

IMPROVED MOVABLE TEETH FOR SAWS.

The novelty of this invention consists, first, in punching out only the central part of the lower half of the circular shanks, then cutting off the remaining segment at *d*; it is thus rendered elastic, and may be sprung laterally, so that the V on the inner edge of the socket may enter into the corresponding groove cut in the edge of the shank, as shown in the tooth at the left hand of the engraving. It will be seen that, if the said tooth were turned in the direction to elevate the point, the circular shank would be rolled out of the socket, the butt of the tooth, *c*, passing to the opposite side of the plate; also, were the point turned down so that the butt, *c*, would pass the shoulder, *a*, then the butt, *c*, would spring into line with the plate; then the tooth must be struck on the back, at *b*, light successive blows with a hammer, until the shoulders meet. To remove a tooth from or to insert it into a socket, the corresponding movements must, of course, be made; and to effect the object, a common hammer only is required. The shanks are milled to the size of the sockets and given a spring temper; the tooth is next laid on an anvil and struck with a hammer on the side and near the inner circle, so as to open the space where it has been cut, at *d*, and make the shank larger than the socket. The segment or spring of the shank is left just strong enough to cause the necessary friction to hold the tooth firmly in position, and it readily conforms to the size of the socket, always making a perfect fit when turned into place.

Some of the advantages claimed for this new mode of construction are: A more perfect interchange of teeth; being so strong and stiff, the saw will be the same in every respect as a saw with solid teeth; and the saws afford twice as much stock for wear, as those heretofore made, and are said to be fifty per cent cheaper to the consumer.

Patented in the United States and Canada through the Scientific American Patent Agency, by W. P. Miller.

For further particulars address R. Hoe & Co., 29 and 31 Gold street, New York city.

HILF'S IRON PERMANENT WAY.

We extract from *Engineering* the annexed illustrations of a system of iron permanent way, recently designed and introduced on the Nassau State Railway, in Germany, by Mr. Hilf. About 65 miles of line have been laid, and we understand that the cost of maintenance has been scarcely one third of that for ordinary permanent way. The invention consists in iron longitudinal sleepers to which the rails are secured, the gage being maintained by the bolts passing through the web of rails. The latter, shown in section in our engravings, are of Bessemer steel, and for the Nassau railways were made in lengths of 19 feet 8 1/4 inches each, weighing 48 lbs. to the yard.

The mode of fastening rails and sleepers is clearly represented in Fig. 1. The former are notched only at the ends and are secured by a bolt, *a*, placed on one side to avoid longitudinal displacement. *b* is the tie rod, two of which per length of rail are used. The entire structure weighs 232-64 lbs. per yard, and its entire cost, in Europe, is estimated at about \$7.50 per similar distance. In Fig. 2 is represented the drainage adopted in connection with the system. A peculiar arrangement of switch is employed, the characteristic of which is that the center is not between the two lines of rails, but within the line, so that two frogs are saved.

The combination is such that a train may pass from one line to the other in either direction, or, by another setting of the points, may remain on the same rails.

Oil Notes.

Apropos of oil, especially petroleum, the following facts gleaned from the pages of the *National Oil Journal*, are quite novel and of considerable interest:

There have been several articles going the rounds of the press, strongly recommending, to farmers and others, the use of crude petroleum as a cure for the grub or borer. It is suggested to apply the oil with a brush to the trunk or bark of a tree. To this our contemporary registers a very strong objection; and while admitting that petroleum is useful for burns, scalds, corns, sore throat, consumption, fleas, bed bugs, and as a cockroach exterminator, he remarks that there is a point where the utility of the product ends, and that is just before it is rubbed on fruit trees. The editor has tried it, and finds that every leaf is killed in a single day, while there is little doubt but that the same result would follow the application to the bark.

Some time since, we referred to a number of compounds

sold throughout the country as non-explosive oils, but which really were very dangerous, and of course a fraud on the public. A curious record of nostrums is also to be found among recent English patents; and among a list of seven of these mixtures, the following are specimens of ingredients to be added, to prevent explosion: Cascarilla bark, Iceland moss, alkanet root, camphor, potatoes, sulphur, iron rust, gum olibanum, sal soda, and onions. These articles are added in very small amounts to very large quantities of gasoline or naphtha.

It is hardly needful to remark that they merely act as impurities, and disguise the odor of the burning fluid, while of

the average daily product of the Pennsylvania oil regions, from the discovery of petroleum to November 1, 1873, was 10,753 barrels, and the total aggregate for that period 13,385,589 barrels.

Dental Amalgams.

