

UNITED STATES PATENT OFFICE.

JOHN MATTHEWS, OF NEW YORK, N. Y.

IMPROVEMENT IN CARBONIC-ACID GENERATORS, FOUNTAINS AND OTHER VESSELS.

Specification forming part of Letters Patent No. **138,908**, dated May 13, 1873; application filed May 7, 1873.

To all whom it may concern:

Be it known that I, JOHN MATTHEWS, of the city, county and State of New York, have made a new and useful improvement in Carbonic-Acid Generators, Fountains and other Vessels, for charging liquids with carbonic acid in the manufacture of soda-water, mineral-water, and all kinds of effervescing drinks which are made by charging a still beverage with carbonic-acid gas; and I hereby declare the following to be a full and exact description of the same.

The generators for this purpose require to be very strong, and not corrodible by acids. The usual plan is to make a shell or outside vessel of either cast-iron, wrought-iron, or copper, and line it with lead, or a porcelain enamel. The cast-iron is the cheapest, and is therefore most generally used, but is very objectionable on account of being very dangerous from liability to explode under the great pressure of the gas. By making the walls of the vessel very thick, this is remedied to some extent, but then the apparatus becomes clumsy and difficult to transport. Wrought-iron is strong, but expensive to make, and copper still more expensive, especially from the high price of copper.

My invention consists in overcoming these defects and objections by making the shell of the generator of cast-steel, formed in molds, by casting, and afterward lining it with lead or an enamel of porcelain. The vessel, or generator, thus formed, constitutes my invention.

The special advantages which it has over similar vessels as made heretofore, are its great strength and elasticity. The tensile strength of cast-steel is very great, and this with the elasticity which it possesses, gives it special advantages over other metals in resisting high pressure from gases. The generators may be made lighter than heretofore, and still have ample strength to resist even liquefied carbonic acid. Another advantage is the cheapness with which these vessels may be formed.

The shape of the apparatus I make substantially the same as already in use for sim-

ilar vessels. The method of casting hollow articles of steel being well known by those skilled in the art, need not be particularly described.

By cast-steel, I mean not only the ordinary cast-steel which has for time immemorial been used for forming edge-tools, but include any of the steely preparations of iron which are capable of being cast into form, and which range with ordinary steel in their tensile strength, and elasticity. Some of these steels are more fibrous, and are possessed of as great or even greater strength than ordinary steel, and are yet capable of being melted and formed into castings. Any such may be used in forming the shell of my new carbonic-acid generator.

After the carbonic acid is set free in the generator, it is to be either condensed into liquefied carbonic acid, or passed into a liquid such as water, to make what is known as soda-water, or into some beverage, such as wine, ale, beer, mineral-water, or the like. The vessels used for holding these liquids while being charged with the gas, must be strong, and must also have a non-corrodible lining so as not to impregnate the liquid with any deleterious material. The same cast-steel shell or outer vessel, is applicable for these purposes, but a lead lining would not answer, as it would impregnate the liquid with poisonous lead salts. A porcelain lining would answer, but other linings will carry out the purposes of my invention for fountains, or vessels into which the gas is received, such as block-tin in sheets, or a lining of copper, plated with silver, by electroplating or other equivalent process. The silver-plated copper makes an excellent lining when the steel fountains are to be used for wines.

I prefer to put in a lining of block-tin, silver-plated copper, or other non-corrodible lining, because of the difficulty of plating directly upon steel; but a similar non-corrodible lining deposited or formed directly upon the steel would accomplish the object of my invention, and form a part of it; or, instead of either of these linings, one of glass, or a glass vessel inside the cast-steel vessel, will

with the cast-steel shell, form a strong, light, safe, and durable vessel for the purpose of my invention.

The vessel or reservoir formed by either of the plans above described, is very strong and safe, and comparatively cheap, and easy of manufacture. That with lead lining answers as a generator for carbonic acid, and the others for containing liquids which are to be used as beverages, since the inside is not soluble in any of the beverages usually kept in such vessels.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is—

The improved vessel or generator herein described, consisting of a shell of steel formed by casting in molds, and lined with lead, or porcelain, substantially as set forth and described.

JOHN MATTHEWS.

Witnesses:

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