that enabled them to live in an atmosphere of carbonic acid. The accumulation of evidence goes to show that we cannot be too careful, not only in the quality of the air we breathe but also in the manner in which we draw it into our lungs, The nostrils are provided with a natural sieve and filter, and it is possible, on the principle of dialysis and the laws of the passage of gases through membranes, that the nitrogen and carbonic acid are excluded while the oxygen is permitted freely to pass. The warning of such authorities as Professor Tyndall and Dr. Stiles ought not to be disregarded, and we are disposed to concur in the sentiments expressed by Mr. Catlin, where he says: "If I were to endeavor to bequeath to posterity the most important motto which human language can convey, it should be in these words:

SHUT YOUR MOUTH."

## COMPARISON OF TURBINES WITH OTHER WATER WHEELS.

We find the following translation from *Weisbach's Ingenieur- und-Maschinen Mechanik*, in *Van Nostrand's Engineering Magazine*, for April, which sets forth the relative advantages of turbines and other wheels in a very strong light:

A great advantage of turbines compared with vertical water wheels is that they work with any fall from 1 to 500 feet (German), while the latter cannot convert into work the power of a fall of more than 50 feet. It is true that the ratio of effective work of turbines varies for different falls; for example, for small wheels it is less with high fall than with medium or low fall, because in this case the resistances are proportionally greater than with larger wheels under medium fall. On the other hand, overshot wheels obtain a modulus from high fall of from 20 to 40 feet, which cannot be reached by turbines. Equal amounts of work are to be expected from both kinds only from a medium fall of from 10 to 20 feet; but if the fall is low, then turbines in every case give a greater modulus than undershot wheels under the same conditions. Poncelet's wheel can be compared with turbines for falls of from 3 to 6 feet only.

Turbines have another great advantage over vertical water wheels, in working with equal effect under different heads, and especially in not being hindered by back water, so that they work in water as freely as in air, and in some cases with greater effect. Vertical wheels always lose power if the head varies, although in no great degree, unless the fall is low or the wheel is in the water.

On the other hand, variations in the overfall upon vertical water wheels are attended with less loss of work than is the case with horizantal wheels. In an economic point of view this fact is in favor of the vertical wheel. If it is necessary to increase the effect of a vertical wheel already in motion, especially if it is one upon which the water acts mainly by pressure, it is done by supplying more water; and to diminish the effect the supply is partly cut off; in neither case is the actual modulus greater or less. The relation is altogether different in the case of a reaction turbine. This works with most effect when the sluices are wide open and when the charge of water is the greatest; now if less work, and therefore less water, is required and the sluices are partially lowered, it happens that the work is diminished by decrease of supply, but partly by the loss of the living force of the water or by diminution of the head, so that the effective force is lessened. This destruction of living force may be compared with the braking or dragging of a wagon, which is applied in going down hill, when there is an excess of living force. Consequently, while the lowering of a gate only cuts off superfluous water from a vertical wheel, which can be used for other purposes, in the case of the reaction turbine the shutting off a part of the overplus subtracts from the living force of the other part remaining in the wheel.

In pressure turbines which do not run in water, so that the channels are not entirely filled, the modulus of work is more favorable, since the water issues through the channels without causing an eddy.

There is not a great difference between horizontal and vertical water wheels in respect to the change of the velocity of revolution; in both the normal velocity may be increased or decreased about one fourth without material loss of effect. But there is certainly a very great difference in the magnitudes of these velocities. All vertical wheels, with the exception of the undershot (Poncelet's especially), have a maximum velocity of from 4 to 10 feet, while turbines generally have far greater velocities, varying greatly according to the heads. For this reason, and because they have smaller radii, turbines generally make many more revolutions than vertical water wheels. It follows that the choice between these depends upon the number of revolutions; in other words, upon the kind of motion, quick or slow, which is required in the motor. But it must be borne in mind that rapid motion in a machine is rather injurious than advantageous, on account of the great increase of hurtful resistances, such as friction and shocks; for this reason it is often better to increase the number of revolutions by means of some machine of transmission, and to employ the vertical instead of the horizontal water wheel.

If the load of a machine is variable, as in the case of tilt-hammers or rolling-mills, the vertical wheel is to be preferred; for, though it runs slower, yet on account of its greater mass it acts more as a regulator than the turbine, whose variable motion must often be equalized by a fly wheel. But for a constant load preference must be given to the turbine in this respect; because vertical water wheels, especially if of wood, often have a so-called "heavy quarter," *i.e.*, equal parts of the circumference are not of equal weight.

