It has been shown that the indicator cannot always be re- averaged with the good. The United States Government excoal vary so much, also, in different localities, that the better proportioned for economy, probably, than the average amount consumed does not furnish an accurate comparative measure of the cost of the power. When the coal measure alone is used, too, the engines and boilers are both tested together, which gives no opportunity to ascertain which of the two is entitled to the credit of the performance. This standard will not then answer the purpose of a scientific investigation. In such case we must ascertain, in addition to the coal, the amount of water evaporated; we can then estimate the value of the coal, and the separate efficiency of both the engine and boiler. The value of the coal, and the efficiency of the boiler, are shown by The Number of Pounds of Water Evaporated per Pound of Coal, and the economy of the engine as compared with that of others by calculating The Number of Pounds of Steam Used per Horse Power per Hour. The weight of the steam used is, of course, the same as that of the water evaporated.

In all ordinary practical trials, the economy must be determined simply by the quantity of fuel consumed to produce the power. Hence we will first try and find a solution of the difficulties which attend this kind of measurement.

THE FUEL.

The different kinds of fuel vary so much in value that it is impossible to accurately compare them. Coal being most generally used, is the natural standard; but there are so many varieties of this necessary article, varying greatly in quality, that it seems a hopeless task to try and compare the performance of steam engines in different parts of the world, or even of our own country, by the consumption of differing coal, which may vary twenty per cent in heat producing power. The best way is, evidently, in comparative trials, to use selected coal from the same mine. Yet, how rarely can this be done? and even if this precaution be taken, in certain cases, how can a comparison be made with the results obtained by others widely separated, and possessing, possibly, different views? We must say that the problem cannot be solved with scientific accuracy; still we are able to suggest some corrections which will reduce all varieties of good coal to substantially the same standard, and thus enable us to use this measure in simple practical trials.

We cannot examine in this paper, with any minuteness, the chemical constituents of the different varieties of coal. For our purpose we will simply divide them into two portions : namely, the non-combustible and combustible.

The non-combustible portion consists, for the most part, of earthy matters, though oxygen and nitrogen gases are often present; and most coals absorb considerable water. The combustible portion consists of carbon and hydrogen, the first largely predominating. In American anthracite about three per cent of the combustible is hydrogen. The semi-anthracite combustible contains about five per cent; and the bituminous varieties a large proportion, varying with the locality of the mines. It is authoritatively stated, that, in some varieties of Ohio and West Pennsylvania coal, the hydrogen element is often twenty-four per cent of the whole combustible. For the consumption of equal weights of hy drogen and carbon, the first requires three times as much oxygen as the latter; the heat resulting should therefore bear a somewhat similar proportion. Favre, Sieberman, An drews, and others, have, from experiment, estimated the calorific value of one pound of carbon to be the heating of about 14,000 pounds of water, one degree Fahrenheit. The corresponding value of hydrogen was similarly determined to be about 60,000 heat units. Bituminous coal, containing considerable hydrogen, should therefore produce a very much more heat in combustion than anthracite; but in practice the difference is comparatively small. Mere differences in mechanical structure appear to have a greater influence than chemical constitution. The reason is not evident. The latent heat of the steam resulting from the combustion of hydrogen, which is lost in the atmosphere, will not nearly account for the discrepancy. Without attempting an explanation, except perhaps imperfect combustion, we can, for our purpose, only turn to the records of practical experiments, and find what different kinds of coal have done, and may therefore be expected to do again.

