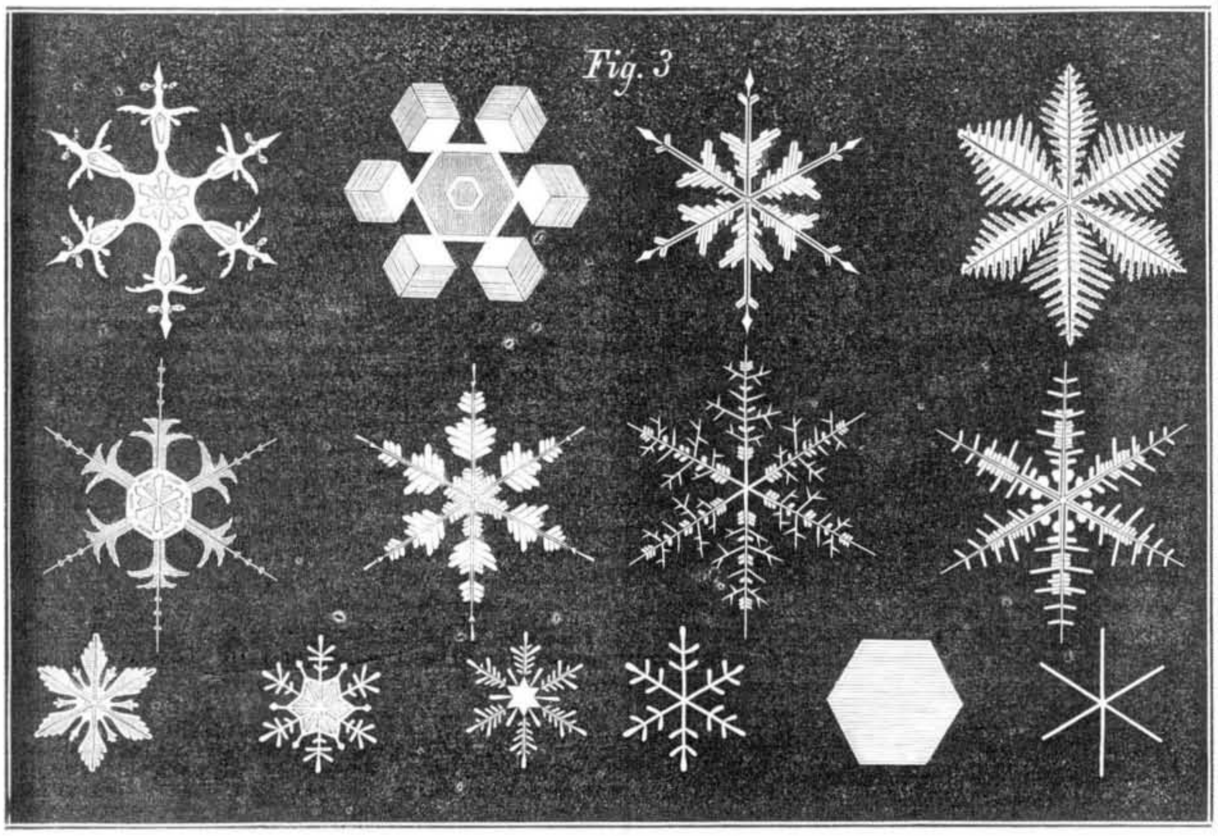
These clouds may fall as rain, but as I have said, they may also fall as snow. I suppose that snow is such a familiar thing to every boy and girl here present, that it may seem to be hardly worth thinking about; but still this substance is one of the most wonderful and beautiful things in the whole world; and when snow is formed in a very still atmosphere, as I have often had the pleasure of seeing it formed in the Alps, it takes the form of those beautiful figures which are represented in the diagram yonder. (Fig. 3.)



It forms as small, six-rayed stars. This is the form of the snow which goes on loading the Alpine mountains year after year; and when we look at these mountains, and at the valleys connected with them, we find that the most wonderful series of appearances presents itself. On very closely observing the snow upon the Alpine slopes, we find that it is in a state of motion. We find that the snow has been incessantly moving down the Alpine slopes into the valleys; and hence we have the valleys filled with rivers of ice. On standing for the first time beside one of these rivers of ice, you would imagine that it was perfectly motionless, and that a body so rigid as ice could not move at all; but when you make proper observations, you find that the ice is perpetually moving down, and thus we have these glaciers of the Alps. I have no doubt that every boy here will one day visit those glaciers for himself. I have here a sketch of one of the most famous of those glaciers. It is called the "Mer de Glace," and is situated near Chamounix. This Merde Glace has its great feeders from the snows that fall upon Mont Blanc and the series of mountains which are rudely sketched in this diagram. Here is a great cascade where the snow, after being half consolidated—squeezed together so as to form ice—actually moves down, forming a cascade of ice which comes along this valley. Here is another basin where the snows collect, and where its particles are squeezed into ice, and you have this ice also always in a state of motion.

