

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Pump.—This invention consists, first, in a novel trip-valve arrangement for admitting of the escape of water from the suction pipe of the pump after each operation of the same, whereby the pump is prevented from being rendered inoperative in winter by freezing, and fresh, cool water always obtained in summer. The invention consists, secondly, in a novel construction of the plunger of the pump, whereby the former is made to serve as an air-vessel as well as a plunger, and considerable expense saved in the construction of the pump, and the latter also materially simplified. It consists, thirdly, in the use of a cap attached to the pump box at the top of the well or cistern, and provided with a brake joint, whereby a very simple, economical and durable means is obtained for a pump fixture at the top of the well or cistern. John Munson, San Jose, Cal., is the inventor of this improvement.

Furnace for Desulphating Ores.—This invention relates to certain improvements in that class of furnaces known as upright terrace furnaces, and the object of these improvements is to regulate the velocity with which the charge passes through the furnace and to reduce the time necessary for a perfect roasting or desulphuration of the ores by the peculiar shape and construction of the terraces and by their peculiar position in relation to each other; also to reduce the expenditure of fuel and to regulate the temperature throughout the furnace by the application of hot-air apparatus and cold-air pipes, in combination with the terraces, and to make such disposition in the internal arrangement that the furnace is applicable for the reduction of gold, silver, quicksilver and other ores. C. A. Stetefeldt, of New York city, is the inventor of this improvement.

Portable Screw Press.—This invention relates to a new portable screw press for pressing cheese, expressing juice from fruit, pressing lard and other substances. The object of the invention is to obtain a press of the kind specified which will admit of the screw, after the pressing operation has been performed, being turned down to a horizontal position so as to be entirely out of the way and allow the article which was compressed to be removed from the bed of the press with the greatest facility, there being no parts to interfere with the ready removal of the compressed article; the screw at the same time being capable of being adjusted and secured in an upright position so that it may perform its work. The invention further relates to an equalizer or regulator connected with the screw and constructed and applied in such a manner that the follower, while being forced down under the action of the screw, will be retained in a horizontal position and made to press the substance underneath it in an even manner so as to leave a horizontal upper surface on the same, however irregular said upper surface might have been previous to its subjection to the pressure. Charles D. Brand, of Oak Hill, N. Y., is the inventor of this improvement.

THE GOVERNMENT EXPERIMENTS IN WORKING STEAM EXPANSIVELY.

On page 212 of our current volume, we published the circular of the Commission appointed by the Secretary of the Navy, "to devise and conduct a set of experiments, to ascertain, by means of practical results, the relative economy of using steam, with different measures of expansion." The Commission consists of Horatio Allen, Esq., President of the Novelty Works, in this city, and B. F. Isherwood, Chief of the Bureau of Steam Engineering, U. S. N. The apparatus is now nearly completed and in place on East 14th street, between Avenues C and D, in this city, and the Commission are just ready to commence their experiments. The experiments have been judiciously arranged, and there can be no doubt that they will be intelligently and carefully conducted. They will furnish more positive knowledge of the economic value of expanding steam, and of the proper amount of expansion, than all previous experience, and will consequently be of inestimable value. We purpose to give a full history of them during their progress, and we are

glad that they will come just in time for our next volume.



How to draw a Line due East and West by the rising and setting Sun.

MESSRS. EDITORS:—To draw a line due east and west by the rising and setting sun, the time must be between the 20th and 21st of June. It will be seen by the almanac that the declination of the sun is the same for both days; so there is no allowance to be made for that. At other times due allowance should be made. The track of the sun is like a screw cut on a globe, with a pitch of about 17 m les. The first thing is to drive the stakes, A and D—the latter is four or five feet high; on the top of this I nail a shelf on which to set a level. At the time the observations are made the inclinations should be the same morning and evening. About half an hour before sunset I drive the stake, C, about 15 feet from A. E is a plumb line, which will cast a shadow on C. I make a mark



on the shadow where it intersects the stake, and notice by the level the position of the sun. The next morning I drive the stake, B, the same distance from A (the center), and mark where the shadow crosses. I can see by the level the time to make the observation. I then take my trammel, set one point at A—the center; with the other point I mark on B and C. The points, B and C, are east and west without any variation. On account of the risk of fair weather it is best to get ready on the 19th, and drive the center stake and the stake, D, and set the shelf with the plumb line. In that way I should have two days, if the weather was fair, to make the observations in.

