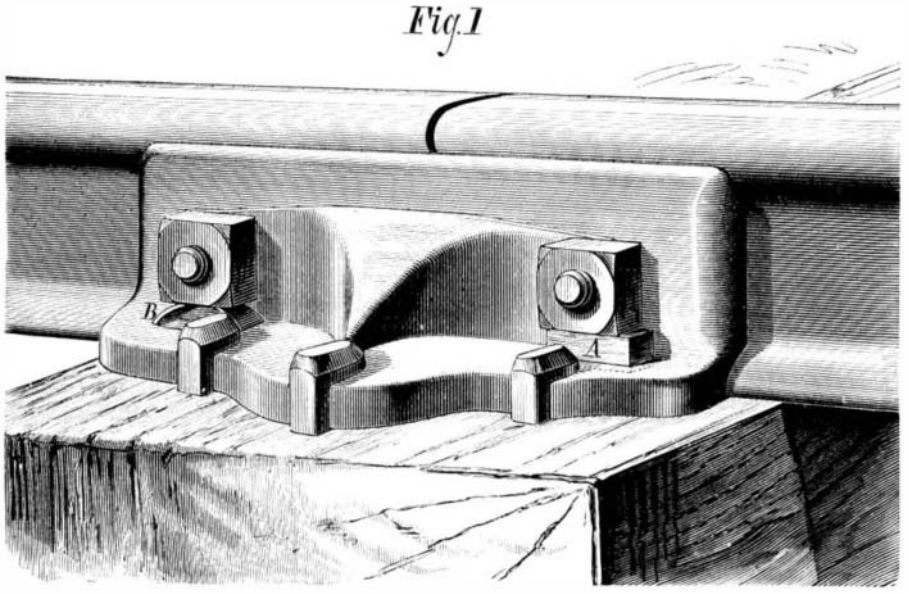
IMPROVED RAILROAD JOINT AND NUT LOCK.

We illustrate herewith a novel railroad joint and nut lock. The object of the device is to support the ends of the rail, keeping them from spreading or turning over, and at the same time furnishing abundant material opposite the joint to compensate for separation of the rails. As the appliance is made to fit closely, two bolts are done away with. The inventor states that the joint would be safe without any bolts on the same section of rail. The nut lock provided is cheap and simple, and may be either a wooden or iron key, or a spring, placed as described further on.

The shape of the device is clearly shown in Fig. 1. As the sectional view, Fig. 2, indicates, it is especially well adapted to the old pear-head rail, a form which has gone almost entirely out of use from the fact of its being too low to admit of fish plates and bolts, as commonly employed. The inventor considers that there is no better shaped rail than this, both for durability and strength; and he claims that, in connection with the joint here described, the pear-head rail will be as smooth to ride over as any of the fished rails. The engraving shows that the pear-head rail, being nearly an inch lower than the ordinary T rail, the leverage will be much less. The inventor further adds that a mile and a half of track, provided with his joint, has been laid, and that the riding thereon is exceptionally smooth. It is not deemed necessary to minutely describe the form of the invention, as it is plainly apparent from the engravings. It is moulded and matched to the rail. It requires no spikes in the flange of the rail, which, with the ordinary fish joint, are very necessary to keep the rail from creeping. In this way the full strength of the flange is retained. The nuts are locked by driving under them a wooden or iron key, as shown at A, Fig. 1, the same fitting down into a channel in the brace, or by adapting a steel bent spring, as shown at B. This device is applicable to ordinary fish joints by having a small projection rolled on the outside plate to hold wooden plugs or keys.

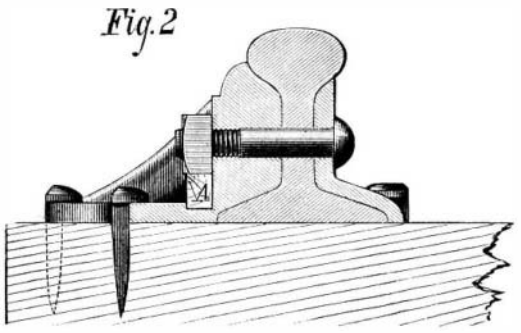
Patents for both brace and nut lock pending through the Scientific American Patent Agency. For further particulars, address the inventor, Mr. T. J. Nicholl, chief engineer, Gilman, Clinton, and Springfield Railroad, Springfield, Ill.

Fig. 1



NICHOLL'S RAILROAD JOINT AND NUT LOCK.

