

New Inventions.

Life-Saving Apparatus.

The following narrative of the recent loss of the schooner *Echo*, on the Jersey shore, near New York, contains a very clear description of the nature, value, and mode of operating various contrivances for saving life in cases of shipwreck. It is seldom that they are employed with such successful results as in the present case. The narrator says:

"When the schooner struck, the crew sprang into the rigging—the last resort for life—and calmly awaited the moment when the vessel's breaking up would give them an opportunity of being drifted ashore on the spars or timbers of the wreck. Hour after hour passed away, and daylight came with no prospect of succor. The cold was intense, and all the seamen were more or less benumbed with the cold. At daylight it was discovered that one of their number, the cook, was missing. He could not be seen anywhere, and it is presumed he must have fallen off the rigging or have been swept overboard when the vessel struck the bar.—Seven, eight, nine, ten, and even eleven o'clock arrived, but no signs of assistance could be discovered by the unfortunates. Seven hours was spent in hanging to the bare rigging, with the sea at times making a clean breach over them.

"About 11 o'clock Capt. Jennings discovered the position of the unfortunate men as they still hung clinging to the rigging. He at once started a posse of men to their relief who arrived at the scene of disaster—distance six miles—about 12 1-2 o'clock, P. M. The wreck then lay about 75 or 100 yards from the shore, and as the sea was running very high at the time, the wreckers momentarily expected to see some of the poor fellows washed off before the life-saving apparatus could be procured for their relief. The mortar was procured from station house No. 15, and the line being attached to the ball, the piece of ordnance was fired off toward the schooner; but, alas! the wire was rusted so badly that it snapped in two like a reed, and the ball fell into the water a short distance between the wreck and the shore.

"Another attempt was made to shoot the line to the schooner, which resulted to the entire satisfaction of all concerned. The ball was thrown across the bows of the vessel, and the line alighting on deck was eagerly grasped by those on board and made fast to the rigging. A hawser was then attached to the line by those on shore, and after a great deal of labor it was dragged through the surf, and properly secured on board the schooner. It was then fastened to a stake on shore, and being made as fast as circumstances would permit, a small life-boat was slung on it and dragged to the wreck by those on board. Into this the shipwrecked sailors crawled, and they succeeded, one by one, in reaching the shore. The situation of these men had been viewed by the residents of the shore for miles above and below the scene of the incident, who, with telescopes, witnessed the sufferings of the mariners as they hung, in the struggle of death, to the frail rigging of the ill-fated vessel."

[The life-boat mentioned consists of a small vessel closely decked over. It holds two persons only, who get inside, and are locked up water tight. This boat can be drawn through the surf and under water without injury to the occupants; the air within is sufficient to sustain life for the few minutes required to pass from ship to shore.

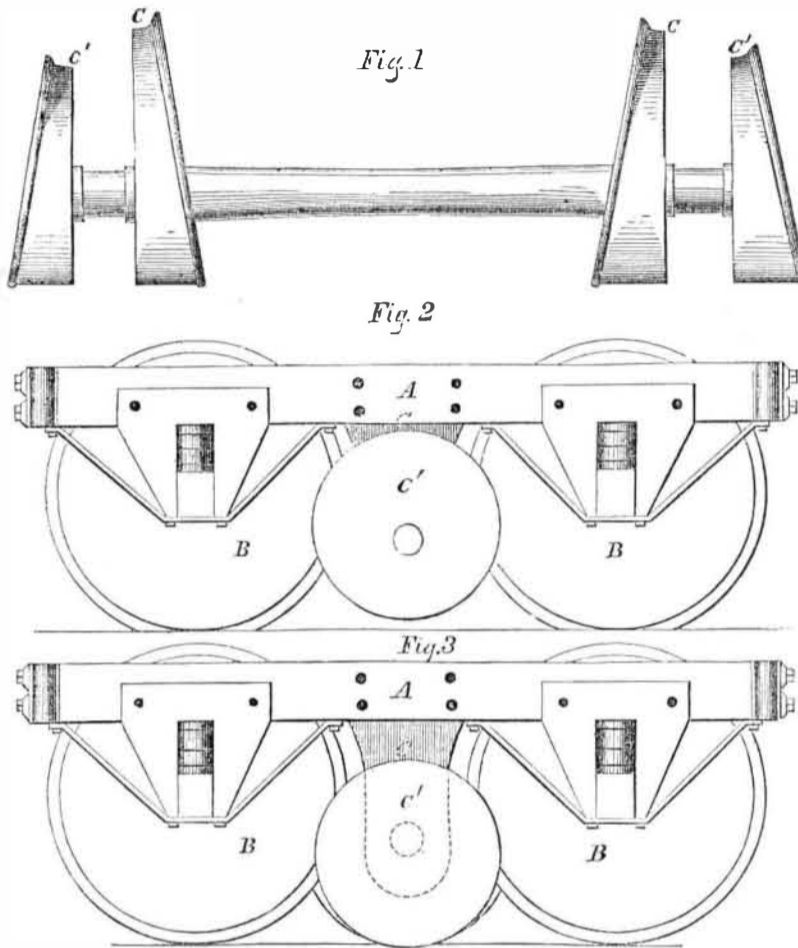
Austrian Electric Apparatus for Blasting.

