

Courage, Ingenuity, and Perils of Firemen.

The perils to which firemen are frequently subjected and the courage with which they are faced are scarcely inferior to the dangers met with and courage evinced by brave soldiers on the field of battle. If statistics were carefully compiled, we think the loss of life and personal injuries sustained by the trained corps that by day and night guards this city from conflagration would more nearly approach the proportion usually killed and wounded in active military campaigns than we could easily believe. They are a noble, though a small army, which yearly gains respect from our citizens; and they often perform heroic deeds that merit a higher reward than the praise bestowed by the chronicler who records the story.

A rare instance of the exercise of great ingenuity under circumstances of great personal danger occurred in a recent fire in this city, an account of which we transcribe from a leading daily:

A portly man was imprisoned by fire and smoke in the fifth story, and there were no ordinary means of reaching him. The adjoining house was smaller, its roof reaching about half way between the fourth and fifth story windows of the burning structure. A fireman reached this roof with a small ladder. He then slid down the ladder until he could get into the fourth-story window, but he found it impossible to ascend to the fifth floor. Then he put the short ladder on the window sill and held it flat against the building, so that it would reach to the story above, and on this support the man whose life was endangered descended. The men were now together, but not out of danger. The ladder was next put with one leg on the sill, but aslant, so that it would reach over to the roof of the adjoining house. Held in this position by the fireman at one end and volunteer assistants at the other, it formed a very dangerous but, as it proved, successful means of escape for the citizen whose life was endangered. The fireman was now left alone, but escaped by the same path, trusting entirely to the grip of the men at the top of the ladder. All this was done at the height of thirty or forty feet from the stone sidewalk, in the midst of excitement attending a great fire. The man who does such work with the necessary quickness of invention and cool bravery deserves something better than the mere wages necessary for his existence, with the chances that, if injured or disabled in the service, he will be discharged as useless.

SLATE PENCIL MACHINE.

It is easier for the schoolboy, with his innate inquisitiveness, to ask how slate pencils are made than it is for the boy of larger growth to answer; however, the machinery employed in making slate pencils is very simple, and the process will be readily understood by studying the annexed engraving.

The bed of the machine has a series of diagonal slots, in which multiple knives, shown in Fig. 3, are clamped by set screws. These knives differ in form and in the size of their curved cutting edges, and the smaller knives succeed the larger ones in acting on the slate blanks.

Opposite the cutting edges of the knives there is a groove adapted to slides capable of carrying blanks, from which the pencils are made. At the receiving end of the machine a frame arranged to slide lengthwise of the main frame is pushed forward by a cam and drawn backward by a weight.

The slate blanks from which the pencils are made are brought to a uniform thickness and length, and are placed on the slides, and put in the machine, one at a time, as the sliding frame falls back.

When the cam pushes the frame forward the slate blank is pushed through the first set of knives. When the next blank is pushed forward in the machine the first one is pressed beyond the second set of knives, and so on. When the blanks emerge from the machine after the first cutting the pencils are half formed.

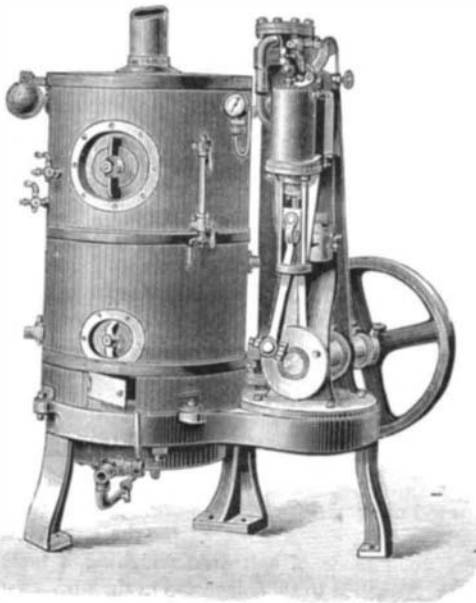
The blanks are reversed and again put through the machine, when they are separated, and the finished pencils are delivered in a receiver at the end of the machine. This machine is the invention of Mr. J. C. Richards, of Brooklyn, N. Y.

Remarkable Locomotive Explosion.

On the night of the 23d of January, 1881, a freight engine on the Philadelphia and Reading road was sent out from Palo Alto, Pa., to bring in a train of loaded coal cars from a siding. An hour later the engine was found a mile beyond the siding with all the crew—engineer, conductor, and two brakemen—dead and terribly mutilated. The boiler had exploded, tearing the engine to pieces and killing all the men. As the explosion occurred in a very lonely place and all the men were killed, no details are known.—*Railway Gazette.*

ENGINE WITH GAS-FIRED BOILER.