Fig. 2

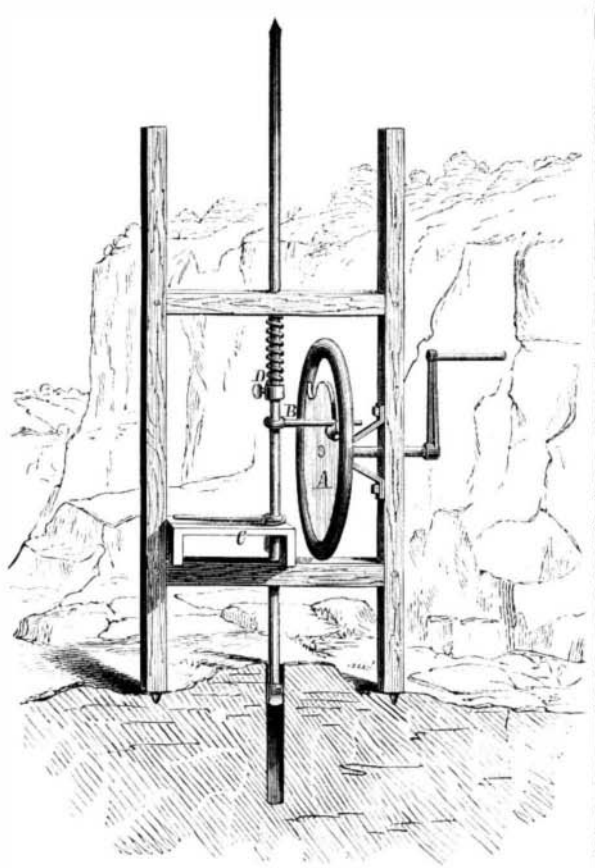


The Telephone.

New facts are discovered in the practical use of Professor Bell's speaking telephone much faster than theories can be framed to meet them. At present he uses only permanent magnets in operating the instrument; there is no battery used at all to give the current, it being obtained solely from ordinary and not very large horseshoe magnets wrapped with fine wire near each of the poles. Strangely enough, the magnets work equally well, no matter which pole of either magnet faces the other in the circuit. Instead of the usual arrangement of poles, + —, + —, these may be placed — +, + —, and yet serve the purpose of the telephone completely. Great electrical resistance, such as that caused by the interposition of 16 persons holding each others' hands as part of the circuit, interferes little with transmission. As the resistance is in such a case nearly twenty times that of the Atlantic cable, there seems to be reason for the hope that the sound of the human voice may be readily transmitted between Europe and America. The Bell telephone is strangely oblivious to some kinds of defective conduction and sensitive to others. Thus wet weather, which interferes with ordinary telegraphy, has no perceptible effect on the telephone; but imperfect joints uniting the lengths of wire are a grave impediment to the working of the new instrument. Three curious sounds are heard in the telephone when used with the ordinary wires between cities; these sounds are fainter than those which the instrument specially transmits, and make a sort of undertone of sound. The most distinct of the three is the ticking of Morse signals and the like. These can sometimes be distinguished as the signals of separate letters and words, but in general they are confusing by their number. They are produced by the vibrations of the telegraph poles from all the other wires that may be fastened to the poles that carry the telephone wire. There is a low crackling sound which is believed to be produced by the rubbing of imperfect or rusty joints of the telegraph wire. There is also a faint, continuous, bubbling sound, for which no satisfactory explanation has yet been offered. The Mechanics' Institute of San Francisco sent a gentleman to Professor Bell to induce the latter to apply the telephone in mines, so as to give prompt and complete communication throughout the mine and with the surface. The ordinary telegraph does not at present work well in the majority of mines, for various reasons. But to that, and many similar applications for the use of the telephone, though backed by most liberal offers, Professor Bell has invariably replied that he has not yet finished his experiments nor ascertained all the conditions necessary to the faithful service of the instrument. Nevertheless, he has one in constant use, connecting the workshop of some makers of electrical instruments with his own laboratory, and "chin-music" travels over the intervening half mile of wire without difficulty or mistake.

MERSHON'S IMPROVED ROCK DRILL.

In the accompanying engraving is represented a novel method of operating rock drills, enabling the same to be driven more rapidly and with greater facility than is possible with the usual sledge hammers. It also saves the labor of the man ordinarily required to hold the drill upright. The mechanism consists in a strong frame, through boxes in the cross beams of which the drill slides. One end of a short shaft is journaled into the frame, and the other in brackets. Upon the inner end of the shaft is a disk, A, in which there is an arc-shaped slot. In the slot is journaled a roller, which is concave in the direction of its length. B is an arm that projects from a ring which encircles the drill, and passes through the slot in disk, A. The brackets that support the inner end of the shaft are of such size as to come wholly within the slot, so as to allow of the rotary motion of the arm. A block, C, is secured to the lower cross timber to receive the ring of the arm, B, at the lower portion of its stroke. The drill point is enlarged and made V-shaped, so that the sharp edges of the V trim the sides of the hole. A spiral spring surrounds the drill bar, and is suspended directly under the upper crosspiece. This spring is compressed by the fixed collar, D on the bar when the latter is raised.



