Historical Technology, Inc.

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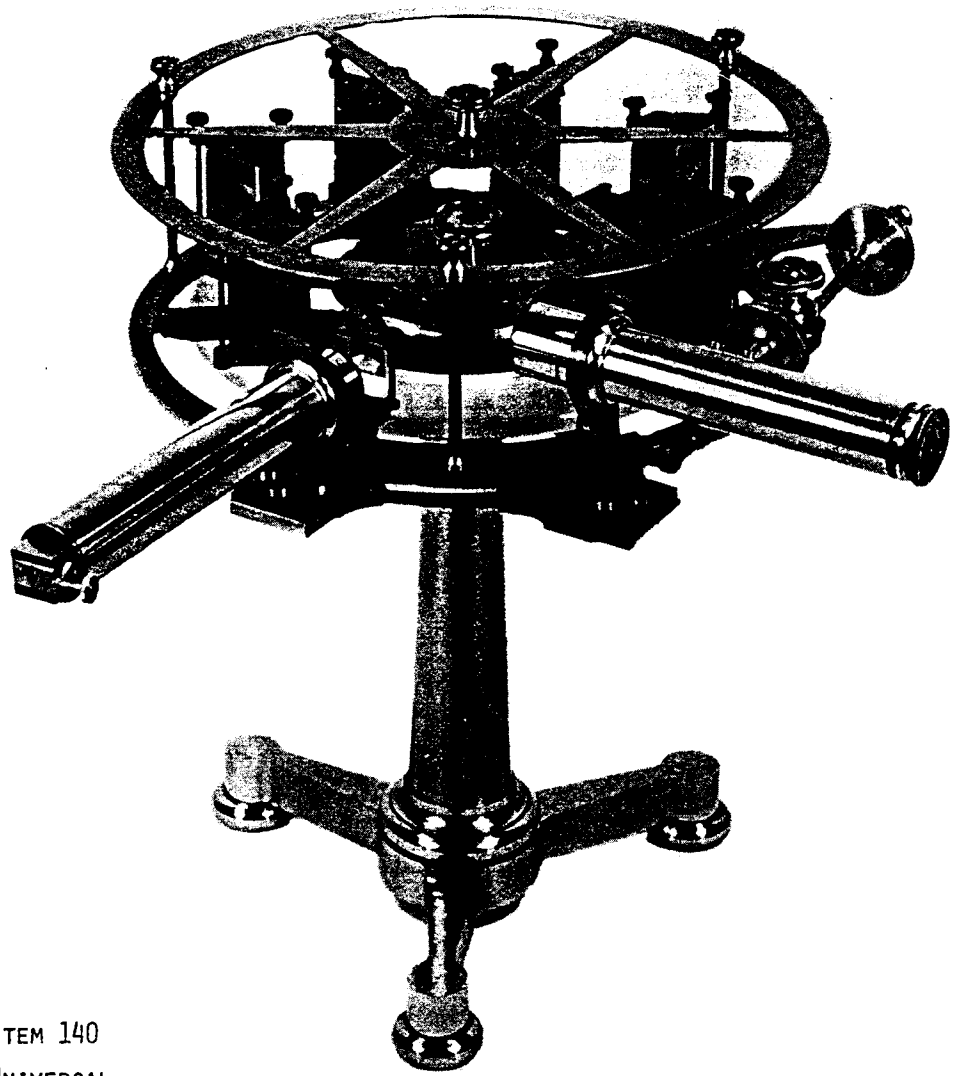

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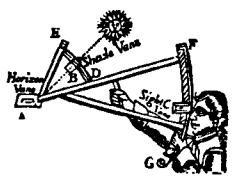

Catalog 123
Spring, 1982
Five Dollars

TERMS OF SALE

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Historical Technology, Inc. reserves the right to limit, restrict, or remove from sale, any and all offerings of this and any other catalog issued by us.

We are interested in buying single items and entire collections.

Residents of Massachusetts please add the 5% sales tax to your payment.

All prices in this catalog may be changed without notice after November, 1982.

CATALOG SUBSCRIPTION INFORMATION

We offer an introductory (one time) year's subscription to these catalogs (issued at 6 month intervals, more or less) at the rate of $ 4 ($ 8 overseas). Those receiving 3 issues (either by individual order or subscription) and not becoming regular customers will be required to pay our standard (scholar's) subscription rate of $ 10 ($ 15 overseas) if they wish to receive further copies.

CONDITION OF INSTRUMENTS

All the instruments in this catalog are intended for display purposes only. However, they are generally functioning although almost certainly not to their original accuracy. (When they are, please do not worry. We will be the first to let you know.) After all, some wear does take place over the years. Condition is given as accurately as possible although old repairs are usually not noted. Missing parts from cased instruments are noted, except for pocket magnifiers, small tools, etc. which are almost always lost. All instruments in this catalog are in nice condition. Where necessary, they have been properly restored. None are offered in an "as is" condition. Descriptions of condition may even tend to be slightly pessimistic.

REFERENCE BOOKS

The following have been employed in the researching of the items in this catalog:

(A-to-Z) (Gilbert, Ed), Photographic Advertising From A - to - Z", Yesterday's Cameras, Riverdale, New York, 1970.

(Baillie) G. H. Baillie, "Watchmakers & Clockmakers of the World", 2nd Ed., N.A.G. Press, London, 1947.

(Bedini) S. S. Bedini, "Early American Scientific Instruments and Their Makers", Smithsonian Institution, Washington, D. C., 1964.

(Billings) Blumberg, Smith & Leeper, "The Billings Microscope Collection", American Registry of Pathology, Washington, D. C., 1967, and (2nd Ed., 1974)

(Bion) E. Stone, trans. & ed. "M. Bion, The Construction and Principal Uses of Mathematical Instruments", London, 1723.

(Bobinger) Maximilian Bobinger, "Alt-Augsbürger Kompassmacher", Hans Rosler, Augsburg, 1966.

(Bradbury) S. Bradbury, "The Evolution of the Microscope", Pergamon Press, London, 1967.

(Brewington) M. V. Brewington, "The Peabody Museum Collection of Navigating Instruments", Peabody Museum, Salem, Massachusetts, 1963.

(Campbell) J. F. Campbell, "History and Bibliography of The New American Practical Navigator and The American Coast Pilot", Peabody Museum, Salem, Massachusetts, 1964.

(Checklist) Gibbs, Henderson, & de Solla Price, "A Computerized Checklist of Astrolabes", Dept. of History of Science and Medicine, Yale University, New Haven, Connecticut, 1973.

(Daumas) M. Daumas, "Les Instruments Scientifiques Aux XVII^{e} Et XVIII^{e} Siecles", Presses Universitaires de France, Paris, 1953.

(Clay & Court) R. S. Clay & T. H. Court, "The History of the Microscope", reprint ed, Holland Press, London, 1975.

(Gray) G. J. Gray, "A Bibliography of the Works of Sir Isaac Newton", Dawsons reprint, London, 1966.

(Frank 2) R.H. Nuttall, "MICROSCOPES from the Frank Collection 1800-1860", A. Frank, Jersey, 1979.

(Goodison) N. Goodison, "English Barometers 1680-1860", Potter, New York, 1968.

(Gould) R. T. Gould, "The Marine Chronometer", London, 1923, reprint, The Holland Press, London, 1960.

(Gross) Harry I. Gross, "Antique & Classic Cameras", Amphoto, New York, 1965.

(Gunther) Robert T. Gunther, "The Astrolabes of the World", 2 Volumes, Oxford University Press, Oxford, 1932.

(Holmes) Edward Holmes, "An Age of Cameras", Fountain Press, Kings Langley, England, 1974.

(Karpinski) L. C. Karpinski, "Bibliography of Mathematical Works Printed in America Through 1850", University of Michigan Press, 1940.

(Lothrop) Eaton S. Lothrop, "A Century of Cameras", Morgan & Morgan, Dobbs Ferry, New York, 1973.

(Mayer) L. A. Mayer, "Islamic Astrolabists and Their Works", Geneva, 1956.

(Padgitt) Donald L. Padgitt, "A Short History of the Early American Microscopes", Microscope Publications, London & Chicago, 1975.

(R. M. S.) Disney, Hill, & Watson, "Origin and Development of The Microscope, As illustrated by · · · Collections of the Royal Microscopical Society,", R. M. S., London, 1928.

(Rees) A. Rees, "The Cyclopaedia or Universal Dictionary of Arts, Sciences, and Literature", London, 1819.

(Smart) C. E. Smart, "The Makers of Surveying Instruments in America Since 1700", Regal Art Press, Troy, New York, Volume I 1962, Volume II 1967.

(Taylor 1) E. G. R. Taylor, "The Mathematical Practitioners of Tudor and Stuart England", Cambridge University Press, Cambridge, 1968.

(Taylor 2) E. G. R. Taylor, "The Mathematical Practitioners of Hanoverian England", Cambridge University Press, Cambridge, 1966.

(Thomas) D. B. Thomas, "The Science Museum Photography Collection", Science Museum, London, 1969.

(Thorndike) Lynn Thorndike, "A History of Magic and Experimental Science", 8 Volumes, Columbia University Press.

(Wheatland) David P. Wheatland, "The Apparatus of Science at Harvard 1765-1800", Harvard University, Cambridge, Massachusetts, 1968.

(Zinner) Ernst Zinner, "Deutshe und Niederlandisch Astronomische Instrumente", C. H. Beck, Munchen, 1972.

(Bedini T & T) S. A. Bedini, "Thinkers And Tinkers, Early American Men of Science", Scribner's, New York, 1975.

(Ricardi) Pietro Ricardi, "Biblioteca Mathematica Italiana", Gorlich, Milano, 1952.

(Tardy) Tardy, "Dictionnaire des Horlogers Francais", Tardy, Paris, 1972.

50 Magnificant Engraved Plates

28. Gaspard Monge, "DESCRIPTION DE L'ART DE FABRIQUER LES CANONS", (1st Ed), Comité de Salut Public, Paris, An 2 de la Republique (1793). Original board covers, newly rebacked, 10 1/2" h, 8" w; pgs. (2), viii, 231, 4 large folding tables, 50 engraved folding plates, the largest 15" h x 23" w. Very fine overall condition with a few spots (foxing) some offsetting from the plates, and the loss of a few upper corners which at one time had been folded over. Ex library copy from the Franklin Institute of Philadelphia. The book describes and illustrates the design and construction (including the facilities and machinery for forging and boring) of field and naval cannon. This is probably the most authorative work on the subject during the period from the American Revolution through the Napoleonic Wars (War of 1812) and certainly the most elegant. The author (1746-1818) was a mathematician of many accomplishments. He invented descriptive geometry, undertook important researches in differential geometry, especially in theory of curvature, and developed solutions to partial differential equations by means of his theory of surfaces. He was the author of several books on statics, descriptive geometry, and the geometry of 1st and 2nd degree curved surfaces. He was the minister of marine for the 1st Republic (1792-93), earlier had been a teacher and professor of physics, a founder of the École Polytechnique of Paris (1794-95), accompanied Napoleon on his Egyptian expedition, and appointed a member of the Senate under Napoleon. The Bourbon restoration then stripped him of all his honors and appointments. C'est la vie. (In French) (postpaid) $ 395

Two Volume Collected Works of the Inventor of the Ballistic Pendulum

29. Benjamin Robins (James Wilson editor), "MATHEMATICAL TRACTS · · · VOL. I. Containing his NEW PRINCIPLES OF GUNNERY, with feveral fubfequent DISCOURSES on the fame Subject, the greateft Part never before printed. · · · VOL. II. Containing his DISCOURSE ON THE METHODS OF FLUXIONS and of PRIME AND ULTIMATE RATIOS, with other Mifcellaneous Pieces.", J. Nourse, London, 1761. Original half leather bindings 8 3/4" h, 5 1/2" w; pgs. I. xlvi, (2), 341, (3), 3 engraved plates; II. 380, text figures as appropriate. Very fine condition, the pages uncut, usual wear to board covers. The author (1707-51), a self-taught mathematician became a Fellow of the Royal Society when only 20 years old, received the Copley medal in 1747, and invented the ballistic pendulum in 1742. The major part of Vol. I was first printed in 1742, the other sections dating through 1751. The mathematical works in Vol. I date from 1727 through the time of his death, some found in manuscript form amongst his papers. The sections on ballistics include comparisons of experimental data with theoretical predictions. Interestingly, the author discovered the great anomalies which take place with muzzle velocities just above the speed of sound but did not realize that this was due to significant non-linearities in air resistance (shock wave effects) which were not properly analyzed until well into the 20th century. (postpaid) $ 215

LAND SURVEYING

30. Charles Davies, "ELEMENTS OF SURVEYING, WITH A DESCRIPTION OF THE INSTRUMENTS AND THE NECESSARY TABLES", 4th Ed, A. S. Barnes & Co., Hartford, 1839. Original leather binding 8 1/4" h, 5" w; pgs. 170, 73, 91, 6 folding plates (4 of surveying instruments). Generally fine condition although some wear to binding and spotting due to foxing. The 1st edition of this work (1830) was prepared for use at West Point. It proved so popular, combining theory and practice, that there were 15 issues between 1830 and 1850. (postpaid) $ 50

31. Andrew Duncan, "THE PRACTICAL SURVEYOR'S GUIDE, Containing The Necessary Information To Make Any Person of Common Capacity, A FINISHED LAND SURVEYOR, Without The Aid Of A Teacher.", (1st Ed), Henry Carey Baird, Philadelphia, & Low, Son & Co., London, 1854. Original cloth binding 7" h, 4 1/3" w; pgs. vi, 9-121, 22 (publisher's book catalog), many text illustrations. Generally fine condition. There is no sign of there ever having been a pg. 7-8 leaf and the work is complete without it. The book is set up in 4 sections: calculation of plane figures, surveying by chain & compass, plotting, and leveling. Of particular interest is the description of an universal instrument "where by distances are found at once without any calculations". (postpaid) $ 27

* Abel Flint, (AUTOGRAPH LETTER) - see "WORKS IN MANUSCRIPT"

32. Robert Gibson, "A TREATISE OF Practical Surveying; WHICH IS DEMONSTRATED FROM ITS FIRST PRINCIPLES", 8th Ed (actually 7th American & 5th Philadelphia), Joseph & James Crukshank, Philadelphia, 1803. Original leather binding 8 1/2" h, 5 1/4" w; pgs. viii, 288, 152 (tables), 13 foldout plates. Good condition, the binding with edge wear and partially cracked hinges but tight, contents sound but stained and foxed. The 1st American edition (called the 4th) was published in 1785, taken directly from one of the London versions (4th edition?) of the period. The first edition may have been issued in Dublin mid 18th century and Taylor 2 notes a 2nd London edition of 1767. The author may well have been the Dublin surveyor (1731-61?) who held the post of examiner of applicant surveyors to the Surveyor General of Ireland and was a teacher of mathematics (Temple Lane, Essex St. 1752; Anglesey St. 1754). (postpaid) $ 75

33. John Gummere, "A TREATISE ON SURVEYING, CONTAINING THE THEORY AND PRACTICE: · · · ADDITION OF ARTICLES ON THE THEODOLITE, LEVELLING, AND TOPOGRAPHY. ALSO, HINTS TO YOUNG SURVEYORS, AND RULES FOR SURVEYING THE PUBLIC LANDS OF THE UNITED STATES. BY GEORGE H. HOLLIDAY, M.A.", 17th Ed, Hunt & Son, philadelphia, (1853). Modern leather binding 9" h, 5 3/4" w; pgs. vi, (2), 9-290, 152 (tables), over 100 text figures including 12 printed as 2 separate plates. Very fine overall condition except for edge stains on the first and last few pages. This treatise (1st edition in 1814) continued in use for over 100 years, Karpinski noting that there was an edition as late as 1917. This is a particularly good book presenting both theory and practical instruction in the use of instruments. (postpaid) $ 50

34. Zachariah Jess, "A COMPENDIOUS SYSTEM OF PRACTICAL SURVEYING, AND DIVIDING OF LAND:", 2nd Ed, Johnson & Warner, Philadelphia, 1814. Original leather binding, newly rebacked, 8 3/4" h, 5 1/4" w; pgs. v, (3), 227, title page for tables, 154 (tables), many text diagrams. Generally fine condition except for extensive light foxing. The first edition was published in 1799 but we have no record of any after this one. The work contains detailed instructions for plane surveying with many examples illustrated by actual calculations. However, it does not go into instrumentation. Our evidence points to it being a relatively rare book. (postpaid) $ 55

The Best 17th Century English Work on Surveying

35. William Leybourn, "THE COMPLETE SURVEYOR: CONTAINING The whole ART of Surveying of Land, BY THE Plain Table, Circumferentor, Theodolite, Peractor, And other INSTRUMENTS. With divers Kinds of Menfurations, and Matters pertinents to a WORK of this nature.", 4th Ed, Corrected and much Enlarged, George Sawbridge, London, 1679. Original leather binding, old rebacking, 11 1/4" h, 7 1/2" w; pgs. title in red and black, (14), 107, 183-438, 6 large engraved plates. Generally fine condition except for light but extensive stains and some 19th century repairs, and complete despite the discontinuous pagination except lacking the frontis portrait of the author. Leybourn (1626-1716) was a noted teacher and writer on astronomy, navigation, mathematics, surveying (he was one of the surveyors of London after the Great Fire of 1666), and dialling. This book was first published in 1653 with revised editions in 1657, 1674, 1679 (this one), and 1722 (as revised by Samuel Cunn after Leybourn's death). There were significant changes from edition to edition, but all had major sections on instrumentation representative of the technology of the period. (postpaid) $ 295

36. John Love, "GEODESIA: OR, THE ART OF SURVEYING AND Meafuring of LAND Made EASY · · · AS ALSO How to lay out New Lands in AMERICA, or elfewhere: And how to make a Perfect MAP Of a River's Mouth or Harbour; with feveral other Things never yet publifh'd in our Language.", 5th Ed, W. Innys, London, 1744. Modern half leather binding 8" h, 5 1/4" w; pgs. (20), 196, (16) (tables), 4, (36) (tables), 8 (surveying by Chain Only Appendix), many text woodcut diagrams. Very fine condition. The 1st edition of this work was published in 1688 just after Love returned from surveying in America. Taylor 1 lists a 2nd edition of 1715 and suggests that Love died before this date. The 3rd edition was in 1720, the 4th in 1731, and there were more through the remainder of the century with an American 1st of 1793 based upon the London 12th, and the American 2nd of 1796 based upon the London 13th. Possibly no book had greater influence on surveying in America during the 18th century. (postpaid) $ 195

