

1,021.—John Fowler, Jr., of Leeds, England, assignor to W. P. Tatham, of Philadelphia, Pa., for an Improvement in Machinery for Plowing and Tilling Land. Patented in England Sept. 8, 1856:

I claim combining the pulley on the anchor carriage which receives motion from the engine by the pulling of the plows or other implements, with the drum that operates the anchor rope, by means of the intermediate mechanism described, or any equivalent thereof, as described and for the purpose set forth.

1,022.—John Fowler, Jr., of Leeds, England, assignor to W. P. Tatham, of Philadelphia, Pa., for an Improvement in Machinery for Plowing and Tilling Land by Steam. Patented in England Sept. 8, 1856:

I claim combining with the central pair of sustaining wheels and with the frame which carries the two gangs of plows or other tilling instruments, a steering apparatus, substantially as described.

1,023.—John Fowler, Jr., and David Greig, of Leeds, England, assignors to W. P. Tatham, of Philadelphia, Pa., for an Improvement in Machinery for Plowing and Tilling Land. Patented in England Feb. 28, 1856:

We claim mounting two gangs of plows or other tilling instruments in suitable framework, and connecting them with a pair of sustaining and gaging wheels interposed between the two gangs, substantially as described, when this is combined with the pulling ropes or chains and suitable means of attachment thereto, substantially as described, so that by the operation of an engine on one side of a field and suitable anchoring apparatus at the other side, the said instruments can be drawn across the field alternately in opposite directions, as described.

And we also claim mounting the frame which carries the two opposite gangs of instruments on a central axis, so that it may be tilted thereon, substantially as described, in combination with the mode of connecting the ropes or chains with the said tilling frame, or the equivalent thereof, on opposite sides of the axis of vibration, as described, so that by reversing the pull on the ropes, the frame shall be tilted to lift one gang out of action at the end of each course, and draw down into action the other gang for the return course, as set forth.

1,024.—B. F. Hooper, of Birmingham, Conn., assignor to E. N. Baldwin, of Huntington, Conn., for an Improved Machine for Making Braces for Carriage Tops:

I claim the clamping dies in combination with the swaging or shaping dies working in succession, substantially as described, for the purpose set forth.

1,025.—C. L. Johnston, of Little Falls, N. Y., assignor to A. M. Colver, of Albion, Mich., for an Improvement in Rotary Pumps:

I claim the pistons, H H, passing through the cylinder, I, and revolving around a center, G, in the manner specified, when said pistons, H H, are formed thinner in the middle, and with the curved sides, for the purposes and as specified.

1,026.—G. W. Martin, of Morrisania, N. Y., assignor to himself and William Sheppard, of Tremont, N. Y., for an Improvement in Pumps:

I claim the pipes, b and c, valves, n and o, arranged as specified, in combination with the air vessel, d and piston, e, for the purposes and as set forth.

And, in combination therewith, I claim the arrangement of the deflectors, l and m, in the reservoir, h, for the purposes specified.

1,027.—A. C. Mason (assignor to himself, H. H. Mason and D. M. Smith), of Springfield, Vt., for an Improvement in Hooks and Eyes:

I claim the forming of the snaps or spring guards, c, with bent ends, d, which extend into openings, e, in the hooks at the back of the bills, substantially as and for the purpose set forth.

1,028.—J. H. Merrill (assignor to the Merrill Patent Fire-arm Manufacturing Company), of Baltimore, Md., for an Improvement in Breech-loading Fire-arms:

I claim the combination of the shoulders upon the levers and upon the casing of the gun, to take the recoil of the breech plug up, instead of allowing it to come entirely upon the pivots, and for security against the springing up of the lever, substantially as described.

1,029.—J. H. Merrill (assignor to the Merrill Patent Fire-arm Manufacturing Company), of Baltimore, Md., for an Improvement in Breech-loading Fire-arms:

I claim, first, in combination with the lever by which the breech is opened and closed, a projection upon or over which the hammer rests when down upon the nipple, to prevent said lever from rising or opening the breech accidentally, substantially as described.

