Correspondence.

The Diamond Rattlesnake.

To the Editor of the Scientific American:

In SCIENTIFIC AMERICAN of April 28, page 259, is an article headed "The Diamond Rattlesnake," which must be a fancy yarn. I have lived among them for more than forty years, have known several persons to be bitten by them; never knew but one to die from the bite, although others with whom I was not acquainted have died in the vicinity; have known dogs to die in an hour; have known one other dog to be bitten twice in one week and get well; had a dog bit by a pretty large one, and although his head swelled badly, he found and killed another within an hour, and was well in a week.

I have known many horses and mules to be bitten by them, and not one fourth of them died, although it goes hard with them, as they get bitten about the legs. I would as soon be bitten by one of them as by a copperhead, and they are a much more active snake, as the copperhead is the slowest snake I know.

Inclosed I send you the rattles and fangs of one 3 feet 3 inches long, the first of the season; never saw but two 6 feet long or more. As you will see, the rattles are not perfect, and seldom are here; the old ones get worn off. Will try and send you better one next time. You will see the one side has two fangs, and sometimes there will be three on a side. At this season of the year they are not venomous, and will always try to get out of the way if found where there is no cover; if kept from running, will hide their head under their body and not try to fight, but in a month or so they will stand their ground.

ED. LYON.

Yreka, Siskiyou Co., Cal., June 2, 1883.

[Our correspondent's letter was accompanied by the specimens of rattles and fangs above mentioned, for which we are obliged.—Ed. S. A.]

Carries its Own Moral.

In one of our New England cities, a few days ago, three wretched tramps were brought before the police court as vagrants, having been found in an intoxicated condition in a barn where they had slept the previous night. On examination it was found that each one had been a former resident of the city, and was well known.

One of them had been, only a few years ago, the superintendent of the foundry department of an extensive and widely known manufacturing establishment, receiving a yearly salary of $2,500, and having a pleasant home occupied by wife and children, and being a man once respected and esteemed by those who knew him. The two others had been workmen under him whom he had discharged for neglect of their work for drink, and he himself was finally dismissed for the same fault.

Did not Pay a Profit.

It is a matter of regret to learn that the recent National Exposition of Railway Appliances at Chicago did not pay its managers and promoters; in other words, as stated by the *Age of Steel*, was not a financial success. That paper says that thirty days was too short a time in which to hold an exposition of so much interest and so great a magnitude. Two weeks longer, we are informed, would have sufficed to even up expenses and receipts, but the end of the affair could not be postponed, for the reason that the buildings and grounds were needed for other purposes. The exposition, therefore, had to close at the appointed time. It was simply a miscalculation for which no one can be seriously blamed, and yet on account of which all must feel sincerely sorry.

Plaster Moulds.

The mixtures of fats and fatty oils hitherto in use for coating the moulds in which plaster casts are to be made has this disadvantage, that the fatty acids unite with the lime to form soaps which render the surface of the cast sticky and thus hold the dust, so that in time crusts of dust are formed in the deeper recesses, which are difficult to remove.

According to Puscher, in *Kunst und Gewerbe*, this evil may be overcome by the use of finely divided stearic acid. One part of stearic acid (or the best quality of stearine candle) is melted in a suitable vessel by immersing it in boiling water, and then four or five parts of 95 per cent alcohol are added, in which it dissolves to a clear solution. By shaking the solution as it cools, the acid will be obtained in a very fine state of division, forming a kind of magma with the alcohol. This may be applied to the mould with a brush. In a short time the alcohol will evaporate, leaving the mould covered with a thin film of this finely divided acid, which allows the cast to be readily removed from it, covered with a film of non-adhesive stearate of lime. It can also be employed on elastic moulds, but if the moulds are shellacked, benzine should be used instead of alcohol.

IN boring an artesian well in the Santa Clara Valley, California, the stump of a redwood tree was met at a distance of 281 feet from the ground surface. The point where the tree was struck is 84 feet above tide water, from which it is distant eight miles, and the depth at which the wood was reached is much greater than that of the water in the bay.

New Jersey Crab Farms.

