

HIGHEST AWARDS.

GOLD MEDAL,

1884.

SILVER MEDAL,

1885.

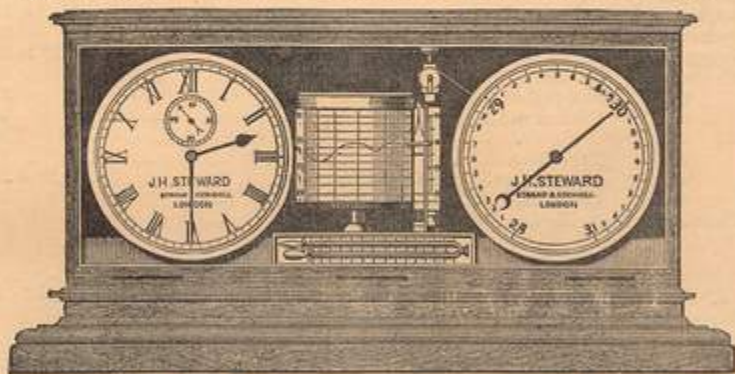


PART. II.

J. H. STEWARD'S
NEW CATALOGUE

OF
Meteorological Instruments

AND
ANEROID AND FITZROY BAROMETERS.



THERMOMETERS, PEDOMETERS,
ETC.

Optician to the British and Foreign Governments, and the
National Rifle Associations of England, Ireland,
India, Canada, and America, by Appointment.

406, STRAND; 66, STRAND, W.C.;
456, WEST STRAND, W.C.; & 54, CORNHILL, E.C.,
LONDON.

August, 1885.

METEOROLOGICAL INSTRUMENTS.

MERCURIAL BAROMETERS.

(FOR ILLUSTRATIONS, SEE PAGES 3 to 7.)

Pediment Cottage Barometer; Ivory Scale, with Vernier and Thermometer attached, in handsome Mahogany, Walnut, Oak, or Rosewood Frame, with screw to make it portable (see Fig. 9, p. 5). Price ... £1 1 0

Ditto Solid Frame Protecting Tube, superior finish (see Fig. 8, p. 5). Price ... £1 15 & £2 2 0

The Farmer's Barometer, in Carved Oak Frame, with Thermometer and Hygrometer attached, Ivory Scale, Vernier, &c. (see Fig. 1, p. 3), or with extra carving on top Price ... £1 15 0

Miner's or Pit Barometer; compact Solid Oak Frame (screwed) Compensated Tube, Ivory Scale reading to 33 inches, attached Enamel Thermometer, Single Vernier with Rack and Pinion Adjustments, strong Glass Face, Framed in Bronze Metal (see Fig. 10, p. 5). Price ... £2 2 0

The Fitzroy Barometer, in Solid Oak Frame, with 2 Verniers, and Thermometer attached (see Fig. 4, p. 3) Price ... £2 10 4

This Barometer is fitted with a good size tube, having a large surface of Mercury to be acted upon, and so shows by its convexity or concavity whether it is rising or falling. The Verniers enable as small a variation as one-hundredth of an inch to be observed. Each instrument is adjusted by a Kew Standard Barometer, and for all ordinary purposes can be strongly recommended.

Small Carved Oak Fitzroy Barometer, Enamelled Scales, Double Vernier, with Rack and Pinion Adjustments, and attached Thermometer (see Fig. 2, p. 3). Very pretty. Price ... £3 10 0

Steward's Best Quality Fitzroy Barometer, in Solid Oak, Round Top Frame, with Enamelled Glass Scales, which enable the words, figures, and divisions to be seen much easier, Double Vernier and Thermometer attached (as used at the principal Hotels and Railway Termini in London). Price ... £5 5 0

Ditto ditto Square Top, Oak or Walnut (Fig. 7, p. 5). Price ... £4 15 0

The Sea Coast Barometer, in strong Square Top Oak Frame, Double Verniers, and bold Tube (see Fig. 7, p. 5). Price ... £4 4 0

Steward's New Handsomely Carved Oak Fitzroy Barometer, with Enamelled Glass Scales, having words and divisions that are very legible and durable; Large Tube, 2 Rack Verniers, dividing to 100th of an inch, and Double Scale Thermometer, attached, as used at the **Railway Termini and Hotels** (see Fig. 3, p. 3). Price ... £6 10 0

If of same quality as those offered by Associations and furniture dealers who sell imitations of this celebrated Barometer £4 15 0

Ditto ditto (Shell Pattern) 6 10 0

Mercurial Barometer, extra large, handsomely-carved design, suitable for large establishments. Price ... £8 8 0, £9 9 0, & £10 10 0

Ditto ditto very elegant design; an exquisite specimen of Fine Wood Carving, with Eight-day Clock attached (see Fig. 13, p. 6). (Suitable for presentation.) Price ... £16 16 0

* * As the Ivory Scales are liable to change colour by exposure, the Enamelled Glass Scales are strongly recommended as the best and most lasting, and therefore, are fitted to all Barometers above 4 Guineas, unless specially ordered otherwise.

Standard Mercurial Barometer, of the best construction; inside diameter of Tube .35 of an inch, graduated to read by means of Verniers to 1-500th and by estimation to 1-1000th of an inch. Price ... £8 8 0

Ditto ditto of the very highest finish; inside diameter of the Tube .50 of an inch, French and English Scale graduated to read to 1-500th (and by estimation to 1-1000th of an English inch), and to one-tenth of a French millimètre (see Fig. 11, p. 6). Price ... £10 10 0

Ditto ditto larger; inside diameter of Tube .75 of an inch, graduated to read by means of Verniers to the 1-500th of an English inch, and the 1-10th of a French millimètre (see Fig. 12, p. 6). All of the highest finish. Price ... £25 0 0

Standard Mountain Barometer, for ascertaining altitudes, with Tripod Stand, very portable, in Leather Case, complete. Price ... £10 10 0

Marine Barometer and Sympiesometer, Oak, Mahogany, or Walnut Frame, best construction, complete fittings, with superior Arm and Gimbals (see Fig. 14, p. 7). Price ... £6 6 0

Marine Barometer, plain Oak or Walnut Frame, Thermometer in front, complete fittings, with superior Brass Arm and Gimbals (see Fig. 16, p. 7). Price ... £2 10 0

Marine Barometer, Board of Trade Pattern, as supplied to the Admiralty, the Board of Trade, the Argentine and Chilian Navies, &c., complete in Case (see Fig. 15, p. 7). Price ... £4 15 0

WHEEL BAROMETERS.

(For Illustrations, see page 4.)

Eight-inch Silvered Dial Wheel Barometer, in Walnut, Oak, or Mahogany Frame, with Thermometer. Price ... £1 18 0

Ten-inch ditto (see Fig. 4A, p. 4) 2 10 0

Ditto ditto in a solid noble-looking Rosewood, Walnut, or Oak Frame, handsomely carved double Bezel Ring, and polished-edged Plate Glass Front, Rack-work, and Patent Stop-cock for Travelling, handsome Thermometer with double Scale, attached in front (see Fig. 6, p. 4). Price ... £4 10 0

Highly-finished Wheel Barometer, 8-inch Silvered Metal or Enamelled Glass Dial, richly-carved Solid Oak Frame, Patent Stop-cock for Travelling, attached Thermometer with Spiral Bulb, all of the very best finish throughout (see Fig. 5, p. 4). Price ... £7 7 0

When preferred, Aneroid movements can be supplied in these frames, instead of the Mercurial Tube and Wheel.

For Fitzroy Storm Barometers see inside back cover.

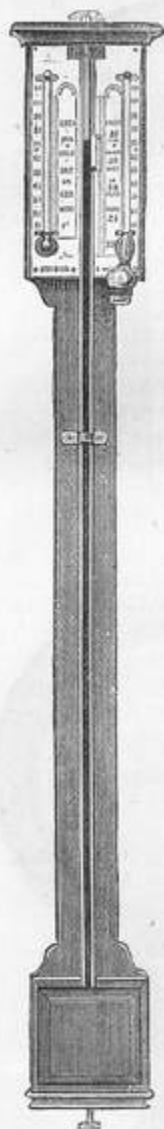


Fig. 1.—£1 15s.



Fig. 2.—£3 10s.

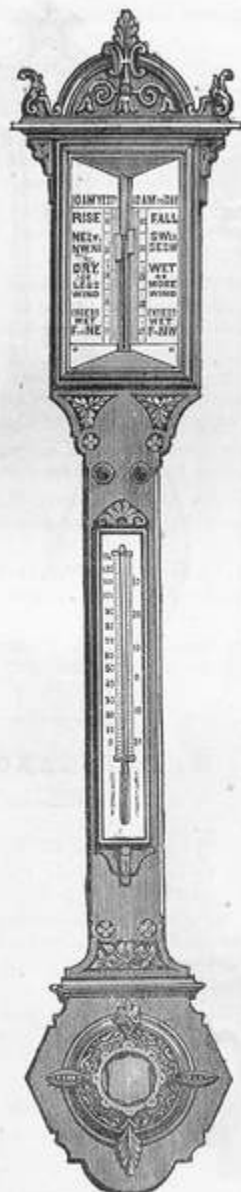
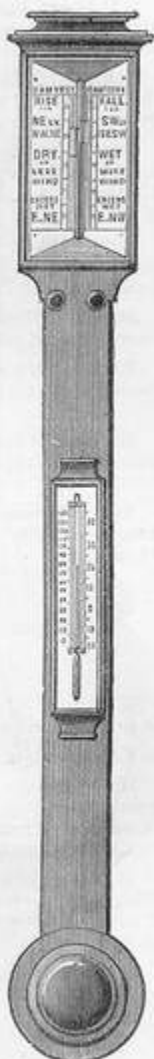
Fig. 3.—£6 10s.
Cheaper quality, £4 15s.

Fig. 4.—£2 10s.

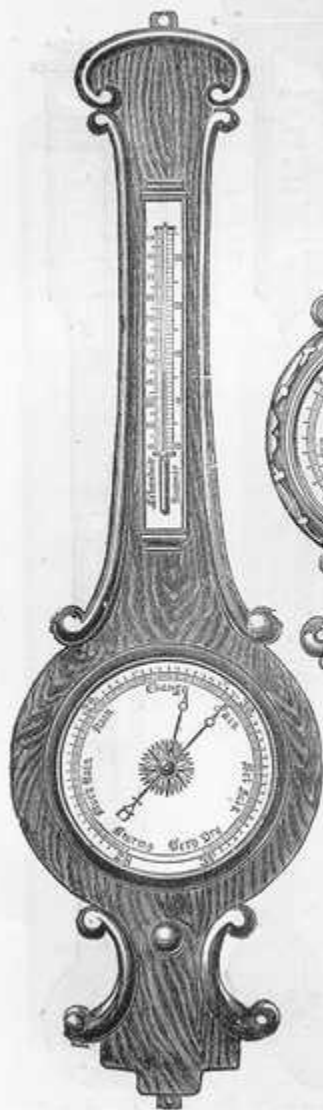


Fig. 4A.—Price £2 10s.

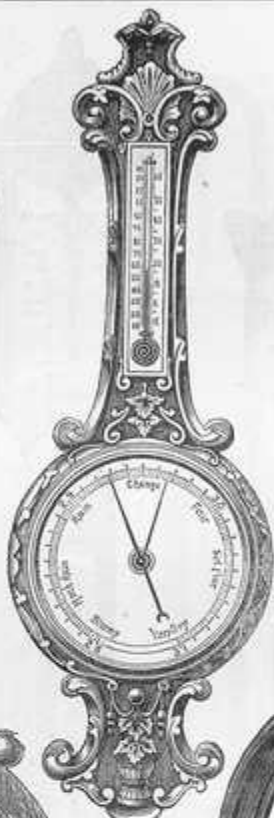


Fig. 5.
Price £5 15s.
and £7 7s.



Fig. 6.—Price £4 10s.

