	14/9	13/–
T.8	70 ,, 130	0·2	15/6	13/–
T.9	70 ,, 210	0·5	16/–	19/–
T.10	80 ,, 140	0·2	14/–	16/–
T.11	105 ,, 115	0·1	16/9	16/–
T.12	130 ,, 150	0·1	17/9	19/–
T.13	135 ,, 170	0·1	14/6	21/6
T.14	150 ,, 250	0·5	16/–	19/–
	°F.			
T.15	30 to 100	0·5	8/9	16/–

Petroleum Test Thermometers

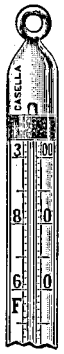
In accordance with the specifications of the Institute of Petroleum Technologists.

Name	Range	Divided to	Price	N.P.L. Certificate
H1076. Low Distillation ..	0 to 300 C.	1°	14/–	20/–
H1078. High Distillation	0 ,, 400 C.	1°	15/–	25/–
H1080. Pensky-Marten Low	20 ,, 230 F.	1°	10/–	15/–
H1082. Pensky-Marten High	200 ,, 700 F.	5°	12/–	20/–
H1084. Cloud and Pour ..	– 36 to + 120F.	2°	10/–	15/–
H1086. Cooling Bath ..	– 50 ,, + 120F.		6/6	
H1088. Redwood Viscometer Low	30 to 150 F.	0·5°	11/6	10/–
H1090. Redwood Viscometer High	130 ,, 250 F.	0·5°	12/6	10/–
H1092. Demulsification ..	30 ,, 212 F.	1°	7/6	15/–
H1094. Asphalt A.17 ..	150 ,, 175 C.	0·5°	7/6	15/–
H1096. A.20	30 ,, 160 C.	0·5°	13/–	15/–
H1098. Wax M. Pt. ..	80 ,, 160 F.	0·2°	12/–	15/–

Chemical Thermometers, Insulated Pattern

Opal Scale, 12 inch, straight tube

No.	Range	Divided to	Price Each	Price Per Dozen
H1100.	0° to 105°C.	1°	4/–	£2 2 0
H1102.	0° ,, 200°C.	2°	4/3	£2 5 0
H1104.	0° ,, 360°C.	2°	5/6	£3 0 0
H1106.	0° ,, 400°C.	2°	11/6	£6 0 0
H1108.	30° ,, 220°F.	1°	4/2	£2 3 6
H1110.	30° ,, 400°F.	2°	4/6	£2 8 0
H1112.	30° ,, 600°F.	2°	5/9	£3 3 0
H1114.	30° ,, 750°F.	5°	11/6	£6 0 0

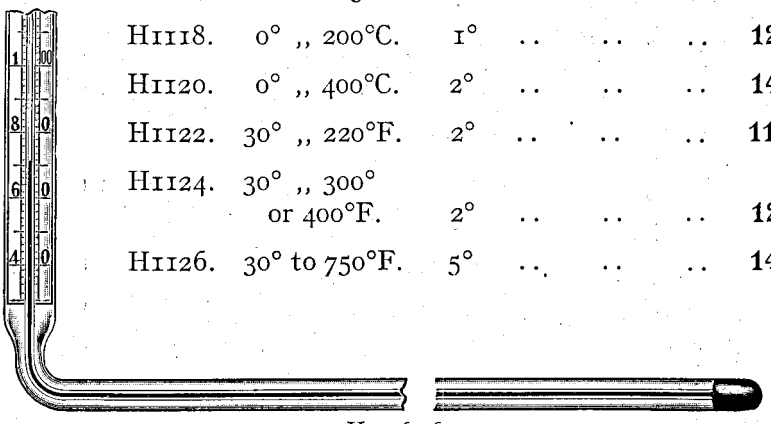


Chemical Thermometers

Insulated Bent Elbow Pattern

Each limb about 12 in. long, Opal Scale

	Range	Divided to	Price each
H1116.	0° to 105°C.	1°	11/6
H1118.	0° ,, 200°C.	1°	12/6
H1120.	0° ,, 400°C.	2°	14/–
H1122.	30° ,, 220°F.	2°	11/6
H1124.	30° ,, 300° or 400°F.	2°	12/6
H1126.	30° to 750°F.	5°	14/–



H1116-26

Works Thermometers, straight, 12 inch scale

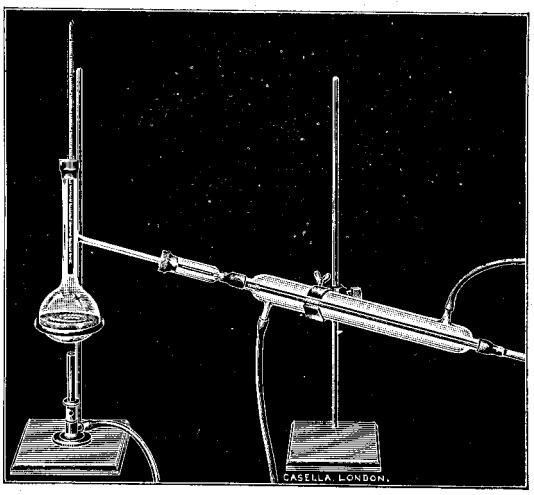
Insulated, Opal Glass Scale

Range		Overall Length 2 Feet		Overall Length 3 Feet	
0° to 100°C.	H1128.	.. 13/–	H1130.	..	15/6
0° ,, 200°C.	H1132.	.. 13/6	H1134.	..	16/6
30° ,, 220°F.	H1136.	.. 13/–	H1138.	..	15/6
30° ,, 400°F.	H1140.	.. 13/6	H1142.	..	16/6

Chemical Type Divided on Stem

Range		Overall Length 2 Feet		Overall Length 3 Feet	
0° to 100°C.	H1144.	.. 11/–	H1146.	..	13/–
0° ,, 200°C.	H1148.	.. 12/–	H1150.	..	14/–
30° ,, 220°F.	H1152.	.. 11/–	H1154.	..	13/–
30° ,, 400°F.	H1156.	.. 12/–	H1158.	..	14/–

Benzol and Naphtha Thermometers



Benzol Thermometer, divided and figured on the stem from **70° to 140°C.,** small bulb, narrow stem ; for $5\frac{1}{2}$ in. immersion.

H1160.	Length, $14\frac{1}{2}$ in. Divided to $\frac{1}{5}°$ ..	ALIDE	**£0 15 0**
H1162.	,, 16 in. ,, $\frac{1}{10}°$ ..	ALIFO	**£0 17 6**
H1164.	**N.P.L. Certificate,** Add " A " to Code Word		**£0 14 0**

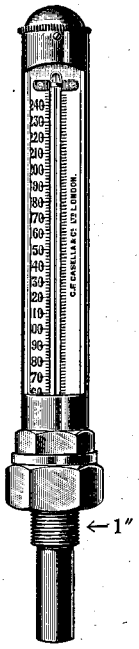
Toluol Thermometer, as above, but range **100° to 165°C.**

H1166.	Length, $14\frac{1}{2}$ in. Divided to $\frac{1}{5}°$ ..	ALIGU	**£0 15 0**
H1168.	,, 16 in. ,, $\frac{1}{10}°$ ..	ALKAB	**£0 17 6**
H1170.	**N.P.L. Certificate,** Add " O " to Code Word		**£0 14 0**

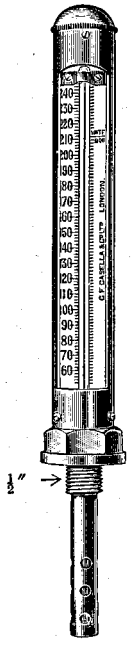
H1172.	**Naphtha Thermometer,** as above, but range **85° to 205°C.,** in $\frac{1}{2}°$. Length, $14\frac{1}{2}$ in. ..	ALKEC	**£0 15 0**
H1174.	**N.P.L. Certificate,** Add " A " to Code Word		**£0 17 6**

Pipe Thermometers

Stout, best quality



Pipe Thermometer, Revolving Cover showing Mercury Cup No. H1192



With Plain Cover without Mercury Cup

Length of Scale	Range	Prices (without Mercury Cup) Silvered Metal Scale	Opal Glass Scale
8 in.	to 230°F.	H1176. £0 15 6	H1178. £0 17 6
10 in.	to 230°F.	H1180. £1 0 0	H1182. £1 2 6
10 in.	to 500°F., **for superheaters** ..	H1184. £1 9 0	H1186. £1 12 0
10 in.	to 750°F., **for superheaters** ..	H1188. £1 14 0	H1190. £1 17 0

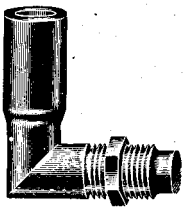
For **plain cover,** instead of revolving, the above prices are reduced by **2/6** for an 8 in. and **3/9** for a 10 in. thermometer.