At certain periods all crabs become too large for their shelly covering and are obliged to move out; this is effected by a rupturing of the tissue connecting the upper and lower carapace. The body is first slipped out through this opening, and the crab slowly draws his ten legs out one after the other until the entire animal is free of the old shell. As the winter months approach, the edible or blue crabs (*Callinectes hastatus*) retreat from the shallow waters of our bays, creeks, and harbors, and congregate in immense numbers in deep water, where they settle themselves into the soft bottom preparatory to taking their long winter's sleep. As the cold weather comes on they pass into a semi-dormant condition till the opening of spring. These congregations of crabs are called by fishermen "crab beds." They are taken by means of clam rakes, the handles of which can be lengthened or extended into the water by the addition of sections or "splices." At the rate at which they are now being captured they will soon be as scarce as are lobsters on our immediate coasts, which only a few years ago were so plentiful.

The New Jersey fishermen are more advanced regarding the habits of crabs than any other fishermen that I have ever met, and from them I have obtained some very interesting information. The boats of all well-to-do crabbers consist of flat-bottomed boats or skiffs that can be pushed along in the shallowest of water or dragged over bars and mud banks with great ease. In length, these skiffs vary from 12 to 16 feet, and in width from three to four feet. They are furnished with four wells which are built on to the bottom of the boat, and are readily opened or closed by meaus of covers. Into these wells a constant supply of water passes through numerous small perforations in the bottom of the wells. For urging the skiff along, the crabber uses the long slender handle of his "seap" or crab net. His position is always at the bow of the skiff, where he stands silent and erect and moves his boat quietly and slowly over the alga-covered bottom, intently watching every object.

We will now go on with the life history of a Jersey blue-crab, and crab vernacular. First is the "hard-shell" crab, which is hardly fit to eat, he being of a watery nature and anything but heavy and plump; but soon, when he strikes a good feeding ground, he will become fat and will be called a "cummer." A "shedder" is a crab that will cast his shell in a few days. Such a crab is quite as valuable as a soft crab, and is carefully placed in one of the wells of the skiff devoted to crabs of his development. Next is the "luster," or a crab that has broken away the tissue that connects the upper and lower carapace, so that the soft crab contained within has become plainly visible in its attempts to burst asunder its upper and lower shell. Such a crab is handled very tenderly, for by to-morrow morning he will be a soft crab and on his way to Market. In from five to seven hours the soft crab has advanced to the stage known as a "buckler" or "leather-back" and "buckram-back." In this stage the soft crab's shell has become tough and of the consistency of thin leather or buckram—hence the name—so that when pressed with the finger it almost seems to crackle, and when the pressure is removed it immediately springs back to its natural position. The lime-hardened crab looks splendid, and the increase in size is something wonderful; the colors are intense and the limbs are clean and shining. In a few weeks this crab will undergo another change and become a "sponge crab;" her "apron" will begin to lift up, and fine strings of minute eggs will be extracted. These will be caught upon numerous curious brush-like appendages which are situated along the abdominal region of the crab and which are covered and protected by the "apron." Millions of these minute eggs will be crowded, parched, and entangled (the eggs are attached to one another on a very fine web like material of the nature of lissus) on the curious appendages, and soon the dull, yellow-colored eggs begin to turn black or very dark, dirty brown; this is a sign that the young crabs are about to emerge from their eggs, and the dark color of the eggs is caused by the development of their black eyes.

When a crabber has fished through a tide, he returns to his marine farm, which consists of numerous water inclosures of wooden stakes which are driven into the sandy bottom of the river, and where the crabs are always well covered with water. Here the "cummers" and hard crabs are confined and are well fed on chopped-up bull-nose clams and winkles. As soon as the lusters become soft crabs, they are packed in shallow wooden boxes with eel grass or "salat," and placed in cool cellars to retard the hardening of the crab's shell, and until the time of shipment arrives. Hundreds of such establishments are to be found at this season of the year along the shores of the bays and rivers of the New Jersey. A. W. R.

American Jade.

The Smithsonian Institution has lately come in possession of a large number of objects made from jade, sent from Louisiana, with a considerable quantity of the unwrought stone. Heretofore it has been impossible to discover the source of the jade ornaments, implements, and charms that have been discovered in ancient American cairns, as no deposit of the stone had been discovered in this country or in Europe. It is believed now that these Louisiana relics will assist in locating the place where this stone exists in this country in quantities.

Advice to Inventors.

