

to prevent its packing after being acted upon by the subsoil share. The invention also has for its object the pulverizing of the surface soil simultaneously with the subsoil, so as to render the whole light and friable and, therefore, permeable to air and moisture.]

416.—D. S. Wagener, of Penn Yan, N. Y., for an Improvement in Machines for Hulling and Cleaning Clover Seed:

I claim, in combination with a clover hulling and cleaning machine, a suction fan that will concentrate the dust and other light impurities within the machine and then pass them out through a suitable conductor to any proper depository, substantially as described, when the same is accomplished by an arrangement of mechanism and passages, as described, for effecting the object and purposes represented.

417.—Dutee Wilcox, of Providence, R. I., for an Improvement in Sleeve Fasteners:

I claim the sleeve fastener constructed with a slider, f, its spring catch, h, and hook, g, or its equivalent, arranged and applied to the body, a, and the hook, e, or its equivalent, substantially in manner and so as to operate as specified.

418.—C. M. Wilkins, of West Anover, Ohio, for an Improvement in Upsetting Tire:

I claim the combination of the wedges, D D, with an anvil in the manner described.

419.—C. W. Williams, of Boston, Mass., for an Improvement in Sewing Machines:

I claim the peculiar combination of the jaws, F and G, and doubly beveled tongue, h, and doubly beveled switch, H I; the said parts being constructed and arranged as shown and described and operating in the manner described, to cause the clamping of the thread during the early stage of the withdrawing of the needle and prevent the clamping thereof during the downward stroke.

420.—Theodore Burr (assignor to himself, Augustus Rower and Parcel Brinkerhoff), of Battle Creek, Mich., for an Improved Life-preserving Ship:

I claim the use of the socketed masts in connection with a life escape ship detached by means of straps and keys, substantially as described, and for the purpose set forth.

421.—Joseph Davis, of East Wilton, N. H., assignor to himself and J. A. Locke, of Watertown, Mass., for an Improvement in Carding Machines:

I claim the described application and arrangement of the fluted rollers under the main card cylinder and to operate therewith substantially in manner as specified.

422.—C. W. Fossler (assignor to himself and J. Balsbaugh) of Freeport, Ill., for an Improvement in Seeding Machines:

I claim the arrangement of the seed boxes, I, slides, H J, shaft, D, rods, F, bar, G, rollers, B, lever, M, rod, N, castor wheel, O, and shares, C' B', in the manner and for the purpose shown and described.

[This invention relates to that class of seeding machines which are designed for planting seed either in drills or in hills and in check rows. The invention consists in a novel and improved arrangement of seed slides and a cut-off, whereby the seed-distributing devices placed under the complete control of the driver. The invention also consists in an improved means for elevating and depressing the front end of the implement so as to regulate the depth of the planting, as may be desired, or to elevate the furrow shares entirely above the ground when the seed-distributing device is rendered inoperative and the implement is being drawn from place to place.]

423.—L. K. Jenne (assignor to himself and William Ashley) of Grand Rapids, Mich., for an Improvement in Corn Planters:

I claim the arrangement of adjustable plows, A and F, seed and fertilizing slides, e, e, sliding shaft, b, by which the machine is thrown in and out of gear, lever, a, double boxes, D, D, and check pins, n, when the whole shall be combined and operated substantially as and for the purpose specified.

424.—Jefferson Nash (assignor to himself and A. K. Cutts), of Janesville, Wis., for an Improvement in Grain Separators:

I claim, first, A hinge or joint formed by means of mouth, A, of a gang of sieves and the edge of apron, D, of a separator shoe, when used in adjusting the angle and supporting the front end of a gang of sieves, substantially as described.
Second, Sustaining a gang of sieves within the compressible sides of a separator shoe by means of a rod, a, or its equivalent, substantially in the manner and for the purpose described.

425.—Quartus Rice, of West Winstead, Conn., assignor to himself and L. H. Smith, of Salem, N. J., for an Improvement in Sewing Machines:

I claim the employment of a sewing machine on a railroad in such manner that the machine shall travel on the road while sewing, in combination with any suitable mechanism for imparting motion to the machine and sewing mechanism from a stationary driving shaft, substantially as and for the purposes described.