separate the glycerin from the tallow. Bourne gives the evaporation efficiency of thirty varieties of coal from different parts of the British Isles, or from 7 to THE World intimates, not without reason, that members of 10.2 pounds of water from a temperature of 212°. The aver-Congress are selling their frank to further private enterprises age was 87 lbs. These coals are, as is well known, of the soft or bituminous variety. The results of experiments and personal schemes. We have repeatedly called attention to the abuse of this privilege, and we have now before us a made by the Navy Department, with thirteen varieties of American anthracite, from different parts of the Pennsylvania letter from a western correspondent in which he asserts that he received fifty copies of a pamplet of a swindling patent coal field, gave a mean evaporative efficiency per pound of coal of 89 pounds of water, from a temperature of 212° Fab. agency at Washington under the frank of John A. Logan, M. C., (Pub. Doc). We prefer to think that Mr. Logan knows Three specimens of American bituminous coal gave a mean nothing about the business, but be that as it may, it is a result of 99 pounds, under similar conditions. These figures fraud upon the postal revenues. make it appear that our American coals are superior to those of other nations. Professor Johnson, at an earlier period, ACCORDING to the returns made to the United States Assesmade some experiments for our Government, with smaller sors, the total value of the boots and shoes manufactured and quantities, but obtained more marked results in the same sold in Lynn, during the three months ending Oct. 1, was direction. On the contrary, the engineers of the English and \$3,483,477. This does not include goods made by the smaller French steamers, out of this port, speak of our Cumberland manufacturers, whose sales do not amount to \$5,000 annually, and kindred varieties of coal as inferior to those procured at which amount, added to the above, would give a total of at home. We are in search of the truth, and cannot therefore least three and a half million dollars for the past three cater to national vanity. Our best bituminous and clean, months. For the corresponding period last year the sales free-burning anthracite coals are undoubtedly better than can amounted to \$3,214,060. be found in large quantities in any other part of the globe. All must admit, however, that some of our American bitu-WE see it stated that Liebig, the chemist, complains that minous coals are almost identical with the English in appeople are forever pestering him with letters asking questions pearance and chemical constitution. Both should therefore of the most extraordinarily silly nature, such as they might give the same results, when tested under the same circumnaswer for themselves by consulting any elementary textstances. In the experiments above mentioned, the English books. They come at the rate of two or three hundred a coals comprised a greater number of kinds, the bad being day and in eight or ten different languages,

lied upon to accurately measure the power. The qualities of periments were tried with the greatest care, and in a boiler in England. On the who'e, we think it fair to assume that the English and American bituminous coals, of the qualities ordinarily supplied to the market, are substantially equal in value, though selected varieties, fresh from our mines, would of course give much better results.

The Government experiments above mentioned showed that the evaporative efficiency of the American anthracite, and the American bituminous coals are in the proportion of 8.9 to 9.9.

(To be continued.)

The California Earthquakes-A different System of Building Necessary.

W. Frank Stewart, Esq., published a series of articles in the San Francisco Alta., in 1865, called forth by the earthquake of October of that year, an extract from which will be read with interest at the present time:

"When the solid land trembles and gyrates beneath us, like a disabled ship upon the waves; when the substantial habitations of men come toppling headlong to the ground, and when the startled populace, with blanched lips and whitened visages and smiting knees, rush shrieking and howling into the streets, the appalling phenomenon may be a matter of levity to the learned, but for my part, I have yet to discover 'where the laugh comes in.'

"In this region, together with the visible evidences that. at no very remote period, the country has experienced far more powerful shakings, are warnings which sensible people cannot disregard. There are old settlers still surviving in California who have witnessed convulsions of the earth which would have demolished the most substantial building in San Francisco. Only a few years ago an earthquake occurred which opened a chasm in Salinas Plains, which is yet plainly traceable for a distance of fifty miles. During the shock of the 8th of last month (Oct., 1865), the ground to the north of San Juan was rent into innumerable fissures all along the stage route. Will any sane man contend that if these cracks and chasms had occurred in a similar manner on Montgomery street, the lofty brick shells along that thoroughfare would have remained uninjured? It is utterly beyond the limit of possiblility that a perpendicular brick wall, sixty feet in height and only one foot in thickness, could stand up under such circumstances.

"I know it is dangerous to make predictions, but, guided by the experience of the past and by the deductions of science, I shall hazard the opinion that every brick and stone building now on the coast of California will be thrown down by an earthquake, unless mechanical skill can render them more secure than they now are. Men may smile at my suggestion of 'pyramidal walls,' but the day is not far distant when our present shell walls will not be considered particularly safe.'

Mr. Stewart, who is said to have devised a means for determining the time when earthquakes may be expected to return, and who has given so much attention to the subject that he has acquired the title of the Earthquake Seer of San José, according to the Argus, of that city, made a prediction that an earthquake would be felt of greater force than had ever been witnessed since the settlement of the coast by Americans. His confidence was so great in the truth of his prediction that he backed it with a bet, and of course has won. -----

Editorial Summary.