Second, I also claim, in combination with the lever by which the breech of the gun is opened and closed, a projection which extends under the cap when on the nipple, so that the raising of said lever preparatory to recharging the gun shall throw off the exploded cap and leave the nipple free for a fresh cap, substantially as described.

1,030.—Langdon Sawyer, of Springfield, Vt., assignor to himself, and A. M. Billings, of Wethersfield, Vt., for an Improved Shade or Curtain Roller:

I claim making the rod or roller, G, so that it can be extended or contracted longitudinally, when the same is combined with the other fixtures, for operating the shade or netting, substantially as and for the purposes described.

[The object of this invention is to so construct the bar under which the netting or shade passes from a spring roller which winds up the netting or shade, as the case may be, that the whole fixture may be applied to window frames varying in widths, and secured therein with very little labor, without employing the usual fixtures which are secured to the window casing and mutilate it. The nature of the invention consists in making said rod under which the netting or shade passes, adjustable longitudinally, and in securing to the ends of this rod the plates or brackets on which the spring roller has its bearings, whereby the roller and bearing plates may be thus extended and thus adapted to, and secured within any ordinary window frame in a substantial manner.]

1,031.—J. O. Whitcomb (assignor to himself and Joseph Dodin), of New York City, for an Improvement in Hemmers for Hand Sewing:

I claim, first, The plate, A, with its rest, e, tongue, c, and thumb strap, B, for holding the folder, C, and supporting the fabric while the hem is folded, substantially as described.

Second, Providing an opening, i, in the scroll of the folder for the admission of the end of the thumb, substantially as and for the purpose specified.

Hunter Davidson, of the United States Navy, for an Improved Hook for Attaching and Detaching Boats to their Davits:

I claim the catch, C, the strap, S, and the particular form of hook, H, so that it may be fitted to the boat's stem or stern post, so as to be used with their usual outlines; the whole combined and arranged as described.

RE-ISSUE.

N. Wyckoff, of Brooklyn, N. Y., and T. M. Fell, of Charlottesville Mines, Va., for an Improvement in Gold Amalgamators. Patented July 26, 1859:

We claim the process of separating gold or silver from other substances by mixing the whole with water, combining it together with mercury within suitable containing vessels, and there by the action of heat commingling the mercury throughout the entire body of water and substances containing the precious metals, substantially as set forth.

[The nature of this invention consists in a process by which the metals gold and silver can be more economically and effectually separated from their ores or the earthy matter in which they are found than has yet been done.]

DESIGNS.

Charles Prosbtt, of Hudson City, N. J., for a Design for Window Glass.

W. W. Stanard (assignor to Jewett & Root), of Buffalo, N. Y., for a Design for Stoves (3 cases).

J. W., of N. Y.—Good copal varnish is the best known to us for coating the seams of tin buckets used for carrying maple sap, to prevent them from rusting. The varnish, after being applied, should be dried in a warm place, such as an oven heated to a temperature of boiling water. Put it on in two or three successive coats, and dry each time.

F. H. A., of Mass.—It would require volumes of our paper to enumerate all the "wants of the world in the way of chemical processes and manufactures." Any improvement in dyeing, tanning, sugar making, or any of the chemical arts; in the process of making paints, cements, bread, beer, wine, cider, and thousands of other articles, the world is ready to pay for it as soon as it is produced. The field is boundless.

H. R. S., of Pa.—No. 2 of your minerals is red hematite, a good iron ore. No. 1 is magnesian limestone in process of disintegration. The little crystals in it are quartz.

E. R. R., of Ill.—The characters on the slab are merely accidental; similar ones are quite common on mica.

J. B. D., of Mass.—Your idea about the employment of the metallic in air engines is not new. You will find that it has been used for this purpose by reading page 21 of the present volume of the SCIENTIFIC AMERICAN.

