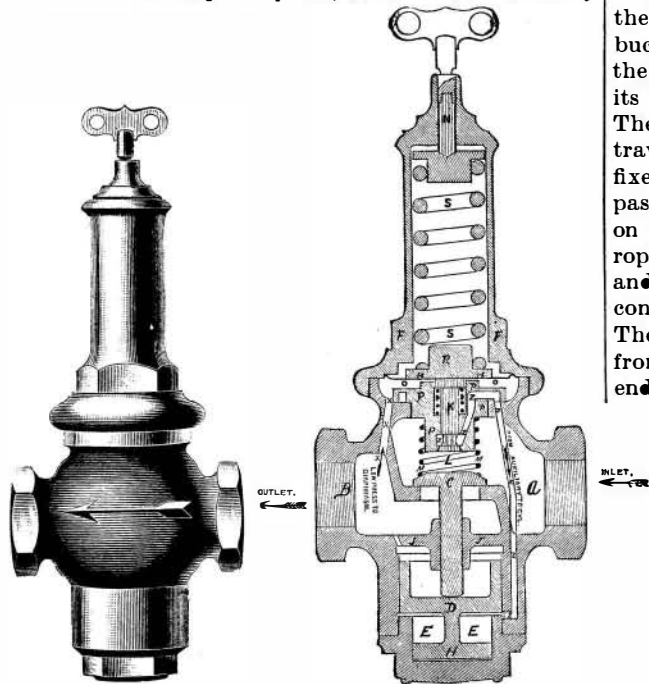


**THE MASON REDUCING VALVE.**

The accompanying illustrations represent a valve designed to automatically reduce and maintain an even steam or air pressure, regardless of the initial pressure. The principle upon which it operates is that of an auxiliary valve controlled by the low pressure, and admitting steam from the high pressure side to operate a differential piston, which is the main valve. The high pressure enters the reducing valve at the side marked "inlet," and passing through the auxiliary valve, K, which is held open by the tension of the spring, S, passes down the port marked "from auxiliary to cylinder," underneath the differential piston, D. By raising the piston, D, the valve, C, is opened against the initial pressure, since the area of C is only one-half of that of D. Steam is thus admitted to the low pressure side, and also passes up the port, XX, underneath the phosphor bronze diaphragm, OO, upon which bears the spring, S. When the low pressure in the system has risen to the required point, which is determined by

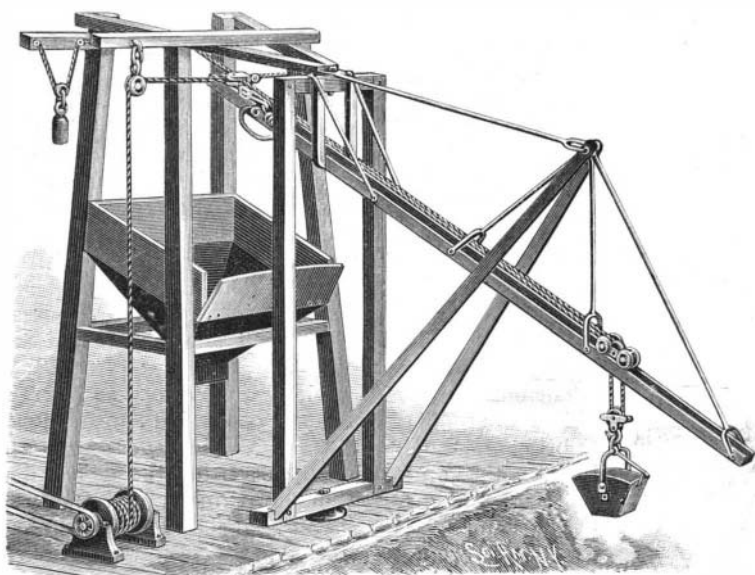


**THE MASON REDUCING VALVE.**

the tension of the spring, S, the diaphragm is forced upward by the steam in the chamber, OO, the valve, K, closes, no more steam is admitted under the piston, D, the valve, C, is forced on to its seat by the initial pressure, thus shutting off steam from the low pressure side. This action is repeated as often as the low pressure drops below the required amount. This piston, D, is fitted with a dash pot, E, which prevents chattering or pounding when the high or low pressure suddenly changes. This valve is manufactured by the Mason Regulator Company, Boston, Mass., the sizes up to and including two inches being made of composition, and above that of cast iron, with composition linings.

