

portion to the size and cost; besides which, there are the advantages due to the saving in weight. It will be seen that great protection is afforded to the moving parts, and that cleanliness of working is insured. The economy arising from the friction being so much reduced is very considerable, while the ready applicability of the engine to a great variety of uses is one of its chief merits.

#### The Effect of the Panic on the Iron Works.

It appears that the late financial crisis is producing after results of a rather serious nature as affecting the iron manufacture in the neighborhood of this city. A *Tribune* reporter has lately visited officials of several prominent establishments, and, with the exception of the statements of representatives of the Quintard and Architectural works, the inference to be drawn from the opinions selected is that the prospect for the autumn and winter is far from encouraging.

The agent of the West Point Foundry says that, previous to the panic, there was every expectation of a brisk demand for machinery. Now, however, prices have fallen, and people are putting off enlarging or repairing their shops until more favorable times. The West Point works, which usually employ from 600 to 700 men, are working barely two thirds of that number, and it is probable that even further reductions will be made. Little hope is held out of a revival of business before spring. The President of the Atlantic Dock Iron Works confirms the latter statement, and adds that the workmen have but a gloomy outlook. Out of 250 men employed at the last mentioned establishment, 100 will be shortly discharged. To the panic, the entire difficulty is ascribed, notably through the stringency of money, the fact of a general retrenchment taking place, and buyers are holding back in apprehension. Few contracts are now being made because contractors hesitate to involve themselves in engagements in the present unsettled state of affairs, while manufacturers shrink from accepting offers, unless they are certain they can get ready money on their completion.

The J. L. Mott Iron Works will continue carrying on a large stock and running on full time with a strong force of hands, in expectation of better times in the spring. If matters become worse, the company will have to follow the general example and make reductions. About 400 men are employed.

The *Ætna* Iron Works employs but 300 hands, instead of 700, and proposes to reduce the former number by half. Substantially the same views as already given, as regards an amendment of business in the spring, are held.

The Architectural Iron Works have work ahead for two or three months. Their customers are of the wealthiest class, and the government is also a patron: consequently collections are exceptionally ready with this company, but even in their case some difficulty has been found during the early part of the difficulty. No trouble is experienced in obtaining currency to pay off. The Quintard Works have not been interfered with seriously, on account of their business being mainly repairing. The proprietors consider that the complications will be merely transient and that money will be plentiful during the winter, while an unusually active trade will spring up during the spring. The full force at the establishment is 500 hands, and no material reductions will be made.

#### A New Mode of Condensing the Liquefiable Matters held in Suspension in Gases.

BY MM. E. PELOUZE AND P. AUDOUIN.

It is well known to all gas engineers that gas, as it passes from the retorts, carries along with it a quantity of liquefiable matters (tar and ammoniacal liquor) to the amount in general of 12 per cent of the weight of the coal distilled. Only 4 or 4½ per cent, however, condenses in the hydraulic main, although the temperature of that part of the apparatus is always below 212° Fah., while the boiling point of the tar is above 600° Fah. The reason, no doubt, is that the liquid particles are present in the gas in the vesicular form. The reduced temperature, which it is easy to obtain by the employment of a refrigerating apparatus, is not sufficient to cause the condensation of these particles; and it is only by carrying the gas a long circuit, and using a coke condenser, that they can be so completely removed that the tarry matters may not interfere with the action of the purifying materials. It may be asserted, however, that, in a majority of works and especially at the time of greatest production, the gas is not completely deprived of the matters which ought to be removed before it reaches the purifiers.

The new mode of condensing, invented by the authors, is founded upon the principle that the liquefaction of the globules, held in suspension by the gas, is brought about by the contact of the particles either with solid surfaces or with each other; the object is to obtain, by the aid of a very simple apparatus, occupying but a small space, the complete condensation of the liquid particles carried along by the gas or vapor.

The action of the apparatus is as follows: The gas to be purified is made to flow through a series of holes of small diameter, so forming jets, which strike against a surface placed opposite. In the passage of the gas through the holes, the liquid molecules are brought into close contact with each other, and the action is completed by the contact with the solid surface upon which the tarry matter is deposited.

