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Contents:

(Illustrated articles are marked with an asterisk,)

CAUTION.

It has become necessary for us to state very distinctly that the Scientific American Patent Agency Offices are at No 37 PARK ROW, and not at No 39.

ARE OUR COAL FIELDS INEXHAUSTIBLE?

Some sneers were indulged in when, a few months ago, English *savans* debated the question of the exhaustibility of the coal fields of Great Britain, but it might be well even for us, whose area of already discovered coal is seventeen times as great as that of England, to consider the question as applied to us.

A few days ago a gentleman residing in this city informed us that the heating and cooking apparatus of his dwelling had consumed since November last—less than five months—thirty-three tuns of coal. This is no exceptional case; it can be duplicated and even exceeded in hundreds of instances. But the consumption of coal for domestic purposes is as the drop in the bucket compared with the consumption in manufactories, on railroads, and in steamships. If coal is in process of formation now the process is a very slow one. We have no atmosphere of carbonic acid, no forest of gigantic ferns and mosses, no sluggish sea, nor perpetual hot-house summer which might form a coal bed of three feet in thickness in as many weeks, while it would now, under our present circumstances, require 7,400 years to produce a deposit of equal thickness.

The coal beds of Great Britain cover an area, according to Taylor, of 11,859 square miles. Prof. Hitchcock estimates the area at 12,000; other authorities average 7,995, and Prof. Rogers calls it only 5,400. Probably, when the deductions for "faults," "trap dykes," and "worn out" territory are made, about 5,600 square miles will give the present available resources of the English coal fields. Every vertical foot will yield 1,500 tuns of coal to the acre, and 50 feet total thickness will give 75,000 tuns per acre.

Our known coal area is estimated at 206,939 square miles, of which only about 470 square miles is anthracite, yet of 22,000,000 tuns mined in 1864, 10,000,000 were anthracite. When it is considered that the amount mined represented only the current demand, or rather that which was produced for the market, and did not comprise that wasted, lost in pillars, etc., it may excite some inquiry in regard to the ultimate exhaustion of our anthracite beds. The population of the entire East, a portion of the South, and the Northwest, over 12,000,000, draw their supplies from the Pennsylvania anthracite fields, and large quantities are exported to Canada and shipped to other countries. The natural increase of the anthracite coal trade is over two and a half per cent per annum, so in 1870 the demand will be not less than 15,000,000 tuns, probably much more. Estimating an average of sixty vertical feet in thickness our anthracite fields contain 18,000,000,000 tuns, which, at the present rate of increase in demand, would entirely exhaust them in 600 years. But about one half of this is lost and wasted by our present system of mining, and should the anthracite trade ever approach the dimensions of the English coal trade, our supply would melt away in about 180 years.

Some impure anthracite is found in Massachusetts and Rhode Island, and Oregon contains a limited field of the same, but owing to superiority in quality and advantages of location, Pennsylvania will probably continue to be the source from which the nation's supplies will be mainly drawn. While the anthracite of Pennsylvania underlies only 470 square miles of her surface, her bituminous deposits have an area of 12,656 square miles, and all the great Western and the Southern coal fields hold only this hydrocarbon. This will not be used for manufacturing purposes (iron) so long as the nearly pure carbon can be obtained, and will be employed for household and other purposes only when its comparative cheapness offsets its advantages. What the hitherto unexplored regions of the country west of the Mississippi may contain in the way of a mineral fuel, can at present only be conjectured.

PHONOGRAPHY AND PHOTO-PHONOGRAPHY.

The query is not now to be raised for the first time, whether human speech may not be made to record itself. Yet it is in reality a novel question, for we have as yet but vague hints of the possibility, and scarce a hint of the process. Among these hints, the first is the perfectness and definite laws of echo. Since a screen may be erected over against a speaker which will "report" or throw back a *fac simile* of his words, as a likeness is thrown back from a camera—and that by an analogous process, only coarser, *i. e.* the vibrations of a more sensible fluid—why may not the one likeness be embodied and fixed in some way as well as the other? Why may not forces which rebound with such wonderful precision, be brought to make equally precise impressions? Why not a sensitive preparation to be fixed by rays or pulses of sound, as well as of light? If this be attainable, there is evidently no difficulty in securing the reflection of the sounds upon it, in all their perfection and with intensified force.

The difference at once strikes us, that so far as we know, the action of accoustic vibrations is purely mechanical, whereas we have lately discovered that in light there is chemical or actinic power, besides the supposed mechanical action that affects the retina. But how do we know that the sensible effects of luminous and accoustic undulations, or either of them, are of a mechanical and not chemical nature? Who knows that the eye and the ear are not both laboratories, in which a chemical operation is performed in seeing and hearing, as much as in impressing shades upon a sensitive plate? Nay, is it not most probable, that seeing and hearing are or involve chemical processes, equally with tasting and smelling, breathing and muscular action? And if so, is there not probably some means of imitating the process and fixing its results in the case of hearing as of seeing?

