

horseman. The head is the first point, however; let us have that protected and the efficiency of the cavalry will be doubled. Who will introduce a cavalry helmet?

#### GREATER ECONOMY IN COAL CONSUMPTION DEMANDED.

The exorbitant demands of the coal-dealers are causing a universal inquiry into the justice or necessity of such prices as are exacted. We have seen no evidence adduced that is worthy of a moment's attention, which could justify the enormous advance of this article of prime necessity, although it has been urged that the strikes of the miners and inadequate facilities for transportation are insuperable obstacles to a reduction of the price. If the public cannot succeed in inducing the coalition—for there evidently is one somewhere in the coal interest—to abate one jot of their exactions, they may at least cooperate with us in calling forth, and employing when brought to light, improvements in furnaces of all descriptions, whether for steam purposes, culinary use, or warming apartments. It is a notorious fact that a large part of the fuel, whether wood or coal, daily used, is not economized as it should be, either in burning it or in using it after it has passed through the fire. Although American stoves and furnaces rank deservedly high for apparatuses of their class, yet we think the most sanguine inventor who has ever investigated the subject will admit that there is room for improvement, and that too many of the stoves and ranges now in use devour fuel as greedily as if their proprietors held the fee simple of a coal mine. The actual value of a stove, furnace, or steam boiler depends upon the arrangement and amount of surface exposed to the action of heat, and so contrived that the greatest possible amount of caloric will be extracted from the ignited gases before they pass up the chimney. The heat, at a reasonable distance from the stove, which passes off into the air through the pipe unused, is a proof that more fuel is burned than the stove can work to advantage, and also that money is expended for which there is no return. The same is the case with steam boilers; although we do not anticipate that the currents passing through the chimney—that gases liberated by combustion will be so cooled that the smoke-pipe will answer the purpose of a refrigerator—yet we do expect that vital improvements will be made so that the heat which issues from the smoke-pipe will not be so great as to burn out the top of the same in a short time, sixty feet or more from the furnace.

We remarked at the commencement of this article, that fuel, more particularly coal, was not generally used after it had once passed through the fire. Such is the fact. All of the coals are not subjected to the same heat alike, and some are reduced to cinders and ashes while others are only roasted or calcined and turned into coke. This refuse, so-called, properly screened and picked out, makes an excellent summer fuel, easily ignited, and gives heat enough for ordinary purposes, and it is inconceivable why so many persons throw away their ashes, and with it certainly a tenth of their coal account. Such waste is reprehensible and ought to be checked, and we hope ere long to chronicle a great addition to the list of improved coal burning apparatuses.

#### THE ENGLISH STEAM FIRE-ENGINE TRIAL.

In a conversation we had recently with a celebrated builder of steam fire-engines in this city, he expressed the opinion that, in the forthcoming trial to be had in London, our engines would prove victorious in point of distance to which water could be thrown. The English are very partial to the quantity of water projected in a given time, as a favorable quality of a steam engine, and all their machines have a much less proportion of steam area in the pistons than have ours when the relative size of the pumps is taken into account. The *Manhattan* steamer, of this city, is considered a favorable exponent of the American steam fire-engine, but it is said that the English engineering community do not look upon the rotary pump with much favor. We think this rather anomalous, considering the merits accorded to the Gwynne centrifugal pump, and the changes rung upon it by all English journals, from those competent to criticize its qualities down to others who do not know the difference between a rotary pump and

a penny whistle. We have expected to see some English fire-engine fitted with this pump, and a trial had of its virtues or advantages over the Carey pump, such as is the *Manhattan's*; there may be some engine of this kind entered for exhibition, but we have been given to understand that the English machines are all fitted with reciprocating pumps. A large proportion of our mechanics are away at the war, fighting for their country, but those who remain will look eagerly for the result of the trial, as they expect to see the confidence they have placed in their machines fully sustained.

#### THE DISCOVERERS OF THE SOURCE OF THE NILE.

Captains Speke and Grant, whose discovery of the true source of the Nile was formerly noticed in our columns, have arrived in London, and were publicly received by the Royal Geographical Society on the evening of the 23d ult. Sir Roderick Murchison introduced the two travelers, who addressed the meeting and gave an interesting account of their discoveries and adventures. They were attended by two boys, aged about 15 years, natives of the country, who were brought to England with the consent of their parents to receive a good education and then be sent back to their native clime. Their skin is black and their heads covered with the usual coat of wool, but their features are regular, their noses being straight and foreheads as high as those of Europeans. The races in the region of Lake Nyanza (Captain Speke believes) are descended from the Abyssinians and Hindoos. The men are tall and well made, and they are honest and friendly.