A report has been laid before the Austrian Academy of Sciences by M. Ebner, Major of Engineers, on the subject of employing electricity, or voltaism, for the purpose of exploding mines of gunpowder, or blasting in stone and slate quarries, and other engineering operations. The former is preferred in the report, because the amount of effect of the voltaic battery depends on the quality of the conductor through which it acts. The apparatus employed by the Austrian Corps of Engineers consist of two disks, 12 inches in diameter, and the charge is made by merely placing a point between the plates. The conductor con-

sists of soft brass wire, and each apparatus is furnished with 12,000 feet of plain wire, and 2400 feet of insulated wire, being coated with gutta percha. The explosive substance employed is a mixture of sulphur, antimony, and chloride of potash, which can be made with ease in the form of a cartridge, and placed at any part of the conducting line. With these machines explosions have been effected at a distance of a German league and a half; and 50

mines discharged, simultaneously, on a line of 100 fathoms. Under water explosions have been effected at 400 fms. distance, the conductor extending to the length of 500 fms., and the effects totally independent of season or weather. They have been in use at the marble quarries near Nieustadt for two years without the loss of a single life, and numerous discharges have taken place in the Danube, for clearing the navigation.

APPARATUS FOR REPLACING CARS UPON THE TRACK.



The accompanying engravings illustrate a novel invention by Mr. F. L. Bailey, of Freeport, Ind., for replacing railroad cars upon the track, when from any cause they are thrown off. The device is self-operating, and is intended to effect the replacement almost instantly, before the cars have time to stop; in other words the idea is to compel the cars to jump back again on to the rail as quickly as they came off. If, on trial, the improvement practically accomplishes this feat, it is certainly an important discovery, and the inventor will be entitled to rank among the benefactors of his race.

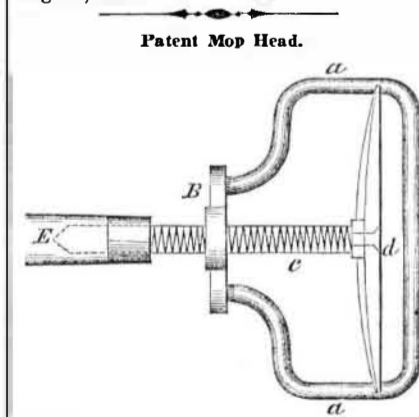
The nature of the invention consists in furnishing the car trucks with an extra axle, having on each end a pair of flanged cam wheels, as shown in fig. 1. The axle is supported by bearings between the cam wheels, and is attached to the truck, A, between the ordinary wheels, B, as seen in figs. 2 and 3. The upper portions of the cam wheels, C, are lighter and narrower than their lower parts; consequently when they are left in a state of rest, the heavier and broader parts will assume the lowest position, as shown in figs. 1 and 2; when the car wheels are on the track, of course there is no need of the cam wheels, and by reason of the greater gravity of their lower or shorter parts, they remain above the rail, out of the way, as in fig. 2. But when the car runs from the track, as in figure 3, one of the cam wheels, C, comes in contact with the rail, and revolves, bringing the long ends of the other cams down to lift the car, while the peculiar screw shape of the flanges on the cams tend, at the same time to push and pull the car sidewise to its original position. The cam wheels, C, being longer than the others, are intended to operate on the ground; the small cams, C', are expected to catch and hold their flanges upon the edge of the rail; the screw shape of said flanges, when in contact with the rail, tending to pull the car wheels to their places.

Should the device fail to operate, from any reason, before the car stops, it will be of great

service in assisting to replace the same afterwards.

