# Scientific American

NEW YORK, JULY 6, 1850.

### Chemical Philosophy.

To all matter we ascribe certain properties: water possesses properties of chemical action, and what are known as physical laws. It presents the three great conditions of matter on earth, viz., the solid, liquid and gaseous conditions. The first attribute we ascribe to mat- Journal (8th June), the best periodical of the at the other, and stored in separate gasometers more or less illuminating by means of hydroter is gravity; by this law all bodies have a kind in England, and for which we are agents for use. tendency to approach their common centres of for the United States. We publish this speciattraction. This force belongs to the laws of fication owing to the present excitement resting hydrogen gas illuminating, is by causing a of combustion, as before described. Mechanics,—but the force which changes the condition of matter, such as water into steam, or by pouring sulphuric acid on marble and disengaging carbonic gas, is termed "a chemiical force." When we look into the constitution of certain bodies, we find them to be made up of particles, some of these being all of one kind, others made up of different kinds. By the voltaic battery, water can be separated into a gas, and that gas again separated into two different gases, one very light and highly combustible, and the other heavier, which will not burn of itself but will assist other bodies to burn, and is called oxygen. The elements of water are oxygen and hydrogen-both gases and both have a gravitating power. Oxygen By carbon. III. By magnets. is the most abundant of all elements: it has neither color, taste nor smell. It has the pro- ing hydrogen in decomposing water by incales- the greater or less intensity of the heat to which perty of combining with all the other elements in many proportions. By mixing the chlorate and fitted up with iron tubes (enclosed in iron modified in their shape,—the patentee does not of potash with one fifth of its weight of the peroxide of manganese, and applying a gentle heat, the oxygen will be set free, as by the vol- the patentee introduces steam from any gener-principle of his invention be retained. taic trough. One hundred cubic inches of this ator whatever,—or he even produces steam by gas weighs 34.6094 grains.

drogen gas will be evolved. Hydrogen, unlike which it is supplied for use. oxygen, will burn; 100 cubic inches of it. When the iron is oxidized, the pantentee disweighs 2 1318 grains. Since there is in wa-oxidizes it first by means of the waste gas of carbon, and air combined together; the hydrogently hang upon a lady's needle, when it bepower by which the molecules of hydrogen and oxygen combine, to produce water, is termed chemical affinity. This power is totally unlike gravity, yet it cannot exist apart from it. carbon, and to the hydrogen which has been The melted ore in the furnace is more or less When two bodies having chemical affinity for one another come in contact, each parts with some of its properties, producing a new mass with different properties from those which each possessed separately. Soap is made of oil and substances, &c.; also by igniting with oxide for steel. The same hereinbefore described potash, each separately possessing different, of iron some hydrogen, oxide of carbon, or by process is equally applicable to reverberatory properties. Common salt is made of soda and chlorine—an acid and an alkali, each possess- of any the hydrocarburets,—eventar or ammoing quite different properties. If a leaf of silver is placed in a bottle of chlorine gas, for about two weeks, a distinct body will be formed. Chemical affinity is characterized by wait. loses its oxygen like peroxide of manganese, and concentric tubes set under the boilers, and ing and instant attraction.

Oxygen and hydrogen have a great affinity by which means the water is decomposed. for one another, yet these two elements of water may remain in contact for months and neoperation from some third substance,—such a

forming a mixture, the other a chemical compound, and to produce a chemical compound lows (states the patentee) that in communica- | Fifthly—The means of rendering platinum in all cases, the particles of the two bodies ting such force, I put in action a considerable and other unalterable and inoxidizible metals must be different.

rolled May 22, 1850.

its application to heat and light. The means

rals of the same metal rendered incalescent, length, or the height of the wick, provided the means of water injected into the retort. The Hydrogen may be separated from water in oxygen of the water combines with the iron, other metals:—In melting furnaces already many ways: if a piece of zinc is placed in a and the hydrogen is conducted first into a revessel containing water and sulphuric acid, hy- frigerant, and thence into a gasometer, from

latter transmits the oxygen to the oxide of out by means of a strong mechanical draft.

causing to fall on incalescent iron, some pul- dling furnaces, in which carburation is easily throwing on the incalescent iron some oil or furnaces, for heating boilers and locomotives. niacal waters.

