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## NEW PROSPECTUS OF THE SCIENTIFIC AMERICAN.

FOURTEENTH YEAR!

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FARMERS AND MANUFACTURERS.

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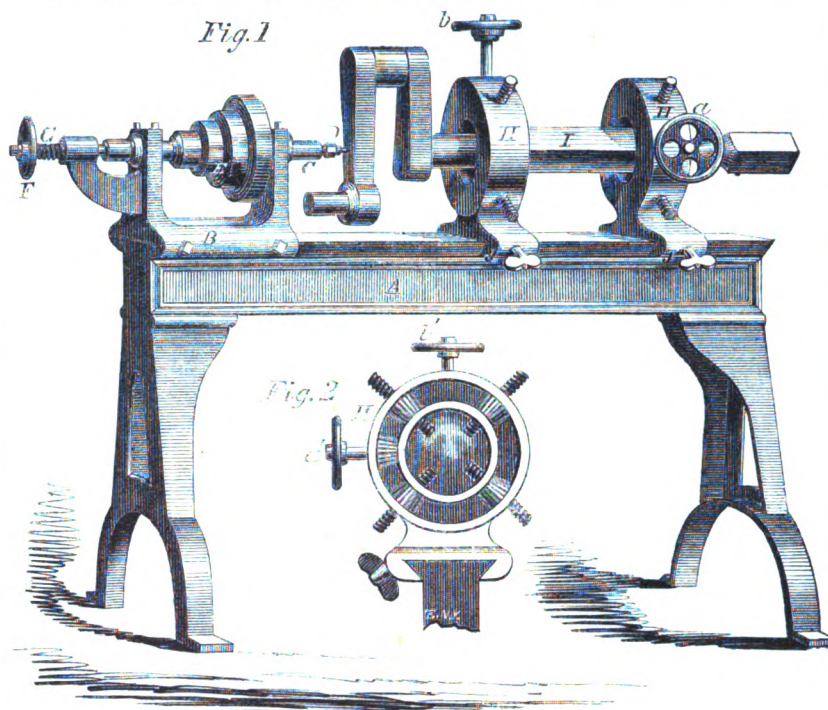
### Improved Centering Lathe.

The lathe which is the subject of our illustration is so constructed as to bore centers in line with the geometrical center of any desired part of both regular and multiform objects. It often occurs that the object to be centered is of such form that some of its sections are eccentric to others, and it is indispensable that the centers be bored not concentric with the end, but eccentric to it, and concentric with some particular part which may be in the middle or more or less distant from the end. An object having some of these peculiarities is seen at I, Fig. 1. The object above explained, which has been hitherto accomplished by much manual labor, these inventors—G. Henderson and J. Steetle, of Alleghany City, Pa.—effect by the machine shown in perspective in Fig. 1.

The article to be centered is supported in the lathe by the part with which the centers are to be bored, in one of the concentric chucks, which are combined with a lathe and boring tool in line with the centers of the chuck.

A is the frame of the lathe, having a head, B, in which a spindle, C, revolves, holding a boring tool, D, by means of cone pulley, E.

## HENDERSON & STEETLE'S CENTERING LATHE.



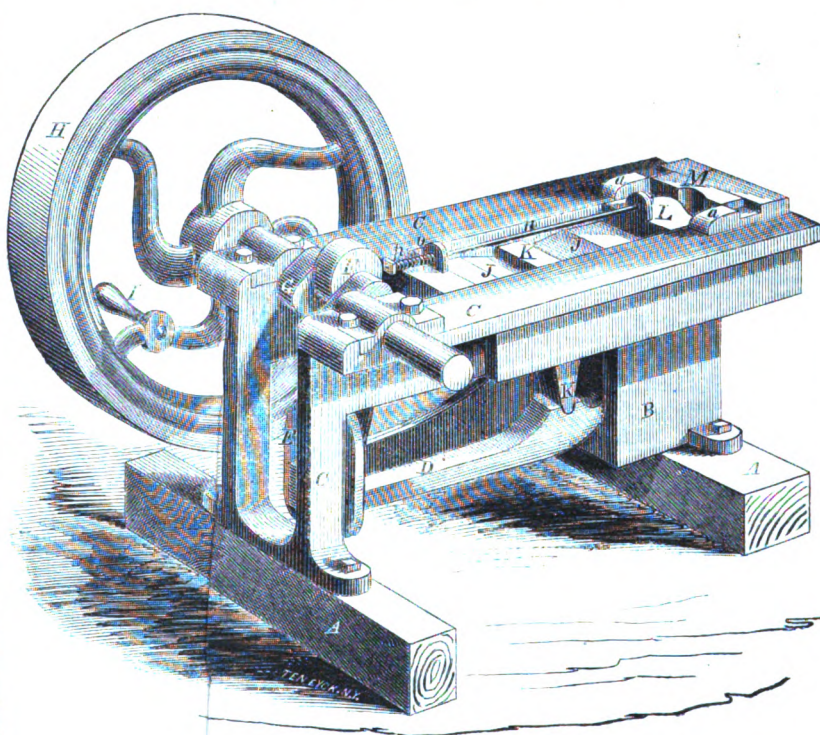
The tool, spindle and pulley are moved back and forth by the screw, G, and hand-wheel, F. H H are two concentric chucks made to slide along the bed of the lathe, to which they can be secured in any position by screws, J; a and b are hand wheels to secure the object in the chuck after it has been adjusted by the screws seen in Fig. 2, which is a front view of a chuck.

The operation is simple, the piece, I, being

secured in the chucks, H, in the desired position; the boring tool is brought in contact with it, bores a center coincident with the geometrical center of the chucks, without reference to the shape, size, or position of the object.

This lathe was patented by the inventors July 6, 1858, and by addressing them as above, any information or machines can be obtained.

## BLAKE'S STONE BREAKER.



The great necessity which exists for a good and efficient stone-breaker is appreciated by all engineers, roadmasters, and lime burners, and at last the want has been supplied by Eli W. Blake, of New Hæm, Conn. The qualities necessary in a good and efficient machine are that it should be strong, durable, and compact, and that it should exercise a great force through a small space. The stone-

breaker which is the subject of our illustration fulfills all these conditions, and not only breaks the stone or other hard substance, but delivers them nearly all of equal size, which can be easily regulated by the attendant or operator placing in breaking blocks of proper size.

Our illustration is a perspective view of one of these machines resting on two wooden

blocks, A, the rest of the machine being cast iron. B and C are supports of the frame, C, B being also the box or space in which the crushing jaw works. D is a lever, one end of which rests upon B, and the other is held in a link, E, which hooks at F on to a crank, G, rotated by a fly wheel, H, and handle, I, or other means. In a semi-circular recess in D, the piece, K, fits, and two pieces, J, one each side of N. These pieces have rounded ends, and they fit or move in semi-circular grooves in the back of the frame, o, and the breaking jaw, L. This jaw is of chilled iron, as are the block, M, and side blocks, a. From the jaw, L, a rod, n, extends back, and a spring, p, has always a tendency to draw it back nearer the back, o. The jaws are nearer each other at the bottom than at the top, so that as the stones are dropped between the jaws they will first be broken a little, and as they fall down between the jaws by their own gravity, they will be broken more, until they are sufficiently small to pass out on to a screen beneath, or on to a simple heap.

The operation is simple and perfect. The rotation of the wheel elevates the link, and with it the lever, D, and piece, K, which presses J J out, and so pushes L nearer M, the force exerted breaking the stones between the curved surfaces of the jaws. There has been one of these stone-breakers at the Central Park in this city some time, where it has given the greatest satisfaction.

It was patented June 15, 1858, and any further information may be had by addressing the inventor as above.

### Effect of Heat upon Meat.

Professor Johnston, in his "Chemistry of Common Life," says that a well cooked piece of meat should be full of its own juice, or natural gravy. In roasting, therefore, it should be exposed to a quick fire, that the external surface may be made to contract at once, and the albumen to coagulate, before the juice has had time to escape from within. The same observations apply to boiling; when a piece of beef or mutton is plunged into boiling water the outer part contracts, the albumen which is near the surface coagulates, and the internal juice is prevented either from escaping into the water by which it is surrounded, or from being diluted or weakened by the admission of water among it. When cut up, therefore, the meat yields much gravy, and is rich in flavor. Hence a beefsteak or mutton chop is done quickly, and over a quick fire, that the natural juices may be retained. On the other hand, if the meat be done over a slow fire its pores remain open, the juice continues to flow from within as it has dried from the surface, and the flesh pines and becomes dry, hard, and unsavory. Or, if it be put in cold and tepid water, which is afterwards brought to a boil, much of the albumen is extracted before it coagulates, the natural juices for the most part flow out, and the meat served is in a nearly tasteless state. Hence to prepare good boiled meat it should at once be put into water already brought to a boil. But to make beef tea, mutton broth, and other meat soups, the flesh should be put into cold water, and this afterwards very slowly warmed, and finally boiled. The advantage derived from simmering—a term not unfrequent in cookery books—depends very much upon the effects of slow boiling, as above explained.

