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IMPROVED HOISTING MACHINERY.

In the annexed engravings are represented a new hand outrigger or hatchway hoist, and a crane or derrick hoist, for which several valuable advantages are claimed. The derrick hoist, Fig. 1, is provided with shifting gears on the crank shaft, arranged to be operated by a hand lever so as to be thrown into or out of contact as desired, thus enabling the brake wheel on the drum shaft to be more easily overhauled. The entering sides of all the gears are V shaped. The sliding shell is also provided with a spring pin to retain it in either position by springing into V indentations in the shaft on which it slides.

The mode of using two gears, one on either end of the drum, is new, as well as the method of sliding the gears on the square shaft to connect on either side for the purpose of getting two powers or capacities of hoisting, as well as to throw both gears out of connection for rapidity in lowering.

In the outrigger hoist, Fig. 2, the advantages are that two pinion gears are employed, gearing into two large gears. As both the larger gears are bolted to the ends of the drum flanges, this relieves the shaft of all strain, as is the case usually when the large gears are applied outside and the drum inside the bearings. The use of two gears instead of one (as is usually the case) evens the strain on both ends of the drum, while if one gear should get broken the machine will not be disabled. The brake is applied very simply by a lever and shoe on the circumference of a groove in the rope wheel. It is entirely clear of the wheel when the pull on the check rope is released by means of the weight overhead. The machine, being all complete in a single iron frame, is easily erected, and its bearings are not liable to get out of line.

For further particulars address the manufacturers, Messrs. Volney W. Mason & Co., Providence, R. I.

A British Man-of-War Capsizes.

One more disaster, this time attended with terrible loss of life, is to be added to the long list of casualties which, during the last few years, have overtaken the British navy. The training ship *Eurydice*, a wooden vessel of 921 tons, was, on March 24, struck by a squall off the Isle of Wight, and almost immediately capsized and sank, carrying down with her some 400 sailors. Nothing but the grossest carelessness and bad seamanship can account for a disaster of this kind. A similar fate occurred to the ironclad *Captain*, it will be remembered, some years ago; but that was directly attributable to her low free-board and otherwise faulty construction, and her designer paid for his errors by being lost with her. For a wooden sailing vessel thus to be wrecked is phenomenal, but it is no more discredit than the ramming of the *Vanguard* by the *Iron Duke*, or sundry other events which lead to the conviction that British war vessels stand more in need of protection against the men who handle them than against the enemies they are to confront.

Iron Hail.

While examining, by the microscope, the pulverulent matter in the air, in the sediment obtained from Alpine snow, and in rain water, MM. Tissandier and Meunier recently detected among the objects attracted by a magnet numerous spherules remarkable for the geometric regularity of their form. These

were found to be identical with the similar spherules produced by burning metallic iron in air, and hence it was conjectured that whenever meteoric iron enters our atmosphere large numbers of these minute bodies are produced. This

which still further points to their meteoric origin. Not only have these metallic globules been detected in the air and water of widely separated places, but they are brought up by dredges from the sea bottom, and are found in geological strata dating far anterior to the presence of man on earth. It would appear, then, that from some early geological period a rain of iron globules has been going continuously on. It would be of great scientific interest to determine, if possible, when this iron hail began, and to what extent it has augmented the iron supply of the earth.

New Mode of Warming Railway Cars.

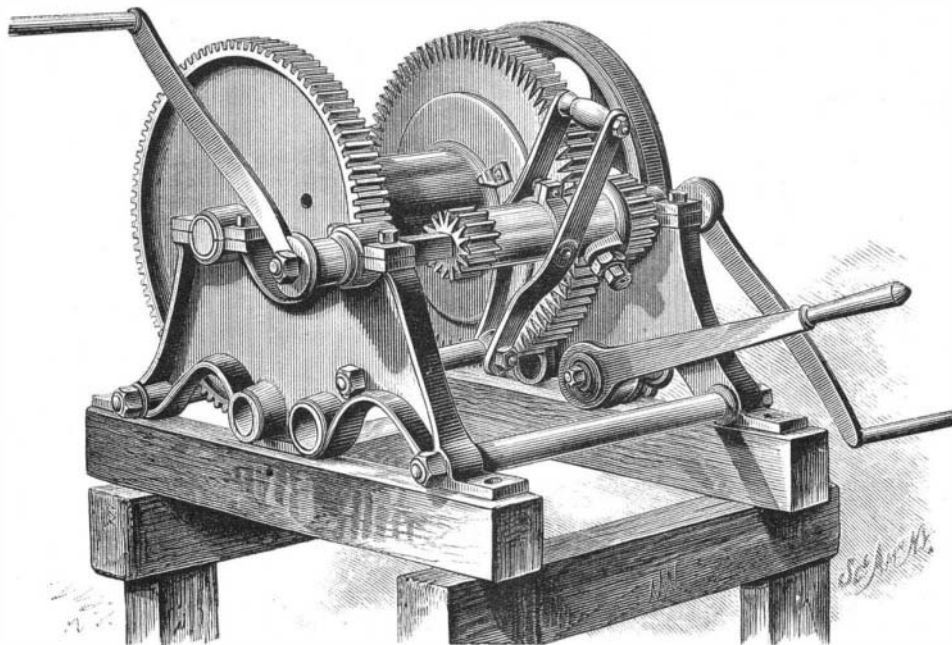
An experiment was lately made by the New York Elevated Railroad Company in the use of a newly invented apparatus for heating a train of cars by the surplus steam from a locomotive, and satisfactory results were obtained.

