Science and Art.

The Loss of the Ava.

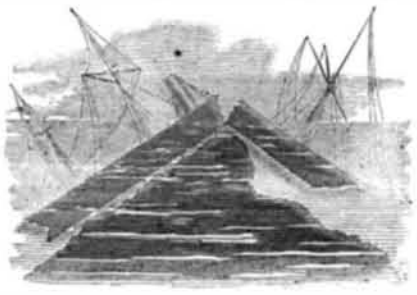
The following remarks and sketch, explanatory of the manner in which the *Ava* was lost, are taken from a new scientific journal published at Calcutta, entitled *The Engineer's Journal and Railway Chronicle*:—

"We give below a rough sketch, kindly sent us by a correspondent, illustrative of the manner in which the P. and O. Company's steamer *Ava* was lost. After striking on the rocks, she appears to have broken her back amidships, and then to have gone down.

The rock on which she struck is between Pigeon Island and the mainland, about nine miles north of Trincomalee. It is reported that a fishing light was mistaken for the harbor light, which might easily have been the case, because the latter is a disgrace to the fine harbor, the entrance to which it is intended to show.

The *Ava* had on board the only shaft in India that would fit the *Alma*. The last-named vessel, therefore, will have to wait until a new shaft is ordered, made, and can be sent out from England.

The passengers, as our readers are doubtless aware, were all saved, but suffered severe privations. Among them were several refugees, and, we believe, some of the Lucknow garrison. The greater part of the mails and the cargo have gone down with the vessel. In addition to a very valuable cargo there was upwards of £266,000 in specie on board. There is evidently no reason why, with a pro-



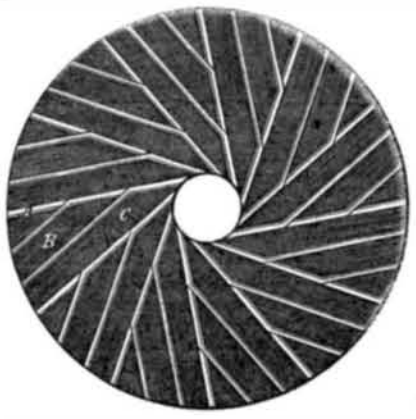
per diving apparatus, a large amount, if not all, of the specie should not be recovered. The precise spot where the vessel went down is well-known, and there is apparently no difficulty in the matter. The Peninsular and Oriental Company will certainly be very unwise to abandon the wreck without an attempt of some kind being made. If it is abandoned, it will turn out a most profitable speculation to those who embark in recovering it."

Late advices speak not only of the shaft of the *Alma*, said to be worth from £2,000 to £3,000, being recovered, but also of several boxes of specie. When the last accounts left the wreck, the work of recovery was going merrily on, and there appeared every reason to hope that the valuable part of her cargo would be saved.—*London Engineer*.

Natcher's Millstone Dress.

The improvement in the millstone dress which is illustrated in the accompanying engraving is the invention of Gabriel Natcher, of Indianapolis, Ind., and two patents were granted to him April 27, 1858, for his invention, one for the dress and the other for the tool which he employs to cut the stone.

The whole of the face of the stone being polished as smooth as possible, the tool which we will now describe is used. It is composed of one or more diamonds, inserted in a handle, and when two or more are used they are to be firmly set in a row at equal distances apart. The crack or grinding surface is commenced at A. The furrows or cracks, A and B, are produced by running the diamonds over the face of the stone by the side of a straight ruler. The curved lines, as represented at C, are made by operating the diamond by the the side of a curved ruler. The width of the space separating the lines upon the grinding surface of the stone is regulated by holding the points more or less diagonally across the line of motion. In the usual mode of dressing stones, a pick is used, which being brought down upon the face of the stone produces the stellated fracture, thereby weakening the stone as far as the fracture extends. Thus the edges of the cracks weakened by the blow from the pick soon crumble away, wearing the face of the stone as the particles thus detached are thrown out. All these disadvantages are entirely prevented by this mode of dress.



The line cut by the diamond upon a glossy surface which has never been disintegrated by a blow from a pick is clear and distinct, having its edges sharp and fine with no disposition to crumble, the cohesion being perfect up to the edge of the crack, thereby insuring a sharp corner or cutting edge perfectly straight and equal. The stone will be more perfect when dressed again upon this plan, as the diamond gets below the bruises occasioned by the old mode of dressing with a pick. The furrow is smooth, having the side upon which the grain rises a regular inclined plane. The passage of the grain to the face is uniformly checked by the lines at A, where the bran is taken off. As there is no crushing contact of the stone with the wheat, the sharp edges of cracks or small lines cutting or shaving up the grain, while no roughness or inequality is allowed although brought close together.

The flour comes from the stone with all its nutrition, as the stones run very close, scraping the bran clean without cutting it up. There is no perceptible moisture generated in the operation of grinding by this mode, and the spouts are clean and dry, because the grain is moved to the eye by the retarding curved lines until well ground, and while the motion is less rapid, and consequently less liable to heat, the pressure being the same, when, having reached the extreme of the breast-circle, it is rapidly thrown from the stone, finding few or no irregularities to retard its progress.

The inventor has sold half his interest to A. P. Orton, of the same city, from either of whom further particulars can be obtained.

Drawing Iron.