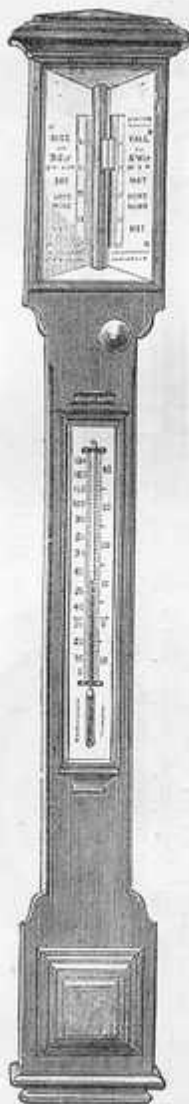


Fig. 7.
Price £4 4s.
and £4 15s.

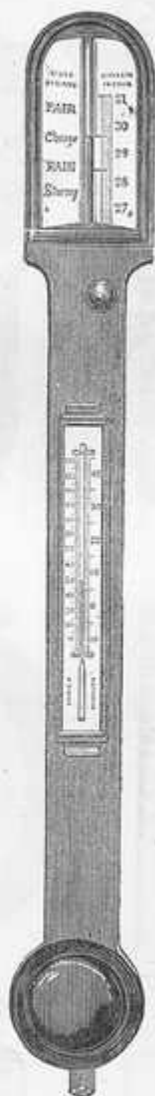


Fig. 8.
Price £1 15s.
and £2 2s.

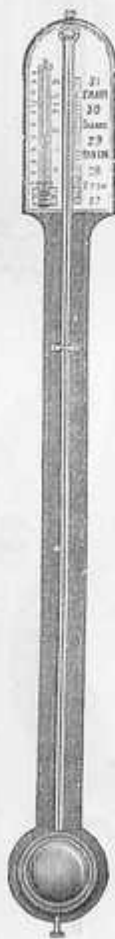


Fig. 9.
Price £1 1s.



Fig. 10.
Price £2 2s.



Fig. 11.—Price £8 8s. and £10 10s.

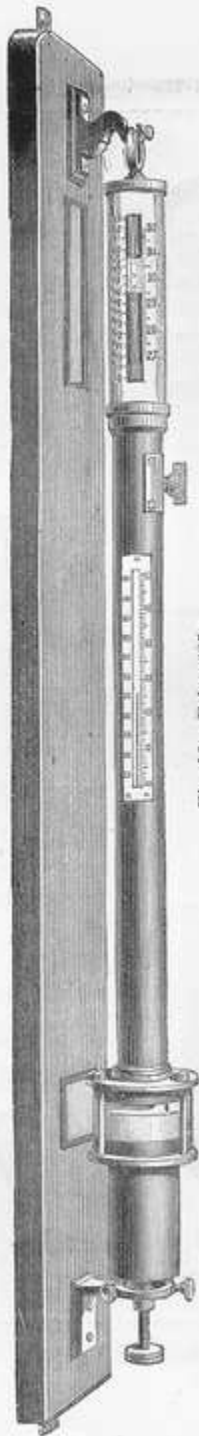


Fig. 12.—Price £25.

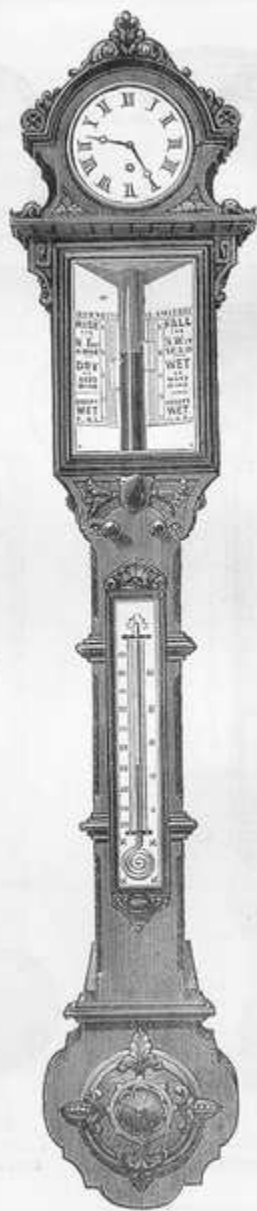


Fig. 13.—Price £16 10s.

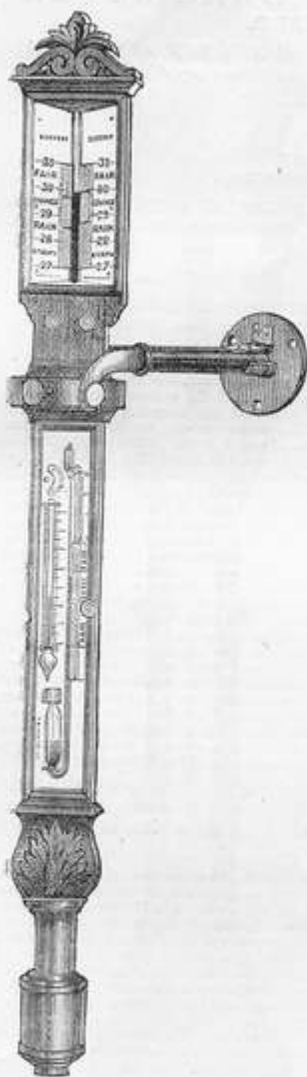


Fig. 14.
Price £6 6s.

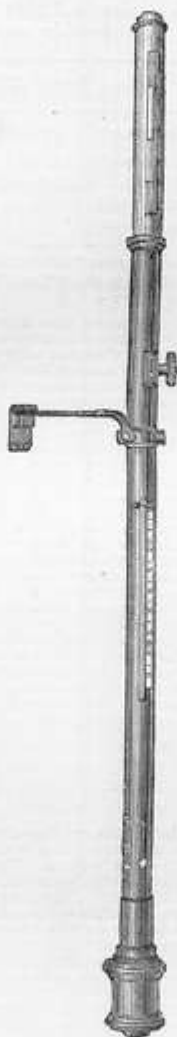


Fig. 15.
Price £4 15s.

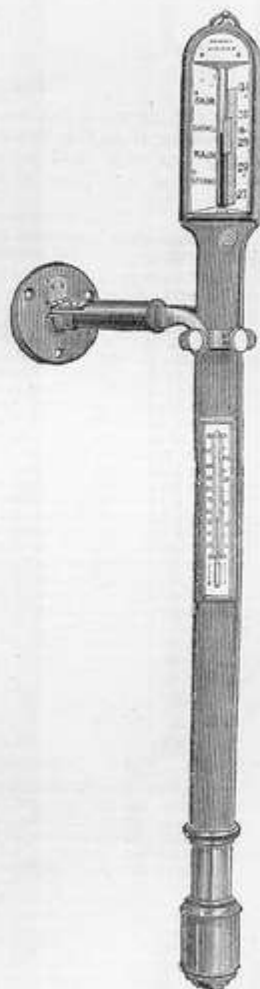


Fig. 16.
Price £2 10s.

JORDAN'S GLYCERINE BAROMETER, Made by J. H. STEWARD.

By Special Permission of the Inventor Mr. JAMES B. JORDAN, of the ROYAL SCHOOL OF MINES, from drawings and particulars supplied by him.

Price, from £20.

FOR ILLUSTRATION SEE FRONTISPICE.

This Instrument has been designed for the purpose of affording a delicate "Weather Glass," indicating small changes of atmospheric pressure by large oscillations of a fluid column of Glycerine, at the same time preserving all the accuracy of the Mercurial Barometer.

The following is an extract from "THE TIMES," October 25th, 1880.

Referring to the Instrument fitted up at the "Times" Office, and from which readings are taken every two hours, and published daily:—

"A fall or rise of 1-10th of an inch in the mercurial column attracts little attention, and is apt to be thought of no consequence; but when the same causes are shown to make a difference of more than an inch in the height of the glycerine column no intelligent person can fail to be impressed by their meaning. In 1830, Professor Daniell made for the Royal Society a water barometer, but the effect of changing temperatures on the water vapour in the Torricellian vacuum masked the indications of varying pressure, and the attempt failed. Other experiments in the same direction gave similar unsatisfactory results, and it was not until Mr. Jordan, of the Museum of Practical Geology, in Jermyn Street, constructed his glycerine barometer that the problem, simple as it appears, could be considered solved. The specific gravity of pure glycerine is 1.26, or less than one-tenth that of mercury; so that the mean height of the glycerine column is 27-ft. at sea level. The only serious drawback found by Mr. Jordan was the tendency of glycerine to absorb moisture from the atmosphere. He ingeniously overcame that defect by covering the surface of the liquid in the barometer cistern with a shallow layer of heavy petroleum oil, thus neutralising its absorbing tendency while the atmospheric pressure remained intact. The tube is an ordinary composition metal gas pipe, forming the body of the instrument, three-eighths of an inch internal diameter, and furnished at the top with a metal socket, into which is cemented a glass tube 4-ft. long and having an inside diameter of one inch. The upper end of this glass tube is formed in the shape of an open cup, fitted at its neck with an india rubber stopper. In this tube the fluctuations of the top of the column are observed and the height read off on scales placed on either side of the tube and fitted with moving indices and verniers. The scale on one side is divided into inches and tenths of absolute measure, numbered from the level of the liquid in the cistern, while that on the other shows equivalent values reduced to a column of mercury and divided into tenths and hundredths, each hundredth being equal to about one-tenth of an actual inch. The main tube, 27-ft. long, is connected at the base with a copper cistern, tinned inside, 5-in. deep and 10-in. in diameter. This cistern is fitted with a screwed cover, through a small hole in the cup of which the air has access, while cotton wool is used for filtering out dust."

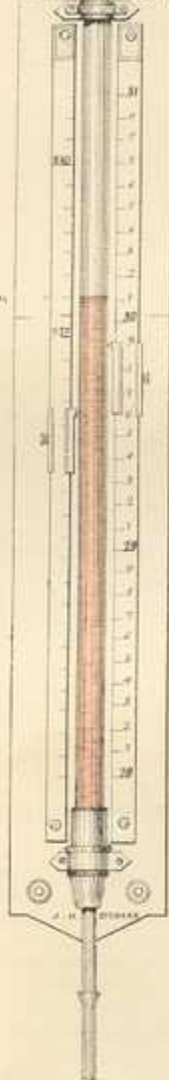
To fill the Barometer it is only necessary to screw the plug into the end of the tube in cistern (E), and gently pour the glycerine (previously warmed to 100° Fht.) into the cup at top, so that it slowly runs down the inside of tube until it is full, and the india rubber stop is then inserted:—

"The screw plug of the cistern being removed for a few seconds, to allow the column to fall an inch or two and then replaced, the instrument is now allowed to rest until all traces of air in the liquid have ascended into the Torricellian vacuum. Then the india rubber in the top cup is again withdrawn and the tube finally filled up with glycerine, when, the screw plug in the cistern being withdrawn, the column gradually falls until balanced by the pressure of the atmosphere. A small quantity of glycerine left in the cup above the india rubber stopper, with a plate-glass cover on the top to keep out the dust, hermetically seals the vacuum and completes the arrangement. One of these barometers has been constructed at the Kew Observatory, the Royal Society Committee devoting a small grant from the Government fund at its disposal for the purpose. Another has been placed in the Museum of Practical Geology in Jermyn Street. There is a third in operation at South Kensington, and the fourth is now in operation at this office. It seems unquestionable that an instrument of this kind is admirably suited for practical use at meteorological stations, at seaports, in collieries, and in all other situations where it is of importance for the unpractised eye to notice frequently and easily the changes taking place in atmospheric pressure."

Since the above was written, J. H. STEWARD has fitted up an instrument at Folkestone Harbour for the South Eastern Railway Company; also one at his Head Establishment, 406, Strand, and another at his 456, West Strand Establishment.

