five years—we should enlarge our scope of observation and corresponding powers of analyzing and generalization.

Leaving for the present those portions of the United States where oil has been most successfully found, and before coming into the geological strata of the thick and heavy oils, we have on the eastern flanks of the Appalachain Mountains, in Pennsylvania and Virginia, 5,000 feet of the Catskill group of rocks. (Ponent of Prof. Rogers.) Lapping around the southern outcrop of the coal measures of Tennessee, Kentucky and Illinois there are 200 feet of the lower carboniferous and 3,000 feet of the middle carboniferous. (Umbral of Rogers.) A total in the aggregate, as measured in Nova Scotia and the United States, of 1,500 feet. Throughout the whole of the series oil and gas springs are found.

We now come into the true coal measures. These are divided into lower, middle, barren measures and upper, a total of the bituminous portion of 2,500 feet.

The lowest member of the coal series caps the highest hills, near the mouth of Oil Creek, and lies about 600 feet above the bed of the creek, or 1,300 feet above the third sand rock, which is the most abundant oil-producing stratum.

At the Kiskiminetas, Slippery Rock, Butler Co., Pa., Beaver & Smith's Ferry, oil is in the lower coal measures—800 feet thick. High up the Kiskiminetas and on the Monongahela River, oil is found in the middle coal series 1,000 feet thick. At Marietta, Ohio, and in the oil region around the strata of the upper coal are the productive series.

To conclude, then, oil is found through 24,000 feet of rocks, as measured vertically in the geological scale, and geographically from Nova Scotia to Lake St. Clair, and from Virginia to Tennessee River. The geographical area, covered by the oil-bearing group of rocks in the United States, Canada, New Brunswick and Nova Scotia cannot be less than 200,000 square miles.

Over this area, wherever oil and gas springs are found, there we may reasonably hope for success in boring deeply for oil. But oil and gas springs are not always sure indications of subterraneous supplies of oil in their immediate vicinity, for the course the fluids may have pursued from deep depths to the surface may have been very tortuous. Neither is the absence of such springs absolute negative proof of oleaginous accumulations beneath, for in many very notable instances, such as the lower portion of Oil Creek, and at Smith's Ferry on the Ohio River, very copious fountains were struck where no surface signs were visible.

I deduce the following practical and economical conclusions:—

First, Each widely-separated locality must be governed by its own laws as developed by boring and observation.

Second, Each geological horizon or stratum of oil-bearing rock received its supply, not from another, but from causes operating at the time of its own deposition.

Third, There is not now any reproduction of oil, but we are drawing from fountains filled of old.

Fourth, No stratum of rock is so thoroughly saturated with oil as to form a subterranean sheet or belt of rocks where petroleum is surely to be found, but in frequently isolated cavities, or fissures, at various depths and of various sizes, and containing diverse grades of oils. R. P. S.

A NEW ELECTRIC ANNUNCIATOR.

Mr. Thomas Taylor, of Washington, D. C., has sent us a description of a new annunciator, which we publish below. He says:—

"I was invited the other day by a friend to witness a few experiments in the telegraphing line, by means of a very simply-constructed device, and named by the inventor, 'Electric Annunciator.' It is on private exhibition at the Smithsonian Institute, Washington, and was constructed and invented by Mr. John Blackie, recently of Scotland. The object of this invention is to enable the pilot of a vessel to communicate with the engineer or helmsman, whereby prompt and efficient orders may be transmitted. One most valuable feature of the device consists in the fact that every movement of the rudder is made known to the pilot or Captain in their respective apartments, day or night. The *Great Eastern* was in the trough of the sea ten hours before the Captain was aware that the shaft of the rudder was broken. The value of this instrument may be inferred from the fact that the annunciator would have informed him the moment the accident occurred; for it not only informs the pilot of the Captain's wishes, but also communicates the pilot's orders to the engineer and helmsman. Further: it informs the Captain whether his orders have been obeyed; the rudder itself giving the information by means of a different galvanometer. When the pilot sends an order he presses a knob and a bell rings, meaning attention. The engineer looks to the index, which resembles a clock face, on which are printed the 5 general orders used, viz:—stop; ahead easy; ahead full speed; back easy; back full speed. The pointer indicates the order, and always remains at the last, and is locked. The device by which the pilot transmits his orders to the engineer is constructed as follows:—First, there is a dial on which the five orders described are printed. A pointer, like the hand of a clock, moves at the will of the pilot from order to order. The pointer is attached to a cylinder of iron 4½ inches long, ½ inch diameter, which leads from the center of the dial backward at right angles, and is supported at each end eccentrically. On each side are two electro-magnets and one underneath; there being one magnet for each order. A wire from each magnet leads to the pilot-house, and all wires are connected with a battery. By means of five knobs in the pilot-house the connections are made—one on each wire. The iron cylinder, or keeper, moves from side to side, or downward, according to the attraction of the magnet, and as the pointer is attached to the keeper or cylinder, the movements on the dial will correspond with movements of the keeper, by reason of its eccentric motions. It is stated on good authority that four-fifths of the collisions on our rivers are caused by the present mode of signalizing by bells. The pilot rings to stop, and in an instant he may discover that he should proceed, and rings again, but the two orders are combined in one, and it may be forming one order in itself, to the engineer, yet having no relation to the pilot's order, first or last. The prompt action of the engineer increases the confusion, and before it can be rectified a collision takes place. Our late sea-fights at Mobile will suggest to any one the necessity of some brief yet more perfect mode of conveying positive information between the commander, pilot and engineer than ringing a bell. One false move may be the destruction of many lives and much property, and cause terrible disaster to the nation.

