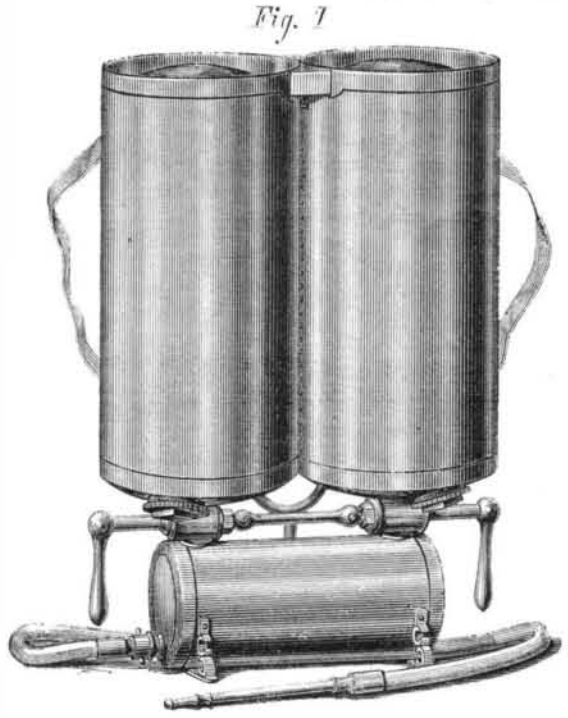
GARDNER'S FIRE EXTINGUISHER.

We need not repeat what we have so often said in regard to the value of small portable apparatus for extinguishing fires at their very outset. Suffice it to say that our views upon this subject have been generally approved by those who have made the extinguishing of fires a study. Among apparatus of this kind, none have so rapidly won their way into public favor as extinguishers the action of which is based upon the fact that no fire can live under even the thinnest stratum of carbonic acid gas. An envelope of this gas so effectually cuts of the supply of oxygen from the air that, when combined with water so as to cool the heated surface below the point of ignition, it forms the best known means for the extinguishing of a fire.

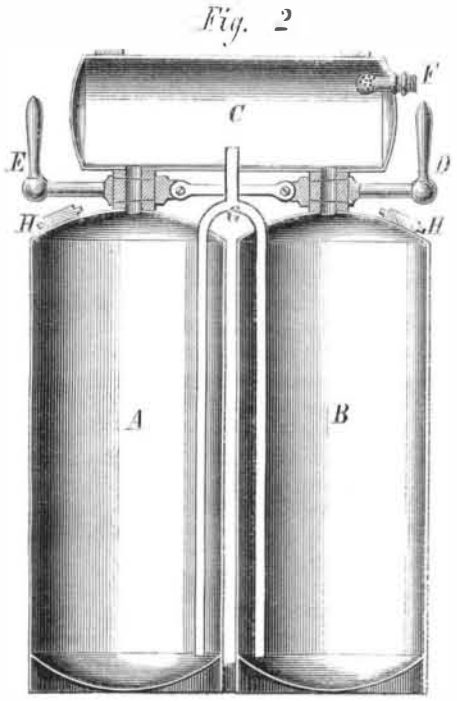
Fig. 1



Quite a number of devices have been brought out, all designed to render easy and rapid the use of carbonic acid gas and water for this purpose. The apparatus shown in our engravings has points claimed to give it superiority over others which have preceded it.

The parts of the device, as lettered in the engraving, Fig. 2, are an acid chamber, A, a bicarbonate of soda chamber, B, a gas chamber, C, handles of stop cocks, D and E, the two

Fig. 2



handles being joined by a rod so that either hand may be used for operating them, hose coupling, F, equalizing pipe, G, which keeps the pressure uniform throughout the machine, and stoppers, H, which are removed for charging the machine.

The acid chamber, A, is charged with dilute sulphuric acid (oil of vitriol), and the soda chamber with solution of bicarbonate of soda, equivalent proportions being used. When not in use, the machine is placed in the position shown in Fig. 2. In this position the acid and soda are kept asunder, and no gas is generated.

In use the position of the machine is reversed, as shown in Fig. 1, straps being provided whereby the machine is held upon the back of the operator. In the latter position, when the cocks are opened, the acid and soda solutions flow into the gas chamber, C, where the sulphuric acid instantly sets free the carbonic acid in the bicarbonate of soda, generating a high pressure, which causes a jet of mingled solution of sulphate of soda and free carbonic acid to issue from the hose pipe. This being properly directed, first upon the bottom of the fire, and so upward as the fire is extinguished, will soon put out quite a formidable conflagration.