Altitude Determination by Ramsden's Barometer

37. Colonel William Roy, F. R. S., "EXPERIMENTS AND OBSERVATIONS MADE IN BRITAIN, IN ORDER TO OBTAIN A RULE FOR MEASURING HEIGHTS WITH THE BAROMETER.", Author's reprint from the Philosophical transactions, J. Nichols, London, 1778. Early (original?) half leather binding 11 1/2" h, 9" w; pgs. 142, (1), 2 full page plates of instruments and 2 double page plates. Some edge wear to the binding, contents fine to very fine. Colonel, later Major-general, Roy (1726-90), director of the Royal Engineers from 1783, is best known for the first successful triangulation across the English Channel using Jesse Ramsden's Grand Theodolite. Ramsden designed and provided the mountain barometer used by Roy on this earlier program. Indeed, Ramsden's instrument was such an improvement that, according to Middleton, "This construction was copied or reinvented with changes in detail by J. B. Haas and Friedrich Korner. Gehler wrongly ascribes the tripod construction to Nicolas Fortin, who indeed made use of it." One of the important results of Roy's work was the development of improved compensation equations and an accurate relation between pressure and altitude. (postpaid) $ 160

Micrometer Calibrated Reticle For Ranging

38. Georg Gottlieb Schmidt, "Boustandiger Unterricht uber den Gebrauch der Mikrometer zur Bestimmung von Entfernungen auf der Erde, nebst praktischen Borschriften zur bequemen Berfertigung der Glasmikrometer durch eine besonders dazu eingerichtete Theilmaschine", Barrentrapp and Wenner, Frankfurt am Main, 1795. Later board covers 8" h, 5" w; pgs. vi, 7-76, (4), engraved folding plate. Very fine condition. Ex library copy. This approach of Professor Schmidt, placing a calibrated reticle in the focal plane of the telescope of a theodolite or level, has reappeared a number of times. Stanley of London in the late 19th century, and later, fitted some of their instruments for "tacheometrical" readings. The basic problem with any of these stadimetric systems is that linear accuracy is proportional to distance and so that resulting measurements are of use only for approximate work. (In German) (postpaid) $ 35

39. Frederick W. Simms, "A TREATISE ON THE PRINCIPLES AND PRACTICE OF LEVELLING. · · · Application To · · · RAILWAY ENGINEERING AND THE CONSTRUCTION OF ROADS, & c.", 7th Ed, Crosby Lockwood & Co., London, 1884. Original cloth binding 9" h,x 6" w; pgs. vii, 215, 7 plates (most quadruple foldouts), 56 (publisher's catalogue of books). Light edgewear to binding, generally fine to very fine overall condition. This work first appeared in 1836 as an appendix to Simms "Treatise on the Principal Mathematical Instruments". It was then expanded from edition to edition, each time growing more comprehensive. This is probably the best English treatment of the subject of the entire 19th century. (postpaid) $ 55

THE PHYSICAL WORLD

The Bilingual Rivault Edition of Archimedes

40. Archimedes, "ARCHIMEDES OPERA QVAE EXTANT. NOVIS DEMONSTRATIONIBVS COMMENTARIISQVE ILLVSTRATA. Per DAVIDEM RIVALTVM A FLVRANTIA Coenomanum è Regia Turma sacri Cubiculi, sanctioribusque regni Consiliis & à literarum pietatisque studiis Christianissimi Gallorum & Nauarrae Regis LVDOVICI XIII. semper Augusti.", Claudium Morellum, Paris, 1615. Early leather binding (later rebacked) 14" h, 9 1/4" w; pgs. title in red and black, (43), 1-543, 540, 543-549, with hundreds of text illustrations. Some early marginal annotation. Fine overall condition except that the rebacking is rather crude and several pages at the front and back have been reattached by glued-on paper strips. The text is complete despite some odd page numbering. This book contains all the surviving works of Archimedes with sections on geometry, machines for generating planar figures, statics including determination of centers of gravity, conics, spirals, hydrostatics, and mechanical systems including the famous water-lifting screw and configurations of pulleys. Major propositions and theorems are given in parallel Latin and Greek versions with detailed explanations following in Latin. The latter were revised from the 1544 edition of Hervagius (Basel), the first printed Greek-Latin edition. Rees lists the editor of this work, David Rivault (c. 1571-1616) as a soldier turned scholar, born at Laval, France, who served in the armies of the Count of Laval and the Emperor of Hungary. King Louis XIII of France honoured him with various appointments and the title of counsellor of state because of his accomplishments as author and scientist. His most important technical publications were "Elements of Gunnery" and this, the complete works of Archimedes. It remained the definitive version until J. Torelli's monumental edition was published at Oxford in 1792. (In Greek & Latin) (postpaid) $ 675

41. James Ferguson, "LECTURES ON SELECT SUBJECTS IN MECHANICS, HYDROSTATICS, HYDRAULICS, PNEUMATICS, AND OPTICS. WITH The USE of the GLOBES, The ART of DIALING, AND The Calculation of the Mean Times of NEW and FULL MOONS and ECLIPSES", 5th Ed, W. Strahan, et.al., London, 1776. Original leather binding, label missing, 8 3/8" h, 5 1/4" w; pgs. xi, (3), 396, 48 (added supplement), 36 engraved folding plates. Very fine overall condition except for cracked hinges and wear to the spine (but covers are tight). This edition, of what was considered the standard work in the field, is much expanded with respect to the first of 1764 (which had 23 plates). The author (1710-76), self-educated as a boy, was sent to the University of Edinburgh by several leading Scottish intellectuals, including the well known Newtonian scholar Colin Maclaurin, in recognition of his intelligence and ability. He became a prolific and good writer of scientific works, and one of the leading lecturers in natural philosophy. He designed and made many of his own instruments and lecture apparatus. In the 19th century the great Scottish scientist, David Brewster, revised this work still further, adding another quarter century to its usefulness. (postpaid) $ 125

Extensively Illustrated Treatise in Six Volumes

42. Jean Antoine Nollet, "LEÇONS DE PHYSIQUE EXPERIMANTALE", Arkstée & Merkus, Amsterdam & Leipzig, 1754,5,6. Original half leather bindings 6 1/2" h, 4" w; pgs. I frontis plate, title page in red and black with engraved cartouche, liv, (2), 372, (7), 19 foldout engraved plates; II. colored title page, 476, (8), 20 plates; III. colored title page, 502, (14), 19 plates; IV. colored title, 536, 14 plates; V. colored title, 566, (2), 24 plates;VI. colored title, 524, 20 plates; with half titles to Vols. II, III, IV, V and seeming to lack only the unnumbered plate list to Vol. 6; otherwise complete. Some edge wear and hinge cracks to the binding, contents extremely fine. This work with 116 finely drawn plates and over 3,000 pages is possibly the most comprehensive French discourse on experimental physics of the 18th century. The subjects covered include the properties of materials (solid, liquid & gas), statics, dynamics, motion in gravitational fields, hydrostatics, properties of air and the atmosphere, water and the oceans, heat and combustion, light and optics, astronomy, magnetism, and electricity. Hundreds of instruments and forms of experimental apparatus are described and illustrated. The author (1700-70) published the 1st edition of this work in 1743. He was elected F.R.S. in 1734, started teaching experimental physics in 1735, becoming professor of physics at the University of Paris in 1738. He discovered osmosis about 1748, invented the electroscope about 1747, and made other discoveries in the fields of fluidics, electricity, and optics. (In French) (postpaid) $ 295

43. John Rowning, "A COMPENDIOUS SYSTEM OF Natural Philofophy: With NOTES, Containing the MATHEMATICAL DEMONSTRATIONS, AND Some Occafional REMARKS.", 2 VOLS, Sam. Harding, London, 1758. Original leather bindings 8 1/4" h, 5 1/4" w; pgs. I. xlviii, 80, 19, 3-176, 3-96, 21 engraved foldout plates; II. 97-212, 3-284, (20), 21 (should be 22) engraved foldout plates. The work is in 4 parts: Machanics, Hydrostatics and Pneumatics, Optics, Astronomy -the last 3 parts possibly once having been issued with half titles and so starting on p. 3 in each case. This book (first issued in 1735, seems to have gone through 7 editions by 1772) is complete in its present form except for Plate I of the Astronomy section which was Figure I, a depiction of the Solar System. Generally fine condition with some binding wear and weak hinges, some light foxing and staining of the otherwise crisp contents. This book was the author's (1701?-1771) major published work. He was known for his ingenious frame of mind, well illustrated by his mechanical analog computer which was described in his paper for the Philosophical Transactions of the Royal Society, 1770, "Directions for making a Machine for finding the Roots of Equations universally". His general approach could be described as "typically Newtonian". (postpaid) $ 120

HOROLOGY & DIALLING

44. (Anon.) "SCIOGRAPHIA FACILIS, Seu INSTRUMENTI AZYMUTHALIS Descriptio & Vsus.", no place or date, probably northern Europe late 17th or early 18th century. Old paper wrappers 8" h, 6 1/4" w; 20 pgs and folding engraved plate with a number of diagrams pertaining to the layout of flat sundials. Fine overall condition with the plate repaired at one fold. (In Latin) (postpaid) $ 60

Noted Chronometer Maker

45. Ferdinando Berthoud, "L'ARTE DI ADOPERARE E REGOLARE GLI ORIOLI A PENDOLO E DA TASCA Ad ufo di quei che non banno cognizione alcuna del meftierre dell' Oriolajo", (1st Italian Ed), Stecchi e Pagaini, Florence, 1778. Old (not original) vellum binding 6" h, 3 1/4" w; pgs. 12, 113, foldout table, 4 engraved plates. Very fine condition with a few pages bound out of order and a marginal corner torn from 1 leaf. The original of this work, "L'Art de Conduire et de Regler les Pendules et les Montres" was published in Paris in 1760. Gould provides an interesting account of the claims for priority between Le Roy and Berthoud. The author's 3 major books were "Essai sur l'"Horlogerie", 1763; "Traité des Horloges Marines", 1773; and "Histoire de la Mesure du Temps", 1802. (In Italian) (postpaid) $ 95

46. Giuseppe Antonio Di Corsanico, "TRATTO DE GNOMONICA PRATICA Per Costruire Con Facilita', Ed Esatezza Gli OROLOGJ SOLARI", Rome, 1829. Half vellum binding 9" h, 6" w; pgs. 136, the 5 foldout engraved plates, and the (often lost) loosely inserted 4-page "Letters Dell' Autore Del Trattato Di Gnomonica Piana". Fine condition. This is an interesting continuation of the earlier Italian tradition in dialling. It includes treatment of the problem of erecting dials on declining surfaces, a topic often ignored in introductory texts. (In Italian) (postpaid) $ 70

An Important & Rare Treatise on Clock-Work & Orrery Design

47. James Ferguson, "TABLES AND TRACTS, RELATIVE TO Several ARTS and SCIENCES", 2nd Ed, W. Strahan, et. al., London, 1771. Modern full leather binding 8 1/4" h, 5 1/4" w; pgs. xv, 334, 3 foldout engraved plates, (1) (list of books by Ferguson). Very fine condition. This, the rarest of the author's books (1st edition in 1767), is composed of a number of separate articles and tables quite similar in style to his "Select Mechanical Exercises" but of earlier date. Of special interest are: a 25 page article on an analog computer for problems of spherical astronomy; 26 pages on 3 uncommon forms of clocks; 6 pages on how to represent the motions of Jupiter's 4 satellites in a clock; and 14 pages on Orrerys. Several dozen other subjects are covered as well from the fields of weights and measures, astronomy, mathematics, and calendar studies. (postpaid) $ 195

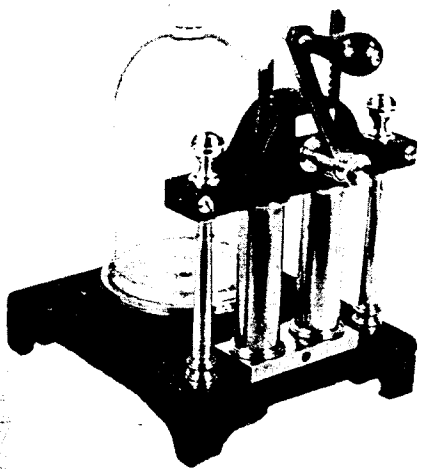
48. Pierre de Sainte Marie Madalaine, "TRAITE D'HORLOGIOGRAPHIE, CONTENANT PLUSIERS MANIERES DE construire sur toutes surfaces, toutes sortes de lignes horaires, & autres cercles de la Sphere.", Nouvelle Edition, (Dezallier), Paris, (1701?). Modern leather binding 6 3/4" h, 4 1/2" w; pgs. (6), 294, 72 engraved plates. Very fine condition with lower portion of title page torn off affecting imprint and date only. It does not appear that this edition had a frontis plate. First edition in 1645, at least 3 more before this one, and other(s) as late as mid 18th century, indicating a popularity justified by its contents. The conventional forms of horizontal, inclining and equatorial dials are well covered. Declining dials, ignored in may texts because of their complexity, as well as those on curved and double curved surfaces are described in detail. The 72 plates with almost 130 figures add greatly to the usefulness of the book. (In French) (postpaid) $ 195

49. François Rivard, "LA GNOMONIQUE, OU L'ART DE FAIRE DES CADRANS", 3rd Ed, Desaint & Saillant, Paris, 1757. Original leather binding, rebacked, 7 3/4" h, 5 1/4" w; pgs. xv, (1), 16, 324, 53, the 12 foldout engraved plates. Generally very fine condition. The first edition of this work seems to have been published in 1745, the author having written other books on mathematics and spherical geometry. The basis for this book lies in the use of concepts of spherical geometry followed by analytical techniques whereas the author's compatriot and fellow diallist Antoine Deparcieux selected a trigonometrical approach in his work. However, this book follows the format of Deparcieux's own book and Rivard acknowledges this, "J'ai cru qu'il pouvoit etre de quelque utilité se présenter les mêmes verites en differentes manieres, . . . ". A comprehensive work sufficiently popular in its own times to go through several editions. (In French) (postpaid) $ 135

147. LENS ON BRASS STAND - English, 19th c, unsigned. Convex (positive) lens of 9 1/2" FL and 3 1/8" clear aperture in a brass ring mounting pivoting within a semi-circular suspension ring atop a 6 1/2" h post on a 4" d base; 10 3/4" h overall. Bright brass stand and mount in original lacquer finish, some darkening (mostly on base). Fine overall condition. Such lenses were used to set up on optical bench systems for demonstrating various aspects and forms of optical design. (An entire telescope could be assembled from lenses of appropriate focal length, properly positioned.)

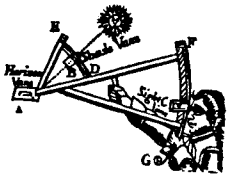
(6 lbs, UP, PS) $ 125

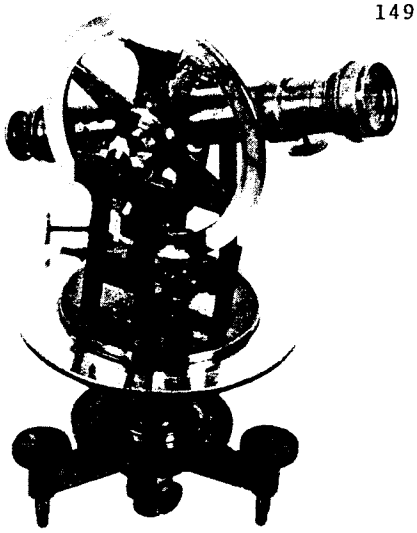
148. FINE LITTLE VACUUM PUMP - English, 1st half 19th c, unsigned. Mahogany base 9 1/2" w x 11 1/2" deep, mahogany crosspiece 9" w, bright lacquered brass turned columns and vacuum cylinders, 6" h, single ended brass crank arm 5 1/4" long, and 6" d brass bell jar platform (with 10 1/4" h x 5 3/4" d later glass bell jar). Overall ht 15". Spherical brass finials attach the wooden crosspiece to the brass columns. There is a blank ivory name plate. Very fine overall display condition noting that two base feet are old replacements, the lacquer finish is a modern restoration, and the deterioration of interior valves and the loss of the front base valve mean that the pump will no longer produce a vacuum.



This form of vacuum pump dates from the late 18th century although urn shape finials seems to have predated the use of globes. Item 196 of our Catalog 112 shows a globe finial pump by Cary while Item 76 of Special Catalog 1 is an 1838 American variation on this design. By mid-century the double ended handle replaced the crank both in England and on the Continent (see Item 248 of Catlog 116). Such apparatus was an important component in a laboratory for the physical or chemical sciences.

(28 lbs UP) $ 935





149. RELIC OF FERDINAND de LESSEPS' GREAT FAILURE - French theodolite, c. 1880, signed "Mon. Richer Guyard & Canary succrs a Paris" and marked "Cie du Canal de Panama". Brass construction, some parts in lacquered finish, others black oxidized, with inlet silver scales, standing 11 1/4" h incl 3-screw leveling base. The azimuth plate is 6" d, its 5" d scale graduated to 400 metric degrees is read out by opposing verniers to 2/100 of a degree. The vertical circle of 4 3/8" d is similarly graduated but has only a single vernier. The rack and pinion focussing telescope is 8 1/4" long (min). There are tangent screw slow motions on concentric azimuth axes and the elevation axis. Scale diffusers and magnifiers, and part of the upper azimuth motion clamp assembly are missing. The surface finishes have deteriorated due to exposure in the jungles of Panama, yet overall the instrument is still in reasonable display condition considering its background. (We do not suggest any restoration.) No case or tripod.

Ferdinand de Lesseps (1805-1895) was the moving force which produced the water-level Suez Canal. Its completion in 1869, and its subsequent success as a commercial enterprise, renewed the interest in crossing Central America by a similar canal. A canal through Nicaragua would have required locks. However, at an International Congress held in Paris in May, 1879, it was decided that a sea level canal could be built through Panama. The Cie du Canal de Panama, de Lesseps as president, was organized in December, 1880 and 6 million shares at 500 francs each were sold. The next two years were devoted to Surveys and the preliminaries of the layout of the canal. That these plans included an enormous cut to be made at Culebra and did not include any method of controlling the eratic and sometimes tremendous flows of the Chagres river did not seem to bother enough people. The jungles with their yellow-fever-carrying mosquitos were not a consideration either. Work under de Lesseps sea-level plan continued until the latter part of 1887, the management being characterized by a degree of extravagance and corruption rarely if ever equaled in the history of the world up to that time. It was evident by then that the original canal could not be completed at sea level with the resources of time and money available. A redesign with locks, was worked on for the next two years until the company went bankrupt. A new canal company was organized in 1894, de Lesseps now in disgrace, and additional sums, over a billion francs, were raised to complete the work. By the year 1900 about 5 million cubic yards had been excavated and the end was not in sight. The jungles consumed men, equipment, and money as fast as it was sent to Panama. By the time Major Goethals and the U.S. Army Corps of Engineers came on the scene in 1907 almost nothing survived from the French efforts. The instrument here is of the greatest rarity; we know of only one other (a level) at the Smithsonian.