AN ELEPHANTINE PASSENGER.—Amongst the passengers at the Lyons (France) railway terminus, a short time since, was an elephant, booked from Abyssinia to Paris.



[Reported officially for the Scientific American.]

**ESCAPE**—Owen Sweeney, of Brooklyn, N. Y.: I claim the drum, D, with rope, E, attached, brake, F, and compensating spring, J, and vibrating or tilting plat-

form or board, C, placed within the box, A, combined and arranged to operate as and for the purpose set forth.

I further claim the particular arrangement of the rack bar, H, pall, I, platform or board, C, and strap or brake, F, as shown, whereby the person that descends solely by his own gravity releases the drum from the brake, and causes the car or basket to ascend, and also by the same means regulates for his descent the pressure of the brake on the drum, as described.

[A drum with a rope and basket attached, a brake and platform, compensating spring, are employed in this invention, so arranged that a person can descend from a window in the upper stories of a building with perfect safety, the device being automatic in its action, requiring no attention after it has been once attached to the window sill.]

**WATER METERS**—Franklin A. Tenney, of Concord, N. H.: I claim the arrangement of the shifting weight, e, the spring valves, l, and the pins, k, k', or the equivalent of said parts, with the double chambered vessel, B, substantially in the manner and for the purpose set forth.

**APPARATUS ATTACHED TO STEAM COILS IN VATS**—John Frager, of New York City: I do not claim arranging steam coils on shafts or journals to swing to a vertical position, for the purpose of cleaning out the vessels in which they are placed.

But I claim providing ratchets, l, on the peripheries of the couplings, and palls, j, j', attached to the stationary supply and escape pipes, a, b, to prevent the working loose of the coupled joints by the swinging of the coil.

[This invention consists in a novel arrangement of the pipes, journals, and joints of a steam coil, whereby a uniform distribution of heat throughout the whole horizontal area of the boiling or heating vessel is obtained. Provision is also made for raising the coil to clean the bottom of the vessel, without any danger of disturbing the joints, and great facility is afforded for applying the coil within the vessel.]

**COMPOSITION FOR MINIATURE CASES, &c.**—Mark Tomlinson, of Birmingham, Conn.: I do not claim broadly the employment of shellac in compositions. But I claim the composition for useful and ornamental articles, made of shellac, Breckenridge or Cannel coal, and ivory black, in about the proportions and in the manner substantially as set forth.

[This composition consists of equal parts, by weight, of shellac, Breckenridge or Cannel coal, and ivory black. The shellac and Cannel coal are first finely pulverized, separately, and the three ingredients are then well mixed together, and fed between a pair of steam heated rollers, one of which rotates at a higher velocity than the other, and thereby ground into a pasty mass, which, while still hot and plastic, is cut or divided by a spatula or other instrument into cakes of sufficient size to form the articles or pieces to be made. These pieces are laid up on a plate or tray, and placed in an oven heated by steam or other agency, and allowed to remain therein a short time, after which they are taken out, and while still hot are placed in steam heated dies of the requisite form to produce the articles or forms desired, and therein subjected to a heavy pressure. The pieces or articles are then allowed to cool in the dies to a degree sufficient to enable them to be taken out without any danger of bending, or otherwise injuring their form.]

**TEMPERING WIRE AND STEEL**—Henry Waterman, of Brooklyn, N. Y.: I claim the process of hardening steel wire or thin steel, in long sections, being kept under a longitudinal strain by means of the wheels, D, D', while passing through the fire in the furnace, C, the guide, H, to conduct the wire directly from the fire into the hardening bath, in combination with such hardening bath as specified.

**CORN PLANTERS**—Horace Whitman, of Kingsville, Ohio: I claim the adjustable or articulating frame, C, hinged to the machine, and provided with teeth and blades in combination with the rock shaft, Q, weighted lever, T, and lever, I, when arranged in relation to a seeding machine, substantially in the manner and for the purpose specified.

**CORN SHELLING MACHINES**—Loren J. Wicks, of Racine, Wis.: I claim the employment of the screen, Q, in the apron, P, in connection with the tube, N, provided with valves, O and O', and grating, T, when the several parts are constructed and arranged with respect to each other, and to the shelling wheel, F, and cylinders, D and D', and operated conjointly therewith, in the manner and for the purpose specified.

**ATTACHMENTS TO ARTIFICIAL LEGS**—Oliver David Wilcox, of Elmira, N. Y.: I claim providing for the adjustment of the sack, H, by means of straps and buckles applied substantially as described.

[This invention consists, firstly, in a certain system of levers connecting the leg with the thigh piece and foot, for the purpose of controlling the proper operations of the leg and foot in walking. It also consists in the employment of a spring to give elasticity to the ankle joint. It further consists in providing for the adjustment of the sack, which the inventor patented September 30th, 1855, to adapt it to the condition of the stump, by means of straps and buckles.]

**LOCOMOTIVE ENGINES**—Ross Winans, of Baltimore, Md.: I do not limit myself to the precise form and construction of the parts which I have described, as these may be varied without affecting the principle of my invention.

But I claim the combination with the smoke box of a locomotive steam engine of a blast pipe, extending from within the lower end of the chimney downwards to near the lower flues, an annular space between the upper end of the blast pipe and the chimney, a diaphragm near the lower end of the blast pipe and between the latter and the bottom of the smoke box, and a nozzle directing a jet of steam into the blast pipe, the several elements of the combination being arranged and operating substantially as described.

I also claim the construction of the diaphragm with its upper surface sloping towards the exhaust nozzle, to cause the coals and cinders to run down by their own gravity beneath the blast pipe, thereby bringing them within the sweep of the draught, and so rendering their discharge more speedy and more certain.

**OBSTETRICAL CHAIRS**—C. C. Wings, of Newport, Va.: I am aware that obstetrical supporters have been used with pads on the back and in front of the knee of the patient, and have been operated by means of straps and handles so far as to produce results somewhat analogous to those produced by my arrangement. I therefore do not claim as new any and every arrangement of the pads and straps which would produce like results.

But I claim passing the strap or cord, b, through the standard, H, of the portable chair, at a point on a level, o, a level or nearly so with the pad, o, and the cord, a, around a pulley in the back of the chair, and a little above the seat of the same, substantially as described, so that the operation of the straps or cords will be in the direction in which the support is most needed, and the counter pressure, produced by the action of the two pads, o and G, may have the fullest effect.

I also claim the adjustable hands slats, c, c', and the foot pieces, J, J', when arranged and combined with a portable chair, substantially as described, for the purpose of adapting the chair to different persons.

**MACHINE FOR SETTING THE STAPLES IN BLIND SLATS**—James Wyman, of Schaghticoke, N. Y.: I claim, first, the arrangement and combination of the vertically sliding punch, D, spring supporting and stop bar, F, spring feeding slide, G, and grooved sliding bar or anvil, B, substantially as and for the purpose set forth.

Second, in combination with the above, the ratchet teeth, K, of the sliding bar or anvil, B, dog, M, spring pawl, L, and adjustable gauge plate, N, substantially as and for the purposes set forth.

**LOCK**—Hjalmar Wyblad, of West Hoboken, N. J.: I am aware that revolving wheel plates, with recesses on the periphery to receive the end of a pendular lever, have been used, and do not claim the same.

But I claim the arrangement of tumblers provided with cogs and notches, in connection with a projection on the bolt, and operating in the manner and for the purpose substantially as described.

**WATER CLOSET**—Isaac Edelman (assignor to G. W. Edelman), of Philadelphia, Pa.: I claim the casing, G, pipe, F, soil pipe, H, and exterior pipe, I, when constructed and arranged with respect to each other, and when communicating with a ventilating pipe or flue, substantially as and for the purpose set forth.

**VALVE GEAR OF STEAM ENGINES**—James Ferguson, (assignor to himself and Lazell, Perkins & Co.) of Bridgewater, Mass.: I do not claim any of the mechanism described for operating the steam valves, as it differs little from the mechanism commonly employed for working valves with a tripping motion, nor do I claim, generally, operating valves by cams and yokes.

But I claim the employment of cams, E, E', of the form specified, applied in the manner described, to connect the valve stems with the rock shafts, D, D', which receive the tripping motion for the purposes set forth.

[This is a useful improvement in valve gear for engines, and cannot well be described without drawings.]

**CHAIN STOPPER**—Wm. H. Gray, of Dover, N. H., assignor to himself and A. G. Brown, of Salem, Mass.: I claim the improvement in chain stoppers described, which consists in hanging the butt of the pull on bearings cast on the inside of the two supporting standards or ears, in combination with the shoulders, h, h, on said pull bearing against said standards, as described, the whole being arranged and operating as specified.

**APPARATUS FOR BROILING, TOASTING, &c.**—H. W. Harkness and W. A. Tutty (assignors to themselves and Joseph Sigourney), of Bristol, Conn.: We claim the described broiling and toasting apparatus, consisting of case, C, clock movements, D, arms, H, spindle, A, pins, c, arranged and operating substantially in the manner and for the purpose set forth.

