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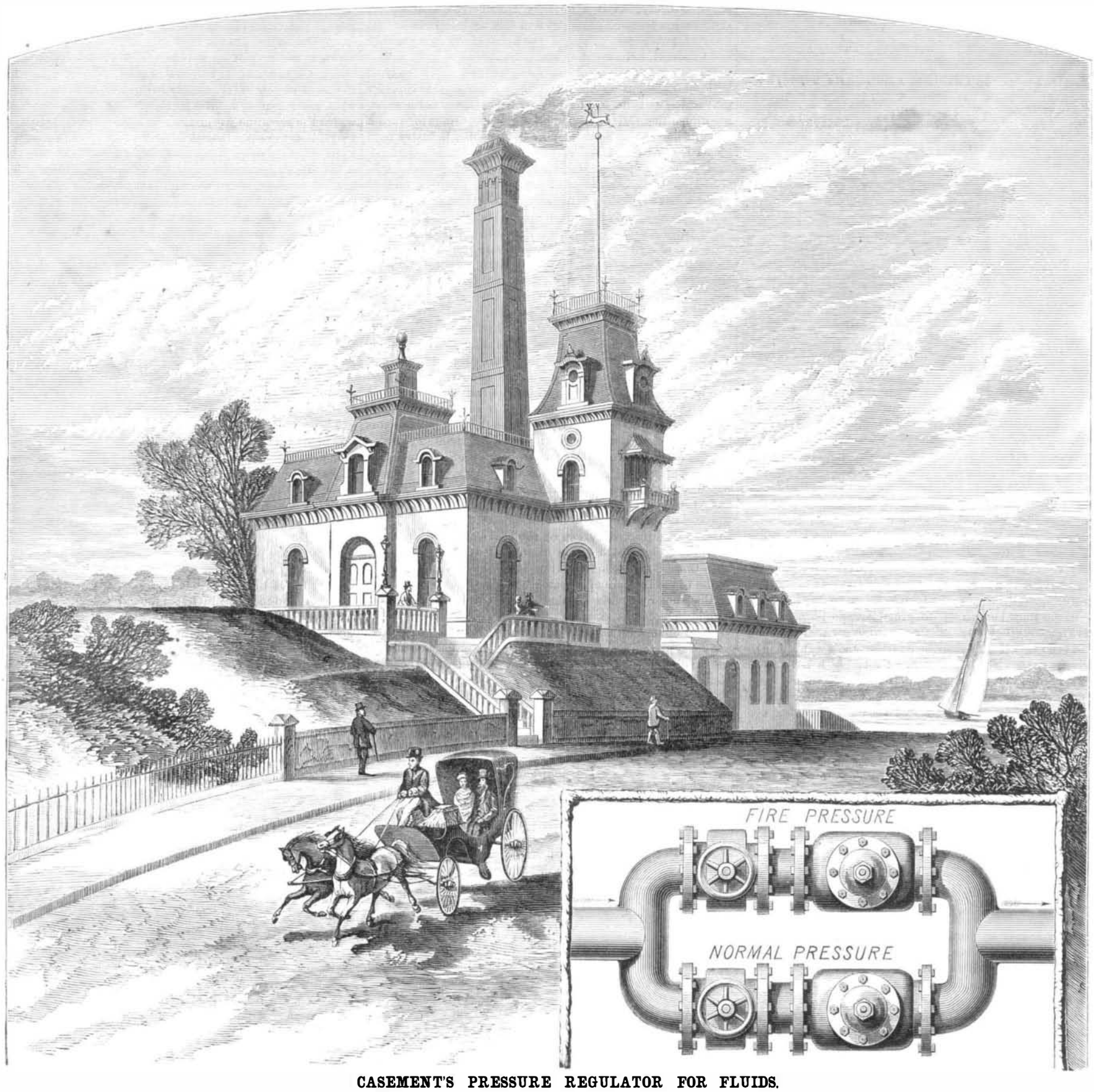

CASEMENT'S PRESSURE REGULATOR FOR FLUIDS.

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In describing the invention of which our illustrations depict the construction and principal applications, we deem it hardly necessary to prefix any extended prefatory remarks regarding the obvious utility of the type of apparatus to which it belongs. The advantages of a device by which a maximum and normal pressure may be reduced for ordinary continuous employment to any required low degree, while the full force is susceptible of instant utilization at any moment: or by which, from a single powerful source of supply, several deliveries may be effected, all varying in intensity: will, we think, be clearly apparent.