Again, an apparent difference between the actual and the supposed art is that the one must in some way be bridged over into the other: the latter is complex, and includes both the former and some *nexus* between them which is precisely the undiscovered element in the problem. But this is perhaps only a *prima facie* necessity, and thus the inquiry here branches off in two directions; on the one hand in quest of a point of contact between accoustic operations and visible phenomena, through which audible undulations may register their effects in visible symbols; and on the other, of a way for the accoustic impulses to be impressed upon secondary agents which shall give them back as the negative does, when properly called for and not otherwise.

If the latter were possible, a reciprocating pair of such agents, properly re-inforced in energy, could maintain the impulses and propagate copies of them *ad infinitum*, and thus the speech of an orator would be handed down to all time and all mankind exactly as it sounded from the lips. All books worth reading *verbatim* would be read to the phonograph by elocutionary experts, and thenceforth read by the phonograph to the hearing (not reading) public, who would thus be saved the labor of reading, and perhaps the art itself would go out of fashion. But it is hardly worth while to anticipate just now all that might be hatched out of such an egg as that. Less extravagantly, we may surmise that an arbitrary language of phonic symbols might be constructed in which dumb things could be made to utter a translatable echo of human speech.

There are some advantages obvious to phonography proper, compared with photography, as original questions. There is the wonderful ubiquity and uniformity of the accoustic undulations, precisely the same to an infinite number of hearers in an infinite variety of positions; whereas the undulations of light are confined to right lines of movement, and no one of them can impress more than a single objective point. There seems no more intrinsic difficulty in concentrating and intensifying the accoustic than the optical undulations, and if this were to become practicable, (by the aid, perhaps, of some imitation of the tympanum) it would follow that a system of accoustic reflectors and conductors could carry human speech not only to indefinite distances but to innumerable auditors. Practical attempts in the distant transmission of the voice are now going on in France, as our readers are aware. But leaving this aside, the fact that an accoustic wave takes effect in all directions and at all points, greatly facilitates the attempt to fix its effect. For, suppose a mechanical or chemical appliance to be invented, so delicately adapted that an individual accoustic wave would in some way make its characteristic mark. Let such sensitive points be brought into exposure and withdrawn in succession as rapid as the contractions of the stylo-glossus in speaking. Or let a surface of this character be covered with a moving protector having a single perforation which should traverse the whole in regular lines, at the proper speed. Every wave would infallibly find its proper objective point and make its mark in its proper order, and the intervals of sound between letters, words and sentences, would be shown with absolute precision by the unmarked spaces, as in print.

The sensitiveness of flames to the accoustic vibrations, on which we had experiments so interesting from Prof. Tyndall, of late, suggests the possible application of gases, incandescent or otherwise, for registering sounds in a variety of ways. Flames would be most naturally expected to register photographically; but they have also calorific, mechanical and chemical effects adaptable to the same purpose. Thus there are four distinct modes in which effects can undoubtedly be transmitted through flames from the sounds of the voice. If it be practicable to find adjustments of flame which shall respond distinctively to each vocal sound and interruption, and with corresponding rapidity, it would seem much easier to register those responses in some of the various modes that already suggest themselves.

Other conjectures might be made, but we have said enough to stimulate thought and inquiry upon the subject; and as that is all we had in view in setting out with these cursory speculations, they may be dropped at this point as well as at another.

THE DANGERS OF OUR ARTIFICIAL LIGHTS.

It is becoming a matter demanding serious inquiry and possibly legislative interference what shall be done to prevent the accidents so commonly occurring from the use of the common means for producing artificial light, or, at least, to diminish the danger. If a correct record could be presented of the catastrophes—the injuries to person and property—which have been caused by the use of gas, kerosene, camphene, and burning fluid the statistics would appal the reader.

Gas explosions are always the result of carelessness or thoughtlessness. It is probably the least dangerous agent for producing light since the relinquishment of whale and lard oil for this purpose, but the ignorance or the thoughtlessness of people make it sometimes a very dangerous substance. Confined in pipes it is perfectly safe. It cannot explode nor even burn until mixed with the oxygen of the atmosphere, and it has the valuable quality of denoting its presence when mingled with the air we breathe. In this form it is dangerous, yet when a meter or the pipes located in a vault or dark cellar leak, it is too common a practice to enter the room with a light to examine the leak, when of course an explosion takes place. This can be readily prevented by first ventilating the room through doors and windows. There can be no excuse for these accidents nor for the blowing out of a gas light leaving the pipe open for the escape of the gas, a trick usually ascribed to country visitors to cities, but not seldom performed by those who should know better. Cases of death by asphyxia in sleeping rooms from this inexcusable carelessness are not unfrequent.

Camphene and burning fluid have been largely superseded by kerosene, yet they are still used to a limited extent, the fluid being burned by a wick in the ordinary manner or used to generate a gas in the lamp itself. In whatever manner employed these mixtures of alcohol and turpentine are dangerous, as many fatal accidents have proved. We know of no method of preventing the danger attending their use, and are glad they are going out of fashion. But it may be doubted whether in exchanging them for kerosene we are not "jumping from the frying pan into the fire."

Kerosene accidents are altogether too common. It would seem that this hydro-carbon might be made at least non-explosive; that it can be made non-inflammable is impossible without destroying its light-producing qualities. But many serious and fatal accidents are continually occurring by explosions of kerosene lamps. A low distillation of the oil would easily remove the more etherial substances in its composition, which, at temperatures not excessive, generate an explosive gas. There should be some simple means of testing kerosene to detect the presence of these volatile elements. Beyond that, only care in the use of kerosene promises to avert its dangers.

