New Inventions.

New Process of Vinification.

It has been discovered by analyzation that the grape substances giving out color, taste, bouquet, and flavor to wine,—viz., tartar, tannin, essential oil, and coloring matter—constitute only 1 per cent. of its composition, the remaining 99 per cent. consisting merely of sugar and water. It is this 1 per cent. alone which makes wine, distinguishes it from all other liquids, and bestows its different valuable qualities.

It appears that the above-mentioned component parts—especially that which is most precious, the essential oil—are only one-fourth absorbed by the usual process of fermentation; there is, therefore, left undeveloped at the bottom of the fermentating tuns or vats 75 per cent. of flavor, &c., which, if saturated in a solution of refined sugar and water, will give one-third of its unexhausted properties, which is sufficient to produce wine of a better quality than that derived from the natural must. This operation may be three times repeated with the same result; and, even if tried a fourth time, will yield sufficient flavor to make a small description of vinous liquid. This discovery is due to the French chemists, who, on account of defective vintages, have deemed it worthy to investigate the subject.

Miniature Toy Balloons.

During the recent holidays, small balloons made of goldbeater's parchment colored red, and filled with hydrogen gas, have been the delightful gift toys of the season to the infantile world in Paris. Each is made with a string attached to it, by which it is held in the hand of a child, and when it escapes, up it mounts, and sails along the ceiling of the nursery or parlor, a wonder to the youngsters.

Such toys might be successfully introduced into our cities. The first of them made in Paris was by a poor mechanic as a desperate effort to raise a few francs; they took with the public, and it is asserted that he realized 300,000 francs profit, from the great number he made to fill the orders of the toy dealers.

It is thus, by speculative efforts of this kind, that many enterprising men make fortunes.—Those who never venture never win, in inventions, commerce, or literature.

Carbonic Acid Gas Engine.

The accompanying figure is a longitudinal vertical section of an engine designed to be propelled by carbonic acid gas, as a substitute for steam. The inventor is J. Ghilliano, of Marseilles, France.

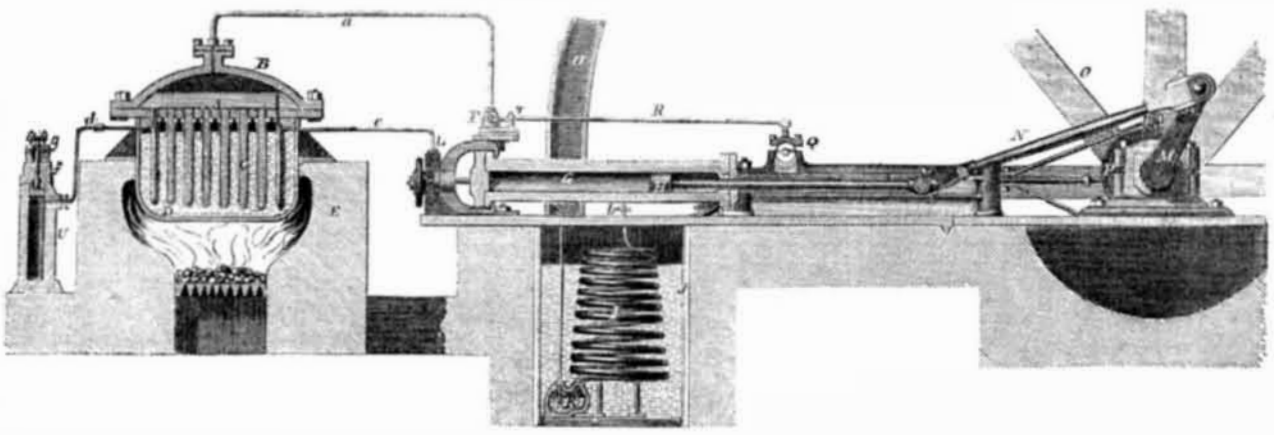
The main feature of this invention is the generation of the carbonic acid gas or vapor by the aid of a water-bath, whereby a uniform heat is sustained, which keeps the vapor at a uniform or nearly uniform pressure. The generator consists of a strong cast-iron vessel, and into the bottom of this vessel is fitted a number of vertical tubes closed at their lower extremities, but opening at the top into the interior of the vessel. Liquid carbonic acid is poured into these tubes so as to fill them, and cover the bottom of the vessel. The hot water bath or boiler is a cast-iron vessel, filled or nearly filled with water, and it is placed over a furnace of the ordinary construction. This bath or boiler is open to the atmosphere, and the water it contains surrounds the tubes already mentioned. When the water is heated, the generation of carbonic acid gas commences, and as long as the water is kept at the boiling point, the heat will continue to be uniform, and the gas will exert an unvarying pressure. This vapor may now be employed as a substitute for steam in generating motion, and after passing into the cylinder of the engine, and there exerting its expansive force upon the under side of the piston, it escapes through an exhaust port into a worm pipe, in a vessel of cold water, where it is condensed, and flows into a well or chamber in the form of a liquid. This liquid carbonic acid is then, by a feed pump, supplied again to the generator. The generator may also be supplied at will from a vessel containing liquid carbonic acid by means of a pipe communicating therefrom to the generator.