The points briefly enumerated above constitute the objects of the present device, and a reference to our illustrations will render plain the simple means by which the inventor secures them. Fig. 2, on page 134, shows in section the interior mechanism and modifications of the same are represented in the other engravings, of which due explanation will be made as we progress. A is the pipe which conducts the fluid from the source of supply, and represents the apparatus used by the inventor in conducting gas, from a natural gas well to his dwelling at Painesville, Ohio, for heating and illuminating purposes. Just above the orifice of pipe, A, is coupled a short section of tube, forming a chamber; and secured between the couplings by a flange and packing rings, is a truncated conical diaphragm, B. The latter it is proposed to make of hardened steel, and also as thin as possible, while securing the requisite strength, so that its upper aperture, which forms a seat for the valve, C, will be reduced as much as practicable to lessen the area subject to friction, and thus prevent any liability of the valve to stick. Valve, C, has a long stem which passes up through a guide, D. The upper portion of the chamber is closed by a screw plug, E, which can be readily removed to admit of access to the interior, and also for the purpose of placing in position the rings, F, of heavy metal, which serve to weight the valve.

We will suppose that the gas escapes from its source under the high pressure of 20 lbs., to the square inch, and that it is desired to distribute the same at a *constant pressure* of but one third of a pound. In such case, the weights on valve, C, would be adjusted to aggregate 19⅔ lbs. It is evident that, with this force acting in one way opposed to the greater one coming from the other direction, the amount of gas corresponding to the difference between the relative pressures would be that allowed to pass the valve: for should the pressure above the valve equal that below it, clearly gravity would bring the valve to its seat, closing the orifice and preventing further escape, until the pressure above once more became less than the force acting from below. Hence, by adjusting the weights, any degree of pressure in the distributing pipe may be maintained. The valve is, of course, automatic, and, as it is held suspended by the upward current, adjusts itself to the quantity of gas demanded, so that, as a moment's consideration will show, the sudden extinction of, say, twenty out of twenty-one burners cannot have the effect of causing the single one left to flare and sing; or, conversely, if an additional number of lights be started, the result is simply to decrease the pressure above the valve more rapidly, and allow of a quicker flow from below, which soon restores the proper equilibrium.

The gas, we have stated, passes under the conical valve, [illegible] delivering main, G, depositing in its course any impurities which it may hold in suspension, which, naturally falling to the bottom of the chamber, between the walls of the latter and the diaphragm, B, are subsequently drawn off by the cock, H. The shape of the diaphragm and consequent loca-

[*For remainder, see page* 134.]

[*Continued from first page.*]

tion of this cock may be altered to suit conditions of accessibility, etc. It doubtless has been surmised that the escape of a strong current by the valve, would, when the gas is first admitted, produce a vibratory motion or chattering of the valve. To avoid this, the inventor supplies a push pin, I, which is pressed down by the flange and held by the weight, J, above it, until its lower extremity strikes the valve stem, thus steadying the latter until the gas has entered the distributing mains, and the proper conditions of pressure above and below the valve result. The pin is then released, when it returns to its normal position.

Another application of the device, essentially the same, though differing somewhat in construction, is shown in Fig. 3. The apparatus is here placed in the main leading from the gasometer. The latter is weighted or otherwise arranged to give the fullest pressure ever necessary, and the regulator governs the quantity of that force required for existing needs. The mains, A A, enter a box which is divided into two compartments, as shown. In the diaphragm the valve, B, is seated, and the area of its face is made sufficiently large to compensate for the low pressure coming from the holder; or about equal to, or perhaps a little greater in diameter than, that of the main. C C are the weights, and D the push pin, acting exactly as above described. E is the cock for drawing off deposits, etc. Of course the advantages of this adaptation are about the same as already described, only more extended. For instance, if we lived next door to a theater or hall in which a thousand burners were nightly lit, this wholesale illumination, the inventor tells us, would be without effect on the dozen or so lights in our dwelling. It has also been suggested that the regulator might be advantageously located in various quarters of a city, so as to regulate the supply of gas—or water, just as well—in accordance with the extent of the demand.

