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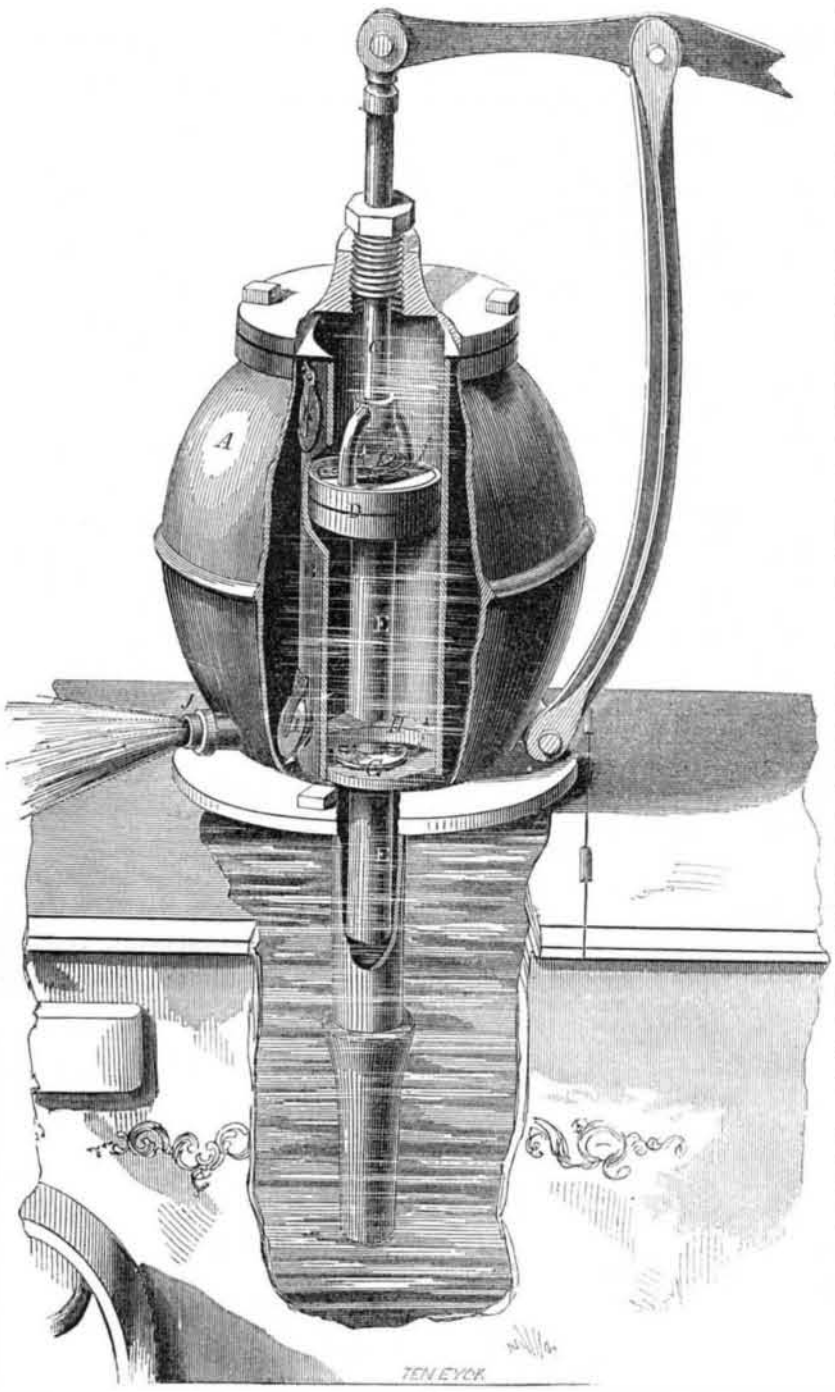
Motion and Heat.

Mons. Foucault, of Paris, the inventor of the famous pendulum experiments which set the world agog a few years ago, has lately constructed an apparatus to demonstrate that motion produces caloric. Arago, while observing the movements of a magnetic needle placed in a case constructed of copper, remarked that the needle oscillated during a lapse of time less than was to be anticipated from its great mobility, and thought that if the copper had no action, *per se*, upon a magnetic needle in a state of rest, it might acquire an influence by the oscillation of the needle.

He then placed a magnetic needle upon copper disks of different thicknesses, and after allowing it to acquire its natural position, set it in motion. The magnitude of the variations of the needle diminished in proportion to the thickness of the disk. The same phenomenon was remarked with disks of zinc and tin, since the needle in motion acts upon the disk, the same results should be obtained when the disk is put in motion. Thus, if a disk is made to turn above a magnetic needle, the latter will be seen to leave its normal position, change its direction, and deviate therefrom to an angle, which increases in proportion to the augmented rapidity of motion communicated to the disk, until the needle turns upon its pivot, following the motion of the disk in every direction. If the disk be sawn through, following the line of several radii, the action is less energetic. In order that it might not be supposed the movements of the needle were induced by the revolving currents of air created by the rotation of the disk, the needle was separated from the latter by a membrane, and enclosed in a case. From this experiment has been deduced, that if the needle were rendered fixed the disk would meet with a certain resistance to its revolutions. Upon this theory M. Foucault has based his machine. A thick bar of iron, bent into a horse-shoe form, is converted into an electro magnet; between its two extremities is supported a disk of copper, to which a rapid rotary motion—300 or 400 revolutions a second—is communicated by the intervention of toothed gearing. So long as the horse shoe is not electro-magnetized the disk turns with ease, but so soon as the horse shoe is placed in communication with a battery, and thereby converted into an electro-magnet, a great resistance to the further revolution of the disk is made manifest. If, in spite of this resistance, the disk is turned during a minute or so, and a thermometer be placed upon the disk, the mercury will ascend to 60 or 80° (centigrade,) although the toothed gearing axles, &c., remain at the ordinary temperature. There is, however, no point of contact, no friction, and the disk alone is heated.