EPXPLOSION OF A SOAP TANK .- A saponifying tank in a soap and candle factory in Cincinnati exploded on Nov. 4th. Two workmen in the factory were badly scalded by the hot stearine, but a number of others, men and women, employed escaped uninjured. The tank, twelve feet long and six feet in diameter, was projected upward some five hundred feet and alighted a distance of two and a half squares from the point of explosion. The tank had for years borne a pressure of from eighty-five to ninety pounds per square inch, receiving its steam direct from the boiler, the steam being used to

A PARTIAL obscuration of the sun has recently been made the subject of observation and comment in Calfornia. Many attributed this to a smoky condition of the air caused by distant fires in the woods. The California Academy of Sciences have taken the subject into consideration and have decided that the extreme heat and dryness had caused the moisture from the fog to disappear, and left the silicious and saline matters contained in it suspended in the air.

MANUFACTURE OF SUGAR-A German paper mentiones a new process of refining sugar in which the saccharine juice, after being clarified in the usual way by means of lime and carbonic acid, is precipitated at boiling temperature with caustic baryta (60 parts of the latter for every 100 of sugar), the precipitate suspended in water and decomposed with carbonic acid. A pure solution of sugar is obtained, which only requires to be evaporated.

IT is announced that an important discovery of iron ore of a superior quality for the manufacture of steel has been made near Ellenburg, Clinton Co., N. Y. The situation of the vein is said to be very favorable, being in the immediate vicinity of everything necessary to its profitable working. By all accounts the quality and quantity of ore in the new mine bid fair to rival if not excel those of the Peru mine in the same county.

ALONG the lines of the principal railways in England the elf-delivery mail bag arrangement is now in use for express trains. The Crane Hook delivery is soon to be put in motion at the several way stations between Boston and Springfield. The mail bag is suspended on a hook at the station, and is taken off by a hook fixed at the same hight on the mail car.

A POWERFUL LENS.-Mr. Parker of London, has just made a lens,^a three feet in diameter, three inches thick in the center, and weighing two hundred and twelve pounds. In the focus of this powerful lens the most refractory metals are almost instantly fused and dissipated in vapor, while unyielding stony substances are as readily vitrified.

OLE BULL, after charming for years the musical world by his skillful performances upon the violin, has at last, it is sa^{jd} , turned inventor. He has invented an improvement in sounding boards for pianos, by which the sound can be prolonged. This has been a long sought desideratum.

TEH Rural New Yorker, advertised in this number is one of the very best agricultural and family journals in this country. It is to be enlarged to sixteen double quarto pages, and otherwise improved.

CHASSEPOT has commenced a suit against the French Minister of war for \$200,000 due him on a rifle contract. His rifles are pronounced worthless, hence payment has been refused.

The fossil remains of an immense crocodile have been found at the end of the Kansas Pacific Railroad. The entire length of the skeleton is 125 feet.

THE heart softened by the fire of affliction is like the iron when heated in the furnace; capable of receiving impress ions and being fashoned at will.

LEATHER belts are frequently ruined by too much oil. It permeates and rots the leather, or burns it by the heat generated by friction.

> MRS. SECRETARY MCCULLOCH'S REPORT. No Decline in Household Treasures.

Ten years ago I purchased a Wheeler & Wilson Sewing Machine, and have had it in constant use in my family since. We used it during the war to make clothing for our volunteers in the service, and for the hospitals, and this work was very heavy, being coarse woolen and cotton fabrics. It is still in good working order, nothing having been broken but a few meedles. You are welcome to use my pame in your recommendations.

MRS. HUGH MCCULLOCH, Wife of Secretary of U. S. Treasury, Washington.

To Messrs. Wheeler & Wilson.

MANUFACTURING, MINING, AND BAILROAD ITEMS.

BEAVER DAMS .- One of the agents in the construction department of the Union Pacific Railroad says, that in floating ties down the Laramie river, it becomes necessary to build dams to produce a flood in consequence of the low stage of the water, as is frequently done in the Oil Regions of Pennsylvania, to float the flat boats loaded with oil, and which saved our fleet on the Red Riverduring the late war. After the men left their work at night heavers begun where they left off and carried it on in a very satisfactory manner. In two or three instances where breaks occurred, these industrious animalshaverepaired them in a single night, to the saving of hundreds of dollars to the contractor.

An armor has been made at Brown's Atlas Works. Sheffield, England which was, before rolling, 20 feet long, 4 feet broad, and 21 inches thick weighing 420 cwt. The finalrolling reduced the thickness to 15 inches. Two hundred and fifty tuns of coal were consumed, and the labor of 200 men re quiredfor its production.