JORDAN'S
CERESINE BAROMETER

INCHES
CERESINE
EQUIV.
MERCURY



NEUTRAL
POINT



FRONT VIEW
OF PORTION OF TUBE
FULL SIZE



NEUTRAL
POINT

27 FEET

WALL



CISTERN

ANEROID BAROMETERS.

IN CARVED OAK AND OTHER WOOD FRAMES.

Carved Oak Circular Frame Aneroid Barometer, 5-inch Card Dial, with Thermometer attached, suitable for Yachts, Library, or Hall, Price £1 15 0

Ditto ditto 8-inch, with Ebonized and Nickel-plated Rim, very pretty. Price ... £2 2 0

Ditto ditto ditto Medal dial ditto 2 10 0

Carved Oak Aneroid Barometer, 5-inch Card Dial, with attached Thermometer to Frame. Price ... £2 2 0

Solid Carved Oak Wheel-form Aneroid Barometer, 8-inch Card Dial, with attached Thermometer. Price £2 15 0 & £3 3 0

Ditto ditto very handsome Frame, 8-inch Dial, with Visible Movement. Price ... £3 10 0

Ditto ditto superior finish elaborately carved Frame and Silvered Metal Dial, with attached Silvered Metal Thermometer to match (similar in form to Fig. 5, p. 4). Price ... £4 15 0

Ditto ditto in Mahogany, Walnut, or Rosewood Frame Price £5 0 0

Ditto ditto Compensated Movement (Fig. 5) 5 15 0

Ditto ditto more elaborately carved 6 15 0

Ditto ditto with Key and mechanical arrangement for Setting Index, and Nickel mounts 7 15 0

Very handsomely Carved Oak Frame Aneroid Barometer, 8-inch Silvered Metal Dial, Visible Movement, compensated for Temperature, with attached Mercurial Thermometer, having large Spiral Bulb, best quality throughout. Suitable for presentation. Price ... £6 10 0

Best Quality 5-inch Aneroid Barometer, Silvered Metal Dial, in handsome Carved Oak Frame (similar to Fig. 29, p. 11). Suitable for a Library or Study. Price ... £3 18 6

Ditto ditto with Curved Thermometer attached to the Dial... 4 4 0

Richly Carved Oak Aneroid Barometer, best quality, 5-inch Silvered Metal Dial, with Thermometer attached (see Fig. 22, p. 11). Price ... £5 15 0

Ditto ditto ditto (see Fig. 22, p. 11). 5 15 0

A variety of Designs in this style of Aneroid always kept in stock.

COMBINED CLOCK AND ANEROID BAROMETERS, WITH ATTACHED THERMOMETERS.

The above are now very much in use, and form a very happy combination of the useful and ornamental. The Designs are varied, and the prices range from £3 10s. to £25.

No. 1. Carved Oak Frame, to hang up, with 6-inch Card Dial Aneroid Barometer, attached Thermometer, and 8-day Horizontal Clock. The latter is fixed at the top of the Frame, the Thermometer in the centre, and the Barometer at the bottom. Price ... £4 10 0

No. 2. Ditto ditto superior finish, with Silvered Metal Dials to the Aneroid and Clock. Price ... £6 10 0

No. 3. Very superior, highly finished, and elaborately Carved Oak Frame, with 8-inch Silvered Metal Dial Aneroid, Visible Movement, 8-day Lever Striking Clock, and attached Circular Bulb Thermometer. Price ... £12 12 0

No. 4. A very massive and handsomely carved Frame, Eagle supporting Clock, Silvered 10-inch Dial to Barometer, Spiral Bulb attached Thermometer. Total height of Frame, about 4 feet. A very noble looking Instrument. Price ... £15 15 0

No. 5. Handsomely designed carved Oak Frame, suitable for a Library or Dining Room, 5-inch Silvered Engraved Dial Aneroid, and 8-day Horizontal Clock, with Spiral Bulb Thermometer, Double Scale (see Fig. 20, p. 11). Price £12 12 0
Ditto ditto not quite so highly finished, and Plain Dial ... 6 6 0

No. 6. Carved Oak Aneroid, 5-inch Dial, and Clock with Horizontal Movement, fitted in Frame above it. Price ... £3 10 0

METAL GILT COMBINED CLOCK AND ANEROID BAROMETERS.

No. 1. A very pretty design, consisting of an Eagle with spread wings, resting on a pedestal. On one side of the Eagle is an Aneroid, and on the other a Clock; the Dials of each are Silvered Metal; Stand about 8-in. high, and the entire width of instrument, 8-in. Price, complete ... £4 15 0

Glass Shade and Stand for the above ... 0 5 0

No. 2. Metal Gilt Aneroid Barometer; a very pretty design of an Eagle, with spread wings, supporting the Aneroid, which has a Silvered Metal Dial. Price ... £2 2 0

A Clock to match the above ... 2 10 0

(Any of the above in Oxidized Metal, at the same price.)

Glass Shade and Stand to either of the above ... 0 3 6

No. 3. Very superior finished Ormolu Gilt Combined Clock and Aneroid Barometer, of the best quality, complete, in Travelling Case, and including Glass Shade and Stand. Price ... £8 15 0

No. 4. Ditto ditto with the addition of a Thermometer on Pedestal between the Aneroid and Clock. Price ... £9 15 0

No. 5. Nickel Plated, combined Aneroid and Clock, oval dials, and pillar in centre; reliable movements. Price ... £5 5 0

Handsomely Ormolu Gilt Aneroid Barometer, the Framework being in the form of the Steering Wheel of a Ship, richly engraved. Silvered Dial to the Aneroid. All of the highest finish. Complete, with Glass Shade and Stand. Price £6 10 0
Ditto ditto a size larger ... 7 10 0

WATCHMAN'S CONTROLLERS.

Patent Portable Control Watch, or Tell-tale Clock, with strong lever movement going 42 hours, and revolving a chart divided into hours and 10 minutes, on which distinctive marks are made by six different keys, that can be fastened by their chains at different stations or places that a Watchman, Gaoler, &c., should be at a given time. The brass case is 3 inches diameter, 1½ inch deep, with extra strong bow, and a lock and key. Price complete, with 800 Bulletins or Charts, and a Control Book for fixing same in for reference ... £5 5 0

These have been supplied by J. H. STEWARD in considerable numbers to the Indian Government for use in the Prisons and Gaols of India, and give great satisfaction.

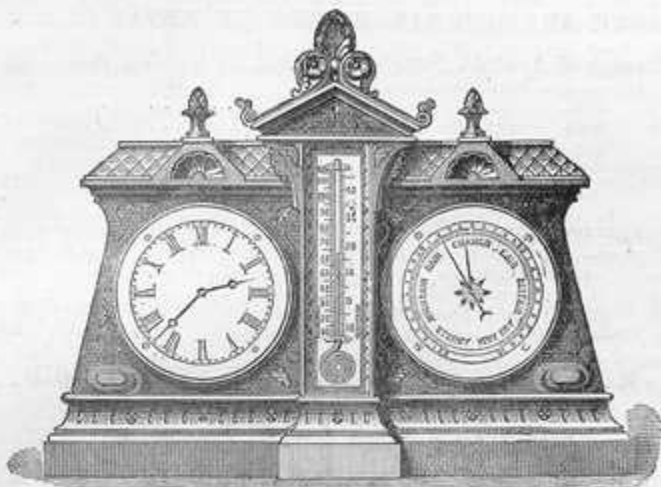


Fig. 20.—Combined Clock and Aneroid Barometer in carved Oak,
 £6 6s. & £12 12s.
 (See No. 5, page 10.)



Fig. 29.—Carved Oak Aneroid
 Barometer, £4 4s.
 (See p. 9.)



Fig. 22.—Carved Oak Aneroid Baro-
 meter, best quality, £5 15s.
 (See p. 9.)

5-INCH ANEROID BAROMETERS, IN METAL CASES.

The Improved Aneroid Barometer, 5-inch Card Dial, in Brass Lacquered Case, and including a Travelling Case.				Price	...	£1 1 0
Ditto	ditto	with Thermometer	...	...	...	1 5 0
Ditto	ditto	with Silvered Metal Dial	...	...	...	1 15 0
Ditto	ditto	without Thermometer	...	...	...	1 10 0

The foregoing Instruments are of French manufacture, but tested and guaranteed by J. H. S.

The Improved Aneroid Barometer, J. H. Steward's own make, 5-inch Card Dial, in Brass Lacquered Case, and including a Travelling Case				...	£1 10 0
Ditto	with Thermometer	...	...	...	1 13 6
Ditto	Metal Silvered Dial	...	...	...	2 5 0
Ditto	ditto with Thermometer	...	...	...	2 10 0
Ditto	Open Metal Silvered Dial, showing Movement	...	...	...	2 15 0
Ditto	ditto with Thermometer	...	...	...	3 0 0

Adding small feet to any of above, so that they can stand alone, 2s. 6d.

Best Quality 5 inch Aneroid Barometers.

Best Quality Improved Aneroid Barometer, compensated for the variation of Temperature; best Silvered Metal raised Dial, reading to 100ths of an inch, with Thermometer attached, and including square Morocco Leather Travelling Case.

				Price	...	£4 4 0
Ditto	ditto	with fixed or revolving Altitude Scale of feet up to 10,000.	...	...	...	6 6 0
Ditto	ditto	with revolving or fixed Altitude Scale, reading to 20,000 feet.	...	...	...	7 7 0

Best Quality Extra Sensitive, very open Scale 5-inch Aneroid, reading very clearly to 100ths of an inch, in Oak or Mahogany Case, with Lock and Key, Glass Top. Range 28 to 31 inches.

If a Solid Leather Sling Case is supplied in addition to the Ordinary Case, 10s. 6d. extra.

Very Sensitive Open Scale 5-inch Aneroid, with Revolving Altitude Scale of feet—3,000 up and 1,000 down, to read to 5 feet; Nickel Plated Case, with adjusting Magnifier to rim, and including a Solid Leather Travelling Case.

Price ... £7 15 0

(This will be found to be an exceedingly reliable and valuable Instrument in measuring small altitudes.)

Carved Oak or Mahogany Stands, to fit any of the above Instruments, from 9s. 6d. to 30s. each.

Yachting Aneroid. Best Quality. Compensated for Temperature, 8-inch Silvered Metal Dial, with Attached Thermometer, the whole inclosed in a Metal Case.

Price ... £4 4 0

Ornamental Frame Aneroid, Carved Oak, Nickel, &c., from 5-inch Card Dial Ship's Aneroid, with Thermometer in Bronze Cylindrical Case.

Price ... £2 10 0

8-inch ditto ditto 2 15 0

6-inch Lever Clock to match ditto 4 4 0

6-inch Horizontal Clock ditto 2 15 0

The sizes quoted represent the diameter of the dials.

POCKET-SIZE ANEROID BAROMETERS.

These Instruments are called Pocket Aneroids, from their convenient size. They are between the 5-inch and the Watch Aneroid—outside diameter of dial about 2½-inches, depth of case 1½-inch. They are recommended where extreme portability is not so much a consideration as an Open Scale.

No. 1. Steward's Pocket Aneroid Barometer, ordinary ranges, in Leather Snap Case.				Price ...	£2 10 0
No. 2.	Ditto	ditto	Compensated for temperature ...	...	3 3 0
No. 3.	Ditto	ditto	with Fixed or Revolving Altitude Scale of feet ranging from 6,000 to 16,000, according to requirement ...	...	4 10 0
No. 4.	Ditto	ditto	ditto 20,000 ...	...	5 5 0
No. 4A. Ditto ditto ditto Altitude Scale 8,000 or up to 17,000 feet. With Ivory Circular Thermometer at Back, and a Singer's Patent Day and Night Compass with Stop, in Centre. Complete in Reversible Snap Case, so that either the Barometer or Compass and Thermometer may be used without removal of the Instrument from its Case.				Price ...	5 15 0

No. 4B. The Sopwith Aneroid. A very compact and reliable Instrument. Diameter of Case just under 3 inches; compensated for temperature. Fixed altitude scale, 3,000 up and 1,000 down; reads to 10 feet; Magnifier attached to glass. At the back of the case, which is made of brass, bronzed, is a Singer's Dial Day and Night Compass, 1½-inch in diameter, with stop. Around this is a Circular Thermometer, with a double scale. The whole fits into a solid Leather Sling Case for Travelling.