**ANCHOR BALL**—H. W. Harkness, of Bristol, Conn., assignor to himself and J. W. Bliss, of Hartford, Conn.: What I claim is, as a new article of manufacture, an anchor ball, A, with flukes, C, springs, D, grooves, B, staple, F, substantially in the manner and for the purpose described.

**SEWING MACHINES**—T. D. Jackson (assignor to J. W. Bartlett), of New York City: I claim, first, The employment of a yielding roller constructed as described, for the purpose of closing the barb of the needle during its movements, substantially as set forth and specified. Second, And in combination with a yielding roller, the swinging thread guide, to carry the thread in position for the needle to insure the stitch, as set forth.

**CUT-OFF VALVES OF STEAM ENGINES**—John Jackson, Jr., of Newburyport, Mass., assignor to himself and E. H. Ashcroft, of Boston, Mass.: I do not claim the devices or mechanism covered by the patents before mentioned.

But what I claim is my improvement or the combination of the levers, S and T, and the collar, U, as arranged and applied to the rod, R, of the ball governor, and to the slide rod, A, of the inclined plane, C, substantially in manner as specified.

**HORSE COLLAR BLOCKS**—B. W. McClure and George Marsh (assignors to B. W. McClure and I. H. Windsor) of Pike Hollow, N. Y.: We are aware that the individual members of this machine are not new, and hence we do not claim them as such.

What we claim is the peculiar arrangement of the mold block, B, and rim setter, C, with the cord, a, and stretcher, D, when the same are constructed, operated and combined in the manner set forth and for the purpose described.

**TRAP FOR ANIMALS**—Frederick Renthe (assignor to M. Lath) of Hartford, Conn.: What I claim is the notched curved yoke, B, and the application and combination of the various parts to form a rat trap, in the manner and for the purpose substantially as set forth and described.

**CARPET STRETCHER**—Henry Ridley (assignor to S. P. Thatcher and Walter Stillman), of Hartford, Conn.: I do not claim either of the devices separately considered, as described in my specification, as I am aware that they have been used before separately and for different purposes, as for instance that described and represented in "Nichols's Operative Mechanic," American edition, p. 357, 358.

But I claim the construction and arrangement of the clamps, I, strap, H, wheel, C, ratchet, E, pawl, G, in the frame work, A, B, substantially as and for the purpose as described.

**BURNISHING MACHINE**—L. S. White (assignor to E. W. Sperry, E. Hurlbut and J. H. Ashmead), of Hartford, Conn.: I have described this machine as specially adapted for burnishing spoons, oval handles, &c. It will readily be seen and understood that variations must be made for different kinds of ware, also that the same motion may be produced by different device. I do not therefore wish to confine myself to the particular way or mode of operating as described, as, for instance, the revolving motion of the jack may be produced by arms, levers, &c., instead of gear. Thus it will be seen by the use of this machine, the work of burnishing, hitherto unpleasant and disagreeable, can be rapidly and perfectly performed by machinery which hitherto has been done successfully only by hand work.

What I claim is the grinding or rolling jack, H, and the oscillating or vibrating rack, E, substantially in the manner and for the purpose as described.

#### RE-ISSUES.

**MANUFACTURE OF HARD RUBBER GOODS**—Gustavus Coppers, of College Point, N. Y. Dated July 20, 1855: I claim the improvements in the hardening and vulcanizing of India rubber or gutta percha, by which the manufacture of perfectly shaped articles may be facilitated, substantially as described.

**PUMPS**—Hoses Lindsey, of Ashville, N. C. Dated Dec. 4, 1855: I claim, first, The combination and arrangement of the vertical central conducting pipe, C, horizontal double chambered or double valve-receiving and supplying cylinder, K, two alternately reciprocating pistons or plungers, F, F, and piston connecting and guide rods, G, G, substantially as and for the purposes set forth.

Second, Effecting the reciprocation of the piston or pistons, F, F, by means of a curved inclined plane, I, arranged horizontally on the bottom of the well, substantially as and for the purposes set forth.

#### Keeping the Teeth Clean.

Microscopical examinations have been made of the matter deposited on the teeth and gums of more than forty individuals, selected from all classes of society, in every variety of bodily condition, and in nearly every case animal and vegetable parasites have been discovered. Of the animal parasites there were three or four species, and of the vegetable, one or two.

In fact, the only persons whose mouths were found to be completely free of them, cleansed their teeth four times daily, using soap. One or two of these individuals also passed a thread between the teeth, to cleanse them more effectually. In all cases the number of parasites was greater in proportion to the neglect of cleanliness. The effect of the application of various agents was also noticed. Tobacco juice and smoke did not injure their vitality in the least. The same was true of the chlorine tooth wash, of pulverized bark, of soda, ammonia, and various other popular detergents. The application of soap, however, appears to destroy them instantly. We may hence infer that this is the best and most proper specific for the teeth. In all cases where it has been tried it received unqualified commendation. It may also be proper to add that none but the purest white or Castile soaps should be used. We have been in the habit of using finely pulverized charcoal for this purpose, and have found it a most excellent dentifrice.

#### First Maple Sugar.

The important discovery that sugar can be made from the maple tree has been attributed to New England, and its date fixed as far back as 1765, in an article which has gone the rounds of the press. This statement has called forth a unanimous, indignant and patriotic protest on the part of the French Canadian press, and with pleasure we give currency to their claim for priority of discovery. They state that maple sugar was in general use in Canada previous to the Revolution, and long before *Dudley's Register* recorded, in 1765, its first manufacture in New England. Indeed, the Jesuit priest Charlevoix, in his *History of New France (Canada)*, wrote as early as 1721 an account of the process by which the sugar was obtained, stating that the sugar was unknown to the Indians, thus favoring its French origin. All honor, then, to the French Canadians for the maple sugar, unless our New England cotemporaries have records to substantiate their claim beyond the year 1721.

#### Cotton Manufacture.

The best cotton now costs, when delivered either in Providence or Boston, 13½ cents per pound. It has been steadily advancing in price for eight or ten years, notwithstanding a rapid increase of production. In 1848, the crop exported from the United States was 814,274,000 lbs.; the average price was 7-81 cents per lb. The crop of 1846 exported was 1,351,131,701 lbs., at 9-41 cents per lb. The exports of 1857 were 1,048,282,475 lbs., at 12-55 per lb. The home market in 1856 absorbed 640,000 bales of 400 lbs. each, or little less than one-sixth of the entire crop. At present prices, this amount of raw material would be worth \$31,000,000. It is impracticable to ascertain what additional value is given it by the labor, skill and ingenuity bestowed upon the manufacture, but it is probably no exaggeration to estimate the gross proceeds of this branch of industry in the New England States at \$150,000,000 per annum.

#### The Value of Coal.

Ere we wrap up this carboniferous integument of the landscape (says the eloquent Hugh Miller), let us mark to how small a coal field England has, for so many years, owed its flourishing trade. Its area, as I have already had occasion to remark, scarcely equals that of one of the larger Scottish lakes; and yet how many thousand steam engines has it set in motion; how many railway trains has it propelled; how many thousand wagon loads of salt has it elaborated from the brine; how many million tons of iron has it furnished, raised to the surface, smelted and hammered? It has made Birmingham a great city, the first iron depot of Europe, and filled the country with crowded towns and busy villages. And if one small field has done so much, what may we not expect from those vast basins laid down by Lyell in the geological map of the United States?

#### Important Hint in Washing Clothes.

The *American Agriculturist* asserts that the great secret of the success of nine out of ten of the washing fluids, mixtures, and machines which have been sold over the country for many years past, is not owing so much to the inherent qualities of the articles themselves as to the process of soaking, which they invariably recommend. If people pursuing the old-fashioned system of washing will simply take the precaution to throw all the clothing to be washed into water ten or fifteen hours before beginning operations, they will find half the labor of rubbing and pounding saved in most cases. Water is, of itself, a great solvent, even of the oily materials that collect upon clothing worn in contact with the body, but time is required to effect the solution. Every one is aware of the effect of keeping the hands or feet moist for a few hours—the entire external coating of secretion is dissolved. The same effect is produced by soaking for a few hours clothes soiled by the excretory matter of the skin.

**QUEEN VICTORIA ACCEPTING A MECHANIC'S HOSPITALITY.**—The English papers state that Queen Victoria has accepted the offer of Woodsey House, the residence of the Mayor of Leeds (Mr. P. Fairbairn), on her next visit to that town. Mr. Fairbairn is a manufacturer of machinery for woolen mills—a mechanic, in fact. This is probably the first time in the history of England that a reigning sovereign has accepted the hospitalities of any but nobles.

**SOMETHING USEFUL.**—The *Green Lake Democrat*, published at Berlin City, Wis., asserts that there are probably more well preserved volumes of the *SCIENTIFIC AMERICAN* in the United States than of any other weekly publication ever issued, and the causes which have led to their preservation are attributed "its exceeding usefulness as a work of reference upon machinery and patents, its well executed illustrations of new inventions, the clearness with which they are described, and the exceeding beauty of its typography."

**STEAM SLEIGHS.**—A Polish exile in Siberia has invented a means of applying steam power to the traction of sleighs, by which journeys can be made with rapidity over the frozen snows and the steppes covered with ice, which abound in the Russian dominions. Such an invention, it seems to us, might be valuable in this country for winter traveling over our broad prairies and ice-bound lakes.

