

## Science and Art.

## Improving Iron.—Nickel.

Many persons entertain the opinion that pure iron is superior for use to an alloy of it. This is a great mistake. Pure iron is unfit for use; it is soft—not so strong as an alloy of it, and it cannot resist the action of the atmosphere. Pure iron reduced to very fine powder, when thrown into the atmosphere, takes fire, on account of its great affinity for oxygen, and it is soon reduced to an oxyd (rust.) Unless iron contained some other ingredient, it could not be employed for forged or cast-iron work. Cast iron resists the action of the atmosphere (is not liable to rust) far better than wrought iron or steel, simply because it contains more carbon.

It is true that there are some substances generally found associated with common iron, such as silica and sulphur, which are adulterations, and injure its useful qualities; but then there are other substances, which, when combined with it, improve its character for strength, and capacity to resist the action of the atmosphere. Iron containing a small portion of carbon, copper, zinc, nickel, chromium, or cobalt, is stronger than when pure and is not so liable to rust.

Owing to the abundance of iron scattered over and combined with the earth's crust, and owing to the facility with which it can be molded, forged, and welded, it is really the most useful, as it is the most generally used metal in the arts. The method of alloying it with carbon, and rendering it (in the form of steel,) the strongest and hardest of metals, is well known; but steel rusts rapidly by the affinity which it has for oxygen, when exposed to a moist atmosphere. Could wrought iron be made capable of resisting the oxydizing effects of the atmosphere, and also made stronger, it would be a grand achievement. The way to do this is known.

An alloy of iron and nickel is very ductile and strong, and almost proof against rusting. Could nickel be obtained so cheap, that only about from 2 to 6 per cent. of it could be combined with our common iron, the latter would be rendered far more useful for all wrought-iron work exposed to the atmosphere. The discovery of rich nickel ores in our country would be of great consequence in tending to improve and advance the useful arts, by using it only to alloy iron, not to speak of its value as a useful metal for other purposes. The most productive ores of nickel are those of Germany; and its early use in that country, as an alloy of copper, acquired for it the name of German Silver. It is found at Chatham Conn., in gneiss, but it has been mined there with only moderate success. Owing to the vast extent of the metaliferous rocks of the United States, we are of opinion that sufficient attention has not yet been directed to the discovery of nickel ores. In the copper regions of Lake Superior, and other parts of our country, we believe that rich nickel ores exist, and await to reward indefatigable scientific and observing mineral explorers.

## A new African Grain.

A grain called the "fundii," cultivated in some of the districts of the colony of Sierra Leone, has lately been described in *Chambers' Edinburgh Journal*, and brought to the notice of European agriculturists for the first time. It is a slender grass, with digitate spikes, and grows to the height of about eighteen inches. The ear consists of two conjugate spikes, the grain being arranged on the outer edge of either spike, and alternated; the grain is attached by a short peduncle to the husk, from which it is easily separated. The grain, which is heart-shaped, and about the size of mignonette seed, is covered by a thin fawn-colored membrane, and when freed from this membrane is whitish and semi-transparent. It is highly glutinous, and has a delicate flavor, between that of rice and kiln-dried oats.

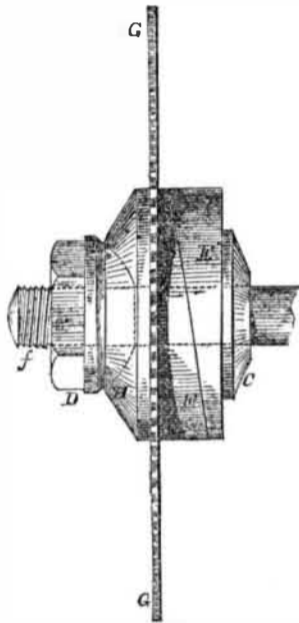
When ripe it is cut down, tied up in small sheaves, and placed in a dry situation; for, if allowed to remain on the ground and to get wet, the grains become agglutinated to their coverings. The grain is trodden out with the feet, and is then parched or dried in the sun

to allow of the more easy removal of the outer membrane in the process of pounding, which is performed in wooden mortars. It is afterwards winnowed with a kind of a cane fanner on mats.