When a bar of wrought iron is broken by a weight being placed upon it, it is supposed by many persons that the remaining parts are rendered weaker than they were before, on account of the strain to which they have been subjected. This is a mistaken idea. Such pieces of iron bars are generally stronger, according to their diameter, than they were before the bar was broken. The strain to which they have been subjected, by drawing the fibers closer together, increases their density, and, as a consequence, the strength of the metal. A wire of one-eight of an inch in thickness is, *proportionably*, stronger than one twice the thickness, simply because its fibres are packed closer together by the operation of drawing.

The British Post Office.

From the report of the Postmaster General of Great Britain, as published in *Hunt's Merchant's Magazine*, we cull the following information:—Since the improvement of the letter delivery system, there has been a free delivery of 300,000 letters per week or about sixteen millions a year. In London alone, the number of places where letters can be posted has been increased by the addition of sixty new receiving houses and sixty-six letter pillars—cast iron columns set up in the street, from which letters are collected. From 1840 to the present time, the net annual revenue has increased three and a half times the amount—it is now $7,252,075—while the expenses have only doubled, being for the past year $8,604,075, and the amount of money transmitted through the Post Office in the shape of money orders was $60,901,365. All this is due to the energy and genius of one man—Rowland Hill.

Douglass' Railroad Car Spring.

This invention relates to springs of the description known as "elliptic," and consists in a novel mode of constructing and combining the upper and lower plates of the spring, whereby greater strength is obtained with a less weight of metal than is required in springs of the usual construction.

In our engravings, Fig. 1 represents this improved spring as adapted to railroad cars; Fig. 2 is a side elevation of the same, modified and applied to a locomotive truck; and Fig. 3 is a side view of a double elliptic spring, constructed upon the same improved plan, and designed for ordinary carriages.

The ends of the upper leaf, A, of the spring, are bent around bolts, B, secured in jaws attached to the truck, C, of railroad cars, or to jointed bars, I J, on which is suspended the truck of the locomotive, and the lower leaves, E, which are made of different lengths, in the same manner as the common elliptic springs are made, of a more rounding curve, so as to leave the space between the center of the upper and longest leaf, and corresponding part

Fig. 1

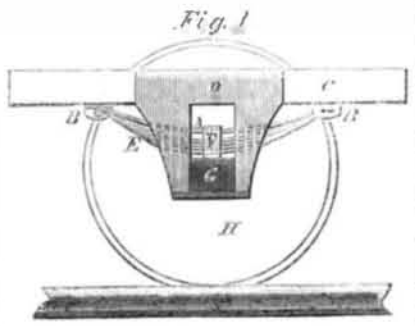


Fig. 2

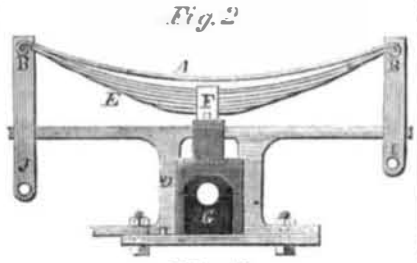


Fig. 3

of the leaf, A, when they are arranged below the same, with the ends of the upper longest leaf sprung in between, and arranged against, the rounded ends, B, of the leaf, A. The leaves, A E, are held in their places during their elastic movements over each other by the usual clips, near the ends of the lower ones, and by right-angled jaws, F, between which they are placed, which jaws are secured to the journal boxes, G, arranged between the guides, D, secured to the truck of the car or locomotive. When this plan of spring is employed for ordinary carriages, the leaves, *a b*, are arranged in the relation together represented in Fig. 3, and are connected together by joint pins at *c*.

It will be seen that the spring is supported at the center of the lower leaves, E, and receives the weight of the car or other object at or near the ends of the upper leaf, A. The tendency of the weight thus applied is to cause the plates, E, to be straightened, and this tendency exerts a tension in a nearly longitudinal direction on the plates, A *a*, so that while the plates, E *b*, yield considerably in the direction of the pressure, the plates, A *a*, though sufficiently elastic, yield but slightly, and serve to give great strength to the spring.

Springs constructed on this plan have been in operation on the heaviest tenders on the Delaware and Lackawanna Railroad for a year past, and they are found to be capable of sustaining a far greater pressure with an equal degree of elasticity, and a saving of at least twenty per cent of steel, than the ordinary construction of springs.

This excellent form of spring was patented December 29, 1857. Any further information can be obtained by addressing the inventor, George Douglass, Scranton, Luzerne county, Pa.

Habits of Grasshoppers.

A Goliad correspondent of the Colorado (Texas) *Citizen* gives some curious facts in relation to the grasshoppers which have recently swarmed in that region. He says:—

"They have an especial fondness for wheat and cotton, but don't take so kindly to corn. The only vegetable they spare is the pumpkin. The most deadly poisons have had no effect upon them; fumes of sulphur they rather like than otherwise; musquito nets they devour greedily; clothes hung out to dry they esteem a rarity; blankets and gunny-bags they don't appear to fancy. They swim the broadest creeks in safety, sun themselves awhile, and then go on. The whole mass appear to start and move at the same time, traveling for an hour or two, devouring everything in their way, and then suddenly cease, and not move perhaps for a week, during which time no feeding is noticed; and finally, they carefully avoid the sea-coast."