Note.—Each scale is divided to its own tube, thus ensuring accuracy.

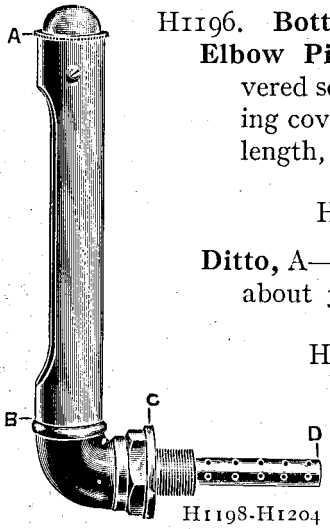
H1192. **Iron Mercury Cup,** straight pattern .. £0 5 0

H1192

H1194. **Angle Mercury Cup,** for use with pipe thermometers enabling the thermometer to be removed without cutting off the steam £0 13 6



H1194



H1198-H1204

H1196. **Bottle of Mercury** .. £0 3 0

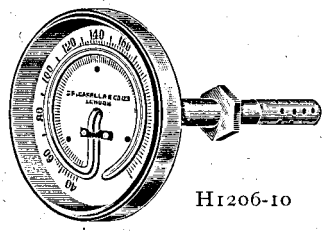
Elbow Pipe Thermometer, silvered scale, stout frame, revolving cover, length, A—B, 8 in., length, C—D, up to about 3 in.

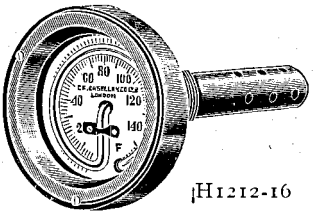
Revolving Cover		Plain Cover	
H1198.	£1 7 6	H1200	£1 5 0

Ditto, A—B, 10 in., C—D, up to about $3\frac{1}{2}$ in. .. .. ..

Revolving Cover		Plain Cover	
H1202.	£1 12 6	H1204.	£1 8 9

When ordering please state whether thermometer is to be bent back or to the right or to the left, when viewed from the front.


H1206-10


H1212-16

H1206. **Dial Thermometer,** brass frame, 4 in. dia., screwed $\frac{3}{4}$ in. gas thread, with back nut, silvered scale, with stem up to 6 in., to 230°F. £1 15 0

H1208. With stem up to 12 in. £1 18 0

H1210. ,, ,, ,, 24 ,, ... £2 5 0

H1212. **Ditto,** in heavy gun-metal frame, 3 in. dia., screwed $\frac{3}{4}$ in. or 1 in. gas thread, silvered metal scale, plate-glass front, with stem up to 6 in. £2 3 6

H1214. With stem up to 12 in £2 7 6

H1216. ,, ,, ,, 24 ,, ... £2 15 0

H1218. **Opal Glass Scale,** in place of metal, extra £0 4 6

In ordering dial thermometers, please state length of stem; this should be kept as short as possible. Dial thermometers of this kind are not suitable for use in dark boiler houses or for reading from a distance. Distance thermometers as described on pp. 7–9 should be used in these conditions.

H1220-48

Metal Cased Thermometers

These thermometers are particularly suitable for works use in connexion with superheaters and steam plants of every kind.

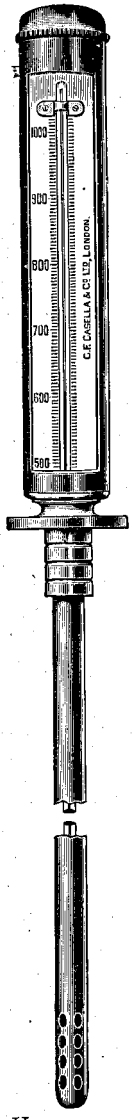
They are made of English glass, are provided with safety chambers, and those reading higher than 400° F. have the space above the mercury column filled with nitrogen. As in the case of all our thermometers, the tubes are carefully annealed before being divided.

12 inch

Fahrenheit	Divided to	In Steel Case	In Brass Case	Thermometer only
0° to 120°F.	1°	H1220. **11/6**	H1222. **7/-**	H1224. **4/-**
0° ,, 230°F.	2°	H1226. **11/6**	H1228. **7/-**	H1230. **4/-**
0° ,, 300°F.	2°	H1232. **11/6**	H1234. **7/-**	H1236. **4/-**
0° ,, 400°F.	2°	H1238. **12/6**	H1240. **8/-**	H1242. **5/-**
200° ,, 750°F.	5°	H1244. **17/6**	H1246. **12/6**	H1248. **9/6**

See also No. H1372.

Flue Gas Thermometers



H1250-1252

The regular and careful observation of flue gas temperatures is a very important assistance to the works manager in keeping down costs and maintaining efficiency. The temperature of these gases serves as an indicator of the conditions of draught and combustion in a boiler, and also of the state of the boiler walls. If the flue gas temperature is kept at the correct figure, there is no waste of heat, and economy is effected.

The thermometer figured here is designed to give **permanently reliable readings up to 1000°F.,** and is filled with nitrogen under high pressure. The scale is on **opal glass,** protected by a **revolving cover ;** the stem is made of seamless steel tubing, and of any reasonable length.

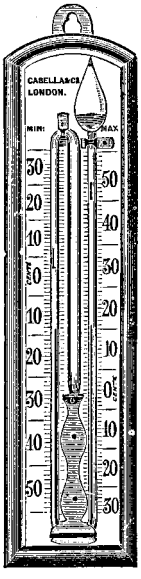
PRICES

H1250.	Overall length, 4 ft., stem, 3 ft. ALKID	**£4**	**10 0**
H1252.	,, ,, 5 ft. ,, 4 ft. ALKOF	**£5**	**0 0**

SIX'S THERMOMETERS

In this pattern, invented by James Six in 1782, the maximum and minimum readings are obtained from one instrument. The tube is in the form of a U, having a bulb at each end, one bulb being completely filled with creosote or other liquid, the other only partially filled so as to act as a safety chamber. As the temperature rises the liquid in the filled bulb expands and pushes in front of it a column of mercury in the lower part of the U, having an iron index at each end. The indexes remain at the farthest point to which they are pushed by the mercury as it travels backwards or forwards, and thus indicate both the maximum and minimum temperatures, readings being taken from the ends nearest the mercury. The indexes are reset by means of a magnet.

Six's thermometers are sometimes rather troublesome to correct if they have been put out of order in transit. Swinging and tapping are the only remedies which the user can adopt as a rule. If these do not avail, or if either of the indexes has become embedded in the mercury, it is necessary to return the thermometer to the makers.