**FALL OF CEILING.**—On the evening of the 16th of July a portion of the rich ceiling of the British House of Lords fell between two noblemen, who had a narrow escape—the falling mass actually grazing the head of the Earl of Shelburne. The fragment which gave way had "*Dieu et mon Droit*," in gothic characters inscribed upon it.

**PROCESS OF RENDERING LARD.**—Charles Wilson, administrator of Ebenezer Wilson, deceased, has applied to the Patent Office for an extension of the patent granted for the above process. The petition is to be heard at the Patent Office on the 20th of September next. This is an important patent, and much interest is felt in reference to it by parties engaged in the business.

**NEW BULLET CASTING MACHINE.**—A Berlin engineer has, it is said, invented a machine which can be worked by two men in the field, and will turn out 4,000 Minie rifle bullets per hour. Quite as much can be done by well-known machines invented in this country.

**A WINE COMPANY** has just been organized in Alabama, with a capital of \$25,000, all of which has been subscribed. It is called the "Mobile Wine Company," and has for its objects the growth and production of native wine.

ONE hundred and twenty vessels, loaded with 20,000 tons of coal, were entered at Boston in one day.



## New Inventions.

### Important Improvement in Steam Boilers.

The amount of fuel which is but half consumed, and remains as coal unburnt in the fire-box of a boiler, or escapes as smoke and carbonic oxyd instead of carbonic acid through the chimney, must, when we consider the number of boilers used for stationary, locomotive and marine engines, be immense. To save fuel has been the attempt of every person who has endeavored to improve the steam engine during the last few years, but the majority of inventions have had relation to attaining greater mechanical perfection in the engine, and although these inventions may do much, yet the chief waste of heat is not in the engine, but in the steam generating apparatus, to which part Mr. F. B. Blanchard has directed his attention. It has been laid down as a principle by one of the most eminent writers on the steam boiler and furnaces, that an artificial draft produced more perfect combustion than a natural one, and the excessive heat of the blast furnace, which, capacity for capacity, burns but little more than the reverberatory, whose heat is much lower, may be adduced as an illustration of the fact, and the invention which is the subject of our illustrations takes the fullest advantage of this principle.

Fig. 1 is a top view of the boiler and superheaters; Fig. 2 is a vertical longitudinal section of the same; Fig. 3 is a front view of the boiler, and Fig. 4 is a cross section of the boiler.

A is the fire-box and B the boiler; C is the front plate of the boiler in which are fire and ash doors, D, that close air tight, so that no air can go through them to supply the furnace, and they are only opened to start the fire or rake the bars, E, which are arranged as seen in Fig. 4. The coal is fed from the deck by means of a feeder, F, which is a tube or spout provided with two valves, *a* and *d*. The two arms, *c*, connected at the top, have between them a roller, *b*, which, pressing upon *a*, keeps it tight down, and this being thrown back, *a* is opened, and coals placed in, so as to fill the space between *d* and *d'*; *a* is then closed, and the frame and roller, *c b*, put over it and *d* is opened, the coal falling on the distributor, *e*, which is shaken by the axle, *f*, passing through stuffing boxes outside the boiler, and so the fuel is projected evenly over the fire. The air is supplied underneath the fire bars by a pipe, H, from an air-pump worked by the engine, and keeping the fire-box full of air at about 1 to 1½ pounds pressure. The tube, G, communicates with H, and by the regulator or the cock, *g*, a given quantity of air can be supplied above the fire. The products of combustion pass through the tubes, I, into the smoke box, J, and when the fire is lighted the valves, *k k'*, are opened by the lever, *j*, and rod, *i*, to produce a direct draft up the chimney, O; when the fire is going the doors are closed, the air sent through from the air-pump, the valves, *k* and *k'*, closed, and the products of combustion pass through the return flues, K, into the box, L, which is covered with water, and from it through two flues, M, into the superheaters.

The steam when generated passes from the chamber, N, through the pipe, P, into the superheater, Q, and after it has received an additional quantity of heat from the products of combustion, it is conveyed through R to a high pressure engine. From this it comes back through the pipe, P', into the superheater, Q', and after receiving a quantity more heat to compensate for the loss sustained in the high pressure engine, and passes through pipe, R', to the low-pressure beam engine.

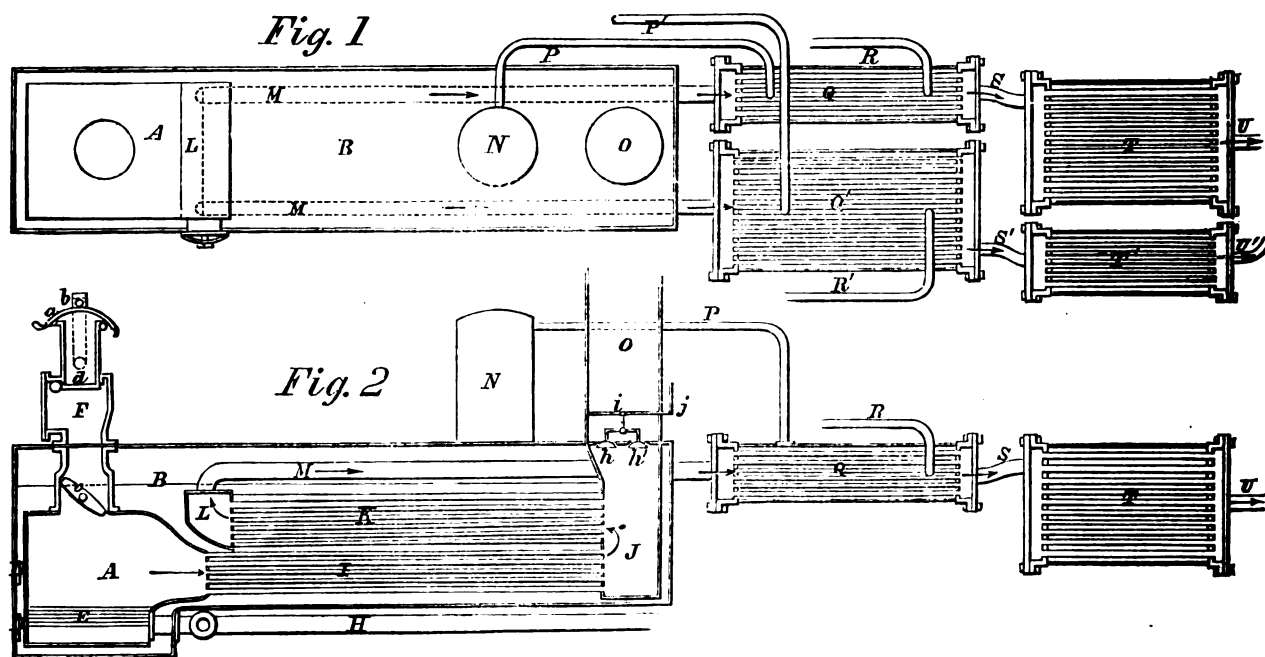
The products of combustion, after having heated the steam, are not yet to be thrown away, but are made to pass through tubes, S S', into heaters, T T', where the feed water and feed air are heated to a proper tempera-

ture, and they finally pass out by tubes, U U', into a small smoke pipe not over six inches in diameter, from which there issues, not smoke and carbonic oxyd, or flame, but nearly pure carbonic acid, at a temperature but exceeding that of the atmosphere a few degrees, showing the perfection of the combustion in the furnace, and great economy in the application of the heat.

Perhaps the best method of illustrating the many advantages of this arrangement will be to state some data made from hourly observations by ourselves on board the *John Faron*, on a trip from this city to Albany on Aug. 21, and all our mechanical readers will from them be able to judge for themselves of its great merits. The boat is not built for speed, and is 145 feet keel, 24 feet beam, and draws

about four feet of water. The cylinder of the engine is 36 inches in diameter and has 8 feet stroke; it is not particularly well framed, and was not built specially for Mr. Blanchard's improvements. With the ins and outs which we made to landings, the distance was about 160 miles, which we accomplished in twelve hours. The amount of coal used was 6,074 pounds or 467 pounds per hour, running time,

### BLANCHARD'S IMPROVEMENT IN STEAM BOILERS.



from which must be deducted 446 pounds of coke and wood for kindling and 996 pounds of coal to start the fire, and 905 pounds of coal and ashes were taken from the furnace at the end of the trip.

