A KEY TO THE SOLAR COMPASS, AND SURVEYOR'S COMPANION; COMPRISING ALL THE RULES NECESSARY FOR USE IN THE FIELD

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649042722

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Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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WILLIAM A. BURT

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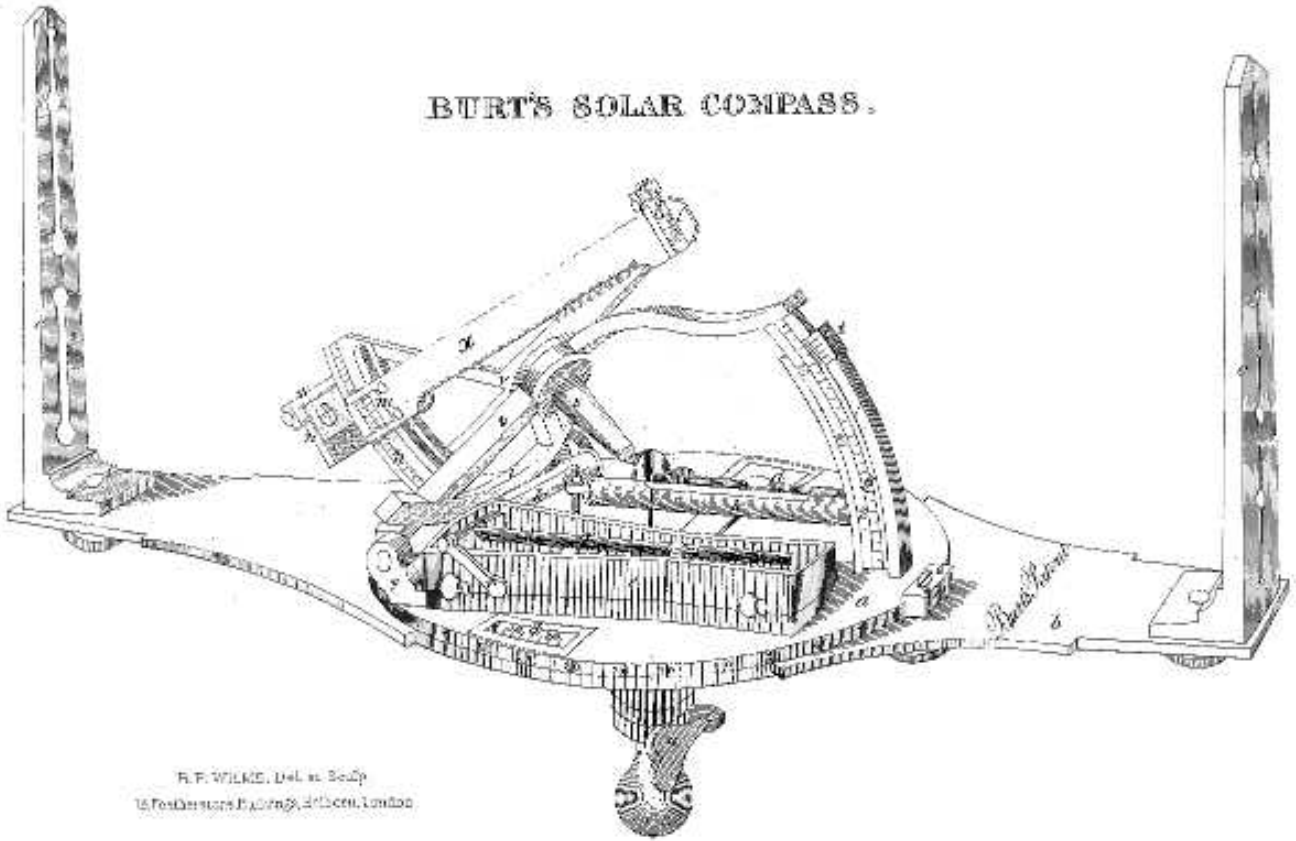
BURT'S SOLAR COMPASS.



R. F. WILKES, Del. et Sculp.

16 Featherstone Buildings, Holborn, London

A KEY

TO THE

SOLAR COMPASS,

AND

SURVEYOR'S COMPANION;

COMPRISING

All the Rules necessary for Use in the Field.