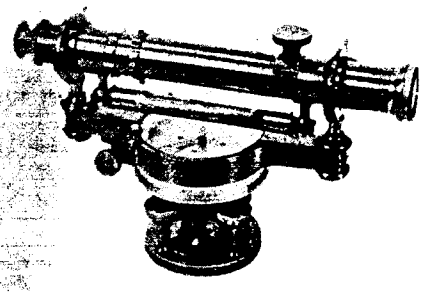
(15 lbs UP) $ 1,425

150. MINIATURE 4-VANE CIRCUMFERENTOR - English, c. 1800, possibly late 18th c, signed "Bleuler, London". Bright brass, restored lacquer finish, the base plate 5 3/4" d, overall ht 6 1/2" incl the ball and socket joint for staff mounting. The outer (fixed) folding vanes are 2 1/2" h and the inner (rotating) folding vanes are 2 3/8" h. The azimuth scale on the base plate is graduated to degrees and there are opposing index lines (no verniers) on the beveled 5 5/16" d rotating top plate. Except for a thumb screw missing from the lower end of the ball and socket joint and some etching of the under surface of the base plate, overall condition is extremely fine. No case.

Taylor 2 lists John Bleuler (1757-1829) as apprenticed to Henry Shuttleworth in 1771 and worked with him until 1791, when he succeeded to the business of Thomas Whitford. Although not much more about him is listed in the references, two of his trade cards are illustrated (Plates 11 & 12) in the Science Museum's catalogue "Scientific Trade Cards". His known instruments display a high level of workmanship, one such example being the large ring dial sold as Item 108 in the Linton Collection sale, Paris, 1980. However, relatively few museums list even one of his instruments in their catalogs - none at the National Maritime, Greenwich, none in the Whipple Museum surveying instrument collection, none in the Van Marum collection in Holland, only one ebony quadrant at the Peabody Museum, Salem - leading us to conclude that any surviving work by him must be relatively rare.

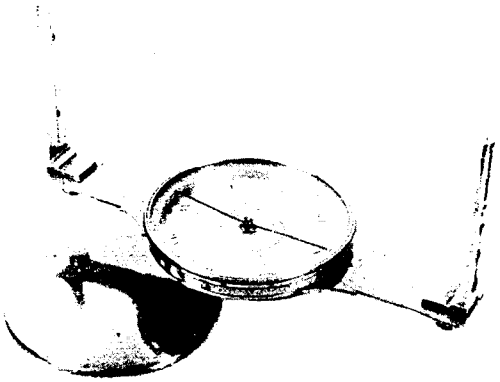
(6 lbs UP) $ 1,395

151. ARCHITECT'S Y LEVEL WITH TRIPOD - American, 1903, signed "KEUFFEL & ESSER CO./7365/NEW YORK" and marked "Frost & Adams Co. Boston" and "PATENTED DEC. 3. 89./AUG. 12. 90./MAY 26.91." Brass and gun metal construction in steel-grey oxidized finish, some fittings in bright lacquered brass and the 3 3/8" d compass dial silvered as is the azimuth readout scale with its 5 arcmin vernier. Overall ht is 6 3/4" (incl 4-screw leveling base) and the rack and pinion focussing telescope is 13" long (incl slip-on sunshade). The bubble level vial is 5 1/8" long. The 5 1/4" deep x 8 1/4" h x 13" w original case also contains a plumb bob and triangular foot for plane table use. It is in very good to fine condition as is the original tripod with its 58" long oak legs. The level is in extremely fine original condition.



This was K + E's model no. 5113 and its second most elaborate architect's level; the most elaborate being the convertible model no. 5117 which had a removeable axis so that the telescope could be used in sighting vertical lines. Although the last patent date is from 1891, the date given above corresponds to the marked serial number.

(2 UP packages, 16 lbs & 12 lbs) $ 435

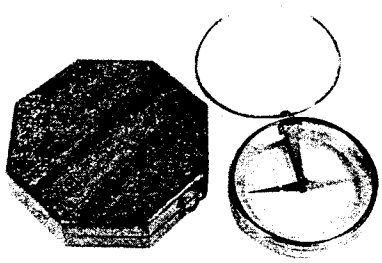


152. SURVEYOR'S COMPASS BY WILLIAM J. YOUNG'S TEACHER IN THE ART - American, signed "T. Whitney Maker Philada." with serial "No. 321" on the base outside the compass housing and marked "1817 B" on an underside interior surface, which we assume to be the date. Bright brass, restored lacquer finish, the silvered dial compass within a 6" d housing on a 14" long baseplate. There is the original compass cover but no ball and socket joint and no case. The 6" h screw-on sight vanes are instrument-maker-made old replacements. Generally fine overall condition.

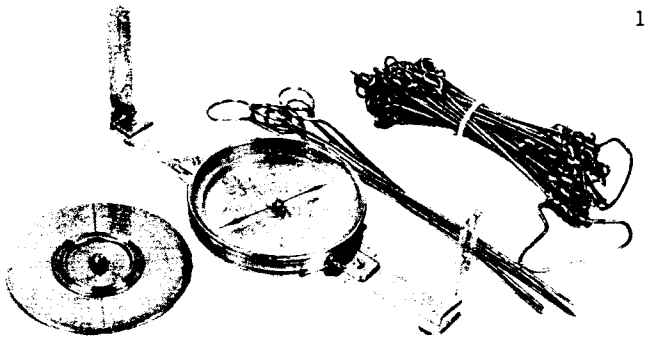
Thomas Whitney (?-1823) came to Philadelphia from London and first advertised himself as an instrument maker in 1798. By 1820, according to his advertisement of that year reprinted on p. 167 of Smart, he specialized in surveying compasses and had made 500 by then. William J. Young, the inventor of the American Surveyor's Transit, apprenticed to Whitney in 1813. It may very well be that Young worked on part or all of the instrument here since his 7 year term was not concluded until 1820 when he started his own firm with the construction of a dividing engine.

(9 lbs UP) $ 725

153. OCTAGONALLY CASED DIPPING NEEDLE - American, 2nd half 19th c, unsigned. Bright lacquered brass case 3 3/4" d x 3/4" thk with glass windows and 4" d folding loop handle. The needle is 2 3/4" long and reads out on a silvered interior scale graduated on both sides. The original octagonal case is 4 7/8" across flats x 1 1/8" thk and is in fine condition. The instrument is very fine with original finish. These were intended for tracing veins of iron ore which would cause variations in the local magnetic field.



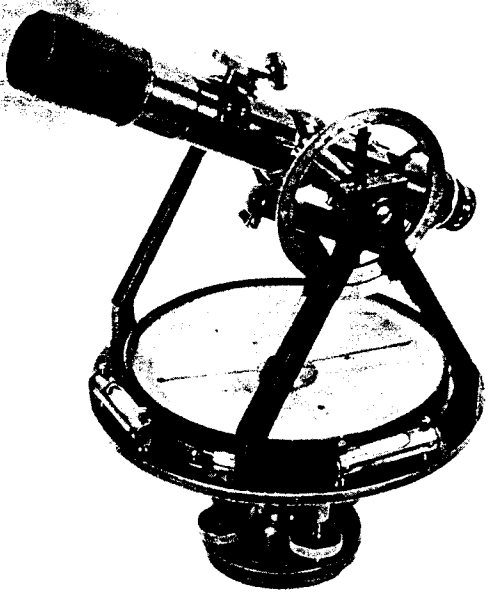
(3 lbs, UP, PS) $ 175



154. THE IRISH-AMERICAN SURVEYOR - Surveyor's compass, Irish, 18th c, signed "Thos. Cave * Dublin Fecit"; 50 link 2 pole chain, probably American, c. 1800, unmarked; set of 6 marker pins, probably American, 19th c. The compass is bright brass, restored lacquer finish, silvered compass dial within 5 1/2" d housing which is attached to a 13 1/2" long base. The screw-on vanes are 4 5/8" h each. The brass compass cover is graduated 90°-0°-90° so that the compass may be used for elevation sightings. Overall condition is very fine although one vane was broken off at its base (some time ago) and repaired by soldering on a brass plate over the break, there is no ball and socket joint, one screw for the mounting socket is missing and one vane thumb screw is a later replacement. The 50 link (33 ft) chain is made of iron wire which varies in thickness from 0.116" to 0.149" and is up to 0.020" out-of round. It has wire handles and 1 (of 4) brass tags. It is in fine condition. The 6 pins appear to be made of much more uniform wire (only a few thousandths variation) leading us to believe that they are much later origin. The compass, chain, and pins were found in a stained oak case 6 1/2" deep, 6 3/4" h, 14 3/4" w which, clearly, was made for the outfit and, in our opinion, dates from when it was first assembled in America.

In Great Britain this form of compass was usually intended for mine surveying. The cover with its elevation scale would have little application to general land surveying and is a feature not found on American made surveying compasses. Taylor 2 lists Thomas Cave of Dublin as a mathematical instrument maker of c. 1780 and notes that his "name is on extant compass, and on another mathematical instrument at Cambridge" which the Webster index indicates is now at the Whipple History of Science Museum (together with a Butterfield type sundial). We have no history on the use of this outfit in America.

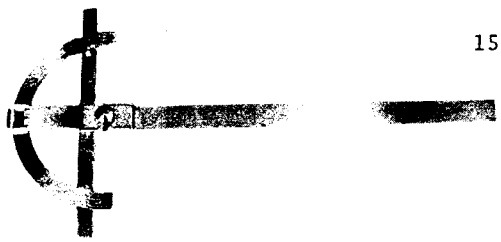
(16 lbs UP) $ 995



155. UNCOMMON VERNIER TRANSIT COMPASS WITH TRIPOD - American, early 20th c, signed "THE L. BECKMANN CO. TOLEDO, OHIO" with serial no. 6283. Brass construction in original black oxidized finish and bright lacquered brass fittings, standing 11" h (8 3/4" long telescope, with 4" bubble, in level position), 8" d base plate, 6 1/2" d silver-faced compass with internal vernier for the magnetic variation and 5 1/2" needle, and crossed bubble vials. Telescope with rack focussing objective and screw focussing eyepiece on elevation axis fitted with slow motion tangent screw and 3 1/2" d silvered vertical circle reading out by vernier to 5 arcmin. Four-screw leveling base with tangent screw azimuth slow motion. Complete equipment includes sun shade, lens cap, plumb-bob, hand magnifier and adjustment tools. Original mahogany case 9 1/2" sq x 13 1/4" h in almost fine condition. The transit compass is very fine as is original tripod with 4 ft oak legs.

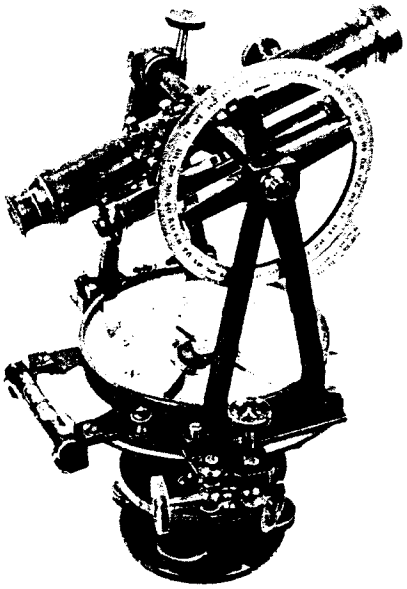
Ludwig Beckmann was born in Doberon, Mecklenburg, Germany in 1845 and died in Toledo in 1914. He came to the U.S. in 1870 and started making surveying instruments in 1874. He built his own dividing engines (3 in all). After his death the business was continued by his son Louis, Jr., until 1945 when all manufacturing was discontinued. The transit compass is an unusual instrument in that, functionally, it is no more than a vernier surveyor's compass. There is no azimuth readout except with respect to the needle. Thus it is an instrument unable to produce readouts with an accuracy anywhere near that to which the telescope can be aligned. The cost of manufacture of the base plate and superstructure is no less than that of a full transit with an azimuth circle and considerably more than that of a sight vane compass. In 1902 Gurley charged $ 40 for a large vernier compass, $ 101 for the equivalent transit compass and $ 145 for a surveyor's transit with azimuth scale. Very few transit compasses must have been sold by any of the instrument companies because they made no economical sense. As a consequence, even though they were marginally cheaper than a full transit, they are now far more rare.

(2 UP packages, 30 lbs & 10 lbs) $ 845



156. PROTRACTING T-SQUARE - Possibly American, 19th c, unsigned. Bright brass, restored lacquer finish, 20 5/8" long. The edge guide bar is 10 1/4" long and the protractor semi-circle is 8" d. Vernier readout is to 5 arcmins. A 10" long inch scale is engraved on the arm which can be read out by its diagonal scale to 0.01". The lock nut is a modern replacement, all else original. Extremely fine overall condition.

(8 lbs, UP, PS) $ 250



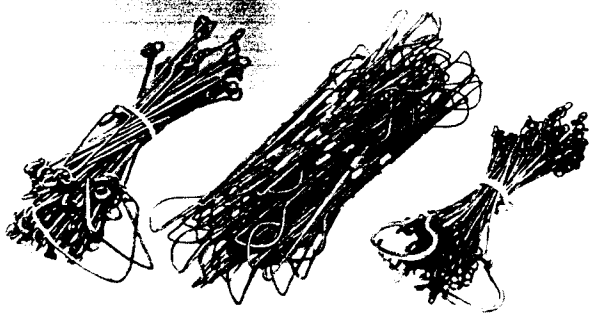
157. NEW YORK SURVEYOR'S TRANSIT - American, c. 1870, signed "B. Pike's Son 518 Broadway. N. Y.". Brass construction in purple black oxidized finish, some fittings bright lacquered brass, standing 13 3/8" h. The rack focussing telescope is 9 1/4" long with a 5 1/4" bubble level. The silvered compass is in 5 7/8" d housing on a 7 1/4" d azimuth plate. Readout is by a 5" d silvered circle on the elevation axis with a single 2 arcmin vernier and an exposed 6 1/2" d silvered azimuth ring with opposing 1 arcmin verniers. Tangent screw slow motions are fitted to all axes. The orthogonal base bubble levels are externally mounted. Generally fine overall condition although the finish is worn in places and shows some uneven fading elsewhere. The original hand dovetailed wooden case, 9 1/4" x 9 3/4" x 18" h, is sound but has rather poor surfaces.

Daniel Pike (1815-93) was Benjamin's (1777-1863) middle son, the others being Benj. Jr. (1809-64) and Gardiner (1824-93). The original firm was founded in 1804. From 1831-41 it was "& Son" with Benj. Jr. as the junior partner. It was "& Sons" from 41 to 43 with Benj. Jr. and Daniel. Benj. Jr. then left and worked under his own name from then on and the firm reverted to "& Son" (with Daniel only) from 1844-49. Then Gardiner joined and once again (from 1850) it was "& Sons" until Benj. Sr.'s death in 1867. At this time the firm was at 518 Broadway. Gardiner drops out of the picture until 1886 when he is listed as an optician at 331, The Bowery. Meanwhile Daniel continued the original firm as Benj. Pike's Son (1867-1916) at the same address until 1876, then moving to 960 Broadway by 1881. After his death in 1893, his sons, Mansfield and Hanvill, worked under the same name until 1916. Based upon the address, this transit is not later than 1876 and based upon its design with the exposed azimuth circle, it should be somewhat earlier still.

(35 lbs UP) $ 995

158. RARE 40 LINK 2 POLE CHAIN - Probably American, 1st half 19th c, unsigned but one brass tag with unrecognizable hallmark. Iron chain with iron wire handles. Small ring between each pair of long links, and brass tags at 10 link intervals. Fine overall condition noting extensive wear at points of link contact. The link-to-link distance is 9.9" so that overall length is 33', or 2 poles. The common 2 pole chain has 50 links. Wire thickness varies from 0.141" to 0.156" pointing to an early origin. We have never seen another chain with this number of links and its convenient division into half-pole intervals.

(6 lbs UP) $ 195



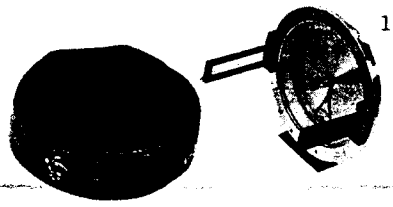
(Surveying Chains for sale only to purchasers of other surveying equipment)

159. D-LOOP ENGINEER'S CHAIN FRAGMENT - Probably American, 2nd half 19th c, unmarked. Galvanized steel links, each 12" long, without interlink rings, consisting of 50 links, but without handles or tags. Each link is formed from 1 piece of steel wire doubled over, with "D" loops at either end and wrapped and soldered at the midpoint. Generally very good condition although there are touches of rust on some links. We have been unable to determine if this chain was experimental or made on a (limited) production basis. The uniformity of the wire, 0.097" dia, suggests a later rather than earlier origin.

(7 lbs UP) $ 75

160. BRASS HANDLES 50 LINK 2 POLE CHAIN - Probably American, possibly mid 19th c, unmarked. Steel chain with brass handles, 3 (of 4) brass tags, and 2 small rings between each pair of long links. Fine overall condition except for some darkening at the ends of the links and the rings. Wire thickness varies between 0.094" and 0.100". This is the form of chain which seems to have been very popular in New England, particularly in the towns with their small lot sizes.

(5 lbs UP) $ 175

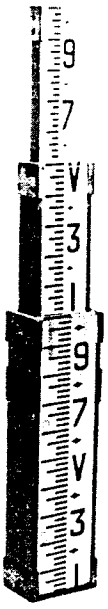


161. POCKET SURVEYOR'S COMPASS AND CLINOMETER - French, for the Norwegian market, signed and dated "Helge Varingsaasen Elverum 1884". Bright lacquered brass 3 1/8" d with black oxidized folding sight vanes and clinometer base. The 2 1/2" d silvered dial is fitted both with a 2" compass needle for bearing measurements and a pendulous pointer for inclinations. Original black leather case 3 1/2" d in good condition. The instrument is very fine.