In an economic point of view, turbines rank at least equal with vertical wheels; and for high and medium falls and a great overflow they are preferable because they are cheaper In respect to durability, also, the turbine must have the preference.

On the other hand, it must be remembered that turbines require a clear overflow, and that their effect can be hindered in a very great degree by sand, mud, moss, weeds, leaves, pieces of ice, twigs of trees, etc., which do no damage to vertical wheels. Finally, it is to be considered that turbines, particularly those with guide-curves, are more difficult to construct, and that departures from the mathematical rules of construction are followed by worse results than in the case of vertical water-wheels. This is the reason that so many turbines failed in the early trials, and that they are not yet as extensively employed as their advantages warrant.

## WHERE AND HOW CORKS ARE CUT.

We condense from the *Druggists' Circular* the present account of the way in which corks are manufactured.

In Europe the greater portion of corks are cut in the towns and hamlets in the immediate vicinity of the cork forests, and in the seaports of Seville, Barcelona, Oporto, Lisbon, Bordeaux, Lyons, Marseilles, and Gibraltar. In Germany the small homeopathic vial cork is largely cut, while it is safe to say that in most of the leading cities of the civilized world, cork-cutting is conducted as a branch of industry.

Throughout the whole cork-growing region the wood is cut by hand into the various sizes for use. For the common varieties, children are largely employed, while men of experience are engaged in cutting the finer qualities. After trimming the wood, slicing, and cutting into convenient-sized squares, the corks are cut, and then assorted in qualities and sizes. When assorted, they are then packed in bales varying from one hundred to three hundred and fifty gross each, and are then ready for shipment. In Germany they are frequently put up in small bails of twenty gross each. When cut in this manner the sizes must be judged by the eye, and there is consequently a lack of uniformity of size as well as imperfection in roundness of the corks. This will readily be seen by examining samples of imported hand-made corks.

Previous to 1855 all corks were cut by hand, and the exportation of corks from southern Europe was immense. Since the application of steam machinery to cutting corks in this country, the importation of foreign hand-made corks has rapidly declined.

About thirty years ago an attempt was made by an enterprising New Englander to cut corks by machinery, and an establishment for that purpose was constructed in Boston; but they failed to carry out the project successfully. As near as I could learn, the failure of the machine was in delivering the corks with smooth ends and with sufficient rapidity. In 1855 cork-cutting machines were constructed that proved successful, and since that time the trade has been revolutionized. It was soon proved that corks could be cut more uniform with less waste of material, and with vastly greater rapidity. An average day's work cutting by hand, and having the wood already cut to the proper-sized squares, would rarely exceed ten or twelve gross, though in a few cases the most expert workmen would cut nearly twenty gross; while an average day's work by machine would be one hundred gross, and a single instance was told me of a lad that had cut one hundred and eighty gross in ten hours. The number cut by machine per day will vary with the kind of machine, and the dexterity of the workmen, as also the quality of the wood. There have been quite a number of cork cutting machines introduced from time to time, but I believe they are all of two general styles. The kind most largely used (I believe) is the punching and boring machine, originally invented by J. D. & W. R. Crocker, of Norwich, Conn., and since improved by them and others. This original machine cut only straight corks. Another machine was afterwards added which cut the taper cork. There have been some modifications of the machine and adaptations by other manufacturers, but it is believed that the credit for introducing steam machinery for cutting corks is due to the Messrs. Crocker. There are others who are entitled to praise for judicious modifications, but the writer omits names lest he should do injustice to some whose names are not known to him.

The principles of the two styles of machines used may be of interest, and I shall endeavor to explain them as clearly as possible. In the punching or boring machine there is a sharp steel cylindrical knife, revolving horizontally, being propelled forward to the block of cork-wood to be cut, and backward again, as rapidly as the skill of the operator desires it. The knife cuts through the block of cork-wood, and the cork cut by the operation passes through the cylinder and is carried off out of the way of the operator. This machine cuts only a straight cork, and it is ready for sale without any further operation, except sorting out those in which the wood is imperfect. There is another boring machine which bores at one operation a taper cork, but requires a separate handling to remove the cork from the block. The tapering machine alluded to previously has either a square of cork-wood or the round straight cork inserted in an adjustable lathe (which is a part of the machine) in which it revolves rapidly; it is then presented to the blade of a flat circular knife, from 24 to 30 inches diameter, which lies flat and revolves about five or six hundred times a minute. Two or more revolutions of the cork are made, which removes a thin shaving and gives the requisite tapering shape to the cork. This tapering machine is adapted to cut either a straight or taper cork, as it needs only a very slight alteration of the adjustable lathe to cut either style of cork. There are some minor details, but a five minutes' examination of the machines would convey more information than pages of written description. It is an exceedingly interesting mechanical operation, and those who have not seen it should embrace an early opportunity to do so.

