

Success in Heliography.

A dispatch from Prescott, Arizona, mentions a great achievement in heliographing recently accomplished during practice in the Department of Arizona, by Lieut. Wittenmeyer, who succeeded in signaling a message by a single flash 125 miles from Mount Reno, near Fort McDowell, to Mount Graham, near Fort Grant, where it was received by Capt. Murray. The latter by turning his instrument flashed the message to Fort Huachuaca, a distance of 90 miles, making a distance of 215 miles with a single intervening station. The longest distance heretofore made with a single flash is said to be 70 miles.

A heliograph may be described as a simple instrument that is used for signaling by sunlight from a plane mirror. The signals are made by flashing reflections or by obscuring and revealing at will, by a movable screen, an otherwise constant light, which is technically called a "standing flash." The instrument working with a screen has been usually called by the inventor a "heliostat." That giving flashes has been called a heliograph or a heliotrope.

The word heliograph, however, is commonly used to denote both, and will no doubt continue to be the accepted name. A complete instrument consists essentially of two plane mirrors and a "sighting" rod, and, when a "standing flash" is used, a screen. The mirrors are firmly supported, usually on a tripod, and are fitted with vertical and horizontal tangent screws. By means of the tangent screws the mirrors can be turned on their supports so as to face in any desired direction toward the sky. When a movable flash is used, one of the mirrors is so mounted that a motion of three or four degrees about its horizontal axis can be given it independently of the tangent screw, so that the flash can be thrown on and off the receiving station at will, and quickly.

The screen, when used, is on a separate support, in order, when working, to avoid any shaking of the mirrors. Both mirrors are used when the signalman facing the receiving station has the sun in his rear. When the sun is in his front, or nearly at his right or left, only one mirror is used. The sighting rod, as its name implies, is an auxiliary used with the tangent screws, to put and keep the mirrors in such a position that the flash can be cast with certainty on the receiving station.

Unless the flashes are produced rather slowly, and the dots and dashes separated very clearly, there is great liability of confusion. Even very expert readers of these signals are liable to make mistakes, and to clearly communicate ideas the operator must observe constant care and "space" his dots and dashes with extreme nicety. The heliograph may be manipulated after night by means of a clever arrangement of two small lamps attached to the instrument. Flashes, long or short, can be produced by delicate adjustment.

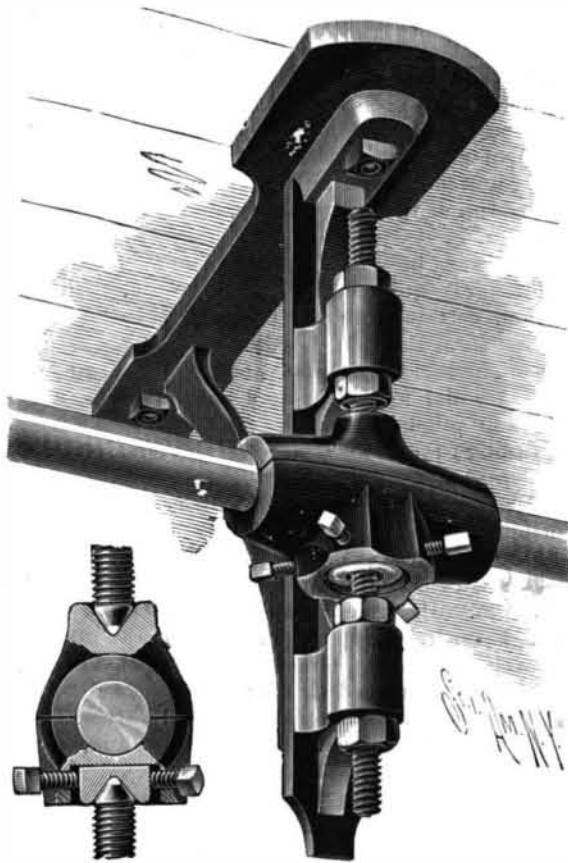
Among the heliographic instruments heretofore described in the *SCIENTIFIC AMERICAN* is one by which, when a key is pressed, like a telegraph key, the flash of light is made of long or short duration, answering to the telegraphic dot or dash. Another improvement is that in which the flashing mirror is attached to an opera glass.

