dissolving, in distilled water, equal weights of sulphocyanide of ammonium and bisulphite of ammonia. When this is added to a liquid containing copper, it immediately precipitates white sub-sulphocyanide of copper, as an insoluble powder readily washed; while scarcely any other metal is affected by it. It appears to us that this combination of a sulphocyanide with a sulphite is capable of application in photography and ought to be tried. Its value in separating copper from other metals appears to be well ascertained.

GASES ABSORBED BY COAL.

Ernst von Meyer finds that the gases absorbed by coal are chiefly the following: Carbonic acid, marsh gas, nitrogen, oxygen, and hydrocarbons. He publishes a table with the interesting statement that more nitrogen is retained by coal than any other gas. If it be true that anthracite coal absorbs more nitrogen than oxygen, we have the germ of an important application, as this method could be employed to effect the separation of the nitrogen from the oxygen in the atmosphere, and lead to a cheap way of making oxygen. It may be worth while for some one to repeat the experiments with a view to attaining this desirable result. We give below the table of gases found by Meyer inclosed in coal:

Carbonic acid	16·9	22·4
Marsh gas	20·4	22·3
Nitrogen	53·3	48·0
Oxygen	1·7	4·1
Heavy hydrocarbons	7·7	3·2
	100·0	100·0

[Special Correspondence of the Scientific American.

HOLLY'S SYSTEM OF FIRE PROTECTION AND WATER SUPPLY.

WASHINGTON, D. C., Nov. 11, 1871.

The most severe conflagration that ever occurred in New York city was that of 1835, and $20,000,000 of property were destroyed. The late fire in Chicago destroyed, it is estimated, $200,000,000. Lake Michigan and Chicago river encircled the city, but were as impotent to save it as were the exhausted firemen and broken engines. They only environed the awful scene or steamed under the falling cinders.

The property of the Chicago Fire Department cost about $700,000, of which sum the fire engines and auxiliary apparatus cost about one half. The annual cost of maintaining the department was nearly $500,000. The water works were admirable of their kind, and cost considerably over $3,000,000. They embraced the famous tunnel extending far out into the lake, and a large and handsome building within which powerful machinery lifts the abundant waters to the top of a stand pipe 136 feet high. The gravitating pressure of this column of water was relied upon as the power for supplying the ordinary demands of the city through more than 200 miles of street mains, and also to furnish, in case of fire, twenty steam fire engines through a thousand hydrants. Was this the best system of fire suppression Chicago could have had? Might she not have been spared this terrible affliction? Cannot water be concentrated on a burning building so promptly, and in such measure, as to insure the rapid extinguishment of the devouring element, even under the adverse circumstances of high wind and severe cold? These are questions now very anxiously asked.

On a recent visit at Saratoga, I took occasion to examine the new water works of that place, and found the apparatus and general arrangement to be the same as was introduced into Lockport, N. Y., in 1863, Auburn in 1865, and still more recently into thirty cities in ten different states: Buffalo, Binghampton, Dayton, Covington, Minneapolis, Cumberland, Atlanta, etc.

The reservoir at Saratoga is about a mile from the village, and is formed by damming a small but abundant stream; and I learned, to my surprise, that it is several feet below the average level of the main streets. Just below the outlet of the reservoir, and situated on a still lower plane, is the well built and tasteful structure containing the machinery; and a glance at its nature, large proportions, and superior workmanship is sufficient to answer some of the questions of an interested visitor. The whole is known as "Holly's System of Fire Protection and Water Supply," and consists of a series of powerful rotary forcing pumps, worked by turbine wheels below, driven by water from the reservoir, or by a massive steam engine, according as circumstances require. In this case the water power is sufficient during more than half the year. The simplicity of the system is apparent to any observer, and experience has shown its economy and efficiency.

Its leading feature consists in this, that, independently of what is called a "gravitation supply," whether from an elevated reservoir, or a stand pipe constantly filled from a source on a lower plane, the mains of a city can be supplied with water in exact proportion to the demand; and in case of a conflagration, a power of propulsion can be given far exceeding in steadiness and degree that attained by any other means. By combining, with pumps so admirably constructed and arranged, a hydrostatic pressure regulator, the whole is placed under such perfect control that in twenty seconds the pressure can be increased from the ordinary measure, say sixty pounds to the square inch, to double that amount, or even triple, if required.

A telegraph line connects the works with the headquarters of the fire department in the town; but aside from this communication, a most delicate and automatic one exists in the apparatus itself, for the opening of a single hydrant in the most remote street is instantaneously indicated by the regulator, causing, at the same time, a bell to ring for the information of the engineer. Just after the works were completed in July last, a fire broke out in a hotel situated between the Union and the Clarendon, seriously threatening both; and about the same time another fire started, several blocks distant, among very combustible buildings and material. The village itself was in great danger, and, when both fires were speedily brought under control, the citizens were of the opinion that the works had, on that one occasion, saved the entire cost, and that the three steam fire engines heretofore depended on could not have been equal to such an emergency.