The average pressure in the boiler was 64.7 pounds, and in the cylinder it varied at the different positions of the stroke from 30.8

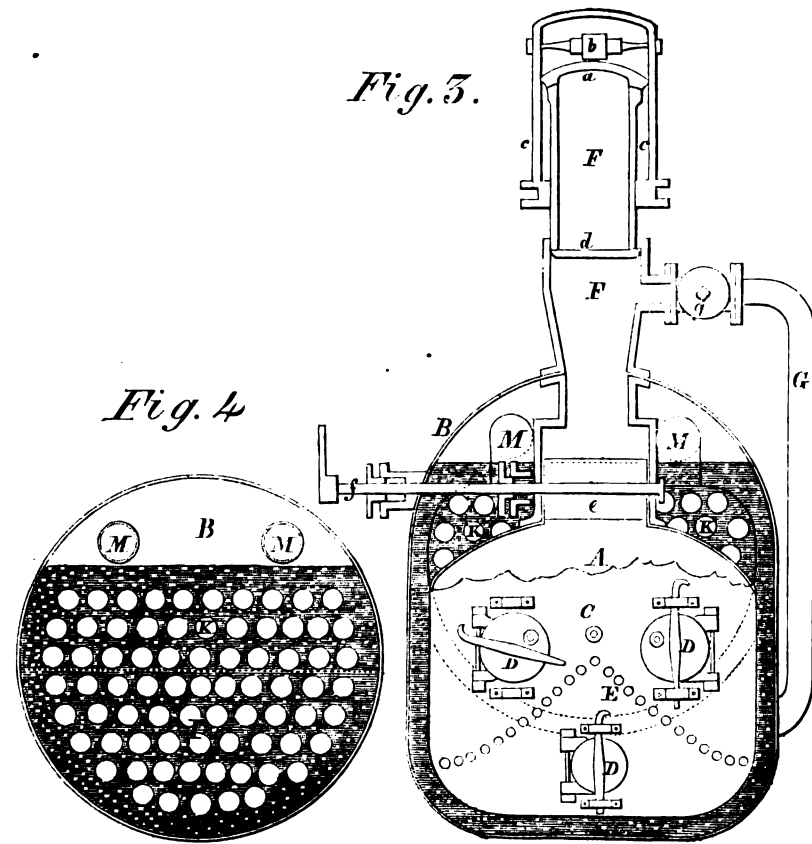
pounds to 38.0 pounds, having a temperature of 340°. The great point, however, was that the coal was weighed, and the water measured, and 12½ pounds of water were evaporated for every pound of coal, and the steam was heated 80° above the initial temperature. Calculating the horse power of the engine in the usual way, from the number of strokes

four inches square was placed across the machine used for proving chain cables, and a piece of chain was attached to a ring fixed in the center of it. A strain being laid on, the oak broke under a force of 3,900 pounds, the teak with that of 7,200 pounds, and the Honduras mahogany of 7,460. The oak and teak appeared as if crushed, but without a complete disjunction of the fibers; the mahogany showed long splinters, indicating a much longer grain or fiber than the others. M. Arman considers this result as a conclusive proof that mahogany is superior for many kinds of ship-building purposes, and although it is less flexible than good French oak, its permanent resistance under a direct strain is more considerable. MM. Le Mire & Son, builders at Rouen, also confirm the opinion of M. Arman, by giving an account of the results obtained in the use of mahogany in a vessel which they had built, the *Adele*, just returned from a long voyage. The captain, in a letter to the builders, gives a most satisfactory account of the state of the vessel, and expresses his decided opinion that the use of oak in ship-building may be advantageously replaced by mahogany.

**ALUMINUM.**—A new alloy under the name of "bronze aluminum" has been produced by M. Delalonne, of Valenciennes. It consists of one-tenth aluminum and nine-tenths copper; has the appearance of pure gold, is remarkably easy to cast and chisel, and is much less subject to oxydation, discoloration, &c., than ordinary bronzes or brass castings. It is suggested that this bronze, which is very hard, might be advantageously used for the bearings of machinery.—*Exchange*.

We think that the inventor is not M. Delalonne, but Dr. Percy, the English metallurgist, who exhibited this same material, or one having a similar composition, nearly three years ago at the Royal Institution, London.

**REWARD TO THOSE FORMING CLUBS.**—Any person who will get up a club of ten or more subscribers at our clubbing rates, can add his own name to the list, and we will send him the *SCIENTIFIC AMERICAN* free so long as the club is kept up. Will not our friends be induced to go to work and get up clubs on these terms? Do all you can for us this year.



per minute, the area of the piston and pressure of the steam, and then deducting one-tenth for friction, we find that it is about 300 horse power, which gives the extraordinary result, that by Mr. F. B. Blanchard's arrangement only 1.7 pounds of coal per horse power per hour were used on that trip.

The inventor obtained a patent in this country July 10, 1855, and two in England and France, and he is about applying for some others here. Any further information can be

obtained by addressing F. B. Blanchard, box 2,454 Post Office, New York.

### Timber for Ship-building.

The increasing scarcity of good oak timber for ship-building, says the *London Engineer*, induced M. Arman, the well-known ship-builder at Bordeaux, to make some experiments last year to ascertain the strength of mahogany as compared with French oak and teak. A piece of each kind of wood about

## Scientific American.

NEW YORK, SEPTEMBER 4, 1858.

## Valedictory.

"All's well that ends well!"

We close the Thirteenth Volume of the SCIENTIFIC AMERICAN with this number. The curtain drops upon a year remarkable for some of its events; and as we glance cursorily over its history, and connect the several years of our varied and interesting experiences, the incidents, the toils, the pleasures, and the pains so mix themselves together and so crowd upon us, that we scarcely know where or how to begin our retrospect.

The progress of science during the last thirteen years has been marked by startling strides, and each great discovery or invention seems more like the dream of some visionary than one of the wonderful and tangible realities which almost daily spring into existence, to mark the mighty triumphs of mind over matter. Could some skillful painter depict upon his glowing canvas the myriad mutations that have occurred in the affairs of our own country since the close of the Revolution which introduced us into the great family of nations, and by an artistic array of scenes, actual and ideal, display the principal agencies that have combined to produce our present national greatness—how deeply would our minds become impressed by the contemplation! In the marvelous results that have been accomplished, it is true that money, and business talent, and experience have each played a conspicuous part; yet it cannot be denied that the *inventive genius* of the American people has been the secret and omnipotent mainspring of that machinery of means which has operated to place them in their present elevated scale. Genius is the master-spirit of all progress—the brilliant planet in comparison with which all other agencies are but the satellites. Wherever the track of true social, moral, and intellectual progress is perceived, there also will be seen the early footprints of the man of genius—the inventor. It needed the workings of such a mind to project the Steam Engine and render it subservient to the uses of industry and commerce. It required the magic power of inventive genius to produce the Electric Telegraph, by which the very lightnings of heaven are transformed into the fiery-tongued messengers of men. It employed the mental skill and patient toil of sons of genius to devise the Plow, the Printing Press, the Reaper, the Loom, the Sewing Machine, and the thousand of other valuable contrivances which enter into the daily service of man, and contribute to his comforts, luxuries and actual necessities. Thus might we go on, almost interminably, to show that, in all questions of real material progress, in the world of science and art, the inventive genius of our people is the principal pillar of our country's greatness. What stronger proofs of this can be found than those which have been inscribed upon the pages of the SCIENTIFIC AMERICAN during the last thirteen years? How abundant is the testimony which they bear to the achievements of American inventors!

The end is not yet. "Progress" is the watchword. Although the much-sought channels of discovery may seem to have been exhausted of their treasures by the pioneers of progress, there yet remain innumerable fields of facts to be explored by men of genius; difficult problems remain to be solved, and vast results are yet to be elicited.

We shall enter on our Fourteenth Volume with the determination to make it not inferior to any of its predecessors. We shall think, and toil, and labor, day and night, to benefit the mechanics and inventors of our country, and shall carefully and closely chronicle the progress of art and science, at home and abroad. All we ask in return is that cordial fellowship and hearty support may be extended to us, by all our old friends and thousands of new

ones. Soliciting the influence of each of our readers, in extending among their acquaintance a knowledge of the benefits which may be derived from the information contained in the SCIENTIFIC AMERICAN, we assure them that our aim shall ever be to—

"Find tongues in trees, books in the running brook,  
Sermons in stones, and good in everything!"

## Origin of the Atlantic Telegraph.

The Hamilton (C. W.) Times contains a long article headed "The Originator of the Atlantic Telegraph an Englishman," in which it gives a detailed account of the efforts of a young Englishman named F. H. Gisborne, toward bringing the subject of a transatlantic telegraph before the capitalists of Canada and Nova Scotia, and claims that the grand conception of the work now happily completed originated with Mr. G. in 1850 or '51. We beg leave to inform our Canadian neighbor that we have a prior claim to originality in this matter, on behalf of our own countrymen, of at least two years anterior date, and that the distinguished honor of originating and pointing out the feasibility of the great enterprise for whose completion the world is now ringing with praise, belongs exclusively to Gen. Horatio Hubbell, a distinguished member of the Philadelphia bar, who projected and originated the grand idea as early as 1848, and to his associate, J. H. Sherburne, who had the moral courage to join Gen. Hubbell in signing his memorial to Congress, detailing the plan, and asking governmental assistance in carrying it out.