U. B., of Pa.—The boiler feeder to which you refer as having been seen at Chester is Giffard's injector. You will find it illustrated and described on page 260, Vol. II. (new series), of the SCIENTIFIC AMERICAN.

W. N., Jr., of Mass.—The silver soap to which you refer has been patented. Sand mixed with soap is not a patentable feature, as some soaps are now made in which there is a mixture of ground pumice stone.

M. M., of Mo.—Lard oil is not an artificial mixture; it is obtained from lard by submitting it to severe pressure in presses constructed for this purpose. You will find the process fully described in Moritt's work on soaps and candles. It requires a peculiar apparatus to manufacture it.

E. W., of N. Y.—For a complete equation of time several circumstances must be taken into account, such as the change in the earth's orbit, the precession of the equinoxes, &c.; but the most important of these, next to the elliptical form of its orbit, is the inclination of the earth's axis to the plane of its orbit.

C. S. P., of N. Y.—We have never seen an explanation of the twinkling of the stars that was at all satisfactory.

P. H. W., of N. Y.—We also have observed that acorn-shaped rifle bullets make a smooth round hole in a target.

W. N. R., of Wis.—We should perhaps be better able to give the reason of water rising in your wells during a south wind, if we were familiar with the topography of the region.

J. S. M., of N. Y.—The yeast plant will produce fermentation in suitable liquor. If the fermentation is allowed to continue, it first turns starch into sugar, then the sugar into alcohol, and lastly the alcohol into vinegar.

J. P., of Ala.—We do not remember the particulars relating to the anesthetic effects of the oxyd of glycerine, but we consider it a very unsafe substance to tamper with.

A. H. S., of N. Y.—We have not seen a weighing device such as you describe, and we think a patent may be obtained for it.

A. H. P., of Iowa.—We are not aware that any machine has ever been constructed for punching metal, for the purpose you describe, although the work could undoubtedly be done by machinery provided the demand would warrant it.

T. D., of Pa.—We advise every person who wishes to purchase advertised machines, to examine them for himself and not trust altogether to the opinions of others, as regards their qualities. There is no patent on the common mode of making enameled cloth. You will find a detailed description of the French process for making it on page 265, Vol. XIV. (old series), of the SCIENTIFIC AMERICAN.]

F. D. H., of Md.—Boil a strong solution of fustic and add a very minute quantity of the sulphate of copper and a little log-wood, and apply it warm to the leather with a sponge; it makes a good dark olive-green color.

H. & V., of Ind.—The portable engine illustrated on page 408, Vol. I., present series, of the SCIENTIFIC AMERICAN, affords an answer to your inquiries respecting the advantages of securing the mechanism to a bed plate. You surely have not examined it carefully, or you would have perceived that the power is taken equally from both sides of the boiler, so as to prevent racking on one side.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, April 13, 1861:—

- S. E. A., of N. Y., \$15; J. D. B., of N. Y., \$15; E. B., of N. Y., \$40; M. J. K., of N. Y., \$15; J. N. D., of Iowa, \$15; L. H. D., of Iowa, \$15; G. B., of N. Y., \$25; L. S. B., of N. Y., \$25; S. M. S., of Iowa, \$30; F. F., of N. Y., \$15; S. F., of Ohio, \$25; S. W., of Mass., \$35; L. F. B., of N. H., \$10; S. S. H., of N. Y., \$40; T. C., of N. Y., \$20; M. & L., of Conn., \$15; L. A. B., of N. Y., \$10; J. J. K., of Ill., \$25; J. A. H., of Ind., \$20; E. R. B., of Ill., \$20; W. B., Jr., of N. Y., \$100; F. C., of N. Y., \$20; J. R., of N. Y., \$20; G. W. S., of Maine, \$20; I. P., Jr., of N. Y., \$25; J. G. W., of N. Y., \$40; G. G. C., of Mich., \$15; E. G., of Mass., \$12; H. L. B., of Conn., \$25; J. T. S., of Wis., \$100; A. B. C., of N. Y., \$15; E. H., of Vt., \$10; D. S., of Mass., \$15; G. S. R., of Ill., \$15; S. S. H., of Maine, \$10; C. R., of Ill., \$25; A. M., of Pa., \$25; H. L. P., of Mich., \$15; S. C. D., of Conn., \$25; C. C., of Ind., \$20; C. & P., of Ill., \$10; M. L. P., of Ind., \$15; W. C. F., of Maine, \$15; H. W., of N. Y., \$15; W. K., of N. Y., \$20; B. D. H., of N. Y., \$25; K. & T., of N. Y., \$30; G. of N. Y., \$30; H. Y., of N. Y., \$40; N. C., of N. Y., \$20; J. W. H., of N. J., \$15; D. E. S., of Maine, \$15; F. G. L., of Iowa, \$15; J. H., of N. Y., \$15; C. R., of Vt., \$15; N. L.