AN IMPROVED LOGGING RAILWAY.

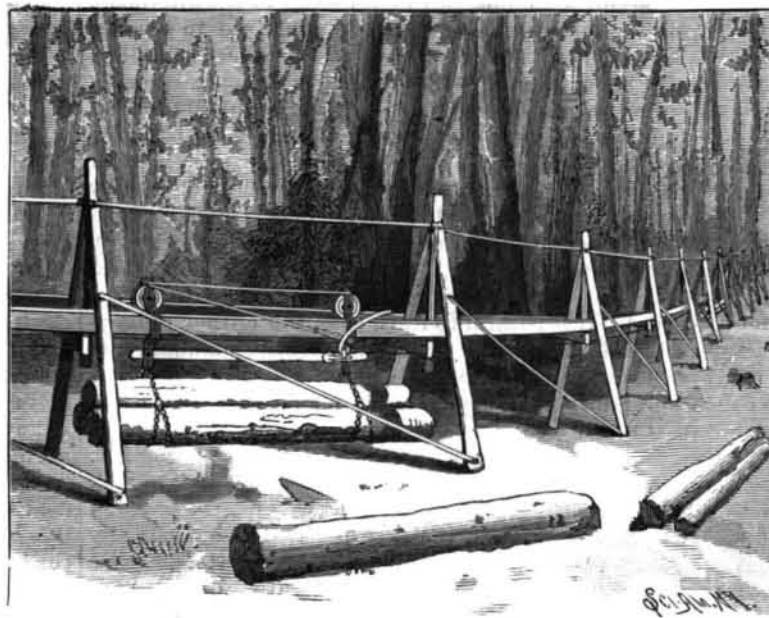
The illustration represents a simple form of logging railway designed to be expeditiously and conveniently built in any lumber region from the materials at hand. It has been patented by Mr. Frank V. Holston, of Bayfield, Wis. The supports or standards are formed of logs placed in the shape of the letter A, and between their upper contacting ends is secured a depending perpendicular log of about half the length of the standards, there being attached to this latter log and to one of the side standards a cross bar of hewed timber. The standards may also be connected by side and bottom brace rods when deemed necessary. The tracks are laid upon stringers resting upon the inner ends of the cross bars, and upon the tracks travels a carriage consisting of two or more hangers, connected by rods or bars, the hangers being bent upon themselves at their upper ends, where a grooved wheel is pivoted to travel upon the track. The lower ends of the hangers are carried beneath the track and connected by a log, and each hanger has a chain with a grab hook of any approved construction, whereby the logs to be transported may be held from the carriage at an elevation from the ground. To the upper curved extremity of one hanger is attached a cable designed to return the empty carriage, while a second cable, operated by power from any convenient source, is carried beneath the track and over a grooved roller on an arm attached to one of the hangers, in such position as to be readily gripped by a cam lever, when the logs have been securely attached to the carriage.

AN IMPROVED SHAFT BEARING.

The illustration represents a universal shaft bearing adapted to adjust itself automatically to the position of the shaft, which has been patented by Mr. H. Schneider. The bearing support has vertical screw-threaded bosses in line with each other, threaded bolts with conical ends working in the bosses, the bolts being adjusted to position by set nuts. The bearing con-

**SCHNEIDER'S SHAFT BEARING OR HANGER.**

sists of an upper and lower section, which, when placed together, have the proper aperture to receive the shaft, and the upper section has a recess for the insertion of the conical point of one of the threaded bolts, while the other section has a recess within which is a bearing plate fitting the conical end of the other bolt, the recess for this plate being large enough to permit the plate to be shifted by means of radial binding screws working through threaded horizontal apertures in the raised rim or edge of the recess, and bearing with their inner ends against the sides of the bearing plate, as shown in the sectional view. The illustration represents the bearing as applied in connection with a hanger, but it may as readily be used in connection with a standard fixed upon the floor, or with wall brackets, the movable bearing plate being placed either above or below the shaft, as may be most convenient, the improvement giving the journal box or bearing sufficient play to enable it to yield or adjust itself automatically to any slight play or vibration of the shaft, thereby avoiding undue strain and the friction and wear incident thereto. The movable bearing plate also permits of lateral adjustment of the shaft bearing, even when the shaft is running, while vertical adjustment may be quickly effected by the adjustable upper and lower bolts or pivotal bearings and their respective binding

**HOLSTON'S LOGGING RAILWAY.**

nuts. For further information relative to this invention address Mr. H. Schneider, Dey Street House, No. 58 Dey Street, New York City.