Price ... £7 7 0

In this form of Instrument the Altitude Scale is engraved on a ring of metal, raised above the dial, the Barometrical Scale being on the dial; the two are thus distinct from each other, and readings can be quickly taken.

The above Instrument was designed and constructed for Mr. T. Sopwith, jun., the eminent Engineer, who found it to answer its purpose most efficiently.

No. 5. Steward's Improved Pocket Aneroid, with Revolving Altitude Scale, reading to 10 feet, 4,000 up and 1,000 down.

Price ... £4 4 0

This Instrument has been designed to meet the requirements of Engineers, Surveyors, &c., in measuring altitudes of from 10 feet to 4,000 feet, and for use in mines. It has a very open Scale of Inches, and a Revolving Altitude Scale divided in a new way, so that each division represents 10 feet, and can be clearly distinguished from the next. The hand is made long and very fine at the point, and the other parts of the Instrument are all constructed so as to insure the greatest possible accuracy. Since their introduction J. H. S. has sold a great number of these Instruments to practical Surveyors and Miners, and in each case with the most satisfactory result. He has also had the pleasure of supplying several for the American Government Surveys, as will be seen by the following letter. (See also No. 12, page 15, for Watch size):—

Milwaukee, Wisconsin, U.S.A.

Mr. J. H. Steward, 406, Strand.

March 13th, 1874.

DEAR SIR,—Prof. E. T. Cox, State Geologist of Indiana, showed me an Aneroid Barometer of extra fine quality as to graduation, compensation, &c., which he purchased of you (price £4 4s.) last year, and which he finds to answer the purpose of measuring altitudes with great satisfaction.

I herewith send you a draft for three such Instruments, for use in the State Survey of Wisconsin.

Yours truly,

J. A. LAPHAM, State Geologist.

(See also Mr. Hall's Letter, page 16.)

No. 6. Steward's Improved Military Surveying Pocket Aneroid, with Revolving Scale, reading to 20 or 25 feet, 1,000 up and 1,000 down. See Letter below.)

Price ...	£3 13 6
Ditto ditto to read to 10 feet	4 4 0

N.B.—All the Cases of the above Instruments are Brass Lacquered; extra cost of substituting a Nickel Plated or Electro Silvered Case, 6s.

Solid Leather Sling Cases, 8s. 6d. each, or improved pattern with front to fall, 15s. 6d.

Singer's Patent Day and Night Stop Compass and Double Scale Thermometer on Ivory in Lid of Case. Suitable for any of the above Instruments.

Price ...	£1 12 6
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North Camp, Aldershot,
March 10th, 1873.

Mr. J. H. Steward, 406, Strand,
SIR,—With much pleasure I give you my opinion of the beautiful Surveying Aneroid you made for me. I have found it very accurate in estimating heights from 25 feet upwards, and I consider it a most valuable Instrument for fixing the contours in a military survey, saving an immense amount of labour necessarily occasioned by the use of the ordinary Levels, &c., and still more valuable time. The perfect manner in which the scale and indicator have been finished, enable the reading to be taken far more accurately than they can be in any similar Instrument I have ever seen.

Very truly yours,

B. BENNETT, Major 46th Regt.

Mr. J. H. Steward, 406, Strand.

London, April 7th, 1876.

This is to certify that I have had a Pocket Aneroid, made by Mr. Steward, for five years, having been most of this time in Canada. The variation of the Instrument during this period was only 1-10th of an inch.

R. S. KNIGHT, F.R.S.L.,
London.

WATCH ANEROID BAROMETERS.

So called from their similarity in shape and size to a Watch. The usefulness and accuracy of these Instruments may be gathered from the following extract, copied by permission of the author, from a small work entitled, "The Aneroid Barometer: How to Buy and How to Use it," by a Fellow of the Meteorological Society, a copy of which is given with each Instrument sold:

"We have a no less important authority than that of the late Admiral Fitzroy for stating that 'Aneroids are now made so portable that a pilot or chief boatman may carry one in his pocket, as a railway guard carries his timekeeper; and thus provided, pilots cruising for expected ships would be able to caution strangers arriving, if bad weather were impending, or give warning to coasters or fishing boats.'"

"The same authority says the Aneroid is quick in showing the variation of atmospheric pressure, and to the navigator who knows the difficulty, at times, of using the Barometer, this Instrument is a great boon, for it can be placed anywhere quite out of harm's way, and is *not affected by the ship's motion*, although faithfully giving indication of increased or diminished pressure of air. In ascending or descending elevations the hand of the Aneroid may be seen to move (like the hand of a watch), showing the height above the level of the sea, or the difference of level between places of comparison.

"Colonel Sir Henry James, R.E., of the Ordnance Survey Department, has issued a series of *Instructions for taking Meteorological Observations*, and in speaking of the Aneroid Barometer he says: 'This is a most valuable Instrument; it is extremely portable. I have had one in use upwards of ten years, and find it to be the best form of Barometer as a weather glass that has been made.'"

"James Glaisher, Esq., F.R.S., the fame of whose balloon ascents is now almost world-wide, and one of whose objects in making balloon ascents was 'to compare the readings of an Aneroid with those of a Mercurial Barometer up to five miles,' says: 'The Aneroid readings from all the observations made in the several ascents may be safely depended upon, and also that an Aneroid can be made to read correctly to pressures below twelve inches, and even to the first place, and probably to the second place of decimals.'"

"Mr. J. H. Belville, of the Royal Observatory, Greenwich, in referring to results

obtained from the Aneroid during a tour in Wales, says that 'its movements were always consistent.' 'It was a delightful companion, and highly useful, its indications preventing many an excursion which would have ended in disappointment. The tourist should never travel without it; and the seaman will find it a safe guide when the motion of the mercurial column renders the marine Barometer almost useless. In all cases the writer has used the Aneroid as its inventor intended it should be used; and its movements are so far perfect that they merit the calm and impartial investigation of the true philosopher, whose vocation is to aid the development of ingenuity, and not to crush its effects because they are not perfection.'

(For Illustrations, see page 18.)

Each Instrument tested under Air Pump in presence of the Customer, if required.

No. 7. Steward's Improved Watch Aneroid Barometer, with Travelling Case.	Price ...	£2 10 0
No. 8. Ditto ditto superior finish compensated for variation of temperature (see Fig. 23, p. 18).	Price ...	£3 3 0
No. 9. Ditto ditto with fixed or Revolving Altitude Scale of Feet from 6,000 up to 8,000 or 10,000 feet.	Price ...	£3 15 0
No. 10. Ditto ditto with fixed or Revolving Altitude Scale of Feet up to 13,000 (see Fig. 24, p. 18).	Price ...	£4 4 0
No. 11. Steward's Improved Military Surveying Watch Aneroid, reading to 25 feet, 1,000 up and 1,000 down.	Price ...	£3 13 6
No. 12. Steward's Improved Watch Aneroid, with Revolving Altitude Scale, 4,000 up and 1,000 down, reading to 10 feet.	Price ...	£4 4 0
N.B.—This is the same description of Aneroid as the No. 5 pocket size, fully described at page 13, and is a very useful one as a weather glass.		
No. 13. Steward's Watch Aneroid Barometer, with Raised Dial Revolving Altitude Scale of Feet up to 8,000 or 10,000, Thermometer on Dial, and Singer's Patent Stop Compass at back.	Price ...	£5 5 0
No. 14. Steward's Compensated Watch Aneroid Barometer, complete, with Singer's Patent Pearl Dial, full-size Stop Compass, and Best Thermometer, all fitted into flat Morocco Case, complete.	Price ...	£5 5 0
No. 15. Ditto ditto with Altitude Scale up to 13,000 feet ...		6 6 0
No. 16. Compensated Watch Aneroid Barometer, with Fixed or Revolving Altitude Scale of Feet from 6,000 to 13,000, and a full-size, fully divided Singer's Dial Compass, with Stop, which may be detached from the Aneroid by unscrewing, and used separately. Complete in double-top reversible Case.	Price ...	£5 15 0
No. 16a. Ditto ditto ditto with Thermometer ...		6 6 0
No. 16b. Ditto ditto ditto 20,000 feet ...		7 7 0
No. 17. The Himalayan, or High Mountain Range Watch Aneroid Barometer, with Altitude Scale of Feet up to 20,000, compensated for variation of temperature, and finished in the best manner throughout (see Fig. 25, p. 18; Testimonial, p. 16).	Price ...	£5 5 0
If in Gorman Silver, Electro or Nickel Plated...	... extra	0 6 0
If Solid Silver Case ...	... ..	1 1 0
No. 18. Steward's Extra Small Watch Aneroid Barometer, compensated for temperature, with Altitude Scale of Feet up to 10,000 (see Fig. 27, p. 18).	Price ...	£3 3 0
	Extra Quality ...	£4 4 0
Solid Silver ditto ditto ...		4 15 0

Extra Thin Cased Instruments can be supplied in any of the above qualities at same prices.

N.B.—The foregoing are all in Metal Cases, gilt in the best possible manner; but any of them may be had in a Nickel Plated Case at an additional cost of 6s., with the exception of Nos. 13, 16, and 16A, which are not recommended in Nickel.

They may also be had in sterling Silver Cases, at prices varying from 26s. to 42s. extra, according to the style in which they are got up.

Ivory Double Scale Circular Thermometer, with a plain Needle Compass in the centre, for fitting into the Lid of the Morocco Case with the Aneroid.

Price ... £1 1 0

If a Singer's Pearl Dial (see Fig. 26, p. 30), or best Bar Needle Compass with Stop.

Price ... £1 5 0

The addition of this is strongly recommended, as it makes a very complete set of Instruments. Another way of fitting up the Watch Aneroid Barometer is putting it into a flat Morocco Snap Case, with a Singer's Stop Compass, same size as the Barometer, and an Ivory detached Thermometer in the centre. This adds 42s. to the cost of any of the Watch Aneroids of the following numbers—7, 8, 9, 10, 11, 12, 13, and 17.

Watch Aneroid Barometer, in 18-carat Gold Case ... from £11 11 0

Miniature Watch Aneroid Barometer, in 18-carat Gold Case. Size about 1½-inch in diameter, with altitude scale to 7,000 feet; perfectly reliable; constructed on the same principle as the larger aneroids, but with an extra fine chain.

Price ... £7 10 0

Gold Charm Aneroid Barometers, as usually sold, suitable for weather, from £4 4 0

The following refers to No. 17, Watch Aneroid Barometer, "The Himalayan":—

Whybank, Mussoori, N.W.P., India,
October 4, 1869.

This is to certify that the Aneroid Barometer made to my order by Mr. J. H. STEWARD, of 406, Strand, London, has proved to be a most useful Instrument. As regards recording the heights of mountains, I have proved it to be wonderfully correct, on a late visit to the Himalayas; and I can most strongly recommend a similar Instrument to any who may have occasion to travel in a country whose mountains range between 5,000 and 20,000 feet. I may also add that the Instrument in question has proved itself to be a very good indicator of the state of the weather, and, when returning to India in February, 1869, it was tested on board the steamer with the ship's barometers, and found to be very sensitive and true. I have seen, both in the country and at home, other Pocket Barometers, but none which for portability and accuracy could approach the one under notice; and the Compass and Thermometer fitted in the lid of the case are novel, useful additions.

ROBERT PRINGLE, M.D.,
Surgeon H.M. Bengal Army, and Superintendent of Vaccination
in Terra Ghurival, Himalayas.

Cape Town, September, 1876.