It is commonly burned in glass lamps. Now glass is one of the most unreliable substances known, and if not properly annealed will sometimes, even when untouched, fall in pieces as though shattered by a blow. Very likely many of the so-called explosions of kerosene lamps occur by the fracture of the glass lamp containing the oil. An eminent chemist tells us that a few days ago a glass bottle which he had used for years, and which contained collodion, suddenly shivered into fragments while standing on a table where it had remained untouched for weeks, and a flask that he had used for distilling benzine broke in a similar manner after it was laid aside.

The practice of blowing out the light when the flame is full, by throwing the breath down the chimney is pernicious. If the wick is loose in the tube the flame may be forced into the lamp and instantly ignite the surface gas or the oil itself. A better practice is to turn the flame down to a flicker and then blow it out. Lamps of metal would seem to be preferable to those made of so treacherous a material as glass, although they are not so elegant.

It is hardly credible that manufacturers or venders of kerosene would willing deal in a dangerous article containing explosive elements, as their reputation and consequent profits depend upon the quality of the fluid, but the presence of naphtha and benzine in much of it now sold is susceptible of proof. Legislative interference, aided by science, appears to be demanded as a protection to consumers; for it cannot be expected that the people at large are to become analytical chemists in order to judge of the quality of the oil they use. Either this, or we must go back to the use of the old fashioned oil lamp, the breaking of which is attended with no more serious consequences than the formation of a grease spot.

OUR STREET PAVEMENTS.

In our issue of April 13th, we spoke somewhat in favor of the Nicolson pavement, our opinion being founded on the reports of its trial in Chicago. We have received several communications in relation to the subject, our correspondents being much gratified with our expression of opinion. A resident of this city says that the substitution of wood for stone, or the London Mc Adam for our cobble and Belgium pavements, is demanded on the score of mercy to the horse. He asserts that the number of horses permanently injured by our

stone pavements amounts to from 30 to 50 per cent, enough, if only half true, to pay for laying new pavements of wood every three or four years. He sees no reason why our streets could not be made as easy for horses and vehicles as the Park avenues, if paved on the Nicolson plan.

Another praises the pavements of Buffalo which are of the "Medina Rattlesnake stone" which has been well tested there and in Chicago.

We do not know the peculiar advantages of the Buffalo pavements, although we have visited the city several times, but there can be no doubt but improvements can be made on the pavements of New York. It would probably cost much to transport the Medina stone to this city, while the material for the Nicolson pavement can be obtained at every lumber yard.

AMERICAN EXHIBITORS AT THE PARIS EXPOSITION.

The following list of the articles of American Manufacture contained in the sixth group of the American Department of the Exposition in Paris, embraces instruments and processes of common arts:

G. J. Wardwell, Poultney, Vt.—Stone channeling and quarrying machine.
R. C. E. Ganjot, Tamaqua, Penn.—A model of apparatus for breaking up coal; a model of machinery for lifting from mines.
J. R. Harrington, Brooklyn, N. Y.—Self-rarifying tweer for manufacturing iron in blacksmith forges, or in any fire where a blast is used.
Herman Haupt, Philadelphia, Pa.—A gang of three steam drills designed for tunneling.
Philip S. Justice, Philadelphia, Pa.—Power hammer.
Walker & Platt, New York.—Power hammer.
E. E. Myers, Springfield, Ill.—Design for a model American farmhouse.
C. H. McCormick, Chicago, Ill.—Corn-reaping machine and grass-mowing machine.
R. H. Allen & Co., New York.—One combined clipper mowing and reaping machine.
Walker A. Wood, Hoosick Falls, N. Y.—One self-delivering combined reaping machine.
Joel A. Hall, Columbus, Ohio.—Cotton chopper, garden cultivator, and drill.
A. H. Wellington, Woodstock, Vt.—Root cutter.
Oscar F. Burton, New York.—One plow made in the style of the Moline plow now in use.
John G. Perry, Kingston, R. I.—One mowing machine.
D. C. Colby, New York.—Flour sieve, coffee mill.
Joel Nourse, Boston, Mass.—Plows with changeable furrow boards for plowing sod and stubble lands; swivel plows, adapted to level lands and hillsides; expanding horse hoes with changeable teeth; Brown's hay tedder; horse hay rake; Harrington's patent seed sower and cultivator combined; Howe's patent seed sower and cultivator combined; Adams' patent farming mill and grain separator; hand hoe.
Emery & Co., Chicago, Ill.—One American hog tamer.
H. H. Munroe & Co., Rockland, Me.—Rotary harrow.
Deere & Co., Moline, Ill.—One steel plow.
A. J. Fullam, Springfield, Vt.—Machine for shearing sheep and clipping horses.
Morris, Tasker & Co., Philadelphia, Penn.—Hay-band machine.
Hall & Spear, Pittsburgh, Pa.—Iron center plow.
Silas C. Herring, New York.—Bullard's patent hay tedder.
Collins & Co., New York.—Steel plow.
J. C. Bidwell, Pittsburgh, Pa.—Comstock rotary spader, also plows.
Jacob Brinkerhoff, Auburn, N. Y.—A hand Indian-corn sheller, separator, and cleaner.
M. Alden & Son, Auburn, N. Y.—A horse hoe, for cultivating all kinds of hoed crops.
Wheeler, Melick & Co., Albany, N. Y.—Palmer's excelsior horse pitchfork.
Partridge Fork Works, New York.—Manure, spading, and hay fork, rakes, and potato diggers.
L. L. Langstroth & Sons, Oxford, Ohio.—Two improved movable comb beehives.
Williams, Wallace & Co., Syracuse, N. Y.—Johnson's Great Western self-raking reaper.
Samuel J. Wallace, Carthage, Ill.—Grain binder, self-binding and raking harvester.
John W. Free, Richmond, Ind.—Fanning mill and grain seed separator; improved shoe for grain and seed separator; improved straw cutter; grain and seed sower.
Frank Fuller, New York.—Machine for husking Indian corn.
John B. Seymour, Pittsburgh, Pa.—Cotton planter.
S. T. Bacon, Boston, Mass.—Nourse's universal plow.
Silas H. Wooldridge, Venisee, Ill.—International shovel plow.
James A. Saxton, Canton, Ohio.—Ohio reaper and mower.
Glidden & Williams, Wood's Hole, Mass.—Samples of guano.
John H. Noyes, Oneida, N. Y.—Specimens of animal traps, from the rat trap to the grizzly bear trap.
George R. Baker, St. Louis, Mo.—Dough-kneeding machine, for family use.
D. H. Goodel, Antrim, N. H.—Lightning apple-parer.
S. W. Palmer, Auburn, N. Y.—Combined clothe wringers, manglers, and ironers.
Metropolitan Washing-Machine Company, New York.—Washing and wringing machine.
D. M. Somers, Washington, D. C.—Self-acting tumbler washer.
Howard Tilden, Boston, Mass.—Bon-ton flour and sauce sifter; self-feeding tobacco cutter.
Chas. A. Harper, Rahway, N. J.—Hand flour mill.
Morris Tasker & Co., Philadelphia, Pa.—Wringing machine.
Windle & Co., New York.—Mechanical brush for sweeping carpets.
E. K. Sargeant, Boonton, N. J.—Alarm coffee boiler.
J. Ward & Co., New York.—Union washing machine; Union clothes wringer.
Joseph Sedgebeer, Painsville, Ohio.—Farm corn meal and feed grinding mill; crank hand cottage or army mill; house coffee and spice mill.
Louis Elsberg, M. D., New York.—Peat-steaming and pressing machine.
Howard Tilden, Boston, Mass.—Champion egg beater.
John Ross, Stapleton, N. Y., Conical Burr-stone mills with flour-dressing machines and mill apparatus.
Elting Bolt and Duster Company, Cincinnati, Ohio.—Bolt and duster machine.
Geo. Purrington, Jr., New York.—Carpet sweeper.
Chas. H. Hudson, New York.—Clothes washer and rinser.
Schultz & Warker, New York.—Glass fountains for mineral waters.
Joseph Dixon & Co., Jersey City, N. J.—Plumbago or melting pots, stove-polish, and other articles of plumbago.
E. A. Pond, Rutland, Vt.—One-spring-power portable gas machine.
Hicks Engine Company, New York.—Steam engines of 5, 15, and 60 horse-power.
W. D. Andrews & Bro., New York.—Oscillating steam engines.
Corliss Steam-engine Company, Providence, R. I.—One Corliss steam engine.
T. R. Pickering, New York.—One stationary and one machine engine regulator.
Joseph P. Pirson, New York.—Seamless copper and brass tubes.
L. H. Olmsted, Stamford, Ct.—Friction clutch pulley,
Geo. Dwight, Jr., & Co., Springfield, Mass.—Steam pump.
P. H. & F. M. Roots, Connorsville, Ind.—Rotary blower.
Joseph Sheldon, New Haven, Conn.—Wate -pressure regulator.
Francis S. Pease, Buffalo, N. Y.—Atmospheric and hydraulic pump for mines, oil wells, and other purposes.
Joseph Firmenich, Buffalo, N. Y.—A variety of faucets made of hard rubber and wood.
Philander Shaw, Boston, Mass.—Shaw's Union double-action air engine.
James A. Robinson, New York.—Ericsson caloric pumping engine, 15-inch cylinder.
Joel Bryant, Brooklyn, N. Y.—Bushing for ships' blocks; hand grinding mill.
E. & T. Fairbanks & Co., New York.—Scales or weighing machines of various patterns; also weights of all standards.
Junius Judson. Rochester, N. Y.—Graduating governor for steam engine.
Crosby, Butterfield & Haven, New York.—Hot-air engine one horse-power.