The advantages of this extinguisher are that the diluted sulphuric acid and the solution of bicarbonate of soda are kept in separate chambers, and brought together when needed for use simply by turning the handle of a stop cock.

They are brought together in equivalent proportions, and the stream of a solution of sulphate of soda is thereby charged with carbonic acid gas from the start.

As much or as little of the charge may be used as is desired, and the remainder saved, for any future time, perfectly unaltered and unimpaired.

When the machine is charged and set away, the stopcocks and mechanical arrangements are never in contact with the chemicals. This is considered one of the greatest advantages of the machine, and is a point in which we believe it differs radically from all other extinguishers.

The machine is made of polished copper, lined with lead to prevent corrosion, and the stopcocks are made of lead bronze, and will resist all chemical action from the materials used. The machine is so constructed that it fits the back firmly and steadily, because, there being two upright chambers to contain the chemicals, the weight is equally distributed. It weighs only 65 pounds when charged, and it is claimed that it is lighter than any other machine of the kind, and can be put in action more promptly.

Patented February 14, 1871. For further information, address Philadelphia Fire Extinguisher Company, 1,306 Chestnut street, Philadelphia, Pa.

BUTTER FROM CALIFORNIA.

The transporting of fresh grass butter from the Pacific coast to New York, by rail, is something new, and is likely to become a large business.

A few days ago, a car load of 20,233 lbs. arrived from San Francisco, consigned to J. S. Martin, corner Chambers and Greenwich Streets, creating quite a sensation among the butter dealers. By the courtesy of R. L. Stuart, Esq., a well known resident of this city—but who, from the note accompanying it, we infer is at present a guest at the Fort William Henry Hotel, Lake George—we are indebted for a handsome cylindrical roll of the new butter, from the first shipment across the continent. Other shipments are announced; and if the experiment of bringing yellow grass butter, fresh from the Pacific coast, proves as feasible as it seems likely from the satisfactory result of the first shipment, we may expect to get our spring butter in this city much earlier as well as cheaper than heretofore. The color of the California product is all that can be desired, and the flavor quite equal to State butter of a month hence. It costs in San Francisco 30 cents, gold, and the freight is 2½ cents per pound, which leaves the seller in New York a fair profit at 40 cents per pound. It comes in neat 2 lb. cylindrical rolls, each wrapped in cloth, similar to the Philadelphia mode of putting up butter.

Printing from Iron.

Mr. Van Ruth, who has for several years acted as inspector of iron for the Dutch Government, has from time to time turned his attention to discovering some means of examining the fiber of iron, and recording it for the purpose of comparison. After several trials, he has arrived at an extremely simple and efficient method of obtaining the results required.

The sample of iron whose fiber is to be examined is first planed, so as to expose a suitable section, through any desired point; this section is immersed in muriatic (hydrochloric) acid for such time as is necessary to eat out the cinder; this time varies from six hours to twenty-four hours, according to the strength and temperature of the acid solution. The cinder is attacked in a more rapid manner than the fiber of the iron, and the effect is that the fiber is left in relief—in fact an etched plate is formed, from which, by suitable ink or other substance, an engraving may be printed, showing every fiber of the iron in a clear and distinct manner. The application of this simple process is too obvious to need much description. Whenever the formation of piles in a rail, round or other section of iron, is required, here is a quick and handy method for discovering it. As a means of studying the alteration of fiber in the neighborhood of welds, it is invaluable. It may also be applied in supplying information in relation to M. Tresca's valuable memoirs on the flow of solids.—*Engineer*.

The Thunderer.

A new armored war vessel, on the turret or monitor plan, called the "Thunderer" has lately been launched in England. The vessel has a burthen of 4,400 tuns, carries two turrets and four 35 tun guns, being the heaviest naval armament known. Her expected speed is 12½ knots per hour.

As she is to rely, like a true Monitor, upon steam alone, and is totally unprovided with masts or sails, she is provided with two distinct sets of engines, connected with twin screws, and capable of acting independently of each other. The object of this arrangement is that, if one of the engines is disabled, the ship will not be left without any means of motion beyond the caprice of the waves. Perhaps one of the most remarkable features of this wonderful vessel is its capacity for stowing away coal. It can carry more than twice the quantity of the largest of the iron clads, being able to provide itself with a sufficient consumption for 12 days, or as much as 1,750 tuns.

