For the Scientific American.

Theodolite and Circumferentor.

CAMBRIDGEPORT, MASS. April 18, 1849.

MESSRS. MUNN & Co.—I, sometime since, promised to furnish you with a description of my new Surveying Instrument, which I now undertake to do.

This instrument, a model of which you have seen, is a combination of the Theodolite, the Circumferentor, and Y. Level. That is, as a Theodolite, it will do, accurately the work of any instrument that has ever been made for Civil Engineering or Land Surveying purposes; while none of them will do its peculiar work. It is so constructed, that the vertical limb, with its telescope and the standard that supports them, may be removed instantly by means of a thumb screw; and by attaching the sight vanes accompanying this instrument to their appropriate place, the horizontal limb is at once converted into a Circumferentor which will perform work that none other can possibly do. These sight vanes answer several purposes. Again, the horizontal limb can be instantly removed from the levelling heads, or parallel plates; and the vertical limb, &c. being attached thereto, makes it a beautiful, light, strong and accurately working Y. Level with the capacity of taking angles of elevation or depression.

With this instrument, used either as a Theodolite or Circumferentor, I can (having the sun,) obtain the true North and South at pleasure, by three or more different methods, one of which will give, immediately, without calculation, the true meridian. Along magnetic needle is attached to this instrument, being contained in a narrow box, I however have no other use for this needle, than to show the magnetic meridian through a survey, and to show the variation of the needle, for any purpose I may wish, which I can do at pleasure.

In surveying a field, this instrument guides itself from station to station, independent of the needle, giving at the same time, a difference of latitude and departure more accurately than can be obtained by using the needle and tables for that purpose. Thus, at the end of a survey, I can at once determine the area, or detect any error committed in chaining the bounds. If an error has been committed in measuring any of the angles, the instrument will show it, without fail; hence all corrections can be made while on the field. But no one at all capacitated to survey need err with this instrument.

In laying out, or cutting off any given amount of land it is far superior to any other, always preventing the operator from commiting a mistake. It is a perfect instrument in triangular surveying, executing with facility, and truly, all the cases that can possibly occur in plain trigonometry or in laying out, or cutting off triangular pieces, of land, among which are the following :—

Given, the area and one of the acute angles of a right angled triangle; (of course the other angles are known,) these are all the terms required. The acute angle in this case is to be worked from, and in a few minutes, with but little calculation, I can give the true length and direction of all the sides, and the position of each of the other angles, without having removed the instrument from the first angle.—Given, the area (only) of an equalateral triangle, and almost instantly the work is ready for the chain, and stakes. Given, the area one angle of an isoselese triangle, and, as before, the work is done. Given, the area and the angles of a scalene triangle, and in a short time the length and direction of the sides, and position of the angles are determined. Given, the area, one angle, and one side of a scalene, and as before, the other parts are as quickly determined. Given, the area, and the ratio of all the sides of a triangle of any form, and in a very short time, the true length and directions of the sides, with the measurement of the angles will be ascertained.

In the above, and like cases, where the location of the angle and the direction or bounds of one side are known, they are to be made the foundation of the operation.

I have also invented and connected, to both the horizontal and vertical limbs of my Theodolite, a simple apparatus for fine reading. This is constructed on scientific principles. It divides to the sixth hundred and forty eight thousandth part of a degree, which is read by the unassisted eye. It can be made to read finer if desired. By means of this fine reading, in connection with a peculiarly formed staff I am enabled to measure distances in various ways, without chain or tape, on a level or at any angle of elevation or depression, hence, in railroad surveying, it is of superior utility; being, in itself, a perfect magazine of instruments; even supplying the place of the sextant, the latitude of a place being readily obtained by it in several ways.

In running the longitudinal section of a railroad it will give the straight line with the difference of level, or depth of cut and filling, with the distance from station to station, without requiring any calculation to be made.

Again, it will give you the cross section in all its particulars in like manner. For instance, it has been ascertained, that a certain stake on the longitudinal line, is fifty feet above the true level of the road. The hill declines, or slopes, with the transverse section of the road. On one side of the stake the hill is above it, on the outer it is below it. This Theodolite being placed under the stake and adjusted, the surveyor can (having his height from the level of the road, with its width and the angle of its side slopes,) direct his assistant, at what distance, up, or down the hills, and at what angle to drive a stake, which being followed in excavating, will meet that side of the level road nearest to said stake, and at the same time, he can obtain without calculation, the end area of said transverse section. All this applies alike to filling as well as to excavation.

