American and Russian Petroleum.

The recent sensational rise in the value of American crude and refined petroleum, and the causes to which it may be attributed, are readily accounted for, and a study of the relative positions of the American and the Russian industry shows that the present revolution in the petroleum market may soon be accentuated by the replacement of a large proportion of the American oil by the Russian product. The Americans possess the advantage of having been first in the field, and of producing an oil which yields on distillation nearly twice as much illuminating oil as does that of Russia, and, furthermore, of producing a type of oil which is better adapted for burning in the ordinary lamp than that of any other country. It is true that the oil of Ohio is an inferior quality, owing to the presence of an excess of sulphur compounds, and that it yields only about as much lamp oil or kerosene as that of Russia, but at present it is not of great importance as regards the European markets, and American oil may be considered to be almost entirely derived from the States of Pennsylvania, New York, and Western Virginia.

The American industry, dating only from 1859, has hitherto grown year by year under the skilled guidance by which it has been fostered, and until within the last two years or so has shown no indication of diminution of supply; but it is now becoming evident that the depletion of the oil lands which Mr. Carll, Professor Leslie, and other American geologists years ago asserted would before long result in a large decrease of supply, is beginning to show its effects. The older fields are rapidly falling off in their supply, while, although new areas of more or less importance are constantly being opened up, the amount of untested territory is rapidly becoming less, and the prospect of a renewal of the enormous supply of the past is ever becoming smaller.

If we glance at the statistics showing the stocks held of late in America, we find that at the end of 1892 there was in the crude oil tanks no less than 17,395,389 barrels of 42 American gallons; that this fell, by the end of 1893, to 12,111,183 barrels, and was, at the close of 1894, 6,336,777 barrels; and that, on March 1 last, it was only 4,908,776 barrels—and this in the face of a demand which shows no sign of diminution, and of a supply which is inadequate and constantly decreasing. It is, of course, certain that the increased activity in the sinking of new wells, which is now in progress, will result in a large increase in production; but this can only be at enhanced cost, and must bring ever nearer the time when the American oil industry shall become of secondary importance, and ultimately of only historical interest.

When we study the position of the Russian industry, we find that it possesses entirely different features. Although of great antiquity, its commercial importance only dates from 1872, when the monopoly of Prince Meerzoeff was abolished, and only within the last few years has it become a dangerous antagonist of the United States. The production shows no diminution, and, so far as appears at present, can be almost indefinitely increased at small cost, whenever occasion demands. The wells are shallow, usually about a fourth of the depth of those of Pennsylvania, and entirely dwarf the latter in output. Wells which are considered rich in America would not be worth sinking in the Baku district, which at present constitutes almost the entire producing area of Russia. From the fact that the Apsheron peninsula, on which the Baku fields stand, possesses an area of oil-containing land estimated at 1,200 square miles, and that only about 7 or 8 square miles is at present under the drill, we can readily realize how important a factor the Russian oil forms in the present position of affairs, and how probable it is that the Russians will soon take the leading position in the oil markets of the world. Furthermore, there are enormous tracts of country in the Caucasus and elsewhere in the Russian empire which, although scarcely tested, have given indications of richness even exceeding that of Baku, and showing a potential wealth of oil capable of supplying the world for ages to come. Wells drilled in the Grosnaia field to the north of Baku and in Gouria—Georgia—between the Black Sea and the Caspian, have given the most encouraging results, and both these fields, and also that of the Crimea, are more favorably situated for transporting the oil than Baku.

The conditions under which the oil occurs in Russia and America are very different. In the former it is found in strata of the Tertiary period, usually a formation resembling a quicksand, and at depths of only a few hundred feet; while in the latter it occurs at great depths in the older compact sandstones and limestones of the Carboniferous, Devonian, and Silurian periods. The oil of Russia consists of a class of hydrocarbons known as naphthenes, and belonging to the "benzene" group, while the American oil is mainly composed of paraffins. It is to this difference in composition that the great variation between the products from these oils is due, for whereas the American oil yields a very large proportion—about 70 per cent—of illuminating oil exactly suited for combustion in our ordinary lamps, the Russian oil produces far less of such oil and a larger proportion of the high class lubricating oil for which that country is famous. The Russian illuminating oil also requires to be burned in a modified form of lamp with a more perfect draught, to overcome its tendency to produce a smoky flame. Hence, before the Russian oil can obtain a powerful position in the English market, the Kumberg or any other of the lamps which are employed in Russia must become naturalized among us, and, although that is a somewhat difficult operation with such a conservative people as we are, it is practically certain to result in the near future from the greater cheapness which Russian oil will now show as compared with that of America.—The Engineer, London.