ALSO,

DESCRIPTION OF THE LINEAR SURVEYS, AND PUBLIC LAND SYSTEM
OF THE UNITED STATES; NOTES ON THE BAROMETER,
SUGGESTIONS FOR AN OUTFIT FOR A SURVEY
OF FOUR MONTHS, ETC., ETC.

BY WILLIAM A. BURT,
U. S. DEPUTY SURVEYOR.

PHILADELPHIA:
PRINTED FOR THE AUTHOR BY WILLIAM S. YOUNG,
No. 50, North Sixth Street.
1858.

PREFACE.

Much perplexity and difficulty has been felt by surveyors in the use of the Magnetic Compass, in consequence of its variations from the true meridian, at various localities or stations, and also its almost constant diurnal changes as well as aberrations, caused by local attraction. A more perfect guide for the surveyor than the Magnetic Needle was, therefore, very desirable. The long continued efforts made by the author to accomplish this object, resulted in the invention of the Solar or Astronomical Compass. A model of this instrument was made in the year 1835, by the inventor, in order to test its principles, and in the latter part of the same year, the first Solar Compass was made, under his direction and supervision, by William J. Young, of Philadelphia, Pa. The instrument was then submitted to a committee of the Franklin Institute, of the State of Pennsylvania, who after a full examination of its principles and merits, awarded the inventor a premium of twenty dollars and a "Scott's Legacy" medal. The Solar Compass as then made, like most newly invented instruments, was soon found susceptible of improvement and of greater usefulness than at first anticipated. Accordingly the inventor made several alterations and improvements suggested by experience, and in December, 1840, again submitted the instrument, as improved, to a committee of the same Institute, who reported a decided improvement, in point of accuracy, and the simplicity of its adjustments and use. The inventor

has since continued to improve this instrument as more experience in the use of it seemed to suggest. And in 1851 exhibited it, as improved, at the World's Fair, in the city of London, where a premium medal was awarded the exhibitor by the jurors on Astronomical Instruments.

Since its invention in 1835, and during its progressive improvements, the inventor has been called upon, personally or by letter, from a large portion of the surveyors of the public lands, for information how to adjust and use it. Such inquiries could be but imperfectly answered by letter, or a few hours' conversation, and the author could *not*, without being discourteous, avoid replying in some manner to such necessary inquiries, though a serious tax sometimes on his business. To prevent this the inventor published a few pages of instructions, showing how to adjust and use this instrument, and distributed them among the surveyors; but soon after this, new discoveries were made in the construction and adjustments of the Solar Compass, consequently what had been done only supplied their wants in part, and the inventor was solicited by many of the surveyors of the public lands for full instructions on this subject, and a treatise on surveying adapted to their wants in the field of survey. The foregoing remarks constitute the apology of the author for assuming a task so foreign to his habits of life, and to which duty seemed to impel him in the absence of any prospects of this much needed work being soon accomplished by any other person. This treatise contains much original matter, mostly derived from experience in practical surveying. The elements of surveying as published and taught in the schools, are purposely omitted to lessen the size of this work, the object of which is to furnish the practical surveyor with a convenient pocket companion suited to his business while engaged in his field work. The inexperienced surveyor in this branch of the public service has

need of all necessary information to enable him to accomplish his arduous duties in a proper manner. The frequent failures in part, or in whole, by many Deputy Surveyors, have done much injury to the public surveys, and ruined their hopes and reputation.

This is a sufficient reason for introducing into this work the necessary outfit and preparations for a large survey in the wilderness, the want of which has been one of the principal causes of those failures.

The author does not presume that this treatise is without defects; he indulges the hope, however, that it will answer the purpose for which it is designed, until further experience shall furnish a better. The author has availed himself of the experience of several practical surveyors, in preparing this work, and has also consulted the best authorities that appeared to throw light upon the subjects treated of.

The tables of Natural Sines and Tangents, at the end of the work, have been carefully compared with different standard works, and are offered to the surveyor with a confidence that he will find them accurate. The table of chords has been added to supply a want, frequently experienced, in draughting, where a reliable protractor is not at hand. The majority of protractors accompanying draughting instruments are either so small or so inaccurate as to be productive of sensible errors in large draughts.