(3 lbs, UP, PS) $ 160

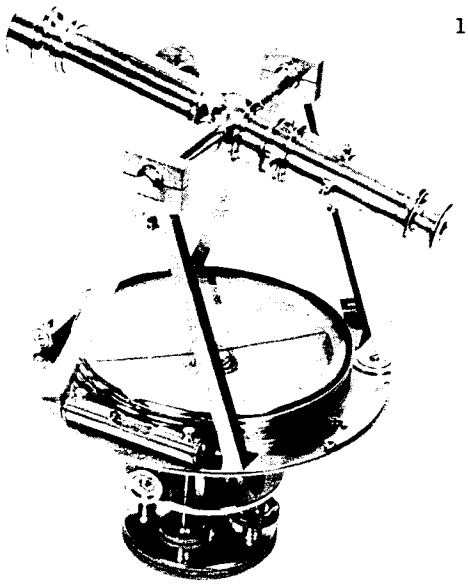
162. EXTREMELY RARE AMERICAN WAYWISER - 19th c, unsigned. Standing 53" h, the frame, 22" w handle, and wheel spokes are in golden oak. The iron tire of the approx 31 1/4" d wheel rolls 8' 3" per revolution or 1/2 pole. A spring steel wire produces a loud click each revolution. The more common English versions have a clockwork geared readout dial which reads to smaller intervals than 1 revolution and accumulates much greater distances. The American surveyor using this would have to keep a mental count of clicks. The waywiser does not give true dimensions in the horizontal plane. Thus it can be used for the rapid determination of approximate distances if there are clear paths along the appropriate boundaries and hence its relative scarcity in America. We suspect that the example here's greatest use would have been the determination of post road distances for setting appropriate charges. Condition is fine noting some age cracks and original construction pencil marks. We have never seen another like it and suspect that it may have been made by its original user.

(air freight because of size) $ 750



163. COMPACT LEVELING ROD - English, c. 1900?, signed "MICHELL, COX & Co./WINDSOR HOUSE,/ VICTORIA STREET./LONDON S.W.1.". Mahogany with white painted face and lacquered bright brass fittings, 2 1/4" x 3 1/4" x 15 1/8" h (min) extending in 3 sections to 24". Graduated in large divisions to tenths of feet and then into 50th's. Fine overall condition although the original lacquer finish has extensive pinpoint spotting. We can understand the use of a short rod in city areas where construction already exists, but only the English would have gone to the trouble of making a 2 ft.rod with the complexity of 3 sections which telescope, one within the other, so as to reduce the overall length by 9 inches. The quality of construction and workmanship is far above that of typical American rods.

(8 lbs, UP, PS) $ 160



164. EXCEPTIONAL TRANSITING TELESCOPE VERNIER COMPASS - American, possibly 1854, signed "W. & L.E. Gurley, Troy, N.Y.". Bright brass, with restored light gold lacquer finish, 12" h (11" long rack focussing telescope horizontal), the base plate 8 3/4" d. The compass housing is 6 3/4" d; silvered dial with 5 3/4" long needle. The crossed bubble levels are 3 1/2" long each. The rack and pinion driven magnetic variation vernier has silvered external readout scales as does the survey-leg counter. The 4-screw leveling base has tangent screw slow motion. There is also the original tripod with 56" mahogany legs, but no case. The tripod is in fine condition and the instrument is extremely fine, the restored finish matching the original still present on the underside of the top plate of the leveling base.

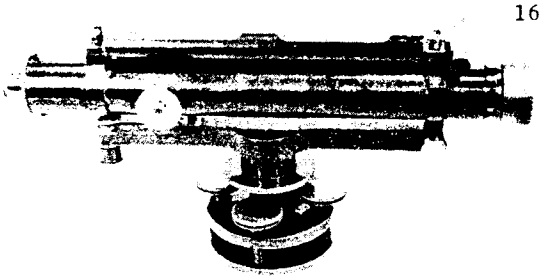
The firm, still known today as W. & L.E. Gurley, was founded by Jonas H Phelps (1809-1865), possibly as early as 1833, when he was first listed in the Troy City Directory. William Gurley (1821-87) became his partner in 1845, the firm becoming "Phelps & Gurley", then "Phelps & Gurleys" in 1851 when William's younger brother Lewis E. (1826-97) was also made a partner. Phelps retired in 1852 and the firm's name took its present form. Serial numbers did not appear on instruments until 1905 or 6. However the figures "23 + 54" are scratched on an interior surface and may represent a serial number and date. All early company records were lost in the fire of 1862. A more sophisticated version of this instrument is shown opposite p. 28 of the 1869 Gurley catalog, having a vertical circle and a slow motion tangent screw on this axis. The construction of the telescope of the instrument here is the same as that shown on p. 29 of the same catalog. Although it has many features in common with a full transit, functionally it is a surveyor's vernier compass with a transiting telescope instead of sight vanes arranged on an extended base. Azimuth readouts can only be made with respect to the needle for there is no azimuth readout circle. As a hybrid instrument costing more than a compass and less than a full transit, it appears to have been little used and surviving examples are quite rare compared with either of the latter.

(2 UP packages, 22 lbs & 12 lbs) $ 1,110

165. MILITARY SURVEYOR'S COMPASS WITH ATTACHED SHORT TRIPOD - Possibly American, 18th c, unsigned. Mahogany construction with bright lacquered brass fittings, 6 1/8" d silvered compass face. The basic compass body is 7 1/2" w x 7" deep x 1 1/2" thk with a hinged cover which hooks in place. A 14 3/4" long alidade pivoted in elevation is attached to a wooden bracket below the compass body. It has brass sight vanes (one now broken off short) and a bubble vial beneath a 6 1/2" long x 1 1/8" w brass cover plate. A 5" d turned mahogany tripod head is permanently affixed to the bottom of the compass body. The turned tripod legs extend 10 1/2". It is in very fine restored display condition.

Age shrinkage had caused the original cover glass to crack (now replaced) and 2 very large cracks to develop in the compass body. The compass was removed, the cracks glued together, the now oval compass well returned on a lathe and the compass refitted. The brass fittings were cleaned and relacquered. The dial silvering is original. The thumb screw for the compass needle lifter is present but not the arm which would have extended to the compass center. There are several other age cracks and the wooden surfaces have worn from field usage. This specialized form of surveying compass is described in George Adams "Geometrical Essays" and illustrated by Fig. 3 of Plate XV of the same work.

(12 lbs UP) $ 1,200

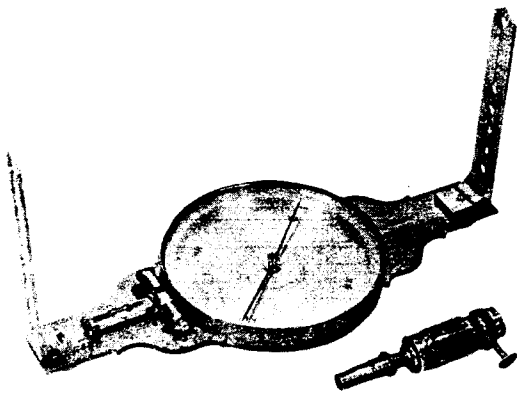


166. FINE ENGLISH DUMPY LEVEL - 2nd half 19th c, signed "TROUGHTON & SIMMS/LONDON", serial no. 23188 crudely stamped in case but none on instrument. Brass construction in original brown-black oxidized finish with some fittings in bright lacquered brass, 14 3/4" long (min), 7 1/4" h incl 4-screw leveling base, rack and pinion focussing eyepiece assembly. The longitudinal bubble is 8 1/2" long and the transverse one 2 1/2". Instrument complete except for objective lens cap. Original hand-dovetailed mahogany case 5 1/2" w, 5 1/4" h, 20" long in fine condition except for several age cracks. The level is very fine.

This typical English level of the 2nd half of the 19th c has several refinements in the design of its adjustments not found on the instruments of other makers (such as Items 215 of Cat. 122 and Item 248 of Cat. 117). It is the work of one of the "great" firms of instrument making. Troughton & Simms was established in 1826 when Edward Troughton (1753-1836) took William Simms (1793-1860) in as a partner so that the firm could continue since he had no family and his brothers had died years earlier. In 1922 they merged to become Cooke, Troughton & Simms.

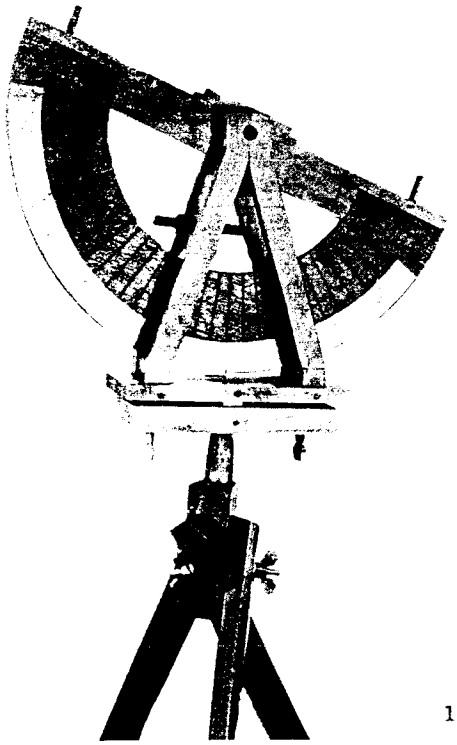
(18 lbs UP) $ 425

167. LARGE, NICELY CASED, SURVEYOR'S COMPASS - American, between 1840 and 58, signed "C. G. King Boston". Bright brass, original lacquer finish, silvered dial within 7" d compass housing mounted on a 15 7/8" long base with crossed bubble levels on one side. Sight vanes, 7 3/4" h, screw on at either end. Complete with ball and socket joint. Original mahogany case, 8 1/2" deep x 4 1/8" h x 16 5/8" w, in fine condition with King's trade card showing a sea captain with a sextant and a top-hatted surveyor with a transit inside the cover. The compass is in very fine condition except for some wear to the finish on the outside of the vanes and some dark streaking/spotting on the compass base.



Charles Gedney King (1808-58) was son of the Boston instrument maker Gedney King (1770-1839) and probably related to the Kings of Salem. His father was listed in the Boston directories from 1800 and both were partners between 1837 and 39. Nautical and surveying instruments by the father and son are included in the collections of the Essex Institute, the Peabody Museum (both of Salem, Mass.), the Gurley Museum, and have been listed in several of our catalogs. The compass here, and others, show that both were quite skilled in their profession.

(20 lbs UP) $ 835

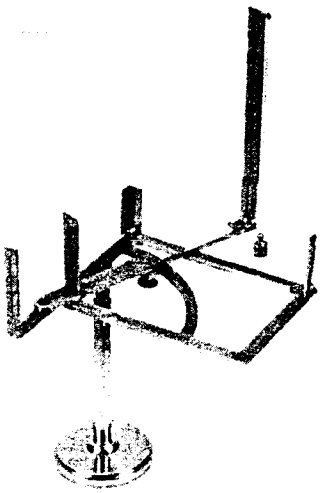


168. LARGE WOODEN ELEVATION THEODOLITE ON TRIPOD - American, 1st half 19th c, possibly quite early, unsigned. Wooden semi-circular ring, 18" d, with 1" h V-notch and peep sights, a 3 1/2" bubble vial (no liquid), suspended in 9 7/8" h standards, which in turn are located on a double base plate, 8 7/8" long x 4" w which can be leveled in the elevation plane. The leveling screws are wood and most joints are pinned with wooden pegs. There is also a wooden tangent screw assembly on the elevation axis (one connecting link is a modern replacement). An engraved copper elevation circle is attached to the outer edge of the elevation ring and is, rather roughly, graduated to degrees. The wooden tripod with 56" legs and brass thumb nuts is later than the instrument, although still 19th c, but only now supplied for display purposes. Extremely fine overall condition considering natural aging and shrinkage of original materials.

It is suspected that this may be a patent model dating from the beginning of the 19th c rather than an instrument intended for actual use. The lack of fine graduations on the readout scale point in this direction although the craftsmanship involved is at least equal to that of other wooden instruments known to have been made for practical use. The elimination of an azimuth scale, however, limits the applications of such an item and again suggests an invention conceived more from a point of uniqueness than in response to an existing need. The basic design seems to have evolved from the Ramsden pattern of theodolite. A very impressive and probably unique American instrument.

(2 UP packages, 10 lbs each) $ 1,150

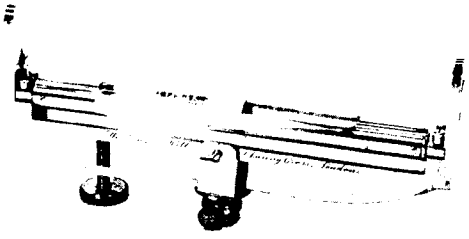
169. EXTREMELY RARE "UNIVERSAL INSTRUMENT" - French, c. 1800?, marked with the letters "P/D/JE" within a triangle and "DES/BOR/DES" within a square. Bright brass with original lacquer finish with a basic rectangular frame 8.5cm x 11.5 cm (3 5/16" x 4 1/2") with one short side extended 3.8 cm. Three folding sight vanes (one double) are located on this structure plus a fitting for a handle. A pivoted alidade of 14.5 cm radius has large (12.3 cm h) and small (4.5 cm h) folding sight vanes and reads out on a tangent scale engraved on one long side of the rectangle. A plumb-bob can be suspended from the large vane. A handle attaches to the frame so that it may be placed either horizontally (as shown) or vertically. (The 4" stand shown in the photograph is not original but is provided for display purposes.) The original 5 1/4" sq x 1 1/8" h black cloth covered fitted case (not shown) is in very good condition (some edge wear), the instrument is very fine.



A Charles Desbordes prepared a plan of Turin, Italy in 1705, but we have been unable to locate an instrument maker with such a name. The "Universal Instrument" is more a display of the designer's ingenuity than an item for use by a surveyor in the field. The readout scale has nominal graduations only (every 0.1) and so comes nowhere near the accuracy potential of the instrument. Versions first appeared on the Continent in the 16th century and one early form is described in the anonymous book "Methode de Lever les Plans et les Cartes de Terre et de Mer" published in Paris in 1693. Two "Universal Instruments" similar to this example are now on exhibit in the Science Musemm, London. Keily, "Surveying Instruments Their History" describes several instruments under this designation but most have circular readout scales and none employ linear structures, suggesting that he was unaware of the type offered here.

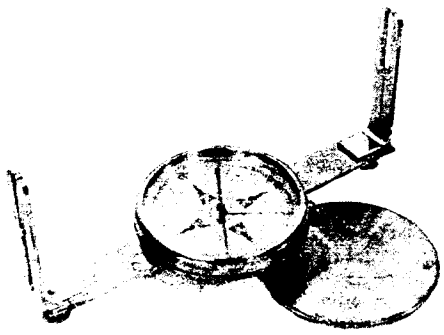
(4 lbs UP) $ 795

170. MILITARY ENGINEER's LEVEL - English, 2nd qtr 19th c, signed "Watkins & Hill. Charing Cross, London". Bright brass, restored lacquer finish, 10 1/2" long x 4 7/8" h. The bubble level is 9 1/8" long, the sight vanes 3 1/8" h, and azimuth leveling is by the thumb screw working against the curved leaf spring which bears on the sight base. Original hand dovetailed oak case, 5 7/8" x 11 1/2" x 2 1/8" thk, in good condition with several age cracks. The level is extremely fine.



This form of level was made into the 20th century without any change in design (see Item 154 of Catalog 121). The firm which made this instrument was established by Francis Watkins (1723-84?) in 1747. At various times it was known as F. Watkins (1747-63 and 1774-84), Watkins & Smith (1763-74), J. & W. Watkins (1784-98), J. Watkins (1799-1818), becoming Watkins and Hill in 1819. (and lasting till 1856). They were appointed instrument makers to the University of London, which was opened in 1828.

(8 lbs, UP, PS) $ 355



171. ENGLISH SURVEYOR'S COMPASS - early 19th c, signed "Spencer & Co. LONDON". Bright brass, original lacquer finish, silvered compass dial within 5" d housing which is mounted on a 12" long base. The screw-on sight vanes are 4 3/4" h each. The brass compass cover is present but the ball and socket joint is now lacking. Original hand dovetailed stained pine case, 6" deep x 2 7/8" h x 12 1/4" w is in fair condition with a 2 1/4" long chip out of one end and typical surface wear. The compass is very fine.

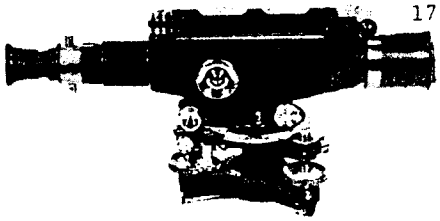
Spencer & Co. was the name used by Spencer, Browning & Rust for their higher quality instruments, particularly those in brass. Item 207 of our Catalog 120 was made under this name after they had moved to 111, Minories (1840 according to Brewington). A slightly larger compass of the same design was listed by us as Item 117 of Catalog 113.

(10 lbs UP) $ 725

172. ELEGANT GRAPHOMETER - French, 1st half 19th c, unsigned. Bright lacquered brass, 7 3/8" major dia with fixed vanes 2 1/4" h, pivoted alidade 5 5/8" long also with 2 1/4" h vanes; 6 1/2" overall ht including ball and socket joint for staff mounting. The semi-circular scale is read out by opposing verniers to 2 arcmins. Overall condition is excellent with 80% original, 20% restored finishes. Original painted hand dovetailed wooden case, 4 1/2" deep x 4 3/4" h x 8 1/4" w, is in only fair condition with several major age cracks. The display base in the photograph is not included.

The graphometre, although popular on the Continent, and in France particularly, was little used in the English speaking world. Most were made with relatively small compasses which would serve for coarse alignment, at best. The example here was designed without this feature and was clearly intended for relative bearing measurements only.

(6 lbs UP) $ 635



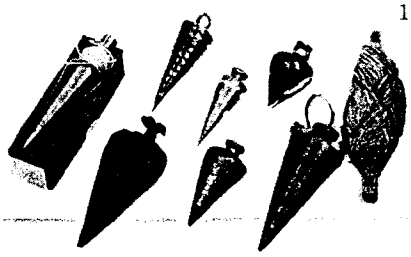
173. ENGLISH LEVEL FITTED FOR TACHEOMETRICAL READING - Early 20th c, marked "PATENT/STANLEY, HOLBORN, LONDON/27052/BRITISH MADE". Cast and machined brass in green-black oxidized finish with some fittings in bright lacquered brass, 11 1/2" long by 6" h including the 3 screw leveling base. Crossed bubble levels, 2 1/4" and 4 3/4" long, azimuth readout circle 3 3/4" d divided to degrees. Rack and pinion eyepiece focussing. Original mahogany case 13 1/4" x 6" x 7 3/4" h. Case in almost fine and level in near mint condition.