When Captain Speke visited the king of Uganda, his sable majesty said he must sit on the ground and wait until he was given an audience. The captain answered that he was a prince and was not accustomed to wait; and he terrified the king and his whole court into submission by opening his umbrella, which they took to be a deadly weapon employed for killing by magic.

Lake Nyanza, the source of the Nile, is situated at an elevation of 3,500 feet above the level of the sea, in latitude three degrees south, and from where the Nile leaves this lake until it reaches the Mediterranean Sea it traverses a distance of 3,000 geographical miles. The lake is in the region of the Mountains of the Moon, in the middle of the rainy zone where, in 1862, Captain Speke noticed that rain fell, more or less, during 233 days of the year. This accounts for the perpetual supply of waters to the Nile. At the center of the northern coast of the lake the parent stream of the Nile issues over a precipice twelve feet in height. The travelers proceeded down this branch from Lake Nyanza, and after many delays and incidents reached Rhartown last spring; the time of their travel having occupied two years and a half, and the distance explored being 3,000 miles.

#### OUR "BRANCH OFFICE" AND THE WAR.

At the beginning of the invasion of Pennsylvania the necessity of "uncovering" Washington became a fixed fact; but to leave it unprotected, while the army of Gen. Meade went forth to drive back the forces of Gen. Lee, might result in its possible capture by Gen. Beauregard's forces, which were understood to be "on the move" from Richmond to aid the rebel army of invasion. To provide against this exigency the President called into the service for sixty days—unless sooner discharged—every able-bodied man between 18 and 45, within the limits of the District of Columbia. The entire force employed in the Washington "Branch Office" of the *SCIENTIFIC AMERICAN* was called out, and we are happy to know, went cheerfully to meet the summons. At one time it seemed to us that we should be compelled—for a short time, at least—to close our efficient "Branch Office." We are much pleased to learn, however, that the President considers that the exigency no longer exists, and all our Washington employes are now following their accustomed duties in our service.

The ram *Atlanta* has been pronounced unseaworthy by an examining board from our navy at Port Royal. She has six inches of water in her hold, and a steady leak is observable in the place where the iron-work is fastened to the hull. Her guns are all marked "Tredegar Iron-works, Richmond," and one of them is of this year's casting.

#### KRUPP'S PRUSSIAN STEEL-WORKS.

At the recent great International Exhibition in London, the products of the immense steel-works of Frederick Krupp, at Essen, Prussia, attracted great attention from scientific and practical men of all countries, by reason of the character and class of articles made at that establishment. Steel crank-shafts forged solid, double throw, are produced weighing 12 tons and over; cast-steel guns of the largest bores and the finest possible texture are turned out according to contract in large numbers. The Russian Government are now having 100 steel breech-loading guns made, of 11½ inches bore, and weighing approximately 16,666 pounds, at an aggregate cost of 500,000 thalers. (A thaler is 70 cents.) Our own Government has also ordered a 7½ inch steel gun, Dahlgren pattern, to experiment with. Every kind of steel forging that can be named is made by Krupp; and his steel tires for locomotives are especially commended by all who have used them. The tires for locomotives are made without a weld, and are calculated to run from 80,000 to 100,000 miles without turning; and when turned up they lose but ½ of an inch of metal. The "life" of a 2-inch tire is usually computed at about 250,000 miles on an average. Cast-steel ingots are produced weighing 40 tons, which are forged under a steam hammer of 50 tons' weight, having a fall of 10 feet. The cannons have undergone trials at Woolwich (England) which have proved that they cannot be bursted, so exceedingly tough and well wrought is the nature of the metal. Nearly all the Governments in the world have ordered some cannons from Krupp's works. A bolt, 8 feet 9.5 inches long and weighing 1,000 pounds, was fired from one of Krupp's patent breech-loaders, without injury to the gun or breech-loading apparatus.

The works are located near the Rhine, about 50 miles below Cologne, on the opposite bank of the river; they cover nearly 200 acres, about one-tenth of which are under roofs. The consumption of coal is about 250 tons per day; the coal is obtained in the immediate neighborhood.

Mr. Krupp's New York agent, Mr. Thomas Prosser, of 28 Platt street, this city—has large lithographs representing Krupp's works and other matters connected with that establishment, all of which are very interesting.

