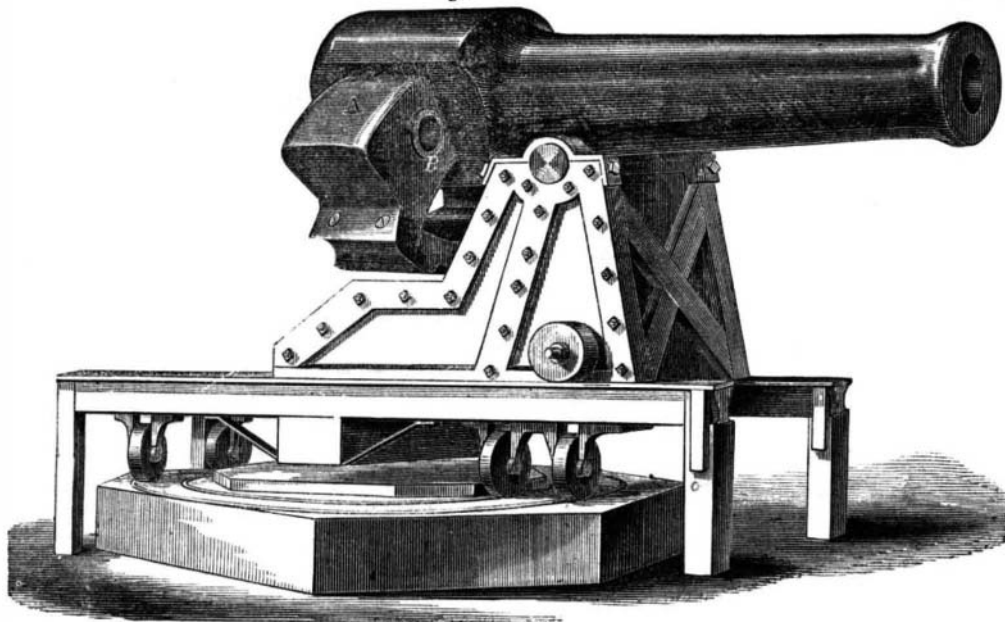


**Improved Breech-loading Cannon.**

This method of loading cannon at the breech consists in having a movable arm, A, jointed to the cannon so that it swings freely on its axis. In this arm are the chambers, B, which contain the charge. Figs. 1 and 2 show the arrangement. The vents are in the side of the chambers where they can be easily

Fig. 1



manipulated at each discharge, and are also convenient for firing.

As each shot is fired, or as one chamber is brought into line with the bore, the other is thrown back far enough to allow it to be loaded, so that a continuous discharge can be kept up so long as the temperature of the gun permits. The dotted lines in Fig. 2 show the position of the vibrating arm when moved so as to bring one chamber in line with the barrel of the gun.

One half the right may be bought on reasonable terms by addressing the inventor, John A. Miller, of Paducah, Ky., by whom it was patented Feb. 7, 1865.

**New Oxide of Magnesium Light.**

It is well known that the oxide of magnesium is practically infusible, and that it has the property of being volatilized, but in the smallest quantity, in a flame of oxygen and hydrogen mixed together, and without imparting any color to that flame. The oxide has also the property of spreading, on being placed within the flame, an intense, bright, and constant light, and which is admirably suitable to photography. Many magnesium salts, and particularly chloride of magnesium and carbonate of magnesia, have the property of leaving some oxide of spongy magnesium on being decomposed by the oxyhydrogen flame. Availing himself of a knowledge of these principles, Prof. Prospero Carlevaris, of Genoa, proposes to employ the process now to be described. A piece of chloride of magnesium, larger or smaller, according to the effects of light required, is placed upon a small prism of gas-retort coal, and upon it, through a small tube purposely made, the flame of the oxyhydrogen gas (the mixture of oxygen and hydrogen) is directed; or a prism, or even a small and well-compressed cylinder of carbonate of magnesia is placed within the flame from the same mixed gases. The chloride of magnesium or the carbonate of magnesia is directly decomposed and resolved into oxide of spongy magnesium, from which the intense, bright, fixed and constant light comes forth, causing all the chemical phenomena of diffused sun light. The gases of the said combination, which are pure hydrogen, or even ordinary illuminating gas, and pure oxygen, or even atmospheric air, flow separately from two different gasometers, and are mixed only in a very small tube at the end of the pipes. They can be prepared in the ordinary way when wanted in small quantities; if wanted on a large scale, pure hydrogen is prepared by causing steam to pass over incandescent charcoal. Oxygen is prepared with manganese, and

