

Ambler is also perfecting a series of ingenious improvements in the rolling stock of railroads generally, which will be given to the public in due season.

The patent for this invention was procured through the Scientific American Patent Agency, in the United States on the 1st of April, 1862. Patents have also been taken out in several foreign countries. Information in relation to the invention may be obtained by addressing Warrick Martin, Chicago, Ill., care of Sherman House, or at Milwaukee, Wis.

NOTES ON MILITARY AND NAVAL AFFAIRS.

THE SITUATION OF THE ARMIES.

The situation of affairs just now is critically interesting, and speculation is rife and ingenuity is fertile in solving the mystery that hangs over the present condition of things. What has become of Beauregard? is still the great question. Some 20,000 of his deluded followers have either deserted or have been taken prisoners, and so far as himself is concerned

"Quoth Hudibras, friend Ralph, thou hast
Ostrun the constable at last."

He has got away, so says report, with an army of some 80,000 men—a formidable force—but what he intends to do is a mystery which time alone will reveal. The impression prevails that he has reached Richmond with the flower of his army, and that the Mississippi Valley is given up temporarily, with a view of making a desperate and last determined stand in front of Richmond. There is some probability in this theory; indeed, we have often wondered why Jeff Davis did not concentrate all his forces—as he can do by railroad—and thus, if possible, defeat at least one wing of the Federal army, and thereby secure a basis upon which to compromise in some way.

Gen. Halleck's army is far down the Mississippi Valley and cannot be changed from point to point with facility, while the Confederates have the advantage of railway connection with their seat of government; this affords them excellent facilities for concentration, and by backing off and drawing our forces forward the possibility of a junction of all their forces is greatly increased, while the possibility of any such movement on our part is greatly diminished. It seems to us, taking all the contingencies into view, that our government ought to have taken every man that offered and marched him on to Richmond to reinforce McClellan. We must not fail there for want of men, and we presume the government is fully awake to all the urgencies of the case. Richmond ought to fall by the defeat and dispersion of the rebel army, and in order to do this we shall need an overwhelming force. We believe Gen. McClellan is equal to this great task—only give him the means wherewith to do it. Gen. Fremont is nobly following up the retreating forces of Jackson, and in a severe battle fought on Sunday the 8th inst., near Harrisburg, he drove Jackson back and occupied his camping ground, with heavy losses on both sides. The General states in a dispatch to the War Department yesterday, dated on Saturday, that the loss of the rebels on their retreat from Harrisburg on the day before the battle was very severe. Among the killed was the ubiquitous Colonel Ashby, who, with his cavalry, has been harassing our troops in Western Virginia at almost every quarter. We scarcely heard of a single battle or skirmish for months past that Ashby and his cavalry did not have a hand in. When he was slain, according to Gen. Fremont's report, he was covering the retreat of the enemy with his whole cavalry force and three regiments of infantry with admirable skill and audacity. The retreat was followed up by pursuit on the part of Fremont's forces.

We hope Fremont will not be caught in a trap.

MEMPHIS—ITS SITUATION AND SURRENDER.

The surrender of Memphis to the Federal authorities is certainly one of the most important achievements of the war for the Union and Constitution. This important city is situated on the Mississippi River on the fourth Chickasaw bluff, four hundred and twenty miles below St. Louis, and contained according to the census returns of 1860, 50,000 inhabitants. In 1840 it had only 8,839. Thus it will be seen that no other city in the Union had grown more rapidly than Memphis, and at the hour when the State of Tennessee undertook to secede from the Union its prosperity and growth were almost un-

paralleled. Now its streets are almost deserted, and desolation and gloom hang, temporarily at least, over its once fair prospects. The leading citizens of Memphis have been quite as bitter against the government as any other in all the South, while its press was vitriol and gall boiled down. It is now a conquered city, and like New Orleans, and all the other cities and towns along the Father of Waters, can never escape the authority of the government of the United States. The millions who inhabit the great and rich valleys of the Ohio, Missouri and Upper Mississippi, will never allow a weaker power than themselves to hold control of the mouth of that River.