The following are the more evident advantages of the Holly system:

1. Dispensing with all locomotive fire engines.

2. A gravitation supply not needed, nor even an artificial reservoir, where a lake or river is at hand. At Binghampton the water is drawn directly from the Susquehanna, and at Cumberland, Md., from the Potomac.

3. The water is applied to a fire much more speedily than in any other way, or as soon as a hose can be attached to a hydrant.

4. The water is thrown more rapidly, and from one fourth to one third greater distance than by a steam fire engine; and the stream is steady and not exposed to irregularities and failures from the effect of extreme cold or defective machines.

5. Every building can have within it an effective extinguisher, and every private hydrant and water cock becomes a fire engine, effective in proportion to its size.

6. The propulsion is so great that long hose can be used, even half a mile, with entire success.

7. The great reduction of insurance rates—twenty-five and even fifty per cent in some cases.

Mr. Holly has devoted himself for years to devising improvements in the construction of pumps and their application to fire prevention. The records of the Patent Office show at least ten patents issued to him, one as early as 1849. Wherever adopted, the system has proved valuable and effective.

Replaceable Pivots for Watches.

When, heretofore, watch pivots have broken from their stems or spikes, it has been customary to bore into the remaining end of the spindle and insert a new pivot into the socket thus prepared. The boring of the very small spindles is a matter of difficulty, requiring delicate handling. It often happens that the spindles or axles break out while being bored, or that the boring tools break off during the operation and remain in the spindles, thus making the latter useless. When this occurs, it is necessary first to soften the spindles for boring, and then reharden them, thus adding still more to the cost and difficulty of repair.

The invention of Mr. Simon B. Simon, of New York, consists in the production of repair pivots, having tubular sockets, so that they may be slipped upon the ends of the spindles or stems when required, thus dispensing with the necessity of boring the spindles.

Electric Pyrometer.

A most ingenious and valuable application of the known fact that the resistance of metals, to the galvanic current, increases directly as the temperature, has lately been devised in Germany, The resistance of a platinum wire having been determined, a cylinder of clay is surrounded with such wire, and covered with a tube of the same earth. The coil is connected with a two cell Daniell's battery, and also with an indicator for the determination of the resistance, and subjected to the heat of which a test is required. Such an instrument would be valuable in temperatures at which mercury would evaporate and glass melt.

HOW TO ACQUIRE A GOOD MEMORY.—We read too much and think about what we read too little; the consequence is that most of the people we meet know something, in a superficial way, about almost everything. Not a tenth part of what is read is remembered for a month after the book or newspaper is laid aside. Daniel Webster, who had a rich store of information on almost every subject of general interest, said that it had been his habit for years to reflect for a short time on whatever he read, and so fix the thoughts and ideas worth remembering in his mind. Any one who does this will be surprised to find how retentive his memory will become, or how long after reading an interesting article, the best portions of it will remain with him.

As daylight can be seen through very small holes, so little things will illustrate a person's character.

Inventions Patented in England by Americans.

From October 19 to October 30, 1871, inclusive.

[Compiled from the Commissioners of Patents' Journal.]

ANIMAL TRAP.—W. H. Chase (of New York city), London, England.
HARVESTER.—W. F. Goodwin, Metuchen, N. J.
ORDNANCE.—N. Thompson, Brooklyn, N. Y,
PAPER BOX MACHINERY.—H. R. Heyl, Philadelphia, Pa.
PHOTOGRAPHIC PICTURES.—F. A. Wenderoth, Philadelphia, Pa.
PISTON, ETC.—S. L. Wiegand, Philadelphia, Pa.
PRESERVING WOOD.—N. H. Thomas, New Orleans, La.
ROVING FRAME.—E. P. Morgan, J. H. McMullen, York, Me.
SEWING MACHINE.—D. Mills (of Brooklyn, N. Y.), Aston, England.
STEAM PACKING.—G. M. Cruickshank, W. R. Smith, Providence, R. I.
TRANSMITTING POWER.—W. F. Goodwin, Metuchen, N. J.

Foreign Patents.

The population of Great Britain is 31,000,000; of France, 37,000,000 Belgium, 5,000,000; Austria, 36,000,000; Prussia, 40,000,000; and Russia, 70,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. A large share of all the patents secured in foreign countries by Americans are obtained through our Agency. Address MUNN & Co., 37 Park Row, New York. Circulars with full information on foreign patents, furnished free.