SCIENCE

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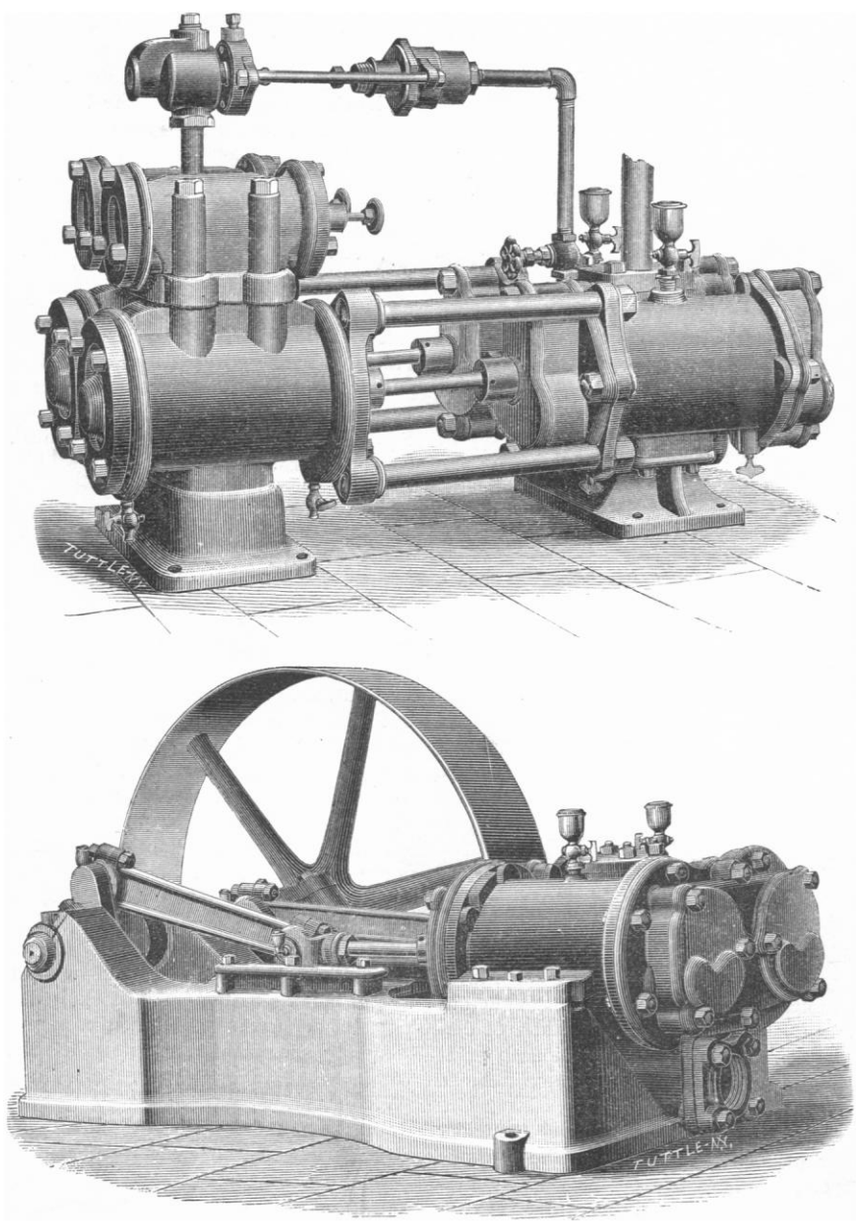
THE HALL AIR-COMPRESSOR.

FOR any purpose in which a positive air-pressure is required, a compressor possesses many advantages over a fan or blower. Even for moving air for ventilating purposes, where under ordinary circumstances a blower answers very well, there are times and places in which a positive movement of the air, such as that produced by a compressor, is not only desirable, but actually necessary. For such purposes, where the required pressure does not exceed twenty-five pounds to the square inch, the compressors shown on this page are intended.

These compressors are built by the Hall Steam Pump Company of this city, and they are much used for elevating liquids, such as strong acids, etc., as well as for ventilating mines and shafts. They are also largely used for furnishing the air-blast where oil, atomized or converted into spray, is made use of on a large scale for fuel. Such a system of burning atomized or aerated petroleum was described and illustrated in *Science* of April 5, 1889.



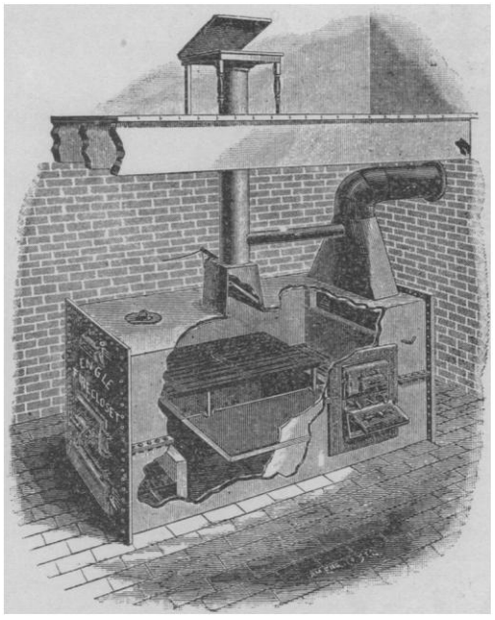
THE HALL AIR-COMPRESSOR.