Now let us look at the lines which I have drawn on the diagram. The mountains beside the glaciers are always sending down stones and dirt, and consequently you always have lines of dirt carried down; and you see that where two glaciers have their sides turning and uniting as here shown, they form a line along the middle of the trunk of the glacier. Now these lines which I have mentioned are called *moraines*. Those at the side are called *lateral moraines*, and those in the middle are called *medial moraines*. We have in the Mer de Glace these three moraines. If we examine this glacier we find that notwithstanding the rigidity of ice it moves down like a river. Eminent men have worked at this subject; Saussure worked at it a little, not much, and was followed by Bordier, who observed that ice behaved almost like a viscous body. He was the first to propound the fact that ice was of this character. He was fellowed by Rendu, who also took up the idea that ice behaved like a viscous body, such as honey, treacle, or tar, or paste. Then he was followed by Mr. Agassiz, and another, and they determined the velocity with which this ice falls. Then came Principal Forbes, an eminent Scotchman, and his measurements pushed the question far beyond its former stage. And then came Mr. Huxley and myself; and we pushed the matter a little forward; and afterwards I did a little on my own account in reference to this question. It is in this way that scientific knowledge is accumulated. It goes rolling on and becoming bigger like a snow-ball, and thus it is that science grows and has grown to what it is at the present day.

A Transcript from Old Records.

From "Morse's Gazetteer," published in 1797, we take the following relating to New York city:

"The city was incorporated in 1696. It is two miles in length and one mile in breadth. Its population in 1756 was 11,000; in 1771, 22,000; in 1786, 24,000; in 1796, 70,000.

"From the gallery in front of Federal Hall, at the head of Broad street, George Washington took the oath of office as President of the United States, April 30, 1789.

"The supply of water is insufficient, and many of the inhabitants are provided from a well at the head of Queen street, from which the quantity of 110 hogsheads, or 14,400 gallons is daily drawn, and on some hot days the amount of 216 hogsheads. The well is but 20 feet in depth, and holds but three feet of water, which is sold at three pence per hogshead."

From the same work, under the head of "Mingo Town," Pa.: "In this vicinity are some springs which yield 'Petrel,' a bituminous fluid." [The "coal oil" which so universally dispels the darkness of 1868.—ED. SC. AM.]

And from the same work, under the head of "Territory"—relating to the Northwest Territory of the United States—is taken the following prediction, made eleven years previously to the passage of Robert Fulton up the Hudson river in a steamboat: "It is probable that steamboats will be found to do infinite service in all our extensive river navigation."

WHIPPLE'S COMBINED TAPER HOLDER AND MATCH SAFE.

The object of this invention is to furnish a ready means of providing a light on occasions when an ordinary lamp might not be accessible or convenient to carry about. For this purpose the little device shown in the engravings is admirably adapted, being neat, handy, and so small as to be readily carried in the vest pocket. Larger sizes for ordinary candles

Fig. 1.

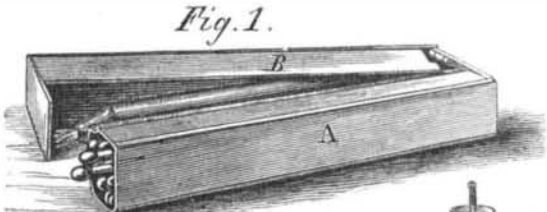
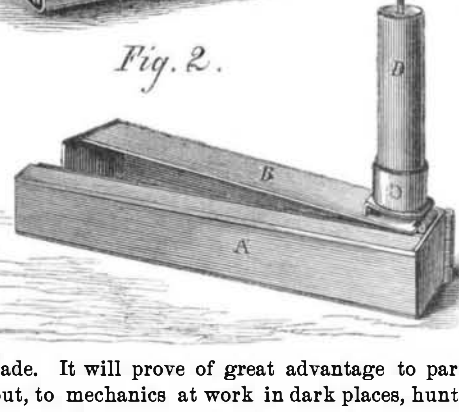


Fig. 2.



are also made. It will prove of great advantage to parties camping out, to mechanics at work in dark places, hunters, frontier's men, and convenient for Christmas tapers. It was patented in the United States, May 28, 1867, by John A. Whipple, 297 Washington street, Boston, Mass. It is also the subject of several foreign patents.

The case proper is in two parts, hinged, and formed of sheet metal. One compartment, A, is the match receptacle; and the other, B, a case or box for its reception. Hinged to the end of the match safe is a socket, C, for holding an ordinary candle or a miniature candle, or taper, D. When closed the contrivance is simply a rectangular box, being, for the small size, about three quarters of an inch square by three-and-a-half inches long. When opened the taper and its socket stands on one end of the case, and the case is a handle and standard for the light.