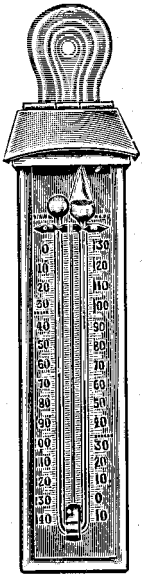
Six's Thermometer, opal glass or zinc scale, mounted on oak or mahogany back.

Opal Glass Scale

H1254. 9 in. ..	ALKUG	£1	2 6
H1256. 11 in. ..	ALLAA ..	£1	17 6

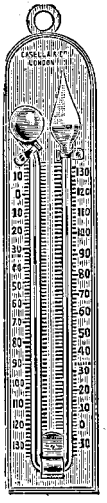
Zinc Scale

H1258. 9 in. ..	ALLEB ..	£0	18 6
H1260. 11 in. ..	ALLIC ..	£1	10 0



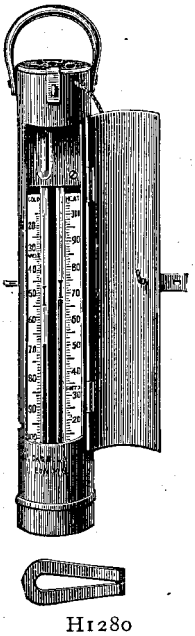
Six's Thermometer, in metal case, single scale, japanned white or black, with magnet.

Length of scale ..	8 in.	10 in.	12 in.
Opal glass scale ..	H1268 **9/–**	H1270 **15/–**	H1272 **18/9**
Boxwood or zinc scale	H1274 8 in. **7/–**	H1276 10 in. **11/–**	— —



H1278

Copper Cases for the above, instead of japanned, 8 or 10 inch, **2/6**, 12 inch, **4/–**



H1280

H1278. **Six's Thermometer,** 8 in. Tube mounted on boxwood back, divided and figured on the boxwood; with magnet **£0 7 6**

H1280. **The Casella-Miller Deep-Sea Thermometer,** for registering the maximum, minimum, and present temperatures of the sea to a depth of 3 miles, guaranteed to bear a pressure of 3 tons per square inch

ALLOD **£3 17 6**

H1282. **N.P.L. Certificate** .. **£0 10 0**

Add " Y " to Code Word

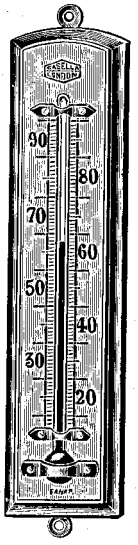
H1288. **Clinical Thermometer, hospital pattern, round stem,** indestructible index, 4 in. (10 cm.), divided to fifths of a degree Fahrenheit or tenths Centigrade. In nickel case ALMEC each **£0 3 0**

H1290. **Ditto, round stem,** 4 in., 1 minute ALMIF ,, **£0 3 6**

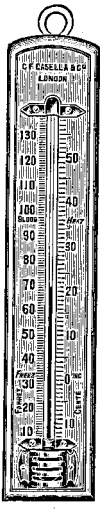
H1292. **Ditto, round stem,** 4 in., ½ minute ALMOK ,, **£0 4 0**

H1294. **Ditto, lens front,** 4 in., 1 minute ALMUM ,, **£0 5 0**

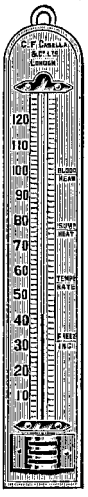
H1296. **Ditto, lens front,** 4 in., ½ minute AMABA ,, **£0 5 6**



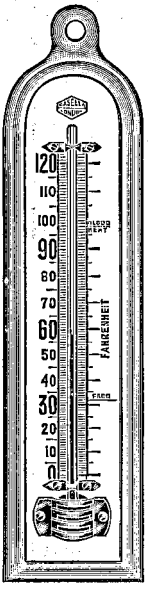
H1298



H1300-2



H1304-8



H1344

H1298. **Wall Thermometer,** 8½×2 in., polished oak mount, white ivorine scale, black spirit column, very clear to read, range 20° to 90°F., or −5° to +30°C. **£0 5 0**

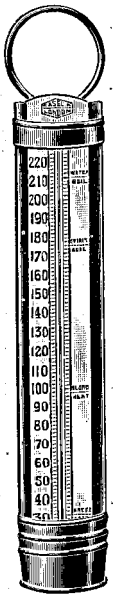
Boxwood Thermometer, polished, with elliptical top, bevelled edges ; enamelled tube, double scale Centigrade and Fahrenheit ; superior quality ; a popular pattern.

H1300. 8 in. .. **£0 6 6** H1302. 10 in. .. **£0 8 6**

Boxwood Thermometer, polished mount, enamelled tube, single scale.

H1304. 6 in. **2/6** H1306. 8 in. **3/6** H1308. 10 in. **5/6**

H1344. **Wall Thermometer,** porcelain, spirit column ; height, 11 in. overall **£0 4 6**



H1346-52

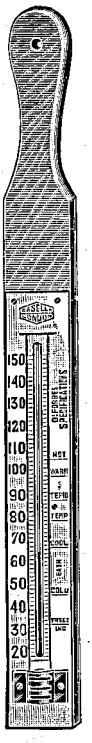
Brewer's or Bath Thermometers, best quality, enamelled tube, metal scale, japanned metal case.

8 in.	10 in.	12 in.	14 in.
H1346	H1348	H1350	H1352
2/6	**3/3**	**4/-**	**4/3**

Ditto, enamelled tube, metal scale, **copper case.**

H1354	H1356	H1358	H1360
3/3	**4/-**	**5/-**	**5/6**

H1366. **Bath Thermometer,** 13½ in. overall, silvered scale on hardwood mount, 30°-150°F. **£0 3 0**



H1366

H1370. **Baker's Dough Thermometer,** enamelled metal case, spirit column, overall length 13½ in., range about 30°-240°F. **£0 7 0**

H1372. **Weir's Pump Thermometer,** similar in appearance to the above, but with mercury column, instead of spirit, range 0–300°F., in brass case .. **£0 7 0**

See also Nos. H1220–48, p. 32.

H1374. **Refrigerator Thermometer,** overall length 10½ in., polished boxwood, spirit column, range –30° to +100° F. **£0 3 3**

H1370

H1374

H1376

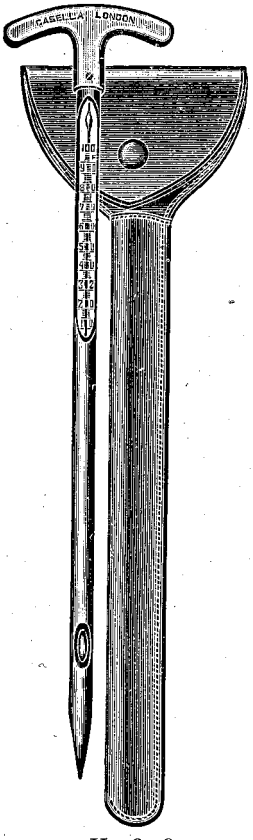
H1376. **Refrigerator Thermometer,** turned boxwood, 11½ in. overall, range −30° to +100°F. **£0 3 6**

H1378. **Ditto,** cone pattern, copper case, silvered scale, overall length 12½ in., range as above **£0 5 0**

H1380. **Spear Thermometer for Frozen Butter or Meat,** overall length about 15 in., range 0° to 100°F., in nickelled steel frame **£1 5 0** See illustration below.

