THE SOURCES OF SPRINGS AND RIVERS.

In the interesting communication of a correspondent on another page, the great source of springs and rivers is asserted to be water flowing direct from the ocean to the interior of the earth, thence thrown to the surface by the centrifugal action of the earth's rotation. The sea is compared to a great fountain, and the water channels in the earth to the veins in the human body, supplied from this great reservoir. One argument advanced in favor of this theory is that springs are sometimes found on the tops of hills and mountains which are higher than any of the surrounding country. As it regards the mountains, this is not the case. A few years since we examined the peak of the highest mountain in the range on the east side of the Hudson river at the Highlands, and found no spring there, but there are several springs at lower elevations. The river Nile is cited as an instance to prove the theory, but it militates against it, for the sources of the Nile are among snow-capped mountains in the interior of Africa; these afford perpetual supplies of fresh water. If the source of the Nile had been in Egypt—"the land where no rain falleth"—the theory would have been well supported.

It is also stated that "all waters beneath the surface of the earth have a communication with the ocean." And this is asserted to be "a fact not disputed or even doubted." There is no warrant from science or any good authority for such a statement. The waters of the ocean are salt; those of springs fresh, and it is impossible to transmute the water of the sea by any known mode of filtration unconnected with chemical decomposition. If the ocean supplied our springs with water according to the mode laid down in the communication, the springs would send forth salt water, not fresh. The true source of springs is clouds surcharged with moisture, then condensed on the mountain tops. The heat of the sun evaporates fresh water in the form of vapors from the waters of the great deep; these vapors are carried by atmospheric currents to colder regions, where they are condensed and fall down either in the form of rain or snow. The rains and melted snows percolate into caverns and fissures in the earth's crust, and these are the sources of springs. In other cases they furnish supplies for lakes, swamps and ponds, which afford a constant feed of water to rivers, increasing and decreasing in quantity with the fall of rain and amount of melted snows. We are not acquainted with a single river which has its origin in a region where neither snow nor rain fall. The regions of "no rain" are always barren wastes, unless furnished by water flowing from rainy regions, like those which supply the Nile.

THE WASTE OF COAL.

A pamphlet has been laid before us which proves from facts and statistics compiled by competent persons, that a large portion of the anthracite coal mined in this country is wasted before it is reduced to a merchantable article. The masses of coal are thrown out from the vein by powder, and these must be reduced to the various sizes, such as stove, egg, and nut, before they are marketable; to do this the lumps are thrown into machines which crush and break the masses into pieces of all sizes; these are then assorted by passing through screens whose meshes conform to the standard qualities. The cause of the waste originates with the breaking machinery; it is asserted, that with the best tools now in use, that nearly one-half of all the coal mined is wasted by being smashed into dust, or else so destroyed as to be unfit for use. This is indeed a fearful loss, and mountains of coal dust near the mines assert the truth of the assertion. The coal-mining interest and the community at large are greatly affected by this enormous waste, for it is not to be supposed that the burthen is borne by the capitalists who work the mines—that would be impossible; it is all in the bill, and our fuel costs much more than it would, were it not for the facts above stated. In view of them it seems absolutely necessary that some new and improved machinery for the purpose is required, and we think the inventive genius of our country is fully equal to the task of providing it. We have been furnished with an excellent map of the Lackawanna coal-fields, in plan and section, by a gentleman of this city, Mr. W. Woodman, for which we are obliged.

DISCOVERIES AND INVENTIONS ABROAD.

Slide Valves for Steam Engines.—A patent has lately been applied for by J. Petrie, of Rochdale, England, for an improvement in slide valves, which consists in forming the slide valves of steam engines with cylindrical faces, so that they may be capable of turning upon centers of motion; and the inventor effects this turning by means of tappets or other ordinary apparatus connected to a moving part of the engine. In addition to this rotary motion the valves slide as usual, but, by the first-described arrangement, the steam may be cut off at any part of the stroke. The valves may constitute a portion or the whole of a cylinder, and, in the latter case, he avails himself of the back part thereof for packing, whereby a portion of the steam pressure is removed.

Regulating Watches.—W. Wighton, of Edinburgh, Scotland, has taken out a patent for a mode of regulating watches by a key from the outside of the inner case instead of the common mode of shifting a small inside hand. A toothed quadrant is attached to the ordinary regulator hand, and a fine worm screw gears into the teeth of the quadrant and a spindle carries a click for dividing the shifts of the worm into the teeth of the quadrant. This spindle terminates like the one for moving the hand and the one for winding up the watch, and it is operated by the same key. In this manner the regulator can be moved more conveniently and with greater exactness than by the usual mode.

Coloring Articles of Copper and Brass.—J. Hunt, of Birmingham, England, coats copper and brass articles, imparting to them a bright steel color, with a solution of the bichromate of platinum. The articles are placed in such a solution and a thin film deposited by the galvanic battery in the usual way. If the surface of the article is previously burnished, then placed in the solution of the bichromate of platinum, it assumes a beautiful blue steel tint. The solution used is weak and heated to the boiling point when applied.