This memorial is the *origin* of the Atlantic telegraph, and was presented to the Senate of the United States by the Vice President, Hon. G. M. Dallas, and to the House of Representatives by Hon. J. R. Ingersoll, on the 29th of January, 1849. When first published it was treated as a chimera of the wildest kind, and the memorialists, if not mad, as nearly so as possible. When presented in the Senate by Vice President Dallas, the greater part of that body were for throwing it under the table; but one Senator (says Mr. Dallas in a note to Gen. Hubbell, dated March 18, 1854), *Jefferson Davis*, moved that it be referred to the Committee on Commerce, remarking that "the world was not yet prepared for the project, but might be soon." This memorial is recorded on the Senate journal of the day it was presented, and will speak for itself. The idea of establishing a transatlantic telegraph with Gen. Hubbell was not a vague and impulsive one, but was the result of long and patient study, investigation and inquiry of an original and practical mind, which, while it thoroughly comprehended the gigantic character of the undertaking, was yet alive to, and singularly suggestive of the obstacles to be encountered, and the means of overcoming them. In the memorial, the existence of the plateau or table land between Newfoundland and Ireland is first announced to the world as the course where the telegraphic communication would be established between the Old and the New continents. The words of the memorial are explicit on this point, as will be seen by the following extract from it:—

"Your memorialists proceed to say, that from many observations that have been made, there is incontestible evidence of the existence of a submarine table land, extending from the Banks of Newfoundland across the Atlantic Ocean to the mouth of the British Channel. This is proved by the altered color of the sea water, which has a different appearance in unfathomable places from what it has in shallow spots. This, combined with the volcanic construction of Iceland and the Azores, and the situation of that portion of the ocean that lies between both these volcanic groups, has led to the conclusion that there has been a lifting up of the bottom of the sea, through the agency of a Plutonic power, and that the bottom thus elevated appears to be cut through in many places by deep water channels. The appearance of *medusa*, *polypi*, and other marine creatures seen upon the edge of the discolored water strengthens this opinion."

They then proceed to ask that they be fur-

nished with a vessel, in order to make the necessary surveys and soundings, and it was, no doubt, in accordance with this suggestion that Lieut. Berryman was dispatched, and did make his soundings over this part of the ocean in 1853. Lieut. Maury did not make a personal survey himself, but made a report upon the soundings of Lieut. Berryman, under date of 22d of February, 1854—five years after the Hubbell and Sherburne memorial had been presented to Congress and promulgated to the world.

From the foregoing indisputed documentary evidence now on file at Washington, it is plain that the scheme for a transatlantic telegraph had its origin in America, and that the mode, means, and location to carry the telegraph wire or cable across the Atlantic ocean were originated by Gen. Hubbell; that to him and to his deceased associate Mr. Sherburne, who signed the memorial, is due the exclusive honor of first pointing out the existence of the plateau or table land between Newfoundland and Ireland, in connection with the telegraph cable now successfully laid upon it; and finally that these gentlemen were the first to publish and promulgate the feasibility of such an enterprise, and thus enlist in its behalf the attention, capital and skill of the individuals and governments, through whose agency the inceptive idea of the great mind in which it originated has been successfully carried out in accordance with the original suggestions contained in the Hubbell and Sherburne memorial.

## The Gutta Percha Life-Boat.

The great utility of a life-boat can be appreciated by very few persons who have not been upon the ocean, and seen the waters lashed with fury, beating against the sides of a gallant ship. It is the last resource; the ship has been knocked to pieces on some rock or shore, or has been put in a sinking condition by the violence of the storm, and the passengers and crew forgetting their treasure and the cargo, think but of saving their lives. The life-boat is manned, the perishing people cling to her sides, and down goes the ship, leaving but that frail little boat between them and eternity. How important is it, then—not in a commercial sense, merely, but in the higher and grander sense of pure humanity—that this life-boat should be constructed in the best manner, and of the best materials—that it should be able to endure knocking about on rocks—that it should not leak, and if capsized, should be able to right itself immediately.

To produce a perfect one, many philanthropic men have spent time, money and genius; and in 1850 the Duke of Northumberland offered a reward of one hundred guineas for the best life-boat. Three hundred persons answered the call, and Mr. Beeching, of Yarmouth, England, obtained the prize, having produced what was then the very best. Since that time many inventors have tried to produce a better, but all their efforts have been directed in the old and well-trodden paths of improving the arrangement of air chambers, &c.; and it was not until 1855 that a new material was proposed; this was gutta percha, which we think will do much for the saving of our fellow men from a watery grave. On the 17th we had an opportunity of witnessing a practical test of its qualities, and of its adaptability to this purpose, the results of which were satisfactory in the extreme.

The life-boat with which the experiments were made was 16 feet long, about 5 feet beam, and 3½ feet deep; she had an air chamber at each end, and was fitted inside with wooden seats, thwarts, &c. When in the water she will sustain 100 persons, and from what we saw, seems almost incapable of injury. There are no joints or seams in one of these boats, as they are cast or molded in a male and female mold by hydraulic pressure, from one piece of gutta percha, which is therefore compact and hard. The spot chosen for the trial was the beach at Long Branch, N. J., opposite the National Hotel, and as there was a southwest wind, the "rollers" or

surf, was pretty high. The surf-boat men took her and tried hard to capsize her, but could not succeed, and then filling her with water, sent her adrift among the rollers, which brought her safe and uninjured to shore. She was next drawn high and dry, and pummeled by the surf men with an oar, but they were not able to make any impression on her sides. Altogether, the experiments clearly proved that gutta percha was an excellent material for a life-boat, and that it possesses many advantages not found in the substances usually employed. It is light, cheap, and easy of construction and repair, and when worn out or badly damaged, the material is always a marketable commodity. The patentee, Mr. E. B. Larchar, of this city, received many well-deserved compliments from the persons who witnessed the trial, and we understand that a company is formed for the manufacture and sale of these boats.

## Mineral Oil.

The *Mining Chronicle* mentions an improvement recently patented in England by S. Lees, of Salford, by which a considerable saving of time and expense is effected, as three tons or more of raw material may be operated on in one still. The invention consists in distilling or abstracting the oil contained in the coal, cannel, schist, or other mineral substances, by combining such substances with asphaltum or pitch (the residuum formed in the manufacture of gas for illumination), and other suitable substances, and by the application of heat, which dissolves the asphaltum, and causes the mineral bituminous substances to give off their oil in the form of vapor. He breaks the bituminous substances and asphaltum into pieces of any convenient size, and puts the whole into a common still, which is then closed and heated in the usual manner. The vapor is condensed in an ordinary worm, and the residuum may be used as fuel. Another important feature in the invention is, that the still may be heated as rapidly and to as great a degree as possible without injury to the oil produced, or waste from the production of gas; moreover, the oil produced by the single distillation is almost clear, the carboniferous and earthy particles of the mineral bituminous substances being retained in the still by the asphaltum or pitch, whereas in the modes heretofore adopted, the products from coal, cannel, and schists have required a second distillation to separate the oil from the asphaltum or pitch, and to produce oil of a color and specific gravity equal to that produced by Mr. Lees' invention.

## Personal.

T. H. Dodge, Esq., Chairman of the Patent Office Board of Appeals, has obtained two months leave of absence. He lately favored us with a call, when en route to his home in New Hampshire.

We understand that all the back appeal cases have been acted upon so that the docket is clean. Appeals are now heard and decided within a brief time after presentation. This is a very gratifying state of things for applicants, and indicates the closest industry on the part of the Board, for at times their bureau has been much crowded.

The Board of Appeals has been in operation now nearly a year, and we believe its workings have given pretty general satisfaction. It has served to harmonize the decisions of the Office, and inspire a confidence and respect for the institution which it did not before enjoy.

At the time of the creation of the Board, we expressed the opinion that it was a movement which the times demanded, and that it would reflect high credit upon the sagacity of the Commissioner of Patents. Nearly a year's practical experience of the workings of the Board fully confirms the impressions originally formed.

During the absence of Mr. Dodge, the appeals will be attended to by the other members of the Board, Messrs. Lawrence and Little, both of whom are able men.

## Starch Manufacture.

The great consumption of this article—in which every civilized country indulges, as enabling the community to keep that virtue which is next to godliness—has rendered it necessary, from time to time, to improve its manufacture in many ways. A large factory for the production of starch was some time ago started at the pleasant village of Glen Cove, on Long Island Sound, and after it had been in operation about a year, it was destroyed by fire on the 9th of February last. As it was largely insured, means were quickly provided to erect a new one, and a few weeks ago, the Glen Cove Starch Manufacturing Company, through their energetic secretary, Wm. Duryea, who has been the persevering genius of the whole, invited some eight hundred persons to spend an afternoon in the works, to inaugurate their re-commencement. Every visitor who knew anything of starch manufacture was enabled to see at a glance the many improvements there introduced, not so much in the processes themselves, as in a careful attention to detail, and in every practicable instance the substitution of machinery for manual labor, as, for example, it has been the custom to elevate the starch water from floor to floor and into vats, by hand, but at this factory a great number of Cary's rotary pumps are employed, and they save a great amount of labor. The water is also of the best quality, issuing from a spring, and passing through the natural rocky filter of old mother Earth. The factory is capable of turning out eighteen tons a day, which is nearly two hundred thousand pounds a year more than Great Britain produced in 1835.

