# Science and Art.

### Spectacles.

These aids to failing sight were first used about the latter end of the thirteenth century, and their invention is ascribed to Roger Bacon. Sir David Brewster says:—"Persons who have enjoyed distinct and comfortable vision in early life, it is remarked, are the most likely to appreciate the benefit to be derived from glasses. Between the ages of thirty and forty, they begin to experience a change in sight. During the progress of this alteration, much inconvenience is experienced, as no spectacles seem to be serviceable in giving correct vision. Happily, however, two or three months ends this difficulty, and as soon as the alteration is complete, distinct and comfortable vision is at once obtained by the use of well selected glasses of a convex figure. During this transition state it is important that the eyes should be subjected to no severe strain, and great regard should be paid to the general health.

The material of spectacle lenses should be glass, of a very low dispersive power or better still, of rock crystal. They should be as thin as practicable. To correct a common error in the manufacture of lenses, by which the distance between the centres of the lenses is equal to the distance between the pupils of the eyes, the following is given: 'Draw on paper an isosceles triangle, the two sides of which are equal to the distance of each pupil from the point to be seen distinctly; while the third side or base is equal to the distance between the pupils when the eyes view that point. Then set off on each side of the triangle, from each end of the base, the distance of the center of lenses or their frames from the pupil, and the distance of these points will be the distance of the centers of the lenses required.'

The long-sighted persons will generally, for ten or twelve years, require glasses only for reading or work done by hands; but as life advances other spectacles will be needed for objects at greater distances, and it will be of great advantage to have two or three pairs of different local distances. It is a very incorrect notion that it is prudent to avoid the use of artificial helps to the eyes as long as possible.

The human eye is too delicate a structure to bear continued strain without injury, and the true rule is to commence the use of glasses as soon as we can see better with than without them."

### Fire Protector for Buildings.

When conflagrations occur in old, dilapidated, and, for the most part, frame buildings, it is generally not so much an object to save them as to prevent injury to the surrounding property; and in case the supply of water should fall short, we have, at present, no adequate method of staying the progress of the flames. The invention we are about to describe is intended for this purpose. Fig. 1 is a perspective view of the whole, while Fig. 2 is a longitudinal section of the vertical sliding rods detached.

A truck is first constructed, consisting of an iron frame, A, from thirty-five to forty feet long, and of convenient width, and this is mounted on four wheels, B, on the axles, *c*, attached to the truck by ring bolts to enable it to turn a sharp curve in a small space. On each end of A are erected four iron uprights or iron tubes, D, which are connected at the top by frames, E, on which are journals for the axles of the chain wheels, F. Other chain wheels, G, are mounted on the lower part of the frame, A, and these carry the endless chain, H. On the axles of the lower chain wheels, G, are mounted two ratchet wheels, X, one on each, with pawls *y*, hinged to the frame, and locking into their teeth.

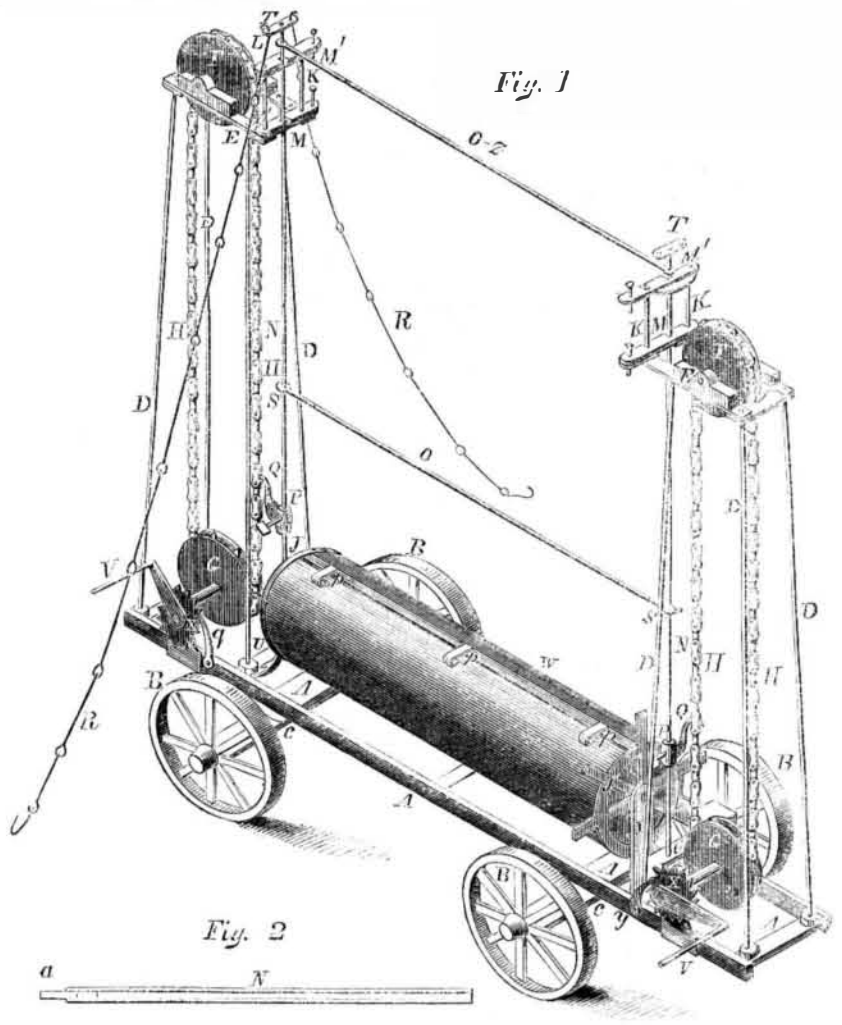
In the center of the truck, nearly filling the space between the chain wheels, is arranged longitudinally with the frame, A, a roller supported at each end on journals in bearings, I, erected on the frame. This roller is constructed with two flanges, J, keyed on a shaft, with a series of wrought iron rods or tubes connecting them, around and near their peripheries. The flanges, J, may either, one or both, form tiller or sprocket wheels, so as to be turned by hand to rotate the roller. This roller forms a foundation on which to wind the necessary quantity of sheet iron, in sheets of about thirty feet wide, (just the length of the roller,) and about twelve feet deep, and are so made at the top and bottom as to form one continuous sheet.