The improvement appears to be a good one. It is applicable as well to engines and tenders as to cars of every description, and the expense of construction is small. It involves no special alteration in the running gear, does not interfere with the operation of the brakes, is out of the way during the period of safety, but on hand at the eventful moment of danger.

The annual loss of life and property on railroads, occasioned by cars jumping from the track, is very great; the loss of time, which is also a loss of property, for "time is money," is also immense. Any practicable invention which mitigates these evils demands attention. Further information may be had by addressing the inventor. His patent was granted Aug. 14, 1855.



The engraving annexed exhibits a simple but very useful improvement in Mop Heads, patented by Mr. Alexander Barnes, of Ashtabula, Ohio, on the 20th of Nov., 1855.

Referring to the cut, it will be seen that the mop is compressed or loosened by simply turning the mop handle, E, to which the screw, c, is attached; the screw passes through a nut piece, B, which also serves to unite the two ends of the bow, a; the mop is held between the bottom part of the bow and the cross-piece, d; this cross piece is pivoted to the lower end

of the screw, and advances or recedes from the bow, a, according to the direction in which the handle is revolved; the mop is thus compressed or released at pleasure.

Those of our lady friends who keep house, will, we are sure, be pleased with the convenience afforded by this little contrivance for cleansing their floors. The cost must be quite trifling. Address the inventor for further information.

Youman's New Chart of Chemistry.

A few years since, a Chart of Chemistry, by Prof. Youman's, of Brooklyn, was given to the public, and owing to its peculiar method of illustrating Elementary Chemistry, it met with great success, and was generally introduced into our schools and academies. For the past two years Prof. Y. has been revising and remodelling his chart, and a second edition of it has just been published—by D. Appleton & Co., this city—greatly enlarged and beautified, and bearing the marks of careful correction.

The principle of illustrating chemistry, on which this chart is based, is peculiar: it represents by colored squares, chemical atoms, and their relative quantities by weight according to their respective areas: thus hydrogen, the lightest atom, is represented by the smallest square on the map, and is of a lilac color, having as its symbol, H., and equivalent, 1. Carbon, the next smallest square, is colored black, and marked with the equivalent, 6. Oxygen, the next smallest, is colored red, and marked with the equivalent, 8. Potassium, the largest square on the map, is colored blue, and marked 39. All the simple elements of chemistry are not represented on the map, as it would take a monster one to do this, but those which form the most common and numerous combinations of salts and compounds—as fats or oils, &c.

The simple elements represented are arranged in a vertical row, then opposite these, the binary compounds which they form are arranged in a second vertical row; then the ternary compounds in a third row, and so on. Thus, for example, light carburetted hydrogen gas is represented by a group of three atoms,—two small lilac-colored squares of hydrogen and one black square of carbon,—and lines are drawn from the squares of the row of simple elements, to show how they combine to form this gas, which illumines our streets.

The chemistry of combustion is also represented by squares, illustrating the burning of a candle or gas light. A candle is composed of carbon and hydrogen; combustion is carried on by oxygen uniting with the carbon and the hydrogen, and passing off from the flame in the state of carbonic acid gas and water. It also represents the new and old views of chemists on the salt-radical theory. According to this theory "all acids are binary—the products of a radical, simple, or compound, with hydrogen, and all salts the result of a simple or compound radical with a metal." Hydrated sulphuric acid, according to the old view, is represented with three atoms of oxygen on one side of a square of sulphur and water on the other side, in the form of one equivalent of hydrogen and oxygen. According to the new view, hydrated sulphuric acid is shown as a compound radical named "sulphion," made up of four atoms of oxygen on one side, one of the sulphur combined with hydrogen.

We welcome this new map of Prof. Youman's as a valuable addition to the science of chemistry; it will be the means of doing a great deal of good by its simple and clear illustrations.

Coal in New Zealand.

Coal in large quantities has been found at Lyttleton, New Zealand, and is now selling at Christchurch, and at the plains in that province, at £5 10s. per tun. An alarm about the scarcity of fuel when the bush is exhausted of timber has now subsided. The fact that a supply of coal can be obtained at New Zealand, a steam-packet communication between Australia and Panama is now contemplated, and is a matter of considerable importance. The employment of more capital in the conveyance of coal will, it is expected, reduce the price considerably.

It would be a good plan, hereafter, for the people to elect the Speaker of the House of Representatives by a plurality vote.