In cutting the wood into corks, it is first steamed for a short time, then by a circular knife cut into strips suitable for either the length or breadth of the cork. If the boring machine is used, the smooth side of the strips is then introduced, and the corks are at once bored out as closely together as can be done. The corks need only sorting, to reject imperfect ones, when they are ready for sale. These corks are straight. If it be a taper cork, the straight ones are now introduced into the adjustable lathe of the tapering machine before alluded to, and a somewhat conical shaving is taken off, when the corks are sorted and put up for sale. It is asserted by those using this machine, that it is the most advantageous and economical. When the boring machine is dispensed with, the strips of cork-wood are cut into suitable squares by hand, and at once cut into either straight or taper corks by simply adjusting the lathe which holds the cork.

The corks, when offered for sale, are usually designated by numbers fron one to twenty, and in addition are called straight or taper. The largest number of any one sold are those suitable for ale and soda-water bottles, while the vial corks of various sizes, except the two smallest, are in nearly equal demand. Of the other styles of corks, there are flat or specie corks of various sizes, enlarging by one-eighth of an inch.

In the manufacture of corks fully one-third of the wood is wasted. This arises from inequalities and imperfections in the wood, and the natural wastage in cutting circles out of any plane surface. This wastage has found some uses, among which the principal are in filling cushions, mattresses, the spaces between the roof and top ceiling of houses, as, also the spaces in the sides of frame houses and buildings for storing of ice, while in the cork factories the coarser wastage is used for fuel.

Foreign hand-cut corks are now in a great measure being superseded by American machine-cut corks, as they are much more uniform in size and quality, and can compete successfully in price.

## NEW BOOKS AND PUBLICATIONS.

THE PAINTER, GILDER, AND VARNISHERS' COMPANION. Containing Rules and Regulations in everything relating to the Arts of Painting, Gilding, Varnishing, Glass Staining, Graining, Marbling, Sign Writing, Gilding on Glass, and Coach Painting and Varnishing, Tests for the Adulteration in Oils, Colors. etc., and a Statement of the Diseases to which Painters are peculiarly liable, with the Best and Simplest Remedies. Thirteenth Edition. Revised, with an Appendix, containing Colors and Coloring—Theoretical and Practical, comprising Descriptions of a great Variety of additional Pigments, their Qualities and Uses, to which are added Dryers, and Modes and Operations of Painting, etc. Together with Chevreul's Principles of Harmony and Contrast of Colors. Philadelphia: Henry Carey Baird, Industrial Publisher, No. 406 Walnut street. Price, by mail, free of postage, $1·50.

How a work of this kind, containing such a copious mass of information, can be made and sold for the price it is afforded is one of the mysteries of book-making we are unable to solve. It is, without exception, the best and cheapest work of the kind of which we have any knowledge. The chapter on the "Principles of Harmony and Contrast of Colors" is well worth the price of the book. Were it studied by painters in general, we should have less of those hideous combinations of color, in house and ornamental painting, of which we have so often complained in these columns.

A MANUAL OF ELECTRO-METALLURGY. Including the Application of the Art to Manufacturing Processes. By James Napier, F.C.S. Fourth American from the Fourth London Edition. Revised and Enlarged. Illustrated by numerous Engravings. Philadelphia: Henry Carey Baird, Industrial Publisher, 406 Walnut street. Price, by mail, free of postage, $2·00.

This work treats of electro-metallurgy in both a scientific and practi manner. It is, as its title imports, a complete manual upon the subject. It commences with a history of the art, brought up to date. This is followed by a description of the various galvanic batteries, with their peculiarities and their applicability to electro-metallurgic operation. The miscellaneous applications of the process of coating with copper are next treated, after which follow in their order discussions of the various methods of bronzing, deposition of metals upon one another, electro-plating, electro-gilding, results of experiments on the deposition of other metals as coatings, theoretical observations, etc. The value of the book is enhanced by a copious index. So far as we can infer from an examination made with special reference to detect omissions of recent processes and discoveries, the work is brought entirely down to the present state of the art.