426.—William Hanson (assignor to himself and F. N. Bangs), of New York City, for an Improved Rock Drill:

I claim, first, The gibs, M N, constructed and operating substantially as and for the purpose specified.

Second, The combination of the hollow piston rod, D, the gibs, M, N, and the rings, P, constructed and arranged for conjoint operation, substantially as described.

Third, The combination of the rings, P, with the tubes, G, G', and the cylinder, A, in the manner and for the purpose substantially as described.

Fourth, The combination of the tappet bar, F, slotted box, f, and valve rod, e, constructed and operating as and for the purpose described.

Fifth, Operating a drill tool or pounder by the direct application of steam or compressed air to the tool holder, substantially in the manner set forth.

Sixth, The holes, m, in the tubes, G, for the purpose specified.

427.—H. C. Alford, of Minooka, Ill., for an Improved Washing Machine:

I claim the arrangement of the oscillating bar, G, slotted arms, H, and hinged levers, B, with the oscillating bar, D, stem, E, oscillating rubber, F, and oscillating tub, A, in the manner and for the purpose shown and described.

[The object of this invention is to facilitate the washing of clothes in such machines as have a segmental slotted concave working in the interior of a semi-cylindrical swinging tub, by connecting the concave with the tub in such a manner that by imparting an oscillating motion to the tub the concave is caused to oscillate in an opposite direction, at the same time leaving the concave free to bear down upon the clothes with its whole weight during the whole operation.]

RE-ISSUE.

32.—S. R. Parkhurst, of West Bloomfield, N. J., for an Improvement in Machines for Ginning Cotton and Burring Wool. Patented May 1, 1845, and Extended:

I claim, first, A hollow cylinder having an outer acting surface composed of flat, strong, long-pointed metallic teeth combined with plain surfaces below the tops of the teeth, substantially as described, and capable of being used to produce the results specified.

Second, In combination with a hollow cylinder provided with an acting or working surface, substantially as is described, I claim feeding rollers constructed and relatively arranged therewith, substantially as set forth, the combination operating substantially as described, and these I also claim in combination with a rotating beater constructed relatively arranged therewith, and operating substantially as herein set forth.

Third, I claim a rotating beater, substantially as is described, in combination with a hollow cylinder having an acting surface of teeth and cylindrical surface, substantially as is specified, and in combination with these I also claim a burr box or trash box and a rotating brush or its equivalent, or either of them, all the parts enumerated being substantially such as are hereinbefore set forth.

Fourth, I claim a hollow cylinder having substantially such an acting surface as is hereinbefore described in combination with a rotating

beater, as specified, and with a carding engine or machine, the combination acting substantially as set forth, and in combination with these three elements or parts of a whole machine I also claim feeding rollers and a trash box substantially such as specified, by which combinations the cleaning preparatory to carding and the carding of wool are carried on jointly as a continuous process.

DESIGNS.

H. G. Thompson, of New York City, assignor to the Hartford Carpet Company, of Hartford, Conn., for Designs for Carpets (16 cases).

NOTE.—The above list contains the claims of SIXTY-EIGHT patents which were granted on the 12th inst., being the work of the Examiners, Revising and Appeal Boards for the week previous. Out of this number of patents granted, THREE—nearly one-half of the entire issue—were solicited through the Scientific American Patent Agency.



B. F. N., of Vt.—By the use of warm solutions of sulphate of copper, the metal is deposited more rapidly in obtaining electrolytes than when cold. The description of the process of electrolytizing given on page 257, Vol. I. (new series), of the SCIENTIFIC AMERICAN, is as full as we can give. Our electrolytizers can take a full electrolyte in two hours, but they prefer a more slow deposition.

F. C. S., of Mass.—The mineral powder which you have sent us appears to be chalk; but without an analysis of it, no person can positively tell what is its real composition. By adding the sulphate of zinc (white copper) to boiling oil, very slowly, its drying properties are greatly improved. Fine lampblack, mixed with boiled linseed oil, makes a glossy black paint. Enameled oilcloth is rubbed down and polished. Any drab colored pigment, mixed with linseed oil, is suitable for making this color on enameled cloth.