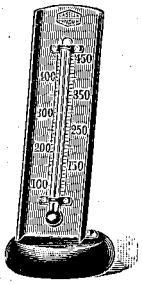
H1382. **Leather Case .. £0 4 0**

H1378



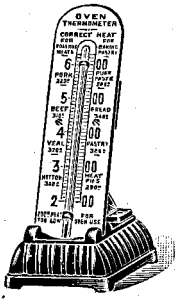
H1380-82

H1384. **Oven Thermometer,** 7 in. high, brass scale with bent-up sides, range 100° to 550° Fahr. **£0 5 0**



H1384

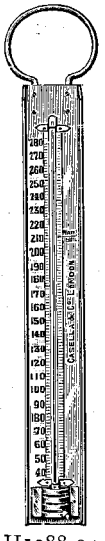
H1386. **Ditto,** 7 in. high, enamelled scale on cast iron base, 200° to 600° Fahr. **£0 7 6**



H1386

Confectioner's Thermometer, stout brass frame with bent-up sides and handle. 400° Fahr.

H1388. 8 in. **£0 6 0**
H1390. 10 in. **£0 7 0**
H1392. 12 in. **£0 8 0**
H1394. 14 in. **£0 9 0**



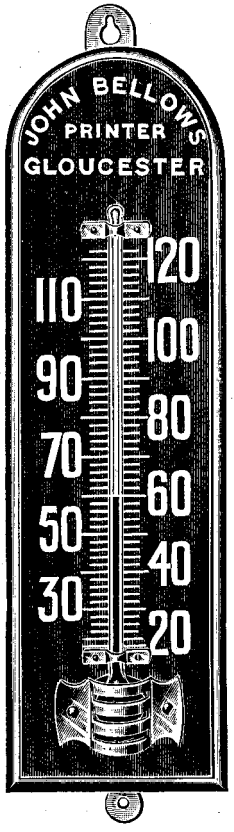
H1388-94

CASELLA LONDON

ADVERTISEMENT THERMOMETERS

A well-made attractive looking thermometer, is particularly suitable for advertising ; the recipient finds it useful and usually leaves it hanging in his office for years where it is seen by all his callers.

We illustrate 2 thermometers only, but will be pleased to submit particulars and prices of other suitable designs.



H1396

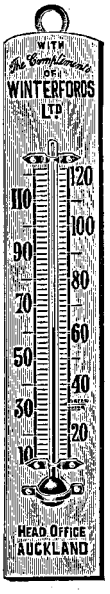
Illustrated by permission of W. Bellows

H1396. **Varnished Birch Mount,** painted black or varnished natural colour, or in polished boxwood, thermometer tube filled with alcohol, coloured red or black. Made usually in the following sizes:—

$10\frac{1}{2} \times 1\frac{3}{4}$, 12×3, 14×$3\frac{3}{8}$, 16×$4\frac{3}{4}$, 21×$4\frac{3}{4}$ in.

H1398. **Varnished Birch or Polished Boxwood Mount,** red or black spirit, or mercury, size $10\frac{1}{2} \times 1\frac{3}{4}$ in.

The prices vary according to the quantities required.



H1398

HYDROMETERS

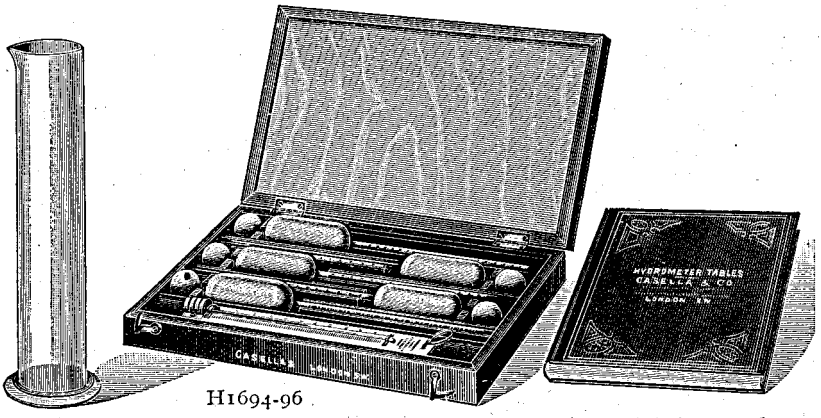
Sikes's Hydrometers, Glass

The invention of the hydrometer is usually attributed to Archimedes; its use, however, had quite fallen into abeyance until it was re-invented by Robert Boyle for testing liquors and counterfeit coin.

Sikes's hydrometer is named after Bartholomew Sikes, who invented it towards the end of the 18th century, having probably borrowed the idea from Boriés, who had devised a similar instrument. Its merit consists probably more in the tables which have been worked out for it than in the hydrometer itself. By these tables, which are particularly accurate and complete, the hydrometer readings can instantly be converted into percentage of proof.

Set of 10 Sikes's Hydrometers, Standard, 0° to 10°, 10° to 20°, etc., with ivory thermometer, in mahogany case. Best quality, complete with jar and book of tables.

H1690.	10 in.	.. ..	£4 10 0
H1692.	13 ,,	.. ..	£5 0 0



H1694-96

Set of 5 Sikes's Hydrometers, Standard, with ivory thermometer, in mahogany case. Best quality, complete with jar and book of tables.

H1694.	8 in.	.. ..	£3 15 0
H1696.	10½ ,,	.. ..	£4 0 0

Set of 3 Sikes's Hydrometers, Standard, with ivory thermometer, in mahogany case. Best quality, complete with jar and book of tables.

H1698.	8 in.	.. ..	£2 18 6
H1700.	10½ ,,	.. ..	£3 0 0

Sikes's Hydrometer, Standard, 50° to 80°, 60° to 90°, 45° to 75°, or other range, with ivory thermometer, in mahogany case.

H1702. 8 in. **£1 10 0**
H1704. 10½ ,, ... **£1 12 6**

Sikes's Hydrometer, Standard, as in Sets Nos. 1690–1704, in metal case, singly.

H1706. 8 in. **£0 10 0**
H1708. 10½ ,, ... **£0 12 6**
H1710. **N.P.L. Certificate** **£0 5 6**

Sikes's "A" Hydrometer, Standard, extended scale for use with high strength spirits, absolute alcohol, etc.; as specified in Major Bedford's new tables. Graduated A0 to A20.

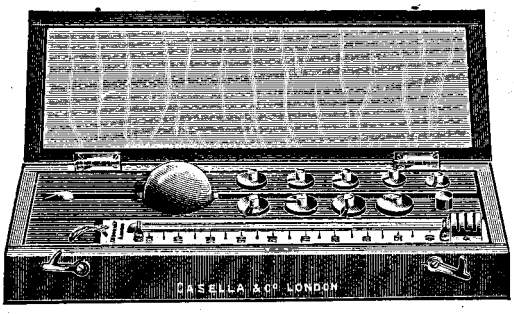
H1712. 8 in. **£0 10 0**
H1714. 10½ ,, ... **£0 12 6**

H1716. **Spirit Hydrometer, 10° under proof to 85° under proof,** 9 in., with thermometer encased in boxwood, book of tables and slip of coloured glass to facilitate reading; Casella's pattern; in stained deal case **£0 15 6**

Special prices for quantities

H1720. **Spirit Hydrometer,** 9 in., 60 o.p. to 40 u.p., paper scale, for 60° F. **£0 6 6**

Sikes's Hydrometers, Gilt Metal



H1722-26

Sikes's Hydrometer, Standard, double gilt, with weights and 9 in. ivory thermometer, in mahogany case. Complete with jar, book of tables and boxwood comparative rule ..

H1722. 7 in. **£3 17 6**
H1726. **Ditto, pocket size,** very compact and portable **£4 0 0**

Sikes's Hydrometer only, gilt, in metal case, with weights.

