

Science and Art.

Percussion or Fulminating Powder.

If the word "diabolical" can be properly applied to any substance that chemical artifice has produced, it certainly belongs to this, which, from the terrific power and force of its explosion, truly deserves that title.—The extraordinary power of fulminating mercury, or, as it is commonly termed, percussion powder, prohibits its use as a projectile, because we have not yet made any cannon capable of withstanding its force, if fired in any quantity at once. Sufficient to project a ball or a bomb-shell would completely shatter a cannon on the instant of explosion. It is a strange mixture that produces fulminating powder—such a combination as none but a true chemist would think of making. Fulminate is prepared with nitric acid (extracted from saltpetre,) alcohol (that is, spirits of wine,) and mercury. These substances are the representatives of the atmospheric, the botanic, and mineral portions of the world; and although they are here united, they have but little affinity to each other, and are only waiting to fly asunder at the slightest call. The fall of a feather upon pure fulminating powder will sometimes cause it to explode. We would describe the method of its manufacture did we not fear to do so, lest some of our ingenious readers should attempt to produce it. None but persons of the greatest experience should ever touch it. Not long ago the principal operative at Apothecaries' Hall, a man extremely cautious, and of profound experience, was shivered to pieces while drying an ounce of it. As a means of igniting gunpowder, it has proved in warfare of great service, as it adds to the force of the powder. Eight and a half parts of powder fired with percussion caps, are quite equal in force to ten parts of gunpowder, fired in the old way by means of the "pan and flint." One ounce of fulminate is more than enough for charging a thousand caps. In charging the caps, the fulminate is mixed with a quarter of its weight of water and half its weight of gunpowder; the whole is then ground together with a wooden muller upon a marble slab. Percussion powder, like gunpowder, owes its terrific force to the concentration into a solid form of the elements of air in the immediate juxtaposition of combustible materials, which, when fired, assume instantaneously the air shape and bulk, which is, by the heat developed at the instant of explosion, fearfully increased in size. All substances that contain a great deal of oxygen will "explode more or less when in contact with combustibles, although not included in the category of warlike stores." Thus, at Gateshead, during the late fire there, dreadful explosions took place, although no gunpowder was present. Some of the warehouses contained vast quantities of nitrate of soda, a substance of similar composition to nitrate of potash (saltpetre). The naphtha and the sulphur being mixed with this, formed a compound precisely similar to, although not identical with, gunpowder. Chemists are, however, acquainted with many substances far more explosive than fulminate, such as chloride of nitrogen, a pound of which would annihilate the strongest fort in the world. By the time the chemists have taught us to control this frightful power, let us hope that the peace of nations will have rendered it useless.

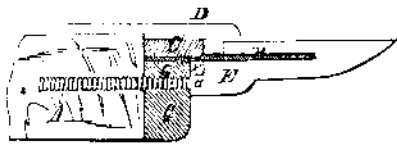
SEPTIMUS PIESSE.

London.

Warming Cities.

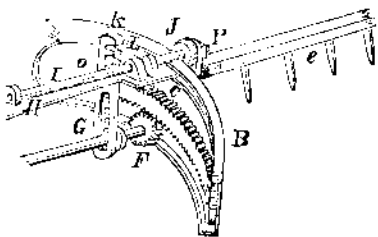
A French journal, *L'Amides Sciences*, points out to speculators an invention, for which he gives credit to the Americans. It is proposed, they say, to found a city in the United States with the streets warmed from below, so that the snow shall melt as soon as it touches the soil, the rain will evaporate, and the inhabitants will always enjoy a mild temperature. The method to be employed consists in carrying the smoke of all the chimneys into the drains, from which it will pass to a great hollow pyramid, erected with-

out the city, and its motion upward will be excited by a powerful steam engine. Though the editor of the *Amides Sciences* calls this a Yankee project, he states at the same time that the remarkable idea of it was first started by a Mr. Jobard, of Brussels; but in this he is mistaken, as we are acquainted with its author, and it was proposed to us about ten years ago.

History of Reaping Machines.—No. 24
Fig. 49.

On the 21st Jan., 1854, Aaron Palmer, of Brockport, N. Y., and S. G. Williams, of Janesville, Wis., obtained a patent embracing two claims relating to the rake and the reel. One for the means of moving the rake on the platform by a double curved rack and pinion on the driving wheel axle. Also a method of hanging the reel to dispense with a post or reel bearer next to the standing grain, (see page 163, Vol. 9, Sci. Am.) We notice this claim in its regular order, according to date, but are preparing some engravings to better illustrate the invention, which we shall publish in a week or two. On page 203 same volume, is the claim of the patent issued to Solyman Bell, of Marseilles, Ill., on the 28th of February, 1854, which has for its object the prevention of clogging the cutter, as shown in this section view through the guard, fig. 49. E is the guard, made with a screw shank, to pass into the bar, G. a is a recess in the guard; the bar, G, forms one side of this recess or score. B is the sickle; there are zig-zag teeth rivetted to the bar, C. A is the stock and D is a bracket fastened to the stock, and the sickle is traversed in the usual manner. A series of pins, F, are placed on the underside of the cutter, so that when the sickle is moved back and forth they will remove any leaves or stalks in the recesses or scores, a, and thus prevent choking. The claim is for the pins in combination with the recesses or scores, a, in the guards, to remove any leaves, &c.

FIG. 50.



On page 249, same Vol. Sci. Am., are two claims of a patent granted March 14th, to Daniel S. Middlekauf, of Hagerstown, Md., for a rotary cutter, embracing the rotary cutters with their edges passing one another; also the combination of the reel and an apron for supporting the grain in an inclined position. On the 21st of the same month, a patent was issued (dated Sept. 21st, 1853), to Henry Green, of Ottawa, Ill., embracing three claims; one for having the back of the sickle shaped zig-zag, the angle of which presses back the substances which collect upon the fingers, to prevent choking. Second, extending the rear ends of the sickle teeth behind the sickle bar, and having them sharpened to cut off stalks, &c., that might collect on the fingers. Third, terminating the sickle stock at the inside of the rail, and fastening them together, so as to permit the sickle and stock to travel near the ground, and parallel with it, while the back of the carriage is so high as to clear the grass or grain of the previous swath, (see claims page 227, Vol. 9, Sci. Am.) On the same page is the claim of the patent granted to P. H. Kells, of Hudson, N. Y., for a method of hanging the cutter bar to make it conform to the surface of uneven ground. On March 28th, 1854, a patent was granted to B. G. Fitzhugh, of Frederick, Md., embracing four claims, relating to the improvement of the blade in the fingers; a curved reciprocating knife, fingers, and platform; a reel with curved beaters, and a revolving reel, with a revolving sweep rake, to dispose the grain

upon the platform with its stalks converging to the axis of the rake, (see page 235, Vol. 9, Sci. Am.) On the same page is the claim for a patent granted to J. Cook, of Enon, Ohio, for a device to force the unbound grain from the table, in combination with an arm at the end of the reel and apron, to carry the grain from the platform to a receiving table, and then deposit it on the ground in bunches for binding. On the same page are two claims of a patent granted to Wm. H. Seymour, of Brockport, N. Y., and relates principally to mechanism for traversing, raising, lowering, and holding the rake, as shown in fig. 50, where the rake is represented by e. The operating mechanism consists of an endless rack, C, arranged on a curve whose center coincides with the swivelling center of an universal joint at the extremity of the shaft of pinion F. The pinion is held in gear with the rack by means of a stirrup, G, which permits the pinion shaft to rise and fall so as to pass above and below the rack alternately. The stirrup, G, is pendant from a vibrating arm, H, the outer end of which is supported by the run guard. The arm, H, carries a shaft, I, which is supported in suitable bearings, as shown. On the outer end of arm I, another arm, J, is attached, to which the rake, e, is secured. If this arm, J, is raised, the rake teeth are also elevated and held in a horizontal position, suitable for carrying them forward over the grain, when, by depressing the arm, the rake teeth are also brought down into a vertical position, and engage with the stalks of grain, carrying them off the platform. While the pinion, F, is above the rack, the rake teeth are elevated and running forward; but while the pinion is below the rack, the rake is depressed and running back. When the pinion is in the act of passing the end of the rack, in descending from the upper to the lower side thereof, the rake teeth are turned down, but when the pinion ascends again the teeth are raised. A rack, k, is mounted on the outer end of the pinion shaft; the upper end of this rack passes through an opening, o, in the arm, H, in such a manner that rack k will be carried up and down, but not turned, by the pinion shaft. Rack k gears with a toothed quadrant, L, on shaft, I, so that as the rack rises the quadrant turns upward, and elevates arm J, and with it rake e; while, as the rack descends, the quadrant is turned down and the rake is depressed. On the 18th of April, same year, a patent was granted to Martin Hallenbeck, of Albany, N. Y., embracing improvements in the fingers to prevent the sickle from clogging, (see page 259, Vol. 9 Sci. Am.) On same page is a claim for a corn harvester granted to Wm. Lapham, of Salem, Ohio.

Who Invented the Zig-zag Sickle.

MESSRS. EDITORS—On the 2nd inst. I had an interview with Hiram Moore, the gentleman who invented the zig-zag sickle. He assured me that he was the inventor in fact, and a gentleman here assures me he has a letter from Mr. Leland, recognizing Mr. Moore as the inventor. The question may now be considered settled, and the only regret is that it was not put into general use, and that the inventor did not receive his reward, and the public the benefit of it. The zig zag sickle then was invented 17 or 18 years ago, since which time five or six persons have claimed to have invented the same thing.

HENRY GREEN.

Washington, March 6th, 1855.

The Fair of the Metropolitan Mechanics Institute.

This Fair in Washington does not appear to have made a very respectable appearance this year. The *Washington Sentinel* speaking of it, says:—

"It is said that over two thousand free season tickets were issued to as many depositors. No matter how trifling the offering, it was accepted; but little or no regard being paid to its beauty, utility, or the degree of ingenuity which was necessary for its manufacture. As to the articles called 'tidies,' they were too numerous for open display, and therefore the directors strung them like fish, and hung the bunches at the window

frames. Even an old calico shoe-bag found a place in the picture gallery! where Professor Whitaker was permitted to rear a cracked plaster of Paris cast of a statue of Venus. To say the least, it is shabby, and should have had, ere this, a coat of white wash, though we should not recommend the addition of a skirt. Perhaps the display of the earthy figure was meant as a burlesque on the fine arts! If so, we have nothing more to say."

To Cure Felons.

J. V. Elliot, of Boston, assures us that it is better to steep the felon finger in a hot lye of wood ashes, than in water alone; he cured one on his finger without lancing, in this manner. The pain ceased entirely after soaking the finger for fifteen minutes.

Wire Fence.

The *Plow, Loom, and Anvil* speaks of a machine being invented by J. Nesbitt, of Lowell, Mass., which can make netting wire fence at from seventy-five cents to two dollars per rod. At such prices this fence, if good, should meet with a most extensive sale.

The Charleston Artesian Well.

This well, the deepest in our country, which continued for some time to pour out its water at the rate of 30 gallons per minute, has ceased flowing. Whether the underground supply has fallen short, or something has choked up the bore, we have not yet heard.

LITERARY NOTICES.

MINING MAGAZINE—The last number of this magazine, published by W. J. Tenny, No. 38 Broadway, this city, contains a number of excellent articles, as it always does. There is an interesting one on the Salt and Gypsum of the Preston Valley, Va., by Prof. Rogers; and another by Prof. Rankin, on the semi-bituminous coal of the Cumberland basin.

GEOGRAPHICAL AND COMMERCIAL GAZETTE—The March number of this very excellent and useful publication, by J. Disturnell, 207 Broadway, this city, is illustrated with a good map of Oregon and Washington Territories.



Inventors, and Manufacturers

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