J. M. S., of Ohio.—You state that the chimney of your boiler is 50 feet high; this is sufficient. The fire space under the boiler leading from the furnace should be 243 square inches in sectional area, and the throat of the chimney, when the flues enter, should have two square feet of area. If you cannot obtain sufficient natural draft, you must exhaust the steam into the chimney, and this will remedy the evil. We are in favor of using the blast extensively for steam boilers. Palmer's artificial leg would be very suitable for you.

Q. & Co., of S. C.—Dextrin, or British gum, which you may obtain at the druggists, when boiled, forms the mucilage used for envelopes, &c., and it may suit your purpose. We advise you to try a strong solution of isinglass, dissolved in whiskey, as a cement for enclosing your ambrotypes.

F. E., of N. Y.—The painted shades for windows are prepared by laying on a ground of white varnish first, then the colors mixed with varnish afterwards. Oil paints being opaque, will not answer for such shades.

J. L. W., of Ohio.—Your ideas of "the peculiar odor of coal oil" may be very different from those which we entertain. If you have made the discovery of deodorizing fossil coal oil, and improving its illuminating qualities at the same time, it is a very valuable discovery, as great quantities of offensive smelling oil are still to be found in the market, thus showing that the mode of deodorizing it is not known by all its manufacturers.

H. W., of N. Y.—A very good and durable dark green paint, for out-door work, may be made by mixing a certain quantity of ground charcoal, with litharge as a drier, and some common ochre, mixed like any common pigment with boiled linseed oil.

A. H. S., of Pa.—Correctly speaking, all coal oil contains paraffine, which should become a whitish mass when the oil is exposed to a very low temperature. Because your coal oil was "frozen whitish," it affords no evidence of its having been adulterated.

J. C. B., of Pa.—Wood-drying kilns are made of brick or wood, and are simply close buildings in which planks and boards may be dried by stoves or steam heat at about 212° or 300° Fah.

H. M., of Pa.—The diagram which you have sent us of a railroad brake represents a metal shoe thrust under the wheel between the latter and the track. This kind of brake is old and well known, but has never been brought into common use on railroads. It is, however, very generally used for wagons running on common roads in hilly countries.

R. W. B., of Pa.—Dissolve some india-rubber in refined turpentine and add it to the lard oil which you employ for lubrication, and you will find that your oil bill will be much reduced.

E. J. W., of Mo.—An undershot float wheel is the cheapest you can make for your saw mill. As you do not give us the velocity of your stream we cannot estimate its power.

G. L. L., of Pa.—We find no mention of any European government offering a reward for a mode of squaring the circle.

G. V. R., of N. S.—Mr. Holcomb's idea was that the battery was formed by the zinc on the wire and the copper plate in the ground, with the damp air between.

G. W. P., of N. Y.—What the non-expansionists say is, that smaller cylinders should be used, so that by working steam full stroke, no more steam would be required to do the same work, while there would be a saving in the cost of the engine.

W. M. H., of Mass.—Water being heavier than steam will run under it whether subjected to pressure or not. In the open air, water and its vapor are both subjected to a pressure of 15 lbs. to the inch, but the waterfalls below the vapor.

G. B., of N. Y.—We think you would be rewarded with an increase of both knowledge and modesty, by a thorough study of the investigations which have been made in vegetable physiology.

J. L. L., of Pa.—Write to your member of Congress to send you the Patent Office reports.

C. C., of N. Y.—If your iron ore contains clay, lime is the proper flux; but if it contains lime, then clay will act as a flux. The cinder will float on the top of the melted metal.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Feb. 16, 1861:—