H1728.	7 in.	£2	0	0
H1730.	9 ,, ...	£2	5	0
H1732.	**Comparative and Reducing Rule** ..	£0	6	6
H1734.	**Book of Tables,** for Sikes's "A" hydrometers	£0	1	6
H1736.	**Ditto,** for "B" hydrometers	£0	1	6

Saccharometers

H1738.	**Set of 3 Saccharometers, Standard,** 970°–1030°, 1030°–1090°, 1090°–1150°, with thermometer (silvered metal scale), table of corrections and instructions for use, in mahogany case, with jar, 12 in.	£2	17	6
H1740.	**Saccharometer, Standard, 12 in.,** mercury poised, cylindrical bulb, any of the following ranges :—1000°–1050°, 1050°–1100°, 1100°–1150°, 1000°–1075°, 1075°–1150° divided to 1° ; or in lbs. per barrel : 0°–25° or 25°–50° (divided to $\frac{1}{5}$ lb.)	£0	11	6
H1742.	**Ditto,** double scale, specific gravity and pounds	£0	13	0
H1744.	**Saccharometer,** good intermediate quality, 9 in., mercury poised, round stem, ranges 1000°-1050°, 1050°–1100°, 1100°–1150° ..	£0	6	6
H1746.	**Ditto,** cheap quality, 9 in., shot poised, pear shaped bulb, ranges 1000°–1150° in 2°, or 0–50 lbs. in 1 lb.	£0	6	6
H1748.	**Bates's Metal Saccharometer,** gilt, with one weight, 0°–100°, with thermometer on silvered metal scale, in mahogany case, with book of tables	£3	17	6
H1750.	**Ditto,** with four poises, 1000°–1120° ..	£5	5	0
H1752.	**Brix Saccharometer, Standard, 13 in.,** showing percentage by weight of sugar in solution, divided to $\frac{1}{10}$° ; any of the following ranges : 0°–20°, 20°–40°, 40°–60°, 60°–80°, 80°–100°	£0	11	6
H1754.	**Ditto, intermediate quality,** 10 in., divided to $\frac{1}{5}$°	£0	8	0
H1756.	**Ditto, cheap quality,** 8 in., 0°–30°, 30°–60°, 60°–90°, in $\frac{1}{2}$°	£0	4	9

Twaddell Hydrometers

Twaddell's scale embraces the range from 1·000 s.g. to 2·000 s.g., and is usually spread over seven hydrometers numbered 1 to 7. To convert Twaddell degrees to specific gravity, multiply by 5, add 1000, and divide by 1000 (**i.e.,** put in the decimal point). The degrees Twaddell and the corresponding gravities for the seven hydrometers are as follows :—

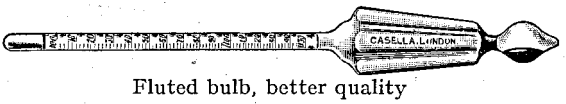
No.	Deg. Twaddell	Specific gravity
1	0 to 24	1·000 to 1·120
2	24 ,, 48	1·120 ,, 1·240
3	48 ,, 74	1·240 ,, 1·370
4	74 ,, 102	1·370 ,, 1·510
5	102 ,, 138	1·510 ,, 1·690
6	138 ,, 170	1·690 ,, 1·850
7	170 ,, 200	1·850 ,, 2·000

H1770. **Set of 6 Standard Twaddell Hydrometers, 12 in., glass,** Nos. 1 to 6, divided to $\frac{1}{5}°$, paper scale, mercury poised, with 12 in. chemical thermometer, in velvet lined mahogany case ; with jar **£6 0 0**

Twaddell Hydrometer, Standard, 12 in., as in the above sets, singly.

H1772. Nos. 1 to 3 .. .. **£0 10 0**
H1774. ,, 4 ,, 6 .. .. **£0 11 6**
H1775. No. 7 .. .. **£0 12 6**

Fluted Bulbs for Glass Hydrometers



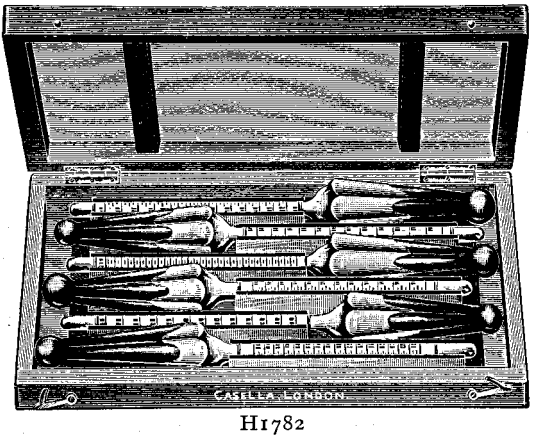
Fluted bulb, better quality

A fluted bulb, as illustrated, has distinct advantages over the cylindrical. It is stronger, the hydrometer is less liable to rotate in the liquid, and it can be laid on a sloping surface without rolling off. We recommend these hydrometers strongly, except for "standards," where the cylindrical bulb is better, owing to the fact that it is less liable to undergo minute changes in volume.

H1776. **Set of 6 Twaddell Hydrometers, intermediate quality, 9½ in.,** divided to $\frac{1}{2}°$, paper scale, mercury poised, with 10 in. chemical thermometer and jar, in velvet-lined mahogany case. Fluted or pear-shaped bulbs **£2 5 0**

Twaddell Hydrometer, intermediate quality, 9½ in. as in above set, fluted or pear-shaped bulbs, mercury poised.

H1778. Nos. 1 to 3 .. each, **£0 3 3** per dozen, **£1 16 0**
H1780. ,, 4 ,, 6 .. ,, **£0 4 0** ,, **£2 2 0**



H1782

H1782. **Set of 6 Twaddell Hydrometers, cheap quality, 9½ in.** shot poised, fluted bulbs, in stained deal case **£1 6 0**

We can strongly recommend this set for ordinary works use where great accuracy is not required. The hydrometers will be found correct within about ¼°.

H1784
Fluted bulb, cheap quality

H1784. **Twaddell Hydrometer, cheap quality, 9½ in.** as in previous set, in card cases
Nos. 1 to 6 .. each, **£0 2 3** per dozen, **£1 2 0**

H1786. **Set of 6 Twaddell Hydrometers,** intermediate quality, **7 in.** divided to 1°, for small samples. With 6 in. chemical thermometer and jar, in mahogany case, lined with wash-leather **£2 0 0**

Twaddell Hydrometers, intermediate quality, **7 in.** as in above set

H1788. Nos. 1 to 3 .. each, **£0 3 0** per dozen, **£1 10 0**
H1790. ,, 4 ,, 6 .. ,, **£0 4 0** ,, **£2 0 0**

H1791 **Twaddell Hydrometer, brass,** gilt, 9½ in.

Nos. 1 to 3 .. .. each	£0	16 0
„ 4 „ 6 .. .. „	£0	19 6

Salinometers

H1794. **Salinometer,** metal, 9½ in. heavily gilt, best quality; in tin case to Board of Trade Specification No. 1673 .. £0 10 0

H1795. **Ditto,** in mahogany case .. £0 12 0

H1796. **Ditto,** glass, in tin case .. £0 2 6

H1800 **Salinometer, glass,** 9 in. cheap quality, shot poised, double scale (ozs. per gallon and " blow " scale) .. each £0 2 6

per dozen £1 0 0

H1804. **Brinometer, glass,** for pickling vats, etc., 10 in. mercury poised, 0–100% in 1% .. £0 6 6