The bluff on which Memphis stands is thirty feet above the highest floods, and along its front extends a fine esplanade several hundred feet wide—facing which are the principal warehouses. The landing place is a sandstone ridge, which projects into the river from the foot of the bluff. Memphis has had an immense business. Especially in cotton, the shipments of which for the year ending September, 1860, were upward of 400,000 bales. In addition to its river advantages it is an important railroad center—a point, indeed, on which is destined yet to stand, under the auspices of the Union, one of the great cities of the American continent. The people of that city have been blinded to their own interests by the madness and fanaticism of a vile press and a vile set of political ruffians, whose mission is either to rule or ruin.

The city formally surrendered on the 6th inst., to Flag-officer Charles N. Davis, previous to which, however, there was a

SHORT BUT BRILLIANT NAVAL ENGAGEMENT.

The fleet of Federal gunboats had passed Forts Wright and Pillow, which were abandoned by the enemy, and on approaching Memphis it appeared pretty certain that the rebel fleet of gunboats, consisting of eight vessels carrying twenty-five guns, would make a stand. They did so by opening a brisk fire on the Federal fleet, which was briskly returned. The contest begun at 5.30 in the morning, and terminated at 7 in a running fight. In addition to the gunboats engaged there were also a "flock of loyal rams," under command of Col. Charles Ellett, Jr., who has long contended for the introduction of this important arm of defence. He performed a noble service, and aided Commodore Davis very much in gaining his brilliant victory. Davis reports to the Navy Department that seven of the rebel vessels were captured or destroyed, only one making its escape. This was the last hope of Memphis, whose citizens only a week before had resolved not to surrender the place. Col. Gorham N. Fitch, late United States Senator from Indiana, is acting as Military Governor of the city, and we indulge the hope that its citizens will return at once to their allegiance, and set about repairing the immense damage which has been wickedly brought upon their once thrifty and beautiful city.

The flotilla of eight gunboats which contributed so much to this gratifying result were razed and fortified by covering their sides with two layers of live-oak timber, each about eight inches thick. The prows are iron-plated and quite sharp, and instead of heavy guns these vessels carry a number of sharpshooters, whose firing among the rebel gunners during the action was very effective. These rams are not under the command of the flag-officer of the fleet, but are a part of the army and are commanded by Colonel Ellett.

THE OPENING OF THE MISSISSIPPI

is an event which cannot long be delayed. The fleets of Commodore Farragut and Davis are gradually making toward each other, and will soon meet face to face in the great river. Not in hostile array—not for the purposes of deadly strife, by terrific bombardments and hand-to-hand encounters on the quarter-deck; but to shake hands under the old flag, and exchange congratulations that the gallant navy has unlocked the commerce of thousands of miles to all nations, and completely destroyed all the enemy's works, including his navy, which after all was no mean affair. When this object is fairly attained, it will be an epoch in our history, and may well enlist all the hearty rejoicings of the whole world, and especially of our own countrymen.

At last accounts, Farragut's fleet was at Vicksburg

—the rebel forces at that place refusing to surrender. Com. Davis can now push forward and clear the river below Memphis, as it is believed no serious obstructions exist below that city. We may, therefore, soon hear of the junction and active cooperation of the two fleets to give the last and finishing stroke to the free navigation of the Mississippi. This act literally cuts the Confederacy in twain, and places all the country along its banks forever under the control of the government. Surely this is an event over which we may all rejoice.

GEN. MITCHEL AT CHATTANOOGA, TENNESSEE.