In Fig. 4, we show an application of the device toward the regulating of the descent of water in pipes down mountain sides. Commencing at the summit, it is proposed to place a regulator, A, at a point in the pipe where the water attains a pressure say, of 120 pounds, so as to reduce the latter to 20 pounds. Then further down, after the water again assumes the first mentioned pressure, a second regulator, B,

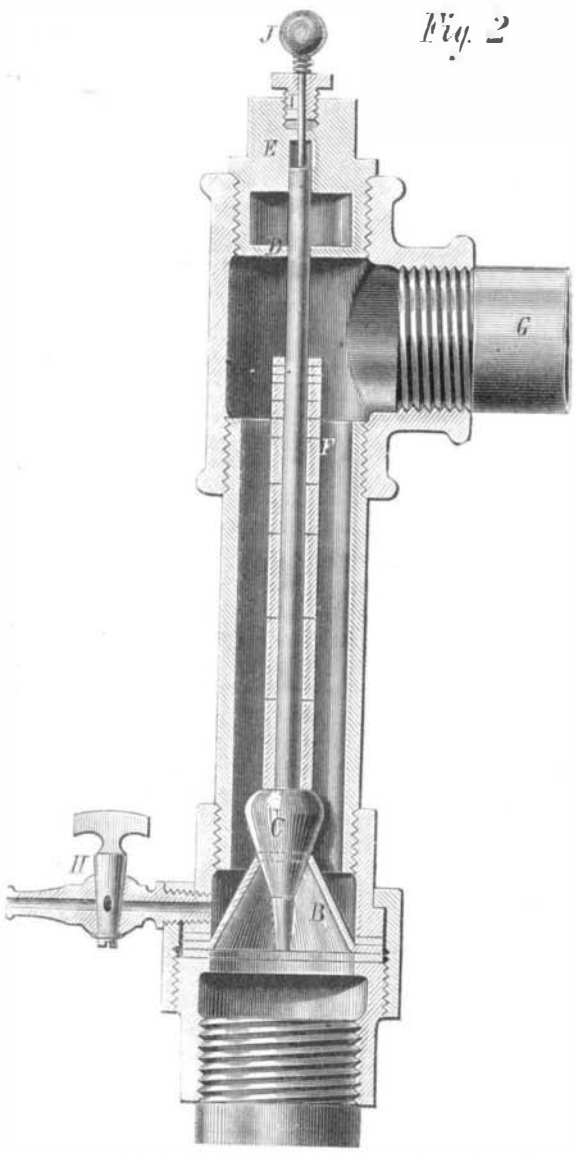

Fig. 2

is located, and the force is a second time reduced. This is continued until the descent is complete. By this means the water can be safely carried down any declivity, however long and steep, without undue strain or injury to the pipes.

Our large front page illustration is intended to show how the invention may be applied to regulating the water supply of an entire city, so as to change the pressure, in the mains, to the high force useful in throwing streams for extinguishing fires, from the working pressure ordinarily employed This may be adapted to the Holly system of water works, in which the water is pumped directly from the river by powerful engines usually constructed in substantial buildings on the banks, and of the type represented in our engraving, and subsequently driven through the distributing mains. The idea in this case is to divide the main into two branches which are afterwards reunited. In each branch a regulator is placed, and through each the water may be directed by opening or closing the valves shown. The regulator in the fire pressure branch is adjusted to pass a powerful stream, while that in the other admits of the escape of a current of a force just necessary to insure the complete distribution of the water to all parts of the town.

Another advantage which the inventor claims is that the pressure is equalized throughout the entire system of pipes, so that the latter may be of a uniform strength over their extent, and not subjected to undue strains at any point beyond the valves.

