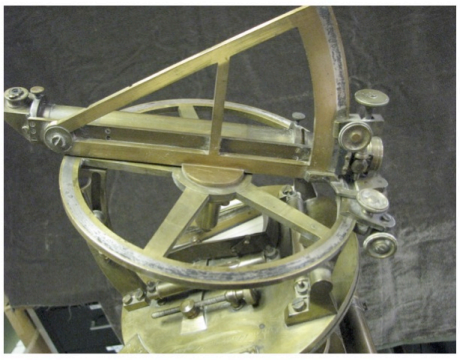
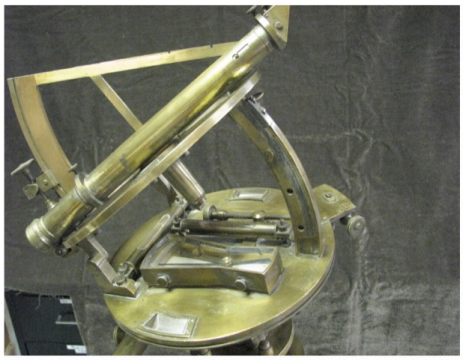
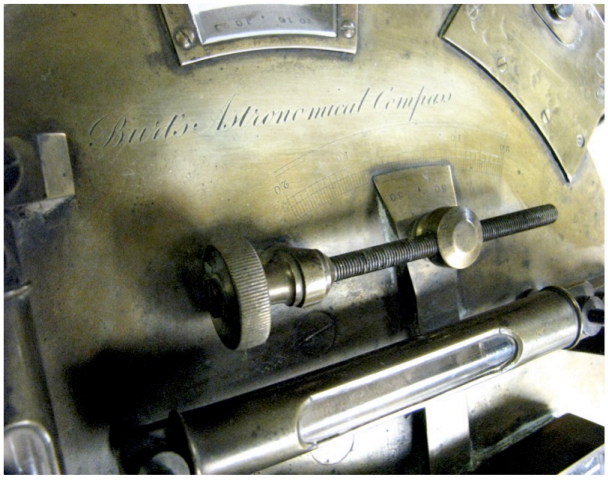
Burt's Astronomical Compass

Like Burt's Solar Compass, Burt's Astronomical Compass was used to determine true north, but it also included a circle for determining longitude. This instrument is described in my book *They Left Their Mark* on pages 92-93 and Robert Miller's book *Burt's Solar Compass* on pages 52-54, but neither Miller nor I had actually seen the instrument.

In June 2014, however, Bob Miller informed Michigan surveyor Jack Owens that a Burt's Astronomical Compass was on display at the Pioneer Village in Minden Nebraska. Inscribed on the instrument are "Burt's Astronomical Compass" and the manufacturer "William J. Young, " of Philadelphia, the original manufacturer of Burt's Solar Compasses. Subsequently, Pioneer Village's manager Marshall Nelson graciously sent me the following photos of this rare and unique compass.







Burt's Astronomical Compass
Pioneer Village, Minden, Nebraska

Photo & comments at the following link:
http://beerleg.com/index.php?mode=thread&id=241469

Identify this Instrument

by **Jack Owens**, Thursday, June 12, 2014, 16:59 (13 days ago) @ J. Penry

J. Penry, Dave Ingram and Dale Beeks are correct. This is a special and unique type of Solar Compass. It was made by Wm. Young for Wm. Burt in 1850. Burt called it an 'astronomical compass.' It should have Wm Young and Phil on the top somewhere as that's where Young placed them on the standard SC.

The arcs and hour circle are larger than those of a standard Solar Compass. The Michigan Society of Professional Surveyors Institute published a book written by Robert Miller on the development and history of the SC and the collaboration between Burt and Young. He spent about 25 years researching the material. The book sells for $35. Mr. Miller also wanted his research material included so we put it on a CD which is included with it.

Mr. Miller explains what he learned of its construction, etc., but was not able to learn the location of this instrument until recently. There is a good amount of detail considering Mr. Miller did not have the instrument to look at. He also gives an indication of where it was used for running a state line.

The level vials definitely look larger than those of the standard SC. As noted, the arcs and hour circle are all larger than the standard SC. The angle of view of the picture isn't good for some details but it looks like the viewing lens is mounted over a 45 degree prism at the near end of the telescope. There would have to be a shaded or dark glass since it appears that one would directly view the Sun with this instrument. This is one detail not known without seeing the instrument. With the standard SC the image of the sun was projected thru a small lens onto an image plate, as designed so as not needing to be directly viewed by eye to operate the instrument.

- See more at:
http://beerleg.com/index.php?mode=thread&id=241469#stha
sh.X4bhPRkU.dpuf

From John S. Burt's manuscript of "*They Left Their Mark*:"

On his way home from Washington in January 1850, William Austin visited William J. Young in Philadelphia and supervised construction of Burt's new invention. The idea was first presented to Young in the winter of 1847. Burt called the instrument an "Astronomical Compass." It incorporated the principles of the solar compass with additional improvements, including a complete circle for determining the approximate longitude. It could also be operated during the day or at night.

Burt predicted his device would become "a most useful instrument in the geological surveys and other exploring

expeditions in our new country."_ In a letter to John Wilson, he said:

I hope the attempt to make an important improvement will be successful for it will be quite an expensive one.

By March 1850 the Astronomical Compass was nearly completed. Four of William J. Young's workers had labored on the instrument and Young personally marked it with precise graduations. To Burt he enthusiastically wrote:

I have had it pretty much all together today, and it was a very fine appearance. Both telescopes are done and fixed, and its numerous tangents, the circle of arc, makes it look imposing. I feel sure you will be pleased with it.

In May 1850 William Young finally sent the new compass to Burt with an apology for the lengthy delay. According to Young, the workman who finished the main component "only works to live, and does not live to work, and during a goodly part of the time he lived up to his doctrine."_ Young charged Burt $250 for the Astronomical Compass, although he estimated it took at least $300 in labor and materials to make it.

Burt's new invention was field tested in the Upper Peninsula by geologist Charles Whittlesey, who called it "Burt's Solar Compass for longitude."_ In December 1850, Burt informed Young that the arcs of the instrument were in serious index error._ Five months later, from London, Burt notified his wife that, "I had no objection to the sale of my astronomicle compass, but shall not order another one untill I returne."_

Detroit instrument maker John Aylesworth Bailey advertised in 1852 and 1853 that he could make either Burt's Solar Compass or Burt's Astronomical Compass._ It is not known, however, if the latter was ever put into practical use. Conceivably this modified solar compass was the precursor of the universal instrument developed by Burt in 1856.