The annexed engraving, which we take from *Iron*, illustrates a useful vertical engine combined with a gas-fired boiler, which was lately exhibited at the Agricultural Hall, Islington, for the first time, by its designer and manufacturer, Mr. E. S. Hindley, of Burton, Dorset, England. The engine is self-contained, occupies a very small space, and works without vibration, all the parts being strong and well proportioned. It can be supplied separately from the boiler, and either thus or in the combination which we illustrate is

**ENGINE WITH GAS-FIRED BOILER.**

reported to do excellent work. The boiler contains a large number of brass tubes running the entire depth from top to bottom. The gas is burned in a chamber below mixed with air, the burner being so constructed that any one or more can be lighted so as to vary the consumption to the power required. No attention is required besides occasionally regulating the feed-water cock; steam is raised in about thirty five minutes, the boiler is neatly lagged with mahogany, and there is a feed-water heater supplying not only the boiler with water at over 200°, but supplying a large quantity of

cases where, without it, filling or recrowning would be impracticable. The patent covers broadly the use of hollow pivots with central removable stoppers for dental purposes.

Mr. Charles J. Schumaker, of Alleghany City, Pa., has patented a novel puzzle-game board, which consists in a sheet or board having twenty-one numbers arranged in the form of an octagon, which numbers are connected with each other by a series of rectangular and radial lines. Each number is provided with a pin, and to solve the puzzle all the pins must be taken out by one pin, by means of jumping over the others upon vacant numbers, and when the last pin is taken the player's pin must jump into a number that has been previously designated.

Mr. John F. Hoffman, of Cincinnati, Ohio, has patented a new paint for application to tinned roofs and other structures exposed to the weather. The ingredients are light dead-oil of coal tar obtained by distillation and treated with quicklime, rosin, and asphaltum, melted and mixed by heat in certain proportions.

Mr. Henry Textor, of Brooklyn, N. Y., has patented an improved sewer trap which will prevent the flow of back-water, and which cannot become clogged by sediments or floating matter. A hemispherical or cup-shaped vessel is connected with the sewer and provided with a cup-shaped strainer containing a hollow metal float which is raised by back-water and pressed against the lid of the vessel. The latter is provided with a central aperture and is covered by a strainer held down on the vessel by a removable screw clamp. An opening provided with a screw plug serves for cleaning the trap.

Mr. Henry B. Sherwood, of Westport, Conn., has patented a tool handle for hand-weeders, currycombs, and various other tools, which is firm, strong, and durable. The wood handle is formed with a transverse borehole and two grooves leading therefrom to the end, upon which is placed a ferrule. The wire shank is passed through the hole and bent down into the grooves, in which the ferrule holds it securely when applied. The ends of the wire are then spread apart and may be secured to the tool by riveting.

Mr. Henry D. Starr, of Texana, Texas, has patented an improved bale-tie buckle, so constructed that the bale can be easily and quickly tied, and it will hold securely. The buckle is made of a plate having four transverse slots formed therein, thus forming five crossbars, and having the second bar rounded or thickened to adapt the buckle to be hinged to one end of the tie, and also having its fourth bar stamped into a loop form to receive the other end of the band.

Mr. Edward P. Haff, of Brooklyn, N. Y., has patented a razor strop so constructed as to present on one side a fixed oval strop, and on the other a flexible strop the tension of which may be regulated.

Mr. John A. Moore, of Woodville, Tenn., has patented a combined cotton scraper, chopper, and cultivator, so constructed that the cotton will be scraped, chopped to a stand, and dirtied at one passage along the row, and which can be adjusted to work closer to or further from the plants and at any desired depth in the ground.