Hematite Mining in Greece.

A new hematite mine at Marathon, in the village of Grammatico, Greece, was opened last year. The ore is carried down by a railway for about five miles to Limonia Bay, where there is a jetty on the west side 200 feet in length, by means of which 1,000 tons daily can easily be loaded. Proper appliances have been provided for mooring the vessels. The anchorage is considered quite safe, as it is well sheltered. The mine has been leased for twenty years by several French capitalists. The actual output is 6,000 tons monthly, but if necessary the quantity can be increased to 15,000 tons. The ore is of an excellent quality, and contains 56 to 58 per cent iron, 3·80 to 4 per cent manganese, and 1·60 to 2 per cent only of silica, but whenever the several lodes are found in contact with some small veins of yellow ocher, the presence of a very slight percentage of arsenic is found by analysis, but this seldom happens.

Spirit for Incandescent Lighting.

The problem of employing spirits for lighting on a new principle similar to the incandescent gas light has, it is stated, been solved with great success by a Berlin firm. Experiments have just been carried out in presence of the Prussian Ministers Herren Berlepsch, Miquel, and Hammerstein, which are reported to have been completely satisfactory. If this news is confirmed it is likely to prove of enormous importance to the German spirit industry, which has recently been in extremis.

RECENTLY PATENTED INVENTIONS.

Electrical.

TELEPHONE CALL.—Frederick J. Troll, Washington, D. C. This invention relates to a call in which the revolving armature is rotated by a flexible metal tape on a drum, the tape when drawn out revolving the armature in one direction, and the tape being rewound by the tension of a coiled spring. By an improved construction and arrangement of parts the motion is transmitted to the armature direct, and the armature is made to ring a call by both the forward and backward movement of its oscillation, the armature being also cut out when the call is not in use. The call box is very simple and not liable to be damaged by inexperienced operators.

BOILER LOW WATER INDICATOR.—Charles D. Tisdale, Boston, Mass. According to this invention an auxiliary connecting piece is inserted between the lower end of the water gage and the water gage cock, the intermediate piece having contact wires extending up into the tube, and a float within the tube being adapted to form an electrical connection between the contact wires. The device can be applied to a boiler by removing the glass water gage tube and replacing it with a tube having the auxiliary connecting piece, the tube and attachments being made to replace the ordinary water gage tube. The alarm may, with this improvement, be given in the boiler room or at any desired distant point.

Mining, Etc.

REDUCING GOLD AND SILVER ORES.—John C. Garvin, Denver, Col. This inventor has devised a simple apparatus for rapid and economical work, in which the firebrick stack has a central shaft, alongside of which are ore-drying chambers connected by upwardly slanting apertures with outer gas chambers, there being in the central shaft opposite inclined shelves of tile, and the ore dropping from one shelf to the other, the central shaft being used for chloridizing and roasting and the outer chambers for making sulphuric acid. Below the central shaft is a roasting chamber with cone-shaped hearth on a revolving disk, and this chamber is connected with the fire box, the pulverized ore, mixed with chloride of sodium or salt, being kept upon the hearth until it is desulphurized, chloridized, and roasted.

Mechanical.

COTTON GIN AND WOOL BURRER.—Samuel L. Johnston, Boston, Mass. This machine belongs to the class known as roller gins, but it has a reciprocating stripping mechanism supported and held to operate in a more effective, rapid, and uniform manner. It also has a vibrating receiver and separator mechanism which receives the material from the hopper and delivers it to the roller and stripper, and also serves to clear the seed and dirt therefrom as it feeds. The machine likewise has other features designed to increase its capacity and improve the quality of the cotton and wool treated.

MACHINE FOR MAKING DRESS SHIELDS.—Emil Barsuck, College Point, N. Y. For pressing and forming a flexible material into dress shields in a simple and inexpensive manner, this inventor has devised an arrangement of a male and female die, each provided with a heating chamber, and one of the dies being adapted for vertical reciprocating movement, while the other die has means for moving it bodily in a horizontal direction into and out of position to be engaged by the first die. Several shields are thus formed at one pressing operation, the dies remaining long enough in contact to firmly shape the material, after which the pressed material is cut transversely to form the individual shields.