On the inner end of the frame, E, are erected standards, K, with capping pieces, L, to support their upper ends. To these uprights are jointed clamps, M M′, at their top and bottom, through which rods, N, are free to play vertically. A bar or tube, O, having an eye at each end, spans and connects the two rods, N, horizontally above the sheet roller. These rods, N, are also provided with a socket, P, which may be secured to them at any point by a set screw. To these collars are jointed hooks, Q, of a suitable form to hook into the links of the endless chain, H.

To the upper edge of the sheet, W, are attached a number of hooks, *p*, by which it is connected with the bar, O. When it is intended to raise the sheet, pins, S, are passed through the rods, N. The hooks, Q, are connected with the endless chains, H, and their

## ODION'S FIRE PROTECTOR FOR BUILDINGS.

*Fig. 1*




collars secured by set screws to the rods, N, near their lower ends. The chain wheels, G, are then rotated by cranks, V, on their axles, which raise the rods, N, and with them the bar, O, and sheet, W, by unwinding it from the roller until the ends of the bars come in contact with the lower clamps, M, which are then opened, to allow it to pass up, and closed again, and the upper ones are opened, the rods, bar and sheet pass through, and they are again closed. The screen is then supported by the ends of the bar, O, resting on the clamps, M′, in the position represented at O Z, whilst the rods, N, are released from the chains and allowed to slide down to their original position. A man then ascends by the rattlings, or in any other way, to the head of the endless chains, and secures the cross bar, O, to the rods, N, by inserting a pin, or tightening a collar by a set screw underneath them, and at the same time attaches guy chains, R, to the cops, T, on the tops of N. The hooks, Q, being again connected with the endless chains and rods as low down as possible, they may be raised as before, until a section of rod (made of wrought iron tube, with socket joints, by riveting a shank, *a*, seen in Fig. 2,) can be connected at their lower ends, which are then let to rest on the feet, U, whilst the collar and hook can be again lowered, and connected as before, near the bottom, with the chains and rods, when the sheet is raised by turning the chain wheels. This may be repeated by adding sections of rod, until the screen is raised to the necessary hight to protect the neighboring property, when the guy chains, R, are to be anchored to steady the top. A number of these screens may be arranged in a line, or around a burning building, so as to protect, in a great measure, the surrounding property.

Further information and particulars may be obtained from the inventor, Thomas Odion, of Portsmouth, N. H. It was patented September 29, 1857.

### Difference between a Watch and a Clock.

A watch differs from a clock in its having a vibrating wheel instead of a vibrating pendulum; and, as in a clock, gravity is always pulling the pendulum down to the bottom of its arc, which is its natural place of rest, but does not fix it there, because the momentum acquired during its approach to the middle position from either side carries it just as far past on the other side, and the spring has to begin its work again. The balance wheel at each vibration allows one tooth of the adjoining wheel to pass, as the pendulum does in a clock; and the record of the beats is preserved by the wheel which follows. A main spring is used to keep up the motion of the watch, instead of the weight used in a clock; and as the spring acts equally well whatever be its position, a watch keeps time although carried in the pocket, or in a moving ship. In winding up a watch, one turn of the axle on which the key is fixed is rendered equivalent, by the train of wheels, to about four hundred turns or beats of the balance wheel; and thus the exertion, during a few seconds, of the hand which winds up, gives motion for twenty-four or thirty hours.—*Dr. Arnott.*

### Observation.

The habit of observation is one of the most valuable in life, its worth can never be too highly estimated, and it is one that can easily be cultivated. Never do anything without observing that all you do is correct. Do not ever take a walk without having your eyes and ears open, and always try and remember what you see and hear. By this means you will acquire more knowledge than can ever be learned from books, as you will find the information in exactly the form you are capable of receiving it. Read books and newspapers, but above all acquire observing habits, for they will be always with you, and ever ready to store your mind with the truths of nature.

### The Ague.

Ague is now far less common in London than formerly. The disease was very common some two or three hundred years ago, James I. and Cromwell having died from it. When the population of London was not one-fourth its present amount, the deaths from ague were very much more numerous than now. The average number of deaths in London from real ague do not exceed twenty-four or twenty-five per annum. This decrease is entirely due to the many local improvements, in the way of drains, cleansing the streets, and compelling the inhabitants to obey strict sanitary laws. Ague is not the only disease which can be driven away by drains and cold water—in fact, there are few ailments or epidemics that their combined efforts will not eradicate.