Mr. J. H. STEWARD,

DEAR SIR,—Your small Aneroid with scale of heights I had many opportunities of testing with Levels accurately fixed in Railway or large Geodetical operations, and found it extremely accurate, giving the strictly ascertained heights by levelling or other scientific operations within 3 feet, in a height of more than 3,000 feet; it is just the thing for mining, railway, or geological levelling in a country like South Africa.

Yours very faithfully,

HENRY HALL,
Late Surveyor War Department.

Extract from Letter received from Lieut. Jacson, 28th Regiment, in reference to one of the Watch Aneroids, Sept., 1876.

I may mention that last year I used one of your Aneroid Barometers for heights, through Corfu, the Herzegovina, and Dalmatia, and down through Italy, crossing the mountains twice, which I found acted admirably.

Extract from Letter received from Professor M. Stuart Phelps, U.S.A.

I tried the Aneroid on Drachenfels to-day. Correct within six feet.

The following Testimonial refers to the Watch Aneroid Barometer, with Altitude Scale to 9,000 feet:—

Monksfield, near Ryde, Isle of Wight,
February 6, 1877.

Mr. J. H. Steward, 406, Strand.

Sir,—The performance of a Watch Aneroid Barometer (No. 632, compensated) which I bought of you so long ago as June, 1870, has been so remarkably good that I think I ought to let you know of it. I now find it absolutely correct on comparison with a standard mercurial barometer, notwithstanding the fact that it has never been once regulated, or the regulating-screw touched, since I bought it; and during this time it has been exposed to some very severe usage, having been six times taken across the Atlantic, and having undergone great variations of climate, and some thousands of miles of land travel. I may add that I have found it extremely accurate in measuring heights, and though it has twice been taken from 500 to 700 feet higher than the altitude (9,000 feet) for which it is graduated, its accuracy has remained unimpaired.

Very truly yours,
G. PEABODY RUSSELL.

The following letter refers to the Himalayan Watch Aneroid:—

To Mr. J. H. STEWARD, Optician, &c.,
406, Strand, London, W.C.

Westbury, Wilts.
April 23rd, 1881.

DEAR SIR,—I have much pleasure in bearing testimony to the accuracy and usefulness of the small 1½-inch scale Pocket Aneroid Barometer I had of you six years ago, *i.e.*, in 1874. It has been with me four times across the Atlantic, besides on voyages in the Pacific, on the west coast of South America, and it has worked with the ship's Barometers with remarkable accuracy, only of course moving through a smaller space by reason of its larger or more extended scale. It also showed the height of the different mountains I ascended in South America, especially in Peru, where, besides visiting the Trans-Doya line of railway, which rises to a height of more than 14,000 feet above the sea, I also visited several of the mines, which are situated at a height of 12,000 feet or more above the sea, and these heights it indicated to within a few feet of the other Barometers used by the engineers. I had previously tried it in both the Alps and the Pyrenees, in which latter it indicated accurately the heights of the Pic du Midi d'Osseau, and the Pic de Ger, as well as several of the heights of the Apennines. I consider it a thoroughly reliable Instrument for altitudes, as the little variations on the railways may also be noted by it. While it is no less useful for the weather, and the approach of the late storms of the past increment winter and spring season of 1881 was invariably indicated by its retrograde motion and its low position until the force of the storm was about to abate. As this kind of Barometer is now used on the largest steamships, it is a proof, if others were needed, of their utility. And I gladly bear testimony to the utility of the one I had of you, which is also exceedingly convenient for its portability, and forms a most interesting and useful travelling companion, which, with use, one can hardly do without.

I remain, dear Sir,
Yours faithfully
W. B. KEER, M.R.A.S.,

Curate in charge of Heywood, Wilts. and late British Chaplain, Valparaiso,
formerly Harbour Chaplain, Bombay, &c.

WATCH ANEROID BAROMETERS—CHEAP SERIES.

These are thoroughly reliable as Weather Instruments in indicating the varying pressure of the Atmosphere, also for giving Altitudes up to 8,000 feet, being of a quality quite equal to what are generally sold as best. Where extreme accuracy is required, J. H. S. recommends those previously described at pages 14 and 15.

PRICES.

Watch Aneroid Barometer,	Hard Enamel Dial.	Price	...	£1 15 0
Ditto ditto	Silvered Metal Dial, with words, Fair, Change,			
	Stormy	...	...	1 18 6
Ditto ditto	ditto	fixed Altitude Scale	...	2 5 0
Ditto ditto	ditto	revolving Altitude Scale	...	2 10 0
Ditto ditto	Silvered Metal Dial	ditto	...	2 8 0
Ditto ditto	Hard Enamel Dial, with Thermometer and			
	Compass at back	...	...	2 10 0
Ditto ditto	Engraved Dial and revolving Altitude Scale,			
	with Thermometer and Compass at back	...	...	3 5 0

The following Illustrations give the exact size of some of the Watch Aneroids:—



Fig. 23.—Price £1 15s. and £3 3s.

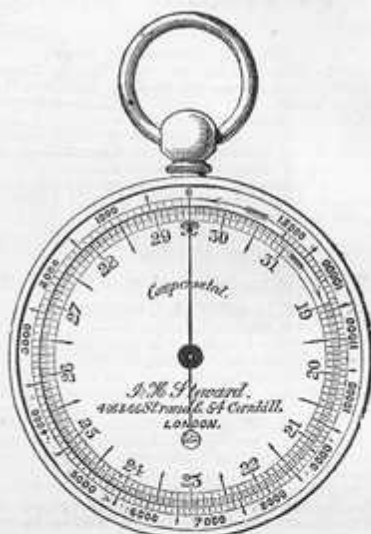


Fig. 24.—Price £4 4s.

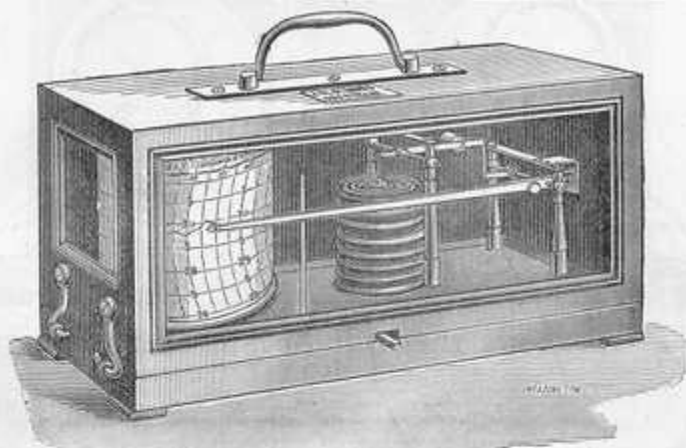


Fig. 25.—Price £5 5s.
The Himalayan Aneroid.



Fig. 27.—Price £3 3s.
and £4 4s.

THE NEW
PORTABLE RECORDING BAROMETER.



SIZE, 11-INCHES LONG, 6-INCHES HIGH, 5-INCHES DEEP.

PRICE £6 6 0.

WITH SET OF 52 WEEKLY CHARTS.

This Instrument is extremely sensitive, and accurate, and very portable. It can be moved about without fear of deranging the works, and only requires attention once a week.

DESCRIPTION.

The works consist of a series of vacuum boxes attached together, and working a lever having a counterpoise fixed to it. The variations of atmospheric pressure act on the vacuums the same as in the ordinary Aneroid Barometers, an increase or decrease of pressure causing them to contract or expand. This action is considerably increased by multiplying levers connected with a long arm having a pen attached to the end which marks on a chart. This chart is placed on a cylinder containing clock-work, with horizontal movement, which causes it to make one revolution in a week, and as it is divided longitudinally into days and hours, the exact height of the Barometer is registered continuously. Adjustments are provided for setting the instrument to agree with a standard Barometer, also for adjusting the pen for position and pressure on the paper, and for putting the instrument in and out of action.

The pen only requires filling once a week with the prepared ink (Aniline mixed with Glycerine), supplied with the instrument, and the chart is easily replaced by a fresh one when the clock is wound up weekly, a strip of metal keeping the ends of the paper down. The time can be told by estimation to within a quarter of an hour.

The whole works are contained in a Mahogany Case, 11-inches long, 6-inches high, and 5-inches deep, with a glass front.

Several of these have been supplied to scientific gentlemen, noblemen, &c., and are giving great satisfaction, both from their sensitiveness, accuracy and simplicity.

THERMOMETER recording on similar system to above,
(description post free) £6 6 0.

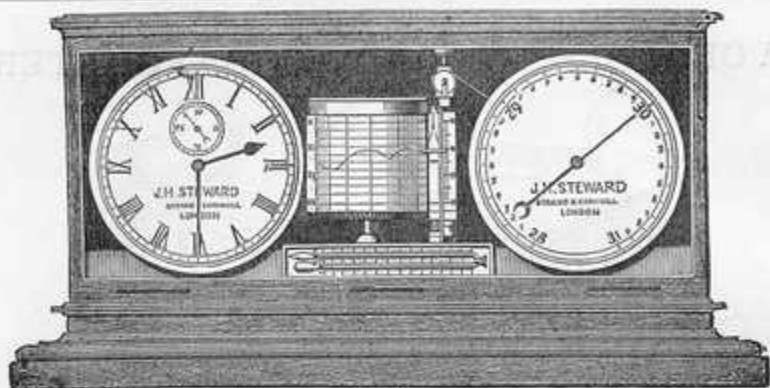


Fig. 31.

J. H. STEWARD'S IMPROVED HOURLY SELF-RECORDING ANEROID BAROMETER.

Price £25.

This Instrument is designed to show the various fluctuations which may have taken place in the Barometer in the interval between the hours of observation. It consists of a large and powerful Aneroid, with very open range, and scale reading to 100ths of an inch, and an eight-day clock, each with eight-inch Dials; between these is placed, in a vertical position, a cylinder four inches in diameter. The circumference of this cylinder is furnished with a tooth wheel, which works in an endless screw at the back of the Instrument; it has a paper attached to it ruled to coincide with the Barometer scale. This paper, besides being ruled horizontally into inches and tenths, to correspond with the Barometer scale, is divided vertically throughout its entire length of 12 inches into seven principal and seven minor divisions indicated by darker and lighter lines; the dark lines represent the noon, and the lighter lines the midnight of every twenty-four hours. The paper (which is metallic prepared) thus lasts one week. Near the paper, a point guided by a rod of metal is moved up and down, as the action takes place in the Aneroid, and at every hour the point is made to mark the paper by simple mechanism connected with the Clock. A system of levers in connection with the Clock produces a sharp tap or blow on the Aneroid movement three times in every hour, to overcome any slight friction, and ensure a due response to the pulsations of the vacuum chamber.

By this means a black dotted curved line is produced, showing at a glance the height of the Barometer, whether it is falling or rising, or how long it has been doing so, and at what rate the change is taking place—whether at the rate of one-tenth per hour, or one-tenth in twenty-four hours—facts which can only be obtained by very frequent and regular observations from an ordinary Barometer, but which are, nevertheless, essential to a reliable “weather forecast.”

The Barometer has the advantage of freedom from complication, and has great improvements on those previously made, by which the friction is reduced to the minimum, and the greatest possible accuracy obtained. It is designed especially to suit the general public, and is handsome in appearance, and not easily put out of order, being admirably adapted for public libraries, the reading rooms of Clubs, &c., as well as for use by meteorological observers generally. The case is made of Walnut Wood or Mahogany.

* * This extract is, by permission of the Author, from a very useful little work, entitled, “The Aneroid Barometer: How to Buy, and How to Use It.” By a Fellow of the Meteorological Society.

Small size Instruments, suitable for Yachts or Ships, the Clock movement being Lever. Price ... £30 0 0

PEDOMETERS.



Fig. 32.

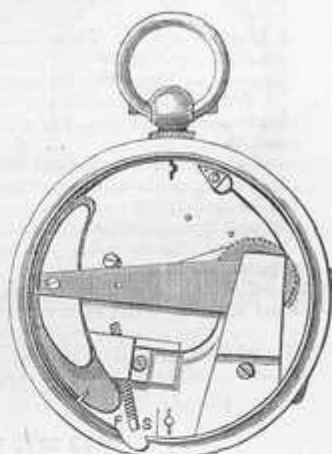


Fig. 33.

