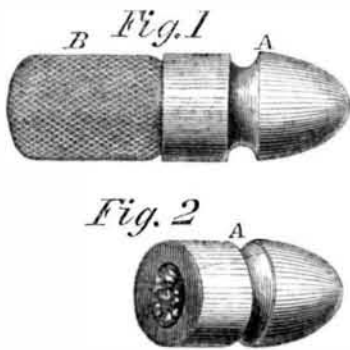


**Norton's Gossamer Cartridge.**

One of the most practical inventors at the present time in England is Captain Norton, who has for many years turned his attention chiefly to the improvement of implements of war, and who has in the course of an active life produced so many inventions that we can only enumerate a few of them, viz.: an elongated rifle shot and percussion shell; a percussion hand grenade, for the protection of private dwellings in case of riots; a railway guard and passenger signal; rifle fire shot; a safe way of fixing percussion appliances in the mouth of rifle shells for rifle cannon; concussion fuze; liquid-fire rifle shell; percussion blasting cartridge; artificial stone rifle shot; improved cordage; fog alarm signal; and the subject of our illustration, the gossamer cartridge, which we copy from the *London Engineer*.



The object of this cartridge, B, is to prevent the necessity of the soldier biting off the end of the cartridge, a very injurious operation. The cartridge is made by putting the powder of the charge in a small bag or cap of thin paper without any previous preparation of the paper, and then adding strength to this thin covering by enclosing it in a small piece of common cotton net as shown in the illustration, the cavity of the shot, A, being roughened out, for the purpose of readily attaching the cartridge to it.

An experiment was lately tried with cartridges constructed upon this principle, with the ordinary Enfield rifle, and it was found that without puncturing or piercing the cartridge previous to loading, the flash of the percussion cap was amply sufficient to penetrate the thin paper through the opening of the network, and fire the charge. The soldiers of the fort who witnessed and tried the experiments were much pleased with the cartridges, as being a great improvement on those at present in use. On firing the rifle the net is carried out, leaving no residue whatever in the barrel. The net secures the thin paper that encloses the gun cotton or gunpowder, and prevents it from bursting when pressing the gun cotton or gunpowder into it. Major Straith, professor of fortification, referring to some experiments he had made upon cartridges both in paper and linen, and of which the present invention is an improvement, states that "the motion of biting the cartridge being saved, time is saved in loading, and the entire charge, without the usual waste, is always delivered into the piece." In making the present cartridge the thin tough paper is first placed with its center on the point of the mandril or former, and the net in the same manner over the paper, both together are then pushed into the tube mold, the ends are drawn down, and the mandril drawn out, the powder or gun cotton is then put in and the ends of the paper and net are tied up. In preparing it for Sharp's breech-loader, Captain Norton places a little gun cotton first in the lower end of the cartridge, and gunpowder over the cotton, the fire from the cap being certain to fire the cotton, although it may not always fire the gunpowder through the thin paper.

In a paper which Captain Norton read recently in the United Service Institution, London, he gave a full account of his numerous inventions, and the assembled *élite* of Great Britain's army and navy listened with great attention to the man who had done so much to improve the so-called art of war.

**Another Supposed Cause of the Potato Rot.**

We some time since gave a theory in regard to potato rot, and a novel and curious method of preventing the same by the insertion of peas in the seed potato. We now find in the *Buffalo Commercial* an account of another cause for this destructive disease, discovered by Mr. Alexander Henderson, of that city. He thinks it is produced by an insect, the egg of which is laid on the skin of the potato, is invisible to the naked eye, but may be detected with a microscope, and is planted with the seed potato. The egg is hatched in about six days, and the young insect remains in the ground until he gets wings. In the meantime he is engaged in stinging the tubers, each perforation poisoning the root and begetting the rot. While yet in the ground, and as early as the tenth day of existence the young insects cohabit, and from the great rapidity with which they propagate, Mr. H. argues that the egg is deposited before the first emergence from the ground, although in case of cold wet weather, the insect sometimes leaves the vines and returns to the tuber. Only a few days are required for the entire destruction of the vine. The insect is remarkably industrious, but the destruction of the vine does not affect the tuber except to stop its growth. The *Commercial* gives further particulars, as follows:—

"Mr. Henderson states that he discovered the bug on the vines in 1850, but thought it was confined to them. During the last year he has found it on the tubers, and watched its effect upon them. It appears on the vines in from two and a-half to three months after planting, according to soil and manure—a richly manured soil producing the perfect insect sooner.

"A short time since Mr. H. left at our office a glass jar containing a sound and healthy potato plant, with which were confined some six or eight of the insects alluded to. The insect itself we cannot describe scientifically. It is about half the size of the common house fly, of a brownish color, has six legs, two pair of wings, two antennæ, and a long strong proboscis. The insect was actively engaged upon the various portions of the plant, and in the course of twenty-four hours it was evidently diseased, the leaf becoming brown and mouldy, while the stalks, in the course of two or three days, suffered a putrescent change; in four days some of them fell over by their own weight, the stalks being swollen and softened in some places quite to a jelly of a sickly green color.

"If we put a stop to the planting of the egg with the seed potato, we stop the propagation of the insect. The egg being invisible, any means applied should be thorough, and reach the whole surface of the root. Mr. H. states that by sprinkling quicklime over the potato, as it is cut for planting, the moisture will dissolve the lime and bathe the tubers in a caustic alkali, which will destroy the eggs. At this time of the year the ravages of the insect may be prevented by packing the earth around the tuber firmly with the foot, which will smother the insect."

**Origin of Brandy.**

Brandy began to be distilled in France about the year 1313, but it was prepared only as a medicine, and was considered as possessing such marvellous strengthening and sanitary powers that the physicians named it "the water of life," (*Peau de vie*), a name it still retains, though now rendered, by excessive potations, one of life's most powerful and prevalent destroyers. Raymond Lully, a disciple of Arnold de Villa Nova, considered this admirable essence of wine to be an emanation from the Divinity, and that it was intended to re-animate and prolong the life of man. He even thought that this discovery indicated that the time had arrived for the consummation of all things—the end of the world. Before the means of determining the true quantity of alcohol in spirits were known, the dealers were in the habit of employing a very rude method of forming a no-

tion of the strength. A given quantity of the spirits was poured upon a quantity of gunpowder in a dish and set on fire. If at the end of the combustion the gunpowder continued dry, enough it exploded, but if it had been wetted by the water in the spirits, the flame of the alcohol went out without setting the powder on fire. This was called the proof. Spirits which kindled gunpowder were said to be above proof.

From the origin of the term "proof," it is obvious that its meaning must at first have been very indefinite. It could serve only to point out those spirits which are too weak to kindle gunpowder, but could not give any information respecting the relative strength of those spirits which were above proof. Even the strength of proof was not fixed, because it was influenced by the quantity of spirits employed—a small quantity of weaker spirit might be made to kindle gunpowder, while a greater quantity of a stronger might fail. Clarke, in his hydrometer, which was invented about the year 1730, fixed the strength of proof spirits on the stem at the specific gravity of 0.920 at the temperature of 60 degrees. This is the strength at which proof spirit is fixed in Great Britain by act of Parliament, and at this strength it is no more than a mixture of 49 pounds of pure alcohol with 51 pounds of water. Brandy, rum, gin, and whisky contain nearly similar proportions.

**Consumption of Tobacco in France.**

The *Genie Industriel* says that it is difficult to account for the tremendous increase, during the last few years, of the consumption of tobacco in France; but that it has increased, and that enormously, the following figures will show:—In 1830, the value of tobacco consumed was about \$13,000,000. In 1840, it had increased to \$19,000,000. In 1850, it attained \$24,000,000, and in 1857 the sum of nearly \$35,000,000 was puffed away in smoke.

**Recent Patented Improvements.**

The following inventions have been patented this week, as will be found by referring to our List of Claims:—

**LOCOMOTIVE GRATE.**—Joseph W. Pole, of Philadelphia, Pa., has invented an improvement in the grates of locomotives, which consists in a certain construction of hollow grate bars, with provision for the admission of air to be forced through them by the movement of the locomotive for the purpose of keeping them cool.

**GAS RETORT COVER.**—With this arrangement the retort can be packed by the water in the chamber or channel round its upper edge, sufficiently tight to prevent the escape of the gas when the pressure on the same is at the proper and safe degree, but when the pressure of the gas in the retort becomes too great and dangerous, instead of an explosion occurring the gas will, by means of the perforations in the periphery of the box or cylindrical cover, exert its pressure upon the water in the channel or chamber at the upper edge of the retort and displace and spill said water over the upper edge of the chamber or channel until its level falls below the safety perforations in the periphery of the cover, when the gas will have a free escape and cease to act with a dangerous pressure upon the retort. We regard this as an excellent attachment to gas retorts for family cooking ranges and portable gas apparatus, it rendering explosions impossible. It is the invention of A. Hendrickx, of New York.

**SWITCH LAMP.**—This is a signal lamp for placing upon the switches of a railroad junction. The invention consists in placing within a lantern of proper construction, glass slides of different colors, the slides being fitted in proper guides and connected with a pendulous frame—the whole being arranged so that by operating the switch lever the colored slides will be moved or adjusted by the pendulous frame, and a light of a different color thrown from the lantern at every position of

the lever, thus indicating the position of the switch. By this invention the signal lantern is rendered self-adjusting or made to operate automatically by the movement of the switch lever, and accidents which have hitherto occurred by the negligence of the switchman in not moving the switches will be avoided, for the engineer will be able to see at once the position of a switch. S. N. Lennon, of Deposit, N. Y., is the inventor.

**PAPERMAKING MACHINE.**—Thomas Lindsay, of Westville, and Wm. Geddes, of Seymour, Conn., have invented some improvements in the Fourdrinier papermaking machine, the objects of which is to vary the width of the paper while the machine is in operation and during the process of manufacture. The invention consists in having the "lip" or basin which conducts the pulp from the endless wire apron constructed in two parts, so arranged that one part may slide over the other, and having said parts connected with the "deckles," which, as well as the "deckle straps" are, by a novel mechanism, rendered susceptible of lateral adjustment. The "deckles" determine the width of the pulp on the wire gage apron, and consequently determine the width of the paper, and as the two parts of the "lip" or basin which conducts the pulp to the apron, are connected to the "deckles" one to each, the two parts of the "lip" or basin will be removed simultaneously with the "deckles," and consequently expanded or contracted in width so as to correspond with the width or space between the "deckles." A novel way of adjusting the usual gage for distributing the pulp on the endless wire apron is also employed. These improvements have been patented in England.

**GAS REGULATOR.**—There are many gas regulators, the opening of whose valve is controlled by the pressure of the gas on an inverted cup floating in a basin of quicksilver, and this invention relates to that description. It consists in the employment, in regulators of that arrangement of a regulating valve of the form of an inverted cup, having apertures in its sides, and dipping into the quicksilver which constitutes the valve seat, this valve being applied to the outlet passage of the regulator, and so connected with the inverted cup by a lever, and the arrangement of the inlet and outlet passages being such that as the street pressure or number of burners in use varies, the valve is caused to dip more or less deeply into the quicksilver, and more or less submerge its apertures, and thus regulate the amount of opening of the valve to supply the gas at all times at a uniform pressure to the burners. The inventor is J. H. Powers, of Newark, N. J.

**MILK CLOSET.**—E. H. Nash, of Westport, Conn., has invented a new and useful milk closet or house, the object of which is to provide a cheap and portable device, one in which a large number of milk pans can be placed in as small a space as possible, and in a very expeditious manner, the device being so arranged as to allow the air to circulate freely through it, and at the same time obstruct the sun. The invention is designed for those who have but a very small dairy, too small to warrant the building of an expensive milkhouse, and also for those who at times have a supply of milk greater than can be kept in the permanent milkhouse. The inventor has assigned three-quarters of his invention to Wm. Wood, of the same place.

**IMPROVEMENT IN BRIDGES.**—This invention consists, firstly, in a certain mode of arranging and combining the string pieces or chords, the main and counter braces, tension-rods and counter tension-rods, and bearing blocks, whereby the inventor—Mr. Albert D. Briggs, of Springfield, Mass.—produces a truss frame capable of sustaining any required load with less material than is required with the common mode of arranging and combining the parts. It consists, secondly, in a certain method of increasing the bearing surface for the bearing blocks, against which the braces abut in truss frames.