- A., of N. Y., \$25; S. D. L., of Mass., \$10; T. C. H., of N. Y., \$15; C. & W., of Maine, \$16; D. O. F., of Mass., \$40; R. R., of N. Y., \$15; J. L. A., of N. Y., \$15; J. G., of N. Y., \$15; L. O. W., of N. Y., \$25; H. W., of N. Y., \$15; G. W. D., of Ohio, \$25; J. E. M., of Pa., \$25; E. D. C., of Vt., \$10; A. H. T., of N. J., \$50; J. H., of N. J., \$10; C. E. L. H., of Conn., \$22; A. B. C., of N. Y., \$15; J. R. R., of Mass., \$40; J. H. F., of Ky., \$50; W. W., of Cal., \$25; A. E. K., of Pa., \$25; P. H. S., of Cal., \$106; W. C. & J. D., of N. Y., \$25; C. H. C., of Mass., \$25; F. B. B., of N. Y., \$25; R. W., of Vt., \$25; J. A. W., of N. Y., \$25; H. N., of N. Y., \$25; E. W. G., of Mass., \$25; L. F. L., of Cal., \$20; J. K. P., of Mich., \$15; S. P., of N. Y., \$25; T. H., of Cal., \$75; P. S. of N. Y., \$25; C. W. S., of Maine, \$15; A. C. K., of N. Y., \$28; I. W. H., of N. J.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending April 13, 1861:—

- K. & T., of N. Y.; G. B., of N. Y.; W. & F., of Tenn.; E. H., of Vt.; F. W. L., of N. Y.; C. R., of Ill.; C. W. C., of N. Y.; N. C., of N. Y.; B. D. N., of N. Y.; C. & P., of Ill.; L. A. B., of N. Y.; J. S. McC., of N. Y.; J. H., of N. Y.; S. D. L., of Mass.; G. & S., of Ohio; L. S. B., of N. Y.; I. P., Jr., of N. Y.; S. F., of Ohio; A. M., of Pa.; S. C. D., of Conn.; J. J. K., of Ill.; J. E. M., of Pa.; J. J. II., of Ky.; C. E. L. II., of Conn.; E. G., of Mass.; H. L. B., of Conn.; C. F., of N. Y.; H. Y., of N. Y.; R. R., of N. Y.; J. R. M., of Texas; P. C., of N. Y.; H. W., of N. Y.; C. C., of Ind.; G. R. B., of Ill.; G. W. T., of N. Y.; W. C. & J. D., of N. Y.; A. H. T., of N. J. (2 cases); R. W. of Vt.; P. A. M., of France; S. P., of N. Y.; J. A. W., of N. Y.; W. W., of Cal.; A. E. K., of Pa.; A. C. K., of N. Y.; I. W. H., of N. J.

New Books and Periodicals Received.

THE BIBLIOTHECA SACRA. Published by Warren & Draper, Andover, Mass.

The number of this most able theological review for the present quarter contains a profound article by the Rev. James McLane, D.D., of Brooklyn, on "Geology and the Bible." It is one of seven essays by different learned authors on as many subjects.