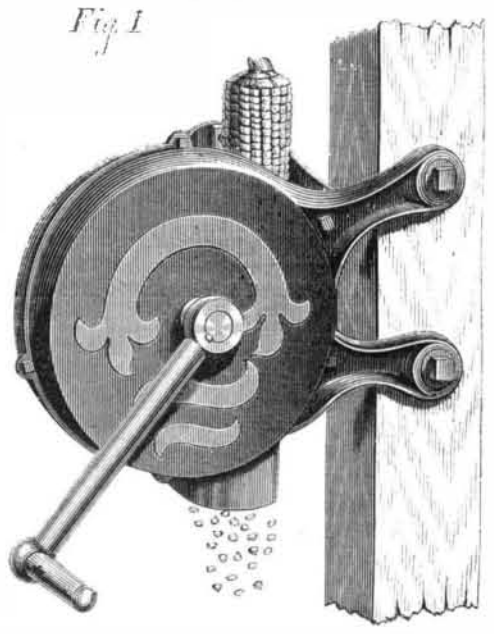
The *Thunderer* has a horse power of 5,600, divided between two double engines. The length of the vessel is 285ft. her breadth amidships 62ft., and she will draw about 26ft. of water when fully equipped. Although the iron at the stem of the ship will not exceed 8 in. in thickness, the broadside is protected by 12 in. of plating, while the turret carries 14 in. of armor, supported by the usual backing. The plating of the *Thunderer* is thus thicker than that of any other iron-clad, except her sister ship, the *Devastation*, and appears to be as strong as can be carried by vessels of the size. In order to assure the stability of the ship, no masts have been placed in her, and the sole motive power lies, therefore, in her engines. The *Thunderer* is altogether the completest and strongest iron clad yet constructed.

PATCH'S CORN SHELLER.

The extreme simplicity, durability, and compactness of this machine, together with its efficiency and convenience, will commend it to all who understand the need and use of a good corn sheller. The working parts are so few and so easily made (nearly all of them can be cast) that the machine can be constructed very cheaply. There are no complications to perplex the inexperienced, and no nice adjustments are required. The machine can be bolted to an upright post, and is then ready for work.

Two pan shaped castings bolted together form the case. One of these is removed in Fig. 2. The other, lettered A,

Fig. 1



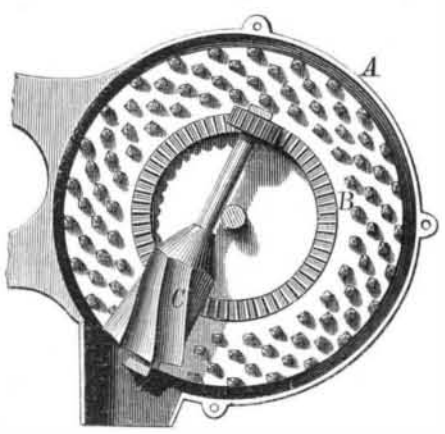
remains. B is a disk, having, about midway between its center and circumference, a circle of cogs which mesh into the pinion of the fluted roller. This roller, with its pinion, is cast all in one piece. Suitable bearings for it are bolted to the case, as shown.

The disk, B, is provided with annular rows of shelling teeth, as shown.

The corn is fed in as shown in Fig. 1. A spring (not shown), on the inner side of the case, holds the ears firmly against the disk, so that varying sizes of ears do not interfere with the operation of the machine.

The fluted roller revolves with greater rapidity than the toothed disk, the combined action of these two simple parts stripping off the kernels rapidly and thoroughly.

Fig. 2



Patented through the Scientific American Patent Agency, April 2, 1872, by Asahel H. Patch, of Hamilton, Mass., who may be addressed for further information.

To Purify Water.

Chloride of iron and carbonate of soda, in the proportion of 32 kilos. of the former salt and 84·5 of the latter to a quantity of water equal to 1,000 cubic metres, has been found a most valuable and quite innocuous means of purifying water, even such as is otherwise quite unfit for drinking purposes, and could not be rendered fit by alum. The salts alluded to are best previously dissolved in some pure water, and the solutions, that of iron first, poured into the tank containing the water intended to be operated upon. The soda solution is not added until after a few moments, the water being first vigorously stirred. The soda solution having been added, the fluid is stirred again, and then left quiet for the purpose of allowing the very bulky and flocculent sediment to deposit; this takes considerable time—from twenty-four to thirty-six hours. The *strychnos potatorum* is used in India for purifying clayey water.—*Chemical News*.

AMONG the remains discovered last year in Kansas by Professor Marsh and party were bones of the flying dragon. Professor Marsh judges that the dragons, to whom these fragments of bone belonged, must have measured, from tip to tip of their extended wings, some twenty feet.

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