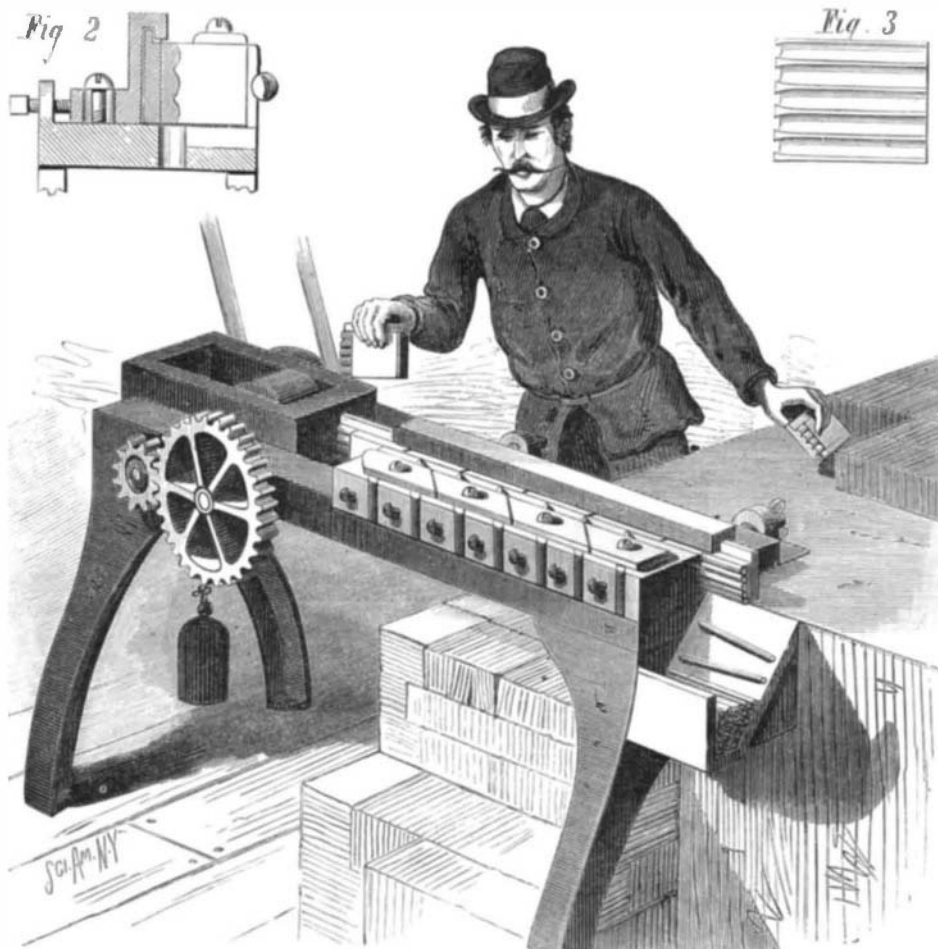
Mr. Frederick W. Jackson, of Watkins, N. Y., has patented a wall paper exhibitor by means of which any number of samples can be exhibited rapidly and advantageously. An endless carrier is formed of a close series of slats movable in guide grooves. The slats to which the samples are attached are provided with studs which are engaged by a median spur wheel for turning the series. The samples are displayed upon an inclined apron.

Mr. Edward Barnard, of Rome, N. Y., has patented a quarter boot for horses, which, being an improvement on an invention for which he obtained letters patent No. 237,157, dated Feb. 1, 1881, causes the quarter boot to fit the heel of the hoof more closely and to keep in place better, and at the same time gives the article a neater appearance.

Mr. John B. Shaffer, of Kearney, Neb., has patented a well bucket so constructed that when lowered into the water it will readily fill, which holds the water securely while being raised and when standing in the spout, which can be readily emptied in part or wholly, and which is simple in construction and easily repaired.

Messrs. Charles Tyrell and Edward Kearns, of Norwalk, Conn., have invented an improvement in hat-pressing machines, which provides for more accurate and convenient adjustment and regulation of the pressure in machines for pressing hat-bodies, and which much increases the range of adjustment. The construction is simple and well calculated to secure the ends sought.

Mr. James Hill, of Providence, R. I., has patented a jappanning oven, in which a novel construction and a blowing apparatus connected therewith secures a uniform temperature of the air throughout the oven while baking the articles to be jappanned.

**MACHINE FOR MAKING SLATE PENCILS.**

hot water besides for other purposes, and which costs nothing to heat. This renders it valuable for many trades requiring hot water, and also in stables. It is so safe from risk of fire that some of them are at work in the midst of hay and straw—cutting chaff, etc.

MISCELLANEOUS INVENTIONS.

Mr. Philip A. Palmer, of Chicago, Ill., has patented an improved means for treating teeth, and for preserving work done upon a tooth while permitting access to the pulp cavity for treatment. It consists of a hollow screw, into the outer extremity of which a smaller screw is inserted, which can be removed to permit access to the pulp cavity and replaced. Teeth may be filled or recrowned by the use of this device in