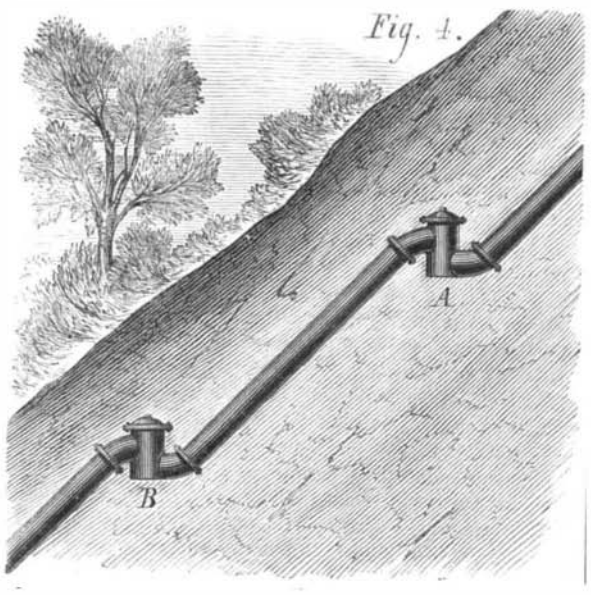

Fig. 4.

We have now cited sufficient modes of application of the invention to give our readers a fair idea of its value and uses. The inventor informs us that he has made it the subject of practical tests with invariably successful results, and that it has been in operation in his own dwelling, as we before stated, regulating the flow of his gas well for some time past. He is enabled to gage just the pressure he requires, either for fires or lights, by suitable arrangements of pipes and differently adjusted regulators. The device is susceptible of ready adaptation to the purposes of a safety valve for steam boilers, for regulating the water pressure in cooking ranges, water backs, etc., or the pressure of compressed air or vapors.

Patented, through the Scientific American Patent Agency, in the United States, Canada, England, Australia, and most of the countries of Continental Europe. The inventor is Mr. Daniel T. Casement, of Painesville, Lake county, Ohio. Letters for further information should be addressed for the next three months to the patentee, at the Fifth Avenue Hotel, New York city.

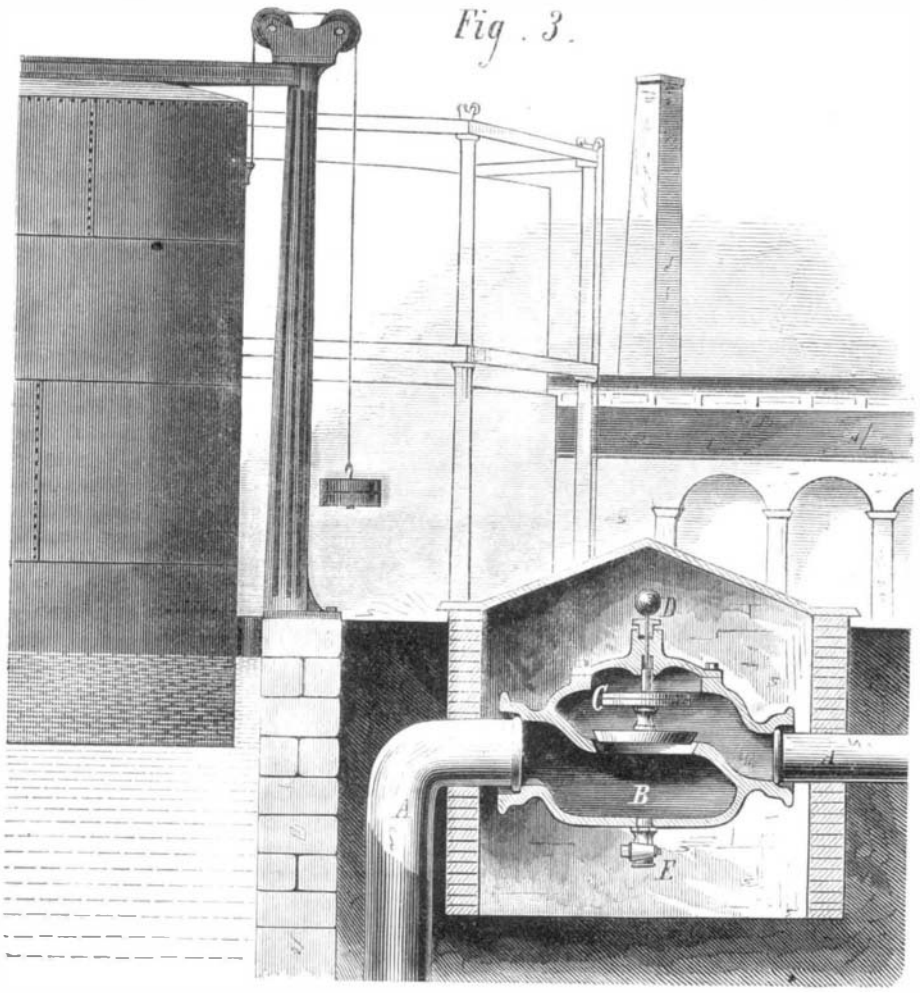

Fig. 3.