THE TRIUMPHS OF INVENTION AND DISCOVERY. By J. Hamilton Fyfe, published by Nelson & Sons, London, Edinburgh and New York.

This is a very neatly printed and illustrated volume, containing short biographies of the great European inventors of modern times, justly commencing with Coster and Guttenberg, the inventors of printing with single movable types. The histories of printing; the steam engine; the iron manufacture; the electric telegraph; the cotton manufacture, &c., are given briefly and written well, but Mr. Fyfe does not seem to be acquainted with American inventions, which is a great loss to himself and his countrymen.

CHANGE IN THE PATENT LAWS.

NEW ARRANGEMENTS—PATENTS GRANTED FOR SEVENTEEN YEARS.

The new Patent Laws, recently enacted by Congress, are now in full force, and promise to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from \$30 down to \$15. Other changes in the fees are also made as follows:—

- On filing each caveat.....\$10
On filing each application for a Patent, except for a design.....\$15
On issuing each original Patent.....\$20
On appeal to Commissioner of Patents.....\$20
On application for Re-issue.....\$30
On application for Extension of Patent.....\$50
On granting the Extension.....\$50
On filing Disclaimer.....\$10
On filing application for Design, three and a half years.....\$10
On filing application for Design, seven years.....\$15
On filing application for Design, fourteen years.....\$30

The law abolishes discrimination in fees required of foreigners, except in reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian, Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms.

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO. in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees, at home and abroad. Thousands of Inventors for whom we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds in the quickest time, and on the most liberal terms.

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.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK-RROW, NEW YORK. We have also a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F and SEVENTH 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 their office.

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

THE GREAT WONDER OF THE AGE.—SEAMLESS HOSIERY.—Manufacturers of hosiery are requested to examine the new machine for the manufacture of perfect hosiery with calf, heel, foot and toe at one and the same operation. This invention having been fully completed and in practical operation, the proprietors of the patents are now prepared to grant licenses to a limited number of manufacturers to manufacture under their patents. The licenses will be issued upon such terms as to insure great economy of time and money, besides giving an article far superior to any other in the market. Address, for information, the President of the McNary Knitting Machine Company, No. 25 William-street, New York.

THE SCOTTISH AMERICAN JOURNAL.

THIS IS A FIRST-CLASS FAMILY NEWSPAPER OF eight pages, devoted to the interests of Scotsmen in America...

CHAPTERS FROM THE LIFE OF JAMES TACKET, will be commenced in the SCOTTISH AMERICAN JOURNAL for April 20.

THE SCOTTISH COVENANTERS. The SCOTTISH AMERICAN JOURNAL has been pronounced one of the most readable papers published in America.

TO INVENTORS.—A PERSON OF MECHANICAL INGENUITY and experience offers to inventors assistance in perfecting their ideas.

PATENT FOR SALE.—FLEMING'S SELF-REGISTERING Lumber Measurer, patented Feb. 5, 1861; will measure from one foot to any amount required.

ENGINE FOR SALE.—A 6-HORSE ENGINE, MADE by Burdon, complete, with Boiler, Pump, &c.; now in use at No. 306 Pearl-street, New York.

\$8,000 WILL BUY A GOOD STEAM FACTORY, with Machinery and five acres of Land, in this city; the best location for a furniture, chair or agricultural implement manufactory in the West.

TO CANDLE AND SOAP MAKERS.—PROFESSOR H. DUSSAUCE, chemist, gives advice on any chemical processes relative to candle and soap making.

CHEMISTRY APPLIED TO THE ARTS, MANUFACTURES, AGRICULTURE, METALLURGY AND MINING.—Consultations and advice on Manufacture (with drawings) of Colors, Varnishes, Coal Oils, Gas, Candles, Soaps, Dyeing, Beer, Alcohol, Vinegar, Manures, Acids, Alkalies and Salts, Glass, Pepper, &c.

WANTED TO PURCHASE.—A PATENT RIGHT FOR Massachusetts; one on which money can be made.