The generator consists of a cast-iron plate, A, surmounted by a cast-iron curved cover, B, secured thereto by bolts. The plate, A, is fitted with a number of tubes, C, which are closed at their lower ends, and open at their upper extremities into the space formed by the curved cover, B, and plate, A. These tubes are all filled with liquefied carbonic acid, which covers the surface of the plate, A. The whole apparatus is placed over the boiler, D, which is open to the atmosphere, and is filled or partially filled, with water or other suitable fluid, in which the tubes, C, are partially immersed. The whole is placed over a furnace, E, the heat derived from which is just sufficient to maintain the water or other fluid in the boiler at boiling point. The liquid carbonic acid contained in the tubes, C, is converted into a powerfully elastic vapor, which is disengaged into the upper vessel, B, at a temperature of 212° Fah., the boiling point of water.

The gas is conducted by means of the pipe *a*, to the valve chamber, F, communicating with two cylinders, G, which contain pistons, H. As it is extremely difficult to prevent an escape of the gas through the packing of the piston rod stuffing-box, an arrangement is adopted for allowing the gas to act only on one side of the piston; thus the effect is the same with two cylinders acting alternately as it would be with one cylinder of the ordinary construction.

In the machine represented in the figure,

FRENCH CARBONIC ACID GAS ENGINE.



the vapor is alternately conducted first to one cylinder and then to the other, pushing forward first one piston and then the other. At the return stroke of each piston, the gas escapes by an exit port, as in an ordinary steam engine, and is conducted by a pipe, *b*, to the condenser, where its elastic force is destroyed, and it is reconverted into a liquid.

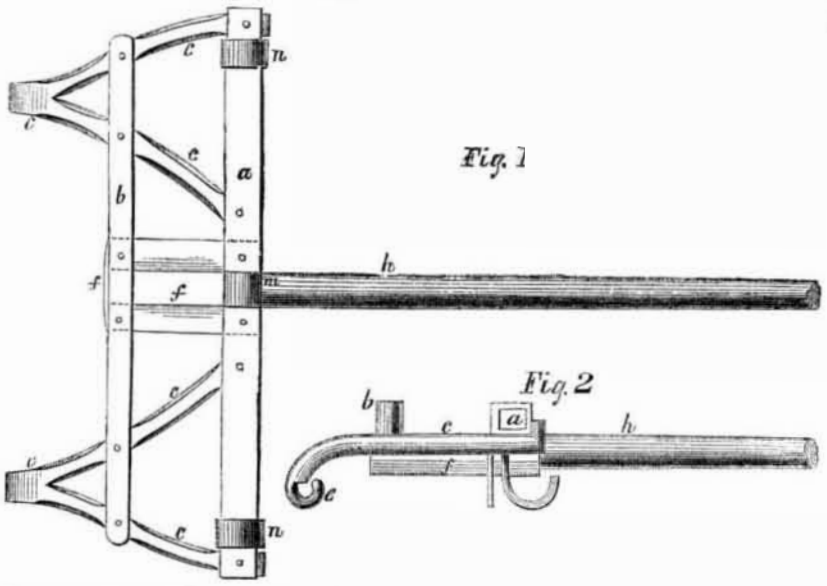
The condenser consists of a serpentine tube, I, completely immersed in a cold liquid contained in the vessel, J. The condensed carbonic acid thus produced flows into the closed vessel or well, K, from which it is pumped up and forced back again into the generator by means of the feed pump, L, and pipe, *c*. The generator is furnished also with a pipe, *d*, communicating with a liquefying apparatus consisting of an iron vessel, U, closed by a screwed cover *f*, of the same material. This cover, which is itself hollow, is closed by the gland, *g*, also screwed in. Liquid carbonic acid can by these means be conveyed from the liquefying apparatus, whenever required, to the generator.