The War Department has received information of the advance of the division of Gen. Mitchel upon Chattanooga. His advance forces under command of Gen. Negley, have had a sharp engagement with the rebels, who were utterly routed, and their baggage, ammunition and supplies taken. The astronomical general is after the enemy, and we may soon expect to hear of more of his gallant exploits. Chattanooga is, or was, a flourishing town on the Tennessee river, near to the Georgia line, and is the terminus of the Nashville and Chattanooga, and of the Western and Atlantic railroads. The advance from this place, either upon Cleveland or Dalton, will cut the South-western line of railroad from Richmond just as effectually as though it was done at Knoxville, though the latter point would be much the more satisfactory, as it would be "a harbinger of sweet relief" to those noble mountaineers of East Tennessee, whose devotion to the country is grand and impressive in suffering and sorrow.

MISCELLANEOUS.

The official report of the loss in the battle of Seven Pines is made by Gen. McClellan, and much exceeds the first estimate. The killed are 899; the wounded, 3,627; and the missing, 1,222. The aggregate is 5,739. These figures show it to have been, next to the battle of Shiloh, the most desperately fought field of the war. The Richmond Dispatch sets down the loss at 8,000, which includes five generals, twenty-three colonels, ten majors and fifty-seven captains, killed or taken prisoners. The Dispatch also complains that the National forces can at any time cut off the retreat of the Confederates South by seizing the railroads at Petersburg, and intimates that a retreat to Lynchburgh and the mountains was the only one left to them.

The Navy Department has issued proposals for the construction and complete equipment of fifteen gunboats, with a speed of not less than thirteen knots, to be delivered within four months; and in conjunction with the War Department, proposals are invited for heavy guns for both these branches of the public service.

Paymaster Wise, of the gunboat flotilla, publishes a card in the Western papers, in which he says: "I have paid the whole expense of the flotilla from the first, and including the cost of the gunboats, their equipment, the purchase of several large steamers, pay of officers and men, and the accumulation of a vast amount of material got together in a hurry, and with all the disadvantages of forming a navy in the far West, our whole expenses do not thus far cover three millions of dollars, and we have hardly a debt unpaid. Our expenses are now about \$150,000 per month, making \$5,000 per day.

The *New Ironsides*, building at Philadelphia, has already received four tiers of plates upon her sides, and some idea can now be had of the impregnability of the vessel. As she now lies in the water she does not draw over eight feet; the remaining seven of her draught will be made by the use of the remaining iron plates. She will be ready for sea by the 15th of July.

In the second number of the SCIENTIFIC AMERICAN, issued Sept. 4, 1845, the editor presents to his readers what he terms "The Labyrinthian Curiosity—the City of Jungo, the bewilderology of which has no parallel." The engraving resembles the Chinese scrawls which usually adorn the sides of a weather-beaten tea-chest, and we doubt not the good reader at that time looked upon the picture as a complete "bewilderology."

DR. G. F. J. COLBURN, of Newark, N. J., informs us that the patents for his improvements in lamps, illustrated on page 273 of the current volume of the SCIENTIFIC AMERICAN, have been allowed.

Indian Implements for Cotton Culture.

A contributor to the last number of the *Edinburgh Review* gives the following description of the Hindoo plow:—This is apparently a rude instrument but in effect it is most efficient. It is formed invariably out of strong tough wood. A branch of a tree furnishes the bend required for the plowshare and the handle. The share or body of the plow is shaped to a point, and a strong coulter of iron is fitted into a groove on the upper side of the share, and is held there by strong clamps. When fitted it projects a few inches beyond the wood.