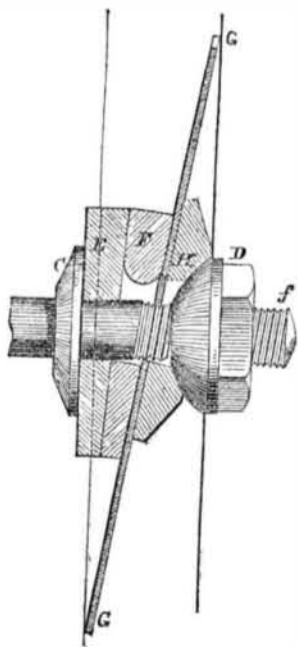
The Europeans and negroes connected with the colony generally stew it in a close saucepan, with fowl, fish, or mutton, a small piece of salt pork being added for the sake of flavor. This is said to make a very good dish. Sometimes it is made into puddings, and eaten either hot or cold with milk. The grain appears to be quite as delicate as arrow root, while it possesses a more agreeable flavor than sago, potato starch, and other similar preparations.

## English Patents.

*Highfield and Harrison's Adjustable Circular Saw.*—This invention consists in securing a circular saw to its spindle in an oblique direction, so as to make a saw of the common construction to cut grooves or rebates of any required widths. This is effected in the following manner:—



Between the saw, G G, and collar, C, on the spindle, are two beveled washers, E F, each capable of being turned round independently of the other; and on the opposite side is a plain washer, H, having a concave recess for receiving a convex nut, D, which screws on to the end of the spindle, and secures the saw firmly thereto. The whole is so arranged that by changing the relative positions of the two beveled washers, E and F, a surface more or less oblique with the axis of the spindle, is presented for the saw to be screwed against. The obliquity of the saw with the axis of the spindle may be varied at pleasure, and grooves or rebates of various widths cut into the wood submitted to its action.



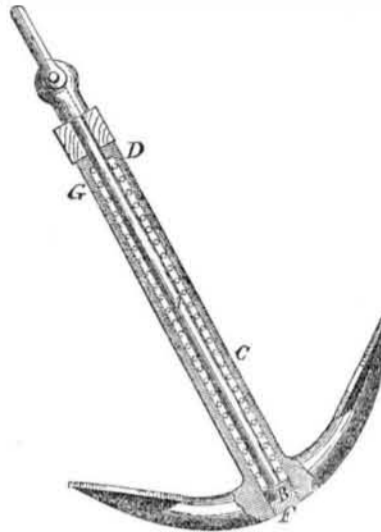
This is a most ingenious contrivance, and will save the great expense of having saws made to the thickness of the rebate required.

The invention has been patented by Mr. Henry Laxton, as a communication from Messrs. Highfield and Harrison, of the United

States.—[London Civil Engineer and Architect's Journal.

[The above is a very good arrangement for what is known as a drunken saw; but it is an old invention here.—ED.]

*Ruston's Improved Anchor.*—This invention



consists in giving elasticity to the shanks of anchors, as shown. A is the shank of the anchor, consisting of a rod of metal, on the lower end, of which a head or shoulder, B, is formed. C is a metal tube, in which the shank is enclosed, the tube being contracted at top so as to form the shoulder, D. A helical or coiled spring is situated upon the shank, and occupies the space between the shank and the tube, the spring bears at its lower end against the shoulder, B, and its upper end bears against the shoulder, D. The shank, A, is introduced into the tube, C, at the bottom, and the lower end of the tube is afterwards closed by a plug, F.

A washer of india rubber or other elastic substance is placed at G, the upper part of the shank, so as to fit the tube, C, tightly, and prevent water gaining access to the spring. The stock of the anchor is made separately from the tube, C, and is attached thereto by sliding it on the upper square part, and afterwards securing it by a cotter or otherwise. A swivel link is connected to the top of the rod, A. As the cable is attached to the rod A, and the arms of the anchor to the tube, C, the anchor is capable of lengthening by the application of any force greater than that of the spring, and the lengthening power in the anchor peculiarly fits it for resisting sudden strains.—[London Engineer.