It is the general practice to combine the alloy with an excess of mercury, afterwards squeezing out the surplus mercury with the fingers or a pair of pliers.

As it is impossible to get rid of the mercury by this operation, since about twice the necessary quantity remains, leaving the amalgam hard and unworkable, the only proper

course is to use the exact proportion necessary to the combination. Should a surplus of mercury at any time be found on the surface of an amalgam filling, when the packing is finished, it can be tolerably well absorbed by slices of crystal gold, cut thin with a razor and laid upon the dry surface of the filling, until they are white with the mercury, when they are removed.

Now, if chemically pure silver and tin be combined in atomic proportions, silver 108, tin 118, twenty-four grains of the clean filings, mixed with seven grains of mercury, will result in a powder, adhesive under pressure, which will not dissolve in alcohol, and therefore needs no washing, and which will weld up as

solid as a coin. This is a true amalgam, containing no free mercury, in fact there is great difficulty in separating a trace of mercury below a red heat. But, of course, it is impossible to use a powder in the majority of cases.

But there is a filling which it is practicable to use in almost all circumstances, namely, the ordinary silver and tin amalgam mentioned above, with the addition of ten per cent of fine gold and sufficient platinum to insure rapid setting. If to twelve grains of alloy four or five grains of mercury be added, and the resulting compound be carefully packed, without washing, into the cavity, little by little, with small points, warmed, if necessary, and finished up by repeated burnishing, the result will be a more perfect filling than can be procured by ordinary means, and that, too, with a compound containing little or no free mercury.—*Dental Miscellany*.

Idleness.

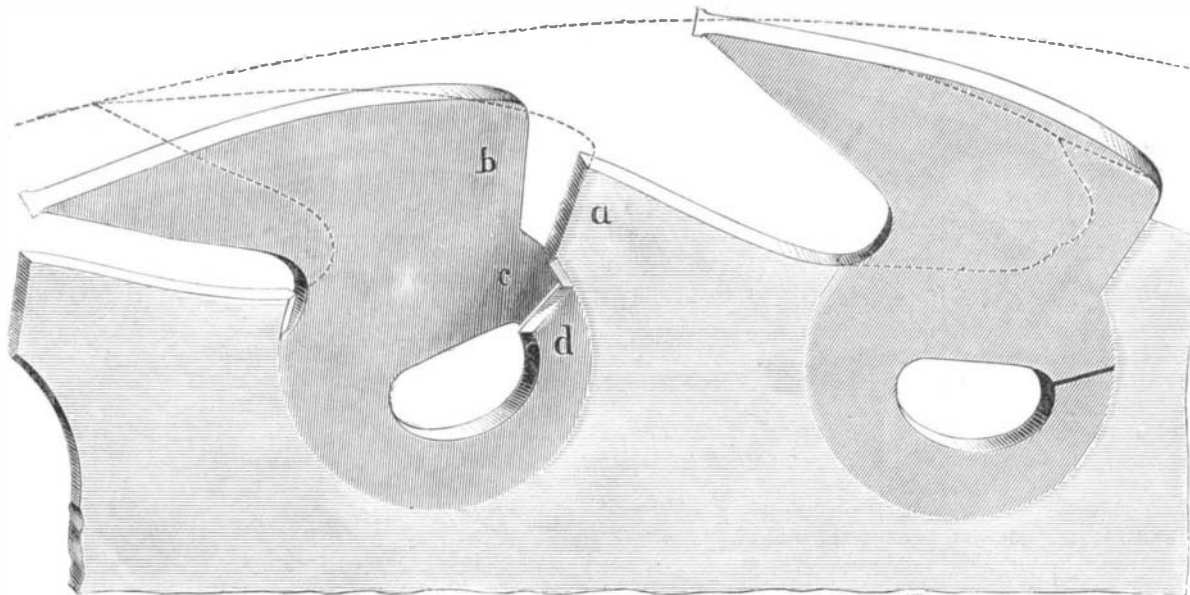
Many young people think that an idle life must be a pleasant one; but there are none who enjoy so little, and are such burdens to themselves, as those who have nothing to do. Those who are obliged to work hard all day enjoy their short periods of rest and recreation so much, that they are apt to think if their whole lives were spent in rest and recreation, it would be the most pleasant of all. But this is a sad mistake, as they would soon find out if they made a trial of the life they think so agreeable. One who is never busy can never enjoy rest; for rest implies a relief from previous labor; and if our whole time were spent in amusing ourselves, we should find it more wearisome than the hardest day's work. Recreation is only valuable as it unbends us; the idle can know nothing of it. Many people leave off business and settle down to a life of enjoyment; but they generally find that they are not nearly so happy as they were before, and they are often glad to return to their old occupations to escape the miseries of indolence.—*Herald of Health*.