The apparatus consists of a chain of pipes extending through the cars on each side, connected between the cars and the locomotive by an elastic hose, wound to prevent condensation, and with couplings similar to those used for the car brakes. The dome, or some convenient steam main on the locomotive, is tapped for a small pipe, in which is a valve, by which the engineer or fireman can control the heat in the cars. Under the car body are two expansion valves to allow vent for the air when steam is first turned on, and also to allow the cold water of condensation to be freed from the pipes and to prevent freezing. The pipes inside the cars are inclosed within other and thinner pipes, and the space between the two is packed with fine dried sand.

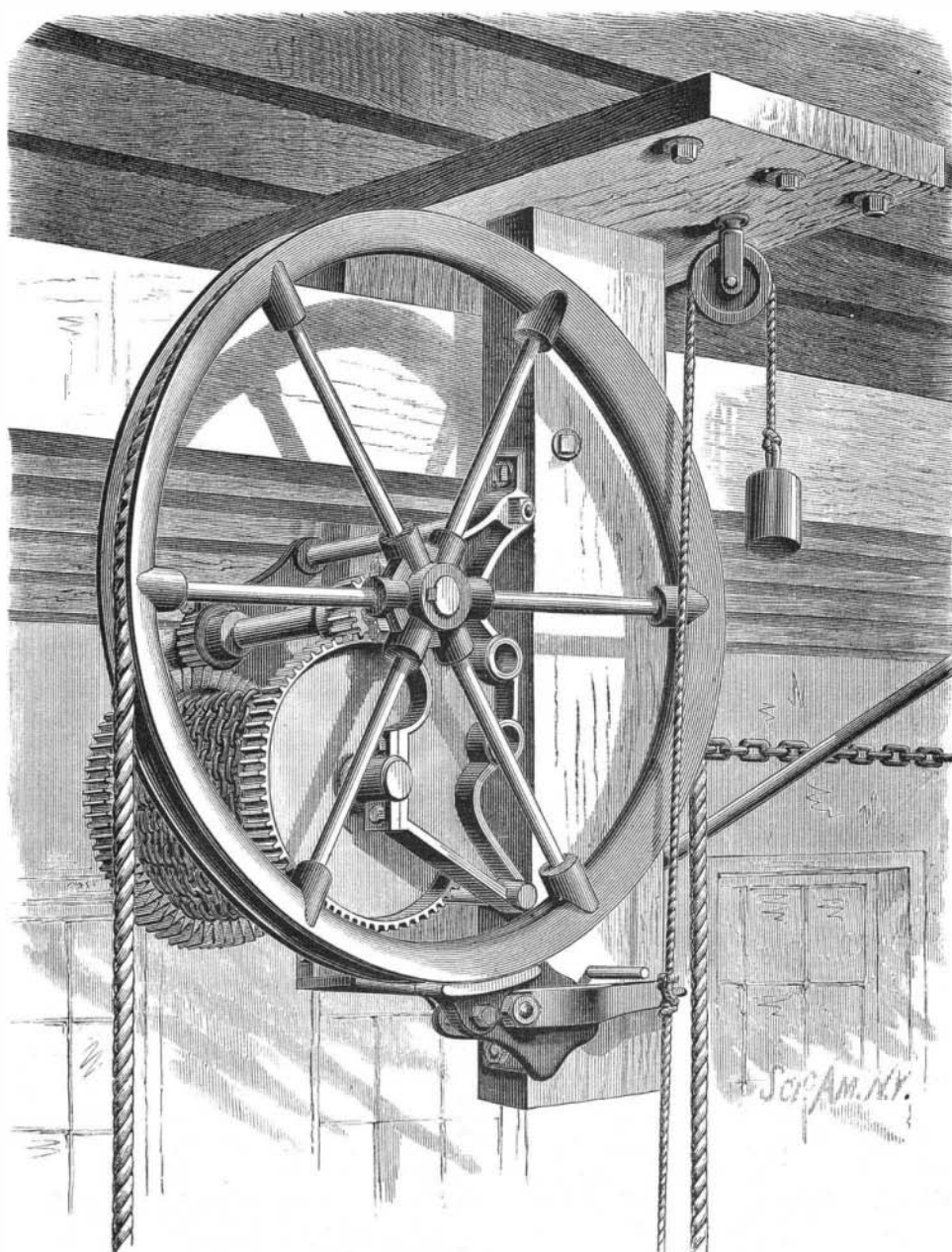
The heat from the hot steam pipes is imparted to the sand, which radiates it through the thin outer pipe. By this means the heat of 350° which is imparted to the inner pipe is given off so gradually as to keep the cars comfortably heated for two or three hours. So that by charging the apparatus before the train starts, and from time to time throwing into it the surplus steam which would otherwise have to be blown off and wasted, the necessity for stoves is obviated, as well as the danger of fire in case of accident. It is also claimed that the proper ventilation of the cars is rendered easier by this process than by the use of stoves.

Sound Colors.

At a recent meeting of the Physical Society, London, Mr. Sedley Taylor exhibited the colors produced in thin films by sonorous vibrations. A piece of thin brass, perforated with a triangular, circular, or rectangular aperture, and bearing a thin film of soap solution, was placed horizontally on one end of an L shaped tube; the beam of the electric lamp, after reflection from it, was received on a screen. It was shown that, when a sound is emitted in the neighborhood of the open end of the tube, the film takes up a regular form, which is indicated by the different colors of the reflected light, and each note has its own particular color figure; and, further, with different instruments we have different figures. Thus, when a square film was employed, a kind of colored grating was the result, which was modified by changing the note, and with a circular film concentric rings, traversed by two bars at right angles, were observed.



MASON'S DERRICK HOIST.



MASON'S OUTRIGGER HOIST.