Chicago is to have some new gas works to cost \$400,000 and consume 45,000 tuns of coal per annum. The gas holder's capacity is 600,000.

The Boston and Maine Eastern Bailroads have made arrangements with the Montreal Ocean Steamship Company, to transport merchandise brought from Europe in the steamers of that line, and landed at Portland, to Boston and any part of New England.

A vessel arrived at Cleveland, Ohio, last week bringing with her 821 tuns of iron ore from Marquette, Mich., the largest cargo of iron ever yet received at that port.

A new line of steamers is to be established between Italy and New York. The vessels will run from Naples to New York, and vice versa, touching at Messina and Palermo.

The latest attempt to establish communication between passengers and guard, and guard and driver on English railroads, appears, from the Engineer, to be a series of tubes for whistling, speaking, and displaying signals. Its value is yet an unsolved problem.

The Bessemer Steel Works, at Troy, N. Y., burned on the 20th of October. aro to be im multiste y reply. The original cost of the mill was \$250,000 d1

gine and engine house are uninjured. Two of the converters are also uninjured.

The gold product of Nova Scotia for the last eight year amounts to nearly \$3,000,000.

Improvements amounting to \$1,200,000 are being made upon the Chicago 'docks

The Scotch iron works produced in 1867 over a million of tuns of pig iron. English capitalists have \$90,000,000 invested in East India Railways

Becent American and Loreign Latents.

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

HAY AND COTTON PRESS .- Stephen Q. Carey, Waxahatchie, Texas.-The objectof this invention is to provide a press which shall be simple and neat in construction and appearance, which can be conveniently and rapidly worked, and the operation of which shall be such that the platen in starting moves quickly, but as it approaches the end of its movement its velocity decreases and its power proportionately increases.

HYDRANT.-Robert Reilly, Baltimore, Md.-This invention is a durable but simply and easily operated hydrant, which can be detached and removed from the water pipe by means of its own handle, and without the use of a wrench. It is constructed in a peculiar manner for convenience in taking it apart for repairs; and it is provided with an apparatus by which it indicates any leak within, and at the same time protects the working parts from dust and dirt.

APPARATUS FOR MANUFACTURING MEDICAL EXTRACTS,-Edward E.Bur rough, Baltimore, Md.-This invention has for its object the construction of a simple, cheap, and convenient apparatus, with which, by the application of hot water to the walls and bottom of the vessel that contains the materials to be heated, essences, medical extracts, etc., may be rapidly, conveniently, and thoroughly extracted from either liquid or solid substances.

ANIMALTRAP.-W. A. Stack, Hillsborough, Md.-This invention relates to the class of self-setting traps, and consists in a new and improved arrangement of the bait box with the trap door and passage way for the animals, by which they can be enticed more readily to the middle of the trap door, before it falls and precipitates them into the receptacle below.

FEED CUTTER.-Norman McLeod, Clio, S. C.-Thisinvention contains several important improvements in feed cutters, among which may be mentioned the following, viz.: first, the knives can be sharpened on the machine; secondly, it does not waste the straw or grain; thirdly, it can be operated equally well by hand or horse power, indoors or out; fourthly, it is simple, light, portable, and cheap; fifthly, the sheat box or feed table can be easily removed for convenience in transporting the instrument and in carrying it through small doors.

DERRICK FOR STACKING HAY .-- J. B. Drake and W. H. Hutson, Montours ville, Pa.-Tbe object of this invention is to provide a light, cheap, and convenient portable derrick for elevating and stacking hay, which when used in combination with a horse hay fork or other equivalent device, will raise the hay from the load, convey it to the proper position, and drop it upon the stack, and will then automatically return the hay fork to the load to receive another burden.

TOOL HOLDER FOR LATHES.-Wm. O. Hickok and Geo. W. Reisinger, Harrisburg, Pa.-This invention consists in a novel construction of the holder whereby the tools may be fitted or applied to the holder with far greater facility than usual, and adjusted in proper position to suit the work required of them, with any trouble or difficulty whatever.

SLED BRAKE.-Jacob Latta and Lewis Snyder, Bethlehem Center, N. Y This invention consists in constructing a sled brake in such a manner that it may be rendered operative and inoperative when desired, and when applied or rendered operative admit of the sled being readily turned without subjecting the draft pole or thills to any undue strain.