Ropes of untanned hide are fitted to the stem or handle of the plow, and are connected with yokes in front, which are again fixed on the necks of the oxen. This heavy implement plows very deep, probably from a foot to a foot and a half of the soil, and tears it up in huge clods, breaking the tangled and matted grass roots below the surface. The field is plowed two ways, or perhaps three, or four, according to the quality of the soil, and until it is thoroughly broken up. All stumps are then removed, dug out, or burned, and the field allowed to remain as left by the plow, through the whole of the hot season. The clods of earth are in fact baked, as it were, and all the grass roots withered and killed. Without this process, the grass roots would not be eradicated, and would spread again with rapidity. On the first fall of rain all the clods swell and fall into powder, not unlike the process of slaking lime; and when this is complete, a large hoe, formed of a block of tough wood into which a strong iron hoe about three feet long is fixed at an angle of 45°, is employed with a pair of bullocks, or two pair if necessary, to clean the surface. This instrument collects all grass roots as it moves, which are thrown off in heaps as the hoe is clogged; and the soil is turned up and thrown over the back of the iron portion of the hoe, so as to mix and pulverize it perfectly. The hoe is used as long as there is any inequality or roughness in the field; the roots and grass are afterward collected and burned, and the ashes spread over the land. The field is now ready for sowing; and if care be taken to eradicate grass afterward, there is no need of the heavy plow, or of subsoil plowing, for twenty years; at the same time it is employed should the surface soil grow poor. The surface remains clean; and the yearly cleaning by the hoe, or by a light plow, and subsequent drill plow, sowing is sufficient to ensure good crops.

The Sounding Properties of Rooms.

A correspondent of the *London Builder*, presents the following useful ideas on the proportions of rooms for propagating sound. He says:—A building of a certain height, length, breadth and form, is required to enable an assemblage of persons to hear clearly and distinctly in every part of the room. I only know one room which is as near perfection as possible, viz: a concert room at Harrowgate. The following are its dimensions:—

Length of room inside.....	86 feet 6 inch.
Width.....	33 "
Height to ceiling line.....	22 " 7.
Height to center of ceiling.....	24 " 2.

The ceiling is the segment of a circle rising one foot in seven inches. There are nine sunken panels in the length of the ceiling and seven in width, each 9 inches deep. There are nine large windows along the north wall, three at the east and three at the west end. On the south side there are two doors and one window, a small orchestra 10 feet high and two Doric columns on each side of the orchestra.

Washing Silk.

No person should ever wring or crush a piece of silk when it is wet, because the creases thus made will remain forever, if the silk is thick and hard. The way to wash silk is to spread it smoothly upon a clean board, rub white soap upon it and brush it with a clean hard brush. The silk must be rubbed until all the grease is extracted, then the soap should be brushed off with clean cold water, applied to both sides. The cleansing of silk is a very nice operation. Most of the colors are liable to be extracted with washing in hot suds, especially blue and green colors. A little alum dissolved in the last water that is brushed on the silk, tends to prevent the colors from running. Alcohol and camphene mixed together is used for removing grease from silk.

Poisonous Effects of Carbonic Oxide Gas.

Carbonic oxide gas is the product of imperfect combustion, and it is composed of an equivalent each of carbon and oxygen. It is very poisonous. Birds placed in a vessel containing it have dropped dead before they could be taken out. Sir Humphrey Davy took three respirations of it mixed with one-fourth of its bulk of common air, when he became temporarily insensible. This loss of sensation was succeeded by giddiness, sickness, acute pains in different parts of the body, and extreme debility; some days elapsed before he entirely recovered. Rabbits have been killed in seven minutes when put into a mixture of this gas with seven parts of atmospheric air. One per cent of this gas in atmospheric air has killed a dog in a minute and a half. Quite recently Dr. Letheby, of London, ascertained that air containing only 0.5 per cent of the gas will kill small birds in about three minutes, and that a mixture containing one per cent of this gas will kill in about half this time. In all these cases, the effects are the same. The animals show no sign of pain; they fall insensible, and either die at once, with a slight flutter—hardly amounting to convulsion—or they gradually sleep away. The post-mortem appearances are not very striking: the blood is a little redder than usual, the auricles are somewhat gorged with blood, and the brain is a little congested. In birds there is nearly always effusion of blood in the brain.