Thirdly-The patentee dis-oxidizes iron by and returns to the state of protoxide of iron,

decomposition of water with incalescent coal, the tenders, which are purposely constructed ver join to produce water. Affinity in this coke, pit-coal, ligneous substances, or carbon- as reservoirs,—are made to enter. The patencase waits as a sentinel to receive its orders for ized pit (peat,) or by means of oxide of carbon. | tee constructs gas burners with double currents -The patentee causes steam to pass into hor- of air, that is to say, the air acting internally substance is platinum. When this metal is izontal retorts similar to those employed in gas and externally on the flame; these burners brought into contact with these two gases, the works, filled up more or less with deep layers of have the advantage of presenting a large quanwhole are thrown into action, and water is the coal; the steam is distributed to the whole of tity of air or of oxygen to the combustion of result. The two gases, nitrogen and oxygen, the retorts, and over the surface of the coals, by the gas. The patentee does not confine himwhich compose our atmosphere, remain in a means of one or more pipes in connection with self to the precise details in the construction state of mechanical, not chemical, mixture. | a boiler, pierced with heles of a small diameter, | of the apparatus or the precise mode of carry-On the other hand, when a thin slip of like the spout of a water-pot; the contact of | ing out the processes described, provided the copper is mixed with chlorine gas, the former the steam produces hydrogen, carbonic acid, general features of the mechanical arrangeis at once burned and the chlorine disappears and a small quantity of oxide of carbon and ments and processes for carrying out his inven--the action, like the law of gravity, is in-other gases; these mixed gases pass off through tion be preserved; but what he claims as his the educt pipe into an epurator, when the car- invention is-Gravity, having commenced action, conti- bonic acid is taken up, and the hydrogen passnues it until its completion, but it is different es off into the gasometer. The patentee obwith chemical affinity, for after it has begun serves that this apparatus for decomposing it often becomes suspended after a certain ef- water is similar to that in which coal is disfect is produced. When a piece of bright cop- | tilled, differing, however, from it, as regards per is exposed to the atmosphere for some time the steam tubes, the boiler, and the system of gen and a small quantity of oxide of carbon it becomes tarnished by an oxide forming on depositing the steam on the surface of the (carbonic oxide,) hereinbefore described. its surface, and there it remains unchanged, coals, instead of passing it through them; these

resisted by that of the opposite pole, it fol-hereinbefore described. transmission of mechanical movements, the jor even of oxygen, as hereinbefore described. Light and Heat from Water.

The following is a specification published in magnets decompose the water;—pure hydrogen

The patentee's improved process for render-

pecting Mr. Paine's alledged discovery. As it small jet of lighted hydrogen to pass through is of considerable length, we reserve some a burner (the holes very small) on a thin strip heating platinum and other more oxidizible comments we intended to make upon it, until of plantinum wire, the threads being excessimetals to luminous white heat, by means of sively fine, and of graduated section, propor-Joseph Pierre Gillard, a gentleman, in the Re- tioned to intensity of the pressure of the fiame public of France, for certain improvements | and the burning hydrogen, -- a very powerful in the production of heat and light in gen- light is thus produced. The platinum threads eral. Patent dated November 22, 1849-en-, are immediately heated to such whiteness that processes which are not described. the luminous refulgence is extraordinarily bril-The patentee's invention consists in certain liant. Besides platinum, other unalterable apparatus and processes for producing hydro- and unoxidizible metals may be employed.gen gas, by the decomposition of water, and The wick must be of the shape necessary to agree with that of the jet of hydrogen,-it and processes by which he obtains this gas may be that of a cone, or any other figure, are: I. By the incandescency of iron. II. according to the size which the gas takes when it is allowed egress from the burner; the wick First—The means and purposes for obtain- must be made more or less strong, according to cent ore. In retorts purposely constructed, it is exposed. The burner and wick may be plates) or with iron chains, iron wire, or spi- limit himself as regards the strength, the

Process for heating melting furnaces for ores. locomotive boilers, and dis-oxidizing iron and constructed, the patentee utlizes the gas which is lost through the mouths (of The furnaces,) and he accelerates the melting of the ore by the combustion of hydrogen, oxide of ter only the molecules which compose the two i furnaces; the carbonic acid of them is at first | gen is produced either in the retorts, as before gases, they are certainly curiously modified to changed into oxide of carbon within the fur- stated, or in a furnace, from twelve to fifteen be so heavy under one condition and so light nace in which the hydrogen, as well as the feethigh, constructed like a kiln, and filled up in another. A drop of pearly dew that might oxide of carbon is produced; the last gas is with coke, charcoal, pit-coal, or other ligneous obtained by the passage of steam into the ox- substances; the patentee causes a powerful comes gaseous, will fill a large bottle. The ide furnace (a kind of kiln); the oxide of car-draft to be maintained, at the same time that bon and hydrogen are afterwards injected into he injects steam; the hydrogen and exide of the retorts containing the oxidized iron; this carbon which are produced together, are drawn generated in the furnace for oxide of carbon. carburetted by the powdered coal thrown up-Secondly—The patentee dis-oxidzes iron by on it, and this process is employed in pudverized coal, coke, charcoal, pit-coal, ligneous effected by cementation, as well for pig iron as The patentee heats beilers and locomotives by hydrogen and oxide of carbon injected under the boilers in the locomotives with hot or cold submitting it to a white heat, when this metal air, by means of many small holes or divided he also injects hydrogen and oxide of carbon into the tubes of tubular boilers, by employing Process for producing hydrogen gas by the concentric tubes, in which the air and gases of