SUSPENDER FASTENING .- Wendell Wright, Bloomfield, N. J .- This invention relates to a new and improved suspender fastening, and is designed to supersede the ordinary flexible straps provided with button holes to fit over buttons on the pantaloons and retain the latter in a proper elevated state ont the wearer.

KITCHEN UTENSIL.-Warren Cook, Arsenal, Pa.-This invention consist in so constructing a rolling pin as to render it available in several differen culinary operations.

METALLIC BRIDGE.-James B. Eads, St. Louis, Mo.-This invention relates to a new and useful improvement in the construction of metallic arch bridges, whereby a strong and substantial bridge is obtained with a com parativelylight weight of metal.

PISTON FOR DEEP WELL PUMPS .- Charles Jarecki, Erie, Pa.-This invention relates more partic larly to oil wells, which are usually sunk deep and which require the piston and working parts of the pumps to be of the most permanent and durable character.

LUBRICATOR.-Timothy Holland, New York city.-This invention relates to useful improvements in vessels for lubricating journals with oil or other lubricating liquid, whereby the ordinary glass lubricator is rendered more efficient than it has hitherto been.

POCKET TOBACCO CUTTER .- Edward L. Gilman and Theophilus S. Smith, Somerville, Mass.—The object of this invention is to provide a convenient pocketmachine for the use of tobaccosmokers, whereby they maycut their tobacco without resorting to their pocket knives for that purpose, and in combination a match box.

BAG FASTENER.-Charles H. Nye, Vineland, N.J.-This invention relates to an improvement in the method of fastening the mouths of bags for holding grain, or other products or articles, and it consists in securing to the bags by a rivet and washer, leather straps containing a buckle of any suitable size and form, whereby the strap is buckled around the bag and the contents secured.

Toy WATCH.-Joseph Laubereau, Paris, France.-This invention relates to a motor obtained by the tension of anelastic string, with variable self-acting brake proportionate to the work that the motor is able to yield. This variable self-acting brake motion is applicable to various uses, where little force

lars, but the loss sustained from the fre will not exceed \$75,000. The en. | drants or fire plugs, and to provide them with detachable caps, whereby when it is designed to use themalso for hitching posts, a cap or head indic ative of such use may be readily attached to the post or projecting part above the ground.

> MACHINE FOR PACKING TEA, COFFEE, ETC.-John Garsed, and Clayton Dunn, Frankford, Pa.-This invention relates to a new and improved machine for nacking tea, coffee, etc., in paper hags, with agiven weight of the article in each bag. The object of the invention is to obtain a means for the purpose specified, which will admit of the work being performed rapidly and in a perfectmanner, and without the employment of skilled labor.

> MILK CAN.-T. W. Akin, Patterson, N. F.-This invention relates to a new milk can, which is made of iron, and provided with an iron bottom that rests upon a hoop riveted to the under side of the lower part of the can

> RAILROAD CHAIR AND SUPPORT.-Aaron Van Guysling, West Albany, N.Y. -This invention has for its object to improve the construction of railroad chairs and their supports, so as to furnish a substantial, reliable, and elastic support for the rails, which will hold said rails securely in place, and at the same time prevent the jar now so universally felt in railroad riding.

SELF-ADJUSTING HOOK .- William Bisbee, and Fleming G. Hearn, Yreka Cal.-This mvention has for object to improve the construction of the improved hook patented by the same inventors December 31. 1867, and numbered 72,784, so as to make it more convenient and effective in operation.

COMBINED LIFTING JACK AND CANT HOOK -Daniel Fasig, Rowsburg, O.-This invention has for its object to furnish a simple and convenient machine for raising wagons, and for raising and turning, or canting timber, and which shall be so constructed and arranged that it may be easily adjusted to wagons ot any hight, or timber of any size.

PROCESS FOR CASTING CAR WHEELS.-Henry M. Woodward, St. Louis, Mo. -This invention relates to improvements in the process of preparing cast ron, whether in the condition of pig or scrap, for making or casting car wheels, the object of which is to provide carwheels of a better and more uniform quality than can be produced by the common mode.