I of course, in using this instrument, wholly disregard local attractions, and every cause of the variation of the needle, and believe myself to be fully prepared to prove, by occular demonstration, all, and more than I have advanced in this communication. I have taken measures to secure a patent.

WALTER M. WILSON.

[We have seen the above described instrument and endorse Mr. Wilson's description of its advantages and merits.—ED.

Useful Problems.

We hereby annex the answers to the four problems proposed in No. 30. We have two sets of answers, one set by the proposer and the other by Mr. Hinchcliffer of North Andover, Mass.

Solution of problem 1, by the proposer, 15 lbs. 1 7-9 oz., for 15 : 6 4-5 : : 225 : 6 4-5X500 / 15

This answer is wrong, by a hurried mistake no doubt of the author, for he well knows how to work it.

The answer by Mr. Hinchcliffer, is an algebraic equation with the result 202 on the long end of the lever, 15 feet, to balance 225 on the short end of 6 feet 9 2-5 inches. This answer is correct. The way to calculate lever power, is to suppose that equal weights at equal distances from the examen, balance each other, while if they are at unequal distances, the one double the length of the other one half the weight on the long end will balance the weight on the short end, not counting the weight of the lever.

Solution of problem 2, by the proposer.—9 feet 4½ inches, for 8 : 75 : : 12 : 75X12 / 12

The answer from both sources is the same.

Solution of problem 3, by the proposer.—Nearly 4 miles, for 3587 : 3600 : : 3956 : 3,970, and always the times of vibration of the same pendulum on different parts of the earth's surface, are proportioned to the distances of these points from the centre of the earth.

Solution of problem 4, by the proposer.—About 192,000 miles per second, for the light must occupy the 16½ minutes in passing thro' the diameter of the earth's orbit, hence we have 190,000,000 / 16.5X60

By Mr. Hinchcliffer.—It is well known that the earth is 190 millions of miles nearer Jupiter in that part of her orbit nearest him than in that part most remote; therefore since the eclipse is seen 16½ minutes sooner in the former part of his orbit, light travels 190 millions of miles in 16½ minutes.

The answer in both cases is the same.

It is not possible for an editor to sit down and critically examine and descant on mathematical propositions—they require more time than he can afford to spend on their examination, especially as they are of minor importance in the scope of his profession. All answers to propositions should therefore explain clearly the process of arriving at, as well as the results of investigations. For example, as collateral testimony to the last solved problem, we may say, it may be interesting to know how philosophers have been able to determine with certainty, that light really travels at the rate of 192,000 miles in a second of time. The method adopted was the following. The satellites of Jupiter were carefully observed for some time, and a rule was obtained which foretold the instants in all future time, when the satellites were to glide into the shadow of the planet and disappear, or again appear to view. It was found that these appearances took place 16½ minutes sooner when Jupiter was on the same side of the sun with the earth than when on the other side, that is, more distant from the earth by one diameter of the earth's orbit or path, and at all intermediate stations, the difference diminished from the 16½ minutes in exact proportion to the less distance from the earth.

We have some more Problems, which we shall propose next week, and give the answers the week after.

Cullodion for Wounds.

Finely powdered nitrate of potash 40 parts by weight; concentrated sulphuric acid 60; carded cotton 2. Mix the nitre with the sulphuric acid in a porcelain vessel, then add the cotton and agitate the mass for three minutes by the aid of two glass rods. Wash the cotton, without first pressing it, in a large quantity of water; and, when all acidity is removed (indicated by litmus paper,) press it firmly in a cloth. Pull it out into a loose mass, and dry it in a stove at a moderate heat.

The compound thus obtained is not pure fulminating cotton. It always retains a small quantity of sulphuric acid, is less inflammable than gun cotton, and it leaves a carbonaceous residue after explosion. It has, however, in a remarkable degree, the property of solubility in ether, especially when mixed with a little Alcohol; and it forms therewith a very adhesive solution, to which the name of Cullodion has been applied:

The Cullodion is prepared as follows,

Prepared cotton,	-	8 parts by weight.
Rectified sulphuric ether	125	" "
Rectified alcohol,	- 8	" "

Put the cotton with the ether into a well stopped bottle, and shake the mixture for some minutes. Then add the alcohol by degrees, and continue to shake until the whole liquid acquires a syrupy consistency. It may then be passed through a cloth, the residue strongly pressed, and the liquid kept in a well secured bottle.