S. & J., of Ill., \$25; L. Y., of N. Y., \$25; F. B., of N. Y., \$10; H. B., Jr., of Pa., \$25; J. N., of N. Y., \$30; J. E. B., of N. Y., \$25; C. H. A., of Conn., \$30; E. & M., of N. H., \$25; W. E. W., of Cal., \$30; G. N., of N. Y., \$25; W. H. A., of Ill., \$25; E. W. F., of La., \$25; J. S., of Maine, \$25; S. R. W., of Conn., \$30; I. A. B., of N. Y., \$30; G. & S., of N. Y., \$55; J. D. J., of Miss., \$30; F. W. A., of N. Y., \$30; W. W., of Cal., \$60; W. J. M., of N. Y., \$30; M. J., of Mass., \$25; D. W. S., of Ga., \$55; A. G. S., of N. Y., \$25; F. McJ., of Ohio, \$25; H. P., of N. Y., \$30; S. McQ., of N. Y., \$10; R. & W., of N. Y., \$30; R. W., of Pa., \$10; T. P., of Ill., \$30; D. M. C., of Ind., \$12; E. B. C., of R. I., \$25; N. A. R., of Vt., \$25; F. C. T., of N. Y., \$30; W. H. G., of N. Y., \$30; J. McA. G., of Mass., \$25; E. T. S., Ohio, \$30; A. M. G., of N. H., \$32; B. W. H., of Mass., \$25; A. L. W., of N. Y., \$12; C. C., of N. Y., \$30; B. & N., of La., \$25; J. A. A., of N. Y., \$25; F. R. W., of Pa., \$25; W. H. Jr., of R. I., \$30; G. I., of Mich., \$30; W. D. H., of Ga., \$25.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Feb. 16, 1861:—

A. L. W., of N. Y.; A. C. J., of Wis.; H. B., Jr., of Pa.; S. B. S., of Ill.; J. E. B., of N. Y.; D. M. C., of Ind.; G. N., of N. Y.; L. M., of Wis.; N. A. R., of Vt.; C. E. L. H., of Conn.; J. McA. G., of Mass.; A. G. S., of N. Y.; L. Y., of N. Y.; R. W., of Pa.; E. & M., of N. H.; G. & S., of N. Y.; B. W. H., of Mass.; E. B. C., of R. I.; F. C. T., of N. Y.; C. C., of N. Y.; M. J., of Mass.; F. R. W., of Pa.; A. C. M., of Vt.

RATES OF ADVERTISING.

Thirty Cents per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

IMPORTANT TO INVENTORS.

THE GREAT AMERICAN AND FOREIGN PATENT AGENCY.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN inform their patrons that they are still engaged in preparing specifications and drawings and attending to the wants of inventors in every department of the Patent Office, such as Extensions, Appeals, Interferences, correcting imperfect papers submitted to the Patent Office by incompetent persons, examining into the novelty of inventions, arguing rejected cases, &c. The long experience Messrs. MUNN & CO. have had in preparing specifications and drawings, extending over a period of sixteen years, has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with every part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK-ROW, NEW YORK. We have also a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND BRYANT STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at this office.

Messrs. MUNN & CO. are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business they have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that seven-eighths of all the European Patents secured to American citizens are procured through our Agency.

Our Agents will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent in Great Britain.

A pamphlet of information concerning the proper course to be pursued in obtaining patents through their Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office, or either of the Branches. They also furnish a Circular of Information about Foreign Patents.

The annexed letters, from the last three Commissioner of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers.

Yours, very truly,
CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements.

Very respectfully,
Your obedient servant,
J. HOLT.

Messrs. MUNN & Co.—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,
Your obedient servant,
WM. D. BISHOP.

Messrs. MUNN & Co. cordially invite persons visiting the city of Patents, to call at their spacious offices, No. 37 Park-row, and examine the models which are on exhibition, or refer to the works of reference contained in their library, access to which can be had at all hours.

Inventors can communicate in German, French, Spanish, or nearly any other language, in soliciting information from this office. Circulars of information regarding the procuring of patents, printed in German, may be had on application.

Communications and remittances should be addressed to
MUNN & CO.,
Publishers, No. 37 Park-row, New York.

A RARE CHANCE FOR A GOOD INVESTMENT.—Letters Patent, dated Dec. 18, 1860, have been granted on a safety singletree, by which an unmanageable horse can be instantly detached from a vehicle by a child three years old. It is perfectly reliable; cannot get out of order. It combines simplicity with neatness. For durability, it is not surpassed by the very best made in the common way. The convenience of hitching recommends it to all. The cost is a mere trifle compared with its value. It is unlike anything of the kind ever offered to the public. Can be used single or double. It has been examined by at least five hundred persons of good judgment. All have but one opinion, which is, that it is not only a great convenience, but a perfect safeguard against the loss of life and property. State and county rights sold at an amazingly low price. The Western States exchanged for Western land on the most reasonable terms. Address SOLOMON KEPNER, Patentee, Pottsville, Pa.