HAYDEN SANDERS & CO., NO. 306 PEARL-STREET, New York, Manufacturers of Brass Work for Steam, Gas and Water.

TO MACHINISTS.—WANTED, A FOREMAN FOR A shop employing about 20 hands, and manufacturing both light and heavy machinery.

A NEW STYLE OF KNITTING MACHINE, JUST OUT, for family use and manufacturing purposes; elegantly constructed, durable, light, portable and cheap.

VALUABLE NEW PATENT FOR SALE.—HOSTETTER'S combined Bag-holder and Conveyor. Send for circular and description.

N. E. HULE, MANUFACTURER OF PATENT BELT Hook Pliers and Belt Punch, Nashua, N. H.

THE AMERICAN ENGINEER.—A WEEKLY JOURNAL, devoted to the interests of Marine, Locomotive and Stationary Engineers.

WOODWORTH PLANERS.—PLANE 18 AND 24 inches wide, \$85 and \$90. Also tenoning and molding machines; one second hand steam engine, 15 horse power; four engine lathes, second hand.

WARREN'S TURBINE WATERWHEEL (WARREN & Damon's patent).—Cotton and woolen manufacturers, millwrights and millowners, and every mechanic who would economize in water power, should investigate this wheel.

BOOK ON PORTABLE ENGINES.—"PRACTICAL INSTRUCTIONS for the Portable Engine, Enabling Every One to be His Own Engineer; by a Graduate of the Military Academy, and Former Member of the United States Corps of Engineers."

PORTABLE STEAM ENGINES.—6, 8 AND 10-HORSE, at \$50, \$625 and \$780. For sale by S. C. HILLS, No. 12 Platt-street, New York.

MESSEURS 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.

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

MECHANICS, FARMERS AND WORKING MEN. 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.

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.

THE SOUTHERN PART of the State lies within the zone of the cotton regions, while the soil is admirably adapted to the growth of tobacco and hemp; and the wheat is worth from fifteen to twenty cents more per bushel than that raised further North.

RICH ROLLING PRAIRIE LANDS. The deep rich loam of the prairies is cultivated with such wonderful facility that the farmers of the Eastern and Middle States are moving to Illinois in great numbers. The area of Illinois is about equal to that of England and the soil is so rich that it will support twenty millions of people.

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.

APPLICATION OF CAPITAL. Thus far, capital and labor have been applied to developing the soil; the great resources of the State in coal and iron are almost untouched. The invariable rule that the mechanical arts flourish best where food and fuel are cheapest, will follow at an early day in Illinois, and in the course of the next ten years the natural laws and necessities of the case warrant the belief that at least five hundred thousand people will be engaged in the State of Illinois in various manufacturing pursuits.

RAILROAD SYSTEM OF ILLINOIS. Over \$100,000,000 of private capital have been expended on the rail roads 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.

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.

PRESENT POPULATION. The State is rapidly filling up with population; 868,026 persons having been added since 1850, making the present population 1,722,663—a ratio of 102 per cent in ten years.

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.

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.

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.

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.

EDUCATION. Mechanics and working men will find the free school system encouraged by the State, and endowed with a large revenue for the support of schools. Their children can live in sight of the church and schoolhouse and grow with the prosperity of the leading State in the Great Western Empire.

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 land 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 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.

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Foreign Chemical Color Patents.

The following are condensed descriptions of several patents lately taken out in England, connected with the chemical art of manufacturing and applying colors:—

Purples from Coal Tar Products.—R. Smith, a well known chemist, has obtained beautiful colors, not only from aniline, but other bases found in coal tar. He takes a saturated solution of aniline, toluidine, xylydine, cumidine, or either of them in water, and adds a solution of chlorine in water. The proportions are from 1 to 3 equivalents of chlorine to one equivalent of the bases. The mixture is allowed to stand for twelve hours, when a black precipitate is found at the bottom of the vessel. This is washed with water, then mixed with a solution containing about five per cent of soda. In about two hours the solution is filtered. The precipitate is now boiled until the coloring matter is dissolved, when it is filtered, and a small quantity of the chloride of calcium added. This separates the coloring substance, which is collected in a filter, and washed well with cold water. The coloring matter is now dried, and may be afterward dissolved in alcohol, or wood spirit, and is then ready for dyeing or printing. The color so obtained is a bright purple, similar to that called *mauve*, which is obtained from aniline by mixing it with manganates, or the bichromate of potash.