H1806. **Ditto,** divided to 2%, shot-poised £0 4 6

H1794

Beaumé Hydrometers

The Beaumé Hydrometer for Heavy Liquids is ranged from 0°–70°: 0 being equivalent to 1·000 S.G. and the 70 point to 1·933. The scale was originally laid down by extending a range of 15° arrived at by calibrating the hydrometer in distilled water and a 15% solution of dry " salt." Discrepancies became apparent on investigation and the equivalents were no longer regarded as reliable. A formula was adopted by which the value of any Beaumé degree could be obtained from degrees of specific gravity. The formula which is now recognized by all authorities is as follows:—

for Liquids Heavier than Water

$$\text{Degrees Beaumé} = 145 - \frac{145}{\text{S.G.}}$$

Beaumé's hydrometer for liquids **lighter than water** is scaled from 70 to 10. The 10 point is equivalent to 1·000 S.G. (distilled water at 60°F.), the 70 point to 0·700 S.G. at 60°F. Beaumé somewhat indefinitely set out the range of his scale by taking as zero a 10% solution of sodium chloride, obtaining the other points by extrapolation. In practice this has been reduced to a formula.

$$\text{Bé} = \frac{140}{\text{S.G.}} - 130$$

From these formulae the following tables have been produced:

Beaumé and Specific Gravity Equivalents

Heavy Beaumé	S.G.	Light Beaumé	S.G.
0	1·000	—	—
5	1·036	—	—
10	1·074	10	1·000
15	1·115	15	0·966
20	1·160	20	0·933
25	1·208	25	0·903
30	1·261	30	0·875
35	1·318	35	0·848
40	1·381	40	0·824
45	1·450	45	0·800
50	1·526	50	0·778
55	1·611	55	0·757
60	1·706	60	0·737

H1808. **Beaumé Hydrometer for light liquids,** 9 in. shot poised, paper scale, 10°–60°
each, **£0 5 6** per dozen, **£2 17 6**

Ditto for heavy liquids,

H1810. 8 in. 0°–45° .. .. each, **£0 4 0**

H1812. 9 ,, 0°–70° .. .. ,, **£0 5 6**

H1814. **Cartier Hydrometer,** 8 in. paper scale, 10°–45° .. .. each, **£0 5 6**

Cartier's Hydrometer is similar to Beaumé's light hydrometer, but 30° Cartier are equal to about 32° Beaumé. It is not used so largely as Beaumé's.

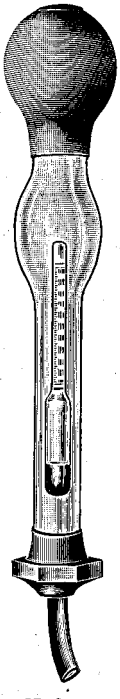
Specific Gravity and Miscellaneous Glass Hydrometers

Specific Gravity Hydrometer, Standard, 12 in., paper scale, **containing 50° on the scale,** divided to $\frac{1}{5}$°.

	Range		
H1816.	Between 700°—1500°	£0	10 0
H1818.	,, 1500°—1800°	£0	10 0
H1820.	Over 1800°	£0	11 6

Specific Gravity Hydrometer, about **10 in.,** paper scale, **containing 100°** on the scale, divided to 1°.

	Range		
H1822.	Between 700°—1200°	£0	6 0
H1824.	,, 1200—1800°	£0	6 0
H1826.	Over 1800°	£0	8 0



H1840

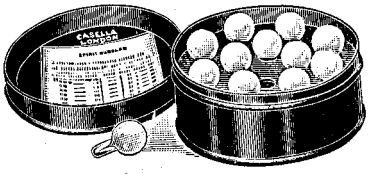
Ditto, 8 inch, containing 200°, divided to 2°, paper scale.

	Range		
H1828.	Between 600°—1200°	£0	5 6
H1830.	,, 1200°—1600°	£0	6 6
H1832.	,, 1600°—1800°	£0	7 0
H1834.	Over 1800°	£0	7 0

Accumulator Hydrometer, flat bulb, for insertion between the plates, about 1100° to 1250°, paper scale.

		each	Per dozen
H1836.	Length about 6 in.	2/3	£1 2 6
H1838.	,, ,, 11 ,,	3/–	£1 7 0
H1840.	**Ditto,** enclosed in glass pipette with rubber bulb and tube (4 in. hydrometer) each ..		£0 4 6

Glass Beads. Glass beads are made to float in solutions of densities corresponding to the numbers. They are more sensitive than hydrometers, but their application is limited, as the bead either floats or sinks completely, unless the gravity of the liquid is within about half a degree of that marked in the bead, when it will remain suspended in the liquid.



H1842. **Glass Beads, Set of Twelve,** numbered, for showing the strength of spirits, from 35 o.p. to 20 u.p., in japanned box £0 11 0

H1844. **Ditto, Set of Eighteen,** from 50 o.p. to 35 u.p. £0 17 6

Glass Beads, as in above sets, singly

H1846. No. 12 (65 o.p.) and No. 13 (60 o.p.) per doz. £1 3 0

H1848. Nos. 14 (55 o.p.) to No. 40 (75 u.p.) ,, £1 1 0

H1849. **Specific Gravity Beads,** adjusted at 60°F. or 85°F., any gravity between 650° and 1850° per doz. £1 3 0

H1850. **Acetometer,** for vinegar, acetic acid, etc., 10 in., pear-shaped bulb, 0–100 (=1·000 to 1·100 s.g.), paper scale £0 6 6

H1852. **Alcoholometer, Gay-Lussac's,** 11 inch, paper scale, showing percentage per volume, 0–100% £0 6 6

H1854. **Ammoniameter,** 9 in. paper scale, mercury poised, fluted or pear-shaped bulb, 0°—40° £0 6 6

(To convert to s.g., multiply by 3 and deduct from 1000).

H1856. **Barktrometer,** for tanning liquor, 10 in. paper scale, 0°–80°, or to order £0 6 6

H1858. **Lactometer, Standard,** $7\frac{1}{2}$ in. flat stem, paper scale 1025° to 1035°, divided to $\frac{1}{5}$° .. £0 6 6

H1860. **Lactometer,** 6½ in. ivory scale, specific gravity on one side, milk scale on the other **£0 4 9**

H1862. **Ditto,** cheap quality, milk scale only, shot poised, divided as follows: W, ¼, ½, ¾, Milk **£0 3 3**

H1864. **Ditto,** as No. 1858, but with tube-jar in outer case **£0 4 9**

H1866. **Hydrometer for Rubber Latex,** paper scale, 980°–1000° in ⅕° **£0 10 0**

H1868. **Oleometer,** for vegetable and sperm oils, 50° to 0° (=8·70 to 9·70 s.g.), paper scale, with specific gravities of various oils marked on the stem **£0 7 3**

H1870. **Urinometer,** in pull-off leather case, 2 oz. size, 0°–60° .. each, **£0 4 9** per dozen, **£1 16 0**

Tar Products Hydrometers

To the specifications of the Tar Products Committee.

The following four series of hydrometers have been adopted, covering a specific gravity range in each series of 0·650 to 1·300, in thirteen separate instruments, each having a range of 0·05.

No.	Series	For Max. Temp. of	Overall Length	Number of Sub-divisions	Price each	Price per set of 13, in Polished Mahogany Case
H1872	A	38°C. 100°C.	340 mm. 13⅜ in.	100	13/– 14/–	£10 15 0 £11 10 0
H1874	B	38°C. 100°C.	250 mm. 9⅞ in.	50	10/– 11/–	£8 5 0 £9 0 0
H1876	C	38°C. 100°C.	185 mm. 7¼ in.	25	6/9 7/6	£6 0 0 £6 10 0
H1878	D	38°C. 100°C.	140 mm. 5½ in.	25	6/– 6/9	£5 0 0 £5 10 0

Note.—In reading the scale of a hydrometer floating in clear liquid in a glass jar, the eye should be brought to the level of the liquid and the reading taken at the bottom of the meniscus. When a metal jar is used an allowance should be made for capillarity.

Thermometers for use with Hydrometers

H1890

Ivory Scale Thermometer, divided on the mount only.

