

# Patent Solar Attachment

## FOR TRANSITS.

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### DESCRIPTION AND PRICES.

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This Attachment is essentially the solar apparatus of Burt placed upon the cross-bar of the ordinary Transit, the polar axis only being directed above instead of below.

A circular disc is first securely screwed to the telescope axis. Upon a pivot in the centre of this disc rests the enlarged base of the polar axis, firmly connected with the disc by four capstan head screws, passing from the under side of the disc, and thus adjusting the axis in any direction.

The HOUR CIRCLE surrounds the base of the polar axis—is figured from I to XII, and is read to ten minutes of time by a small index fixed to the declination circle and moving with it.

A hollow socket fitted to the polar axis and moving about it, furnishes by two expanded arms, a firm support for the declination arc. This arc is of from four to six inches radius, and is read by its vernier to either 30 seconds or 1 minute of arc. The declination arc has the usual lenses and silver plates placed on two opposite blocks like those of the ordinary solar compass. It has also a tangent screw, for accurately laying off the declination. The LATITUDE is set off by means of a vertical limb divided on silver and reading to 30 seconds or 1 minute as desired. The vernier of the arc is furnished with a tangent screw for nice adjustment.

Price for Attachment, .....\$60.00.

A transit to which the patent solar attachment is to be added, must also have a level on telescope, clamp and tangent to axis, and an arc for measuring vertical angles.

To add these to a plain transit will cost as follows :

Level on telescope with ground vial and scale, . . . . .	\$ 14 00
Clamp and tangent to axis of telescope, . . . . .	7 00
Vertical arc, divided on silver and reading to 30 seconds or 1 minute as desired, with vernier adjustable by tangent screw,	20 00

Making the price of Transits with Patent Solar Attachment as follows :

Engineer's Transit, 4 inch needle, . . . . .	276 00
“ “ 5 inch needle, . . . . .	281 00
Surveyor's Transit, double vernier, 5 or 5½ inch needle, . . . . .	266 00
Surveyor's Transit, single vernier, 5 or 5½ inch needle, . . . . .	241 00
Mountain Transit, double vernier, 4 inch needle, adjustable tripod, weight complete, including solar and tripod, 13 lbs.,	280 00

Having given this Attachment the test of over two years service, in which time we have put it on over forty instruments of our own and other makers, we are prepared, with perfect confidence, to commend it to all whose practice requires them to make surveys by the true meridian.

Our own observation with it has assured us of the remarkable delicacy of its adjustments, and the accuracy with which it will enable an observer acquainted with its use, to obtain the latitude, time, and the true meridian, to a nicety hitherto unattainable except with fixed astronomical instruments.

We are satisfied that this is the only successful application of the Solar apparatus to an ordinary Transit, and the numerous instruments of other makers which are sent to us to be fitted with this Attachment, assure us, that Surveyors in all parts of the country are of the same conviction.

We append a few testimonials from those who have given it a practical test.

RENSSELAER POLYTECHNIC INSTITUTE,

TROY, N. Y., May 13, 1876.

Messrs. W. & L. E. GURLEY,

Gentlemen:—In a series of observations which I lately made with your Patent Solar Attachment, as fitted to the ordinary Engineer's Transit, I found that I was able to determine the true Meridian, and the Latitude of the place, each within about half a minute. This result I obtained repeatedly without other previous practice with the instrument than just sufficient to make myself familiar with the manipulations. I am therefore able to speak with confidence of the accuracy with which work may be readily done with the Solar Attachment, and to recommend it as a most serviceable adjunct to any Transit.

Yours very truly

DASCOM GREENE,

Senior Professor of Mathematics and Astronomy.

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BOULDER, COL., October 12, 1874.

Messrs. W. & L. E. GURLEY, Troy, N. Y.,

Sirs:—I received my Transit with Solar Attachment in good order. Have thoroughly tested it, and find it works charmingly.

After testing the various transit and solar adjustments, I leveled the instrument, and setting off the sun's declination for ten o'clock A. M., I turned the telescope into the meridian and clamped all fast. Then at two P. M., I moved the vernier of the declination arc, so as to read the sun's declination for two o'clock P. M., and found that the sun's image on the silver plate could not be discerned even with a magnifier to vary from its place, between the equatorial lines. \* \* \*

Most truly,

E. J. HALL,

U. S. Deputy Mineral Land Surveyor.

April 29, 1876.

Messrs. W. & L. E. GURLEY,

Dear Sirs :—My experience with the Solar Attachment to the transit during the six months that I used it, was highly satisfactory. I regard it as the most important feature of a transit for any kind of work in the West. Of the three Solars you have made for me, I like the last (on the light mining transit) the best. Although weighing but about thirteen pounds including tripod, with it I can do everything required in all ordinary surveying. It is a complete encyclopedia of engineering apparatus. It will measure an angle, run a line, determine a level, obtain the true meridian—the latitude of any place—the time of day, all these too within a few seconds.

Very truly yours,

JAMES W. ABBOTT, C. E.,

Deputy U. S. Mineral Surveyor, Lake City, Colorado.