TO CANDLE AND SOAP MANUFACTURERS.—Processes, with drawings, to manufacture candles of every description—common, French, &c. Process to bleach palm oil and purify tallow. Recipes for ever kind of soaps—hard, soft, fancy. Essays on soaps and greases. Address Professor H. DUSSAUCE, chemist, New Lebanon, N. Y.

5,000 ACRES OF THE CHOICEST FARMING lands in Eastern Texas in exchange for improved property. For particulars address Box 83, Putnam, Ohio.

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SEMI-STEEL LOCOMOTIVE TIRES, FIRE-BOX AND Tube Sheets, and Boiler Plates. Warranted fifty per cent stronger and more durable than the best Low Moor qualities of iron.

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40 SECOND HAND SAFES. Of different makers, for sale cheap. Taken in exchange for Lillie's chills and wrought iron safes.

\$3 A DAY.—FEMALE AGENTS WANTED AT HOME or to travel on salary or commission. For particulars inclose red stamp to HANKINS & CO. New York.

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GUILD & GARRISON'S STEAM PUMPS FOR ALL kinds of independent Steam Pumping, for sale at Nos. 55 and 57 First-street, Williamsburgh, L. I., and No. 74 Beekman-street, New York.

I WOULD RESPECTFULLY INFORM MY FRIENDS and the public that I am prepared to furnish them with my hydraulic jacks and punches as usual.

CLINTON WIRE CLOTH COMPANY—MANUFACTURERS of Power Loom Wire Cloth, for threshing machines, fan mills, grain assorters, rice mills, locomotive spark-arresters, and all other uses.

FAMILY NEWSPAPER.—A MAMMOTH PICTORIAL, in its sixth volume, with 300,000 constant readers; first and only successful paper ever established by a lady.

SCIENTIFIC REPORTING.—PATENT SUITS, INVOLVING questions of science or mechanics, reported verbatim: scientific lectures, or the proceedings of scientific societies, either reported in full or condensed.

NEW SHINGLE MACHINE.—THAT WILL RIVE AND Shave 24,000 Shingles in a day, for sale by S. C. HILLS, No. 12 Platt-street, New York.

C. L. GODDARD, AGENT, NO. 3 BOWLING GREEN, New York. Only manufacturer of the Steel Ring and Solid Packing Burring Machines and Feed Rolls for Wool Cards, &c.

IRON PLANERS, ENGINE LATHES, AND OTHER Machinists' Tools, of superior quality, on hand and finishing, and for sale low; also Harrison's Grain Mills.

WOODWORTH PLANERS.—IRON FRAMES TO PLANE 18 to 24 inches wide, at \$90 to \$110. For sale by S. C. HILLS No. 12 Platt-street, New York.

A MESSIEURS LES INVENTEURS.—AVIS IMPORTANT Les Inventeurs non familiers avec la langue Anglaise et qui préféreraient nous communiquer leurs inventions en Français, peuvent nous adresser dans leur langue natale.

HOUSES FOR THE INDUSTRIOUS, IN THE GARDEN STATE OF THE WEST.

ILLINOIS CENTRAL RAILROAD COMPANY HAVE FOR SALE 1,200,000 ACRES OF RICH FARMING LANDS, in TRACTS OF FORTY ACRES AND UPWARD, on LONG CREDIT AND AT LOW PRICES.

The attention of the enterprising and industrious portion of the community is directed to the following statements and liberal inducements offered them by the

ILLINOIS CENTRAL RAILROAD COMPANY, which, as they will perceive, will enable them, by proper energy, perseverance and industry, to provide comfortable homes for themselves and families, with, comparatively speaking, very little capital.

I. LANDS OF ILLINOIS. No state in the Valley of the Mississippi offers so great an inducement to the settler as the State of Illinois. There is no portion of the world where all of the conditions of climate and soil so admirably combine to produce those two great staples—corn and wheat—as the prairies of Illinois.