MODERN WORKSHOP PRACTICE. As Applied to Marine, Land, and Locomotive Engines, Floating Docks, Dredging Machinery, Bridges, Shipbuilding, Cranes, etc., etc. By John G. Winton, Engineer. Strahan & Co., Publishers, 56 Ludgate Hill, London.

This is one of Weale's Rudimentary Series, intended to treat in a popular style, and in a practical manner, the departments of mechanical engineering named in its title. These subjects are viewed almost entirely from an English standpoint, yet the book contains much valuable information to the American engineer. A valuable feature of the work is found in its tables, the use of which will save much time and labor in calculations of all kinds pertaining to proportions of boilers and engines, bridges, etc.

ELECTRO-METALLURGY PRATICALLY TREATED. By Alexander Watt, F.R.S.A., Lecturer on Electro-Metallurgy, etc., formerly one of the Editors of "The Chemist." New Edition. Strahan & Co., Publishers, 56 Ludgate Hill, London.

This work, besides treating in a plain and specific manner with the difficulties and the various modes of procedure connected with electro-metallurgy, gives much additional matter not contained in former editions, upon the production of a dead white surface on silver articles, whitening brass dials, coloring gold articles, reduction of solutions, etc, etc. This work will be found a great aid, not only to amateurs, but to the profession al electro-metallurgist.

**Inventions Examined at the Patent Office.**—Inventors can have a careful search made at the Patent Office into the novelty of their inventions, and receive a report in writing as to the probable success of the application. Send sketch and description by mail, inclosing fee of $5 Address MUNN & CO., 37 Park Row, New York.

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## Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

604.—MANUFACTURING YARNS AND FABRICS CONTAINING HORSEHAIR.—H. Hayward, Paterson, N. J. March 1, 1870.

409.—SUBMARINE TELEGRAPH CABLES.—James Story, Paris, Ky. February 11, 1870.

424.—GENERATING GAS.—A. I. Ambler, Washington, D. C. February 12, 1870.

510.—MACHINERY FOR SPLITTING ROCKS.—John Robb, New York city. February 24, 1870.

544.—MACHINERY FOR MAKING NAILS.—D. Reed, R. M. Bassett, and T. S. Bassett, Birmingham, Conn. Feb. 24, 1870.

549.—STEAM BOILER AND ENGINES.—F. B. Blanchard, New York city. February 24, 1870.

550.—MANUFACTURE OF NEEDLES.—R. J. Roberts, New York city. Feb. 24, 1870.

551.—WINDMILLS.—Edward Savoral, New York city. February 24, 1870.

563.—MACHINERY FOR MANUFACTURING SCREWS.—J. A. Ayres, Hartford, Conn, February 25, 1870.

564.—MECHANISM FOR ACTUATING MACHINES.—C. H. Wilcox, New York city. February 25, 1870.

568.—MANUFACTURE OF HAIR CLOTH AND LIKE FABRICS AND LOOMS THEREFOR.—I. Lindsay, Pawtucket, R. I. February 25, 1870.

592.—SEWING MACHINES.—Charles Lennig, Philadelphia, Pa February 28, 1870.

636.—RAILWAY.—D. R. Pratt, Worcester, Mass. March 3, 1870.

676.—CARPET SWEEPER.—A, J. Hapgood, New York city. March 7, 1970.

605.—RAILWAY CARRIAGE WHEELS.—H. W. Moore, Jersey City, N. J., and F. Bloodgood, C. B. Wood, and F. Wood, New York city, March 1, 1870.

631.—FLUID METER.—J. F. de Navarro. New York city. March 3, 1870.

635.—JOURNAL LUBRICATOR.—W. A. Wood, Hoosick Falls, N. Y. March 3, 1870.

663.—DEVICE FOR HOLDING LETTERS, ETC.—F. T. Ferguson, Boston, Mass. March 5, 1870.

700.—ETCHING PLATES FOR PRINTING.—J. McLoughlin, Morrisania, N. Y., and E. McLoughlin, New York city. March 9, 1870.

709.—BURNING OIL FROM PETROLEUM.—J. A. Tatro, Hartford, Conn. March 10, 1870.

725.—TYPE-SETTING MACHINE.—J. T. E. Slingerland, New York city. March 11, 1870.