H1890.	7 × ⅞ × 1½ in.	£0	12	0
H1892.	9 × 1 × ⅛ ,,	£0	16	6
H1894.	**Ditto,** divided on the stem and figured on the mount, 9 × 1 × ⅛ in.	£0	18	0

H1898

Boxwood Thermometer, tube encased in the wood to avoid breakage, polished mount, 6×1 in., 30° to 100°F., or other range to order.

H1896.	Divided on mount	£0	5	3
H1898.	Divided on stem and figured on mount	£0	6	0
H1900.	**Thermometer for Saccharometer,** silvered metal scale, 12 in.	£0	9	6

H1902

H1902.	**Thermometer for Salinometer,** silvered scale, 8 in.	£0	6	6

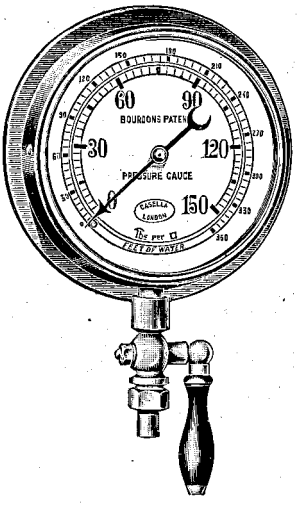
Hydrometer Jars

H1904.	10×2 in.	each	£0	1	6
H1906.	12×2 ,,	,,	£0	2	0
H1908.	14×2½ ,,	,,	£0	2	6

Special prices for quantities

PRESSURE AND VACUUM GAUGES

Improved Bourdon Gauge, in brass case, with central hand, best quality



Prices, without Cocks

	Diameter of dial	3 in.	4 in.	5 in.	6 in.	7 in.
	Pressure Gauges	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1990.	Over 20 lb. and under 400 lb. per sq. in	0 15 0	0 18 6	0 19 6	1 1 0	1 6 0
1992.	Over 400 lb. and under 600 lb. ..	0 16 6	1 1 0	1 2 0	1 3 0	1 11 6
1994.	**Vacuum Gauges** .	0 16 0	1 0 0	1 0 6	1 2 0	1 7 0

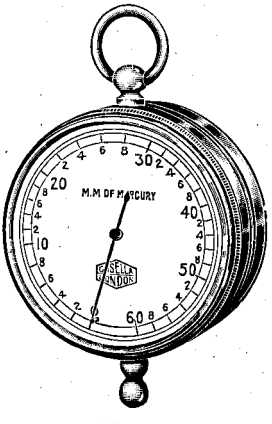
1996. If a **scale of feet of water** is also required, an extra charge of **2/6** will be made.

1998. **Maximum Hand** extra **£0 1 6**

Stopcock, gun-metal, with union, for any of the above gauges,
H2000, $\frac{3}{8}$ in., **5/–**; H2002, $\frac{1}{2}$ in., **6/6**

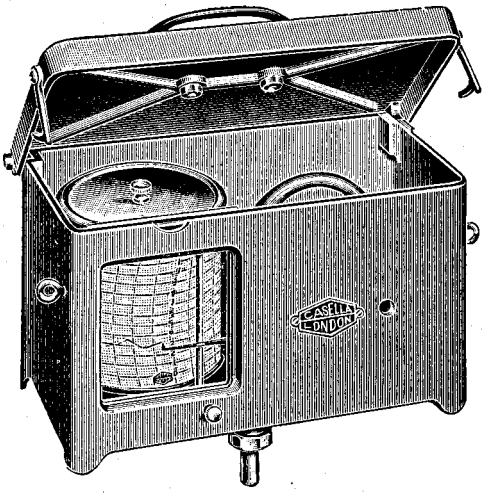
Iron Siphon, fitted to stopcock extra **£0 3 6**

2004. **Sensitive Pressure Gauge,** $2\frac{1}{4}$ in. dia., reading to about 60 mm. of mercury. Other ranges quoted for **£2 17 6**



H2004

PRESSURE AND VACUUM RECORDERS



H2006-2012

Overall dimensions : $10\frac{1}{2} \times 8\frac{1}{2} \times 5\frac{1}{2}$ in.
$26\frac{1}{2} \times 21\frac{1}{2} \times 14$ cm.
Net weight, $7\frac{1}{4}$ lbs. ; 3·3 k.

These recorders are robust instruments designed to stand the wear and tear of factory and laboratory use. The movement is mounted in a strong cast metal case. The glass window is removable, so that it is easy to fill the pen with ink, and each recorder is provided with 55 charts, ink, etc. Additional charts, per series of 55, **5/9** ; per 100, **11/–**.

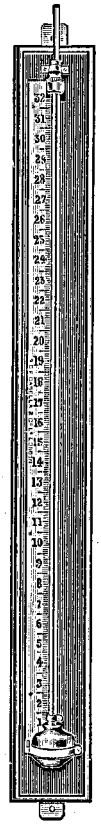
Prices

H2006.	Any range from 20 lb. up to 300 lb. per sq. in. ANADA	**£10**	**10** **0**
H2008.	300 lb. to 600 lb. .. .. ANAFI	**£11**	**0** **0**
H2010.	600 lb. to 1,500 lb... .. .. .. ANAGO	**£11**	**10** **0**
H2012.	**Vacuum Recorders,** same prices as above.		

Please state whether weekly or daily clock is required. Both run for a week without re-winding.

H2014.	**Pen Filler**	**£0**	**0** **6**

MERCURY VACUUM AND PRESSURE GAUGES



H2246

H2246. **Mercury Vacuum Gauge,** simple form, mounted on polished board, engine-divided boxwood scale, reading to 32 inches, AMECE.. **£4 0 0**

H2248. **Ditto, improved pattern,** as made for power stations, etc.; tube mounted on oak back and provided with safety trap at the top to prevent the mercury from being drawn over. The glass cistern has polished faces back and front, and a zero line is etched on it to facilitate filling.

Price, with brass fitting and nozzle for connecting to rubber tube **£5 0 ·0**
AMADI

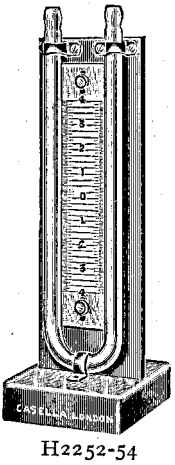
Mercury extra.

H2248

WATER GAUGES

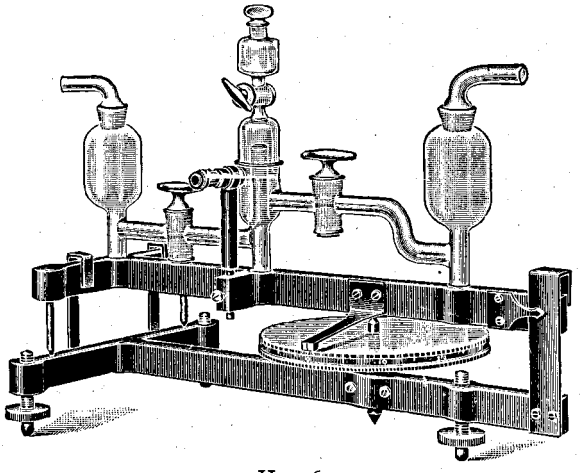
U Tube Gauge, simple form, adjustable boxwood scale, wooden mount.