II. EASTERN AND SOUTHERN MARKETS. These lands are contiguous to a railroad 700 miles in length, which connects with other roads, and navigable lakes and rivers, thus affording an unbroken communication with the Eastern and Southern markets.

III. RAILROAD SYSTEM OF ILLINOIS. Over \$100,000,000 of private capital have been expended on the railroad system of Illinois. Inasmuch as part of the income from several of these works, with a valuable public fund in lands, go to diminish the State expenses, the taxes are light, and must, consequently, every day decrease.

IV. THE STATE DEBT. The State debt is only \$10,105,398.14, and, within the last three years has been reduced \$2,959,746.80; and we may reasonably expect that in ten years it will become extinct.

V. PRESENT POPULATION. The State is rapidly filling up with population; 868,026 persons having been added since 1850, making the present population 1,719,496—a ratio of 102 per cent in ten years.

VI. AGRICULTURAL PRODUCTS. The agricultural products of Illinois are greater than those of any other State. The products sent out during the past year exceeded 1,500,000 tons. The wheat crop of 1860 approaches 35,000,000 of bushels, while the corn crop yields not less than 140,000,000 bushels.

VII. FERTILITY OF THE SOIL. Nowhere can the industrious farmer secure such immediate results for his labor as upon these prairie soils, they being composed of a deep, rich loam, the fertility of which is unsurpassed by any on the globe.

VIII. TO ACTUAL CULTIVATORS. Since 1854, the company have sold 1,300,000 acres. They sell only to actual cultivators, and every contract contains an agreement to cultivate. The road has been constructed through these lands at an expense of \$30,000,000. In 1850, the population of the forty-nine counties through which it passes was only 335,593, since which 479,923 have been added, making the whole population 814,891—a gain of 143 per cent.

IX. EVIDENCES OF PROSPERITY. As an evidence of the thrift of the people, it may be stated that 600,000 tons of freight, including 8,600,000 bushels of grain and 250,000 barrels of flour, were forwarded over the line last year.

PRICES AND TERMS OF PAYMENT. The prices of these lands vary from \$6 to \$25 per acre, according to location, quality, &c. First-class farming lands sell for about \$10 or \$12 per acre; and the relative expense of subduing prairie lands as compared with wood land is in the ratio of 1 to 10 in favor of the former.

ONE YEAR'S INTEREST IN ADVANCE, at six per cent per annum, and six interest notes at six per cent, payable respectively in one, two, three, four, five and six years from date of sale; and four notes for principal, payable in four, five, six and seven years from date of sale; the contract stipulating that one-tenth of the tract purchased shall be fenced and cultivated, each and every year, for five years from the date of sale, so that, at the end of five years, one-half shall be fenced and under cultivation.

TWENTY PER CENT WILL BE DEDUCTED from the valuation for cash, except the same should be at six dollars per acre, when the cash price will be five dollars.

Pamphlets descriptive of the lands, soil, climate, productions, prices, and terms of payment, can be had on application to J. W. FOSTER, Land Commissioner, Illinois Central Railroad, Chicago, Ill. For the names of the towns, villages and cities situated upon the Illinois Central Railroad, see pages 188, 189, 190, Appleton's Railway Guide.

PATENT LAWS OF THE UNITED STATES, WITH other information of importance to Inventors, Patentees and Assignees.

JUST ISSUED, A work of over 100 pages, containing the Patent Laws of the United States, with all the information furnished from the Patent Office relative to the mode of applying for patents, forms of specifications, caveats, re-issues, additional improvements, assignments, &c.; the rules for taking testimony in cases of interference and extensions, with suggestions of importance regarding the rights of patentees, how to mark their patented machines, the penalty for neglecting to put on the correct date, and other information of importance to every inventor, patentee or assignee in the United States.

This hand-book has been carefully prepared by the editors of the SCIENTIFIC AMERICAN, and it is believed contains more information of practical importance to persons who wish to secure patents, or who own patents, or work under a license, than any other publication of a like nature which has ever been published. Price, single copies, by mail, 25 cents; five copies for \$1; fifty copies for \$5.

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Important to Hat Manufacturers—Rejection of an Extension Patent Case.