Coloring and Gilding Leather and other Fabrics.—A patent has been secured by R. A. Brooman (being a communication from abroad) for an improvement in printing in relief, and in color, and in gold or silver. The material or fabric to be ornamented or colored is passed between a pair of rollers, one of which is metal, and has the desired pattern sunk or cut out on it, while the other roller is the counterpart, and is formed of gutta-percha or hard paper, with the pattern in relief. For printing with one color only, a distributing roller is placed in contact with the relief roller, and as it revolves, the color is supplied to its surface. For printing in several colors, the inventor uses what he terms "cliche" rollers of gutta-percha, which have their surfaces in relief. The fabric is passed through in a piece as in calico printing, and the pattern is printed in color, and embossed at one continuous operation. When portions of the pattern are to be gilded, the rollers print sizes or mucilage on the parts, and when the fabric passes through, the gilding is applied in powder dusted upon it. This adheres to the prepared surface, and when dried it may be run between pressure rollers to smooth it down.

Panphiteic Acid—New Color Agent.—H. Johnson has obtained a patent (communicated from abroad) of a peculiar new coloring matter obtained from several plants and vegetables. When vegetables are treated with steam, or boiling alkaline water, a coloring substance is extracted from them, and precipitated. This is placed in a stoneware vessel, mixed with nitric acid, and evaporated. The residuum thus obtained contains panphiteic acid, and it is now placed in distilled water, and washed. Resins, gums, wax, and all vegetable exudations may be converted into panphiteic acid, by first dissolving them in alcohol, ammonia, or bisulphuret of carbon, then submitting such solutions to the action of strong nitric acid; or the wax, &c., may be first treated with nitric acid, and secondly, with the alcohol or other solvent. Panphiteic acid produces a yellow dye, and by mixing with the prussiate of potash, it imparts a light color to silks and woollens, by simply dipping into a solution of it. Panphiteic acid, obtained from catechue, can be employed for dyeing shades of green on cotton, by preparing the fabric first in a bath containing a solution of nitrate of iron.

Purple-blue Color.—Mr. Johnson has also obtained a patent for a new purple-blue color, derived from indigo, and designed for dyeing and printing on textile fabrics. Take, say 20 lbs., of anhydrous bisulphate of soda, and heat it until it becomes fused. In this condition, about one pound of pulverized indigo is added to it gradually, and the mixture constantly stirred to prevent it from sticking to the bottom of the vessel, which may be a cast iron kettle. The mass now swells, and becomes very dark in color, and disengages a great deal of gas. By taking a little of it out occasionally upon a glass rod, and stirring it among some clear water in a glass tumbler,

the progress of the operation is tested; as soon as it colors the water a violet red, no more indigo should be added. The mixture should now be of a pasty consistency. About 147 gallons of hot water are then placed in a cask, and the mixture poured into it and actively stirred; this precipitates the coloring matter, which is a beautiful purple-blue, of a peculiar and brilliant color.

FISHER'S CARRIAGE WHEEL.

The improvement here illustrated has received the commendation of persons familiar with the art of carriage making, and promises to be extensively introduced. In the description, similar letters represent corresponding parts in both figures.