THE best quality precipitated chalk perfumed withorris root makes a good tooth powder or paste.

Purchasing Beets.

The several beet factories which have had a short existence in the United States experienced difficulties with farmers when purchasing beets. The uniform price per ton, regardless of quality, is evidently the most simple method of overcoming the difficulty. The farmer's main object in view would then be to raise large beets, giving a heavy yield per acre, but averaging a low percentage of sugar. One campaign of a factory working under these conditions would end in ruin. If it were possible to contract for roots at say a uniform price of \$4 per ton, with ironclad rules respecting seed used, methods of planting, fertilizer, etc., the existing difficulties offered in California by the sliding scale of prices could be overcome.

On the other hand, experience in America has shown that farmers, while contracting to follow certain lines of cultivation, drift into their own methods without being aware thereof; hence there is a necessity of having a sugar beet overseer, his sole duty being the daily visiting of every portion of land where beets are being raised, and thus make certain that barnyard manure is not used the year of planting, and insist that the cultivator be run several times between rows of beets, so as to eliminate weeds, etc. In other words, his duty would be to follow out all the best rules laid down for the production of roots rich in sugar. Beets to be received at the factory should be analyzed and their exact locality of growing made known. In special cases the fertilizer used could vary. The work of practically carrying out such a method is expensive, but it has for ultimate effect the bringing about of perfect harmony between all parties interested.

We receive letters from California sources wishing to ventilate their grievances in print. We cannot publish such letters, but realize perfectly how difficult it is for them to understand why beets raised upon same soil, with same seed, by same methods of cultivation, should vary in price several dollars a ton. We are convinced that perfect conscientiousness exists on the part of the chemist employed by the factory. Why not do as is frequently done in Europe, *i. e.*, the farmers to have their own chemist, the expense, when divided among many cultivators, being but small, and then insist that the sample of beet selected at factory should be cut into two equal parts—the analysis obtained on the one hand should agree with that on the other. If a variance existed an average could be taken, and the price per ton thus determined would be more satisfactory than at present.—*Sugar Beet.*

Migrating Birds.

A dispatch from Cedar Rapids, Iowa, says: "A migrating bird wave which was passing over here on the night of May 17 encountered a severe rain and thunder storm. Attracted by the electric lights, the birds gathered about them and attempted to fly into the stores. As a consequence, more than 1,000 birds fell dead in the streets from coming in contact with the wires and the glass fronts. Few of these birds inhabit this region, and some rare specimens were captured alive and caged. Among them was a red-poll warbler, one of the rarest birds in the United States. This bird nests in Manitoba and Alaska in summer, and in the winter goes as far south as the Caribbean Sea. More than fifty different species of birds were found.

A Mysterious Olive Disease.

A strange disease has broken out in some of the olive orchards in the Pomona valley, and in many respects recalls to mind the mysterious vine disease. It was first noticed about two and a half years ago, and has been making headway ever since. So far no one has yet discovered its cause, whether it is bacteria in the sap or a disease of the wood. Its attack is indeed singular. The tips of the branches and smaller limbs begin to dry up and the wood turns a light brown, often taking in a whole limb. Many branches will show an apparently healthy twig on one side while on the other side a dead and withered growth tells the story of its presence. One tree may be apparently healthy with the exception of a single branch or shoot, while other trees are nearly from one-quarter to one-half dead. The affected portions convey the idea of having been scorched by a severe fire. The malady is reported quite universal throughout the valley, and is causing no little anxiety among the olive men. Specimens have been sent to Secretary Lelong, of the State Board, but so far no reliable information touching its cause and cure has been learned from any source. Prof. Coquillett has sent specimens

of the leaves and wood to the department at Washington, and it is to be hoped that the mystery will be cleared up and a remedy found before its spread becomes serious. A "mysterious vine disease" is quite enough for Southern California, without the addition of a "mysterious olive disease."—*Rural Californian.*