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The Page Patent Litigation.

There seems to be a probability that the validity of the Page patent will be thoroughly and legally tested. We have before mentioned in *The Telegrapher* the fact that suits had been commenced in the United States Courts against the Manhattan Quotation Company and Mr. Charles T. Chester, of this city, for infringement of this patent, and they are to be contested to the end, and its validity, as affecting telegraph instruments and apparatus, either established or denied judicially.

Our readers are fully aware of our opinion in this matter, and we have shown, as we think, conclusively, that Professor Page was not the original inventor of the devices for which a patent has been granted to him, and that, in fact, the patent is an outrage on the public, who have paid largely for these same devices to other patentees, whose patents have expired and become public property. So well convinced was the Western Union Company of the invalidity of the patent that, when first offered to them for purchase, after an investigation by experts and eminent patent lawyers, it was rejected. It was subsequently purchased by that company for good and sufficient reasons, no doubt, not connected with its validity, and has, for the last three years, been held *in terrorem* over the telegraph interests of the country not connected with the Western Union—no serious attempt having heretofore been made to enforce it.

It should, by all means, be disposed of at as early a day as possible. If properly contested, that it can ever be maintained legally we regard as an impossibility.

The resources of the Western Union Company will enable them to press the matter, and the contest will be protracted and expensive. All who are interested in defeating it should at once join hands with the defendants and make common cause with them, sharing the expenses as they will the benefit of success. The railroad companies are especially and vitally interested in this matter; for if the Page patent be once established, they are at the mercy of the Western Union Telegraph Company, so far as their telegraph facilities are concerned, and will be made to pay roundly for the exemption from such control during the last few years, since the Morse patents expired. They should be wise in time, and cooperate with those who are engaged in supporting the independence of the telegraphs of the country.—*The Telegrapher.*

Beach Mining in California.

On the coast line of Klamath county, Cal., there is a remarkable deposit of auriferous gravel. For nine miles along the beach an unbroken line of cliffs, towering from one to five hundred feet, serves as a sea escarpment to the mountains behind, and these are immense masses of gravel of varying size and of distinctly marked layers or stratifications. In these "gold bluffs," as they are termed, the precious metal is found in considerable quantities, principally in the tenth strata, which is "black sand" or gravel with iron cement.

Mr. A. W. Chase, in a paper read before the California Academy of Sciences, gives a graphic description of how the mines are worked; and as the labor is carried on without shafts, tunnels, timbers, pumping or hoisting machinery, it may be inferred that the expense of exploration is not excessively large.

After the sand is reached, it is shoveled into little piles and thence into canvas bags, containing about 125 pounds each. These are loaded on mules, each animal carrying two, and thus transported to the "sand corral" in the works. The washing is done in "Long Toms" with copper plates, the latter being first coated with silver, before the quicksilver is applied. Mr. Chase states that, during the week he visited the mines, $1,600 was retorted from the washings of two machines. He points out that, as the experience of the successive proprietors of this extraordinary gold mine goes to prove that, immediately after a heavy cave or slide of the banks, the beaches are richer and the gold coarser, it seems strange that, up to the present time, no artificial means have been resorted to in the way of blasting down the cliffs or undermining them by hydraulic process to increase the yield of gold. The sea, working ceaselessly night and day, is the great natural separator, and man has but to gather the results of its tireless work. Many ideas have been advanced as to the possibility of gold in quantities and coarser in character being found beyond the line of surf, predicated on the fact that it, in conjunction with black sand, has been said to have been brought up from the bottom by the leads of sailing vessels. Several expeditions have been fitted out at San Francisco to procure this sand by means of diving apparatus, etc., but none of them were successful.

THE UTILIZATION OF IRON PYRITES.—In connection with this subject, Messrs. Dobschütz and Abend state that large quantities of coal, unfit for smelting purposes on account of the pyrites it contains, are mined in Illinois. The coal does well for steam raising; but being useless in metallurgy, it is sold for about 2½ cents per bushel, and is even burnt to prevent its cumbering the ground near the mines.