Thos. J. Jones, New York.—Spring for steam-piston packing.
Warren E. Hill, Brooklyn, N. Y.—Hill's patent grate-bars.
Dr. J. H. Beidler, Lincoln, Ill.—Beidler's hydro-caloric light or steam lamp.
Nathaniel Jenkins, Boston, Mass.—Valves and cocks,
Howe Scale Company, Brandon, Vt.—An assortment of scales.
Steam Syphon Company, New York.—Steam syphon pump; model of railroad water-station pump.
John B. Root, New York.—Root's trunk engine, five horse-power.
L. B. Tupper, New York.—Furnace grate bars.
H. C. Dart & Co., New York.—Twelve horse-power rotary steam engine steam pump.
Lyon & Isaacs. New York.—Self-feeding hand and power drill for drilling holes in metals, etc.
Hardy, Foulds, & Tappan, Boston, Mass.—Steam fire engine.
C. H. Harrison, San Francisco, Cal.—Steam pump.
James Cochrane, New York—Model of a method of lubricating.
Wm. Sellers & Co., Philadelphia, Pa.—Planing machines, lathes, drills, slotter, boring mills, bolt-cutters, stocks (dies, taps, and tap wrenches); Giffard injectors, with self-adjusting water supply; shafting, to drive above machinery; assorted lot of finished hangers, couplings, pullies, pillow-blocks and wall plates; also, assorted lot of pulley castings.
L. H. Olmsted, Stamford, Ct.—Self-feeding ratchet drill; spring-top oiler.
Webster & Co., New York.—Webster's patent ordinary wrench.
D. L. Harris & Co., Springfield, Mass.—One engine lathe, with improved cross feed, and Vanhorn's patent tool elevator, back gears and screw-cutting mechanism attached.
Bement & Daugherty, Philadelphia, Pa.—Screw, bolt thread, and nut-tapping machine; bolt and nut-threading machine.
American Tool and Machine Co., Boston, Mass.—Fox's screw-cutting lathe, with Nason's screw attachment.
J. R. Brown & Sharpe, Providence, R. I.—Revolving head-screw machine for manufacturers of fire-arms, sewing machines, and other light machine work; also, a universal milling machine.
A. H. Brainard, Agent, Boston, Mass.—Various sizes and styles of cast-iron vises.
Bates, Hyde & Co., Bridgewater, Mass.—Power cotton gin; hand cotton gin;
Southern Cotton-Gin Co., Bridgewater, Mass.—Saw cotton gin of 60 saws; roller cotton gin, 6-inch rolls.
H. L. Emery & Son, Albany, N. Y.—American universal cotton-gin, H. L. Emery's patent; condensers, with cleaner and delivery attachment; 1 one-horse endless railway horse-power, with speed-governor attachment.
Chas. A. Shaw, Biddeford, Me.—Six spindle steps, with spindles; card-grinding machine.
C. L. Goddard, New York.—One mestizo burring picker.
George Crompton, Worcester, Mass.—Loom for weaving woolen fancy cassimeres.
J. E. Palmer, Middletown, Ct.—Circular loom for weaving plain and twilled coverings for cords and other tubular fabrics; circular loom to weave a double twill, with two shuttle or weft threads for hose; machine for tentering and drying wide and thin fabrics.
Morris Opper, New York.—Power loom for weaving fabric with gores or irregular surfaces, such as corsets.
A. B. Prouty, Worcester, Mass.—Card-setting machine for the manufacture of card clothing for cotton and woolen machinery.
Hall Manufacturing Company, Boston, Mass.—Bazon's improved twisting machine for laying up lines, cords, etc.
N. B. Hooper, Newark, N. J.—Hat-finishing machine, worked by power.
Bruen Manufacturing Company, New York.—An attachment for making the double loop stitch; an attachment for making the thin thread stitch for embroidery.
Lathrop Sewing-machine Company, New York.—Sewing machines in different styles, embracing the entirely new principle of working direct from two ordinary spools.
Wheeler & Wilson, New York.—Sewing and button-hole machines of various styles, with samples of work.
A. B. Howe, New York.—Sewing machines, with samples of work.
Weed Sewing-machine Company, New York.—Sewing machines adapted for family and manufacturing purposes.
Charles A. Shaw, Biddeford Me.—Foot and hand knitting machines of various styles and specimens of their work.
Howe Machine Company, New York.—Sewing machines; four styles.
mos L. Wood, Boston, Mass.—Buttonhole and embroidery machines.
Eiskemeyer Hat-blocking Machine Company, New York.—Hat stretching and blocking machine.
Halligan & Shapter, New York.—Leather-sewing machines, with specimens of harness, boots, shoes, belting, etc.
Continental Manufacturing Company, New York.—Crank-motion shuttle sewing machine.
Joseph W. Bartlett, New York.—Sewing machines, double lock-stitch and single thread.
Henry H. Reed, Philadelphia, Pa.—American buttonhole, cording, and combined sewing machines.
Bartram & Fanton Manufacturing Company, Danbury, Conn.—Sewing and buttonhole machine.
Florence Sewing-machine Company, New York.—Reversible feed, lock stich sewing machine, with self-adjusting tension, making four distinct stitches.
Isaac W. Lamb, Rochester, N. Y.—Family knitting machines.
John J. Folsom, Winchendon, Mass.—Globe sewing machine.
Thos. J. McArthur, New York.—Sewing machine.
J. M. Sterling, Paris—Sewing and embroidery machines, and specimens of their work.
Elliptic Hook Sewing-machine Company, New York.—Sewing machines, two styles.
Chas. Houghton, Boston, Mass.—McKay sole-sewing machine.
Emile Nougarit. Newark, N. J.—Hat-pouncing machine.
Mumford, Foster & Co., Detroit, Mich.—Specimens of boot trees and lasts.
John B. Winslow, New York.—Double serpentine moulding machine.
Wright & Smith, Newark, N. J.—Scroll-sawing machine.
H. S. Jacobs, Portland, Oregon.—Wheel-dressing machine.
C. B. Rogers & Co., Norwich, Conn.—Molding machine for planing, matching, and sticking molding; iron-frame pencil machine for making lead pencils, also adapted for sash and moldings; medium tenoning machine with double copes; small power mortising machine; large foot mortising machine; patent self-oiling saw arbor; Brodeworth planing and matching machine.
Fenn & Felber, St. Louis, Mo.—Zimmerman's mortising and slotting machine.