Agricultural.

CORN HARVESTER AND HUSKER.—Gustave Leblanc, Mead, Neb. This is a machine for field use, gathering the ears from one or more rows of standing corn and conveying them to husking devices, from which they are conveyed by an elevator to a wagon, the husks being discharged on the ground. The machine may be drawn or pushed forward by a team at the front or rear, as found most convenient, and all the driving mechanism is actuated from the axle. The machine is designed to be durable, inexpensive to build, and simple in its operation.

Miscellaneous.

TACHOMETER.—James Donnan, Ballaghaut, India. This is a distance measuring instrument comprising a pivoted telescope on one of the trunnions of which is clamped an arm adjacent to a scale, there being mounted on and adapted to move along the arm a lengthening bar having an index adapted to traverse the scale. The instrument is designed to enable the user to readily read off the horizontal distance of any point to about three thousand feet from the point of observation, through the rise and fall of this point relative to the point of observation, and also the bearing of this line from the magnetic north, or the horizontal angle subtended between any two lines which meet at the instrument.

LIBRARY STACK.—Dean A. Beckwith, New York City. The front and rear posts of this stack are provided with lugs connected by plates which form the supports for the shelves, each of the latter having depending flanges adapted to drop into position between the supporting posts, whereby the shelves cannot slip or be displaced, although they may be conveniently removed when desired. The construction is simple and durable, and a stack thus made presents a neat appearance.

WHEEL TIRE.—Samuel A. Smith, McKinney, Texas. According to this improvement the two ends of a wheel tire are connected in a very inexpensive and simple manner by a novel arrangement of a lug and screw, the lug forming practically a part of the felly, and the connection between the tire ends being firmly made, while the tire may readily be tightened at any time by simply turning a nut.

VEHICLE SAFETY DRIVING REIN HITCH.—Isaac A. Stewart, De Land, Fla. In a casing to be attached to the wagon body is held a rotatable roller or drum within which is a retracting spring, while on the drum are two oppositely wound cords, one connected with the driving reins and the other with a wheel of the vehicle. When the cords are properly connected and the horse moves, a gradually increasing tension is put on the cords by the rotation of the wheel to check the animal, the tension being relaxed if the animal backs.

SEWER VALVE.—William Godfrey, Saugatuck, Conn. This valve is formed of two halves, an inlet and an outlet section, bolted together, the inlet extension having an inclined extension with beveled edge forming a seat for a hinged inclined valve, and the outlet section at its mouth being larger than the body of the inlet section. The bottom of the outlet section is sharply curved or bent down to form an offset or drop, affording a clear space under the lower edge of the valve for the passage of sewage, insuring the positive working of the valve and preventing any clogging which may obstruct its closing.

BOTTLE STOPPER.—James F. Martin, New York City. This stopper has two independent valve seats, to be secured at a suitable distance apart in the neck of a bottle, and two ball valves having forked stems each projecting through the central opening of its seat, the forks being bent outwardly at their ends to engage the under side of the valve seat. The stopper is designed to permit the ready pouring out of the contents of a bottle, but prevents refilling, thus making it impossible to adulterate or sophisticate the liquid originally placed in the bottle.

SOAP HOLDER.—Frank H. Milligan, High Lane, England. To allow the draining off of water from toilet and other bar soap after use, this inventor provides a holder consisting of a plate or disk from whose opposite sides project studs, between which are apertures, the outer studs being longer than the inner ones, and thus forming a central depression to receive the soap. The holder may be placed in a suitable dish if desired or directly on the slab of a washstand.

FRUIT JAR CLAMP.—Henry C. Dilworth, East Orange, N. J. Fitting over the top of the fruit jar, according to this improvement, is a clamping piece to which is secured a spring, a cam lever carried by the clamping piece being adapted to engage the spring. The device may be adjusted to form a water tight seal, with the fastening yielding to permit the escape of any steam or gas which may be generated, or it may be adjusted so as to bind the cap rigidly and hermetically seal the jar.

SKATE.—Henry D. Carryl, New York City. This skate is made to be readily and firmly attached to shoes having long or short heels. It has a runner of the ordinary form, to which is secured a sole plate having a narrow portion connecting the heel and ball foot rests, and on the narrow portion is an eccentric dog which engages the forward side of the heel and clamps the narrow part of the sole plate. The improvement is designed to cheapen the manufacture, and to simplify and facilitate the clamping of the skate upon the foot.