744.—WATER INDICATOR AND REGULATOR FOR BOILERS.—R. N. Pratt and R. Berryman, Philadelphia, Pa., and F. A. Pratt and S. Coit, Hartford, Conn. March 14, 1870.

## Answers to Correspondents.

*CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address correspondents by mail.*

*SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1·00 a line, under the head of "Business and Personal."*

*All reference to back numbers should be by volume and page.*

A. G. B., of Pa.—The effective horse power of steam engines is determined by the dynamometer. The absolute horse power, or indicated horse power, by multiplying the mean effective pressure in the cylinder, by the velocity of the piston in feet per minute, and dividing the product by 33,000. The nominal horse power of ordinary condensing engines is found by multiplying the square of the diameter of the cylinder in inches by the velocity of the piston in feet per minute, and dividing the product by 6,000. In the application of this rule, the speed of piston is fixed according to the length of stroke, that is, the speed for a 2 feet stroke is assumed to be 160 per minute, and speeds for other lengths of stroke to be to this speed as the cube roots of their lengths. Nominal horse power is only a conventional expression for the measure of the dimensions of an engine. It does not give any idea of the actual power of which the engine is capable. The Richards Steam Indicator is the best instrument for testing the power of steam engines.

S. H. W., of Conn.—It is evident that your logic is not able to draw any distinction between the statement that matter moves, and your own statement that it moves itself. You will doubtless admit that the earth moves constantly in its orbit. Because you make that admission, we shall not consider it legitimate to charge you with believing that *it moves itself*. You admit the existence of matter, which admission of course allows the existence of the essential properties of matter. What violence is done to just logical inference by supposing that matter was originally endowed with motion, as it was endowed with impenetrability? Such a supposition does not imply self-creation, or power to endow itself with motion, as you illogically assert.

O. S. M., of Va.—The protection afforded against the injurious effects of white lead in grinding would at best, we think, be so partial as not to render it of great practical value. The injury resulting from this substance has been much reduced by modern modes of manipulation. There is no other harmless white pigment known, that could be generally used as a substitute for lead and zinc white. Oxide of zinc, however, is now largely used as less injurious than white lead, and not turning black by the action of sulphureted hydrogen.

H. W. S., of Ohio.—According to Dalton's investigations, it appears that when different gases are mixed, they only act mechanically to retard each other in their occupation of a given space. Thus, if a gallon of oxygen be placed in a jar, a gallon of any other gas that will not chemically combine with it may be introduced into the same jar, and still a third gallon of some other gas, etc. The experiment could not be performed with air and oxygen, as air contains oxygen.

S. & S., of Ohio.—Much obliged for the club of subscribers you have obtained among the workmen in your establishment. Similar efforts on the part of heads of other establishments, would, without doubt, result in mutual benefit. Your first query is answered at length in an article on "Mean Effective Pressure," which will shortly appear. Friction is a variable quantity even in the best constructed engines. No two will agree in this particular.

M. C., of Mass.—Carbonic oxide gives out but a small proportion of heat in its combustion, compared to that produced by the burning of carbon. We do not think it could be applied to brazing, etc., with advantage, and never heard of its being specially prepared to be used as fuel. In ordinary coal stoves a certain amount is generated, which is consumed in those stoves known as gas-burners.

A. P., of N. Y.—The mixture named would not injure leather in any way. On the contrary, we think it would undoubtedly act to preserve it. The different materials have been used, but we do not think they have all been used in a similar combination. We judge the mixture is patentable. Sugar cannot be made in the way you propose.

E. G. S., of Minn.—Water inevitably hardens in a new cistern lined with water-lime cement. You may soften it by adding a little quick lime in the form of milk of lime, see article on page 217, Vol. XXI., of the SCIENTIFIC AMERICAN.

W. M. L., of Pa., wishes a solution of the following problem. Given the length of belt, distance between the centers of two cone pulleys, and *ratio* of their diameters to determine the diameters.

C. B. F., of Brockport, N. Y., will find the information he desires in the Encyclopedia Britannica, Vol. XVI., page 54; also, by a visit to the Morris & Essex canal at Rockaway and other points.

J. M. E., of Pa.—What is generally understood by the term atmospheric engine, is one in which the piston is actuated by steam on one side and air on the other

B. C., of N. H.—A gas, or mixture of gases, absorbs as much heat in expanding after compression, as it evolves when compressed.

