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"The dangers that attend the men who go down to the sea in ships and occupy their business in great waters are scarcely greater than those that await the toilers who descend into the bosom of the earth to win the mineral treasures to which this country, in particular, owes so much of her greatness. Whether it be in the mine or in the quarry, death or disablement are there awaint the unfortunates who may happen to fall a prey to them. In the case of mines, we hear too frequently of fatal catastrophes; but, strangely enough, the disasters which occur in quarries rarely find their way into the columns of the press, perhaps because each disaster is, in itself, too insignificant as compared with the wholesale slaughter of a colliery explosion. We have good reason, however to know that the annual loss of life and limb in quarrying operations is by no means trivial; unfortunately, too, a large proportion of these quarry accidents are more or less preventable by improvements in the hoisting machinery and appliances used to raise the stone when hewn to the surface of the ground.

"A large quarry, in full work, presents a considerable area of operations, and, as a rule, there is but one engine to hoist the material; this is usually placed on the edge of the quarry, at the end of the tramway, along which the stone is taken when raised. The engine is generally on the surface ground; but a sort of step or recess is cut close alongside it, and whose level is about ten feet lower; the tramway is brought to the edge of the quarry along this step, so that the lorries for the stone are beneath the engine level. In a large and deep quarry it is evident that nothing in the way of a jib-crane can be made available, and a grantry (sic) and traveler would be too expensive, even did such an apparatus give sufficient scope to reach all the area in work. Instead, therefore, of either, the following plan is adopted: A large chain is stretched from the engine-house across quite to the other side of the quarry, and there secured, but not permanently so, this end being shifted from time to time, as the position of the stone being hewn requires. On this chain a sort of carriage runs; it is something like an iron block, with two sheaves set side by side in the direction of their diameters, not of their axes. They are wide and deep enough in the grooves of their edges to run on the chain as on a rail. This block carries a real block, or what answers to one, suspended under but close to the chain; through this the rope or chain for lifting is passed.

"It will be evident that the hoisting-rope has a merely vertical action; but the block, or 'horse,' as it is technically called, gives both a vertical and horizontal motion, as the chain is most generally on a considerable inclination.

"The *modus operandi* is as follows: When a certain stone is to be raised, the chain is moved over it and the quarry end made fast. The 'horse' is run along the chain till 'plumb' over the stone. A 'toggle,' or pin, is secured in a link behind it, to prevent it moving down the slope of the chain, and the hoisting-rope is paid out and the stone is hitched on, which is raised till the lifting hook reaches the 'horse,' when it is secured to it. The engine then draws the 'horse' along the chain till the stone is fairly brought out of the quarry, and over the step already described, as well as over a lorry placed there in readiness. A 'toggle' is put into a link of the chain to prevent the 'horse' going back, the stone is lowered into the lorry, and the operation is complete.

"Any person with the most moderate knowledge of engineering must perceive that, however cheap and convenient this arrangement may be, it is fraught with danger to those working or passing beneath the chain; the very best chains, carefully tested, are uncertain affairs, even when subjected to a simple statical strain, and the strain of the main, or, as we may term it, 'gantry' chain in a quarry is not a purely statical one by any means, as the 'horse,' when it begins to move, 'jumps' over the link sufficiently to cause a considerable 'jar,' which, as a matter of course, is constantly breaking the chain, or if the hauling-chain or rope from the engine happens to break, the 'horse' runs violently down the incline of the chain, and the latter, already, perhaps, loaded nearly to its limit of strength, succumbs to the vibration, and the stone and ends of the fractured chain, in all probability, fall on some luckless workmen beneath.

"We have good reason to know that appalling accidents from this cause are common, a fact scarcely to be wondered at, seeing that there is no adequate inspection of the arrangements of quarries, and the chains and whole apparatus are of inferior quality in too many instances.

"We will proceed to sketch the outlines of an arrangement which we consider to present some advantages over that already described. The chain should be abolished altogether, and either a steel wire rope or a rail substituted. The rope would be little, if at all, more expensive than a chain, while it would be infinitely more trustworthy; less power, too, would suffice to raise the loads, as the wheels of the 'horse' would have a comparatively smooth and uniform surface to raise the loads, as the wheels of the 'horse' would have a comparatively smooth and uniform surface over which to travel. We believe a rail might be arranged made of bound iron jointed much as a gas-pipe is, the ends of the joint-sockets being rounded on their outer edges to give free passage to the wheels of the 'horse.' Instead of the 'toggle' used with the chain, to prevent retrograde movement, a 'clip' should be put on the rail (or rope) made of two pieces of iron hinged at one end, and with a coach screw at the other, each half being nearly semi-circular in the centre; this part would embrace the rail, and if screwed up tightly, would prevent backward motion, or at the worst would act as a brake if the strain were too much for it. As to the catenary formed by a chain or rope, the rail would equally well assume that curve, as if of good iron its diameter need not exceed by more than one half that of the round iron in the chain-links, and being without a weld, would be reliable to an extent such as the very best chain can never equal. This round iron rail arrangement would be far cheaper, too, than the chain. – *London Mechanics' Magazine*."