DRIVE WELL.-John S. Armstrong, Delaware, Ohio.-The object of this invention is to furnish an improved drive well. It consists of a conical point, having helical feathers or threads, which are cast on the point when the latter is made. The point is hollow a portion of its length, and the bore or cavity fits with easy contact on the end of the lower joint of the ordinary drive well tube, which is of the size of common gas pipe. The lower end of tube is formed with numerous perforations, which are closed against the en trance of sand, while the point is being forced down into the ground. When owever, it is desired to ascertain if there be water present, at any part of the descent, the tube is raised a few inches to raise several of the holes from out the barrel of the point, and water entering and rising to the surface of the ground will announce its presence.

VENTILATING APPARATUS .- Wilhelm Scharrath, Bielefeld, Prussia .- This invention relates to a new ventilating apparatus to be applied to all temporary or constant habitations of men or animanls, and consists in the ar rangement of porous walls and ceilings or either to the rooms of houses or ars, or to the cabins of ships, so that fresh air, either in a heated or cooled state, may freely enter the said room or cabin, while the foul air can as reely escape.

MACHINE FOR CUTTING SLATE .- Thomas R. Drummond, Hartford, Conn.-This invention relates to a new and improved method of cutting slates for rooting and other purposes, and consists in forming a box knife corresponding in size to the superficial area of the slate, and in a weighted cushion nnected therewith, and also in a cushioned spring bed surrounded by a netallic shell

TICKET AND TAG HOLDER.-James Bramble and Albert H. Nirdlinger.-Fort Wayne, Ind,-The object of this invention is to provide a convenient method for holding railroad and other tickets or fastening tags to goods or packages whereby the same may be exposed to view and still be securely fastened to the dress or package.

MACHINE FOR DRESSING HOP POLRS.-C. D. Brown, Bainbridge, N.Y. The object of this invention is to provide a simple and effective means for sharpening and dressing hop poles. It also consists in the arrangement of three cutter wheels on a shaft in such a manner that the poles to be sharp ened or dressed may be passed between the said wheels, and be cut by cut ters or knives affixed on the radial arms of the wheels, which latter are formed with reference to bearing the said knives and presenting their cutting edges to the wood in the most effective manner

IRON FENCE POST .-- Wm. Merrell, Kent, Ohio.- The object of this invention is to furnish a fence post which is simple, durable, cheap, and efficient It also consists of a flat, metallic fence post, usually of iron, and provided with groups of studs for receiving and holding the planks or horizontal parts of the fence.

PUNCHES.-Geo. C. Wilder, Lawrence, Kangas.-This invention relates to a new and improved method of constructing punches for the punching of nuts and washers whereby the washers or nuts are more rapidly and economically made. It also consists of a follower forced upwards against the washer or nut after the same has been formed by the force of a spring whereby the washeror nut is freed from the punch. It consists also of a central station ry punch over which the movable outer punch works wherepy a center hole is punched in the nut or washer at the same time that the washer or nuts is punched out of the bar.

PUMP .- J. A. Shanner, Plainview, Ill .- This invention consists in a lift ump rod provided with a forked lower termination, wherein a two-lever valve is hinged, the said lever being partlycomposed of leather and partly of metal, and actuated by springs to open the same for lifting. It also consists in a peculiar arrangement of a toothed rack upon the pump rod and a pair of gear wheels for operating it.

NUT CRACKERS .- Charles Hayden, Collinsville, Conn.-This invention con is is in providing one of the pins with a clamp, whereby it may be firmly clamped to a table in a stationary position and in providing two different pints of application between the jaws, one for small and one for large nuts.

BRONZE DRESSING FOR LEATHER.-M. S. Cahill, Boston, Mass.-The object of this invention is to provide a fluid which will give a reasonably permanent pronze color to leather, and is more particularly designed as an accessory article in the boot and shoe trade, inasmuch as it will enable dealers to reno vate their bronze shoes and boots when the same have become shopworn and tarnished, as in the case when this class of goods have been kept on hand for considerable time or much handled.

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 in-formation from us; besides, as sometimes happens, we may prefer to ad-dress the correspondent by mail.

SPECIAL NOTE - This column is designed for the general interest and in-struction of nor readers, not for gravitations replies to questions a function maximum of nor readers, not for the unit publish such inquiries, houseer, when paid for as advertisemets at \$1 00 a line, under the head of "Busi-ness and Personal."

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

E. W., of Ohio.-A full description of the two wheeled velocipede with engravings is to be found on page 120, No. 8, of the current volume of the Scientific American.

G. A. D., of N. Y.-We see no objection to your using spectacles whose glasses are ground to different foci, in order to adapt them to the different conditions of sight in each eye.