JARED W. SMITH.

New Haven, Conn., June 9, 1864.

To Find the Diameter of a Circle from which a Square or Hexagon can be made.

MESSRS. EDITORS:—Workmen are often puzzled to find the diameter of a circular piece from which to make a square or hexagon of given size. The following rules are correct for the square:—Multiply the length of a side by 1.414213 and the product will be the diameter to which the material must be turned. For the hexagon multiply the distance across at right angles to the sides, by 1.1547 and the result will be the diameter. A slight allowance in excess should be made to insure sharp corners. S.

Rochester, N. Y., June 6, 1864.

Iron for Peach Trees.

MESSRS. EDITORS:—Having noticed several articles relating to agriculture in your paper, and knowing that all ideas however small may result in benefiting somebody, I wish to relate something that has come under my own observation. For the past seven years, while working in a machine-shop, the iron shavings (both wrought and cast-iron) have collected around the buildings to the depth of several inches, and under these several peach trees have sprung up and are now bearing fruit every year. The leaves hold their color throughout the season, a very dark green; while for miles around not a tree can be brought to bear before it is affected by the disease so prevalent in this part of the country. If any one will take the trouble to try this experiment of putting iron-dust or clearings taken from a machine-shop around their trees, I think they will meet with success. A SUBSCRIBER.

Waltham, Mass., June 11, 1864.

NEW BOOKS AND PUBLICATIONS.

THE CAMERA AND THE PENCIL.—Mr. M. A. Root, who for many years enjoyed a world-wide reputation as a heliographic artist, has of late devoted himself to the duty of placing before the public some of the results of his large professional experiences. In a genially written, interesting work, under the above title, of which we have received an elegant first volume, the whole history and practice of the heliographic art, is clearly set forth. The author's own resumé will convey a true idea of the intrinsic value of the work.

Each volume is complete in itself, though the two are related to each other. The first volume is chiefly *theoretic*, containing chapters on the 'Fine Arts,' 'The Uses of Heliography,' 'Qualifications of a First class Heliographer,' 'The Sunbeam,' 'The Harmony of Colors,' 'The fitting-up of Heliographic Rooms.' Several chapters on 'Sitting for a Portrait,' with minutest directions about position, the management of light and shade, etc., etc. For chapters on 'Expression,' that essential to a genuine portrait, illustrated by portraits engraved on steel. Several chapters comprising 'Thoughts' of the most eminent artists and art-critics, ancient and modern, with original comments, covering the *æsthetics* of Photography; 'The Microscope,' with its revealing wonders, etc., etc., together with a full and minute chapter on the 'Coloring of Photographs' in India-ink, water and oil colors, in all of the styles now popular both in America and Europe. All these specialties make this volume not only a valuable vade-mecum for artists of every class, but also worthy of a place in every house, on every center-table, and especially in every photographic reception-room, for visitants to examine while awaiting their sittings, and thereby to learn what constitutes a good portrait, and how to obtain one." Appleton, New York, Publisher.

Wiard's Gun.

Appended is a description of Wiard's gun which burst recently at Trenton, N. J.:—"The gun is diminished in thickness, but is surrounded with an outer case or "jacket" connected to the gun proper by arms—the whole, however, being one casting. A cross-section resembles an open car-wheel with covered arms. By this method a greater surface for radiation is gained, thus cooling the gun more quickly, and the expansive force is transmitted by the arms to the jacket, which is cool, and strong enough to be secure from bursting. In this way the unequal expansion of the inner and outer surface of the gun is avoided. The dimensions of the gun are:—Diameter of bore, 15 inches; length, 10 feet 6 inches; outside length, muzzle to cascabel, 13 feet; greatest diameter of jacket, 5 feet; diameter through trunnions, about 6 feet; weight of rough casting, including head, 52,000 pounds; weight of finished gun, 44,000 lbs." This gun was fired with 80 lbs. of fine powder and a shot of 900 lbs. weight. The elevation was said to be 30°. When the charge was exploded the gun burst.

Now is the Time.

A subscriber, renewing his subscription for another year, says:—"There is no expenditure to which I am subject which I bear more willingly than the payment of my subscription; and it is a standing wonder to me how any mechanic, who wishes ever to be other than a 'hewer of wood and drawer of water,' can neglect the opportunity to purchase so much that he needs for so insignificant a sum—a single day's labor *versus* fifty-two numbers of your paper." This is the opinion of thousands of our mechanics and manufacturers, and we trust that thousands more, with the beginning of the new volume, will be added to our subscription list. Three thousand subscriptions expire with this number, and we hope each one will promptly renew his own, and, if possible, get a neighbor to join with him in taking the SCIENTIFIC AMERICAN for six or twelve months.

A SUBSCRIBER says:—"Praise may be superfluous, but I wish to testify to the typographic neatness of your journal. Its elegance will not fail to attract general attention, and thus lead to a better acquaintance. If permitted to offer a sentiment, I would propose, "The SCIENTIFIC AMERICAN—it is wholly American, and should be patronized by every American in America!"

Linon Import and Manufacture.

Our civil war, along with other results, has tended to stop the supply of cotton, to prove the inadequacy of other countries for a sufficient yield of the right staple, and, consequently, to substitute other fabrics. The effect is marked very clearly in English trade returns. Linen has been produced in an unparalleled quantity there, and exported to us more largely than ever before. In the first three months of 1862 the total value of linen piece goods exported from England was £982,013; in 1863 it was £1,327,895, and in the corresponding period of 1864, £1,869,785. This production and export includes white and plain piece-goods; checked, printed, and dyed ditto; cambrics and lawns; damasks and diapers; sail cloth, thread, and hosiery. The total value of exports of linen manufactures of all kinds in the first quarter of 1864 amounted to £1,998,452, against £1,454,777 in the corresponding quarter of 1863, and £1,088,363 in the corresponding period of 1862. The export nearly doubled in three years. This country, too, was the largest consumer and customer for this wonderful increase, which amounts to no less a sum than £,910,089 or \$4,550,445 for a single quarter, and \$18,201,780 per annum. We import to the value of £378,735 in 1862, £556,774 in 1863, and £914,917 in 1864. This is an increase in linen goods of £536,182, or about \$2,681,000, in one quarter, produced in two years. The increase in a year, at this ratio, would be \$10,723,640. The last returns show that the increase is still increasing; and that, although some suffering has been produced among British operatives by the cotton famine, and some mills rendered less valuable, the suffering is compensated in another quarter by an excessive and unparalleled consumption of linen.

These facts show that linen manufactures here are starting at the right time. The creation of so good and sudden a demand cannot but carry up prices. The duties will be added to that cost and render linen manufactures very valuable. We have some manufactures of this kind and evidently need more. Their erection will lead to the immigration of skilled operatives, and thus we shall be permanent gainers through a lesson and discipline of loss. It will also stimulate the production of flax and hemp, and thus we shall have another crop added to the vast variety that already vary our agriculture. Kentucky and Missouri cannot supply even their former yield now. Other States may therefore prepare to meet a profitable demand, and do it safely, since it has been shown that flax-growing does not injure the soil, as it was supposed to do.—*United States Gazette.*

Horses and Mules.

During the year ending June 30, 1863, there were purchased 173,832 horses and 86,254 mules, and there were captured 7,783 horses and 6,915 mules, which, added to those on hand at the commencement of the year, made the number 197,457 horses and 110,068 mules. There were condemned, sold, died or lost by capture, during the year, 57,676 horses and 17,170 mules. More than one horse out of every four was thus *hors du combat*, while nearly one mule in every seven was a used-up beast. Yet, \$16,631 58 was paid for veterinary surgeons, and \$39,292 39 for medicines for horses and mules. This unprecedented destruction of horses and mules will have somehow to be arrested, or it will become impossible to remount our cavalry or to provide animals for the artillery and wagon trains.

Royal Patent to wear a Nightcap.

Agnes Strickland, in her "Lives of the Queens of England," in giving an account of the rewards bestowed by Queen Mary upon her friends after her accession, says:

"The Queen's gratitude took a very odd form in the case of the Earl of Sussex; he was a valetudinarian, who had a great fear of uncovering his head; and, considering that the colds he dreaded respected no person, he petitioned Queen Mary for leave to wear his nightcap in her royal presence. The Queen, in her abundant grace, not only gave him leave to wear one, but two nightcaps, if he pleased. His patent for this privilege is, perhaps, unique in royal annals:—

Know ye, that we do give to our well-beloved and trusty cousin and councillor, Henry, Earl of Sussex, Viscount Fitzwater, and Lord of Egremont and Bur-

nell, license and pardon to wear his cap, coif or nightcap, or any two of them, at his pleasure, as well in our presence as in the presence of any other person or persons within this our realm, or any other place in our dominions wheresoever, during his life; and these our letters shall be his sufficient warrant in his behalf.

"The Queen's seal, with the Garter about it, is affixed to this singular grant."

MISCELLANEOUS SUMMARY.

AN ENORMOUS SCALE.—An enormous scale, the largest perhaps in the country, has just been finished at Cleveland for the Fort Pitt Works in this city. They are intended to weigh the monster twenty-inch gun, and are of the following dimensions: Length, 30 feet breadth, 7½ feet, and 4 feet in height. They will weigh from two pounds and a half up to one hundred tons, and are so nicely and accurately adjusted that the weight of half a pound will turn the beam. A half a pound weight on the beam weighs one ton on the scales. They are built entirely of wrought iron, with the exception of the lever heads, which are cast. The pivots are made of wrought-iron steel edges, for the purpose of securing greater strength and durability. The cost of these scales, when set up in Pittsburgh, will be \$2,000.—*Pittsburgh Chronicle.*

LYON, SHARP & Co., of the Sligo Iron Works, contributed to the St. Louis (Mo.) Sanitary Fair a great variety of superb iron, among which are some rare specimens—one sheet, a boiler head, one hundred and two inches in diameter, half-inch thick, weighing one thousand one hundred and sixty pounds, the largest sheet ever made in the United States, and also several pieces of sheet-iron, rolled to the one nine-hundredth of an inch in thickness, with Russia iron polish on both sides—probably the thinnest sheets ever made—as considerable ado was made through Europe over some sheets rolled in Germany nearly one-half thicker than this. This has a Russia iron surface on both sides, and is as tough as bank-note paper.

BOILED TELEGRAPH WIRE.—Boiled wire is used by some telegraph companies, and the process of preparing it is thus described:—"The wire, in coils, is placed in a large iron cauldron, filled with linseed oil, and boiled about fifteen minutes, when it is presumed to be 'done.' By this process it receives a coat of glazing, which preserves it from rust. The wooden blocks, or braces, by which the insulators are placed, are also boiled, but in different material. They are made of sycamore wood, and are boiled—100 at a time—for a period of one hour, in ordinary coal tar. The effect of subjecting the sycamore to this process is to render it secure against warping or cracking from sun or rain."

A MONSTER steam feed mill designed for the United States Government for recruiting army horses in the public stables, near Washington, is now being constructed at the machine works of Messrs. C. & J. Cooper, Mount Vernon, Ohio. The engine is 100-horse power, and the mill capable of grinding 225,000 lbs. of grain or hay in ten hours. This feed is to be mixed and cooked by steam passing through six-inch horizontal iron cylinders, carried by an apparatus like a chain-pump; to be wetted, steamed and then dried as it is carried along.

ANOTHER IRON-CLAD.—The iron-clad *Tunxis*, of the third class, was to have been launched at Chester, Pa., on the 4th inst. She is put down in the register at 614 tons, and has one revolving turret, mounting two heavy guns. A great many improvements are said to have been made in her construction from the original vessel. She will be fitted for sea immediately. The whole iron fleet is in a prosperous state of forwardness, including the great *Puritan*, *Dictator*, and *Dunderberg*.