More than one prominent manufacturer of electrical and other apparatus have expressed their opinions, based on experience, that inventive efforts do not agree with manufacturing interests; and that, therefore, they have given up experimenting, and devote themselves exclusively to manufacturing to order and for the trade. It is at the present state of manufacturing industry an established fact that, in order to secure financial success, a manufacturer need not be an inventor, and *vice versa*, an inventor does not need to be a manufacturer. Although a man may have the mechanical ability to invent, it by no means follows that he is the best man, or even that he is at all fitted to superintend the manufacture of his own invention, though, perhaps, it may be hard for him to think so, and it may be denying him a great pleasure to have it made by any one else. But the man who may have the experience necessary to the evolution of a new and careful improvement may, and generally does, lack the necessary quality, namely, the experience which begets the knowledge of how to select the best adapted tools and other contrivances, how to obtain and work up the material required, how to superintend the labor, and how to organize and manage a manufacturing establishment so as to turn out good products at the cheapest and most profitable rate. When all these qualities, necessary for those persons who have the immediate charge of manufacturing, are not possessed by the inventor, it is impossible that he should become a financial success. Neither will it, so long as the inventor indulges in the weakness of imagining that if the product of his brains is not manufactured under his own supervision and control, it will not receive the proper construction necessary to its success when placed upon the market. This sort of parental instinct on the inventor's part, the desire to see and lead his offspring through every stage of its career, without escaping for an instant from the wing of his fostering care until it is fully matured and put upon the market on its own responsibility, is but natural, yet it is, nevertheless, a weakness.

In fact, daily experience shows that it is for the interest of the great majority of inventors to keep away from the factory as much as possible, so as to give the factory superintendent an open field. He will not fail, of course, to inspect the character of the work and see that his ideas have been carried out properly. That is his right. But having once made clear what he wants, he should leave the superintendent of the factory unhampered in carrying out his part of the work. The enterprise of manufacturing novel machinery can be divided into three distinct departments, neither of which should conflict with the others. Invention, manufacture, and introduction, each requiring a totally different training, are seldom or never successfully coincident in one single individual. It takes the man of strong imaginative faculties, with a mechanical bent and a practical knowledge of mechanics, to invent; but to manufacture, the man who understands the workshop and the workmen from his own experience with them is necessary; and the business man, who has been trained to knowledge of the methods of trade, is indispensable in placing a new product upon the market. The inventor rarely interferes with the department of the business man, but to the department of manufacture he is a stumbling-block.

It is a blessed circumstance for inventors, says a contemporary, that at the present day, for the construction of any new machine for the market, the ownership of a special plant of machinery is by no means necessary, any more than the actual guidance of the details of the manufacture by the inventor is necessary. There are numerous machine shops with splendid plants of machinery, which will undertake the manufacture. Thus a vast outlay at the outset is unnecessary, and a company can be formed with much less capital. The inventor of a new machine and his associates, by this plan, need trouble themselves but little about the purely manufacturing part of the business. They will easily find those whose business it is to manufacture and relieve them of the work, by running for them a manufacturing outfit that they could not provide for themselves without spending a large sum of money, which it is much better to have in bank, to back up and push the enterprise. Inventors should not lose sight of the fact that the invention of a new machine or device is only the first earnest and most delightful step in what is to be accomplished before an enterprise is fairly afloat. While the business men are hard at work introducing the invention, the inventor must employ his time by watching the product that the business man has to handle, seeing that it is in proper condition, and that the improvements which possibly may suggest themselves to him are applied promptly, so as to keep the mastery of the market, and not to be overreached by other inventive minds.—*The Mechanical World* (*London*).

E. B. TYLOR in *Nature* says that the microscopic examination of the cross section of a single human hair is sufficient to determine to which one of the race divisions of humanity the wearer belongs. If examined microscopically by Pruner's method, it shows circular, or oval, or reniform; its follicle curvature may be estimated by the average diameter of the curls as proposed by Moseley; its coloring matter may be estimated by Sorby's method. There has been even a systematic classification of man published by Dr. W. Muller, of the Novara Expedition, which is primarily arranged according to hair, in straight-haired races, curly-haired races, etc., with a secondary division according to language.

Plating Metals with Lead.

The method of lead plating depends upon the use of a hydrogen flame for covering the clean surface of metals with lead or some alloy thereof. It owed its origin to the fact that in some printing processes the printed fabrics are run through hot or cold sulphuric acid, and it was found that no metal was sufficiently indifferent to hot and cold acid, with the changes of temperature, for making the necessary rolls of sufficient strength, combined with lightness.