Where to Buy Sporting Tackle.

Mr. Walter C. Hodgkiss, late of Cooper, Harris, and Hodgkiss, of this city, a firm noted for its sale of guns, revolvers, and articles for sportsmen's use, has recently withdrawn from that concern, and assumed business on his own account, at No. 7 Warren street, New York. Mr. Hodgkiss offers an exceptionally excellent assortment of the goods above named, and we would suggest the inspection of his stock, to all desirous of supplying themselves with the newest and best improvements in hunting implements and supplies.

J. E. E., of Pa., writes to say that recently, in a church at Alleghany City, Pa., a crowded congregation were warned by the pastor that the services could not be continued, and they retired quietly and in good order. The church was on fire in the roof; and had it not been for the presence of mind of the minister, and of the sexton who discovered the fire, the consequences might have been terribly fatal. Such self-command deserves the highest commendation.

Mr. H. Crosby writes to point out that the easiest way to describe a heptagon in a circle is to take half the chord of the arc of 120°, which is equal to a side of the required figure. This is correct, and will be of practical use.



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course the chances of explosion are not in the least diminished. No oil, which at low temperature will give off the vapor which, mixing with a proper proportion of air, causes explosion, is safe, no matter how much sulphur, potatoes, or other useless matter be added.

As an exemplification of the sudden rise and equally abrupt fall of some of the towns, or rather cities, which sprung up in the oil regions when the petroleum fever agitated the country, our contemporary says (on the authority of another journal that we never heard of) that the famous and at one time popular hotel, the Danforth House, Pithole City, which cost twenty-eight thousand dollars, was sold recently for a ten dollar note, and the furniture, which cost three thousand dollars, brought less than ninety. Within one month from the completion of the first house, Pithole city had an eighty thousand dollar hotel. In two months she had a daily paper, and a fast one it was too. In three months she had a theater. That theatre went to Pleasantville, thence to Lawrenceburg, thence to Parker's Landing, thence to where the woodbine twineth, in the second great fire at the landing last winter. In four months she had another theater and an academy of music. In five months she had her celebrated mud fire extinguisher, a curious invention for throwing mud. In six months she had seventy-four hotels and boarding houses, where the substitute for water was dispensed. In

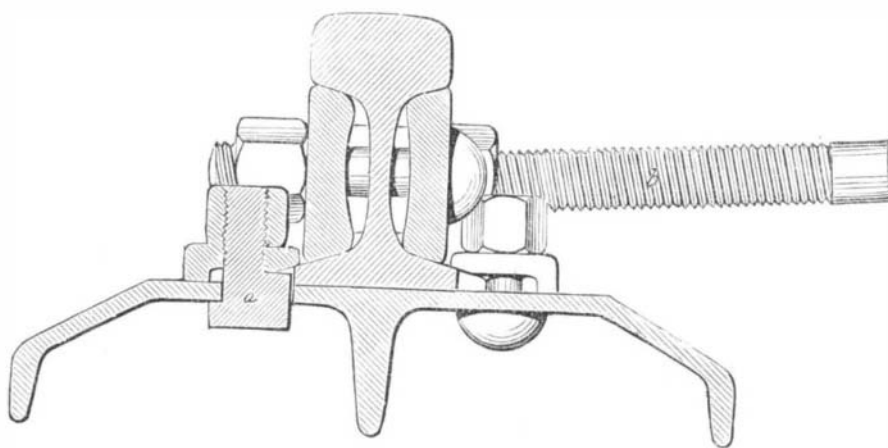
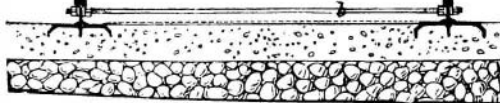


Fig. 1.—HILF'S IRON PERMANENT WAY.

seven months the Miller farm pipe line was completed, which event threw four thousand men and two thousand horses out of employment, and Pithole city had reached the zenith of her glory. She had at that time fifteen thousand inhabitants, elaborate water works, and all the paraphernalia of a city government. She has now no theater, no hotel, no telegraph office (the telegraph office was closed for time and

Fig. 2.



eternity last week), and but nine families out of all that multitude. The Pithole and Oleopolis Railroad runs but one train of one car a day, and that only to hold the charter.

In the way of statistics, we note that the total quantity of petroleum, exported from the United States in 1873, reached 236,899,223 gallons, showing an increase from 80,000,000 to 95,000,000 gallons over the three preceding years; also that