**TESTING ORDNANCE.**—For several weeks past, a thirteen-inch gun, of Rodman's model, cast at Fortress Monroe, has undergone a series of experiments. Its weight is 33,615 pounds, and it is fourteen feet long. A two-hundred-and-seventy-five-pound shot has been fired, with a charge of thirty pounds of powder, and, as yet, there is no perceptible enlargement of the bore, though the piece has been discharged nearly three hundred times. Thus far the experiments have been confined to trying the gun's durability; but, in a few days, the test will be made as to the distance and penetrability of the projectiles thrown.—*Pittsburgh Dispatch*.

The ship *Resolution*, in which Captain Cook left England on his second voyage round the world in 1772—ninety years since—is now at Demerara waiting a cargo of sugar.

The amount of money found in letters at the Dead Letter Office, during the last year, was over \$80,000, being an excess of \$30,000 over the previous twelve months.

DIVERS have already succeeded in securing \$40,000 worth of goods, and raised one box containing \$32,000 in specie, from the wreck of the *Anglo-Saxon*, off the coast of Nova Scotia.

It is estimated that the aggregate yield of the California gold mines, since the discovery of gold in 1846, is twelve hundred and fifty millions of dollars.

ASSISTANT SECRETARY OF THE NAVY, FOX, states that the whole number of vessels captured or destroyed by the blockading fleet up to June 1, is 855.

UPWARDS of £300,000 have been subscribed in England to the Atlantic telegraph, and it is said that the work is to be prosecuted immediately.

It is said that a bank-note printed in blue on a yellow ground is the only one which cannot be reproduced by photography.

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:—

**Brick Machine**—This invention consists in the use of a cylindrical mold provided with sliding plungers and fitted in a mounted frame on which a mixing or tempering device, scraper, sand-box and frame-elevating device are placed; the several parts being arranged in such a manner that the machine may be used either stationary for mixing or tempering and pulverizing the clay and molding the same into bricks, or be drawn along and operated by traction so that the work referred to may be performed and the molded bricks also properly distributed or laid upon the yard. J. N. Newell, of St. Louis, Mo., is the inventor of this brick machine.

**Shingle Machine**—This invention relates to an improved shingle machine of that class in which a circular saw is employed for cutting the shingles from the bolt; and it consists in the employment of a horizontal circular saw in connection with a sliding frame provided with clamps or dogs, arranged in such a manner that the latter may be conveniently manipulated in connection with the frame and the bolt from which the shingles are cut, and fed with the greatest facility to the saw and withdrawn therefrom. The invention also consists in the employment of supporting bars so arranged relatively with the saw and the bed on which the bolt is moved and adjusted, that the shingle, while being cut from the bolt, will be fastened or held in proper position and a clean smooth cut obtained the whole width of the bolt. The invention further consists in using, in connection with the saw, supporting bars, and the clamps or dogs, a bed arranged in such a manner as to admit of the bolt being very readily adjusted to have the saw cut the shingle in proper taper form. Simeon Heywood, of Claremont, N. H., is the inventor of this improvement.

**Weapon of War**—This invention consists, first, in the combination with a lance of a revolving many-chambered cylinder of similar character to that commonly used in revolving fire-arms arranged to rotate upon the pole or shaft of the lance, by having the said pole or shaft passed directly through it. It also consists in furnishing the so-called many-chambered cylinder at its rear end, with a circular series of ratchet-like teeth, corresponding in number with its chambers, and in fitting the lance pole or stock with a sliding hammer so formed and arranged that by turning the cylinder upon the said pole or shaft, the said teeth may be made to force back the said hammer in such a manner as to permit it to be driven forward again by a suitably applied spring, and thereby caused to strike upon percussion caps or their equivalents applied in rear of the several chambers, for the purpose of firing the charges of the said chambers one at a time and in regular succession all round the cylinder. It also consists in fitting the butt of the pole or shaft with a spike which can be sheathed by being packed into the pole or shaft when the weapon is to be carried or used, and protruded from the butt to enable it to be driven into the ground to hold the weapon in an upright position ready to be quickly laid hold of when required for use. This weapon is suitable for arming either infantry or cavalry but especially for infantry. J. C. Campbell, of New York, is the inventor of this weapon.

**Reclaiming Exhaust Steam**—This invention consists in a certain arrangement of a rotary fan in combination with a box or chamber containing a series of parallel radiators into which the exhaust steam from an engine is delivered, whereby air is drawn copiously and directly through the intervening spaces between the said radiators for the purpose of carrying off the heat from and effecting the condensation of the steam, and the said air heated by the heat abstracted from the steam is conveyed to the boiler furnace or other apparatus where such heat may be utilized. A. C. Fletcher, of New York, is the inventor of this improvement.