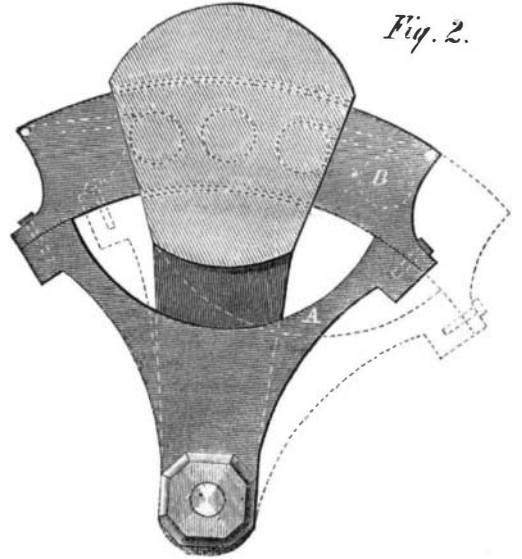
hypochlorate of lime with manganese and silicic acid, or with dry sulphate of iron, the product of whose decomposition is caused to pass upon platinated pumice stone, turning to profit the sulphurous acid resulting from the process to the preparation of sulphites. The invention, is, therefore, essentially the production of light, by placing the oxide of spongy

crack from unequal expansion, we shall owe it to the perseverance of inventors.

The latest invention in this line is illustrated herewith. It is a glass chimney with spiral grooves extending from top to bottom, the object being to equalize the expansion of the glass when heated, and prevent it from breaking.

The engraving shows the invention very clearly. The small figure underneath the principal indicates the amount of corrugation. Patented by H. C.

Fig. 2.

**MILLER'S BREECH-LOADING CANNON.**

magnesium in a flame produced by a mixture of oxygen and hydrogen.—*London Mining Journal.*

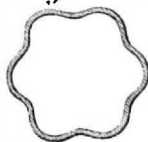
**APPLEBY AND GOULD'S LAMP CHIMNEY.**

"If it were not for the chimney," said a friend to us recently, "the kerosene lamp would be perfect."

Fig. 1



Fig. 2



It gives a whiter light than gas, it is more steady, it is far cheaper, and there are no insolent collectors about it sticking red bills in your face every month."

The advantages mentioned are certainly obtained, and if we are ever to have a chimney that will not

Appleby through the Scientific American Patent Agency June 12, 1866. Address Appleby & Gould, Conneaut, Ohio.

**Report on the Springfield Rifle.**

The *Springfield Republican* says the military board, appointed for an examination of the various fire-arms now in use by different nations, have carefully examined sixty-one different rifles and muskets and have reported that the most effective, safe, and substantial arm, is the Springfield rifle with the Berdan improvement, which changes it to a breech-loading rifle. The board consisted of Major-Gens. Hancock, Buchanan and Griffin, Brig-Gen. Haynes, and Cols. Owens, Benton and Porter, and it is unofficially stated that the members were unanimous in their recommendation of the Springfield rifle. It is not alone in this country that the Springfield rifle is now in favor. Louis Napoleon, while casting about for the most effective arm for his army, came to the same conclusion with our own board of examination; an agent of the French Government, lately bought of a Philadelphia machinist a full set of the machinery needed for the manufacture of the Springfield rifle for 100,000 francs in gold, and shipped it to France. This was before the report of our examiners recommending the addition of the Eerdan improvement had been made, and one of the rifles with that improvement is now being made, and will be sent to France at once as a pattern. When the French Emperor fights he wants to fight successfully, and he seems to have full confidence in the value of our fire-arms and in the ingenuity of American mechanics.

**The "Lord Warden's" Engines.**

The *London Engineer* publishes a supplement to its issue of the 29th June, wherein working drawings, in plan section and elevation of the *Lord Warden's* engines, are given; the scale is one-fourth of an inch to the foot.

The engines have three cylinders each 90 inches diameter, 48 inches stroke, and are of the back-acting variety. There are many novelties in detail, but the most striking one appears to be the use of gearing to drive the main valves instead of eccentrics. There are four large gear wheels, each about 42 inches in diameter, between the main valves and the shaft, and these, through the intervention of a crank shaft, perform the work. It seems rather a perilous reliance to put faith in the teeth of gears to do such work, but we console ourselves with the reflection that the builders, Messrs. Maudslay & Field, probably know what they are about.