Several accidents have demonstrated how injurious this gas is to human beings. Dr. Letheby relates the following accidents occurring from the use of water-gas, which has been used as an agent of illumination. He says:—

Water gas sometimes contains as much as 34 per cent of carbonic oxide. It is obtained by passing steam over red-hot charcoal; and, as the steam is decomposed by the ignited carbon, the hydrogen is set free, and carbonic oxide, is produced. Selligie, in 1840, obtained permission to use the gas in the towns of Dijon, Strasbourg, Antwerp, and two of the faubourgs of Paris and Lyons. At Strasbourg, an accident occurred, which put a stop to its use. The gas escaped from the pipes into a baker's shop, and was fatal to several persons; and, not long after, an aeronaut, named Delcourt, incautiously used the gas for inflating his balloon. He was made insensible in the car; and those who approached to render him assistance fainted and fell likewise. The use of this gas has been interdicted on the continent of Europe.

Chemistry of Iron.

It is stated in the *Comptes-Rendus* that MM. Minary and Resal have been experimenting for two years with cast iron and they find that the puddling operation has for its object the burning of an excess of carbon. Gray and black cast iron contains but little oxygen. Granular white cast iron contains a considerable quantity of oxide, and is very easily refined, but they say it does not make good wrought iron. The fusibility of cast iron increases with the quantity of oxygen it contains. Two crucibles, the one containing iron scraps and the other containing scraps and a certain proportion of the oxide of iron were placed in a furnace, when the former were found merely softened and adhering together, but the latter were fused into one mass. Bessemer's process, it is asserted, should only be applied to gray cast iron.

WASHING WOOLENS.—If you do not wish to have white woollens shrink when washed, make a good suds of hard soap, and wash the flannels in it. Do not rub woollens like cotton cloth, but simply squeeze them between the hands, or slightly pound them with a clothes pounder. The suds used should be strong, and the woollens should be rinsed in warm water. By rubbing flannels on a board and rinsing them in cold water, they soon become very thick.

ZINC WASH FOR ROOMS.—Mix oxide of zinc with common size and apply it with a brush, like lime whitewash, to the ceiling of a room. After this apply a wash, in the same manner, of the chloride of zinc, which will combine with the oxide and form a smooth cement with a shining surface.

THE telegraph line from New York to Utah is 3,242 miles. Messages to this distance have been repeated five times, the longest line being 1,200 miles. The total amount of battery used was 750 Grove cups.

The City Directory, May 1, 1862.

We have just received from John F. Trow, publisher, No. 50 Greene street, the New York City Directory, compiled by H. Wilson, being volume 76. To residents of the city this directory is as indispensable almost as the light of the sun, and to thousands out of the city it would afford business information worth ten times its cost, which is \$2 50. We are much gratified to learn from the preface, in spite of the croakings of the enemies of the government, the fears of its friends, and the large number of volunteers which have gone to the war, that the number of names in the directory has increased this year. In the last year's directory the number of names was 152,825, this year it contains 153,186. In addition to the names in the regular directory, there is also added Wilson's New York Commercial Register, which contains much valuable business information.

American Railway Brakes in England.

The following interesting account of an American invention in England, is from the *London Engineer*: The mode of applying railway brakes invented by William G. Creamer, of New York, has been tried with the best results on the South-Eastern Railway, where it has been finally adopted to a considerable extent. The brakes are applied by the force with which stout springs, previously coiled, unwind themselves when a catch is disengaged. In some recent experiments with an engine tender and sixteen carriages, weighing 143 tons in all, the train when running at the rate of 50 miles per hour, down an incline of 1 in 100 was stopped in 30 seconds and in a distance of 373 yards. When ascending a gradient of 1 in 664 at the rate of 36 miles per hour, the train was stopped in a distance of 133 yards and in 16 seconds.

THE NAVY.—The following are the naval appropriations contained in the bills which have passed at this session of Congress, and have been approved by the President:—For iron-cased gunboats, \$10,000,000; gunboats on Western rivers, \$1,000,000; naval service for 1862, \$20,603,000. The sum of \$22,343,113 02 for the navy for 1862-63 is contained in an appropriation bill which has passed the House, but which has not yet been finally disposed of.