J. P. J., of Ohio.-We can give you a recipe for making boots water proof, as, for instance : Beef tallow, 4 oz ; rosin, 1 oz; beeswax, 1 oz; melted together. Add, when cold a quantity of neats-foot oil equal to the mass. Apply with a rag, warming the boots before a fire, to the soles as well as uppers, and rub in well with the hand. Two applications will make the boots thoroughly water proof and still keep them soft. We, however, do not approve of such preparations, as the feet generally perspire more than any other portions of the body, and any water proof preparations applied to boots prevent the perspiration from eacaping and keep the feet wet and cold.

P. S., of Mass.-Good glue is the best cement for splicing new belts; the best belt makers use it in preference to any other prepara-tions. All cemented joints in belts should be strengthened by a row of rivets on each cross edge. Better buy your belts of some manufacturer than attempt to make them yourself. It is cheaper. Measure the length of your belt by a string or twine and order accordingly. We have before published the plan of laying outbelt holes through floors. We can give you the method by mail, if desired.

J. H. T., of Ill.—"What pressure must the feed pipe to a 14- ${\bf H}. \, {\bf P}.$ boiler be able to stand without bursting, the water being forced with a two-inch pump, through a one-inch pipe, the pressure of steam never to be raised higher than 60 lbs.?" It should stand the pressure of 60 lbs. Can it have any greater pressure put upon it than the resistant of that in the boiler? It makes no difference what the capacity of your boiler, and you will find your one-inch pipe able to stand all the pressure per square inch your 14-H. P. boiler will.

E. W. K., of Mass.—On the subject of the use of divining rods, for ascertaining the truesource of watersupply, we have already published all that we desire to say on the subject. We have very little faith in the theory or practice. We regard it as an amusement rather than a settled science.

Business and Lersonal.

Thechargefor insertion under this head is one dollar a line. If the Notices exceed four lines, an extra charge will be made.

Send 10 cents to T. E. Zell, the publisher, Philadelphia, Pa., for a specimen No. of Zell's new popular Encyclopedia.

Dr. Carpenter's patent oxygenized electro-medicated inhalation cures consumption. bronchitis, catarrh, rheumatism, paralysis, etc. Territory for sale. Physicians are purchasing everywhere. Send for pamphlet to Dr. Carpenter, Newark, N. J.

For sale—the most perfect invention of a feathering paddle wheel extant. Address Richard Connelly, rear 2054 Lombard st., Phila, Pa. Peck's patent drop press. Milo Peck & Co., New Haven, Ct.

Inventors, owners, and manufacturers of small patented articlessend circulars and prices to J. C. Blair, box 87, Huntingdon, Pa.

The Lillingston paint, noticed in last week's Scientific American, can be had at 528 Water st. New York. Address Lillingston Paint Co.

For sale—Newhart & Co. plow factory, Terre Haute, Ind.

Keep posted on what manufacturers allover the United States are doing. See Boston Bulletin, the only paper that gives full reports of their business. Address Commercial Bulletin, Boston, Mass. Terms \$4 per annum.

Wanted—A heavy shears, for cutting railroad iron. Address Napanoch Ax and Iron Co., Napanock, N.Y.

Wanted-a man with plenty of capital to bring out a new velocipede. Address J. R. A., Box 481, Providence. R. I.

For fine double or single-dressed American hemp shorts, bar finetow, tow for paper makers, address W. W. Bruce, Legington, Ky.

Wants to sell rights to manufacture the simplest and best cider mill made. Address H. Sells, Vienna, Ontario.

American Watchmaker and Jeweler. By J. Parish Stelle. Jesse Haney & Co., 119 Nassan st., New York, Price 25 cents,

C. J. Fay's patent water proof roofing, Camden, N. J.

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

Portable pumping machinery to rent of any capacity desired. and pass sand and gravel without injury. Wm. D. Andrews & Brother 414 Waterst., New York.

N. C. Stiles' pat. punching and drop presses, Middletown, Ct. Prang's American chromos for sale at all respectable art

is required; viz., to regulators, toys, and more especially toy watches.