According to the label inside the cover, "The Telescope of this instrument if fitted for tacheometrical [stadimetric] reading, and the points are set 1:100. In taking readings of a distant staff by means of the subtense points or lines in the diaphragm, read every 1/100 foot (or metre) on the staff as being equal to one foot (or metre) of distance from the centre of the instrument, . . . ". The maker is the same Stanley located at Gt. Turnstile, Holborn during the 19th century.

(18 lbs, UP, PS) $ 285

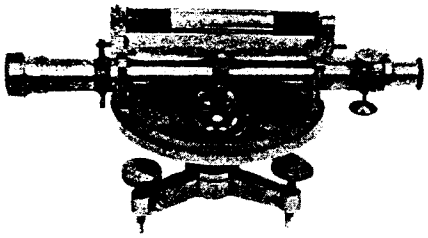
174. CASED POCKET COMPASS - French, for the American market, late 19th c, unsigned. Bright lacquered brass 4 3/4" d, 3 1/2" h brown oxidized folding sight vanes, the 4 1/8" d compass dial with its face in the same oxidized finish, a silvered graduated ring around its edge and a 3 3/8" long needle. The original staff mounting bracket is 3 1/4" h in original bright lacquered brass. The original mahogany case, 5 1/2" x 7" x 1 3/4" h, is in very good condition with several age cracks. The compass is fine except for some uneven fading of the oxidized surfaces. This is a larger version of Item 225 of Catalog 122.

(4 lbs, UP, PS) $ 175



175. COLLECTION OF PLUMB-BOBS - Mostly American, 19th and 20th c, only the one by K + E signed. There are 7 in all: 4 in iron, 2 1/2", 4", 4 1/2", and 4 1/2" long; 2 in brass with steel tips, 3" long each; and K + E no. 6482 in gun metal with steel tip, 4 1/2" long. Condition ranges from good to very fine.

(10 lbs, UP, PS) $ 110

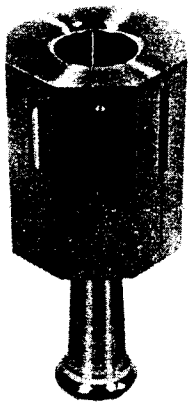


176. INTERESTING CONTINENTAL LEVEL - French, 4th qtr 19th c, unsigned. Original bright lacquered brass, a few fittings and the interior of the azimuth bearing plate in black and the bubble level tube center in nickel plate, 7" h including the 3-screw leveling base and the rack focusing telescope 13" long. The azimuth (ungraduated) bearing circle is 6 3/4" d, and the reversible bubble level 5 3/4" long in a 6 3/4" long mounting bracket. The telescope may also be removed and inverted (for purposes of alignment?). Fine overall condition with one small screw missing. No case.

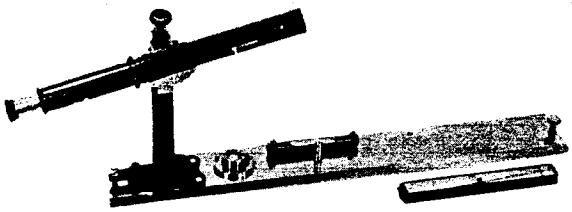
This instrument is unlike any English or American design. Instead of a central axis to which is attached either the telescope (dumpy level) or telescope bracket (wye level), the fundamental reference is the circular azimuth bearing ring. We suspect that the bubble level is first used to level this surface, the crosshairs of the telescope then adjusted with respect to this surface in each of four positions determined by the 2 fixed square blocks which are part of the telescope housing. The bubble level is then fitted to the top of the telescope but we are uncertain as to whether it is then used in this position or just placed there for stowage.

(12 lbs, UP, PS) $ 295

177. CASED OCTAGONAL SURVEYOR'S CROSS - French, 2nd half 19th c, unsigned. Bright brass with original lacquer finish, 6 1/2" h overall and 2 1/2" across the flats of the 3 1/4" h sighting head. The staff mounting post screws off for stowage, is reversed and screwed through the hole in the top of the sighting head. Original stained wooden case, 3" sq x 4 1/2" h, in very good condition. The instrument is extremely fine. This design is derived from the classical 4-vane surveyor's cross and the cylindrical equivalent of the same. The octagonal form with its 4 extra slits, provides fixed angles at 45 deg intervals.

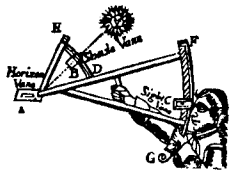


(4 lbs, UP, PS) $ 145

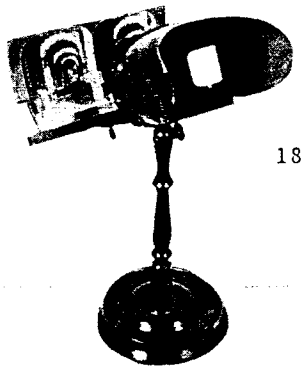


178. EXPLORER'S "REEVES' FOLDING ALIDADE" - English, c. 1900, signed "CARY LONDON" and marked "ROYAL GEOGRAPHICAL SOCIETY No. 17". Inside the case is the trade card of "CARY, PORTER, LTD. OPTICIANS & SCIENTIFIC INSTRUMENT MAKERS TO THE ADMIRALTY, &c. . . . ESTABLISHED 1765". The bright lacquered brass rule is 2 3/4" w x 20" long, engraved with inch and centimeter scales and a diagonal scale for 1/250,000 mapping. It is fitted with a circular bubble level, a 3 3/4" longitudinal bubble vial (instrument maker replacement for shorter original) and a folding telescopic sight with elevation readout by vernier to 10 arcmins graduated between ± 30 deg. The telescope is 11 1/2" long and it and its folding post are black enameled aluminum. The lacquer finish of the brass alidade is a modern restoration, all else original. There is also a 6 3/4" long trough compass for aligning the plane table. The instruments are in fine condition. Original hand dovetailed mahogany case 4 3/8" w, 3 1/4" w, 21" long in sound condition with somewhat abused surfaces. It appears that the Royal Geographical Society provided plane tables and alidades for their various expeditions because they were relatively simple to use, yielding direct maps from field observations rather than numerical data which, if in error, would not be found incorrect until reduced to maps, possibly months later.

(12 lbs, UP, PS) $ 275

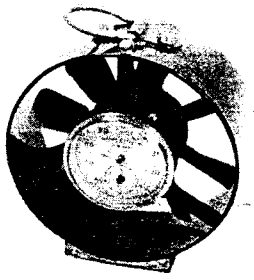


179. TABLE STAND VIEWER - American, 19th c, unsigned. Walnut construction with 5 1/4" d turned base, standing 12" h, the viewer section 12 1/2" long. The card holder slides for focussing and the viewer assembly tilts. The light hood about the viewing lenses is made of cardboard with wood grain painting and shows modest wear. The remainder is in very fine condition. This was a common form of stereoscope made in both hand-held and table stand models.

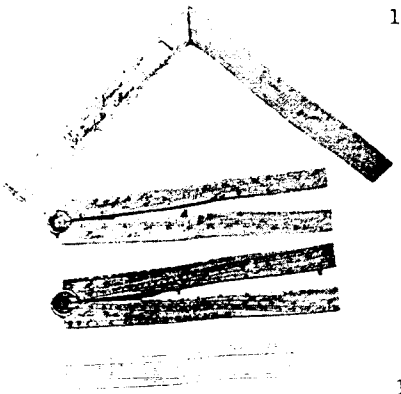


(5 lbs, UP, PS) $ 85

180. PORTABLE ANEMOMETER - American, 1st half 20th c, signed "KEUFFEL & ESSER CO. NEW YORK". Black enameled brass outer ring 3 1/8" d, 1 3/16" deep, brass base, silvered dial 1 1/4" d with fast hand reading from 0-100 ft in 1 ft intervals and slow hand reading to 1000 ft in 100 ft intervals. Fine physical condition and operating (no accuracy guarantee however).



(4 lbs, UP, PS) $ 95



181. FOLDING SQUARE - French, c. 1700, signed "Butterfield A Paris". Bright brass, restored lacquer finish, 6 3/4" long per side and 13/16" wide. Thickness varies between 0.069" and 0.095". One edge has a scale marked "6 p (for pouce or French inch) de france" with intervals just over 1 1/16 English inches. The other edge has a centimeter scale engraved (rather crudely) "Nelle Mesure", and certainly not by the same hand of the signature. In our opinion this instrument was once part of a set of drawing instruments (standard grade) made by the firm of Michael Butterfield, established in Paris by 1677 (see discussion of Item 148 of Catalog 120), which lasted until his death in 1724. About a century later the centimeter scale was added by someone who lacked the skill of Butterfield and his workmen. Very fine condition.

(3 lbs, UP, PS) $ 355

182. SECTOR BY NOTED MAKER - French, c. 1700, signed "Butterfield A Paris". Bright brass, restored lacquer finish, 1 1/8" w x 6 7/8" long when closed, varying in thickness from 0.158" to 0.190". The scales on the face are marked "Les Cordes, Les Solides, Les Metaux" and on the reverse "Les Parties Egales, Les Poligones". The quality of engraving is that of Butterfield's standard grade. In our opinion this instrument was also part of a set of drawing instruments, but probably not from the same set as the item above. Very fine condition except for some marring of the reverse surface.

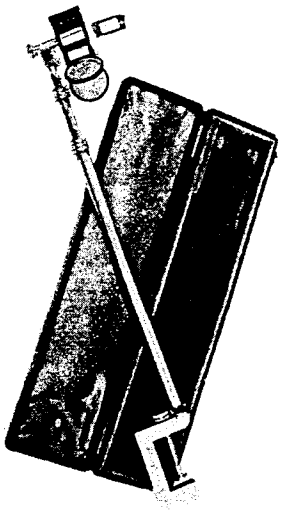
(3 lbs UP) $ 675

183. WELL-MADE BRASS SECTOR - French, 18th c, unsigned. Bright brass, restored lacquer finish, 1 1/4" w x 6 3/4" long (closed), varying in thickness from 0.158" to 0.174". Scales on one side for "Les Parties Egales, les Solides, les Poligones, Poids de Boulets" and on the other for "Les Cordes, les Plans, les Metause, Calibres des Pieces". Along the edged are scales for French and English inches. This is a form of Galileo's sector or "Compasso Geometrico" as made by late 17th and early 18th c French instrument makers. Very fine condition.

(3 lbs, UP, PS) $ 345

184. DIAGONAL SCALE RULE - French, 18th c, unsigned. Bright brass, restored lacquer finish, 7/8" w x 6 7/8" long varying in thickness from 0.070" to 0.082". There are scales engraved on both sides in units of 1/4 and 1/2 pouces (French inches) with the diagonal scales reading to 1/12 of these intervals. The quality of the original engraving is moderate; overall condition very fine.

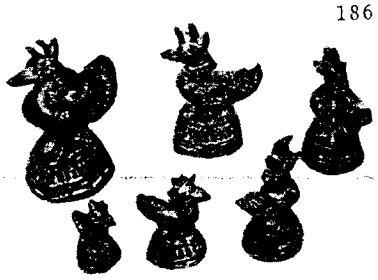
(3 lbs, UP, PS) $ 95



185. IMPROVED FORM OF CAMERA LUCIDA - English, possibly from the 1825 period, signed "CARY LONDON". Bright brass, original lacquer finish, telescoping column (up to 17" long) on C-clamp mount, black oxidized prism housing with pivoted cover over peep hole, swing-away rectangular filter for object viewing window, and second viewing window with swing-away weak negative meniscus lens and circular filter. Original red-leather-covered case 1 1/8" x 9 1/8" x 1" thk in very good condition with some external wear. The instrument is extremely fine except for a crack near the edge of the meniscus lens (outside of the field of view).

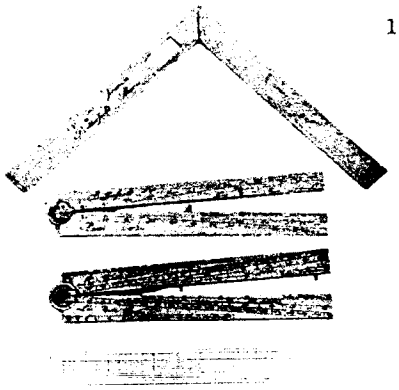
The camera Lucida, one of the optical forerunners of the 'photographic era' was used by the artist as an aid when sketching in the field. It was invented by the astronomer William H. Wollaston (1766-1828) and first described by him in 1812. The original version (see Item 227, Catalog 120 for an example) required 2 eye operation, one looking down in the instrument to see the view ahead and the other to observe the sketched image below. The version here enables one eye operation with the sketching surface and the viewed object superimposed within the instrument. Except for the new optical design, details of fabrication match that of Item 227, Catalog 120 (which we know dates between 1812 and 25) and the cases are of the same period as well. Thus this version, at the latest, is c. 1825 or 30, and so is also prior to the invention of photography.

(4 lbs, UP, PS) $ 280



186. SET OF 4 DUCK WEIGHTS - Burmese, 19th c, unsigned. Six cast bronze graduated balance weights in the form of stylized ducks. The largest is 2 5/8" h and weighs about 10 oz. and the smallest 1 1/8" h and weighs about 1 oz. Very fine overall condition with a deep green-brown patina. This set is unusual in that it is complete and all the weights are original, not a composite or made-up group. Although more common than the dragon (see Item 250, Catalog 118) or elephant (see Item 242, Catalog 120) weights, they are sufficiently unusual to provide an interesting comparison with graduated European sets.

(4 lbs, UP, PS) $ 235



181. FOLDING SQUARE - French, c. 1700, signed "Butterfield A Paris". Bright brass, restored lacquer finish, 6 3/4" long per side and 13/16" wide. Thickness varies between 0.069" and 0.095". One edge has a scale marked "6 p (for pouce or French inch) de france" with intervals just over 1 1/16 English inches. The other edge has a centimeter scale engraved (rather crudely) "Nelle Mesure", and certainly not by the same hand of the signature. In our opinion this instrument was once part of a set of drawing instruments (standard grade) made by the firm of Michael Butterfield, established in Paris by 1677 (see discussion of Item 148 of Catalog 120), which lasted until his death in 1724. About a century later the centimeter scale was added by someone who lacked the skill of Butterfield and his workmen. Very fine condition.

(3 lbs, UP, PS) $ 355

182. SECTOR BY NOTED MAKER - French, c. 1700, signed "Butterfield A Paris". Bright brass, restored lacquer finish, 1 1/8" w x 6 7/8" long when closed, varying in thickness from 0.158" to 0.190". The scales on the face are marked "Les Cordes, Les Solides, Les Metaux" and on the reverse "Les Parties Egales, Les Poligones". The quality of engraving is that of Butterfield's standard grade. In our opinion this instrument was also part of a set of drawing instruments, but probably not from the same set as the item above. Very fine condition except for some marring of the reverse surface.

(3 lbs UP) $ 675

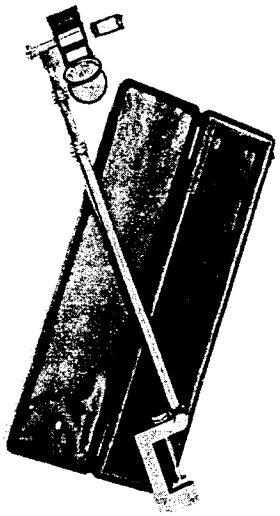
183. WELL-MADE BRASS SECTOR - French, 18th c, unsigned. Bright brass, restored lacquer finish, 1 1/4" w x 6 3/4" long (closed), varying in thickness from 0.158" to 0.174". Scales on one side for "Les Parties Egales, les Solides, les Poligones, Poids de Boulets" and on the other for "Les Cordes, les Plans, les Metause, Calibres des Pieces". Along the edged are scales for French and English inches. This is a form of Galileo's sector or "Compasso Geometrico" as made by late 17th and early 18th c French instrument makers. Very fine condition.

(3 lbs, UP, PS) $ 345

184. DIAGONAL SCALE RULE - French, 18th c, unsigned. Bright brass, restored lacquer finish, 7/8" w x 6 7/8" long varying in thickness from 0.070" to 0.082". There are scales engraved on both sides in units of 1/4 and 1/2 pouces (French inches) with the diagonal scales reading to 1/12 of these intervals. The quality of the original engraving is moderate; overall condition very fine.

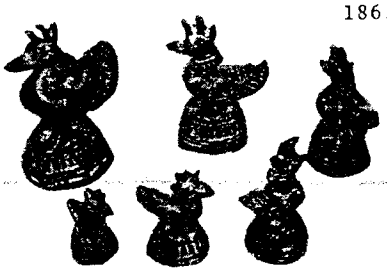
(3 lbs, UP, PS) $ 95

185. IMPROVED FORM OF CAMERA LUCIDA - English, possibly from the 1825 period, signed "CARY LONDON". Bright brass, original lacquer finish, telescoping column (up to 17" long) on C-clamp mount, black oxidized prism housing with pivoted cover over peep hole, swing-away rectangular filter for object viewing window, and second viewing window with swing-away weak negative meniscus lens and circular filter. Original red-leather-covered case 1 1/8" x 9 1/8" x 1" thk in very good condition with some external wear. The instrument is extremely fine except for a crack near the edge of the meniscus lens (outside of the field of view).



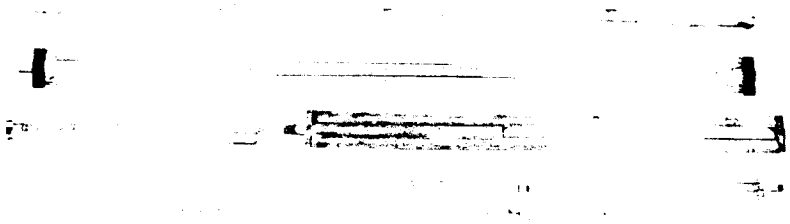
The camera Lucida, one of the optical forerunners of the 'photographic era' was used by the artist as an aid when sketching in the field. It was invented by the astronomer William H. Wollaston (1766-1828) and first described by him in 1812. The original version (see Item 227, Catalog 120 for an example) required 2 eye operation, one looking down in the instrument to see the view ahead and the other to observe the sketched image below. The version here enables one eye operation with the sketching surface and the viewed object superimposed within the instrument. Except for the new optical design, details of fabrication match that of Item 227, Catalog 120 (which we know dates between 1812 and 25) and the cases are of the same period as well. Thus this version, at the latest, is c. 1825 or 30, and so is also prior to the invention of photography.

(4 lbs, UP, PS) $ 280



186. SET OF 6 DUCK WEIGHTS - Burmese, 19th c, unsigned. Six cast bronze graduated balance weights in the form of stylized ducks. The largest is 2 5/8" h and weighs about 10 oz. and the smallest 1 1/8" h and weighs about 1 oz. Very fine overall condition with a deep green-brown patina. This set is unusual in that it is complete and all the weights are original, not a composite or made-up group. Although more common than the dragon (see Item 250, Catalog 118) or elephant (see Item 242, Catalog 120) weights, they are sufficiently unusual to provide an interesting comparison with graduated European sets.