The Cleveland, O., *Herald* says that over one hundred thousand gallons of stone-ware are annually shipped from that port. It is manufactured near Akron, and is of a superior quality. In addition to this, the clay is in great demand, and is shipped in bulk on board vessels running to Milwaukie, where it is also manufactured.

IMPROVED PUMP.



Improved Force and Lift Pump.

Our engraving illustrates the pump of Mr. Benj. F. Joslyn, Worcester, Mass., which was patented April 3d, 1855. The principal advantages which the invention has over the ordinary force pump is, economy in the manufacture, direct flow of the water, whereby better results are obtained from a given amount of power, simplicity of parts, &c.

A is the air chamber, and B the piston barel, which passes directly through the air, chamber. C is the piston rod, D the piston. Attached to the piston rod and moving with it, is a hollow tube, E. F is a valve placed on the piston, at the top of tube E. When the piston descends a vacuum is produced above D, and the water rushes up through tube, E, and valve, F, to fill the same, as shown by the arrows.

G is a round valve, through which the tube E passes, but the two are not connected; tube E slides through valve G; the valve is kept in place between the partition grate, H, and its seat, by means of small springs. When the piston descends, valve G closes, and the water between the piston and valve G is forced through side valve, I, into the air chamber, whence it escapes through the exit pipe, J; the outward course of the water, it will be observed, is on a direct line.

When the piston rises, valve I shuts; a vacuum is produced below the piston, and the water rushes up, lifts valve G, and fills the vacuum; by this movement the water above the piston is forced into the air chamber through valve K.

It will be observed that this pump is exceedingly compact. All the parts are packed into a small compass, yet, as a whole, it appears to be highly effective, durable, &c. In our cut it is shown applied as a garden or domestic fire-engine—a machine with which every farmer or gardner should be provided. Apply to Mr. Wm. C. Freeman, No. 115 Nassau st., for further information.

Salt.

Although salt forms part of the daily food of nearly the whole of the human race, yet few have any idea of its composition. Salt is a compound of two substances, a metal and gaseous body. The metal is called sodium, and the gas chlorine; and as chemists always endeavor to use such terms as they think will convey a clear idea of the things they describe, salt in chemical language is termed "chloride of sodium." The ocean which flows to every part of the earth affords its inhabitants an inexhaustible supply of salt; and lest it might be thought that nature had not in this respect been sufficiently bountiful, she supplies salt from the "bowels of the earth." We have salt mines yielding "rock salt," and salt springs, which, in many instances, are far away from the ocean, such as those at Syracuse, N. Y., in America. The salt mines in Catalonia, in Hungary, and Poland, are of an enormous extent. A salt mine at Wilisca, near Cracow, in Poland, has been worked for more than six hundred years. Within it is found a kind of subterraneous republic, which has its polity, laws, families, &c. When a traveler has arrived at the bottom of this strange abyss he is surprised at the long series of lofty vaults sustained with huge pillars of rock salt, and which appear by the light of the flambeaux to be so many crystals of precious stones. The most remarkable property of salt is its solubility in water hence it is supposed that the sea washing over beds or strata of salt has in consequeuce become saline, as we now find it. The use of salt with food is obvious from an analysis of the blood and the gastric juice. With the addition of water, and under certain influences, salt changes its composition. Water being composed of hydrogen and oxygen, the change in salt which takes place by means of the vital force produces soda for the blood and hydrochloric acid for the stomach. As soda is invariably found in the blood, and hydrochloric acid in the stomach; and as the blood and the stomach play their part correctly enough in our daily life, we can come to no other conclusion than that salt, which supplies these materials, is absolutely necessary to our well-being. Salt is not only useful to man in its primitive condition, but as it affords soda, its value is manifestly increased. The manufacture of soda from salt in England is one of the most important of our arts, for without soda no hard soaps could be produced; and for a thousand other things are we a debtor to Salt & Co. Besides the soda there is the chlorine. The great supremacy of the Manchester cotton mills in supplying the wide world with fabrics, is owing not only to the application of mechanics to machinery, but also to the multifarious uses of chlorine derived from common salt. SEPTIMUS PIESSE.

Disinfecting Agents.

The best and most simple disinfecting agent known is the chloride of zinc. It is made by dissolving zinc in muriatic acid, and is applied in a diluted state, to foul and offensive drains cesspools, &c. The sulphate of zinc, however, is nearly as good, is cheaper, and is more easily managed. It can be purchased at any druggists in the form of a salt. A pound of it dissolved in two pails of warm water and thrown into an offensive cesspool, will soon deodorize it. During hot weather this disinfecting agent should be applied pretty freely in thousands of places in New York and other cities. Copperas (sulphate of iron) may be applied in the same manner and for the same purpose. It is not such a good disinfectant as the chloride of zinc, but it is much cheaper.

Gold Quartz Factories.

There are at present 63 factories situated in different parts of California in which quartz grinding and extracting the gold by machinery is carried on. Thirty of these are driven by steam engines, the others by water wheels. The gold quartz mining and crushing is rapidly on the increase in California.

Sharpe's Rifles for England.

The British Government, it is said, lately made large contracts for Sharpe's rifles with some of our manufacturers, and the manufacture of them by American mechanics at Edgefield, England, is now being carried on under a tremendous press of steam, to supply the army as soon as possible.

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