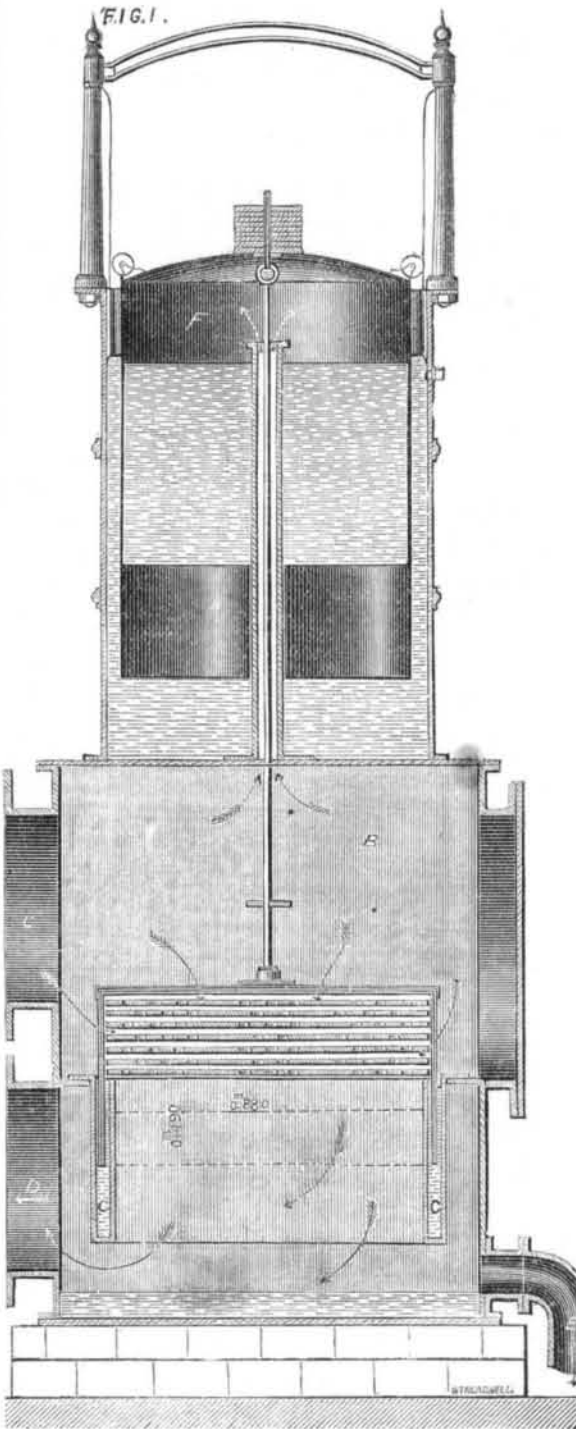
The intimate contact between the liquid globules and the gas which holds them in suspension, obtained by the use of this apparatus, effects the condensation of some matters (ammonia, sulphuretted hydrogen, bisulphide of carbon) which hitherto have only been removed by complicated methods,

sometimes injurious to the illuminating power of the gas (washing with liquor, etc.). It must be added that, by passing the gas, properly cooled, through the apparatus, any naphthalene is completely eliminated and retained along with the tarry matters.

A high pressure is not necessary to the use of the apparatus, eight tenths of an inch of water being sufficient in ordinary cases. It may be placed either before or after the exhauster; if before, a weak vacuum must be maintained.

The most striking result of the use of the apparatus is the almost complete removal of sulphuretted hydrogen from the gas, and it follows that a very important economy in purifying materials must be effected wherever it is employed. An apparatus (of which we append an engraving) has been in operation in one of the Paris works, at which the daily make exceeds 350,000 cubic feet, for several months with perfect success; and others are now to be installed in all the works of the Paris company. The gas, after passing through this apparatus, the capacity of which is less than a cubic yard, is found to be completely deprived of tarry matters; while the tar deposited is rich in oils, and the ammoniacal liquor collected is larger in quantity and more than twice the strength of the ordinary condensed liquor.

In conclusion, it is said that numerous photometric experiments have proved that the gas loses none of its illuminating power in passing through the apparatus.



A is the condensing apparatus, properly so called; B is the chamber in which the apparatus moves; C is the inlet for gas; D is the outlet for gas after passing the condensing apparatus; E is the outlet pipe for condensed products, terminated by a siphon; F is the regulator, by means of which the number of perforated plates in use is varied according to the quantity of gas to be purified; and G is the water space into which the apparatus dips.—*Journal of Gas Lighting.*

#### Statistics of Vassar College.

There are over 21 miles of gas pipe in the building, which, including the various stories, covers a floor space of over five acres. There are 410 young lady students, 50 professors, teachers, and assistants, and 100 servants and helpers, making between five and six hundred persons, all of whom board upon the premises. A special telegraph wire and a horse railway extend from the College to Poughkeepsie, N. Y., distant 2½ miles. The young ladies drink 150 quarts of milk every day, swallow 150 pounds of butter, and 40 pounds of sugar for pudding sauce for one dinner. The students are required to spend one hour daily in the open air for exercise; they have a lake, and boats for rowing in summer, and skating in winter. They have a riding school, bowling alley, gymnasium, etc.