(4 lbs, UP, PS) $ 235



187. WANTAGE OR GAUGING ROD - American, middle half 19th c, signed "H. S. Pearson, Maker. Portland". Tapered fruitwood rod approx 3/4" sq x 36 1/4" long. All four sides are extensively marked with scales and tables as follows: scale of inches from 12 to 47 subdivided in tenths, logarithmic scale from 5 to 200, 6 tables (3 to each of 2 remaining sides) with 3 columns each headed Inches, Quarters, & Gallons. Fine overall condition except for some marks and ink stains. Such rods were used by merchants, sea captains, and revenue agents to compute the volume of wine, etc in full and partially full kegs. Smart provides the following: *"Henry Sleeper Pearson, son of David and Elizabeth Sleeper Pearson was born at Newburyport, Massachusetts 23 May 1789. He died at Portland (Maine) 30 August 1878. He is listed in the Portland directories from 1823, which was the first one issued, to 1875, as a mathematical instrument and watch maker. In 1877 he is listed as a watch and nautical instrument maker with William Senter & Company of Portland."*

(6 lbs, UP, PS) $ 195

188. CUSTOMS OFFICER'S TIMBER SLIDE RULE - English, 19th c, signed "DRING & FAGE LONDON MAKERS TO THE CUSTOMS" and marked "CUSTOMS". Boxwood slide rule 36" long x 1 7/8" w with brass end bands, 4 scales on each side, designated E, C, B, A. The graduated logarithmic scales are in feet and and inches, Fine overall condition although the brass bands have darkened. Taylor 2 lists the firm founded by John Dring and William Fage as being in business from 1798 to 1870. They were noted for their slide rules, gauging rods, hydrometers, tools of the trade of the alcoholic beverage industry and the government tax collectors.

(6 lbs, UP, PS) $ 245

189. FOUR SIDED, FOUR SLIDE, EXCISE RULE - English, probably just after 1825, signed under one of the slides "COOK · MAKER TO THE HONBLE BOARD OF EXCISE · LATE WELLINGTON CROWN COURT SOHO London". Boxwood, 3/4" x 1 1/8" x 12" long with a total of 16 scales on the 4 sides plus one on the back of one slide and tables on the back of another slide. Fine overall condition with some small chips near the ends. Taylor 2 lists Alexander Wellington, fl 1792-1825, at Crown Court, Adinger St., St. Anne's, Soho, London. She also lists Laban Cooke (possible mis-spelling) at 21 Crown Court, Soho, London as successor to Wellington. She notes that he made gauging instruments for The Board of Excise, scales, slide rules, etc.

(3 lbs, UP, PS) $ 165

190. VERY RARE NAVIGATOR'S SLIDING GUNTER - English, c. 1840, signed "Blachford & Imray". Darkened boxwood, 1 7/8" w x 24" long, with a total of 22 scales (both sides); brass insets at the zeroes of several scales. Very good condition noting some stains and a break in the slide which appears to have been glued back together (probably should be repaired with a brass joining plate) and chipping at one end. This slide rule represents an improvement over the fixed Gunter rule but was little used (and hence quite rare) because of the extreme conservatism of the typical ship's officer. Robert Blachford, son-in-law of John Hamilton Moore, established his Navigation Warehouse about 1804 where charts, textbooks, and instruments were sold and the latter corrected and repaired. There was also a navigation school. He was joined by James Imray in 1836, the firm remaining as named above until 1842. Later Laurie, Norie, and Wilson joined in revised partnerships.

(5 lbs, UP, PS) $ 420

191. NAVIGATOR'S GUNTER RULE - English, early 19th c, unsigned. Light boxwood, 1 3/4" w x 24" long, with 16 computational scales, a 10" diagonal scale, a 24" tenths-inch rule on one side, and brass insets at zeroes and points of great usage. Very fine condition with minor warping and edge chipping - really nice for display purposes. The use of this form of computational device (consisting of a set of linear and logarithmic number and functional scales for navigation) was described in Mackay, Bowditch, Moore, etc. Computations were performed by working back and forth on the scales with a pair of dividers (in lieu of the slide and cursor of the modern slide rule). It was derived from the earliest form of computational device using logarithmic scales as invented Gunter between 1610-20.

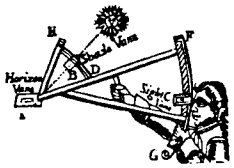
(5 lbs, UP, PS) $ 175

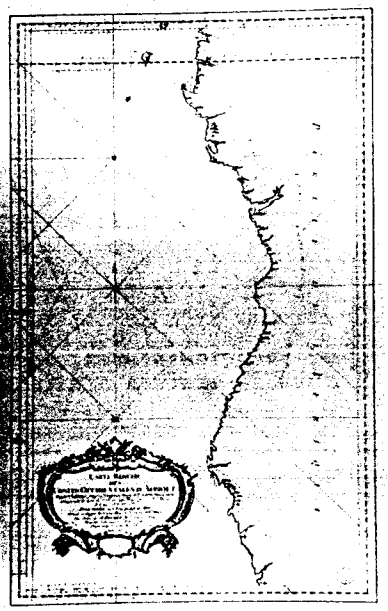
192. DOUBLE-SLIDE SLIDE RULE - English, mid to late 19th c, signed "LOFTUS MAKER 321 OXFORD ST. LONDON" and with an owner's name "G. Fletcher". Boxwood with brass end bands, 2" w x 12 3/4" long, with 16 scales on the 2 faces and 3 along one edge. Fine condition. An interesting device used in the distillery and brewing industry, and by the tax collectors for the same, to calculate the alcoholic content of beverages and the volumes of completely and partially filled casks, either standing up or lying down. Taylor 2 does not list Loftus although Pearsall does have him still working as late as 1894. There is one slide rule by him in the Science Museum (London) collection, Item 464.

(3 lbs, UP, PS) $ 140

193. SET OF 6 GRAM WEIGHTS - Early 19th c, marked with "DR" within a scroll, "22" above, various numbers below, the weight of each piece and inspection date stamps from "15" for 1815 through "69". Construction is brass with copper plugs in some weights, these then stamped with the scroll hallmark as well. The individual pieces are 200 g, 100 g, 50 g, 20 g, 10 g, and 5 g. Fine overall condition noting that the larger weights show greater usage (and marking) than the smaller ones.

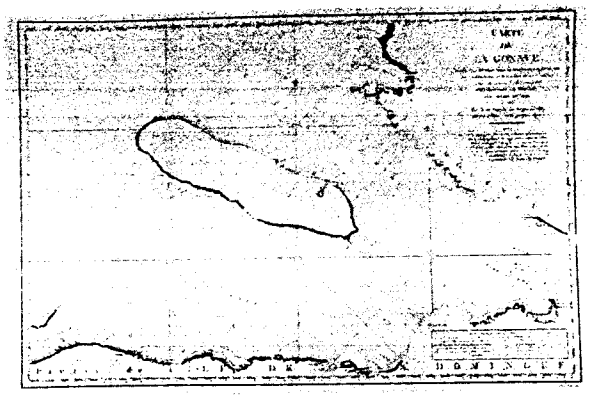
(4 lbs, UP, PS) $ 120





194. THE WEST COAST OF AFRICA - "CARTE REDUITE DES COSTES OCCIDENTALES D'AFRIQUE · · · POUR SERVIR AUX VAISSEAUX DU ROY · · · ", French Dépôt de la Marine chart dated 1754. Printed area 35 1/4" h x 21 5/8" w on paper 37 1/2" h x 25 1/2" w with usual centerfold. The area covered is from 1 1/2° north to 21 1/2° south latitude and from 2 1/2° east to 15° east London longitude, thus including the coasts of what used to be known as French Equatorial Africa, the Congo, and Angola. Fine to very fine overall condition with some creases which will not show upon mounting and a 1 3/4" d light stain on the top edge.

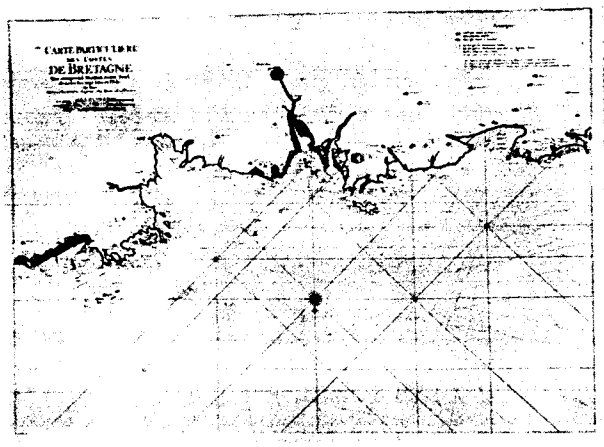
(postpaid in the U.S. only) $ 85



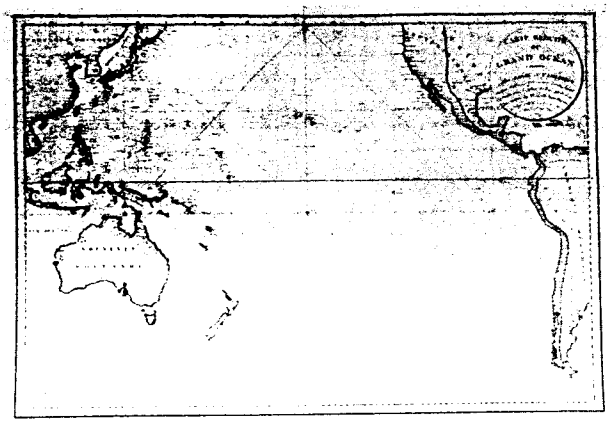
195. GONAVE ISLAND OFF THE COAST OF HAITI - "CARTE DE LA GONAVE Dreſsée fur les Opérations Géometriques faites en 1787, sous l'Administration de M. le Compte de LA LUZERNE · · · et Publiée sous son Miniftère PAR ORDRE DU ROI en 1788 Par M. de Lieudë de Sepmanville, · · · ". Engraved French hydrographic office chart, 34 1/2" w x 22" h (picture area) on paper 27" w x 25 1/4" h, with usual centerfold. Note the town of Port Au Prince in the lower right. Very fine overall condition noting light water stain along bottom edge which extends 5/8" into the picture area.

(postpaid in the U.S. only) $ 85

196. CHART OF THE COAST OF FRANCE IN ORIGINAL HAND COLORING - "CARTE PARTICULIERE DES COSTES DE BRETAGNE · · · Faite Par Ordre Exprez Du Roy de France" - Dutch or French, c. 1700, unsigned. Printed area 23 1/4" h x 31 1/2" w on centerfold paper 24 3/4" h x 36 3/4" w. Elaborate engraved coastal detail, original hand coloring of the coastal regions, very fine overall condition except for some offsetting of the coloring across the centerfold and a few spots where the acid in the colored inks has burned through the paper (these now repaired by rebacking so that no defect shows from the front). Our research leads us to believe that this may be the work of Pierre Mortier of Amsterdam taken from his "De Franshe Neptunus" issued from 1693-1700. It matches the style and engraving of Item 148 of our Catalog 115, a signed chart of the Pacific Ocean. However, the last line in the title also suggests that it may be an early sheet from the series of the French Admiralty charts issued from 1693 to 1740, an example of which was listed as Item 163 of Catalog 122. Either way, early charts with original hand coloring - more costly than the plain black and whites when first issued - are relatively rare.

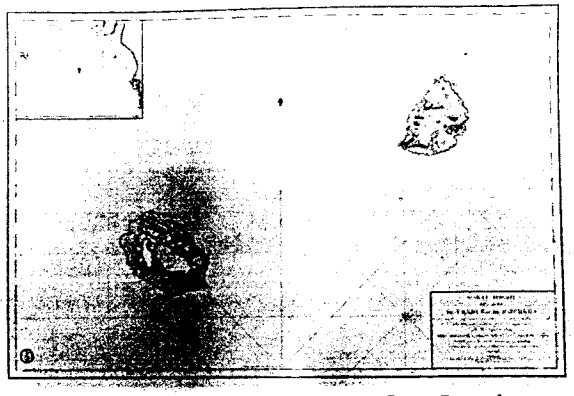


(postpaid in the U.S. only) $ 265



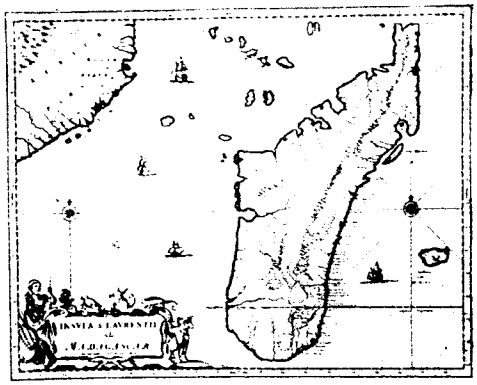
197. RARE CHART OF THE PACIFIC IN COLOR - "CARTE REDUITE DU GRAND OCÉAN compris entre L'ASIE et L'AMERIQUE", French Dépôt de la Marine chart dated 1797, Corrigée en 1818. Large printed area 24" h x 35 1/4" w on paper 25 3/4" h x 37 1/2" w with usual centerfold. Recent hand coloring based upon the original colored editions of this copperplate engraving. The chart extends from 50° north to 60° south latitude and between 102° east and 63° west Paris longitude, including the western sides of North and South America, Nouvelle Zeelande, Nouvelle Hollande, a somewhat fuzzy Ne. Guinee, Tartorie Chinoise, and the Isles Du Japon. Very fine overall condition with several repaired tears into the margins.

(postpaid in the U.S. only) $ 475



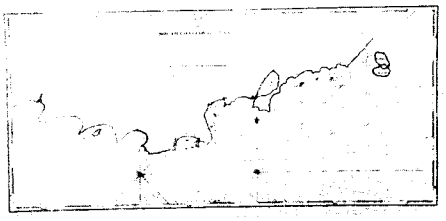
198. COLORED CHART OF ISLANDS OF THE SOUTH INDIAN OCEAN - "CARTE REDUITE DES ÎLES DE FRANCE et DE BOURBON . . . par Mr. Lislet Géoffrey . . . en 1798. Nouvelle Edition . . . 1802." French Dépôt de la Marine edition with the paper so water marked. Printed area 22 1/2" h x 34" w on paper 25 3/4" h x 38 3/4" w with usual centerfold. Very fine condition with recent hand coloring to match that found on original colored editions. Jean Baptiste Lislet-Géoffrey (1755-1836), hydrographical engineer, Captain of the Corps of Military Draughtsmen, worked for the Dépôt and specialized in eastern Africa and the Indian Ocean.

(postpaid in the U.S. only) $ 170



199. EAST COAST OF AFRICA WITH ORIGINAL HAND COLORING - Dutch, c. 1730, signed "INSVLA S. LAVRENTII, vulgo MADASCAR. Amstelodami Apud Covens et Mortier". Printed area 17" h x 22" w on paper 20 1/2" h x 25 1/4" w, with usual centerfold. Typical elegant Dutch engraving including 4 sailing ships in the sea regions, original hand coloring of border and outlines of land areas, interior detail for the island of Madascar, and generally in very fine overall condition. The firm of Jean Covens and Corneille Mortier succeeded to the business of P. Mortier about 1710. According to Tooley, their most ambitious effort was their "Atlas Nouveau" in 9 volumes published from 1711 to 1760. The charts of Africa in this work were issued about 1730.

(postpaid in the U.S. only) $ 275

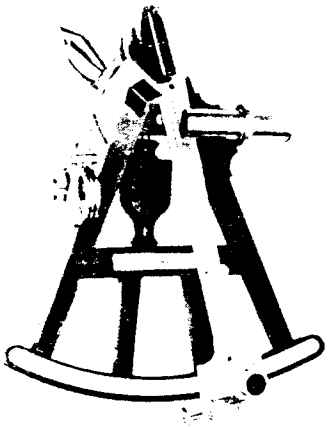


200. ALONG THE COAST OF CHINA - "A CHART OF THE SOUTH COAST OF HAYNAN from TINHOSA to GUICHOW Survey'd in 1776 and 77, By Capn. Haldane. LONDON: Printed for Robt. Sayer, Print, Map & Chartseller, No. 53 Fleet Street, as the Act directs, 20th. April, 1787". Large colored centerfold chart 13 1/8" h x 28 1/2" w on paper 25 1/2" h x 37" w. Extremely fine condition with relatively recent hand coloring.

(postpaid in the U.S. only) $ 85

201. "THE COLE COURSE PROTRACTOR" - American, marked as stated, with "PAT. OCT. 1907" and "M.C. Co. SOLE MAKERS". Metal compass rose 3 1/4" d to which is pivoted a brass arm 11 1/2" long, on the end of which is pivoted a clear plastic arm, 17 1/4" long, now yellowed with age. This arm is connected through bevel gears and a shaft with 2 pointers, 180° apart, along the edge of the compass rose. Original mahogany case 21 3/4" long x 4 3/8" w x 2 1/2" h. Instrument and case in fine condition. There is a "Care of the instrument" label within the case signed by the "MARINE COMPASS CO. Bryantville, Mass.". An identical instrument is listed as Item 286 in Brewington.

(8 lbs, UP, PS) $ 150



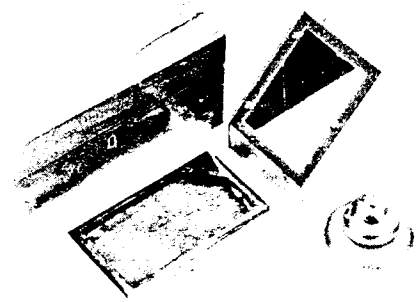
202. ELABORATE EBONY FRAME QUADRANT - English, c. 1830-40, signed "SPENCER & CO. LONDON". Ebony frame with bright lacquered brass fittings, reinforced index arm, ivory scale and vernier of 9 5/8" radius reading out to 30 arcseconds. Sets of 4 index mirror and 3 horizon glass filters, tangent screw adj on the horizon glass, tangent screw slow motion on the index arm, swingaway scale magnifier and screw-in shade tube (but lacking the matching telescopic sight). Very fine overall condition with restored finishes matching the original. The mirrors seem to have been refinished in recent times and are in excellent condition. Original hand dovetailed mahogany keystone case, 13" deep x 11 3/4" w x 5" h, in very good condition with several age cracks and some holes where handles were once fitted.

Spencer & Co. was the name used by Spencer, Browning & Rust on their higher quality instruments, usually those made of brass. This quadrant however, is also appropriately signed. It has a handle, swing-away magnifier, an extended bearing for the conical index arm axis, and shows a high level of workmanship throughout. A similar example (but without scale magnifier) is listed as Item 83 in Brewington and dated c. 1840.