Starch is a beautifully white pulverent substance existing in all grains, fruits, seeds and esculent roots, and is a necessary component of animal nutrition. Rice contains 85 per cent; Indian corn, 65; potatoes, 20; and other vegetables various proportions. In Europe much is made from rice, but here the best white corn is used. The corn when delivered at the factory is hoisted from the sloop to the top of the building, and after having been winnowed, it is soaked in vats to prepare it for the mills, to which it is carried through shoots by a stream of water, and the mixed meal and water passes from the mills into the room where the two principal constituents of the corn, starch and gluten are separated. This is done by kneading and straining the corn, and the starch flows away in a white milky liquid, the gluten remaining behind. The starch is then allowed to settle, and when tolerably solid is placed on shelves of loose brick which absorb the moisture, some of which, however, evaporates. Kiln-drying finishes the process, when it is ready to be packed in papers for sale.

The Glen Cove Starch Company, determined to lose nothing, sell the gluten for food for horses, cattle and pigs, to which purpose it is excellently adapted, being far better, and we should think as cheap as swill. They also make an article of food, in the form of a cake, which we tasted, and have no hesitation in pronouncing it superb; it is called Maizena, and the following recipe will inform our lady readers how it is to be used:—

Maizena.....Half Pound.  
Sugar.....Two Cups.  
Butter.....Half Cup.  
Eggs.....Three.  
Cream Tartar.....1 Teaspoonful.  
Soda.....1 Teaspoonful.

Dissolved in one-third of a tea cup of milk.

Mix thoroughly, place in patty-pans, and bake immediately in a quick oven, from ten to fifteen minutes. The cake improves by age, if kept in a dry place.

The fire extinguishing apparatus of the factory and the machinery are perfect, and the excellent condition in which both are kept, called forth the warmest praise from the visitors, who, after partaking of some substantial hospitalities in the way of a collation, returned highly pleased with what they had seen, and all agreeing that the Glen Cove Starch Manufacturing Company was deserving of an eminent success.

## Atlantic Telegraph Shares and Vested Rights.

Immediately upon the receipt of the intelligence at London of the successful laying of the Atlantic telegraph cable, the shares of \$5,000 each, which were freely offered the day before for \$1,700, advanced at once to \$4,600. The original paid-up capital of the Company was \$1,600,000, and this has been increased to \$2,280,000. Of this sum \$375,000 in shares is to be handed over to the company in payment for the exclusive privilege assigned to it upon completion of the undertaking. The colonial concessions of the company give them an exclusive right for fifty years as regard the Newfoundland coast and the shores of Labrador and Prince Edward Island, and twenty-five years as regards Breton Island. They have also a similar privilege for twenty-five years from the State of Maine.

From the respective governments of Great Britain and the United States the terms obtained are a payment of \$60,000 per annum from each for the transmission of their messages for fifty years, until the dividends amount to six per cent on the original capital, after which each government is to pay \$50,000 a year, such payment to be dependent on the efficient working of the line.

## The First News Message through the Cable.

The following was received in New York on the morning of the 26th ult., and being the first news message transmitted through the Atlantic Telegraph Cable, deserves to be placed on record:—

VALENTIA, August 25, 1858.

Later and highly important intelligence has been received from China.

Later Indian news is to hand, the dates from Bombay being to the 19th of July. The accounts represent that the mutiny was being rapidly quelled.

To-day's London papers have a long and interesting report by Mr. Bright, the Atlantic Telegraph Company's Engineer.

A treaty of peace had been concluded with China, by which England and France obtain all their demands, including the establishment of embassies at Peking and indemnification for the expenses of the war.

The royal mail steamship *Asia*, with the mails for Halifax and Boston, is to be despatched from Liverpool on Saturday next.

The screw steamship *North American*, with the Canadian mails, was to leave Liverpool to-day, for Quebec and Montreal.

The U. S. mail steamship *Fulton*, for New York, was to be despatched from Southampton to-day. We have it on reliable authority that the above message was only two hours in coming across the Atlantic Ocean.

## New Photograph Invention.

Messrs. Seely & Garbanati, photographic chemists, of this city, have recently perfected an apparatus by which life-size photographs may be produced with all the ease and perfection of small pictures. We have examined the mammoth portraits produced by it, and found them quite free from the distortion which has generally characterized large photographs; in fact, the life-size likeness is an exact counterpart in figure and detail of the person, and needs as little of the artist's retouching as the ambrotype or daguerreotype. The cost of materials used in the preparation of the paper is trifling, while the apparatus complete is manufactured for about \$20.

The instruments hitherto employed for making portraits of a larger size than 6 by 8 inches are sold at prices ranging from \$200 to \$1,000, and the chemical preparations required for a commencement involve a large outlay. The old methods, moreover, are uncertain, tedious, and the best results unsatisfactory, till the pencil of the artist has softened down the defects.

The inventors are preparing for exhibition a full length colossal photograph, fifteen feet in height, of one of our most distinguished citizens.

This new instrument, called the "Mega-

scopic Camera," is similar in principle to the solar microscope. A small picture is first produced in the usual way from the object; an image of this small picture is thrown magnified from the new camera on to a sensitive surface (paper or canvas), on which it is impressed in a few seconds. Any small picture (portrait or view) may thus be accurately enlarged to any desired extent.

Many of our most enterprising photographers have adopted the instrument, and seem to think that it will come into general use for all pictures over 6 by 8.

## Steam as applied to Navigation and Land Travelling.

Several nations claim the credit of having first conceived the idea of employing steam for moving carriages on land as well as ships at sea, but the author of the lately published life of George Stephenson seems to think that the weight of evidence is on the side of a Frenchman named Solomon de Caus, who was shut up for his supposed madness in the Bicêtre at Paris. Marion de Lorme, in a letter to the Marquis de Cinq-Mars, dated Paris, February, 1641, thus describes a visit paid to this celebrated madhouse in company with the English Marquis of Worcester:—"We were crossing the court, and I, more dead than alive with fright, kept close to my companion's side, when a frightful face appeared behind some immense bars, and a hoarse voice exclaimed, 'I am not mad! I am not mad! I have made a discovery that would enrich the country that adopted it!' 'What has he discovered?' asked our guide. 'Oh!' answered the keeper, shrugging his shoulders, 'something trifling enough; you would never guess it; it is the use of the steam of boiling water!' I began to laugh. 'This man,' continued the keeper, 'is Solomon de Caus; he came from Normandy four years ago, to present to the King a statement of the wonderful effects that might be produced from his invention. To listen to him, you would imagine that with steam you could navigate ships, move carriages; in fact, there is no end to the miracles which he insists upon it, could be performed. The Cardinal sent the madman away without listening to him. Solomon de Caus, far from being discouraged, followed the Cardinal wherever he went, with the most determined perseverance, who, tired of finding him forever in his path, and annoyed at his folly, shut him up in the Bicêtre. He has even written a book about it, which I have here.'"

It appears that the Marquis of Worcester was greatly struck by the appearance of De Caus, and afterwards studied his book, portions of which he embodied in his "Century of Inventions."

## Danger of Hoop Skirts.

We see it stated that the medical attendant of the Princess of Gothland asserts that hoop skirts are the cause of accouchments lately becoming so dangerous and difficult. He adds that this fashion is the source of a vast number of chills, the consequences of which are, in many cases, mortal. If this gentleman is to be credited, the prevailing method ladies adopt to spread themselves has as many deaths to answer for in Sweden as cholera. We have always thought that hooped skirts of reasonable bounds were not only an adornment to the persons of the fair wearers, but on account of their ventilating character, actually beneficial to health. Ladies generally evidently think so, and as they are the actual sovereigns of creation, and will wear what suits them, we doubt whether this statement will have any effect. One thing is certain, and none know it better than themselves, that no matter how fantastically or ridiculously they may dress, they will be admired the world over.

2,500 ounces of gold has been shipped from Nelson, New Zealand, to Melbourne, Australia, being the first shipment from the newly discovered gold fields of the former island.

## Washington's Tomb and Homestead.

This place, which is to every American as hallowed ground, is about to be bought by the ladies of America, provided they get the money, to effect which object many of our most philanthropic "fair" have formed themselves into a society called the "Mount Vernon Ladies' Association." Their rooms are at the Cooper Institute, in this city; and any of our readers in their patriotic moments may send their donations to Miss M. M. Hamilton, who has undertaken the honorable post of Vicegerent of this State.

## New Disinfecting Cement.

There is a considerable difference between a deodorizer and a disinfectant. The former either merely removes or disguises a foul odor; the latter changes the character of the matter which creates the effluvia, and prevents it from sending forth disease. Fresh slacked lime and charcoal dust are very good deodorizers, but their disinfecting powers are not equal to some of the salts of manganese, which, when they combine with pestilential fluids in sinks and drains, give out at the same time a considerable quantity of pure oxygen to refresh the atmosphere. The manganate of soda, or potash, has recently been tried in London with much success in deodorizing and disinfecting the water of the river Thames, and its use in our cities during dry weather may be of great benefit. It is applied by dissolving it in warm water, and pouring it into the sink or drain to be disinfected.