A brief summary of facts relating to the rejection of a patent extension, on the 9th ult., by the present Acting Commissioner of Patents, will be of very general interest to the public, and the manufacturers of hat bodies in particular.

On the 25th of April, 1846, H. A. Wells obtained a patent for an improvement on machines for making hat bodies, the essential features of which related to the conduit for feeding the fur to the revolving exhausted cone upon which the hat body was formed. This conduit was made adjustable in its size, either by hand or otherwise, to feed the proper quantity of fur upon the cone. Messrs. Burr and Taylor became owners of this patent for a very moderate sum, and before it had expired, the inventor died. The patent, however, has been extended for seven years upon the petition of the widow, but the extension has also been purchased by the same parties.

On the 9th of February, 1847, Messrs. Burr and Taylor obtained a patent for an improvement on their Wells' hat-body feeder, which consisted in rendering the feed trunk better suited for adjusting the discharge opening to cones of various sizes, and for throwing greater or less quantities of fur upon different parts of a hat body. This is the patent, the extension of which has just been refused.

The principal grounds for the refusal of any patent is, that sufficient remuneration has been derived from the invention according to its value to the public. The facts presented in this case show, that from 1847 43,788,717 hat bodies were made by machines embracing the Wells and Burr & Taylor improvements, and the owners of these patents have received \$626,084 above the cost of manufacturing, of which sum \$156,621 were profits for the patent which has been refused an extension. These were held to be large according to the small improvement that was secured in the patent.

Silliman's Philosophy.

We frequently receive inquiries for the best elementary work on natural philosophy, and hereafter we shall experience no embarrassment in answering them, as we shall refer without hesitation to Silliman's work, the second edition of which has just been published by H. C. Peck and Theo. Bliss, of Philadelphia. The title page reads, "Principles of Physics or Natural Philosophy, designed for the use of Colleges and Schools. By Benjamin Silliman, Jr., M.A., M.D., Professor of General and Applied Chemistry in Yale College. Second edition, revised and re-written. With 722 illustrations."

The several treatises on light, heat, electricity, magnetism, &c., embrace the very latest discoveries, and the work contains a great mass of information in relation to the strength of materials, the melting point of metals, &c. As a specimen of the style, we give the following extract:—

A stove snaps and crackles when the fire is lighted, and again when it is extinguished, because of the unequal expansion and contraction of the different parts. The pitch of a pianoforte or harp is lowered in a warm room, owing to the expansion of the strings being greater than that of the wooden frame which supports them; and for the reverse reason, the pitch is raised, if the room is cooled.

Nails driven into wood often become loose; the expansion and contraction of the nails, through variations of temperature, gradually enlarging the holes. A gate in an iron railing may be easily shut or opened in a cold day, but only with difficulty in a warm day, because the gate itself, and the surrounding railings, have become expanded by the heat.

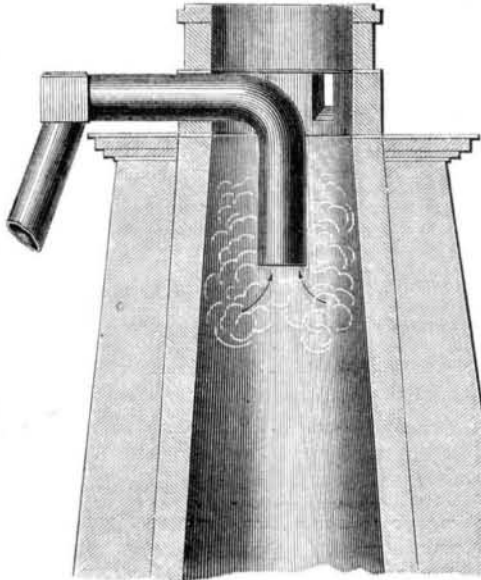
Astronomical instruments, placed on elevated buildings, are sometimes sensibly deranged by the expansion of the walls exposed to the sun. Iron and platinum wires may be successfully soldered into glass, because their mutual expansibility differs very little, while silver, gold and copper, similarly treated, crack out as the joint cools, because their expansibility is much greater than that of the glass.