A. F. H., of W. Va.—The metallic appearance of the mineral you send is due to the presence of iron pyrites.

## Business and Personal.

*The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per line will be charged.*

The paper that meets the eye of manufacturers throughout the United States—Boston Bulletin, $4·00 a year. Advertisements 17c. a line.

Steel Makers' Materials—Wolfram ore, oxide manganese, Speigel iron, borax, titanium, chrome, lubricating black lead, for sale by L. & J. W. Feuchtwanger, 55 Cedar st., New York.

For the best Alarm Money Drawer, address Robbins, Froutz & Co., Hughesville, Pa. Agents wanted.

Machines for manufacturing Screw Bolts and Nuts of all kinds. Makers will please send price lists and other information to C. G. Berryman, Saint John, N. B.

Superior Lacing made under Page's Pat't. Address J. Sweetman, Utica, N. Y.

Missouri Globe Valve—Best in use. Can be ground tight at any time. Send for circular. J. W. Brown, Manuf'r, Baltimore, Md.

Egg Hatching.—Parties having any device, patented or not, for hatching eggs, will address C. C. Runyan, Mansfield, Ohio.

Astronomical Transit, second-hand, and perfect, wanted by T. & E. Dickinson, 254 Main st., Buffalo, N. Y.

For Sale—A Roper Caloric Engine, 1-Horse Power. Nearly new. Address C. F. Werner, Orange, N. J.

Spools of all kinds, and spiral shade tassel molds made by H. H. Frary, Jonesville, Vt.

Peck's patent drop press. For circulars, address the sole manufacturers, Milo Peck & Co., New Haven, Ct.

Millstone Dressing Diamond Machine—Simple, effective, durable. For description of the above see Scientific American, Nov. 27th, 1869. Also, Glazier's Diamonds. John Dickinson, 64 Nassau st., N. Y.

Harry Hammond Augusta, Ga., wishes to communicate with parties who furnish devices for sinking wells.

Jno. A. Hafner's (Commerce, Mo.,) Pat. Eureka Coil Spring for Horse-powers will save 20 per c. power and 90 per c. breakage, positively.

Wanted to buy—A good 2d-hand Band Sawing Machine, in good order. Address C. W. Hyde, Springfield, Mass.

Kelly's Eclipse Hay Elevator—Best in use. Rights for sale cheap. Apply soon. Address T. C. Kelly, West Liberty, Pa.

Manufacturers of Calf and Lamb Roller Skins, Roller and Clearer Cloths. Please send address to P.O. Box 3,756, Boston.

Belting—See advertisement of Page's Patent Tanned Belting on page 278. Page Brothers, Franklin, N. H.

Wanted—Four good second-hand milling machines. Address Thos. H. White & Co., 28 Canal st., Cleveland, Ohio.

Wanted—A Situation by an electro gold and silver plater. Address Box 178, Waterbury, Conn.

An experienced mechanical and railway engineer wishes a position as Master of Machinery, or Manager. Address "Engineer," Station "G," Philadelphia, Pa., Postoffice.

Bartlett's Street Gas Lighter. Office, 569 Broadway, N. Y.

For description of the best lath and blind slat sawing machine in use, address W. B. Noyes, Gen'l Ag't, P. O. Box 558, Manchester, N. H.

Important advance on the draft and easement of carriage. See Jackson's Patent Oscillating Wagon, with tests of draft, models, etc., No. 149 High st., Newark, Essex Co., N.J. See Scientific American, Sept. 25, 1869.

Kidder's Pastilles.—A sure relief for Asthma. Price 40 cents by mail. Stowell & Co., Charlestown, Mass.

Needles for all sewing machines at Bartlett's, 569 Broadway, N Y.

Pat. paper for buildings, inside & out, C. J. Fay, Camden, N. J.

For Sale—An old established Malleable and Gray Iron Foundery, doing a large trade in hardware. Cause of selling, failure of health of the proprietor. Address "Malleable Iron," Newark, N. J.

Brick and Tile Drain Machine—First Premium in Ohio, Indiana, and Missouri; also Fair of American Institute, New York. Address Thos. L. Cornell, Derby, Conn.

Asbestos—Wanted by J.N.Clarke, 126 Dearborn st., Chicago, Ill.

For solid wrought-iron beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

For first-quality new 14, 17, and 20-in. screw lathes, milling machines, and one-spindle drills, at small advance from cost, apply to Geo. S. Lincoln & Co., Hartford, Conn.

Hackle, Gill Pins, etc., at Bartlett's, 569 Broadway, New York.