Among many other combinations experimented with was that of covering iron homogeneously and to any desired thickness with lead, and this actually succeeded. The metal to be covered is pickeled and cleansed in dilute sulphuric acid, then rinsed with water, painted over with soldering acid (zinc dissolved in hydrochloric acid), and tinned. Hard lead was then put on the perfectly clean surface, or a good, pure alloy, just as may be preferred, and heated with the hydrogen flame. The surface is then worked over by hand or mechanically.

Rolls made in this way have a clear metallic ring when struck, from which we may conclude that there is an intimate union of the two metals. The structure of the lead coating suffers no change in boiling sulphuric acid of 60° B., and is absolutely tight.—*Polytechniker.*

What Paint Best Protects Iron?

Among the things that require the most protective paint for iron are carriages, farm wagons, plows, and agricultural implements, from which fact it seems feasible that manufacturers of the like ought to be able to give the best information required. Any mineral paint would answer the purpose much better, and I maintain that the paint that most effectually protects iron is red lead. Not in color is it as well suited; but that is only a secondary consideration, and easily overcome by painting it over with any color desired. It contains the following advantages for the preservation of the iron, which is the main object to be gained:

1. Dries easily with raw linseed oil, without an oil-destroying drier.

2. After drying, it remains elastic, giving way both to the extension and contraction of the iron, without causing the paint to crack.

3. It imparts no oxygen to iron, even when constantly exposed to damp—a fact to which all farm wagon makers can testify.

4. It hardens, where it has been spread thickly, without shriveling, forming the toughest and most perfect insoluble combination of all paints. As proof of this assertion, it is used by calico printers for red figure prints, holding out against soap and water; by gas pipe fitters, as the best paint to resist ammonia and tar; by the English iron ship builders, for painting the hulls of iron ships, namely, two coats of red lead and two of zinc white; by wagon and plow makers, for painting wagon gears and plows; by knowing carpenters, for painting wood that comes in contact with damp brick in walls, as it preserves wood from rot, insects, etc.

For those among us who are uninstructed how to mix pure red lead for paint, it should be made known that pure red lead powder, after being slightly pressed down with the finger, shows no lead crystals. When they are visible, it is merely partly converted, and not first quality. It should be ground in pure, old linseed oil, and if possible used up the same day, to prevent it combining with the oil before it is applied, losing in quality. No drier is necessary, as in the course of a few days the oil forms a perfect, hard combination with the lead. American linseed oil is as good as any imported, where the manufacturer has given it age, and not subjected it to heat, as is the custom, by steaming it in a cistern to qualify it quickly for the market. It deteriorates in quality when heated above 160° F. This red lead paint spreads very easily over a surface, and the best of finish can be made with it, even by a novice in painting.—*Louis Matern, in Carriage Monthly.*

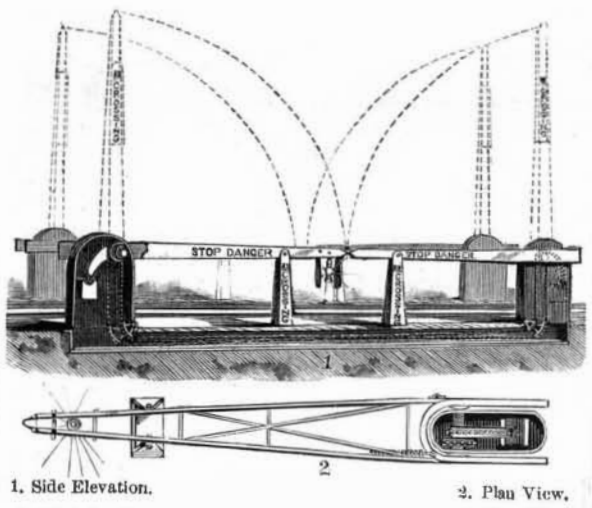
Anti-torpedo Ship.

A singular type of invulnerable war vessel has lately been offered to the notice of the British Admiralty by Sir Edward Reed. He proposes making a convex decked vessel to contain engines and battery, as also men's quarters, stores, magazine, etc., to be supported by a lower portion, which is a cellular boat composed entirely of small air tight and water tight compartments, which will not allow the vessel to sink in consequence of a local injury; and if the lower portion is entirely destroyed by a torpedo the upper portion is expected to become a sea-serviceable raft. The contour of the armored deck is expected to deflect hostile shell and shot, and the under or boat portion is to be only the buoyant means of ready movement; but the upper portion in itself is expected to float if not to readily maneuver, even if the lower portion should be destroyed.