## A Thrifty Machine Shop.

The Newark (Ohio) Machine Works commenced operations some four or five years ago, under the care of our esteemed friend, Mr. Joseph E. Holmes, and since that time the company has had a tide of continued prosperity. The amount of work turned out each year reaches about \$150,000. The men employed in the works, now numbering about one hundred, have distributed within the past three years, for purposes of pure benevolence, \$1,336. Forty-five of them are members of a reading room. They also take 222 papers, magazines, &c. In this list we recognize 90 copies of the SCIENTIFIC AMERICAN. These facts are interesting, and reflect much credit upon the mechanics as well as upon the managers of the company.

Our friend, H. S. Babbitt, is still connected with the above works, and will continue to forward all subscriptions to the SCIENTIFIC AMERICAN entrusted to his care.

## A Rule worth Observing.

In accordance with an invariable rule adopted at the beginning of this journal, all subscriptions are promptly discontinued when the time for which they are paid expires. As a general thing, this system has the approbation of all our readers; but occasionally, we receive complaints, stating that we ought not to have enforced this rule in certain cases. Now it must be borne in mind that we cannot justly make any distinctions between one subscriber and another; besides, we believe it would be impossible for us to manage our journal successfully under any other system than *advance payment*.

The local circulation of the SCIENTIFIC AMERICAN is comparatively small; its subscribers and patrons are scattered throughout all the States and territories of our country, and many copies are circulated in Europe; therefore it would be impracticable and ruinous for us to undertake to employ agents to travel and collect subscriptions. We hope all our friends will promptly remit, in order to renew their own subscriptions, and that they will get as many new subscribers as possible. We urgently appeal to them to come forward and aid in increasing our circulation, and thus not only confer a favor upon us which we shall highly appreciate, but spread abroad the useful information with which the columns of the SCIENTIFIC AMERICAN are always stored.

Clubs of twenty or more yearly subscriptions are supplied with the SCIENTIFIC AMERICAN at \$1 40 each.



## Correspondents

S. Cochran, of Petersburg, Va., wishes to procure a machine for dressing grain cradle fingers to their proper shape after being bent and sawed out of the sheet. Also a lathe that will turn the snaths a gradular taper five feet long.

J. W. G., of Pa.—Your method of instantly converting water into steam by bringing it into contact with heated surfaces is not new, nor has it been found beneficial in practice.

J. E. McC., of Ohio.—You say you do not think that any machine can be made to fly by mechanical contrivance alone; and to overcome this difficulty you propose to suspend the aerial car in the air by means of hydrogen gas, and then propel it by machinery. You do not seem to be aware of the fact that this notion has extensively prevailed for ten years past. Porter, Pennington, and others, are ahead of your project.

F. G., of L. I.—Fine sand is first used in grinding glass, and then very fine oxyd of iron for polishing.

O. M., Washington, D. C.—Call at our office corner of F and Seventh st., opposite the Patent Office. Our folks will take pleasure in posting you up in regard to the novelties of the Capitol.

R. W., of Iowa.—Zinc white is much employed by whitewashers; they mix it with the lime and it makes a very durable wash. The lime used as a body for fresco painting is thus prepared by the artists of Munich: a pit is filled with clean burnt limestone, which is slaked, and then stirred continually till it is reduced to an impalpable consistence. The surface having settled to a level, clean river sand is spread over it to a depth of a foot or more, so as to exclude the air, and lastly, the whole is covered with earth. Thus it remains for two or three years before it is used either for painting or coating walls. Fine gilt stripes are put on glass by first sizing the glass and then burnishing gold leaf on to it, and cutting away the excess of gold leaf.

F. M., of Pa.—If you merely make a model of an invention from a drawing furnished by another, you can certainly lay no claim to the invention. The inventor must apply for the patent, and it can be assigned to you.

C. P. A., of Va.—A composition of four pounds rosin, one pint linseed oil, and one ounce red lead, applied hot with a brush, is an excellent article for stopping leaks in roofs, casks, &c.

G. G., of N. Y.—The best process of tinning iron tacks is to first dip them in sal ammoniac, and then in melted tin. The heads of the tacks should be well cleaned, by immersing them in a weak solution of sulphuric acid, or some other scouring substance.

D. S. H., of Mich.—If a patent is extended, parties who had rights under the original term have none under the renewed term, except to run such machines as were actually in use before the patent expired. The first line of electric telegraph was put into operation in June, 1844, between Baltimore and Washington, and the first public dispatch sent over it was, "What hath God wrought!" This was followed by a dispatch announcing the nomination of Mr. Polk to the Presidency.

A. M. R., of N. C.—The best method of preventing sparks and fire from coming out of your chimney is careful firing up, but a chamber may in some degree lessen the danger.

B. H., of Mass.—Cast iron melts at various and varying temperatures according to certain conditions, but Professor Daniell decided upon 2786° as the practical melting point. You may accept this as a practical standard.

J. F. K., of Ohio.—You had better wait a little while before you prease the want of conducting power in the Atlantic Cable, as should it be perfectly successful, as many eminent men think it will, you would appear foolish.

L. O. H., of Ind.—The specimens of pearls sent to us for examination have no value whatever; and those of your townsmen who are excited to wade daily in the river in search of pearls, had better abandon that pursuit and go to work. Pearls of considerable value have been found in fresh water muscles; but those little bits which you sent us would bring in the market about the same price as gravel stones. We have reported our opinion (by letter) in regard to your invention, and await your determination respecting the prosecution of the case.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, August 28, 1858:—

C. B. M., of —, \$30; J. B., of Texas, \$80; W. H., of Ill., \$30; J. J., of Pa., \$30; T. & M., of Vt., \$30; H. H., of Ind., \$30; R. A. C., of Ind., \$25; D. & S., of N. Y., \$400; E. P. C., of Mass., \$30; H. E. T., of Ill., \$80; A. W., of Ga., \$55; A. W. D., of Me., \$35; R. B. N., of Cal., \$30; R. C., of Pa., \$30; A. G., of Me., \$35; A. R. H., of N. Y., \$60; M. C., of Conn., \$25; F. K., of Mass., \$15; S. Y., of Mass., \$25; E. C., of Mass., \$25; J. M. M., of Ind., \$35; H. McC., of Mich., \$30; J. P., of Tenn., \$15; R. H. E., of Ill., \$25; W. S. T., of Iowa, \$25; M. L., of N. Y., \$30; D. R. K., of Conn., \$25; J. P. V., of Wis., \$30; W. G. S., of Ill., \$35; R. H. D., of Cal., \$35; J. M., of N. Y., \$60; G. H. S., of Iowa, \$35.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, August 28, 1858:—

J. M. M., of Ind.; R. H. E., of Ill.; W. H. T., of Mass.; E. C., of Mass.; W. S. T., of Iowa; S. Y., of Mass.; F. K., of Mass.; W. G. S., of Ill.; J. P. E., of Va.; J. D., of Conn.; G. H. S., of Iowa; J. B., of Texas; L. S. C., of N. Y.; H. & C., of Me.; R. E., of Mass.

## Valuable Hints to our Readers.

It is well known to all our readers that we employ no travelling agents.

In order to become a subscriber to the SCIENTIFIC AMERICAN, enclose the money in a letter, and address it to Munn & Co., 138 Fulton street, New York City. We depend upon our friends to aid us in getting subscribers and forwarding the names.

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If bank bills are sent, we will assume the risk of them reaching us, when subscribers preserve a description of the bills, and take a Postmaster's receipt to show that the money has been mailed.

Many letters sent to us are without Post-office address or signature, and therefore cannot be answered.

When you order the SCIENTIFIC AMERICAN, be careful to give the name of the Post-office, County, and State to which you wish the paper sent. And when you change your residence, and desire your paper changed accordingly, state the name of both Post-offices—where you have been receiving it, and where you wish it sent in future.

## NUMBERS OF VOLUME XIII.

We cannot supply Nos. 22, 23, 31, 32, 34, 35, 36, and 38 of the present volume, but we can furnish Vol. XIII. complete and bound for \$3 75. Postage, 90 cents.

**THE BLANCHARD PATENT STEAM BOILER** generates steam more economically than any process ever before used. A steamboat with this boiler is daily running on the Hudson, carrying passengers and freight. The fire being kindled, when the boat starts the chimney is closed. No smoke, no sparks, no cinders escape, the combustion being perfect. A Blanchard boiler, of half the size, with half the water, and less than half the fuel, generates the same amount of steam as an ordinary boiler. Its construction is not unlike others, its cost about the same. The fire chamber is simple, but in this is found the source of the great gain. It is applicable wherever steam power is needed, and especially on locomotives and canal steamers, where it is desirable to dispense with a chimney. For further particulars, price, rights to make and use, &c., address R. B. BLANCHARD, Box 2454, Post Office, New York.

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**TO HARDWARE MERCHANTS**—We send (free of postage) for one stamp the experience of forty of the most prominent agriculturists in the United States in the use of Gould's Patent Hauling Thimbles, also the experience of agents in their sale, our terms to the trade, &c. "And for one dollar, six sets of the thimbles (assorted sizes), with directions for using, &c., will be sent. Money sent by mail at our risk. Address J. H. GOULD & CO., Sole Proprietors, Alliance, Ohio.

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