The foregoing is sufficient to give the reader a correct idea of this eminently handy and useful device. All orders and other communications should be addressed to the patentee, as above.

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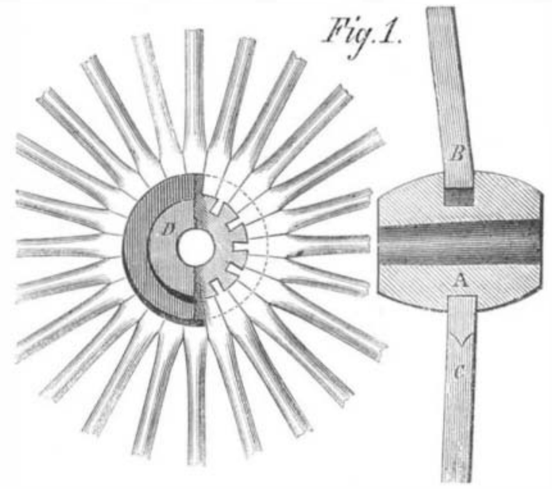
SAWYER'S PATENT CARRIAGE WHEEL.

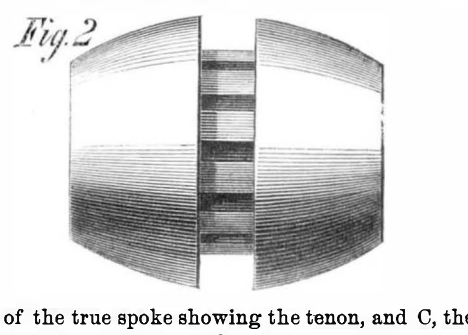
One great difficulty experienced by carriage makers in constructing a strong and elegant wheel is the necessity of cutting away in mortises so large a proportion of the hub as to greatly weaken this important and central part. The design of the improvement shown in the engraving is to retain the largest number of spokes in a wheel, while the hub shall not be weakened by cutting away the most of its interior in mortising.

In this invention only every alternate spoke is mortised, the others, or supplementary spokes, acting as keys or wedges, yet being firmly held in place by their contact with the other spokes, and with the shoulders or rims on the hub. The hub has a circumferential groove—Fig. 2—turned in it of sufficient width and depth to receive the ends of the supplemental spokes.



At the bottom of this groove the mortises for the true spokes are cut, which are seated in the usual manner, they, with the auxiliary spokes, making a solid continuation of the wheel hub, the whole being thus securely locked and fastened.

A, in the engraving, Fig. 1, is a section of the hub. B, a



section of the true spoke showing the tenon, and C, the supplementary spoke, seated in the circumferential recess. The figure marked D, shows the wheel as constructed, the dotted lines on one side denoting the periphery of the hub.

Instead of cutting a score or recess in the hub, it may be made quite small, and two strong bands or flanges of iron or other metal may be shrunk on, or otherwise secured to the hub, their inner surfaces forming the recess or groove which will secure the spokes firmly in place. By means of these bands, wheels already in use may be strengthened by the introduction of supplementary spokes, without diminishing the strength of the hub by increasing the number of mortises. This device applies to wheels, the hubs, spokes, and fellies of which may be made of metal, as well as those which are composed of wood.

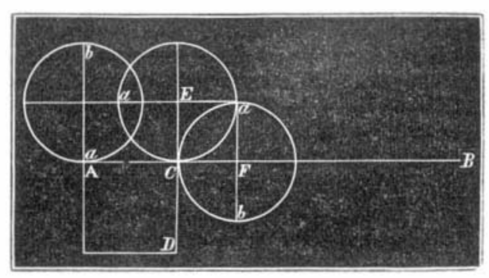
Practical wheelwrights, and others, will readily see the advantages of this mode of constructing wheels. It was patented through the Scientific American Patent Agency, Oct. 22, 1867, by W. T. Sawyer, Whistler, Mobile Co., Ala., whom address for further information.

THE MOVABLE WHEEL QUESTION.

"How many revolutions on its own axis will a movable wheel make in rolling once around a fixed wheel of the same diameter?" [Original question.]

We are in continued receipt of many communications upon the subject, but are obliged this week to curtail our selections. We shall return to the subject next week.

MESSRS EDITORS:—You say that a wheel in revolving around a fixed wheel of the same size makes but one revolution on its axis. You say that L. M., by the diagram given, proves himself wrong. I beg leave to disagree with you, and think the following sketch will make it appear that the wheel does make two revolutions:



If the line, A B, is equal to the circumference of the wheel in revolving from A to B, the wheel will make one revolution, but if A B be bent into a square then the wheel will make two revolutions in passing round it.

Suppose the wheel starts at A, in going from A to C, one-fourth of the distance, A B, the wheel would make one-fourth of a revolution; now before the wheel can advance on the line

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