NEW RAILROAD SIGNAL.

A novel and very simple railroad signal and gate is shown in the annexed engravings. By means of this apparatus a train moving along on the track will automatically, by means of pneumatic pressure in suitably arranged pipes, announce its approach to stations or crossings, far in advance both by visible and audible signals, thus informing passengers at stations to be in readiness for the train and notifying travelers on the highway to clear the track.

This apparatus also divides the track into sections or blocks of any desired length, signals being placed at each end of the block, so that a train on entering will automatically move a signal to indicate "danger" to any train following on the same track, until the first train has passed through the "block," and will then actuate a second mechanism, which sets another danger signal and communicates



1. Side Elevation. 2. Plan View.

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McLEOD'S RAILROAD GATE.

back to the first signal and moves it to indicate "safety;" and it can be arranged to communicate forward by the same mechanism and set an advance signal, and by interlapping them so as to have the train act upon the second or third signal away, and always leave the nearest signal set to indicate danger, any part of the track can in this way be positively and effectually guarded without any additional expense, manual attendance, or electrical appliance.

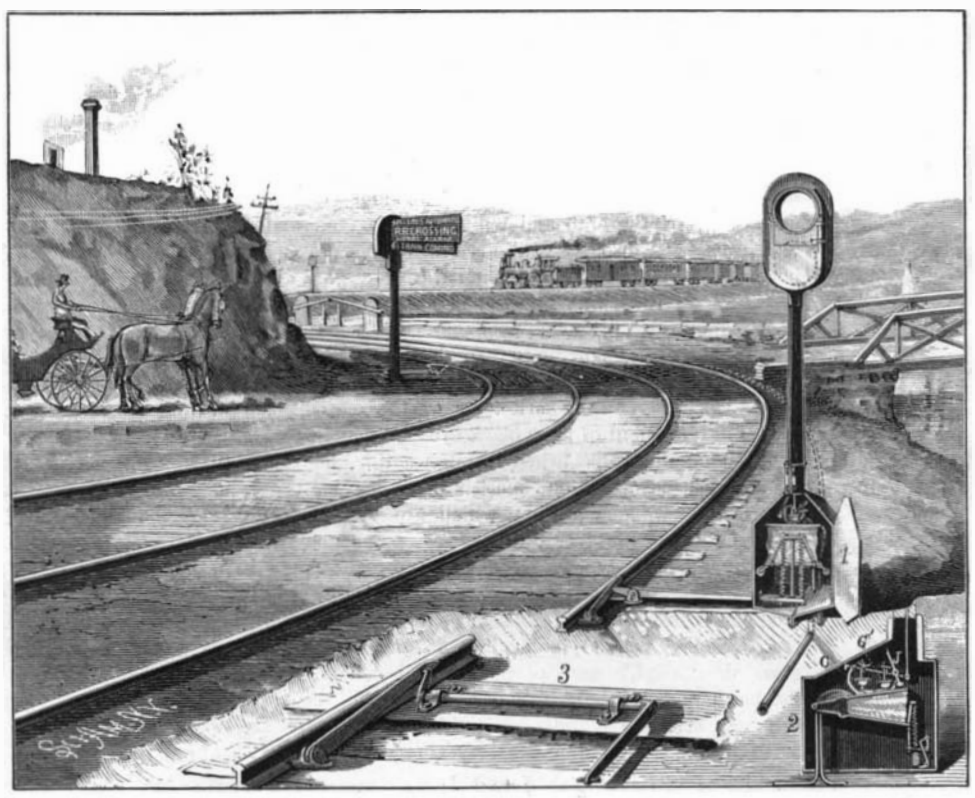
The inventor also combines with the switch a device whereby an engineer will be informed before reaching the switch whether or not it is in condition for his train to pass. These improvements are calculated to add materially to the safety of railroad travel, and will permit of largely increased travel on the same track, and add greatly to the revenue of railroads.