(12 lbs UP) $ 740

203. HAND PUMP FOG WHISTLE - American, c. 1900, unsigned. Bright brass with restored lacquer finish, the air cylinder is 4" d x 12" h on its 3 mounting feet. The whistle body is 7" h. Full drawn, the handle extends another 12". Fine to very fine overall condition although it now emits only feeble squeaks because of the deterioration of the leather piston ring. As far as we have been able to determine, these whistles were used as fog horns by small fishing boats working off the New England coasts.

(12 lbs, UP, PS) $ 235

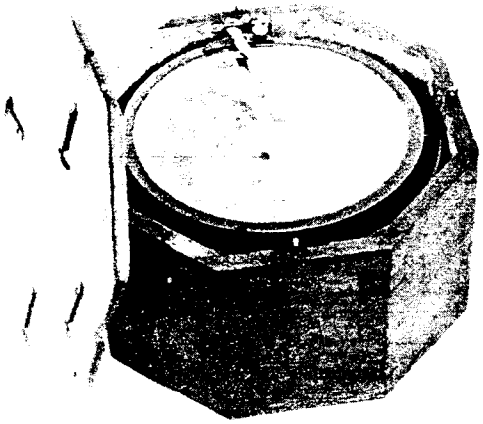


204. MERCURY POOL ARTIFICIAL HORIZON - English, possibly 3rd qtr 19th c, signed "Negretti & Zambra London". Hand dovetailed polished mahogany case, 8" x 9 1/4" x 4 1/2" h, contains the 5 3/4" x 3 1/4" cast iron tray for the mercury, the black oxidized brass windscreen, 6 1/2" x 3 3/4" x 4 1/2" h, with 2 3/4" x 3 3/4" optical windows mounted at right angles to each other, and the 2 3/4" d x 3 1/2" h iron bottle for stowage of the mercury (containing mercury). Fine to very fine overall condition except for an age crack in the lid of the case.

The firm of Henry Negretti (1818-79) and Joseph Zambra (1822-88) was established in 1850 and at one time offered over 2,000 items in their catalogue. We believe that many of these were made by various instrument firms to their specifications and then sold under their own name. They still seem to be in business, but on a much reduced scale.

(18 lbs, UP, PS) $ 285

205. DENT'S PATENT COMPASS - English, possibly before 1850, signed "DENT, INVENTOR & PATENTEE LONDON", "CHRONOMETER MAKER TO THE QUEEN" with serial no. "141". Octagonal mahogany case, 10 3/4" across and 7" h with flat cover (held in place by 4 hooks) containing 8 1/2" d compass in gimbal suspension. The 7 1/4" d compass card has an orthogonal set of balance weights on threaded arms above and a cluster of magnetic rectangular sheets, mounted vertically, below, as well as a damping mechanism, and is mounted on a clock-like arbor which rides in a pair of bearings, above and below. Overall condition is very fine although the wooden case has some chips and shows use.

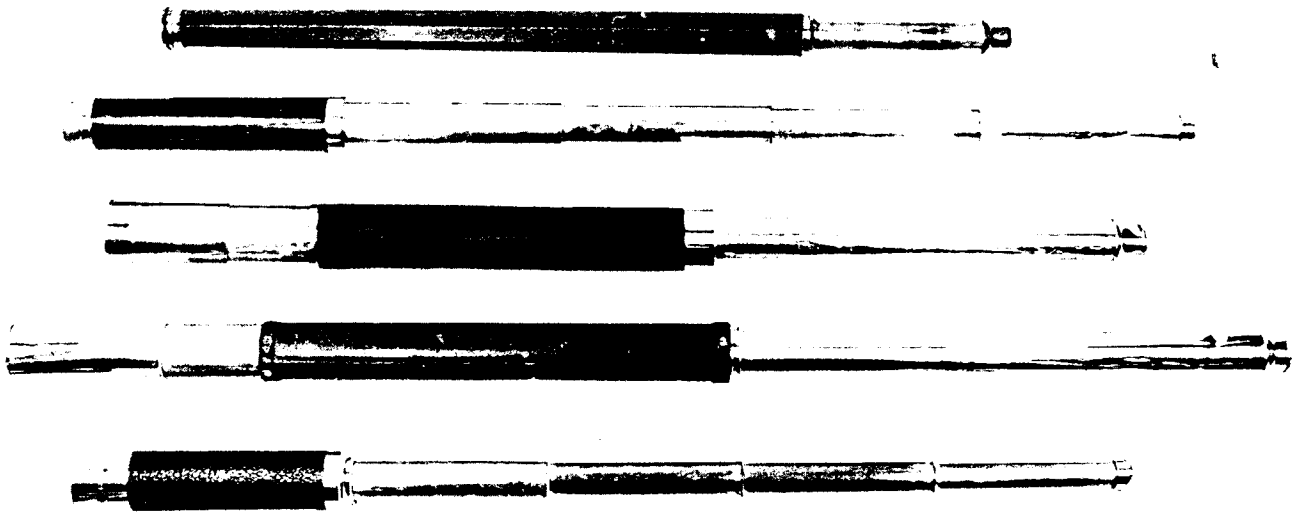


Edward J. Dent, the chronometer maker, patented this compass on July 30, 1844 (no. 10,277). The earliest example at the National Maritime Museum, Greenwich, has serial no. 275 which they date c. 1850. There is no example listed in Brewington.

(30 lbs UP) $ 675

206. NAVIGATOR'S PARALLEL RULE - English, c. 1900, signed "CAPT. FIELD'S IMPROVED". Boxwood rules 1 1/2" w x 21 1/4" long connected by three 5 3/8" long brass cross-links. Fine overall condition except for edge and corner wear from usage and some warping. Such rules are used to advance position lines across a navigation chart.

(4 lbs, UP, PS) $ 55



207. VERY EARLY ACHROMATIC SPYGLASS - English, possibly c. 1765, signed "Dollond London". Ten-sided, reverse taper, red varnished mahogany barrel with brass fittings in original lacquer finish, single brass draw tube, 25" long (min) extending to 33". Barrel 1 3/4" across at back and 1 1/2" at front. Objective and eyepiece protective slides present. Optics consist of a two element "white" objective of 15/16" clear aperture and 20" focal length resulting in a focal ratio of f21, and a 5-element eyepiece. Very fine physical condition with some wear and darkening of the finish on the brass and a few nicks, but no cracks, to the barrel. John Dollond (1706-61) invented his 5-element eyepiece in 1753 and presented his achromatic objective before the Royal Society in 1758. Several aspects of the optics of this telescope suggest the early dating above: the relatively small aperture (f 21), the use of glass without a green tint (which was a later trick used to help the achromatism) and the slight decrease in sharpness at the edge of the field. (By the late 18th c Dollond's spyglassss with apertures as great as f 11 had images uniformly sharp over the entire field of view.)

(6 lbs UP) $ 695

208. GOOD FOUR-DRAW SPYGLASS - English, 1st half 19th c, signed "Dollond London". Dark finished mahogany barrel 2 1/4" d with bright lacquered brass fittings, and 4 draw tubes, 11 1/4" long (closed) extending to 42 1/4". The 2-element achromatic objective of 2 1/16" clear aperture (almost no tint) and the usual 4-element eyepiece yield extremely sharp and color-free images over the entire field. Fine overall physical condition noting that the lacquer finish is a modern restoration, there is a chip in the edge of the rear objective element, the wooden barrel has several age cracks, and the objective lens cap is missing. This spyglass, with its screw-together objective cell (not a common feature of Dollond telescopes) is virtually identical to Item 179 of Catalog 122 and certainly dates from the same period.

(5 lbs UP) $ 425

209. YANKEE SAILOR'S SPYGLASS - English, signed "Spencer, Browning & Co, London, Day or Night", the extending sunshield is also engraved "Wm. W. Kendrick, Boston, March 16, 1858". Leather covered brass barrel 2 1/2" d, lacquered bright brass fittings and single draw tube, eyepiece slide, lens cap, 20 1/4" long (closed) extending to 38 1/4". Generally very fine restored (finish and leather covering) condition with minor dents to the draw tube. Image quality is quite good although there is some field curvature. The maker was the mid 19th century continuation of Spencer, Browning & Rust, a firm which was established in the late 18th c. We have been unable to trace the named owner although he may have been related to the Revolutionary War naval hero John Kendrick of Cape Cod.

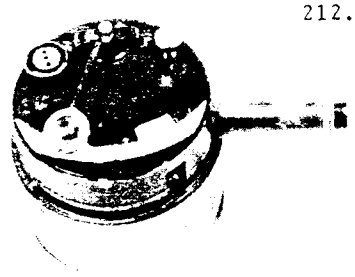
(6 lbs, UP, PS) $ 395

210. NAUTICAL SPYGLASS - English, 2nd half 19th c, unsigned. (Original) leather covered barrel 2 1/4" d with bright lacquered brass fittings, extending sun shield, single draw tube, sliding shutters to eyepiece and objective, 23 1/2" long closed, extending to 45 1/2". Very fine overall condition with restored finishes, some wear to the leather. Optical quality is very fine as well.

(6 lbs, UP, PS) $ 315

211. CASED FOUR-DRAW SPYGLASS - French, c. 1900, unsigned but marked "MADE IN FRANCE". Leather covered barrel 2 1/8" d with bright lacquered brass fittings, lens cap, 4 draw tubes, 10 1/4" long (closed) extending to 36 3/4". Black cloth covered case 2 3/4" d x 10 1/2" long in fine condition. The spyglass is in extremely fine original condition and produces good sharp images.

(5 lbs, UP, PS) $ 250



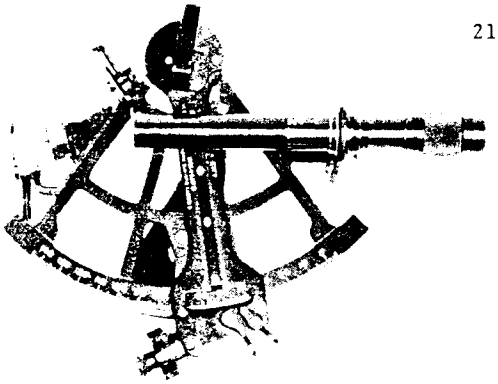
212. TELESCOPIC MODEL BOX SEXTANT - English, 1st qtr 20th c, unsigned. Brass construction, the bayonet joint attached cover in black oxidized finish and the body of the sextant in black enamel, 3" overall d x 1 3/4" thk when cover in closed position. The 3 3/4" long telescope (when extended) screws off and is stowed in the case when not in use. The sextant has 2 line-of-sight pop out filters, a swing away scale magnifier, and an inlet silver scale graduated to half degrees. The index arm, however, has a single line instead of a vernier and so readout cannot be to better than 1/3 of a division, or 10 arcmins. The original leather case, 3 1/2" x 4 1/4" x 2 1/8" thk, is in good condition. The sextant is in fine mechanical and optical condition, very good physical condition because of some wear to the finishes. We do not know why this instrument with a potential accuracy of a few arcmins was not made with a readout vernier.

(3 lbs, UP, PS) $ 175

213. TWO-DAY MARINE CHRONOMETER - English, c. 1855, signed "John Campbell/ LATE NORRIS & CAMPBELL/Liverpool No. 927". Brass-bound mahogany case 7" sq x 7 1/2" h containing gimballed 2 day spring detent marine chronometer with 4" d silvered dial. The dial has gold hour and minute hands and blued steel second and up-down hands. The movement has a conventional Earnshaw type spring detent, blued steel helical hair spring, and fusee driven power train. The case is in very fine condition with an age crack in the cover. The chronometer has been cleaned, oiled, adjusted and over a 14 day trial period, it had a mean rate of 0 seconds/day with fluctations of ± 3 1/2 seconds. These last appear to have been due to temperature changes suggesting that at the test temperature range the chronometer's balance wheel had its least corrected middle temperature errors. The ratchet winding key is a modern replacement.

Vol 2 of Baillie (Loomes) lists Norris & Campbell as chronometer makers from 1848-5, Francis Norris having worked as early as 1834. The way the dial is engraved suggests that this chronometer may actually have been made while the partnership existed and then later John Campbell engraved his name above that of the partnership and added the word "LATE" between the names.

(25 lbs UP) $ 1,575



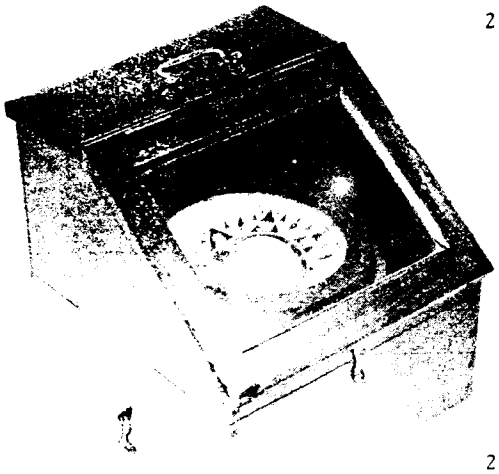
214. U.S. NAVY MICROMETER SEXTANT American, marked "U.S. NAVY BUSHIPS. MARK II No. 10793 - 1942" and signed "AJAX" for the Ajax Engineering Co. Chicago, Ill. Black enameled brass frame of 6 1/4" scale radius, 2 original telescopes - 8 3/4" and 2 3/8" long - sets of 3 horizon glass and 4 index mirror filters, micrometer readout drum divided in arcminute increments with 0.1 arcmin (6 arcsec) vernier. Extra mirrors. Original oak case, 11 5/8" x 11 1/4" x 5" h, in fine condition. The sextant is fine to very fine and a U.S. Naval Observatory inspection certificate dated 11/29/1943 is included. There are slight design differences between this instrument and the one by David White Co. listed as Item 190 in Catalog 122.

(14 lbs UP) $ 495

215. "WALKER'S HARPOON II DEPTH FINDER" - English, 1st half 20th c, signed "Thos. Walker & Son, Ltd. 58, Oxford St. Birmingham" with serial no. "AB 7419". Bright lacquered brass readout unit 6 3/4" long with 2" d 4-bladed rotor, appropriate gearing, 0 - 30 fathoms white enameled dial in red lacquered housing, attached by rope to 6" h, 4 1/2 lb sounding lead. Original wood and plywood stowage box, 2 3/4" x 5 3/4" x 7 3/4" h, with original labels, printed instructions, tag. The entire unit is in mint, original condition, never having been used.

Thomas Walker was born in London in 1805, his mother being the sister of Edward Massey the inventor of the first successful mechanical logs and sounders. About 1850 he began making logs and sounders under the Massey patents. In 1861 his son Thomas Ferdinand patented the first "Harpoon Log". An early version of the sounder here is listed as Item 301 in Brewington (dated mid 19th c) and shown in Plate XLIX.

(13 lbs UP) $ 455

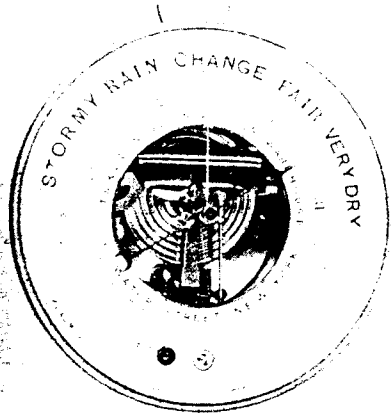


216. LARGE SLOPE FRONT YANKEE WOODEN BINNACLE WITH FLOATED COMPASS - American, c. 1872, the compass signed and numbered "E. S. RITCHIE BOSTON 5012" with the last patent date "July 19, 1870". Well varnished mahogany, standing 11 3/4" h with a 12 1/4" sq base and a hinged front window 12 1/4" w x 10" h. The compass is 8 1/2" d suspended in a 9 3/4" d gimbal ring. The binnacle is in fine to very fine display condition while the compass can only be listed as very good because the card is partially broken away from the internal float element and the liquid is no longer present.

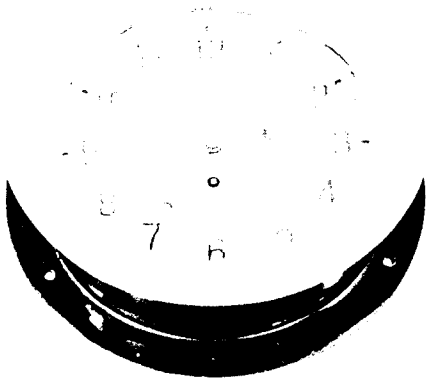
Binnacles such as this are typically, and possibly uniquely, of New England origin. Edward Samuel Ritchie (1814-95) was the inventor of the first successful liquid compass about 1860 which was first patented in 1862. Improvement patents were obtained in 1863, 1866, 1868, 1870, and 1872.

(30 lbs UP) $ 370

217. LARGE MARINE HOLOSTERIC ANEROID BAROMETER - French, c. 1900, marked "MADE IN FRANCE" with the initials "H/PB/N" within a circle. Also marked "T. S. & J. D. NEGUS NAVIGATION WAREHOUSE/140 WATER STREET NEW YORK". Silvered dial within 8 1/8" d x 2" thk brass case, blued steel readout pointer 5" long driven by fusee chain and linkage (all visible in center of dial), 2 1/2" long settable brass index pointer, and alcohol and mercury thermometers graduated in centigrade, Reaumur, and Fahrenheit degrees. Dial in very fine condition, barometer in excellent working condition, brass case has lost much of its original lacquer finish and the suspension ring has been re-attached by soft soldering (with too much of the repair visible from the back, although not the front). Brewington notes that Thomas S. Negus started selling chronometers about 1850 at 84 Wall Street. In 1864 the firm became Thos. S. & Co. at 100 Wall Street and in 1869 Thos. S. & John D. Negus. We do not have detailed records of their addresses after that.



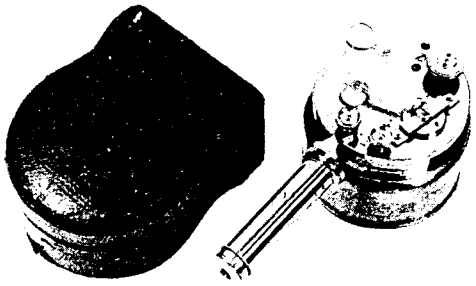
(7 lbs UP) $ 375



218. LARGE ENGINE ROOM CLOCK - American, probably c. WWII, marked "The Ashton Valve Co." and signed "CHELSEA, 2098", the movement with the serial no. 199807. Black enamel iron case with 10 3/4" d mounting flange, nickel plated brass hinge and bezel 10 1/4" d, 3 1/2" h overall. The 8 1/2" d silvered clock dial has a small seconds hand just above the center, a rate adjustment hand to the right and the single winding hole below. This is a non-striking timepiece which is intended to be wound once a week. Very fine overall and running condition. Key not original.