Baxter D. Whitney, Winchenden, Mass.—Cylinder planing machine, two horse-power; gauge lathe, two horse-power; smoothing machine, one horse-power; Wardwell's patent saw bench, one fourth horse-power.
American Saw Company, New York.—Circular saw, with Emerson's patent movable teeth.
Warren P. Miller, San Francisco, Cal.—Adjustable teeth for saws.
Cook, Sherman & Co., Glens' Falls, N. Y.—One barrel machine.
Gegener & Weiler, New York.—Patent liberty quarto medium job presses.
John E. Sweet, Syracuse, N. Y.—Composing machine.
Patrick Welch, New York.—Compositor's type case; also, a machine for dressing printers' types.
Geo. B. Buell, New York.—Patent writing printing machine.
Dustin F. Mellen, New York.—Screw making machines, consisting of one heading, one threading, one shaving, and one nicking machine.
Chas. A. Warland, Pawtucket, R. I.—Potter's fluting machines.
Henry Winser, Philadelphia, Pa.—Shot and shell polishing machine.
Wickersham Nail Company, Boston, Mass.—Wickersham nail machine.
Henry Smith, Salem, Mass.—A method of equalizing the power of coiled springs.
John Prentice, New York.—Cigar machine in operation.
New York Quartz Company, New York.—Emery wheels.
Hoylen & Gratling, Dayton, Ohio.—Self-feeding tobacco cutter.
Wood Brothers, New York.—One phaeton, one buggy.
Brevet Major Gen. D. H. Rucker, Chief Quartermaster's Department of Washington, D. C.—United States Government army wagon and six sets of mule harness.
A. V. Blanchard & Co., Palmer, Mass.—Plough and shovel handles of bent wood. Photographs of machinery on which the articles were made.
John Scott, Ocalo, Fla.—One carriage wheel.
James Hall & Son, Boston, Mass.—One top buggy.
Augustus Harrington, Warsaw, N. Y.—Elastic sursingle attachment.
Chas. Stallman, Natchez, Miss.—Fine lady's saddle.
Chas. Wellman, New York.—Ladies' and gentlemen's saddles.
W. G. Creamer, New York.—Model of an English railway carriage with Creamer's safety brake attached; model or samples of automatic ventilators; samples of perforated ventilator.
B. J. La Mothe, New York.—Model of a portable house.
G. Easton, United States Consul, Bristol, England.—Model and plan of a street railway and carriage.
Andrew Foster, New York.—Graham's locomotive spring balance, designed to regulate and control the safety valves of the boilers of locomotive steam engines.
Grant's Locomotive and Machine Company, Paterson, N. J.—Passenger locomotive engine and tender complete.
Henry W. Warner, Greenfield, Mass.—Cast-iron chairs with two pieces of railroad iron.
J. L. Booth, Rochester, N. Y.—Steel-capped rail for railroads.
Star Metal Company, New York.—Star metal railway journal bearing.
Thos. S. Hall, Stamford, Ct.—Electric railroad switch alarm.
John Stephenson, New York.—First-class street railway car, constructed with top seats, adapted to the European mode.
S. E. & C. L. Morse, Harrison, N. J.—A new mode of laying and raising telegraphic cables.
A. F. Ward, Philadelphia, Pa.—A chart and pamphlet representing combinations of colors arranged in geometrical order, by which the various combinations, amounting to tens of thousands, may be readily found; designed as a universal code of signals.
Moses G. Farmer, Boston, Mass.—A thermo-electric battery.
Paul Schultze, New York.—Model of a church.
Board of Public Works, Chicago, Ill.—A drawing of the tunnel being constructed two miles under Lake Michigan.
John Johnson, Saco. Me.—Model of a steam dredging machine.
Isaac Gregg, Philadelphia, Pa.—A brick machine and specimens of brick.
Horace H. Day, New York.—Model of a new system of canals without locks, adapted for the passage of ships of any size.
Stephen Ustick, Philadelphia, Pa.—Model improved street lamp.
Broughton & Moore, New York.—Instruments and apparatus for plumbers' use.
B. S. Huntington, New York.—Lever blind fastener for windows.
Arthur Huston, Bristol, Me.—Miter box, with scale for sawing miters.
Johnson Rotary Lock Company, New York.—Locks, padlocks, door-locks, etc.
Morris, Tasker & Co., Philadelphia, Pa.—Boiler flues, tubes, valves, cocks, fire plugs, heating coils, etc.
Yale & Wirm Manufacturing Company, Shelburne Falls, Mass.—Various kinds of bank, safe-door, and other locks.
New York Quartz Company, New York.—Specimens of building stones.
Samuel Nicholson, Boston, Mass.—Model of an improvement in wooden pavement.
Wm. Webster, Rochester, N. Y.—Plans for a first-class public park; plans for the grounds of a private mansion; plans for a rural cemetery etc.
James Dana, Boston, Mass.—Faced or pressed brick.
S. T. Bacon, Boston, Mass.—Bacon's challenge lock.
S. W. Palmer, Auburn, N. Y.—An improved adjustable iron bench plane.
Gonges Ventilating Company, New York.—Atmospheric Ventilator.
Louisville Cement Co., Louisville, Ky.—Specimens of cement.
Dodds, Macneale & Urban, Cincinnati, Ohio.—Bank locks.
Henry J. Newman, Andover, Mass.—Imitation of American woods, painted in oil and distemper colors on whitewood plank.
Chapin & Wells, Chicago, Ill.—Model of a swing bridge.
Hon. D. J. Pratt, Washington, D. C.—Working model of propelling apparatus.
Joseph Duffy, Paterson, N. J.—Miniature sectional model of iron-clad ships.
Capt. J. M. Hudson, Brooklyn, N. Y.—Specimen of rigging for ships, having for its object the raising of the topsail yard.
J. B. Van Deusen, New York.—Model of a yacht, called Fleetwing.
Elisha P. Beckwith, New London, Ct.—Miniature fishing smack.
Fred. E. Sickles, Oak Dale, Pa.—Working model to illustrate the effect of controlling the rudders of steam vessels by power instead of by hand.
E. L. Perry, New York.—Life-saving raft for saving human life at sea.
C. L. Daboll, New London, Ct.—Daboll's fog whistle or trumpet.
Brown & Level, New York.—Life-saving tackle.
E. W. Page, New York.—Eight pairs of oars of different styles.
William Oscar Reim, M.D., Springfield, Ohio.—Hydrostatic scale for ascertaining the tonnage of freight of vessels.