CALIFORNIA FRUITS.—Among the fruits being introduced into California, and for which the soil and climate of that State are presumed to be adapted, are the European grape vines, best adapted for wine and raisins, the Mediterranean currants, the abundance of Italy and Smyrna, oranges, lemons, olives, figs, Italian chestnuts and pomegranates.

THE SCIENTIFIC AMERICAN is the cheapest and some people say—"the best mechanical paper in the world." We suppose this must be so or people would not keep repeating it. We do know that no other weekly journal of the kind in the world can be obtained for so small a sum; the leading English scientific papers are treble its price per annum.

THE Australian papers of March contain a sketch of a project for a new steam communication with Europe. It is proposed to construct steamships of from 6,000 to 8,000 tons burthen, capable of carrying sufficient coals, without stopping for a supply, and of sufficient speed to complete the transit, by way of the Cape, in forty or forty-five days.

EXTENSIVE buildings have been erected at Long Beach, near Greenport, for the purpose of manufacturing oil and guano of the fish known as "bunkers," which swarm the coast of Long Island. A long wharf has been constructed, which is to be connected with the buildings by a railway. The engine used is 40-horse power.

FRIENDS, hurry in your subscriptions for the new volume which commences in two weeks, and do not forget to speak to your neighbor about it, especially if you find him in a good natured mood. He cannot refuse so reasonable an application, if he desires to know what's going on in the great world of industry.

VINE cultivation is making immense strides in Victoria, for grapes are selling there at 4 cents per lb. The vineyards yielded, in 1861, the average of 630 gallons per acre.

Cameo Engraving.

The art of cutting cameos is a species of sculpture, rather than engraving. There are two kinds of cameos, one of which is stone of different colored strata, so that the raised figure is of a different color from the ground, the other is of the conch shell. The shells are sawed into squares with saws of soft iron, similar to those used by sculptors. After the shells are cut into suitable pieces they are ground on a stone to their required shapes, by grinding them nicely on the edges and leaving them thick in the middle. After this they must be cemented on a stick about 6 or 7 inches long, with cement of Burgundy pitch and rosin of equal parts heated together until they are perfectly amalgamated. The end of the stick is immersed in the cement while it is warm, and enough attaches itself to it to fasten the shell, which must also be slightly warmed or the two will not be attached. After being cool the shell is ready for cutting. To produce a likeness of an object, the best way is to cut the profile on paper, lay it on the shell and trace it out. The best gravers, the harder the better, are alone fit for the work, and they are ground down to different shaped points, some diamond, some oval, some chisel shaped and some round. After the likeness or design is traced on the shell it has to be blocked out with the hand, or it might be done by flat drills in a lathe. The blocking out is done by tracing the design with the diamond pointed graver, and leaving the pencilings distinct and cutting away all the outside with chisels and gouges, taking care to leave the groundwork thick enough to finish up. After the blocking out is completed, begin with the top of the profession in making the head, by leaving a space for the hair a little raised and then engraving the features, taking great pains not to do too much at a cut, for if once spoiled there is no remedy. The neck and breast are done next, as cautiously as the face. The hair is done last and is the most difficult part to perform, although the uninitiated would think it the simplest, but it is the most difficult work of all, for no matter how good the rest of the work may be, if the hair is poorly executed, the whole figure looks bad. In cutting the hair it must be gracefully curled with delicate curves. Sculptured heads are the best models for the learner to study.

After the figure or design is finished with the graver, the cameo is polished with pumice stone as smooth as possible, until all the marks of the graver disappear. It is then finished with a stiff tooth brush and potter's clay, or whiting and water, and afterward washed in pure water, when it will be observed to have that beautiful polish for which cameos are so justly admired and which has made them, on account of their chasteness of coloring, a very popular branch of jewelry.

To take the cameo off the stick after it is finished, it is necessary to heat the stick over a spirit lamp until the cement warms, when it is ready for framing.

It may be observed that the grace of a figure depends much on the drapery.

Japanning and Varnishing.

Japanning is the art of covering bodies by grounds of opaque colors in varnish, which may be afterward decorated by printing or gilding, or left in a plain state.