Portable Pumping or Hoisting Machinery to Hire for Coffer Dams, Wells, Sewers, etc. Wm. D. Andrews & Bro., 414 Water st., N. Y.

Keuffel & Esser, 71 Nassau st., N.Y., the best place to get 1st-class Drawing Materials, Swiss Instruments, and Rubber Triangles and Curves

For tinmans' tools, presses, etc., apply to Mays & Bliss, Brooklyn, N. Y

Glynn's Anti-Incrustator for Steam Boiler—The only reliable preventative. No foaming, and does not attack metals of boiler. Liberal terms to Agents. C. D. Fredricks, 587 Broadway, New York.

Two 60-Horse Locomotive Boilers, used 5 mos., $1,300 each. The machinery of two 500-tun iron propellers, in good order, for sale by Wm. D. Andrews & Bro., 414 Water st., New York.

To ascertain where there will be a demand for new machinery or manufacturers' supplies read Boston Commercial Bulletin's manufacturing news of the United States. Terms $4·00 a year.

Cold Rolled—Shafting, piston rods, pump rods, Collins pat. double compression couplings, manufactured by Jones & Laughlins, Pittsburgh, Pa.

For mining, wrecking, pumping, drainage, and irrigating machinery, see advertisement of Andrews' Patents in another column.

Pictures for the Parlor.—Prang's Chromos, sold in all art and bookstores throughout the world.

**Caveats** are desirable if an inventor is not fully prepared to apply for a patent. A Caveat affords protection for one year against the issue of a patent to another for the same invention. Patent Office fee on filing a Caveat, $10. Agency charge for preparing and filing the documents from $10 to $12. Address MUNN & CO., 37 Park Row, New York.

## Recent American and Foreign Patents.

*Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.*

SCROLL SAWING MACHINE.—Eliphalet A. Tripp, Newark, N. J.—This invention has for its object to furnish an improved scroll-sawing machine simple in construction, easily and conveniently operated, and effective in operation.

WASHING MACHINE.—James D. Royse and John Royse, Cane Valley, Ky—This invention has for its object to furnish an improved washing machine simple in construction, strong, and durable, which will not rub the clothes and which will, at the same time, wash them quickly and thoroughly.

COTTON SEED AND CORN PLANTER.—Joshua B. Godwin, Williamston, N C.—This invention has for its object to furnish a simple, convenient, effective, and accurate machine for planting cotton seed and corn, which shall be so constructed and arranged that it may be easily adjusted for work in either capacity.

TIN CAN.—John Joseph Burkert, New York city.—This invention has for its object so to construct the covers and fastenings of sheet-metal cans, that such covers, after having been cut open, shall not have become entirely useless.

MONEY SAFE.—Philipp Schreyer, New York city.—This invention relates to a new manner of constructing iron safes, and to a novel method of applying the same to articles of furniture. The invention consists in so constructing a safe of an outer and inner metal case, that the two cases are only connected by a bolt or bolts, passing through their bottoms, no other fastening being required. The invention consists, also, in constructing such safes so that they can be applied as supports or central standards to tables.

PICTURE NAIL.—John H. Squiers and Ezra J. Warner, Newark, N.J.—This invention relates to a new device for fastening the porcelain knobs to the ends of nails or screws, which are used for suspending pictures, and for other purposes. The invention consists in the application of wire-spring fastenings to the porcelain knobs or heads, the springs being so formed as to catch readily over the heads of the nails or screws, to which they are to secured.

MULTIPLE SPONGE.—Hamilton Erastus Smith, Newark, N. J.—The object of this invention is to make small sponges more useful, and to increase their value. At present, large sponges, such as are used for washing coaches, etc., are very expensive, the value increasing with the size, while small sponges are comparatively useless. This invention consists in uniting a suitable number of small pieces of sponge into one large sponge by means of fastening devices, which are entirely concealed. The entire sponge surface of this multiple sponge is, therefore, applicable to use.

COMBINED COUNTER AND SHOWCASE.—L. F. Vienot, New York city.—The object of this invention is to reduce the cost of counters and show cases by combining them, and thereby saving the expensive counter tops.

PHOTOGRAPHIC PRINTING APPARATUS.—J. H. Hamilton, Sioux City, Iowa.—This invention relates to improvements in apparatus for making mezzotint photographs, and consists in the employment of a large box containing several square tubes, and supported on pivots, in a frame mounted on casters, so that it may be adjusted in vertical and horizontal planes to cause the tubes to receive the rays of light from the sun in the lines of their axis at all times and so as to fall on the negative perpendicular to it, the negative with the printing frame being placed at the bottom of the tubes.