EXTENSION NOTICES.

Isaac Brown, Cecilton, Md., having petitioned for the extension of a patent granted to him the 19th day of July 1853, for an improvement in Mode of Driving Saws, for seven years from the expiration of said patent, which takes place on the 19th day of July, 1867, it is ordered that the said petition be heard at the Patent Office on Monday the first day of July next.

Enoch Hidden, New York, N. Y., having petitioned for the extension of a patent granted to him the 21st day of June, 1858, reissued Sept. 8th, 1863, and again reissued March 15th, 1864, for an improvement in Side Light for Ships, for seven years from the expiration of said patent, which takes place on the 21st day of June, 1867, it is ordered that the said petition be heard at the Patent Office on Monday the 17th day of June next.

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING APRIL 16, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$1
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ 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.

63,779.—MODE OF UNITING INDIA RUBBER WITH LEATHER.—Aaron C. Andrews, New Haven, Conn.

I claim uniting rubber to leather or other material by forming grooves or creases in such material into which the rubber is pressed previous to vulcanizing, as and for the purpose specified.

63,780.—SAW MILL.—Asa Bee, White Oak, West Va.

First, I claim the application of the guide rollers N, or their equivalents to the stirups J, substantially as and for the purpose specified.

Second, I claim the V-shaped adjustable and reversible guide bars O, when constructed and applied substantially as and for the purposes set forth.

Third, I claim the clearers P, when constructed and applied in the manner and for the purpose explained.

Fourth, I claim the combination of the springs T T3 T5, and lever T', when constructed and operating as described to communicate motion from the saw sash to the grip iron.

Fifth, I claim the spring T3, when constructed and made adjustable in the slotted lever T1, in the manner specified for the purpose of changing the feed, as described.

Sixth, I claim a grip iron when constructed with adjustable gripping blocks V1 V2 substantially as and for the purpose specified.

Seventh, I claim the adjustment of the blocks W1 W2 by means of the arm X, and clamp Y, as and for the purpose described.

63,781.—MOLD FOR PIPE CASTING.—Henry M. Bird, Cambridgeport, Mass.

I claim the combination as well as the arrangement of two or any other suitable number of the flange finishing and core supporting flasks D, provided with masses E, of molding sand, or its equivalent with a pipe mold, A B, and its core C, the whole being substantially as and for the purpose described.

63,782.—HARNESS BUCKLE.—George S. Caldwell, Syracuse, N. Y.

I claim the combination and arrangement of the buckle as herein set forth, viz., with the toothed jaws B B, reating in the edges of the frame, and bearing upon the edges of the tug or strap by means of the pins and inclined slots I k, or equivalent as specified.

63,783.—AXLE BOX.—Neil Campbell, (assignor to himself and William Frazier,) Brooklyn, New York.

First, I claim the flanges a a' on the exterior of the pedestal in combination with the grooved and shouldered removable base plate C, substantially in the manner and for the purpose described.