All surfaces to be japanned must be perfectly clean. Paper should be stiff for japanning, such as *papier mache*.

The French prime all their japanned articles, the English do not. This priming is generally of common size. Articles that are thus primed, never endure as well as those that receive the japan coating on the first operation. When they are used for some time they crack, and the coats of japan fly off in flakes. A solution of strong isinglass and honey, or sugar candy, makes a good japan varnish to cover water colors on gold grounds.

A pure white priming for japanning, for the cheap method, is made with parchment size and isinglass, laid on very thin and smooth. It is the better of three coats, and when the last is dry, it is prepared to receive the painting or ornamental figures. Previous to the last coat, however, the work should be smoothly polished.

When wood or leather is to be japanned, and no priming used, the best plan is to lay on two or three coats of varnish made of seed lac and rosin, two

ounces each, dissolved in alcohol and strained through a cloth. This varnish should be put on in a warm place and the work to be varnished should, if possible, be warm also, and all dampness should be avoided, to prevent the varnish from being chilled. When the work is prepared with the above composition and is dry, it is fit for the proper japan to be laid on. If the ground is not to be white the best varnish now to be used is made of shellac. This is made in the proportions of the best shellac five ounces, steeped in a quart of alcohol and kept at a gentle heat for two or three days and shaken frequently, after which the solution must be filtered through a flannel bag, and kept in a well corked bottle for use. This varnish for hard japanning on copper or tin will stand forever, unless fire or a hammer be used to burn or knock it off. The color to be used with shellac varnish may be any pigment to give the desired shade.

To form a hard perfect white ground is no easy matter, as the substances which are generally used to make the japan hard, have a tendency by a number of coats to become dull. One white ground is made by the following composition: White flake or lead ground up with a sixth of its weight of starch, then dried and mixed with the finest gum ground up in parts of one ounce gum to half an ounce of rectified turpentine mixed and ground thoroughly together. This is to be laid on the article to be japanned, dried and then varnished with five or six coats of the following: two ounces of the whitest seed lac to three ounces of gum anima reduced to a fine powder and dissolved in a quart of alcohol. This lac must be carefully picked. For a softer varnish than this, a little turpentine should be added and less of the gum. A very good varnish and not brittle, may be made by dissolving gum anima in nut oil, boiling it gently as the gum is added, and giving the oil as much gum as it will take up. Although this varnish is not brittle, it is liable to be indented with strokes and it will not bear to be polished, but if well laid on it will not need polishing afterward. It also takes some time to dry. Heat applied to all oils, however, darkens their color, and oil varnishes for white grow very yellow if not exposed to a full clear light.

To Tin Small Articles.

To tin small articles prepare a solution of the chloride of zinc, which is done by feeding muriatic acid with scraps of zinc until it will take up no more. A strong glass bottle is the best vessel for this purpose. Let the solution settle and then decant the clear and it is ready for use. Next prepare an iron pot, of such size as will suit the purpose for the work to be done. Next put the pot on a fire and put in a sufficient quantity of tin to cover the work. When the tin is melted put in as much beef or mutton tallow as will cover it about one quarter of an inch thick, which must remain in a clear melted state, taking care not to let it get on fire. The iron, or any other metal to be tinned, must be well cleaned, either by filing or scraping, or polishing with sand. Let the article to be tinned be then wet with the chloride of zinc and carefully immersed in the tallow and melted tin, and if the article be well cleaned, it will in a very short time, be fairly and perfectly covered with the tin, when it may be taken out.

To tin a piece of plated metal, say a piece of copper plated on one side with silver, prepare a paste, which may be of common pipe clay, and a very little wheat flour wet up with water. Then take a soft brush and lay an even coat of the paste over the silver side and lay it in a warm place to dry; then when dry it may be immersed in the pot of melted tallow and tin as already described, and the copper side will be covered with tin, but the silver will be protected from the tin by the paste, which may be removed by washing in water.