> First-The production of hydrogen gas by retorts, serving to distil coal, as hereinbefore described.

ric acid to complete the operation. Such are patentee also decomposes water by means mechanical processes, as hereinbefore described. passengers.

some of the principles of chemical philosophy of magnets, working with induct bobbins; Fourthly—The process for producing hydroas it relates to chemical affinity; in other the movements of each magnet on an axis, gen and oxygen, by means of magnets, put in words, that power which enables different ele- sets in motion all the bobbins, and as there is motion simultaneously, by any force whatever, ments of matter to combine together—the one only one resistance of attractive action which is the two gases being separately collected, as

number of magnets, by means of cogs, and illuminating, by the combustion of hydrogen,

Sixthly-The means of rendering platinum our excellent exchange, the London Patent may be collected at one pole, and pure oxygen and other unalterable and inoxidizible metals gen, or of hydrogen and oxygen, or also of hydrogen and air united before, or at the place

> Seventhly—The process of illuminating, by hydrogen, burnt either alone, or combined with oxygen, as before described.

> [This specification contains descriptions of processes which are not claimed, and claims of

## Meanness Carried to Extremes.

The "Farmer and Mechanic," a celebrated journal of "masterly" stupidity, not satisfied with copying the official report of the Patent Claims from our columns, week afterweek. under the grave and honest announcement of its being a "feature now to be found in any other publication in this country."—has got into the habit of copying original articles which have appeared in our columns, and crediting them to other journals. In proof of which we call attention to the "Novel and Ingenious Clock" of John Geldard, on the second page of the last number of that paper, the "humorous description," it seems, the editors found in the "American Cabinet,"-a journal probably of the same stamp, and through whose kindness they were furnished with the description of Chas. S. Snead's Grain Dryer, taken from No. 33, Vol. 5, "Sci. Am." The "Farmer" could have had the description of Mr. Geldard's clock-without credit, two weeks earlier, by reference to the "Sci. Am." of June 8th. We would add that the description was furnished for this paper, and was modified in some points by us. It would seem singular that the "Cabinet" should have hit upon our modification, word for word, as the "Farmer" does in copying our Patent Claims the week after they have appeared in our columns.

If this had been the only instance of their unbounded generosity, we should have paid no attention to it. We now call attention to another misappropriation of our labors, in order, if possible, to open the eyes of the editors to the fact, that like "Sol Gills," the old chronometer maker, they "are a long way behind the time." In their paper of April 25th, an article "To Prevent Dampness in Walls," is credited to a southern journal, which was original with us, and appeared in the "Sci. Am.," April 6th. We sincerely hope that the editors of the "Farmer" will, for the future, abandon a business so small as this. If they are short of brains to fill up the paper, we will not say one word against their extracting largely from our columns, "without giving proper credit for the same," by so doing they will be nearer the age, a benefit not only to themselves, but a corresponding one to some of their readers, who no doubt have full belief that they are first and foremost in the receipt of all that relates to the progressive age.

#### Great Building,--Exhibition of the Industry of all Nations.

A monster building is now being erected for this exhibition: it will be about 2.300 feet long and 400 feet across. The dome of it is to be 200 feet in diameter, made of light sheet iron. This will be an immense project. The whole building is to encircle an area of twenty

# Glasgow.

We are indebted to the News Agent of the City of Glasgow Steam Propeller for the prompt delivery of our files of the "Glasgow Secondly-The process for producing hydro. Daily Mail." The City of Glasgow made a fine run of about 14 days, which is equal to 13 from Liverpool. For a propeller this is a Thirdly—The illuminating by means of the remarkable passage. Capt. Matthews had a waiting for a third substance, such as sulphu- points the patentee states to be new. The electricity of magnets put in motion by any splendid piece of plate presented to him by the