Collodion thus prepared possesses remarkably adhesive properties. A piece of linen or cotton cloth covered with it, and made to adhere by evaporation in the palm of the hand will support after a few minutes, without giving way, a weight of from 20 to 30 lbs. Its adhesive power is so great that the cloth will commonly tear before it gives way. The Collodion cannot be regarded as a perfect solution of cotton. It contains, suspended and floating in it, a quantity of the vegetable fibre which has escaped the solvent properties of the ether. The liquid portion may be separated from these fibres by a filter, but it is doubtful whether this is an advantage. In the evaporation of the liquid, these undissolved fibres, by felting with each other, appear to give a greater degree of tenacity and resistance to the dried mass.

In the preparation of collodion, it is indispensable to avoid the presence of water, as this renders it less adhesive; hence the ether as well as the alcohol should be pure and rectified. The parts to which the collodion is applied should be first thoroughly dried, and no water allowed to come in contact with them, until the ether is evaporated.

This is the famous substance now used for dressing wounds.

Mr. J. H. Leith, a miller in Rochester, N. Y. ground in 24 hours by one run of stones, 200 barrels of flour.

To the Proprietors of the "House" and "Bain" Systems of Telegraphing.

OFFICE OF THE NEW YORK, ALBANY AND BUFFALO TELEGRAPH CO.
Utica, April 13, 1848.

Much having been said, through the medium of the press, about the accuracy and dispatch with which either of the above patent machines are worked I now make the following distinct propositions, which, if accepted, will enable me to judge which is the best and most reliable method of Telegraphing,—

FIRST. I will give to either of the above named parties the use of the wires of the New York, Albany and Buffalo Telegraph Company, in good order, any one or more days between the 1st and May next, they to place one of their machines in the office at New York, and one in the office at Buffalo, and an intermediate one at Utica.

SECOND. Mr. House and his associates shall use only what is patented to them in the United States, and they may have the first trial on the following conditions.

They shall transmit from New York to Buffalo, two hundred consecutive words, averaging five letters each, printing the same at the intermediate station, and using all the letters of the Alphabet, all of which shall be plainly printed in Roman characters or letters and correctly spelt; and two trials may be made and no more, and the result shall be submitted to competent judges, each party choosing one, and they the third, and their decision to be final; and if decided, to be fairly and correctly done, according to the terms, intent and meaning of this proposition, then I agree to pay the said House five hundred dollars; but if not correctly transmitted from New York to Buffalo, and at the intermediate station at Utica, according to the true intent and meaning of this proposition, then the said House, or his associates, shall pay me five hundred dollars for the use of the wire. The money to be deposited in the Oneida Bank, in Utica, on or before the 15th instant, by each party.

THIRD. I offer to Mr. Bain and his associates, the same terms, confining them to Bain's American Patent, without the use of any thing that Mr. Morse has patented.

The money to be deposited as above, subject to be drawn by the party entitled to it by the decision of the judges.

FOURTH. After full trial by the parties as above proposed, I offer to take the same wire used by them, it being in good order, with Morse's instruments, and will have transmitted the same number of words in less time; and for every word not correctly spelt and written out, with "Morse's" machines now in use at said offices, I agree to pay the above parties five hundred dollars, on condition that they agree to pay me one dollar for every word correctly transmitted.

All to be subject to the decision of same judges.

T. S. FAXTON,
President N. Y, A. & B. T. Co.

We would rather have seen the above proposition made without any bet upon the result. There is too much of the jockey about them. It is well known that both Mr. House's and Mr. Bain's Telegraph transmits messages very well. If their method of transmitting messages is an infringement on Mr. Morse's invention, why not bring the matter to Equity at once, and have a fair trial. This would be far more gentlemanly looking than tossing up dollars, for "heads up" and if we have laws, to protect inventions why not resort to them, first.

Weaving Ribbons.

Eight ribbons are generally wove at once in a loom something like our coach lace looms. In those countries like England where a great deal of ribbon weaving is carried on, the looms have eight shuttles, one to each ribbon, and they are so attached that they are worked as though they were but one shuttle. They weave very fast. In Switzerland there is considerable business done in the ribbon line, mostly by females, who spend part of their time in the fields and part in guiding the spindle and directing the shuttle.

A three story brick house fell in Cincinnati on the 3d inst. None of the inmates were injured.