## A Subterranean Reservoir.

A short time since, while the workmen at the Blue Ridge Tunnel, Va., were digging, a vast stream of water burst forth and flowed out of the tunnel. An eye-witness states that the head of the stream was at least ten feet high, and that it swept carts and barrows before it like chaff. The stream gradually subsided, and was low enough at three P. M. to allow us to make a hasty survey of its cause. It seems that there is in the middle of the mountain an immense cavern or pocket, in which water from the melting snow has been deposited for years, and that the line of the tunnel taps this cavern near its center. The cavern is of immense extent, and will save the State a good deal of money, since nature has opened a road through near three hundred feet of solid rock. This will expedite the completion of the tunnel greatly. Such subterranean reservoirs are the sources of the mountain springs, which supply our creeks and rivers with water during dry weather.

## A Manufacturer made a Peer.

England is fast progressing in Democracy and sound policy. The *Manchester Guardian* states that Mr. Strutt, a manufacturer, has been created a peer, under the title of Baron Kepler. This is the first mill-owner who has been created a Peer, and is a new sign of the times in England, as it marks the surrender of feudalism to industry. It is something for those who claim to be the descendants of the mailed barons to receive into their number and order a man who has made a fortune with spindles and looms, and who still pursues the same calling.

The House of Peers is more democratic than

many may suppose. Lord Lyndhurst is the son of a portrait painter, and Lord Campbell, Chief Justice of England, was once a poor man, and the reporter of a newspaper.

## Clarifying Lard Oil for the Hair.

To every twenty pints of lard oil add one of alcohol; place them in a clean glass vessel, and shake them frequently for about two days, after which allow them to stand until they have become quite clear, and a sediment has fallen to the bottom. Pour off the clear and use it for hair oil. It may be colored a light purple with alkanet root, and also scented with the essential oil of lavender, rosemary, bergamot, &c. Maintaining the same proportion of parts by measure—1 of alcohol to 20 of lard—a pint of the latter may thus be clarified as well as twenty.

## Mosaic Gold.

The sulphuret of tin heated with sulphur and sal-ammoniac forms mosaic gold, which is much used as a bronze powder.



OF THE  
SCIENTIFIC AMERICAN.

T W E L F T H Y E A R .

Read! Read!! Read!!!

The most extensively circulated, the most interesting, reliable, attractive, and cheapest publication of its kind, is the *SCIENTIFIC AMERICAN*. It has, by far, the largest circulation, and stands, by common consent, at the head of all other scientific papers in the world. Its contributors and Editors are PRACTICAL, ENERGETIC, and EXPERIENCED MEN, whose constant endeavor is to extend the area of knowledge, by presenting it to the mind, in a simple, attractive, and practical form.

The *SCIENTIFIC AMERICAN* is printed once a week, in convenient quarto form for binding, and presents an elegant typographical appearance. Every number contains *Eight Large Pages*, of reading, abundantly illustrated with ORIGINAL ENGRAVINGS.

All the most valuable patented discoveries are delineated and described in its issues, so that, as respects inventions, it may be justly regarded as an ILLUSTRATED REPERTORY, where the inventor may learn what has been done before him, and where he may bring to the world a KNOWLEDGE of his own achievements.

REPORTS OF U. S. PATENTS granted are also published every week, including Official Copies of all the PATENT CLAIMS. These Claims are published in the *SCIENTIFIC AMERICAN* in advance of all other papers.

Mechanics, Inventors, Engineers, Chemists, Manufacturers, Agriculturists, and People of every Profession in Life, will find the *SCIENTIFIC AMERICAN* to be of great value in their respective callings.

Its counsels and suggestions will save them *Hundreds of Dollars* annually, besides affording them continual sources of knowledge, the experience of which is beyond pecuniary estimate.

A NEW VOLUME commences September 13, 1856. Now is the time to subscribe! Specimen Copies sent gratis.

TERMS OF SUBSCRIPTION—\$2 a year, or \$1 for six months.

## CLUB RATES.

Five Copies for Six Months,	\$4
Five Copies for Twelve Months,	\$8
Ten Copies for Six Months,	\$8
Ten Copies for Twelve Months,	\$15
Fifteen Copies for Twelve Months,	\$22
Twenty Copies for Twelve Months,	\$28
For all Clubs of 20 and over, the yearly subscription only \$1'40.	

## Splendid Prizes. Paid in Cash.

In addition to the above liberal per centage offered to those who interest themselves to get up Clubs, the Proprietors will pay, in *Cash*, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit

For the largest List,	\$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st of January, 1857.

Post-pay all letters, and direct to

MUNN & CO.,  
128 Fulton street, New York.