Science and Art.

Gun Cotton and Gunpowder.

Gun cotton, also known as nitrate oflignine will not explode until raised to a temperature of from 330° to 356° Whether applied in guns or for blasting rocks, it is, weight for weight, from four to six times as powerful as gunpowder.

A charge of gun cotton of the same force as the usual charge of powder occupies about two-thirds the space in a gun, and consequently gives a better effect. For blasting, it is compressed, and entirely concealed in cartridges, with a safety-fuse attached.

Gun cotton explodes more rapidly than gunpowder, and insures somewhat more accuracy in firing from the shoulder.

It makes very little smoke, and leaves hardly any solid or liquid residuum. The gun hardly becomes foul with the longest use. The gun is not so rapidly heated. No priming is required, as the flame from the cap passes down the touch-hole sufficiently far to ignite the cotton below.

Gun cotton is not at all injured by being wetted. No apprehension need be entertained for the magazine of a ship catching fire, for if the cotton is not kept always in water, arrangements may be made for rapidly wetting it. There would no longer be any danger for magazines, as the cotton can be dried rapidly in small quantities, as required. The great waste from ammunition spoiled by wet would be avoided.

The defects which have been urged against gun cotton are: 1st, it may explode by a blow, or in ramming down. This is never the case unless the blow has by some means produced a temperature of 330° In many thousand trials no accident has ever occurred.

2nd, it may burst the gun. Accidents of this kind have only arisen from using a charge of cotton equivalent to many times the usual charge of powder.

There is, however, a danger in using it which arises from the difficulty of persuading men that a substance identical in appearance with common cotton is quite as dangerous as gunpowder.

Chloroform in Sea Sickness.

Dr. Landener, of Athens, in Greece, announces that he has discovered a specific for sea sickness. He gives 10 or 12 drops of chloroform for a dose in a little water, and this, it is stated, soon removes the nausea. He tried the effects of this on twenty passengers on a very rough voyage, eighteen of whom were cured of their sea sickness by one dose, and the remaining two with two doses. This remedy, if it is as effectual as it is stated to be, is certainly the best, because the most simple, that has yet been brought to public notice.

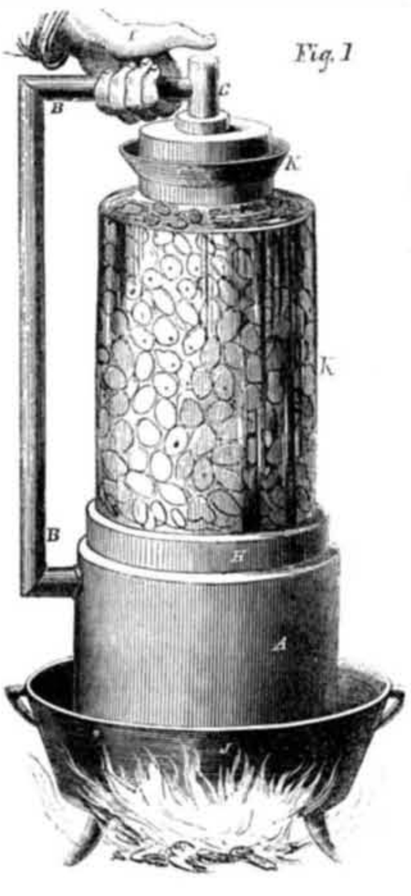
Air Exhauster.—Fruit, Vegetable, and Flower Preserver.

The accompanying figures illustrate an apparatus for exhausting air from jars, containing fruit, &c., without heating their contents; also a new top for jars, to be used with this apparatus. A patent was issued for this invention to A. M. Purnell, M. D., of Washington, D. C., on the 25th of November last.

Fig. 1 is a perspective view of the apparatus; fig. 2 is a transverse section of the exhauster; and fig. 3 is a view of a jar with the top, to be used in connection with the exhauster.

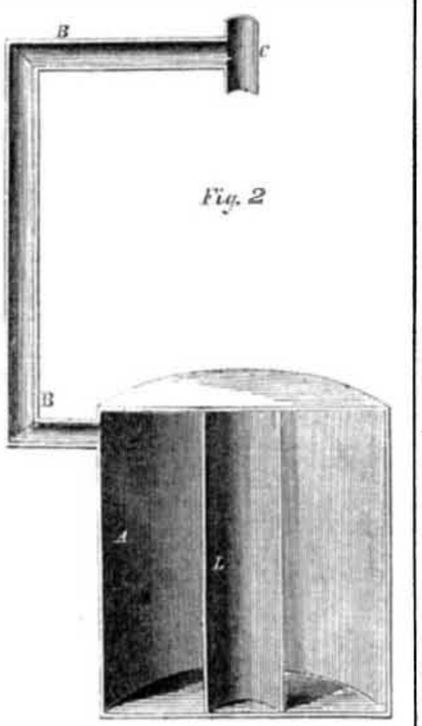
A is the exhauster can, made of tin; B is a tin tube communicating with the can, A, by means of a small hole; C is also a tin tube communicating with tube B, by a small hole, and is open at both ends; *d*, fig. 3, is a tin tube with a flared rim, D, around it, near its middle; E, fig. 3, is a tin top, fitting loosely over tube *d*. F is a short tube soldered to the top, E; a smaller tube, G, is also soldered to the top, E, and inside of F, thus leaving a space between the two tubes, F and G. H is a block of wood, or any other firm body between can, A, and the glass jar, K—which are shown in fig. 1 with the top in connection. I is the hand of the operator, and J is a heated vessel or oven.