The disk shaft is turned by an ordinary crank, or it may be connected with any convenient motor. The mode of operation is as follows: As the disk is rotated, the arm, B, is carried upwards by the roller; and as the arm clamps the drill rod on being raised, it carries the latter with it, compressing the spring, and at the same time turning the rod through a part of a revolution. When the roller comes directly over the shaft, the arm is released, and the drill rod and arm fall together. As the ring of the arm strikes the block, C, the drill rod is entirely released, and is thus allowed to make a full blow upon the rock, the effect of which is increased by the expansion of the spring. Each time that the drill is raised, it is automatically turned, so that its cutting edge is constantly being shifted to new points in the rock.

Patented May 1, 1877, through the Scientific American Patent Agency. For further particulars, address the inventor, Mr. A. J. Mershon, Warsaw, Ind.

California Timber.

The sugar pine of California occupies the same place that white pine or cork pine does here, and is about equal to it as finishing lumber. It is used almost exclusively for sash, doors, and inside blinds. For all uses where a soft, white, straight grain is required, there is no wood on the slope equal to it. The heart is durable for shingles, crossties, and the like. Shingles made from heart sugar pine are free from some of the objections attaching to those made from redwood.

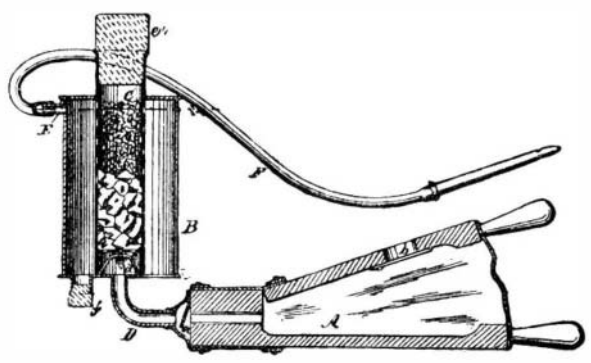
Yellow pine is used in the place of the sugar for some purposes; it has a soft, white and even grain, but works harder and is a firmer wood. Much of it resembles sugar pine so closely as to be barely distinguishable. Some of it is as handsome as many of the ornamental woods. For building lumber and fencing it is preferred to sugar pine.

Spruce, which is sometimes called red fir, is a strong timber adapted for joists and scantling, and all work requiring strength and durability. It stands exposure to the earth and weather very well and resembles Puget Sound lumber quite closely; it makes good plank for sidewalks, platforms, ship plank, car floors and frames, and similar work.

The fir is a white, close-grained wood, free from pitch or odor, useful for ceiling, scantling, and wainscoting, and makes good box lumber.—*Northwestern Lumberman.*

A NEW FUMIGATOR.

Mr. George T. Blanchard, of Plymouth, Me., has patented through the Scientific American Patent Agency, April 24,



1877, the improved fumigator herewith illustrated, which is mainly designed for use in killing lice and ticks on sheep and other animals, and also in destroying insects that infest shrubs and plants.

A is a bellows of ordinary construction, having the valves *a b*. B is a chamber containing a central perforated tube, C, in the bottom of which is placed a perforated grate, *c*, which is supported by the curved strips, *d*. A pipe, D, connects the lower end of the tube, C, and the bellows, A. The upper end of the tube, C, extends above the top of the chamber, B, and is stopped by a cork, *e*. An aperture is made in the bottom of the chamber, B, which is closed by a cork, *f*. A nipple, E, projects from the side of the chamber, B, for receiving the flexible tube, F, which terminates in the nozzle.

The manner of using the fumigator is as follows: A burning coal is placed on the grate, *c*, and the tube, C, is wholly or partly filled with fumigating material, such as tobacco or sulphur, and is stopped by the cork, *e*. The bellows is worked, and the smoke issues through the perforations of the tube, C, into the chamber, B, where it is cooled, and whence it passes, through the flexible tube and the nozzle, to attack the insects.

Ashes and dust that accumulate in the chamber, B, may be blown out through the aperture in the bottom by removing the cork, *f*, and working the bellows.

Foresite.

A new silicious mineral, found at San Cero, in Italy, has received the name of foresite in honor of the mineralogist, Rafael Fores. It occurs in granite, along with tourmaline, felspar, stilbite, and desmin, and crystallizes like the latter. Its composition is as follows: Silica, 49·96 per cent; alumina, 27·40; lime, 5·47; magnesia, 0·40; potash, 0·77; soda, 1·38; water, 15·07.