The chamber, U, contains carbonate of soda, and the hollow cover contains sulphuric acid, which acid flows into the chamber, U, and generates carbonic gas when the valve descends, its descent being caused by the vacuum in the tube, *d*. In order to produce this escape of gas into the tube, *d*, it is necessary that a valve in the tube shall be opened to allow of the passage of the gas into the generator, B. This valve is opened when the level of the acid in the generator, B, has fallen, and the pressure of the gas on the valve is reduced.

In order to prevent any escape of gas which might occur round the piston, the ends of the cylinder, G, are closed in a similar manner to the cylinders of hydraulic presses. This part of the cylinder is placed in communication with the worm, I, by means of a pipe, so that any gas that may escape round the piston is forced by it into the condenser. Each piston, H, transmits its movement to the crank shaft, M, by means of a connecting rod, N. The shaft, M, carries a fly-wheel, O, and an eccentric, P, which gives motion to the valve at F, and feed pump, L, by means of the intermediate rocking shaft, Q, to which are keyed levers attached to the pump rod and to the rod, R, which is connected to the bell crank lever actuating the slide valve.

The foregoing is from the Glasgow *Practical Mechanics' Journal.* In 1823, Sir Humphrey Davy published a pamphlet on this subject setting forth the economy of carbonic acid gas as a mechanical agent, because, at the temperature of 32° Fah., the gas, when reduced to liquid, in its endeavor to assume the gaseous state again, exerts a pressure equal to 38 atmospheres on the square inch. Many attempts have been made to use it as a substitute for steam, but hitherto all have failed. This figure represents another attempt in the same direction, but it must prove a failure also. The reason why, we will tell our readers, to prevent any of them being misled by the project. Gases are elastic in proportion to their latent heat; the more elastic they are, the more heat must they have taken up to render them so; therefore, if steam is less elastic than carbonic acid gas, the sum of its sensible and latent heat is just so much less than that of carbonic acid gas. This is one reason. Another is: carbonic acid gas cannot be condensed into a liquid except under great pressure—very unlike steam in this respect—and this unfits it for the motive agent of an engine in comparison with steam.

IMPROVEMENT IN CARRIAGES.



The accompanying figures represent an improvement whereby a carriage can be readily adapted for one or two horses, by attaching a frame to the running gear, by clips, and providing sockets for the reception of a pole, and also thills.

Figure 1 is a top view of the swinging frame, with a pole attached to it; and fig. 2 is a side view of it; *a* and *b* are two cross-pieces of the frame, connected together by braces, *c c*, terminating in eyes, *e e*, by which the frame is attached to clips placed in the usual way on the front portion of the running gear of the carriage or vehicle.

There are sockets for the thills on the under side of the front bar, *a*, one at each side inside the swingle-tree loops *n n*, and one at *f*, at the middle for the pole, *h*. The thills, when the frame is for one horse, pass (one on each side) between the two angle sides of brace *c c*, and each is bolted to the back piece, *b*. A pole and a pair of thills are made and kept for this frame; the socket, *f*, for the pole, *h*, extends across the frame from *a* to *b*. and the pole is keyed in this socket by a common bolt. The swingle-trees are attached to the front bar either at *n* or *m*, as the case may be. When it is designed to use the carriage with a single horse, the pole *h*, is taken out, and each thill (a simple single shaft) is inserted in its socket and bolted to the back piece, *b*—its inner end being confined between the legs of the angle brace, *c*. This is a very simple, convenient and good improvement for rendering a wagon or carriage adaptable for one or two horses, and it can be applied to all common vehicles. A patent was granted for this invention to Noah Warlick, of Lafayette, Ala., on the 14th of October last.

More information may be obtained respecting it by addressing him by letter.

Dividing Machine.—The Diamond's Point.

We have received from J. C. Terry, of Springfield, Mass., a sample of minute marking on glass, accomplished by a machine which he has constructed. The sample is a rectangular piece of polished plate glass—a micrometer—marked with 100, 400, 1,000, and 2,000 lines to the inch by his machine, and with a diamond point which has been used for more than 20 years. He has no doubt, he says, "but one may be made to mark five, and even ten thousand lines to the inch." When the micrometer is held obliquely to an artificial light, prismatic colors are reflected, which proves that although the lines cut by the diamond are so exceedingly minute as scarcely to be detected by the naked eye, yet they are sufficiently deep to form right-angled prisms. The machine of Mr. Terry must be constructed with great care, skill, and delicacy, to execute such minute marking.

More miles of railroad have been built during 1856 than in any previous years, viz., 3,407 miles.

© 1857 SCIENTIFIC AMERICAN, INC.