TO MAKE STEEL.—Take wrought-iron clean scraps of any kind one hundred pounds, black oxide of manganese 1 pound, and 2 pounds of ground charcoal, put this in a crucible with a lid fitted and luted tight to prevent the carbon from escaping, and submit to the action of intense heat for some time; afterward pour it in molds, which must be warmed and greased to prevent the metal from sticking. It requires practice to make the metal sound, by taking it from the furnace at the proper time. It is afterward submitted to the trip hammer to close the grain.

Fine Cotton Yarn and Cloth.

Some idea may be obtained of the perfection of the cotton machinery used in England, by some statements obtained from a letter published in the Manchester *Guardian*, from H. Houldsworth, manufacturer of fine yarn. It has been stated that the fine cotton yarn spun in India by female hands is finer than that spun by machinery in England. We are informed this is not the case. Mr. Houldsworth examined the finest piece of Indian muslin exhibited in London in 1851, and found that it measured ten square yards, weighed 1,507 grains, contained 104 warp threads and 76 weft threads to the inch, the number being what is denominated No. 357. At the same exhibition No. 400 English yarn was shown, but at the present exhibition in London there is a piece of muslin, woven in France from No. 700 yarn spun in Manchester, which exceeds anything ever before attempted. It is a mere fancy specimen, however, and not fit for practical purposes. On the other hand, there is a whole piece of cloth of about thirty yards in length, made of No. 440 yarn. This cloth was also woven in France, but the yarn was spun in England of Sea Island cotton. The fine muslins of Hindostan have been called in oriental style "woven wind," but they are evidently coarse compared with the finest specimens that have been woven in France. Mr. Houldsworth states, as an item of curiosity, that a few threads of No. 2,500 have been made, but they are of no practical use. A single fiber of Sea Island cotton is equal in fineness to No. 8,000 yarn, and a pound weight of it in a single fiber of thread would measure 3,818 miles in length.

A Good Word for the Skunk.

The *American Agriculturist* takes up the cudgels in defence of the poor, despised, but seldom-kicked skunk, and gives him a good notice. Our cotemporary says:—

"All summer long he roams your pastures at night, picking up beetles and grubs, poking with his nose potato hills where many worms are at work. He is after the grubs, not the tubers. He takes possession of the apartments of the woodchuck, who has quartered himself and family upon your clover field or garden, and makes short work with all the domestic arrangements of that unmitigated nuisance. With this white-backed sentinel around, you can grow clover in peace, and the young turnips will flourish. Your beans will not be prematurely snapped, and your garden sauce will be safe from other vermin. The most careless observation of his habits shows that he lives almost exclusively upon insects. While you sleep he is busy doing your work, helping to destroy your enemies. In any fair account kept with him the balance must be struck in his favor. Thus among the animals we often find friends under the most unpromising appearances, and badly abused men are not unfrequently the benefactors of society."

This all may be very true and we have no doubt it is, but nevertheless we cannot forgive the rascal for certain attentions which he once bestowed on some of our neighbors. The eccentric John Randolph once said, he "would any time go half a mile to kick a sheep." So with us in reference to a skunk if we dare.

PRESERVING ANIMAL SUBSTANCES.—Putrefaction requires the presence of water; hence, by drying animal substances, they are preserved. Putrefaction is impossible above 182° or below 32°. Freezing acts precisely as drying. Hence bodies preserved by frost, and those which remain fresh for years after death on the Arabian deserts, are preserved from the same essential cause.

PRESERVING BUTTER.—Take two parts of the best common salt, one part of sugar and one part of salt-peter, and blend the whole completely. Take one ounce of this composition for sixteen ounces of butter, work it well into a mass and close it up for use. Butter thus cured requires to stand three weeks or a month before it is used.

The Hartford Manufacturing Company of Plated Ware, received on the 30th ult. a large order from one of their old customers in New Orleans. This is the first order from that city since March, 1861, when the secession frenzy broke out.