Both the compressors shown here are duplex or double-acting, but they differ in other features. One is actuated by steam direct, and the other is intended to be driven by a belt. The valves and much of the other mechanism of the compressors are constructed on the same principles as those of the steam-pumps made by the same company, which are too well known to require any description here. As the length of stroke of the pistons, in both the pumps and the compressors, is about the same under all ordinary variations of steam-pressure or load, much less clearance is needed for the steam-valves than would otherwise be necessary, — an important point in the construction of compressors. Any desired air-pressure may be maintained by means of an automatic regulator, which opens or closes a valve in the steam-pipe. It may be added that these machines are as compact and simple in construction as is compatible with the uses for which they are intended; and they are not liable to get out of order, even when run at high speeds.

GARBAGE CREMATION.

WE had occasion a year ago to describe the Engle furnace for the cremation on a large scale of a city's garbage. To-day we are able to show an illustration of a small furnace for the same use in private houses.

It is doubtless true that nature has its own way of transforming offensive unsanitary matter into new forms in which it is no longer dangerous; but the application of fire can bring about in a few moments that which, if left to natural processes, would take weeks or months to accomplish.



THE ENGLE FIRE-CLOSET.

The practice of cremation in place of burial is doubtless growing, and is each day gaining new adherents. A recent canvass of the opinions of the leading physicians of Philadelphia brought out the fact that the majority of them favored the fire method of disposal of human bodies, several of them taking occasion to point out that it all comes to the same thing in the end, the difference being only in the time consumed.

The Engle fire-closet is the application, on a somewhat smaller scale, of exactly the same principles contained in the garbage cremator described last year. By the use of two fires, one at either end of a small furnace, the smoke and gas evolved in consumption are destroyed, There is no escape of any offensive smell, and the furnace perfectly supplies the use intended, for the sanitary and economical destruction of all matters placed therein.

The advantages of such an apparatus as this are obvious. It is placed in a dwelling, where it is used for the reception and destruction of all garbage, as well as night-soil. It is especially useful in places of public resort, hotels, and restaurants, where a large number of people congregate, and supplies the place in such institutions of an expensive and elaborate system and sewerage. It is in daily use in large collegiate institutions and public-school buildings of cities where no adequate system of drainage is in force, and is serviceable for the destruction of the waste and worthless matters produced by all manufacturing establishments.

The Engle fire-closet is in use in hospitals, for the burning of infected clothing, bedding, furniture, and other matter requiring to be destroyed, from patients suffering with contagious or infectious diseases. As an adjunct to the disinfecting and quarantine stations of cities and the general government, it is an auxiliary of importance.

The illustration shows the construction of an Engle fire-closet adapted for the use of a single family. The matter to be destroyed, both solid and liquid, is received directly through soil-pipes from closets above into the evaporating pans and on the garbage bars of the furnace. The flues into the chimney are kept open, and there is no escape of any smell or odor into the surrounding room; and at the proper time fire is applied, and the contents are destroyed. These fire-closets are constructed of steel, lined with fire tiles, with receiving pans adapted for the purpose required, and occupying a comparatively limited space. They are placed in convenient locations, usually in the lower part of the building, or in the cellar, where access can be had to a flue or chimney of moderate size. Being portable and easy to handle, they may be removed at any time to any other desirable site as the exigencies of the weather may require.

A NEW PROCESS OF PROTECTING IRON EFFECTUALLY AGAINST CORROSION.

THE following report on this process was made by Professor H. Haupt to the Franklin Institute of Philadelphia some time since: —

"For a period of more than ten years experiments have been made under the auspices of the Hydrogen Company of the United States to discover a simple, economical, and practical method of protecting iron and steel from all ordinary corrosive influences. A large number of patents were secured, and about $100,000 expended in the erection of plants at Washington, D.C., Newburg on the Hudson, and New York; and some of the results were of the most satisfactory character. Iron that had been treated by the processes referred to effectually resisted the action of nitro-muriatic acid and other severe tests to which it was subjected, while untreated iron was immediately attacked by the acids and quickly destroyed.

"But, although many of the specimens thus treated gave very satisfactory results, others proved defective; and it became apparent to the contributors to the funds that the exact conditions as regards temperature, quality, and quantity of material employed, and duration of treatment, had not been so accurately determined that results could be duplicated with unerring certainty, — an essential condition, without which no process could ever be made a commercial success.

"This explanation has been considered necessary to account for the fact that an industry which promised results of such extraordinary value to the public and to the parties financially interested should have been allowed to linger until the greater portion of the life of the original patents had expired.

"But persistency has at last been rewarded with success. The company succeeded in securing the services of a thoroughly practical and scientific engineer, chemist, and metallurgist, Dr. George W. Gesner, who was enabled to discern the defects of former treatments, and to remedy them successfully by new apparatus and processes, which have recently been patented; so that, while the old patents are still held by the company, they have to a great extent been superseded by more recent issues, under which operations now are and will hereafter be conducted.

"The former treatment consisted in placing the articles to be operated upon in a close chamber, similar to a gas-retort; and when heated to a temperature of about 1200° F., steam superheated in a separate furnace was introduced, followed by naphtha or other hydrocarbon vapor.

"The results, as previously stated, were not always uniform, and,