SPRINKLER.—William L. Van Horn and Martin Yount, Norfolk, Neb. For the sprinkling of lawns and planted beds, these inventors have devised a sprinkler to be placed at any desired point, and which has a revolving section through which the water may be delivered through the sides, or downwardly or upwardly, in the latter case falling in drops to imitate rain.

DESIGN FOR A RING HOLDER.—Adolph Sametz, New York City. This design comprises a series of elongated V-shaped tongue-like figures on a rectangular board, the edges of which display a lace work ornamentation.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each, Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

LEE'S CONDENSED CYCLOPEDIA. A comprehensive digest of the world's knowledge in history, biography, geography, philosophy and science. By Prof. C. M. Stevens. Chicago: Laird & Lee. Pp. 384. Price, library style, 50 cents; leather, full gilt, $1.

NYSTROM'S POCKET BOOK OF MECHANICS AND ENGINEERING. Revised, corrected and greatly enlarged, with addition of original matter. By William Dennis Marks. Twenty-first edition, further revised and corrected by Robert Grimshaw. Philadelphia: J. B. Lippincott Company. 1895. Pp. 675. Price $3.50.

We welcome the twenty-first edition of this book, which has had a wide popularity, this twenty-first edition only emphasizing its utility to the engineering profession.

MECHANICS. An elementary text book, theoretical and practical, for colleges and schools. Dynamics. By R. T. Glazebrook. Cambridge: At the University Press. 1895. Pp. ix, 256. Price $1.25.

This excellent little work, one of the Cambridge Natural Science Manuals, in the Physical Series, is based on the idea of having the student make his own experiments. This it does without in the least impairing the thoroughness of the work, which is a genuine scientific treatise and by no means an intermediate manual. Nothing is clearer than the fact that a thorough knowledge of mechanics is the greater part of the foundation of physics, or, at least, represents the greater portion of the work that is to be done in acquiring a comprehension of the science. The experiments are somewhat in the line of the Harvard entrance examination work, but are far superior in type, a superiority, perhaps, partly due to the somewhat more advanced treatment of the subject employed. It will be understood, moreover, that they do

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not go outside of mechanics. The description of Hicks' ballistic balance, with a "comparison of masses," is particularly to be noted as an example of the treatment given the subject by the author.

POPULAR ESSAYS UPON THE CARE OF THE TEETH AND MOUTH. By Victor C. Bell. Published by the author. 1894. Pp. 103. Price $1.25.

It really seems to us as if this book were one which might have considerable utility. It treats of the general sensible care of the teeth, home remedies, and an excellent chapter is given in conclusion on "quackery," which is really an appeal for good work, and as such must be recommended. The book has no index, but, perhaps on account of its shortness, it hardly needs one.

TELEGRAPHIST'S GUIDE TO THE NEW EXAMINATIONS IN TECHNICAL TELEGRAPHY. Together with an appendix dealing with dry and secondary cells, universal battery system, direct reading battery instrument, duplex (bridge method), new system of morning testing, fast speed repeaters, etc. By James Bell, A.I.E.E.. Certified Teacher City and Guilds of London Institute. London: Electricity. Pp. 101. Price 60 cents.

PRACTICAL TELEGRAPHY. By F. E. Wessels. A book for self-instruction. 1895. Pp. 24. Price 50 cents.

The Locomotive, a monthly publication of the Hartford Steam Boiler Inspection and Insurance Company, has just completed its 15th volume. Its inspectors' reports of examinations of boilers, with the defects found therein, and its notes on boiler explosions, render this little work an especially valuable one to engineers, when it is remembered that the boiler inspections number as many as from ten to twelve thousand per month. In 122,893 boilers examined last year, 597 were condemned, and dangerous defects were found in 12,390. As might be looked for in such a publication, it contains much valuable information on boiler construction and preservation.

SCIENTIFIC AMERICAN

BUILDING EDITION.

JUNE, 1895.—(No. 116.)