**Cutting out Bayonet Scabbards**—The object of this invention is to cut up a piece of leather or other material in pieces suitable to make scabbards for bayonets. The invention consists in the arrange-

ment of two sets of knives secured in oblique directions in the surfaces of two rotary cylinders, at such distances apart that the spaces between the knives on each cylinder correspond in shape and size to the blank required for a scabbard, the two sets of knives being inclined in opposite directions, those in one cylinder toward one and those in the other toward the opposite direction, in such a manner and in such relation toward each other that by the action of the two sets of knives, the blanks are cut out with both edges beveled off toward the same, say the flesh side of the skin, where leather is used and that the same can be bent up and the edges secured together, producing a flat seam. Henry D. Smith, of New York, is the inventor of this improvement.

**Siphon Filter**—The usual mode of emptying a blow-up pan is to melt the sugar in the pan and draw the sirup or liquor at or near the bottom through a strainer, thus first drawing off the dirt. The object of this invention is to draw off the sirup from the surface where it is clear, and allow the dirt to settle at the bottom of the pan, to be shoveled out after the sirup has been all discharged, and to this end it consists in a flexible pipe or a pipe with flexible or folding joints, with an outlet through the bottom of the pan and with a float and strainer at the top, the float remaining at the top of the sirup or liquor and keeping the strainer just below the surface thereof and the pipe connecting with the strainer in such a manner that the sirup or liquor passes through the strainer before entering the pipe. C. N. Brock, of Philadelphia, Pa., is the inventor of this improvement.

**Nail Plate Feeder**—J. S. Fisk, of Youngstown, Mahoning county, Ohio, has recently invented an automatic nail plate-feeder, which is highly spoken of by those who have witnessed its operations as a machine of great merit. The mechanical construction of the machine is of the first class and gives evidence of inventive talent of a high order. Letters Patent for this invention were granted through the Scientific American Patent Agency on June 30, 1863, and an engraving will appear in this paper so soon as it can be prepared.

An Immense Breech-loading Gun.

Our readers will recollect that some months ago we noticed the construction here of a steel breech-loading gun, the invention of Mr. Mann, capable of being discharged with the most extraordinary rapidity. The gun was taken to Washington and gave such satisfaction in its trial there, that Mr. Mann was commissioned to make one of the largest size on the same principle. He has been at work on the new piece for several weeks, and it is now so near completion that in a very short time it will be ready for service. The new gun will throw a ball of the elongated pattern, weighing one hundred and fifty pounds, and will, it is stated, have a range of some four miles! It can be fired with ease, and without the slightest danger, one hundred times in as many minutes, and is so simple in all its parts that it will be almost impossible for it to get out of order. It is the largest breech loading gun ever made in America, and its trial will be looked for with more than ordinary interest.—*Pittsburgh Chronicle*.

Chemical Dangers.

M. Rouelle, an eminent chemist, was not the most cautious of operators. One day, while performing some experiments, he observed to his auditors, "Gentlemen, you see this cauldron upon the brasier; well, if I were to cease stirring a single moment, an explosion would ensue which would blow us all in the air." The company had scarcely time to reflect upon this comfortable piece of intelligence before he did forget to stir it, and his prediction was accomplished. The explosion took place with a horrible crash; all the windows of the laboratory were smashed to pieces, and two hundred auditors whirled away into the garden. Fortunately none received any very serious injury, the greatest violence of the explosion having been in the direction of the chimney. The demonstrator escaped without further injury than the loss of his wig.

The continent of Africa contains over 11,000,000 square miles—being three millions more than the whole of North America.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JUNE 30, 1863.

Reported Officially for the Scientific American.

\*\* Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

39,024.—Rifling Fire-arms.—E. G. Allen, Boston, Mass.: I claim the method of rifling or grooving the barrels of fire-arms by combining the irregular gain twist, as heretofore described, with the shallow curved depression, substantially as herein shown and set forth.

39,025.—Machine for breaking and dressing Flax, &c.—S. M. Allen, Woburn, Mass.: I claim, first, In combination, a series of fluted rollers geared by a revolving fluted drum, two fluted rollers so arranged as to mesh with and be geared by respectively the first and last drum-gear roller, substantially as and for the purpose herein set forth.