The tin can, A, is of such a size as will contain about half a gallon. As near its center as possible, a tin tube, L, two inches in diameter, is soldered to its top only, it has several holes punched in it near its upper end, for the passage of steam and air, it rests upon the bottom, and its object is to brace the can and prevent a collapse of its top or bottom,



after the expulsion of air. The tin tube, B, is soldered to the side of the can and the tube, *d*, is made to fit smoothly in the jar, K, intended to be used. The flange, D, flared at top and narrow at its bottom, is for holding cement. The space that is left between the two tubes, F and G, is for the introduction of melted cement. In the center of the top, E, being also in the center of tube G, is a small hole of one-eighth of an inch in diameter.

OPERATION.—A little water, about four or five ounces, is introduced into the exhauster, A, fig. 2, by first heating it a little to drive out a portion of the air, then dipping tube C in cool water, which forms a partial vacuum in the vessel, and the water then flows in. The tube, C, is then wiped dry. The lower part,



d, of the top fig. 3 is then secured air-tight to the top of jar K, by means of the cement which adheres to glass and tin (and will not melt at the temperature of boiling water.) The jar being filled with fruit, as shown in fig. 1, and the top being placed in its position, and the cement in the groove for its reception being cooled, the tube G, (figure 3,) and tube C, (figure 2,) are connected together, the pipe, C, slid over G, and cemented, to form an air-tight outward connection between them all—the whole apparatus being arranged as shown in fig. 1. The cement is composed of equal parts of beeswax and rosin. A small round piece of paper dipped in the melted cement, and allowed to cool or a piece of thin india rubber is dropped in through the top of tube C, to cover the hole underneath. A cork is made to fit loosely in tube G—having a hole through a center—and is dropped through the top of the pipe, C, and falls on the waxed paper or india rubber valve under it, and keeps it from being displaced. The exhauster being placed on a hot oven, stove, or over a spirit lamp, as shown in fig. 1; it is kept there until the top horizontal tube becomes warm to the hand; the top of tube C is then closed with the thumb, and the exhauster and cannister lifted out the heating vessel J; and the exhauster placed in water untilit is perfectly cold; this forms a vacuum in it by the condensation of the steam, by which the air is drawn from the jar, K, through tube B. The thumb of the operator may now be removed from the top of pipe C, when the outward pressure will then close down the small valve of waxed paper or india rubber under the cork mentioned, and thus exclude the air from entering the jar from the outside.

The operations of heating and cooling the exhauster, A, as described, may be repeated as often as is necessary, until the air is sufficiently exhausted from the jar and its contents. The block, H, is then removed; the tubes, C and G, separated, and the cork taken out, but the cemented piece of paper—the valve—allowed to remain. and the tube, G, then plugged with a stopper of cement.

When it is desired to preserve fruit with syrup in these jars, the syrup is put in with the fruit, the air exhausted, and again admitted to the jar, and the syrup thus made to penetrate and saturate the fruit; the superfluous syrup is then poured off, the air exhausted, and the jar sealed, as has been described.

The principle embraced in the preservation of fruits, vegetables, and flowers, in this invention, is removing or exhausting the oxygen of the atmosphere from the organic substances to be preserved, without submitting them to heat. The claim embraces the apparatus illustrated and described for this purpose.

Dr. Purnell informs us that he can exhaust the air more perfectly from canisters, by this apparatus, than by the very common method of placing them in boiling water to expel the air. Many articles, such as fruit, usually eaten in a fresh or uncooked state, cannot be heated without having their flavor completely altered, therefore to preserve them with their pristine taste, they must be treated cold, as by this apparatus. In preserving fruit with syrup, by boiling in sugar in the common manner, more sugar than is agreeable to the taste is required to be used, for the purposes of preservation; but by this method of treating such fruit preserves, they do not require so much sugar.

All kinds of fruits, we are informed by the patentee, are thus preserved by this apparatus, and their peculiar flavors retained; and flowers are also thus preserved in such glass jars, with all their variegated colors unblanched, during the whole winter season.

Anykind of glass or stone-ware jars, having a wide mouth, may be employed; it is only necessary to have the tops made to suit them.

More information may be obtained by letter addressed to the patentee at Washington, D. C.

Spirits of Turpentine in Paints.

It has been stated that thespirits of turpentine employed as a vehicle in lead paints was the cause of "painter's cholic," and that ifit were not used for this purpose painters would be greatly benefitted in health. In regard to these views, John H. Dennis, of Haverhill, Mass., writes us that with the experience of thirty years as a painter, he knows that the greatest enemy to the health of painters is not spirits of turpentine, but *spirits of alcohol!* The use of them, and the want of cleanliness among painters, have caused all the evils complained of as belonging to their occupation. He says, "let painters eat good substantial food, (their meat somewhat fat,) drink no beer or alcoholic drinks, wash their hands often, especially after mixing paints, and always before eating anything, and use no tobacco, they will enjoy good health, if free from hereditary disease." He speaks according to his own experience, and he has brought up two sons to manhood as painters, who will confirm his views.