Pedometer for accurately measuring the distance walked by the wearer. Fig. 32 represents the exact size, and is a front view of the Instrument. Fig. 33 shows the construction of the works. It should be suspended, either by a ribbon round the neck, or by a hook in the waistcoat pocket. The figures on the dial represent miles, and the dots between the figures quarter-miles. When the Pedometer is to be used, the hand should be set exactly at twelve, which can be done by moving it backward or forward with the finger. The Instrument requires to be regulated to the particular person who uses it. The method of doing this is by walking a certain distance which is known to be correct. If the Pedometer should register a greater or lesser distance, the regulator at the back of the movement is to be turned with the key in the direction of either the letter F or S (fast or slow) as the case may be.

Geneva Manufacture, in Nickel Cases	£1 1 0
Ditto ditto in Silver Cases	1 10 0
Ditto ditto in Nickel Case, with the addition of a small Dial at the bottom of the ordinary one, which indicates, by self-registering every 10 miles walked up to 100 miles. Price ...	1 10 0
Best Quality, J. H. Steward's own make	3 3 0
Ditto ditto in 18-carat Gold Cases	7 10 0

Combined Watch and Pedometer, in sterling Silver Case, a most useful Instrument. Price ... £4 4 0

Passometer, or Step Counter. An Instrument similar to the Pedometer, but recording the number of steps or paces taken by the wearer, from one to 2,500 paces. A third Dial indicating the number of times that 2,500 paces have been taken. Price in sterling Silver Cases £4 4 0
Ditto ditto Geneva make, Nickel 2 2 0

TROCHEAMETER.

This Instrument is for ascertaining the distance travelled by road. It can be readily attached to the wheel of a brougham or coach, velocipede, or gun-carriage, by means of straps supplied with it. It works by an endless screw turning a toothed wheel, connected with a register and index. Price, complete, in Japanese Tin Case £2 17 6

Ditto ditto ditto with Stop, in Copper Case 3 3 0

CHRONOGRAPHS.

Pocket Chronograph, or Time Measure, reading to fifths of a second (same as supplied to the National Artillery Association and the Metropolitan Fire Brigade), complete in case	£4 4 0
Ditto ditto superior finish, size and form of a Watch, sterling silver cases, winds up at the stem same as a keyless Watch, reads to one-fifth of a second	6 6 0
Improved Combined Watch and Chronograph, keyless action, sterling silver cases, reads to quarter seconds; a very fine Instrument, and can be thoroughly recommended	7 7 0
Chronograph Speed Indicators, as supplied to the Westinghouse Brake Company. Shows miles per hour for $\frac{1}{4}$ -mile distances; improved register and index, in case	5 15 0
Combined Watch and Chronograph, keyless, with dial, having centre hand showing fifths of seconds on one side and regular Watch dial on the other; improved starting, stopping, and fly back actions, Nickel Case... ..	4 4 0
Ditto ditto Silver	4 15 0

THERMOMETERS.

(For ILLUSTRATIONS, see pages 28 to 32.)

Boxwood Thermometer, ten-inch Spirit Tube	£0 1 0
Superior finished ditto Mercury 5s. 6d., 3s. 6d., &	0 2 6
Boxwood Minimum Garden Thermometer, for registering the extreme Cold 8-inch, 1s.; 10-inch, 1s. 6d. &	0 2 6
Zinc ditto ditto (see Fig. 67, p. 32) 2s. 9d., &	0 3 9
Porcelain ditto	0 5 6
Brewing Thermometer, in Copper Case, 12-inch, 9s. 6d., 8-inch	0 5 6
Pocket Travelling Thermometer, Boxwood, 3s. 6d.; Ivory, (see Fig. 63, p. 31)	0 8 6
New Pocket Thermometer, with Circular Tube, on Enamelled Glass Scale, in morocco case	1 1 0
Pocket Maximum and Minimum Self-Registering Circular Tube, with two Indices. Price, in morocco case, with Miniature Magnet	1 5 0
Ditto ditto ditto Revolving German Silver Frame (Fig. 65, p. 31), 7s. 6d., 9s. 6d., &	0 12 6
Revolving Case Pocket Thermometer, superior finished, Ivory Scale, backed with German Silver; long range; suitable for any part of the world (length $4\frac{1}{4}$ -inches). Price 14s. 6d.; nickel plated... ..	0 16 6
Pocket Travelling Maximum and Minimum Thermometers, Ivory Scales, complete in Case	1 5 0
Ditto ditto (Dr. Livingstone's pattern) extra small, Metal Scales, Engine divided on the Tubes, Mahogany Case	1 15 0
Bath Thermometer, Eight-inch, in Tin Case 2s. &	0 2 6
Eight-inch Porcelain ditto	0 5 6
Ten-inch ditto ditto with bath words	0 7 6
Eight-inch Porcelain Ordinary Thermometer 5s. 6d. &	0 4 6
Stx's Thermometer, Eight-inch, Scale self-registering the greatest amount of Heat and Cold, Boxwood Scale, in Japanned Case, with Magnet	0 7 6
Ditto Enamelled Tubes	0 8 6
Eight-inch ditto ditto Enamelled Glass Scale 13s. 6d. &	0 14 6
Ten-inch ditto Boxwood (see Fig. 48, p. 29)	0 12 6

Greenhouse Thermometer, Ten-inch, Enamelled Glass Scale (see Fig. 52, p. 29) ...	18s. 6d. &	1	1	0
Thirteen-inch ditto ditto ...	...	1	7	6
Fourteen-inch ditto ditto ...	...	1	15	0
Twenty-inch Porcelain ditto, as in use at the principal Railway Stations (exclusive of case) ...	£2	2	0	0
Ten-inch Enamelled Glass Six's, on Oak Boards, with Brackets, to revolve, for fixing outside a Window (see Fig. 40, p. 28) ...	...	1	15	0
Fourteen-inch ditto ditto ...	...	2	2	0
Combined Maximum and Minimum Thermometer, self-registering, Cold and Heat, 10-inch Enamelled Tubes, in white japan horizontal tin case (see Fig. 62, p. 31) ...	...	0	14	6
Standard Vertical Maximum and Minimum Mercurial Thermometer, with Indices that can be drawn down by means of a Magnet, Enamelled Glass Scales, mounted on oak board, with guard ...	...	1	15	0
Ditto Engine divided on stem ...	...	2	2	0
Ditto ditto with Brackets on window board... ..	...	3	3	0
If verified, extra ... ..	...	0	10	6
* * The above are so constructed that they will travel satisfactorily, and are the only upright form of Maximum and Minimum Thermometers that the Kew authorities will verify.				
Window Thermometer, Twelve-inch, with Brackets to revolve, on Oak Board ...	...	1	1	0
Fifteen-inch ditto ditto (see Fig. 43, p. 28) ...	...	1	5	0
Cheap Form ditto ditto from ... ..	...	0	6	6
Maximum Thermometer, Ten-inch, on Porcelain ... ..	...	0	8	6
Minimum ditto Ten-inch ... ..	...	0	7	6
Ditto Maximum, mounted on Oak, Engine divided on Stem (Fig. 44) ...	...	0	12	6
Ditto ditto ditto Minimum (Fig. 46) ... ..	...	0	10	6
Philip's Maximum Thermometer, Fifteen-inch, Porcelain on Oak Scale, Engine divided on the tube, and figured on the Porcelain (see Fig. 44, p. 28) ...	...	1	1	0
Minimum ditto Fifteen-inch, to correspond (see Fig. 46, p. 28) ...	...	1	1	0
Solar Radiation Thermometer, Tube enclosed in Glass Cylinder (see Fig. 61, p. 31) ...	...	1	11	6
Stand for same ... ..	...	0	4	0
If with Electrical Test for Vacuum extra	...	0	6	6
Grass Minimum ditto ditto ... ..	...	1	1	0
Board of Trade Marine Thermometer, Copper Case, Porcelain Scale, Engine divided tube ... ..	...	0	10	6
Best Mason's Hygrometer, Porcelain Scales, Tubes, Engine divided on Stem, and figured on Porcelain, fitted on Mahogany Board (see Fig. 42, p. 28) ...	£1 5s. &	2	2	0
Boxwood Hygrometer, in Japanned Tin Case (See Fig. 39, p. 28) 9s. 6d. &	0	15	6	0
Porcelain ditto ditto best quality ... ..	...	1	1	0
Milk Testers, from each	...	0	1	6
Thermometer for Testing the Heat of Ovens, Furnaces, &c., up to 500°.				
Porcelain Scale, Tube bent at right, and encased in a Brass Case, with plates for fixing, &c., complete ... ..	...	1	5	0
The new Patent Self-registering Minimum Thermometer, mounted on Oak Board, Cylindrical Bulb ... ..	...	1	10	0
Ditto ditto on Brass Stand (see Fig. 59, p. 31) ... ..	...	1	5	0
Standard Thermometer, Engine divided on the Stem, the Tube carefully Calibrated, 16 inches long, Figured on Metal Scale at side (see Fig. 55, p. 30), in Morocco Case ... ..	...	2	2	0
Standard Thermometers in Oak or other Frames to order.				
Chemical Thermometer, carefully divided Scale, Enamelled Tube with fine Bore, 12-inch, 6s. 6d., 16-inch ... ..	...	0	9	0

Very Sensitive Thermometer, with Spiral Bulb, in Boxwood	... ..	£1 11 6
Hot-bed Thermometers, plain mounting (see Fig. 50, p. 29)	... ..	0 7 6
Ditto Thermometer, 30-inch Porcelain Scale, in Copper Case, with Brass Tube (see Fig. 51, p. 29)	... ..	0 18 6
Hot-bed Thermometer, 30-inch, Mahogany Frame, Tube enclosed in Brass Thermometer on door for Air Temperature (see Fig. 49, p. 29)	... ..	1 15 0
Ivory Scale Pedestal Thermometers, mounted on Stand and under glass shade	... .. Prices from	0 6 6
Superior finished Table Thermometer, Ivory Scale, mounted on Ebony slanting Stand	... ..	0 12 6
Plain and Carved Oak Pedestal Thermometer, Enamel Glass Scales, from...	... .. each	0 12 6
The Zephyr ditto reading to a 5th of a degree, with Index	... ..	2 15 0
Storm Glass, Porcelain, with Thermometer (see Fig. 47)	... ..	0 15 6
Ditto Boxwood ditto	... .. from	0 3 6
Jordan's Sunshine Recorder is the most sensitive and accurate yet introduced, works by actual rays, and the charts only require immersing in water to make record permanent. Suits any latitude. Price		
Set of 100 prepared Charts	... ..	0 10 0

SACCHAROMETERS AND HYDROMETERS.

Glass Saccharometer, Ivory Scale, with Trial Glass, in Mahogany Case	each	0 9 6
Bates' Improved Saccharometer, in strongly gilt Metal, with four Weights and Gilt Thermometer, complete in velvet-lined Mahogany Case	... ..	3 3 0
Hydrometers, in Tin Cases, Paper Scales	... .. each	0 ^a 2 6
Sikes' Hydrometer of Glass, Ivory Scale, Trial Glass and Thermometer, in polished Mahogany Box	... ..	0 16 6
Ditto ditto strongly Electro Gilt, complete in Mahogany Box, velvet-lined, Book of Tables and Directions, Comparative Rule and Trial Glass, complete	... ..	2 10 0
Milk Testers	... .. from	0 2 6



Fig. 34.

CLINICAL THERMOMETERS, &c., &c.