Second, The removable base plate constructed so as to be applied as described and also with sockets to receive a tie rod and end braces D D, substantially in the manner shown and described.

Third, The combination of the brackets E', studs d d', and solid springs F, F, substantially in the manner and for the purpose described.

Fourth, The combination of the enlarged sleeves K, with a grooved face bearing block H having flanges l l, substantially as described.

Fifth, The lugs h h, collar i, and pin j, in combination, as a means for securing a removable sleeve K, to the arm of a railroad car axle, substantially as herein described.

Sixth, The box E, with brackets E', on its sides and the pedestal with semi-cylindric chambers and with a cap A, so that solid springs F F, may be employed and confined in place by means of the removable base plate C, all substantially in the manner described.

63,784.—MACHINE FOR MAKING DRAIN WATER PIPES.—Chas. Collier, Charlestown, Mass.

I claim a clay cylinder or receiver B, in combination with an hydraulic cylinder operating a piston or plunger D, for ejecting the clay from the receiver in the required form for a pipe or tile substantially as described.

I also claim connecting the head or plunger D, with the piston E, of the hydraulic apparatus by means of a screw e, so that it may be moved toward and from the clay-cylinder by hand for the purpose specified.

63,785.—PAPER FILE.—Germond Crandell, Washington. D. C.

I claim a bill and paper file made as herein described or its substantial equivalent.

63,786.—MILLSTONE FEED.—Michael DeCamp, South Bend, Ind.

First, I claim the separator constructed and operating substantially in the manner herein described and applied in the relation substantially as shown and described to the millstone feeder and the eye of mill stones for the purpose set forth.

Second, The construction of the mouth of the separator in the manner substantially as shown and described, so that the separator is adapted to be applied to a mill and to operate substantially as described, for the purpose set forth.

Third, The arrangement of a millstone feeder and a separator in the relation to one another substantially as shown and described and for the purpose set forth.

Fourth, The raised step e e i, arranged on an inclined support and in relation to the inclined partition b, and the passage d, substantially as and for the purpose described.

63,787.—SASH SUPPORTER.—Herman Ehle, Utica, N. Y.

I claim the employment and use of one or more rods or bars C, attached to the sash and operated substantially as described.

I also claim in combination with said roads or bars C, and sash B, the nuts or disks D, and thumb screws E, the whole being attached and operated substantially in manner described, for the purpose mentioned.

63,788.—THRESHING MACHINE.—George Eichenseer, Waterloo, Ill.

I claim the combination of the screw bolts, a and a', substantially as and for the purpose set forth.

Second, The combination of the shaft, e, its bearing block, e2, and sliding bar, e3, the ways, e4, with the screw bar, e5, and handle nut, e6, all acting substantially as and for the purpose set forth.

Third, The combination of the pulleys, e11 and e12, for packing the driving band, D, substantially as and for the purpose set forth.

Fourth, The cutter teeth, h9, for cleansing the crevices between the flanges, h8, and the feed plate, h4, as set forth.

Fifth, The application of the drop guide plate, k5, as set forth.

Sixth, The combination of the conduit, o3, and o4, with the door, o5, substantially as and for the purposes set forth.

Seventh, The combination of a feed plate, h4, arranged for vertical adjustments, with the thresher cylinder, h2, arranged for lateral horizontal adjustment, substantially as set forth.

Eighth, The combination of the separators, k k1 k2, with the return feed plate, k3, chaff discharge plate, k4, and guide drop plate, k5, all with the air currents adjusted and directed by the vane, p4, substantially as set forth.

63,789.—APPARATUS FOR REFINING AND DISTILLING PETROLEUM, ETC.—John Ellis, New York City, and Edward C. Hattell, Binghamton, N. Y.

First, we claim the using of steam and superheated steam for the purpose of separating and removing the more volatile from the less volatile portions of petroleum, kerosene, benzine, naphtha and turpentine, while these fluids are in a state of spray or drops, as specified.

Second, The oil pipes, E, and K, and condensing tubes, D and I, when constructed and arranged in relation to each other, and a retort, as and for the purpose specified.

Third, The separating tank tub, or tube, in combination with an upper and under retort, for the purpose of separating the water and earthy impurities from the oil before the latter flows into the lower retort.

Fourth, The using in a retort scraps of metal wire, wire sieves, nails, turnings, or other metallic or earthen materials, or even vegetable substances, which will either form a screen or a porous mass through which oil can trickle down so as to expose a large surface of it to the action of heat.

Fifth, The using in a retort or retorts of a series of nearly or quite horizontal plates, shallow pans or shelves, which may lie concave or with edges turned up, plain or convex, perforated with from one to numerous openings, or without any openings, over which oil can flow or drop, or run from point to point, in combination with the pipe, I, and coil, K, so as to expose a very large surface to the action of steam, and to form a very large evaporating surface.

Sixth, The using an agitator in a circular or nearly circular retort, for the purpose of throwing the oil into a spray or drops, so as to expose every drop as far as possible to the direct action of heat, and allowing the oil or fluid being distilled to flow through the retort in a steady stream, but not to accumulate in any considerable quantity in the retort, substantially as represented in the drawings.