In operation the tread of the forward car wheel, passing over the incline bar shown at 3, depresses it, and throws up the actuating lever, which, at the bellows, is caught and held up by a catch lever, compressing the spring which yields to that sudden action, and, gradually pressing against the movable portion of the bellows, forces the air to the expansion valves and sets the signals. Experiments have shown that in about one second after the actuating lever is held up, the air moves the valve about one-third of a mile away, and in three seconds the gong is sounded and visible signals given, which so continues until the train passes by and stops it. In case of a train stopping before it reaches the signal, it is so arranged as to automatically stop itself in three minutes. The catch lever will hold up the actuating lever until the air is forced from the bellows, the movable portion of which will automatically disengage the levers and allow it to reset in about one minute. Thus the catch lever holds the incline bar below the contact of the following wheels, and also at the signal the lever is so connected with the weight, that when it is wound up it will hold the incline bar below the contact of following wheels until the weight runs down again, thus averting all unnecessary wearing of the signal mechanism.

An automatic crossing gate, devised by the same inventor, shown in Fig. 4, is operated on the same principle as the signal. An air switch signal has also been devised which is attachable to all switches and draw-bridges, so arranged by means of a double air action as to insure its operation, and when the main track is switched to the right, it will display a right hand danger signal about one-quarter of a mile each way, to notify any approaching engineer, and *vice versa*, left hand. It is also applicable for yards and stations, to signal coming and going trains.

All the mechanism of this apparatus is as simple as the striking side of an ordinary clock. We are informed that a man with one blow of his breath through the pipe can set the signals one-third of a mile away. The apparatus works the same in all kinds of weather and by all kinds of trains. We understand it has been tested three winters on the railroad, and has proved entirely successful.

Further information in regard to this apparatus may be obtained by addressing to McLeod Air Railroad Signal Company, 4 Pemberton Square, Boston, Mass.



2. Bellows Box. McLEOD'S AIR RAILROAD SIGNAL. 3. Signal Levers.

Horn from Sea Weed.

Under the generic term, "sea weed," the sea beaches offer to use as fertilizers a number of distinct vegetable productions, and two of them, at least, are recognized as materials for food. The *Rhodomenia palmata*, or dulse, is frequently sold on the streets of our seaside cities, taking the place of the school girl's chewing gum, while the *Chondus crispus*, known commercially as "Irish moss," is a favorite for the preparation of jellies and blanc mange. Now, it is claimed, that by experiment the *Zostera marina*, or "wrack," can be made to yield by treatment with mineral acids, a substance resembling horn, capable of being manufactured into forms, and of receiving color from pigments. This substance is called "algin," from *algæ*, the generic name of one common species of sea weed. The crude material can be obtained in large quantities on all exposed shores, and its preparation for ultimate manufacture is a cheap process.

Ambulance Stations for the New York and Brooklyn Bridge.

A frame building eight by twelve feet has been constructed on the river side of each tower of the bridge. In these buildings are placed the telephones, which form a part of a very complete system of communication reaching from one end of the structure to the other. The bridge officials are also providing stretchers to be kept at these stations, so that in cases of sunstroke, fainting, or illness from fits of any kind, the patient may be immediately removed by the officers to the buildings and thus receive the necessary attention. Printed directions for treating cases of sunstroke have been obtained from the New York Board of Health, and medicine will be provided at both termina stations and also at the towers. Superintendent Martin, in speaking of this matter, said: "We do not anticipate many sunstrokes on the bridge, as there is a cool breeze up there a good part of the time, but we want to provide for emergencies."

Yellow Pine.

The prejudices against this material for building purposes and inside finishing are disappearing gradually under the necessity for a substitute for the white pine, which is yearly becoming scarcer and dearer. The *Northwestern Lumberman* says that there has been a current belief in the Northern States that yellow pine will not hold paint satisfactorily. It has been thought that any exudation of pitch would stain the paint, and to a certain extent force it off. This idea, however, has been greatly magnified. In sections of the Southern States, where little besides yellow pine is used for building purposes, there is usually heard but little complaint. Occasionally, a builder will put a coat of alcohol over the outside work, which cuts any pitch there may be on the surface, but oftener no special process is employed. The color of yellow pine when left in its natural state or oiled is bright and enlivening. If its brightness is offensive to some tastes it may be modified and sobered by oil, and it will darken with age. By careful culling of the heart from the outer wood very fine effects in shading may be produced.

SHRINKAGE in lumber varies according to the tree from which it is made. Oaks will shrink in drying a half inch to the foot, while the redwoods of California show no perceptible change, and the heavy Eastern or South American woods lose but little.