Second, The combination of a series of fluted rollers arranged about a central fluted drum with one or more pairs of clusters of revolving stripping or scutching blades, arranged for operation substantially as herein described.

Third, The combination of two or more pairs of revolving scutching blades, with intermediate check rollers, arranged and operating substantially as herein described.

39,026.—Nursery Chair.—A. B. Anderson, Jr., Brooklyn, N. Y.: I claim, first, The use or employment of the secondary frame work, B, in combination with the frame-work, A, when arranged and operated as herein shown, for the purpose specified.

Second, Holding the frame-work, B, in position, when the same shall be elevated in the manner and by the means herein fully described.

Third, In combination with the cam-shaped pieces provided with the pins, I claim the sockets provided with the openings, for the purpose fully set forth.

Fourth, In combination with the frame-work, Q, I claim the use or employment of the slotted centerpieces, K, and side arms, N, for the purpose shown.

Fifth, In combination with the same, I claim the frame-work, Q, operated as shown for the purpose specified.

39,027.—Fruit or Preserve Jar.—J. S. & T. B. Atterbury, Pittsburgh, Pa.: We claim, first, The combination metallic and rubber annular band, &c. constructed in the manner and for the purpose described.

Second, The combination metallic and rubber band, &c. in connection with the beveled-edge jar cover, B, d, and jar, A, in the manner and for the purpose described.

39,028.—Drag Saw.—James Bailey, Prairie Township, Ind.: I claim, first, The arrangement of the inclined frame pieces, A, A, in combination with the upright stand, B, front and back sills, C and D, and braces, F, F, in the manner described and for the purpose herein specified.

Second, I claim the truck wheels, S, S, and handles, T, T, in combination with the arrangement of the guide, P, and braces, G and H, and saw-blade attachment, substantially in the manner and for the purpose herein specified.

Third, I claim the connecting link, C, Figs. 2 and 3, in combination with the pitman strap, A, and saw-blade strap, B, in the manner and for the purpose herein specified.

39,029.—Washing Machine.—S. M. Barnett, New York City: I claim, first, The arrangement of the reciprocating cross-head, E, provided with rubbing rollers, d, and swinging soap-box, G, and moving in the slotted hinged frame, C, which is adjustable by a treadle, D, in the manner and for the purpose substantially as shown and described.

Second, The adjustable spring, f, in combination with the soap-box, G, as and for the purpose set forth.

Third, The feed arms, H, in combination with the reciprocating rubber head, E, and soap-box, G, substantially as and for the purpose specified.

Fourth, The arrangement of the swivel arm, M, with the furnace, R, in combination with the frame, A, which carries the wash-board, B, as and for the purpose described.

[The object of this invention is to imitate by machinery the action of hand-washing, spreading the clothes to be washed, one after the other, on a corrugated or fluted wash-board on which the soap is applied and the rubbing performed, while, at the same time, the piece to be washed is fed along, causing the soap and rubbers to pass gradually over its entire surface.]

39,030.—Granary.—A. C. L. Devaux, King William-street, London, England: I claim the gran receptacle, A, when made with perforated walls and an airspace between the receptacles, in combination with the central perforated air tubes, B, as herein shown and described.

The lateral air-pipes, C, in combination with the central tubes, B, and receptacles, A, as herein shown and described.

[This invention relates to a novel construction of granaries by which perfect preservation of the grain placed therein may be insured by means of natural aeration combined with artificial ventilation. The operations of natural aeration and artificial ventilation may be employed, either separately or in combination, according to the requirements of the case.]

39,031.—Siphon Filter for drawing Sirups, &c.—C. N. Brock, Philadelphia, Pa.: I claim having the filter or filtering drawer, C, constructed with the float, D, immediately above it, in combination with the jointed pipe, B, all in the manner herein shown and described.

39,032.—Combined Pike and Revolving Fire-arm.—J. C. Campbell, New York City: I claim, first, The combination with a lance of a many-chambered cylinder of similar character to that of a revolving fire-arm, fitted to rotate upon the pole or shaft of the lance, substantially as heretofore described.

Second, The combination of the series of ratchet-like teeth on the rear of the so-called many-chambered cylinder, the sliding hammer and the spring, substantially as and for the purpose herein specified.

Third, The movable spike fitted and secured in the butt of the lance, pole or shaft, substantially as and for the purpose herein specified.

39,033.—Tape Fuse.—J. E. Chase and Joseph Toy, Simsbury, Conn.: We claim the employment, as a covering for fuse, of tape composed