#### Correspondence.

[Correspondence of the Scientific American.]

#### Middletown, N. Y.—Its Manufactures and Institutions.

To the Editor of the Scientific American:

If anybody wishes to find a really enterprising, thrifty and beautiful place, let him come up here to Middletown. It is 67 miles from New York on the Erie railway, in Orange county, the garden of New York State.

I suppose your readers know that the finding of so many fossil animal remains hereabouts, including bones of gigantic mastodons, is attributed to the ancient attractive fertility of the soil and its superior natural endowment with the phosphates of lime: a substance that contributes luxuriance of growth and vigor not only to grains and grasses, but to all living things that derive nourishment therefrom. Hence the inhabitants of Orange county are notable as an enterprising and long-lived people. The county chickens lay the finest eggs, the cows yield the richest milk, the cattle and sheep furnish superior meat, the oxen are large and brawny, the horses muscular and spirited.

Middletown is one of the homes of inventors. Here new inventions and manufactures flourish. I have been much interested during a tour of the shops. The Orange County Butter Pail Company are making here large numbers of the improved tub, patented not long ago by your house. In the various mechanical establishments, which include large foundries, rolling mills, hat works, horse shoe nail mills, file works, saw factories, etc., I find that the SCIENTIFIC AMERICAN is read and studied with satisfaction by the more intelligent operators.

Among the specially interesting places that I visited were the Madden rolling mills, and the saw factory of Wheeler & Co. Both of these concerns were built up and are guided by a man who, from what some might regard as a humble condition of life, has elevated himself to a high place in the regard of his fellow citizens. E. M. Madden was, only a few years ago, a poor factory boy, but now he is a distinguished man, has occupied many important public positions, is now State Senator, to which place he is soon to be re-elected. I see that some of your city papers speak disparagingly of him, doubtless from political bias. But they evidently know little of his real character. A natural orator, honest to a fault, incorruptible, progressive, the advocate of all useful enterprises and improvements, he is greatly esteemed by the people; and the masses have in him a faithful and able representative. The six noble public schools which exist here are examples of his personal efforts to promote the public good; while among the later works of which he is godfather is the new and splendid State Asylum for the Insane, at this place, now nearly finished. But I must defer a description of this model institution until my next; after which I may give you a few words upon the remarkable mineral deposits of this region, and perhaps say something of certain interesting geological curiosities found near Goshen, seven miles hence.

TRAVELLER.

Middletown, N. Y., Oct., 1873.

#### Carbonic Acid in Wells.

To the Editor of the Scientific American:

Last year I read your articles on carbonic acid gas in wells. I remember that I was once engaged in putting up a bathing house, to be supplied with water from a well. After getting, as I supposed, everything done, the pumps soon exhausted the water from the well, and there was no remedy but to take out the walling and dig it deeper. I had the wall taken out and commenced rewalling, to get the new wall above high water mark before stopping. One of the hands came to me and stated that the man in the well could not get his breath unless he stood upright, and that his candle would not burn. It struck me at once what the matter was. I ordered the man out of the well immediately, and put about a peck of quick lime (oxide of calcium) into the tub, with about as much water, stirred it up well, and lowered the tub and worked the windlass a little so as to cause the gas to fall on the surface of the lime water. Then I drew it up, stirred up the lime and water again, so as to present a fresh surface of lime water, and lowered again. I did this three times, and then let down a candle, which burned perfectly well. My man then went back and walled up above high water mark before stopping for the night. I was astonished last year, in reading your articles on this subject, that no one struck upon this truly scientific remedy.

The burning of charcoal or anything else in wells would only increase the quantity of carbonic acid gas, unless such a current could be gotten up by the fire as to carry the gas out with the smoke, which I think hardly possible. The lime plan is easily done, absolutely certain, and in accordance with scientific principles.

F. A. HOKE.

Walhalla, S. C.

WE published last week a portrait of the late Joseph Gillott, Esq., of steel pen fame. A correspondent is reminded thereby of an amusing conundrum, circulated long ago in connection with his name, as follows: Why was Mr. Gillott a very wicked man? Because he makes people steel pens and then tells them they do write.

Two prizes, of \$350 and \$150, have been offered by the English Society of Arts, on the motion of Sir Joseph Whitworth, for the best essays on the establishment, in large industrial concerns, of savings' banks for workmen. Manuscripts are to be sent to the Secretary of the above association at London, before the 1st of December next.