The New Pocket Self-registering Clinical Thermometer, 3½, 4, 5, and 6 inches, in Boxwood & Black Cases (see Fig. 60, p. 31) 4s. 6d., 6s. 6d., &	... ..	0 8 6
Ditto ditto in German Silver Cases	... ..	0 9 6
Patent Lens Front Clinical improved, with indestructible and magnified Index, in German Silver Case, see Fig. 34	... ..	0 10 6
These Thermometers have the advantage of a small bulb for Sensitiveness, and yet at the same time show a large column of mercury, and the index cannot get out of order.		
Telescopic Set of 7-inch Clinical Thermometers, in Morocco Case, containing one bent non-registering, and one straight registering Thermometer	... ..	0 18 6
Ditto ditto	... ..	1 1 0
Ditto ditto 12-inch	... ..	1 5 0

POCKET INSULATED SURFACE CLINICAL THERMOMETER.
(Patent.)

Sole Maker, J. H. STEWARD, 406, Strand, London, W.C.

Price, complete in case, with Magnifying Lens for the easier reading of the divisions, £2 10s. Od.



This Illustration shows exact diameter of Thermometer, but it is now made about half the depth.



Inside view of Thermometer, showing coiled Bulb.

The following extract from "THE LANCET," of August 11, 1876, will fully explain this Instrument:—

Numerous attempts have from time to time been made to provide a simple, portable, and trustworthy Thermometer for taking the temperature of any portion of the surface of the body, but they have not hitherto been attended with success. Dr. Mortimer Granville seems, however, to have overcome the chief difficulties, and has designed an instrument which accurately records the temperature of the skin, and consequently furnishes ready means of ascertaining the comparative temperature of different portions of the surface of the body.

The principle of the Thermometer is that it takes the temperature of a circumscribed area of surface, which is protected for the time being from the general atmosphere of the apartment in which the patient lies. The instrument consists of a German silver cup, which fits into a socket or case of ivory; a flat coil of tube containing the mercury forms the bulb. This occupies a considerable portion of the orifice of the cup. From the centre of the bulb the tube of the Thermometer is carried through an aperture in the cup and socket fitted with an india-rubber washer, to the outside of the ivory case, and there curved horizontally to form the scale, which is marked from 70 to 115 degrees Fahr.,* each degree being divided into fourths. Some of the instruments are fitted with scales of smaller compass, and graduated to fifths of a degree. When the instrument is applied to any portion of the surface like a cupping-glass, the flat coil-bulb rests on the skin, and the cavity contains an atmosphere which in a few minutes is raised to the actual temperature; the German silver cup, acting as a reservoir of the heat given off by the skin, steadies the column of mercury at the register. Scarcely any pressure should be made in applying the thermometer to the surface, as the strain falls on the glass stem of the bulb, and this being entirely unsupported, to secure insulation, is necessarily fragile.†

* They are also constructed with centigrade scale.

† CAUTION.—The coiled Bulb must not be touched with the fingers or disturbed in any way. The instrument is so constructed throughout that it may be cleaned by dipping in cold water or Condy's Fluid, and dried by being waved two or three times in the air.

An obonite cover protects the horizontal tube on the top of the ivory, and the scale is exposed to view in a groove on the surface, as will be seen in the figure accompanying this notice, from which the general construction of the instrument will be readily understood. The woodcut shows the side view and the under surface, with the bulb of the Thermometer, in two diagrams, actual size. The whole fits into a convenient case, which includes a lens for reading the scale. The bulk of the entire apparatus is small.

Many experiments have satisfied us that the instrument adequately answers the purposes for which it is intended, and Dr. Sydney Ringer, who has tested it at University College Hospital, reports equally favourably of its performance. It must, however, be premised that a source of fallacy is apt to vitiate all attempts to take surface temperature. When the body is stripped the skin cools rapidly, and regains its proper degree of heat but slowly, while both the decrease and the increase of temperature take place at variable and unequal rates, not only for any given area, but for different parts of the body. Dr. Ringer reports that when a patient whose temperature was normal was sent to bed, the skin was rapidly cooled to 94° Fahr., and that an hour and a half elapsed before it recovered its lost heat.

At the commencement of this observation the rectal temperature was taken and found to be 98·6° Fahr.

"The Surface Thermometer was then placed on a level with, just to the right of, the ensiform cartilage—that is, over the liver. At first the surface Thermometer recorded only 94° Fahr., but the mercury gradually rose, and in an hour and a half it recorded 97·5°. We next took the temperature an inch and a half to the left of the umbilicus; in five minutes the Surface Thermometer recorded 97·5°. We then applied it over the skin two inches above the middle of the left Poupart's ligament, and in five minutes it recorded a temperature of 97·5°. We then applied it an inch inside and on a level with the left nipple, and in five minutes it recorded 97·5°. We then placed it over the lower ribs covering the liver, in the nipple line, and it recorded 98°. We then took the rectal temperature a second time at the conclusion of our observations, which had lasted nearly two hours, and found it 98·8°. Observations on fever patients yielded equally satisfactory results."

The instrument is made by J. H. Steward, 406, Strand, who has evidently spared no pains in its manufacture, and has been especially careful to secure accuracy in the marking of the degrees.

In a Letter to "THE LANCET," of August 25, Dr. Mortimer Granville directs attention to an important use of the instrument, which prevents its being made to self-register:—

Will you allow me to say that I anticipate some new clinical results from the use of my instrument as a Spiro-Thermometer? When held about an inch from the patient's mouth, the mercury rises with each expiration and falls with each inspiration, until, like a tidal wave, gaining something at each advance, it reaches the mean temperature of the breath, after which it rises and falls with every respiration, the time occupied and the length of the oscillation indicating the manner in which the lungs act. I believe it will be found that it is by this instrument possible to ascertain the temperature of the breath without taking that of the mouth, which may be determined by local conditions.

The "BRITISH MEDICAL JOURNAL," in its issue of September 29, 1877, in noticing the Insulated Clinical Surface Thermometer, says, "It appears likely to be very useful in Physiological and Clinical Observations."

A small appliance for fixing the instrument on any part of the patient's body has been devised by the maker, and is supplied separately with each, for use when it is necessary that it should remain in position longer than it may be convenient to hold it.

KEW VERIFICATIONS OF BAROMETERS & THERMOMETERS.

The charge for verifying Instruments at the Kew Observatory is as follows:

Standard Barometer, including verification of attached Thermometer, and carriage to and from Kew	£0 15 0
Marine Barometer	1 0 0
Compensated Aneroid Barometer	1 0 0
Thermometer, ordinary range, divided on stem	0 2 6
Ditto scale to 212°	0 4 6
Calibrated through entire range of scale	0 8 6

RAIN GAUGES.

Rain Gauges, Copper	1 15 0
Pedestal Rain Gauge, with Glass Tube divided into 100ths of an inch, and showing at a glance the amount of rain fallen, with Tap for letting off the water	2 10 0
Howard's Rain Gauge, Copper Funnel Top and Glass Bottle, and a divided Glass Measure (see Fig. 54, p. 29)	0 15 0
Ditto Tin Funnel	0 10 6
Glaisher's ditto (see Fig. 53, p. 29)	1 1 0
Porcelain Storm Glass, with Thermometer attached	0 15 6
Boxwood ditto	0 3 6

ANEMOMETERS.

The Educational Anemometer, with four cups, as in Fig. 56, mounted on a convenient hand board, and connected to a dial registering decimals of miles, a minute glass being connected with same, and put in and out of use by the same action as starts and stops the Wind Gauge	2 2 0
Biram's Anemometer, for Registering the Velocity of Currents of Air in Mines, 4-inch complete, in Case	2 15 0
Ditto ditto 6-inches	3 3 0
Improved Portable Air Meter, for measuring the Velocity of Currents of Air in Public Buildings, Air Shafts, Mines, &c., &c. With the aid of this Instrument, the velocity at which a current of air is travel- ling can be ascertained in a few minutes. (See Fig. 58, p. 30.) Price complete in Case	4 4 0
Robinson's Anemometer, for Registering the Velocity of the Wind (see Fig. 56, p. 30)	5 5 0
Steward's Improved Anemometer, for Measuring the Velocity of the Wind, Dial divided to 1,000 miles, with Vertical Wheel at side, reading to 2 yards, and Apparatus for connecting same with Cups, on the house-top or other elevation at any perpendicular distance	25 6 0
Suitable Vane for the above, with four Cardinal Points, all gilt	6 6 0
N.B.—This is the same as that put up at Wimbledon by J. H. S. at the Annual Meetings of the National Rifle Association.	

The Radiometer. A New Invention, illustrating the Motive Power of Light	2 2 0
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THE NEW PORCELAIN THERMOMETER.

With Bold Legible Scale; can be read at a distance (see Fig. 64, p. 30)	8-inch, 6s. 6d.; 10-inch, 0 9 6
Ditto ditto superior finished, with Gun Metal or Nickel Mounts	14-inch 0 15 6
Ditto ditto ditto 16-inch, 25s.; 20-inch	1 15 0

These are the same as supplied to the principal Hotels, and for the
Pullman Cars by J. H. S.



Fig. 39.
Price 15s. 6d. &
9s. 6d.

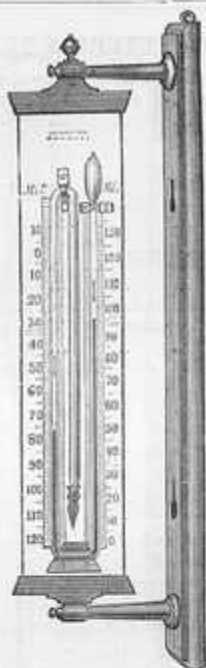


Fig. 40.—£1 15s.

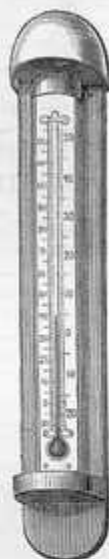


Fig. 41.
Price £1 1s.

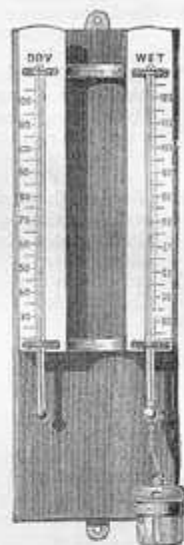


Fig. 42.
Price £1 5s. & £2 2s.

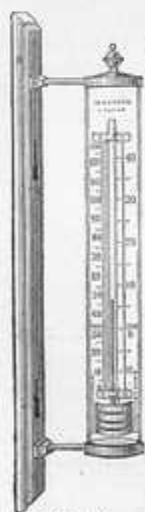


Fig. 43.
Price £1 5s.



Fig. 44.—Price 12s. 6d. and £1 1s.



Fig. 45.—Price 5s. 6d. and 7s. 6d.



Fig. 46.—Price 10s. 6d. and £1 1s.



Fig. 47.
Price 15s. 6d.

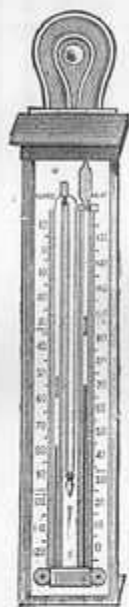


Fig. 48.
Price 12s. 6d.



Fig. 49.
Price £1 15s.



Fig. 50.
Price 7s. 6d.



Fig. 51.
Price 18s. 6d.



Fig. 52.—Price
18s. 6d. & £1 1s.

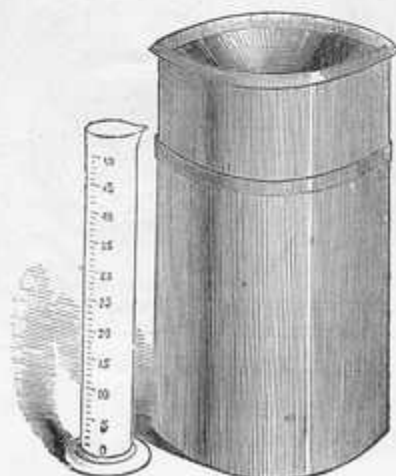


Fig. 53.—Price £1 1s.