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2. An elegant plate in colors showing a cottage at Bronxwood Park, Williamsbridge, N. Y., recently erected at a cost of $2,200. Perspective view and floor plans. Mr. A. F. Leicht, architect, New York City.. A neat design.
3. A cottage at Flatbush, L. I., recently erected for W. K. Clarkson, Esq., at a cost of $5,000. Perspective elevation and floor plans. Mr. Christopher Myers, architect, New York City. A picturesque design.
4. A modern cottage at Bedford Park, New York City, recently erected at a cost of $3,000. Perspective elevation and floor plans. A picturesque design. Mr. Edgar K. Bourne, architect, New York City.
5. The Bedford Park Congregational Church. Two perspective elevations and floor and basement plans. Cost complete, $7,000. Mr. Edgar K. Bourne, architect, New York City.
6. A Colonial cottage recently erected at New Dorp, S. I., at a cost of $3,675, complete. Perspective elevation and floor plans. Messrs. Child & De Goll, architects, New York City. An attractive design.
7. A residence at Germantown, Pa. Two perspective elevations and floor plans. Cost complete, about $10,500. Messrs. Child & De Goll, architects, New York City.
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10. The residence of E. P. Sandford, Esq., at Montclair, N. J. Two perspective elevations and floor plans. An elegant design. Architect and builder, Mr. E. P. Sandford, Montclair, N. J.
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12. Miscellaneous contents: The Hanging Gardens of Babylon.—Perspective drawings.—Concrete roofs.—Points of support.—Architects' estimates.—An improved hot water heater, illustrated.—A new invention for raising water, illustrated.—Improved paving.—The Bommer spring hinge, illustrated.—A mixing regulator for gas machines, illustrated.—Adjustable sliding door track and hanger, illustrated.—Woodworker's improved vise, illustrated,—African mahogany.—A new steam and hot water heater, illustrated.—Powers' improved automatic chimney top, illustrated.—Improved wood working machinery, illustrated.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

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Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(6543) D. T. W. asks: What is the velocity of electricity, as in telegraphy? A. It depends on the delicacy of the receiving instrument and on the capacity of the line. It is fair to assume that the first faint and imperceptible disturbance goes with the speed of light (about 186,000 miles per second), but considerable time may elapse before.

(6544) Machinist, Memphis, writes: If an eccentric on an ordinary stationary engine is chucked in the lathe, got dead true on the outside, turned off ⅛ or ¼ of an inch and the straps bored out to suit, will it change the throw of the valve or not? A. The size of the eccentric does not control the throw of the valve. The amount of eccentricity only is considered, whether it be a pin or a large disk.

(6545) C. A. M., Cal., writes: In laying a pipe line 40 miles long, using 2 inch and 3 inch pipe, which is the most practical method in laying the line, using 20 miles of each? Which will make the most friction, the 2 inch pipe at the pump end and the 3 inch at the outlet, or the 3 inch at the pump end and the 2 inch at the outlet? The pump will lift the oil 200 feet for the first half mile, then it will have a fall of 1,500 feet for 39½ miles. A. The 3 inch pipe should be laid at the pump end of the line. This will relieve the friction on the risingend of the siphon from the work of the pump, and allow the best condition for gravity flow on the long leg of the siphon. This will relieve the work of the pump to a small extent and yield the largest possible delivery at the discharge end.

(6546) B. H. T. asks: 1. Why does not more surface of plate give more current in cell? Text book says that the only difference size of cell makes is difference in internal resistance. A. It does give more current. Lowering the resistance implies at a constant voltage the development of more current. **2. What makes telegraph or telephone wire sing?** A. The action of wind upon them, on the principle of the Æolian harp. —Governments have done considerable in the way of affording State support to colleges and universities. As a rule, anything in the nature of a substantial support received by any individual in pure science is derived from a connection with one of these institutions. There have been some government prizes, but these are of comparatively little importance.

(6547) W. H. K. asks: Which will run the easier, a 26 inch or a 28 inch bicycle, both geared to 60 inch, weight c rried the same, over ordinary roads? A. It is hard to answer this question authoritatively. We should decidedly incline to recommend the larger wheel. The larger sprocket on the rear wheel counts as an advantage, and for even gear the larger sprocket will go on the larger wheel.

(6548) D. R. W. asks: What is the best known (solid) non-conductor of sound? A. Indiarubber is about as good as any.

(6549) H. A. asks how to clean and make smooth the outside of an upright boiler, and what kind of paint is used to paint boilers, and make them shine? A. The boiler can be rubbed smooth with a piece of pumice stone and water, then painted with black japan varnish, or, what is more commonly used, coal tar varnish.

TO INVENTORS.

An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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AND EACH BEARING THAT DATE.

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