"I shall now describe the mode of arrangement by which the Captain or pilot may understand the movements of the rudder while in their respective departments. I shall first describe the arrangement of wires, etc., then the mode of attaining results. From the battery to the rudder head a wire is led. From the rudder head to the cabin two wires are led, and from thence to the battery one wire is led and connected. I shall now describe the arrangements in the cabin. Each of the two wires mentioned terminates in a coil, but they are wound up in opposite directions; each coil is placed on the top of the other and in contact (insulating wire is used), the two ends are left out, and connected here with the third wire which leads to the battery. The coil is of oval form, about 4½ inches long and 2 inches wide. A magnetized needle is suspended in the center; a dial is also used, to which the needle points. This combination forms a differential galvanometer. I shall now describe the combination at the rudder head. A coil of wire like a bell spring, say 6 inches long and ⅜ inches in diameter, connects the two wires alluded to previously, which lead to the cabin. The third wire is connected to a roller which rests on the coil at right angles to it, but this roller is connected with the rudder head in such a manner that when the rudder moves from side to side, the roller will move from end to end of the coil, and in contact. The only use of the wire being in coil form is to have a long piece of wire in a short compass. This completes the arrangements. The battery being in action, a current will pass from the battery to the rudder head, conducted by the roller to the coil. If the roller is in the center the current will split, and one-half go by each wire to the cabin, and as the two coils are wound up in different directions one current will traverse in one direction, and the other in another, but of equal strength. The needle, therefore, will stand perpendicularly. But should the roller move to one end of the coil, by a movement of the rudder, the greater part of the current will take the shorter route, and the needle will be deflected say to the right. A movement to the other end of the coil will cause a deflection to the left for the like reason. It will at once be seen that intermediate movements on the coil will cause corresponding movements of the needle. Thus every movement of the galvanometer indicates every movement of the rudder.

THOMAS TAYLOR.

Washington, D. C., Oct. 16, 1864.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING NOVEMBER 1, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

44,844.—Apparatus for Raising Grates.—Isaac W. Allyn, Philadelphia, Pa.:

I claim the cam-shaped levers, F, hung to the sides of the fireplace and operating on the horizontal grate of a stove or range, substantially as and for the purpose herein set forth.

44,845.—Corn Planter.—Daniel W. Amos, Bedford, Pa.:

I claim the combination of the indented driving-wheel, the gearing, the reciprocating feeding mechanism, and the cut-off with the seed tubes, substantially in the manner described, for the purpose of feeding the corn grain by grain, and securing an accurate register between the planting and covering devices, as set forth.

44,846.—Steam Engine.—Sol. Andrews, Jr., Westfield, N. Y.:

I claim, first, The return of caloric from the exhaust steam to the steam or water spaces of a steam boiler or steam and water passages of steam engines by means of atmospheric air.

Second, Forcing air into the steam or water spaces of a steam boiler or steam and water passages of steam engines by means of an air pump in combination with the air tube and exhaust pipe, substantially as set forth.

Third, The heating of air on its passage from the pump to the steam or water spaces of a steam boiler, or steam and water passages of steam engines by the waste heat of the exhaust steam.

Fourth, The construction and arrangement of the parts hereinbefore described for the purpose of increasing the power of a steam engine and the saving of fuel, and the production of fresh water from salt water for drinking and other purposes, or for other purpose on the working of a marine engine without additional expense for such a purpose or loss of power to the engine.

44,847.—Harvesting Machine.—Wm. B. Birdsall & Edwin H. Cogswell, Hudson, Mich.:

We claim the arrangement of the rake-heads, m, constructed and operating as described in relation to the stand, B, and the dumper, M, substantially as and for the purpose herein set forth.

44,848.—Cover for Milk Cans.—Albert Brightman, New Bedford, Mass.:

I claim a tubular ventilating handle for a milk or other can, constructed and operating substantially as set forth.

44,849.—Balanced Slide Valve.—Alexander Buchanan, New York City:

I claim, first, The attachment of the valve cover to the back or cover of the steam chest by means of hooks, l l, and eye-bolts, m m, or their equivalents, substantially as and for the purpose herein specified.

Second, The attachment of the valve cover to one end of the steam-chest by braces having flexible connections which permit the cover to rise from the valve, substantially as and for the purpose herein specified.

[This invention relates to the protection of the back of the valve from the pressure of the steam by means of a valve cover attached to the back or cover of the valve chest, and it consists in a novel mode of supporting and sustaining such valve cover whereby it is enabled to adapt itself to the back of the valve in such manner that the valve will work against it perfectly steam-tight but without binding or unnecessary friction, and that in case of the engine being suddenly reversed the valve may be permitted to be lifted off the seat and thereby prevent the compression of any steam that may have been shut in the cylinder.]

44,850.—Sugar Evaporator.—Harlow Butler, Chesterfield, Ohio:

I claim, first, The use of the clarifying receiver, I, or a tall narrow vessel for receiving and clarifying the already heated juice, the scum rising and flowing off by a spout, whilst the percipitate falls below the insertion of the discharge pipe for the thus clarified juice, substantially in the manner and for the purposes set forth.

Second, The combination and arrangement of the worm, H, the receiver, I, with the discharge tube, K, and the evaporating chamber, C, substantially as specified.

44,851.—Ice Cream Machine.—John R. Champlin, Laconia, N. H.:

I claim the combined arrangement of the coupling devices whereby the whole freezing apparatus is readily coupled to the driving gear, and as readily removed therefrom, substantially as and for the purpose herein specified.

I also claim the construction and arrangement of the adjustable scrapers, P P, of the beater, substantially as and for the purposes herein set forth.

I also claim the combined arrangement and construction of the two scrapers or scoops, R S, being concave in front, and having their lower edges most advanced in combination with the side scrapers, P P, substantially as and for the purpose herein specified.

44,852.—Stopper for Jars.—G. F. J. Colburn, Newark, N. J.: