

hind the share, and lower down, is a mold-board, which enters deeply and disturbs the sub-soil, the whole being combined with a single plow beam, and drawn in the common manner.

Improved Fish Hook.—By J. T. Buel, of Whitehall, N. Y.—The nature of this invention consists, first, in having the upper part of the shank of the hook, which is made solid or in two parts, terminate in a small barb, whereby a "minnie" can be secured upon the hook more permanently, and in a position to insure the capture of the fish so surely as he bites. Also in having the hook thus constructed, made in two parts, so as to allow of the lower barb being turned out of line with the upper one, and so constructing the upper barb that an elastic eye shall be formed by it and the shank, whereby an artificial minnie may be conveniently placed on or removed from the shank, and a natural minnie substituted for it and twisted spirally, and thus caused to spin similar to an artificial bait when in the water. Also combining with the lower barb of the improved hook, one or more minnie barbs, in a manner to form a "minnie gang," and having one of the minnie barbs turn free of the lower barb of the improved hook, so that when desirable, a spiral twist may be given to the natural minnie.

We have just received from the inventor some very substantial evidences of the practical value of his invention, in the shape of a lot of fish, caught on Lake Champlain. Among them is a specimen of the "Maskalounge," which weighs ten pounds and a quarter. He states that it is one of the finest kinds of fish known, and that in some instances they weigh as high as 45 lbs. We can fully endorse to the latter part of his statement, for a more delicious fish never tickled our palate.

Improved Seed Sower.—By George I. Bitler, of Lancaster, Ohio.—In this machine there is an ingenious arrangement for regulating the escape apertures of the seed, so that a larger or smaller quantity can be planted, per acre, as desired. The devices for adjusting the parts are very convenient. Altogether this is a good invention and merits an extensive introduction. Its use will save much time and labor to farmers.

Combined Weather Strip and Lock for Windows.—By Alfred Speer, Passaic, N. J.—Consists in providing a longitudinal groove in the bottom and top of the sashes, sill, and head piece of the frame, and arranging between said grooves a thin horizontal strip, and causing the same to enter the grooves when the windows are shut, so as to close up all cracks and render the sashes water-proof and also lock them securely. An engraving of this invention may be found in No. 12, present volume of our paper.

Cotton Gin.—By J. H. Kenyon & J. Hollingsworth, of Chicago, Ill.—This invention is intended chiefly for ginning Sea Island and other long staple cotton. It consists in the employment of toothed rollers, husk fans, and a clapper provided with a slotted bottom, and also in the employment and use of inclined passages and rollers arranged and operating so as to gin the cotton in the most perfect manner without breaking or injuring its fiber.

Machine for Making Tin Ware.—By Shepard and Stow, Plantsville, Conn.—The object of this invention is to insert the binding wire and turn the edges of tin vessels. It consists in the employment of an adjustable rotating guide, which is placed on one of the rollers of the machine; also in the peculiar arrangement of a forming roller, whereby the box, kettle, or other article to be operated upon will be fed through the machine by the rollers without the aid of the operator. This improvement effects an important saving in labor.

Electric Printing Telegraph.—By Albert J. Partridge, of Southbridge, Mass.—In the use of this telegraph an instrument is employed at every station, which is both a composing and printing instrument, and is capable of receiving communications without printing, and also of taking a copy at the station from which the communication is sent. The several instruments of the line are connected by a circuit composed of a single conducting wire and the ground. The invention combines several

very ingenious devices, which it would be impossible to describe clearly without engravings.

Improvement in Coal Stoves.—Anthracite coal is one of the best and most extensively used fuels known in this part of the country; and almost the only inconvenience connected with its employment is its tendency to form lava or clinker, which adheres to the sides of the stove, clogs up the interior, prevents proper combustion, checks the radiation of heat, &c. In ordinary stoves there is no method of extracting the clinker, except by letting the fire go out, and then removing the whole contents of the stove. Nobody wants to do this, especially on a cold winter's day or evening.

The improvement shown in our engraving consists of a supplementary grate, A, which is introduced through apertures made in the side of the stove for that purpose, above the lower grate. If the stove is full of fire, and it is desired to remove the clinkers, the grate, A, is shoved in as shown, and the upper part of the fire is supported, while the lower part where the clinkers form, may be removed by tipping the lower grate in the usual manner.



In all stoves where there is an open grate, the supplement may be thrust directly through the fire in front, and thus give the required support to the upper part while the obstructions are being removed.

The saving in time and kindling wood which this simple contrivance effects, is considerable, not to mention its great convenience. It permits a thorough removal of all clinker at any time, without putting out the fire. It is applicable to nearly all forms of coal stoves, furnaces, &c.

Mr. Benj. F. Foering, of Philadelphia, Pa. is the inventor, of whom further information may be obtained. Patented March 4, 1856.

Recent Foreign Inventions.

Gunpowder.—E. Hall, of Dartford, Eng., has obtained a patent for an improved method of sprinkling the gunpowder materials while under the milling process. Under the old system of wetting with a watering-pot the distribution of the water was not uniform, and the powder was not properly damped. Mr. Hall's apparatus consists of a pump, which slowly conveys water to a cistern above each mill, and having a series of sprinkling pipes, connected with an index nicely adjusted, and a stop-cock, to take off the supply while one is being taken off and another put on.

Portable Gas Apparatus.—Messrs. Bridges & Adams, of Westminster Road, London, have taken out a patent for an improvement in portable gas apparatuses to supply the gas econ-

omically when not more than ten or twelve lights are required. It consists of a stove with movable retorts, that when one is burned out it may be replaced with facility; a hydraulic main and tar cistern is contained in one vessel, and another vessel adjoining serves as a purifier. The apparatus takes up little more than six square feet of space, and is well adapted for houses in isolated situations, while other and larger sizes will be found equally efficient for large or small factories, railway stations, &c. The apparatus is designed for making gas from coal, consequently it requires more adjuncts than those apparatuses exhibited at the last Fair of the American Institute for making gas from resin, oil, and wood. The flexible gas holders connected with some of these is an excellent improvement for a portable apparatus over the old iron gas holders.

Ventilating Mines.—The London *Mining Journal* contains an account of a new method of ventilating mines patented by T. Coulson, England. It consists of a reservoir, or hydro-pneumatic box, placed on one side the adit level, supplied with water from a cistern on the surface. A metallic tube descends from the cistern to the vessel in the adit, and the supply is regulated by a self-acting valve. At the top of the metallic tube is a glass one, nicely regulated by a slide, by suspending which, at a certain point, admits no more water than is necessary. To draw in the largest possible quantity of air a vortex is formed, and a continuous stream of air and water varying in proportions according to the distance between the reservoirs and the hydro-pneumatic box, is conveyed from the former into the latter. Here the water and air are separated; the former escaping at the self-acting valve, and the latter being forced through a main tube, which branches off to any part of the mine. At one mine it is now working with a small stream of water, discharging more than one thousand gallons of pure air per hour, at a distance of nearly two hundred and fifty fathoms from the hydro-pneumatic box. This mine must have been abandoned, or a new shaft have been sunk, involving a great expense; the apparatus has completely resuscitated it.

Volute Springs to the Safety Valves of Locomotive and other Boilers.

The following is the substance of a paper on the above subject recently communicated by J. Baillie, and read by Robert Stephenson before the Institution of Civil Engineers, London:—

The volute spring, stated to have been invented by Mr. Baillie, the Locomotive Superintendent of the Central Hungarian Railway, was described to consist of a single plate of steel, wound spirally in a conical shape, sustaining pressure and deflection in reference to its breadth instead of thickness, and was constructed of thicker and deeper plates according to the increased strength desired. The effect attained by this form of applying steel to resist pressure, was found to be such that equal loads were sustained by one-third the weight necessary for elliptical springs of like capabilities and power. From the peculiar mode in which the rigidity and elasticity of the material was applied in these springs, although so very light, they were not liable to break, or to be injured by any amount of force if properly fitted; and the experience of upwards of seven years had proved that they were very economical for all railway purposes. The same experience had proved the unsuitability of india rubber, or other substitutes for steel, for mechanical application, where great wear and tear had to be sustained, whilst the elliptical form of spring had many disadvantages, which were obviated by the direct action, the compactness, and the elasticity of the volute; and the saving effected by their adoption was not only in the first cost, which was great, but also in repairs, owing to the simple construction and application of the volute; whilst, in addition, much of the iron-work necessary in fitting ordinary springs was saved.

It was stated that the volutes had been adapted not only to an immense number of locomotive engines, both abroad and in England, but also to tenders, wagons, tracks, and carriages for bearing, buffer, and traction springs, and in all cases with decided advantage, as to space and durability, over the or-

dinary elliptical springs. They were also now beginning to be employed as auxiliary springs for common road carts and wagons; and they were proved to be very valuable for many kinds of machines liable to sudden pressure, such as any unyielding substance passing between rollers, which would otherwise almost inevitably be fractured.

Concurring in the almost universal opinion of the inadequate dimension of the safety valves being the most fruitful cause of explosion, and at the same time appreciating the practical difficulties attendant upon increasing the number or the area of the ordinary valves, with the present system of weighting them, Mr. Baillie determined to try whether a safety-valve of large area could not be conveniently and steadily held down by a number of volute springs of known power; this appeared to act extremely well, and in order to test the new system, in comparison with the ordinary method, a safety-valve of 12 inches diameter, held down by seven volute springs, was adapted to a locomotive boiler on which there was also an ordinary valve of 3.6 inches diameter, weighted with the usual lever and spring balance. The boiler possessed an area of heating surface of 890 square feet; but lest the cylinder should take too much steam, the engine remained stationary during the experiments, and the fire was urged by a constant jet of steam, of 1.2 inch in diameter, into the chimney. The two valves were equally weighted to a pressure of 64 lbs. per square inch. The large valve was then fastened down, and in four minutes the pressure of the steam had increased to 105 lbs. when the small valve had risen 1.2 inch, and the experiment was stopped, as the valve could not discharge the steam so fast as it was generated.

The small valve was then screwed down, and the large valve was set free; in four minutes the pressure had only increased from 64 lbs. to 76 lbs. per square inch, or 12 lbs., when the valve rose 1.24 inch; and although the fire was powerfully urged for upwards of half an hour, the pressure of the steam could not be raised beyond 76 lbs., as the large area of the safety-valve allowed all the steam that was generated to escape freely.

These experiments were considered so satisfactory, that the system of using volute springs for the valves had been generally adopted for the boilers of the locomotives of the Hungarian and Austrian Railways, upon which Mr. Baillie was engaged.

Tanneries and Railroads.

Since the opening of the Erie and adjacent railroads, extensive tanneries have been established along the lines in localities where bark can be obtained in largest quantities and at least expense. A tannery of the largest class makes sad havoc with timber, using up, on the average, nearly a square mile of hemlock trees per annum. The amount of bark consumed every year by a first class tannery, if estimated in cords, may be set down as not less than 6,000. Each acre of woodland produces from 8 to 25 cords of hemlock bark. It was formerly found necessary to locate tanneries by the side of some stream of water of sufficient motive power, to drive the machinery for grinding the bark, rolling the leather, &c., but steam engines are now extensively used, and the spent bark which was once considered an encumbrance, furnishes them fuel. Furnaces have been and are now used for burning the wet spent bark, and some of these, it is said, operate well; but it has always appeared to us that the only way to economise the spent bark was to sun dry it, and then employ it for fuel. Solar evaporation costs nothing, whereas the water in bark absorbs a great deal of heat in the furnace to drive it off in the state of steam. There are now some large new tanneries in Oswego County. The northern shores of Oneida Lake contain much fine hemlock timber, the bark of which is excellent for tanning. But it appears to us that our tanneries should now be devoting some attention to the cultivation of some shrubs for tanning purposes, the annual crops of which would be sufficient for their business. The hemlock and oak forests are fast disappearing, and when they are gone the tanners must seek some substitute. Young blackberry bushes ground up fine are excellent for tanning fine calf skin for upper leather.