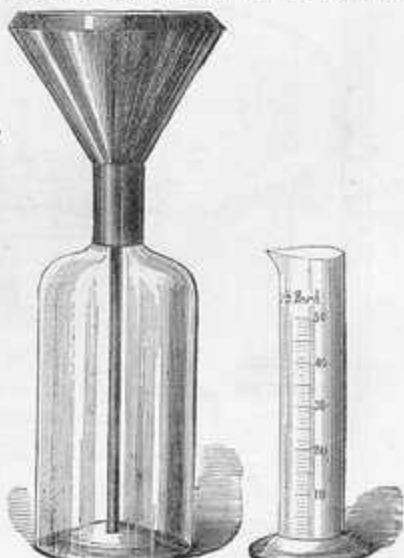


Fig. 54.—Price 10s. 6d. and 15s.

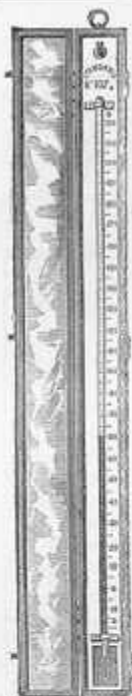


Fig. 55.—Price £2 2s.



Fig. 64.

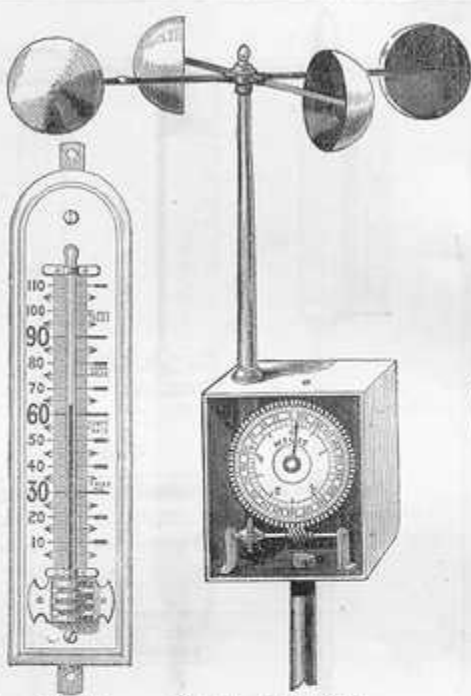
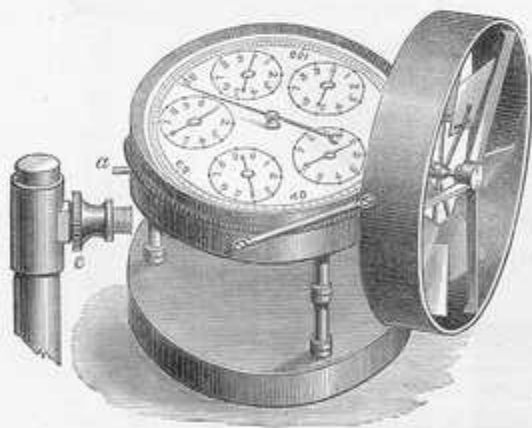
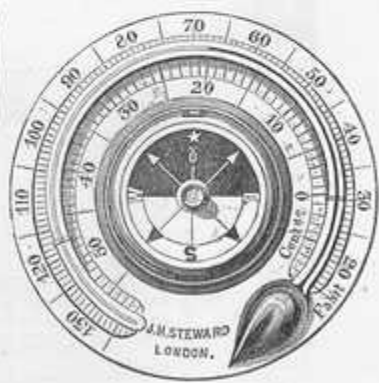


Fig. 56.—Price £5 5s.

Fig. 57.
12s. 6d.Fig. 58.
Price £4 4s.Fig. 26.—£1 5s. Singer's Dial.
Plain Needle, £1 1s.

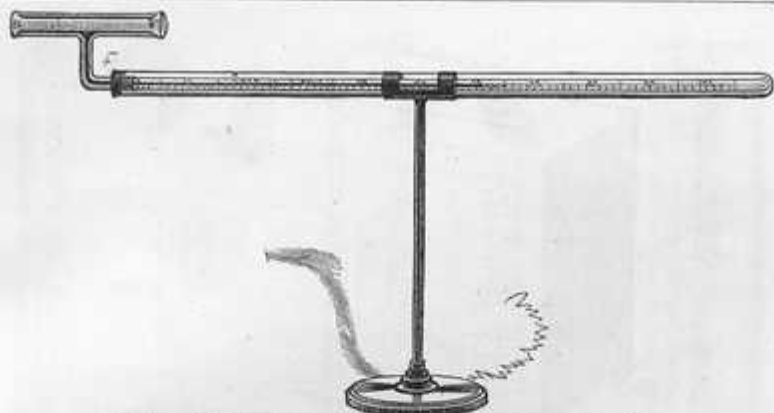


Fig. 59.—The New Minimum Thermometer, on Stand, £1 5s.



Fig. 60.—Pocket Clinical Thermometer, from 6s. 6d.

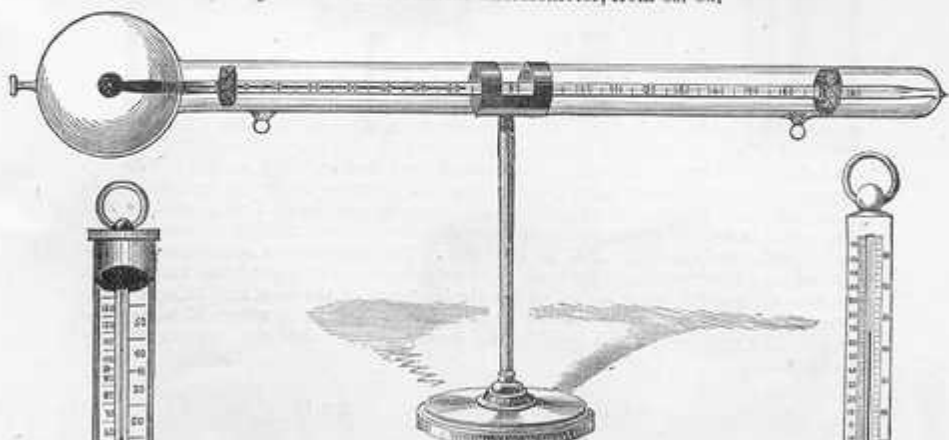


Fig. 61.—£1 11s. 6d.



Fig. 65.
7s. 6d.

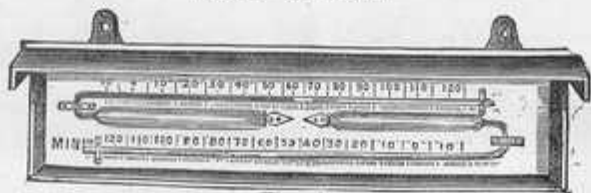
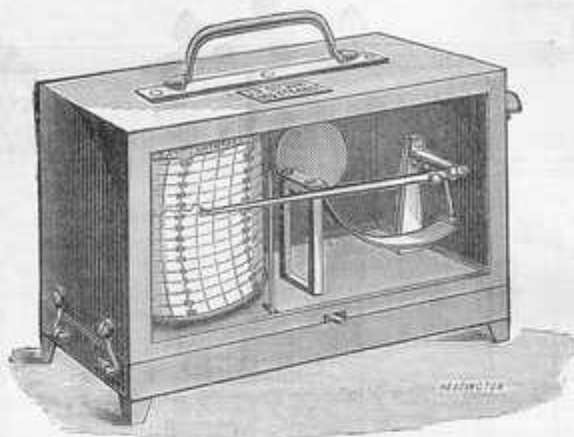


Fig. 62.



Fig. 63.
3s. 6d.
and
8s. 6d.



IMPROVED
SELF RECORDING THERMOMETER.

Price £8 6s., complete with set of Charts.

The Registering part of the instrument is similar to that used in the Recording Barometer, the drum carrying a weekly chart and revolving once in seven days by means of the clockwork inside. The temperature acts upon a metallic Thermometer, composed of a bent tube in brass, on the Bourdon system, and is filled with an alcoholic liquid that is difficult to freeze, and then hermetically sealed. The expansion and contraction of the alcohol causes the lever to move up and down, and when the pen is brought in contact with the chart a continuous line is made. It is thus possible to see the exact hour at which the lowest or highest temperature occurred, the scale being from 0° to 110° Fah. The adjustments made at the time of constructing the instrument are such as to be permanent as regards the movements, and the only possible error is that of the displacement of the zero, and this is easily corrected by raising more or less the fixed end of the tube by means of a key and screw. The great area acted upon by the temperature makes the instrument very sensitive.

For Recording Barometer, see page 19.



Fig. 67.—Zinc Minimum Thermometer, 2s. 9d.; and Double Scale, 3s. 6d.

FITZROY STORM BAROMETERS.

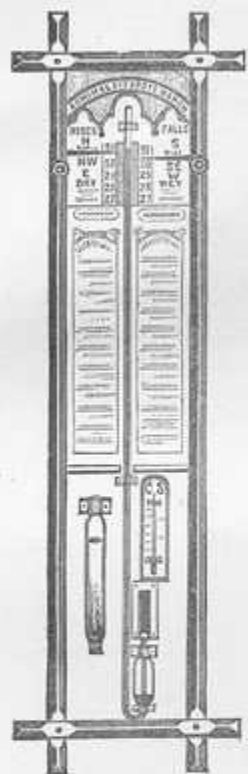


Fig. 17.
Price £1 1 0

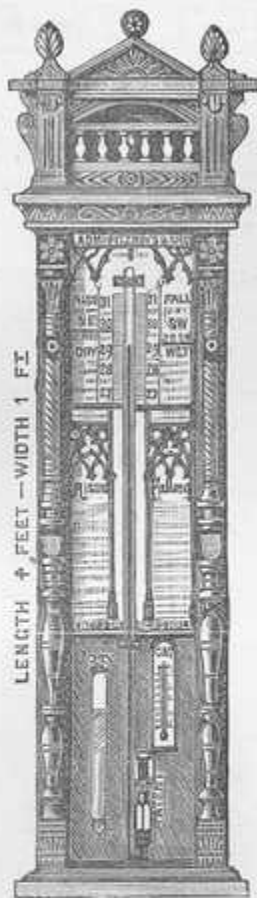


Fig. 18.
Price £3 19 0

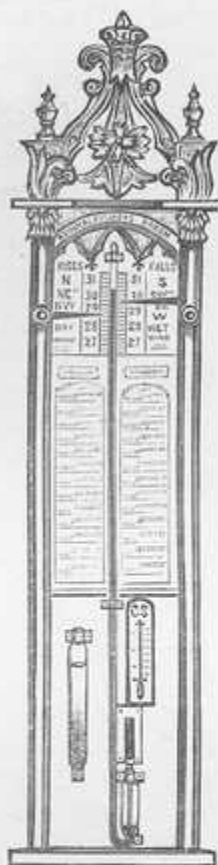


Fig. 19.
Price £2 15 0

The Fitzroy Storm Barometer. In this particular form of instrument the whole of the tube is exposed. Immediately under the Scales, and on either side of the tube, is printed a very comprehensive code of instructions and remarks, by studying which anyone may easily foretell coming weather. At the bottom of the Frame, on the left-hand side, is what is known as a **Storm Glass**. The tube of this glass is partially filled with a chemical mixture of camphor and crystals. At the approach of a high wind, these crystals rise into the upper portion of the fluid, and in calm, fine weather they settle at the bottom. Opposite this Glass is a **Thermometer** for giving the temperature of the air. The price varies according to the size (in diameter) of the Tube, and general get up of the Frame. An ingenious arrangement is attached for fixing the mercury in the tube, so as to avoid damage in transit.

PRICES.

Plain Oxford Frame (see Fig. 17)	£1 1 0
Gothic Carved Oak Frame, double Vernier, Rack and Pinion Adjustment	1 10 0
Ditto ditto ditto (Fig. 19)	2 15 0
Highly finished, very handsome Frame, bold tube, and enamelled Tube to Thermometer (see Fig. 18)	3 10 0