TUG FASTENING FOR WHIFFLETREES.—L. A. Johnson, Candor, N. Y.—This invention relates to improvements in fastenings for connecting the tugs to whiffletrees, and consists in the combination with the tug hooks projecting from the ends of the whiffletree, of slides preferably arranged in grooves in the rear sides of the whiffletrees to slide forward and back, and having bent up ends provided with holes coinciding with the ends of the hooks to receive the said ends when slided inward to prevent the escape of the tug, and strengthen the said hooks. The said slides are provided with spring stops, which hold them in the open position for the reception of the tugs, or in the closed position for retaining them.

SAW PITMAN HEAD.—L. Morrison and A. G. Harms, Allegheny City, Pa.—The object of this invention is to simplify and render more convenient the mechanism connected with a muley saw, having more especial reference to the pitman head, but applying also to the buckle of the saw; and it consists in the method of adjusting the rivet pin of the pitman head, and in the construction of the buckle of the saw.

COVERING FOR STEAM BOILERS, STEAM PIPES, ETC.—James E. Sharp, Eleazer Ainsworth, and F. A. Sabbaton, Troy, N. Y.—This invention relates to a new and useful improvement in the mode of protecting steam boilers, steam pipes, or other articles from the effects of cold air, preventing thereby the condensation of steam and loss of heat.

COLUMNAR MATTRESS.—H. E. Smith, New York city.—This invention has for its object to furnish an improved mattress, which shall be so constructed that the air may pass through it freely to keep it pure; and which shall at the same time, be very elastic and comfortable as a bed.

ROCK DRILL.—Samuel Lewis, Williamsburg, N. Y.—This invention has for its object to improve the construction of an improved drill, patented June 15, 1869, and numbered 91,352, so as to make it more convenient in use and more effective in operation, enabling the length of stroke to be regulated at will, and any one of the drills to be raised and detached without disturbing the operation of the other drills.

KNIFE SCOURER.—J. Q. Adams and S. R. Goodsill, Brooklyn, N. Y.—This invention relates to a new and convenient improvement for cleaning and scouring the blades of table knives. The invention consists in the use of a cylindrical box, which has a perforated bottom and is combined with an annular cork, secured against the bottom.

WOOD PULP MACHINE.—S. C. Taft, Mendon, Mass.—This invention relates to a new machine for reducing wood to a pulp, to prepare it for the manufacture of paper.

STEAM GENERATOR.—Michael Ritchey, Paterson, N. J.—This invention relates to a new steam generator, which is so constructed that the water, before it enters the steam boiler, will be thoroughly heated, and that, when the pumping ceases, a complete circulation may be kept up in the same.

TONGUEING AND GROOVING MACHINE.—B. J. Barber, Ballston Spa, N. Y—This invention relates to a new manner of arranging the cutters on the heads of tongueing and grooving machines, with a view to preventing the tearing of the wooden fiber, and the consequent cracking of the wood, which is frequently occasioned on the ordinary machines now in use.

EASY CHAIR.—William Charles Poppendieche, New York city.—This invention relates to a new adjustable easy chair, which can be so set and adjusted that its back and foot rest will be more or less inclined, and the arm rests extended, at the will of the person using it.

COMBINATION TOOL.—W. A. Sharp, Tama City, Iowa.—This invention comprises the combination in one tool, of a sliding hook, or gage, level plumb, compass, calipers, try square, bevel, foot rule, edging plane, rabbet plane, screw driver, tape measure, and marking gage.

COUNTERSINKS.—Asa Wheeler, Brattleboro, Vt.—This invention relates to countersinks, and in the mode of making them. The bit is formed in the shape of a hollow eccentric cone, with an angular slot at the line from the point to the base of the cone, where the sides of the parts with the greater and lesser radii meet. The base of the bit is united to the handle by a section representing about half, or a little more than half a cone, having its base connected to the inverted base of the bit.

MACHINE FOR STAMPING LACE PAPER.—Ambroise Giraudat, New York city.—This invention relates to a new machine for stamping lace paper either in long strips or circular pieces, and has for its object to do away with the ordinary tedious manual process, and to permit the employment upon the same piece of a number of hammers. Thereby the process of stamping will be greatly facilitated, and less labor required for the pur

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