Paints from Iron Slag.—The iron slag that is produced in puddling furnaces, when pulverized and reduced to powder, then washed and dried, is employed by A. Warner, of London, as a cheap drier for paints, also as a coarse cheap paint mixed, by itself, with oil. As such slag contains a large quantity of oxide it affords a cheap substitute for litharge (oxide of lead), which is very generally used as a drier for paints.

Bronzing Cast-iron.—The pure copper which is deposited by a galvanic battery, has been found eminently adapted to coat cast-iron figures exposed to the weather. It is put on as a paint, being mixed in a state of powder with oil and then laid on with a brush. The iron balcony which decorates the facade of the Theater Francais in Paris is thus bronzed.

Deodorizing Petroleum.—The following is the substance of the specification of a patent granted to J. W. W. Tindall, chemist, of Liverpool, England, for treating mineral oils:—In those cases where the oils contain paraffine, there is added to the quantity of oil to be treated at the rate of 4 ounces, by weight of commercial sulphuric acid, to each gallon of oil. The sulphuric acid is simply run into the oil contained in a suitable vessel; the oil is then allowed to stand for about ten minutes, when heat is to be applied, so as to raise its temperature to about 115° Fah. This temperature is retained for about ten minutes, when the application of heat may cease, unless the temperature should fall materially during a period of about one hour and forty minutes, the whole of which time the oil is kept well stirred. If the temperature fall then, it is desirable that heat should be again applied, to keep up the temperature as near as may be to the degree above-mentioned. At the end of this time, the oil generally will have ceased to give off any offensive, pungent and choking vapors. If such should not be the case, the stirring is to be continued for a further time, and, if necessary, more acid added, after which one ounce and a half, by weight of nitric or nitrous acid, is to be added to each gallon of oil. The temperature is then allowed to fall to about 105° Fah., and it is kept as near as may be to that temperature for about half an hour, the oil all the time being kept well stirred. A pint and a half of urine is now to be added, and the oil to be stirred and maintained at the temperature of 105° for about half an hour, when, at the rate of one ounce and a half, by weight, of commercial hydrochloric acid is to be introduced, continuing the stirring and the temperature during another hour, at about 105°, at which time, in order to bleach the oil, two ounces of chloride of lime for each gallon of oil is added and stirred in or, in place thereof, one pound of fullers' earth or clay. If the oil is to be immediately distilled, the whole mixture is placed in a still, such as is ordinarily used in distilling such mineral oils and hydrocarbons, and the same is to be distilled in the usual manner. If the oil is to be stored or to be sent to a distance, without first undergoing distillation, it should be well washed in water, prefering for this purpose sea-water; after which, the oil is to be placed in suitable casks, and may be used in this state for some purposes. When treating like mineral oils and hydrocarbons which do not contain paraffine, it is found desirable to increase the quantity of chloride of lime to four ounces, by weight, to each gallon of the oil, and four ounces of animal charcoal are stirred into each gallon of oil, and allowed to remain half an hour before applying the nitric or nitrous acid, as above explained; in other respects the process is adopted as above described.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list.

Galvanizing Wire.—This invention is more especially intended for galvanizing skirt hoop or crinoline wire. The wire, after having been annealed, has to be cleaned by acid before it can be subjected to the galvanizing process. The improvement consists in rendering the processes of annealing, cleaning and galvanizing continuous by running the wire in a heated state from the annealing oven directly to and through the cleaning trough, and thence to and through the galvanizing trough, winding it off one reel into the oven and on to another from the galvanizing trough. The inventor is George Bedson, of Manchester, England. The claim (dated Feb. 17, 1863) appeared in our last week's issue.

Globe and Chimney for Lamps.—This invention relates to a new and useful combination of a globe and chimney for coal-oil lamps. The invention consists in having the chimney made in a form approximating to an oblate spheroid and provided at its lower part with a neck of such dimensions that it will incompass the jacket of the burner, and form an external draught passage for the same, while all of the flame will be in the spheroidal part of the chimney, which leaves an air space of equal width all around the flame. The invention also consists in having the chimney at one side ground and at the other side plain or smooth, so that by simply turning the lamp the rays of light may be transmitted through either the plain or ground surface as may be desired. The inventor of this improvement is E. B. Requa, of Jersey City, N. J.

Revolving Shelf.—The object of this invention is to obtain a simple and economical method of constructing rotary shelving for household purposes, so that the device may be afforded at such a small cost as to be within the reach of all classes of the community, and be capable of being packed closely to facilitate and reduce the cost of transportation. This device is the invention of Silas Vernoy and Nicholas Overfield, of Meshoppan, Pa.

Three-leaved Sights for Fire-arms.—The object of this invention is to provide for the convenient adjustment of the joint of the sight and the tightening of the same after it has become loosened by wear; and to this end it consists in slitting the base and one of the leaves of the sight, in such a manner and so applying the joint pin in combination with them that the several parts of the joint can all be tightened up simultaneously and uniformly by screwing up the said pin. James Warner, of Springfield, Mass., is the inventor of this device.

THE Detroit *Tribune* says quite a number of oil wells in Canada have "suspended issue" and "dried up."