CAR COUPLING .- D. D. Howe, Beaver Dam, Wis .- This invention consists in constructing the buffer of two parts, one of which, provided with three walls of the opening for the hook, is rigidly secured to the framing of the car; the other. constituting the top half of the said opening, is connected to a yoke which is supported upon the end of a lever, whereby it may be raised when desired; it may also be raised by the hooks when the cars come together for coupling. It is arranged to be held in a downward or closed po sition by a spring. The said stationary part is provided with a round bolt against which the hook draws, which bolt is arranged so as to be readily removed for the substitution of another when worn, and a sliding rod is connected to the said lever, which serves as a plunger for throwing off the hook for uncoupling the cars.

STAYS FOR PAPER AND LINEN COLLARS .- Simon Kaufman, Fairbury, Ill .-This invention relates to improvement in the method of staying and supporting paper and linen collars whereby their durability is greatly increased.

POTATO AND CORN PLOW .- Charles F. Noftz, Toledo, Ohio .- The object of this invention is to construct a plow for cultivating corn, potatoes, rice, and other plants, which plow shall be of simple construction, cheap, durable, and adjustable to the width of furrows, and hight of rows.

HYDRANT.-James Allison, Cincinnati, Ohio.-The nature of my invention relates to improvements in hydrants, whereby it is designed to simplify and mprove the construction of the same, and adapt them for use either as hy-

OPERATING THE SAILS OF VESSELS .- Frederick B. Dunton, Center Lincoln ville. Me.-The object of this invention is to provide a sail, or sails, of a square rigged vessel. so-called, with devices by means of which the said sail r sails may be set, reefed, or furled in a quick and thorough manner from the deck; thereby lessening the labor of handling the sails, and dispensing with a portion of the attendants requisite for handling sails as ordinarily hade and rigged.

MACHINE FOR BUNDLING WOOL - H. F. Laroy, Richmond, Ill - This in rention consists of a table, the top of which is made in sections, the central and corner sections being secured to the table, while the four sections be ween the corners are hinged to the central sections and connected hy levers and a beltto a foot lever, so arranged that, by the application of pressure to the foot levers, the said movable sections will be folded up like a bag, enclo ing and compressing the wool or other article which is placed on the table in a compact bundle that may be tied by cords previously laid across the aid movable sections.

SPINNING FRAMES.-J. L. Johnson and J. W. Foust. Evansburgh. Pa.-This nvention consists in an arrangement of apparatus for moving the spindle arriage and a means of preserving the proper tension on the belt.

MOP WRINGER.-Geo. Wells and S.A. Haynes, Island Pond, Vt.-The ob ct of this invention is to provide a simple and convenient apparatus for wringing mops. It consists of a pail having a bail or handle which acts as a lever to bring together or separate the squeezing rollers when the handle is lowered or raised.

stores. Catalogues mailed free by L. Prang & Co., Boston.

For breech-loading shot guns, address C. Parker, Meriden, Ct.

The paper that meets the eye of all the leading manufacturers throughout the United States-The Boston Bulletin.

Inventions Patented in England by Americans.

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

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,874-WASHING APPARATUS.-C. H. Hudson, New York city. Sept.18, 1368. 2.923.-PAINT OR COMPOSITION FOR PROTECTING SHIPS' BOTTOMS, PRE-BERTING SUBMARINE WOOD WORK, ETC.-WIL. F. Babcock, San Francisco, Jal. Sept. 23, 1863.

2,968.—CONVERTING CAST IRON INTO WROUGHT IRON, AND UNITING OX-DES AND FULXES WITH MOLTEN CAST IRON.—Thos. S. Blair, Phtteburg, Pa pt. 28, 1868.

2.980 .- GAS EURNER .- Wilbur F. Parker, Meriden, Conn. Sept. 29, 1868.

2.996.—TREATING METALS FOR THE PURPOSE OF SEPARATING FROM IMPU-TITIES.—Norman Cutter, Cincinnaci, Obio. Sept. 30, 1868.

2.998 -- MANUFACTURE OF WHITE LEAD, AND THE PRODUCTION OF CARBONIO CID CAS FROM SAID MANUFACTURE, ETC.- Henry Hanneu, B. F. Pine, and hos. Woods, Philadelphin, P.S. Sept. 30, 1863.

3.000.—IMPROVEMENTS IN SEWING MACHINES, APPLICABLE TO OTHER MA-CHINES WORKED BY FOOT POWER.—Greenleaf Stackpole, New York city. Sept. 30, 1883.

CHANDELIER.-Wiram Tucker, Newton, Mass. Oct. 5, 1868,