MICROSCOPIC BODIES IN SNOW.—Professor Pouchet, of Rouen, has examined snow which fell near that city, for the purpose of discovering what substances it swept down in the atmosphere. The snow was placed under the glass and allowed to thaw, and on the surface of the water thus obtained or precipitated from it were plenty of "smuts," a number of starch grains (some of which were colored blue, as if already acted upon by iodine), a few diatoms and a very small number of remains of infusoria. After many hundred observations, he failed to discover the eggs of animals, or spores of vegetables, except two eggs of infusoria and two spores of *lycopodon* or puff ball.

ECONOMIZING THE HEATED GASES OF SMELTING FURNACES.

The accompanying figure is an elevated section of an apparatus which is employed in a large iron work at Wolverhampton, England, and was put up by C. E. Darby for taking the waste inflammable gases from two smelting furnaces, and conducting them under steam boilers, &c., for raising steam without using furnaces under the boilers. It is described as follows in the *London Engineer*:—

It consists of a large pipe or tube inserted into the middle of the top part of the furnace, and which is made to descend a short distance down into the materials, and is carried over the top of the side of the fur-



nace in the form of a syphon, a continuation of which pipe is taken to the boilers, or hot-air stoves, where the gas is burned in the usual way. Some of the advantages which this plan is claimed to possess over those heretofore used are as follows:—Its extreme simplicity of construction; the small expense its application requires; the ease with which it can be applied to any furnace at work, which has a wide top; and the short stoppage required to put it in; and that it avoids evils which have ensued from the previous plans, viz., the burning of the tuyeres caused when the cylinder is inserted in the top of the furnace, and the gases are taken away from the space between it and the sides of the furnace; and is not liable to the objections that may apply to the closed top or cap, of putting a check on the free escape of the gas, thereby impeding the driving of the furnace, and deteriorating the quality of the iron made. It therefore tends to obviate the forcible objections of some ironmasters to the use of the blast furnace gas, viz., that though there may be a saving of coal at the blast engine and stoves, yet the diminished burden, in some cases, carried in the furnace counterbalances this saving; and that if the make of iron is decreased, much more loss than gain is occasioned by the process.

The two furnaces, to which this method of carrying off the waste gases has been applied, smelt about 240 tons of iron weekly, and the saving in fuel which has resulted, has amounted in value to about \$6,000 per annum.

Mixtures of Nickel and Cast Iron.

A paper has lately been presented to the Manchester and Philosophical Society by Wm. Fairbairn, Esq., C.E., describing the effects of nickel upon cast iron in forming alloys of the two metals. Meteoric iron oftentimes contains about 2½ per cent of nickel, and this iron generally possesses peculiar properties, it being tenacious, malleable, and almost proof against corrosion. In order to determine whether an artificial compound of the same nature could be produced, Mr. Fairbairn made quite a number of experiments with compound bars of nickel and cast iron. He mixed nickel with cast iron at the rate of about 2½ per cent of the former to the latter, fused the alloy in crucibles, and run the products into bars, which were tested with respect to their power for resisting a transverse strain. It was found by these experiments that the tenacity of cast iron was greatly reduced by its mixture with nickel.

A Useful Article for House Owners and Builders—Howland's Adjustable Window Stop.

On page 32, Vol. III. (new series) of the *SCIENTIFIC AMERICAN*, we illustrated and described a newly patented mode of securing "stops" to window frames, invented by Mark Howland, of Waterbury, Conn. The inventor is now prepared to furnish the article, and we think so well of it that we have given an order to apply it to the windows of our own dwelling. The stop is secured to the frame by a silverplated screw, with a neat porcelain washer intervening between the frame and screw head, which is quite ornamental as well as useful. The use of this stop enables the sash to be readily taken out for setting a broken pane or other purpose with the greatest facility. The screw holes in the stop are elongated laterally, allowing the stop to be readily adjusted to compensate for shrinkage, swelling or warping of the sash, so that a window sash may be kept tight in the frame by simply turning a screw. Persons building new houses, and desiring to introduce all the modern improvements, should not fail to use the patent sash stop of Mr. Howland, whose address is at Waterbury, Conn.

PETROLEUM is from the Greek *petros*, a stone, and *olaion*, oil, meaning stone oil, or rock oil.



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