**AN IMPROVED HOISTING MACHINE.**

An easily operated machine, of which the boom can be swung to any desired position and held there, and specially adapted to facilitate the loading and unloading of vessels, cars, etc., is shown in the accompanying illustration. It forms the subject of a patent issued to Mr. George J. Anderson, of West Superior, Wis. The mast consists of a vertical frame having on its bottom a pin adapted to turn in a bearing on the platform,



**ANDERSON'S HOISTING MACHINE.**

which may be part of a dock, and there is a pin in the upper end of the mast frame adapted to turn in a bearing in the ends of forwardly projecting top beams of a frame erected in the rear of the mast, the latter frame having a hopper supported therein. Forwardly projecting beams of the mast frame support an inclined

boom extending rearwardly over the hopper, this boom being built of parallel beams to form a track for a carrier, and having a trip at its rear end over the hopper, while the beam is held on the mast in such manner that the weight concentrates in the lower part of the mast frame, and the latter is easily turned on its pivots. The carrier, besides the usual wheels, supports a frame, in the middle of which a pulley is mounted to rotate, over which passes the hoisting rope, secured by one end to a transverse bar of the carrier frame. The hoisting rope supports the hoisting bucket by passing under a pulley mounted to rotate in a frame carrying at its lower end a hook, the arrangement being such that the bucket is lifted out of the hold by the hoisting rope until the pulley comes in contact with the pulley of the carrier, when the latter travels upward with the bucket, and a latch connected with the bucket engages the trip to discharge its contents when over the hopper. The desired limitation of the lowest travel of the carrier on the boom is fixed by a rope attached thereto and passing upward over a weighted pulley on the main frame, the end of this rope being secured on a cleat or pin, and the weight causing all slack of the rope to be constantly taken up during the travel of the carrier. The outer end of the hoisting rope extends downward from a pulley in a pivotal connection with the upper end of the boom, to be connected with a windlass of any approved construction on the platform, and one end of the block carrying the pulley at the top of the frame, over which the rope passes, is also connected with a rope extending over a sheave and downward, to be secured to a cleat on the post at the opposite side of the frame. When the boom has been turned to the desired position, this rope is fastened to the cleat, the boom being turned to such position by pulling on this rope or on the hoisting rope.

**AN IMPROVED GRATE BAR.**

The accompanying illustration represents a style of grate bar now and for five years past in use on the Sound steamers Stonington and Narragansett, which is said to have been very economical and to have given entire satisfaction. These grate bars allow for ample air space through and between them, and always remain comparatively cool on their bottom edges, while the top surfaces become very hot, and sometimes red hot. This fact, in the case of ordinary grate bars, causes unequal expansion, which breaks, buckles, or warps the bar, a proportionate loss of fuel ensuing. In the Miller bar this expansion is allowed for by the lateral air spaces and openings on the face of the bar, whereby the bar is said to remain straight until burned down to the bottom of the openings. Further information relative thereto may be obtained of Chief Engineer John Smith, of the steamer Stonington, or Chief Engineer Wm. H. Van Wart, of the steamer Narragansett, No. 261 West Street, New York City.