Ranges	4 in.		6 in.
H2252.	**15/–**	H2254.	**17/6**
AMAFO		AMAGU	



H2252-54

H2256—CHATTOCK-FRY TILTING PRESSURE GAUGE



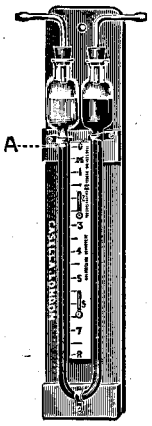
H2256

The sensitivity of this gauge, as usually constructed, is about 0·0001 mm. of mercury ; it can be used for measuring flue draughts or other small pressures up to about 1·5 mm. of mercury (say 20 mm. of water). The construction of the tilting pressure gauge is clearly shown in the illustration. It is made of glass and mounted on a brass stand ; the two outer vessels containing water communicate with the sources of pressure and with a central vessel, one to its body and the other to a tube inside it ; the central vessel is filled with a liquid lighter than, and not mixing with, water. The gauge can be tilted by means of the large micrometer head. Excess of pressure in the chamber connected with the interior tube will cause a bubble of water to rise into the oil surrounding its mouth.

The levels of the liquids are observed through a microscope against a white reflecting surface (not shown in the illustration). The tendency of the one liquid to rise or fall is corrected by turning the micrometer head and the amount of tilt is read on the divided ring.

H2256. **Price** .. .. AMECA **£23 10 0**

H2272.—DIFFERENTIAL PRESSURE AND VACUUM GAUGE



H2272

This is a convenient manometer, mounted on an oak board, for measuring light currents, such as the draught in flues. The principle of the gauge will be seen clearly from the illustration. The lower part of the U-tube is of narrow bore, but each limb terminates in a chamber having a cross section of much greater area.

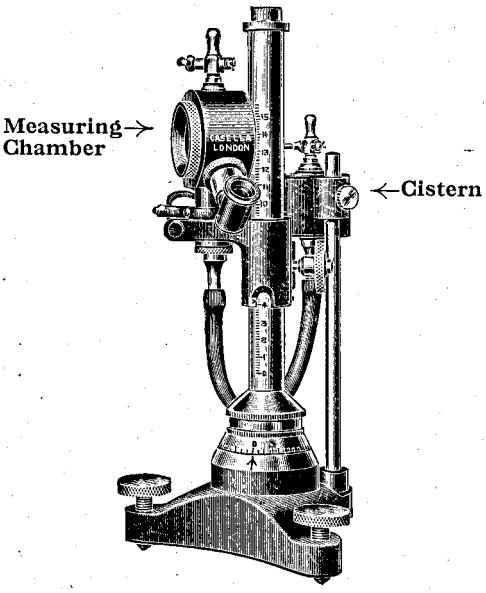
Two liquids are used, which are of different colours and do not mix, the junction between the two (marked A in the figure) forming the index by which the pressure or vacuum is read on the scale. The movement of the surface at A is magnified in proportion to the difference in areas between the cross sections at the wide and the narrow parts of the U-tube, and is also dependent on the densities of the two liquids. The magnification is usually about 10 times.

The limit of difference of levels in the large chambers is, for the ordinary pattern, one inch, but special gauges can be made with a maximum difference greater than this.

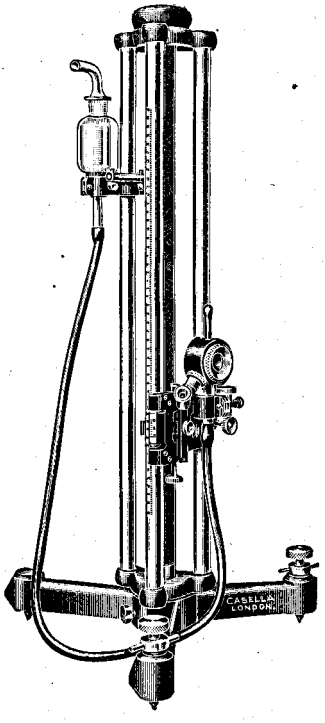
H2272.	**Price,** with 2 bottles of liquids, scale in $\frac{1}{20}$ths inch	AMICE	**£1**	**5** **0**
H2274.	**Ditto,** in millimetres ..	AMIDI	**£1**	**7** **6**

MICROMETER WATER LEVEL AND SENSITIVE PRESSURE GAUGE

Accurate to 0·01 mm. of water



H2260



H2262-4

H2260. 0–150 mm., reading by micrometer to 0·01 mm. of water.

AMEDE **£20 0 0**

H2262. 0–50 cm., reading by vernier to 0·05 mm.

AMEFI **£26 0 0**

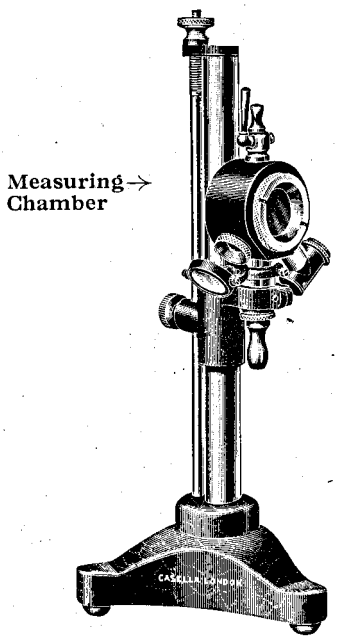
H2264. As above, but range 0–100 cm.

AMEGO **£28 0 0**

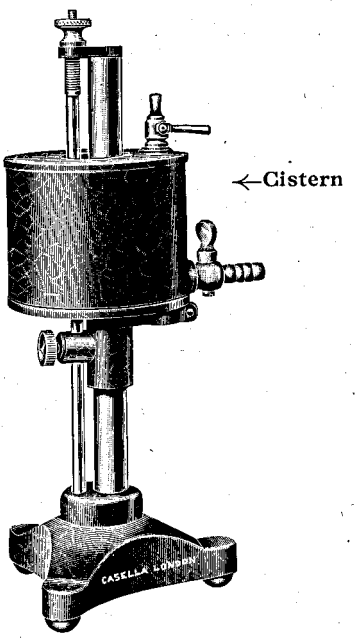
For fuller particulars of these instruments please write for pamphlet.

MICROMETER WATER LEVEL AND SENSITIVE PRESSURE GAUGE

(continued)



H2266



H2268

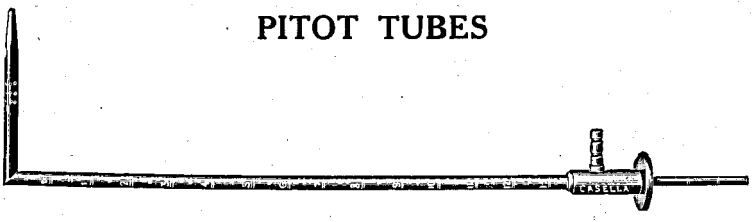
As H2260, but without scale or micrometer; for accurate levelling operations.

H2266. **Measuring Chamber** .. AMEKU **£10 0 0**

H2268. **Cistern,** 2 in. diam., with fine adjustment for height .. .. .. AMIBA **£4 10 0**

H2270. **Ditto,** 9 in. diam., without fine adjustment; this is used for levelling over long distances, about 30 ft. and more .. AMICE **£4 10 0**

PITOT TUBES



Combined Pitot and Static Tube, in brass concentric tubes, N.P.L. pattern, as illustration, but with rounded bend.

No.	Length	Divided in	Code Word	Price
H2280	18 in.	½ inches	AMIGO	£2 2 0
H2282	18 ,,	cm.	AMIHU	£2 2 0
H2284	24 ,,	½ inches	AMOBE	£2 8 6
H2286	24 ,,	cm.	AMOCI	£2 8 6
H2288	36 ,,	½ inches	AMODO	£2 12 6
H2290	36 ,,	cm.	AMOKU	£2 12 6

H2292

H2292. **Ditto,** another form, in brass, stem divided in half inches. Overall length 9 inches (23 cm.) .. .. .. ANACA £1 17 6

H2294. **Ditto,** in centimetres .. ANADE £1 17 6

These instruments can be used with the manometers described on pp. 54–56.

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CASELLA LONDON

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