The wheels, D, are composed of several metallic truss felloes, *f*, the tire, *t*, tubular spokes, *s*, with the binding rods, *c*, the hub, H, and its enclosing cap, C. The axle is composed of two spindles *s'* *s''*, and the shell or tube, B. The hub, H, is cast of brass or other suitable material in form of a cup or hollow cylinder, and has a stem in its center as seen in Fig. 2, with a square taper hole in it, to which the shank of the spindle, *s*, is fitted; being secured thereto by the nut, *h*, outside. The felloes represented by the several letters, *f*, are made in skeleton form, as seen in Fig. 1 and in segments, each being of a length corresponding with two of the spaces between the spokes, so as to receive one spoke in the middle, the felloes having a rim nearly as wide as the tire with a web, *w*, in the middle, extending from one spoke to another. The holes in the felloes which receive the outer ends of the spokes, *s*, are contracted so as to form the shoulder, *i*, seen in Fig. 2, against which the ends of the spoke rest.

The binding rods, *c*, are provided with a center sunk head *c'*. The tire is drilled to match the spoke holes in the felloes, and the rods, *c*, are put in through the tire, *t*; the hollow spokes, *s*, and the rim of the hub, H; receiving the nuts, *g*, on the inside of

Fig. 1

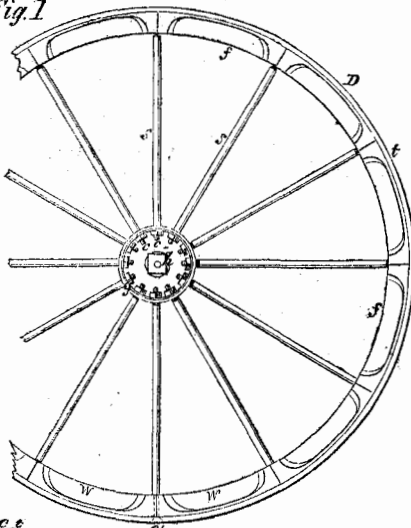
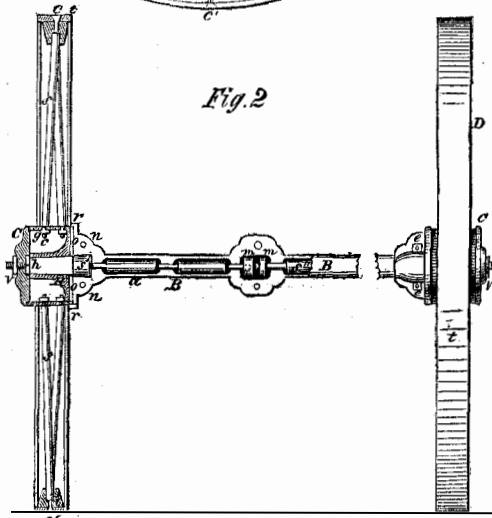


Fig. 2



the hub; by means of which arrangement the several parts are drawn together securely, and then the open end of the hub is closed by the ornamental cap, C, which is securely attached by the nut, *v*. The spokes, *s*, should be connected alternately with the outer and inner end of the hub as shown in Fig. 2. The tube of the axle, B, is made in two parts with recesses, *a a*, for the lubricating material. It is provided with flanges,

n, in the center and at each end, through which the bolts, *e*, pass to secure the parts together. On each end of the tube is a rim, *r*, which encircles the inner end of the hub, H, to prevent sand, &c., from working in between the revolving parts. A washer, *o*, is placed between the end of the tube and the hub, for the purpose of diminishing the friction of these parts. The spindles, *s'* and *s''* are made alike except at the ends where they meet, where the point of *s''* enters the end of *s'*, as shown by the dotted lines. The end of each spindle is enlarged to prevent the wheel from spreading apart; the enlargement coming against the shoulder, *m*, of the tube. The reach and side braces for connecting the front and rear axle may be attached to the tube, B, by the bolts, *e*.

By the construction of this wheel it will be seen that it is both light and strong, and as it is made wholly of metal, if it is kept properly painted, it will be very enduring.

The patent for this invention was procured through the Scientific American Patent Agency, December 18, 1860, and further information in relation to it may be obtained by addressing the inventor, J. P. Fisher, Rochester, N. Y.

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