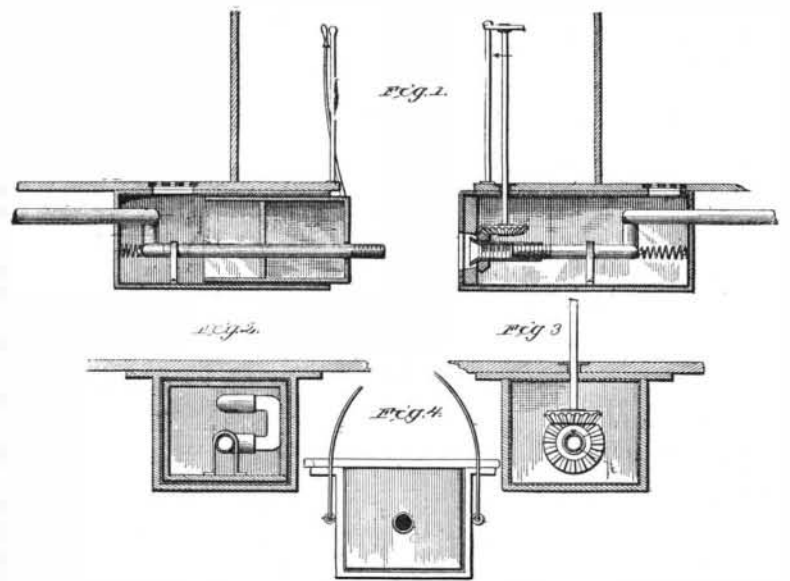
**AN IMPROVED OIL CAN NOZZLE.**

A nozzle or tip adapted for connection to the spout of any ordinary oil can, to prevent waste of oil, is shown in the accompanying illustration, and has been patented by Mr. John S. Peter, Denver, Col. (care of B. & M. R. RR.). Figs. 1 and 2 show side and end views of the nozzle, which has an interior lengthwise passage or bore, for discharge of the oil, a head piece fitted for rotation within the back part of the tube, and to which the oil can spout is fastened, and a spring held to the head piece and engaging the tube to normally turn the latter out of line with the annular passage of the hand-piece, to cut off the flow of oil from the can, as shown in Fig. 3. The spring may also be fitted to the rear end of the head piece, as shown in dotted lines in Fig. 1. In using a can provided with this nozzle, the nozzle or tip is placed in an oiling hole, and the body of the can turned by the operator until the bores of the tube and head piece are brought to coincide, before any oil will be discharged, these parts resuming their normal position to cut off the flow of oil as soon as the tube is lifted from the oil hole. Fig. 4 is a sectional view of a slightly modified form of the nozzle.

GOOD thin shellac varnish.—Break the gum into small pieces and macerate in a stoppered bottle with ether. After swelling sufficiently, excess of ether is poured off, when the shellac dissolves quite readily in alcohol.

**THE SARTELL RAILWAY CAR HEATER.**

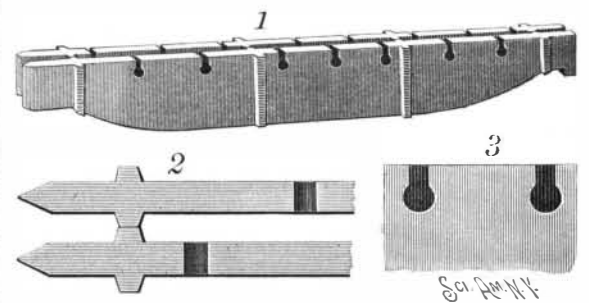
We illustrate herewith a device for heating railway cars recently patented by Mr. E. P. Sartell, of St. Cloud, Minn. Fig. 1 of the accompanying cuts represents a vertical longitudinal sectional view of parts of



**THE SARTELL RAILWAY CAR HEATER.**

two railway cars provided with the heater ready for use. Fig. 2 is a vertical transverse view of the same. Fig. 3 is a similar view, showing a different section. Fig. 4 is a front view of the chest.

The heater chest runs the entire length of car, with attachments underneath at the platform ends. It is lined, and forms an inclosed chamber for steam pipes. On the upper side of the chest are registers, which communicate direct with the interiors of the cars, and when open the heated air from the chest enters into the cars. The source of heat being thus placed outside of the cars, the dangers arising from fire in the event of a railroad accident are removed—the apparatus for generation of steam being located in the forward car of the train or coming from the locomotive direct. Provision is also made for instant detachment of steam pipes, consequent on the coupling or uncoupling of cars, these pipes at the same time having a perfect connection

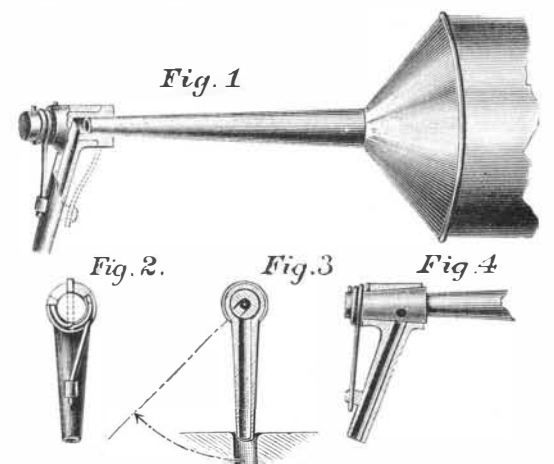


**THE MILLER GRATE BAR.**

with each other. The pipes are also supplied with proper dripecks and valves. We are informed that a practical test of this heater is soon to be made on one of our leading railways of the Northwest.

**Astrology and Railways in China.**

The extension of the Tien-Tsin Railway to Tung-Chow has (the Shanghai correspondent of the Standard says) encountered an unexpected obstacle, which, it is to be feared, will prove fatal to its progress, for the present at least. The great fire which destroyed part of the Imperial Palace in Peking recently caused much disturbance in the minds of the old fashioned and superstitious, who are still strong in the capital. In consequence, the Emperor and his mother consulted the imperial astrologers, who, after much deliberation, declared that the fire was an evil omen, and was intended as a warning against permitting the approach of the "Western invention" to the sacred city. The further extension of the railway has been prohibited by imperial decree.



**PETER'S OIL CAN NOZZLE.**