The Chelsea Clock Co. of Chelsea, Massachusetts began business in 1897 apparently as a take-over of the Boston Clock Co. (although the sign on their building, as I remember, states founded in 1906). No matter, they produced and are still producing the finest marine clocks made in America. A cleaning date of 1947 has been scratched into the back of the clock which together with the serial number leads to the assigned dating.

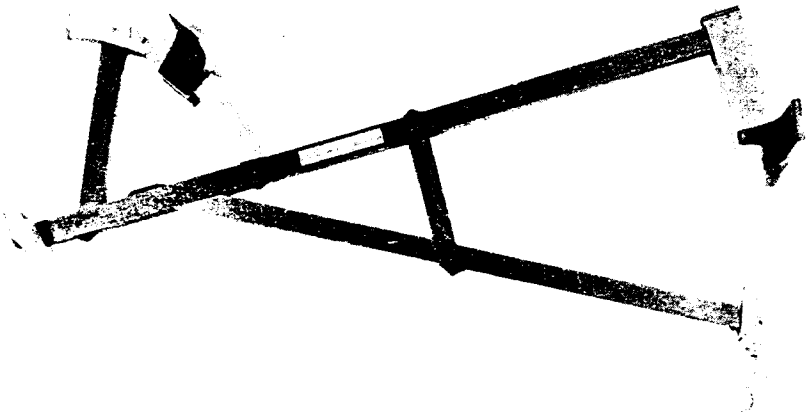
(28 lbs UP) $ 345



219. EXCEPTIONAL BOX SEXTANT - English, mid 19th c, signed "Troughton & Simms, London". Bright brass, original lacquer finish, 2 3/4" d x 1 1/2" h cylindrical case which screws off from one side to screw on as a handle on the other, 2 1/2" long bracket-mounting telescope, inlet silver scale and 1 arcmin vernier of about 1 1/2" readout radius, and swing-a away scale magnifier. A pinion drive acts on a curved rack attached to the index mirror, a peep hole can slide into position in place of the telescope and there are two line-of-sight filters which pop out of a slot in the bottom when not in use. The original fitted red leather case 3 1/4" x 4 1/8" x 2" h, is in sound condition but has spots of external wear. The sextant is in excellent condition.

The firm of Troughton & Simms was established in 1826 (remaining in business under the same name until 1922) by Edward Troughton when he took the younger Frederick Simms into the partnership. Troughton's older brother, John, had acquired the firm from the 3rd Benjamin Cole in 1782, and then built a dividing engine which allowed them to compete on even terms with Jesse Ramsden.

(4 lbs UP) $ 795



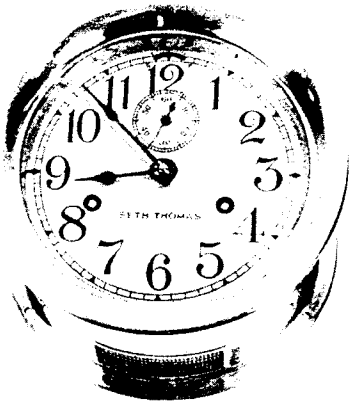
220. DAVIS QUADRANT - Probably English, 2nd qtr 18th c, signed "Iohn Cranevelt Middelbur". Rosewood limbs, boxwood arcs, the name plate, boxwood inlet into the longitudinal bar, and newly made boxwood vanes; 25" overall length. The solar altitude (so called 60° arc) has a radius of 7 1/2", is graduated by degrees and numbered from 0 to 65 in 5 deg intervals, the last, 65, being on the rosewood bar. It is also numbered and graduated along the edge in 5 deg intervals. The long radius (so called 30° arc) has a radius of 22 3/4" and is 25 deg long. It has a scale at the edge numbered in degrees and graduated in 5 arcmin intervals. There is a 10's diagonal scale which subdivides 10 arcmin intervals to 1 arcmin. The hook at the bottom is well formed and undamaged, and has an elaborate pattern of stamped roses, fleur-de-lis, and 8-pointed asterisks. The 3 vanes are modern reproductions made to demonstrate the use of the instrument but not intended to be used for accurate sightings. The instrument is in very fine overall condition.

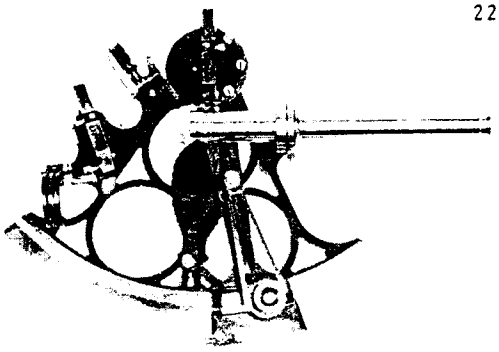
The signed name has not been found on any other instrument nor in any records or lists of known instrument makers. In fact "Middelbur" runs off the name plate leaving no room for the final "g", suggesting that this is an owner's name applied by the actual instrument maker (and not too carefully at that). Middelburg is the ancient capital of the province of Zeeland, Holland, in the middle of the island of Walcheren. It was a prosperous center of commerce until the end of the 18th century. During this period there was extensive trade with the East and West Indies, England, and Flanders. In our opinion the instrument could have been purchased in England by a Dutch mariner from Middelburg. Although we have not been able to identify the particular set of decorative markings, the rest of the instrument is quite similar to signed English work of the 2nd qtr of the 18th century. The one by Benj. Macy dated 1719, listed as Item 12 in Brewington is very close as is the 1713 example, also by Macy listed as Item 126 in our catalog 109. The two John Gilbert instruments at the National Maritime Museum, Greenwich (c. 1740 and 1755) also have the same design characteristics.

(Sent prepaid by Registered Mail in the U.S.; air freight, charges collect, elsewhere) $ 5,400

221. INSIDE BELL SHIP'S CLOCK - American, early 20th c, signed "SETH THOMAS/MADE IN U.S.A.". Bright lacquered brass case 7" dia x 4" h with 5 7/8" dia silvered dial, blued steel hands. The strike adj lever is under the hinged bezel. The clock runs about 2 days on a winding but it is suggested that it be rewound once a day for best performance. It strikes the 8 bell watch sequence which repeats every 4 hours. Extremely fine restored condition.

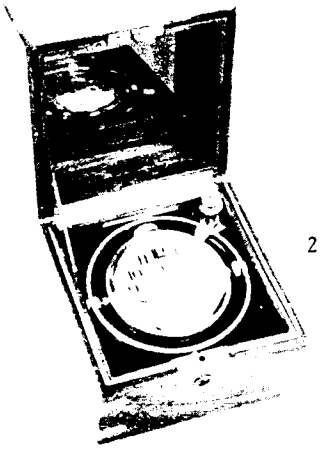
(8 lbs UP) $ 465





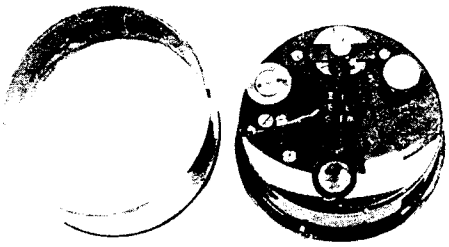
222. VERNIER SEXTANT - English, possibly late 19th c, signed "A. Johannsen & Co. 149, Minories, London". Black oxidized brass frame in the 3-ring design with bright brass fittings and telescopes, inlet silver scale and vernier reading out to 10 arcsecs at a radius of 6 1/8". There are 4 index mirror and 3 horizon glass shades (or filters), a swing away magnifier, an extra wide horizon glass, and 2 telescopes (a shade tube is missing). The instrument appears to have been instrument maker overhauled and is in fine to very fine condition. The original hand dovetailed mahogany case, 9 1/2" x 10" x 4 3/4" h, is in fine condition. As far as we have been able to determine the signed firm began in London as Asmus Johannsen, 1863-69, a dealer and repairer of clocks, watches, and chronometers. We suspect that they remained retailers to the nautical trade and that the instrument here was actually made by one of the primary firms such as Hughes or Heath.

(13 lbs UP) $ 645



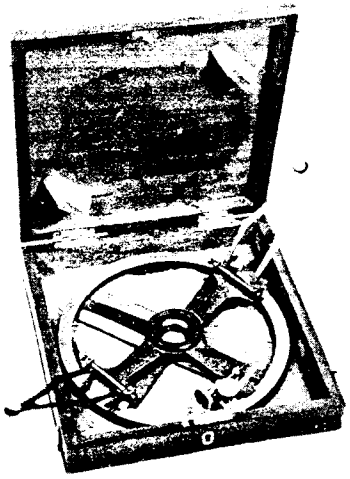
223. 8-DAY DECK WATCH - American, 1910 or 11, signed WALTHAM WATCH CO." with serial no. "18,098,179". It is a 15 jewel lever escapement movement with dual (going barrel) mainsprings, stem wound, in a 3" (max) dia brass case, suspended in gimbals within its original 3 part, brass bound, 4 7/8" cubic walnut case. The silvered dial has blued steel minute, hour, and second hands, and a rotating aperture which shows a red disc on the 7th day (time to rewind). Physical condition is very fine. The watch has been fully overhauled and adjusted so that the measurable rate is 0 secs/day for the first 6 days, -3 secs/ day for the 7th day, and -8 sec/day for the 8th day. This is exceptional performance for a lever movement without a fusee drive.

(11 lbs UP) $ 695



224. MILITARY BOX SEXTANT - English, WWI, the sextant marked "W. F. S./B69/ MK III", its bayonet joint cover/ handle "T.A.R.S. & W. LTD/B 939" and its fitted leather case "D. MASON & SONS LTD/BIRMINGHAM/1918". The 2 3/4" d black enameled brass sextant has an inlet silver scale and rack and pinion driven index mirrir arm with vernier reading to 1 arcmin. There is a fixed peep hole with an internal sliding sun filter as well as the pop out line-of-sight filters, and a swing-away scale magnifier. Within the black oxidized cover is a table of tangents. The 3 1/8" d, 2 1/4" h leather case is in very good condition and the sextant fine. This was a standard British government design made during WWI so that it is not surprising that the 3 separate pieces were made by 3 different firms but all fit together perfectly.

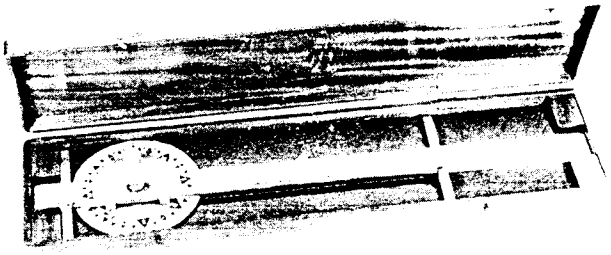
(3 lbs, UP, PS) $ 250



225. EARLY MARKING PROTRACTOR - English, 1st qtr 19th c, signed "SIMMS LONDON". Black oxidized brass frame 5 15/16" d, bright brass readout scale with opposing 1 arcmin verniers, and unusual bright lacquered brass tangent screw assembly. The pivoted marking arms are 3 1/2" long each. Original dovetailed mahogany case, 6 5/8" sq x 1 1/2" h, is in fine condition except for several age cracks. The instrument is in fine to very fine condition and of excellent workmanship.

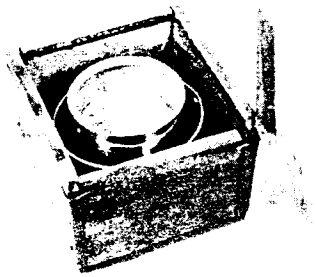
Edward Troughton's partner, William Simms (1793-1860) is the best known member of the Simms family of instrument makers which began with grandfather, James (1710-95), a Birmingham compass maker. His youngest son, William (b. 1763 - retired 1820), moved to London in 1793, with his sons James and George taking over the business in 1820. Meanwhile, his second son, William (II) apprenticed to a Bennett, formerly a worker with Ramsden, then went into business for himself before becoming Troughton's partner in 1826. We have been unable to determine if this instrument was made by the 1st William Simms or one of his three sons, William (the 2nd), James, or George.

(5 lbs UP) $ 485



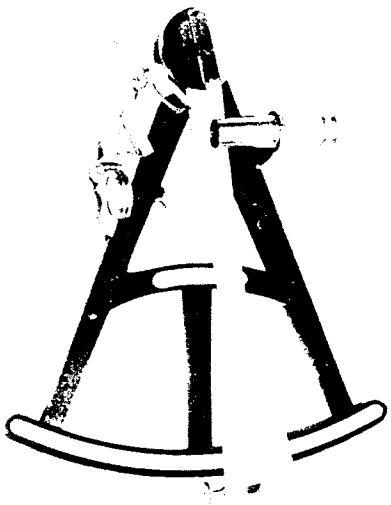
226. MAHOGANY CASED "KENYON MARINE PROTRACTOR" - American, late 1930's, marked as stated, with "PATENT No. 2,265,893". Original mahogany case, 22 3/4" long x 5 3/4" w x 1 3/4" h, in very fine condition. The instrument in nickel plated brass has a 22" long rule which rotates about the 5" d protractor (which may be offset for the magnetic variation), which in turn, slides along the 15" long east-west bar. Fine overall condition except for the east-west bar which is worn down to the brass in its middle section. This is a well constructed course-plotting instrument.

(9 lbs, UP, PS) $ 140



227. LITTLE DRY-CARD DORY COMPASS - American or English, 19th c, signed but the compass card is too stained by salt water burning to make out by whom. Paper-faced mica compass card 2 1/2" d in 3" d spun brass bowl within 4" d brass gimball ring. Original hard pine box with sliding cover 5" sq x 3 3/4" h. The box has seen hard usage and has been repaired several times but is still sound. The brass parts have been cleaned and relacquered so that now overall condition is very fine except for the compass card.

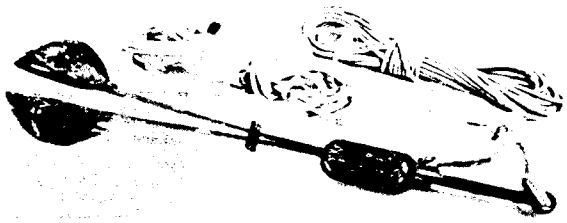
(6 lbs, UP, PS) $ 95



228. EBONY FRAME QUADRANT - English, early 19th c, signed "Spencer Browning & Rust London" and in script "SBR" on the scale. Ebony frame, bright lacquered brass fittings, reinforced index arm, ivory scale and vernier of 11 3/4" radius reading out to 1 arcmin. Sets of 3 index mirror and 3 horizon glass filters, tangent screw adj on the horizon glass, tangent screw slow motion on the index arm, and screw-in shade tube. Very fine display condition with restored finishes noting the following imperfections: missing chip from the edge of one filter, crack and chip in one corner of horizon glass, some loss of silvering on the mirrors, and missing ivory note pad from rear of frame, pencil holder, and pivoted peep-hole cover from the telescope bracket. Original mahogany dove-tailed stepped keystone case, 15 1/4" deep x 14" w x 3 3/4" h in fine condition except for some age cracks and a 3" long chip miss-ing from the bottom.

There is an imcomplete trade card of Gedney King & Son of Boston within the case cover with signs of a still earlier trade card which had been removed before its application. Thus we know that the instrument was resold in the U.S. by 1839 ("Gedney King & Son" existed only from 1837-39) and had to be made earlier. Indeed, it is very close in design details to Item 57 of Brewington (Plate XVIII), by the same maker, which is dated c. 1800.

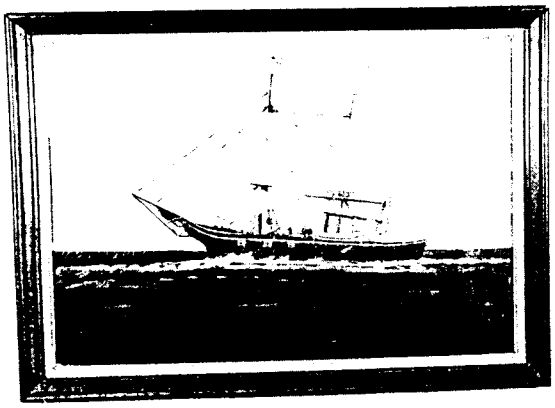
(12 lbs UP) $ 740



229. A MAJOR DEVELOPMENT IN OCEANOGRAPHY - IMPROVED FORM OF ROSS' "DEEP SEA-CLAMM" - English, mid 19th c, unsign-ed. Black iron and lead apparatus 29 1/4" long con-sisting of split iron rod with lead clam-shell scoops 4 3/8" w x 5 1/2" long at bottom end, a sliding square washer and a sliding 2 1/4" d x 5" long cylindrical weight. A line with leather depth tags is attached to a ring at the top of the iron rod and a second line attached to the sliding weight. Fine overall condi-tion considering construction materials and use. Ori-ginal pine stowage box, 5 3/4" sq x 31 1/4" long, in so-so condition.

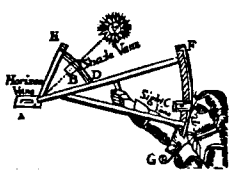
The original "deep sea-clamm", a sounding instrument in brass, was devised for and used on Sir John Ross' arctic expedition of 1818. An example of this instrument is on display now at the Science Museum, London. It may have been the first such developed for scientific study of the sea bottom. It had several problems though, the most important being that at times the jaws would jam and not close. The example here could be dropped to the bottom of the sea so that the scoop would really bite into the ocean floor. Then the weight which had been kept at the top of the rod by the second line would be let go, and, in falling, close the two sides of the scoop. The sounder would then be hauled back to the surface and its contents examined.

(35 lbs UP) $ 495



230. PRIMITIVE OIL PAINTING OF STEAM-SAILING SHIP - Ameri-can, 2nd half 19th c, unsigned. Oil painting on board 12 5/8" h x 18" w in early (original?) frame 14 5/8" h x 20 1/4" w of unidentified 3 masted sail-ing ship flying 2 American flags and the ship com-pany's banner (blowing the wrong way of course). A number of sailors are shown on deck. The ship is si-multaneously under sail and exhausting smoke through the stack. Colors are good and bright. Overall con-dition very fine with extensive and uneven cracking (primarily in a band across the lower sky). There is also an unfinished oil sketch of several figures on the reverse. This is the work of an enthusiastic, if somewhat naive artist, possibly without formal train-ing, but clearly of great ability with a sense of co-lor and composition.

(10 lbs UP) $ 365



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b. Campbell, "History and Bibliography of The New American Practical Navigator and The American Coast Pilot". $ 10

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