ENTERPRISE IN CALIFORNIA.—The *Washoe Weekly Star* states that in Humboldt District, a company is constructing a canal sixty-three miles in length, five feet deep and sixteen feet wide, to lead the waters of Humboldt river to the mining sections of the different districts. This canal will give water power for any number of quartz mills. A city has been located by a company on both sides of the canal, in the richest section of the country where mills are to be built, and it is claimed that this will be the center of business in Humboldt county.

IMPROVEMENTS IN IRON-MAKING.—It is well known that iron undergoes three processes before it is fit for the forge—smelting, refining, and puddling. The smelting-furnace only yields pig-iron, which is a combination of iron with as much carbon as it can take without becoming plumbago, and the subsequent operations tend to deprive it of its superabundant carbon in order to render it malleable. A new process has now been invented, by which malleable iron may be obtained direct from the smelting-furnace; it consists in driving oxide of iron into the furnace by means of the ventilator, whereby all the carbon is at once absorbed. In order to apply this method, the hearth of the smelting-furnace must be built somewhat higher than usual, and the air driven in by the ventilator is previously made to pass through three chambers, in which it becomes charged with oxide of iron at a high temperature, the atmospheric pressure being at the same time kept very high.

The dangers arising from the universal adoption of the common lucifer-match have induced chemists to seek a substitute for it. M. Peitzer has recently proposed a compound which is obtained in the shape of a violet powder, by mixing together equal volumes of solutions of sulphate of copper, one of which is supersaturated with ammonia, and the other with hyposulphite of soda. A mixture of chlorate of potash and the above powder will catch fire by percussion or rubbing; it burns like gunpowder, leaving a black residue. M. Viederhold proposes a mixture of hyposulphite of lead or baryta, or chlorate of potash, for matches without phosphorus. The only inconvenience of this compound is that it attracts moisture too easily.

SOLID DRAWN STEEL TUBES.—The London *Engineer* says:—"An influential company has been formed to purchase and work the patents of Messrs. Hawksworth & Harding for drawing steel tubes, hollow steel wire, or ordnance cylinders from solid steel, by hydraulic pressure. The machinery by which this is effected has been worked experimentally in Paris for the last two years, and it is stated that the French Government are negotiating for the supply of ordnance barrels thus drawn by hydraulic pressure. The machinery is now working (with a 600 ton press) in Willow Walk, Bermondsey."

EGGS IN PHOTOGRAPHY.—We are informed by Professor Seely, editor of the *American Journal of Photography*, that more than 1,200 dozen of eggs per week are used in New York and vicinity for albumenizing paper for photographs. A great deal more than this quantity of albumen is thrown away every week in the blood of the animals slaughtered for this market. Could some plan be devised for separating the albumen from the blood it would be a very valuable discovery.

A PAIR OF REBEL SHOES.—A resident of Wheeling, who has been to Cloyd's Mountain, the scene of the late fight between Crook and Jenkins, secured a pair of rebel shoes. The soles and heels are of wood, and appear to have been sawed out by machinery. The uppers, which are of very heavy, stiff and badly-tanned leather, are nailed upon the wooden soles with large tacks and welts. The shoes are exceedingly clumsy and heavy.

THE SCIENTIFIC AMERICAN.—We have been an attentive reader of this paper for years, and always have felt after its perusal that we have been doubly paid for the time spent in its reading. For our part, we cannot see how a mechanic who cares to perfect himself in his business and also to know what is going on in the mechanical world around him, can do without it. Its cuts and illustrations are rarely equalled—never excelled, and in fine it is a *live* paper for a *live* mechanic.—*Shoe and Leather Reporter, New York.*

A CALIFORNIA HERDSMAN.—A late California paper says that Abel Sterns of Los Angeles, California, lost about 7,000 head of cattle, through want of food, during the last winter. That gentleman is believed to be the largest stock and land owner in the United States. He owns this year 48,000 cattle besides 9,000 calves.

THE FRANKLIN FILE Co., of Bridgeport, Conn., which manufactures files by a machine of American invention, furnishes the market with an article superior to those made by the French patent.