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A LARGE STEAM CRANE.

Messrs. Appleby Brothers, of London, England, have sent to Vienna three steam cranes, for three, five, and seven tons respectively, of the same general design, the difference being only in proportion. We illustrate the largest of these cranes, in which, as in the others, the carriage is cast in one piece, the horns being provided with bearings for the traveling wheels. The central post is of wrought iron, and the top of the carriage is recessed for a spur wheel fitting on the column, and made fast or loose with it, and there is a raised roller path truly turned on the outer edge of the recess. A base plate, fitted with three friction rollers, revolves on the central column, two of the rollers being placed directly below the jib, and one at the back to take the weight of the boiler and tank. The engines are carried on this base plate in a pair of A frames, the feed water tank and the boiler being placed some distance from the center of the crane post, and forming a counterbalance to the weight to be lifted. The boiler is vertical, and is fitted with two cross water tubes, which system, although not so economical as the multitubular as regards fuel, works out better in practice, as cranes are so often fed with the worst kind of water. The work is done with a pair of direct-acting steam cylinders placed slightly on the incline, one outside each side frame, the crank pins being fitted into a pair of balanced disk plates. In addition to the usual lifting and turning motions, each crane has a neat arrangement for traveling by steam and for altering the radius of jib by the same agency. The engine shaft between the side frames carries a bevel wheel made fast or loose on the shaft by means of a toothed clutch, for driving an oblique worm shaft gearing into a tangent wheel on the derrick chain barrel for raising or lowering the jib, the worm

wheel securely locking the jib in any position. A broad spur wheel is geared on the crank shaft, and works a narrow wheel below it on a weigh shaft, which has a small crank pin at each end equal to the stroke of the slide valves. The narrow wheel can be moved by a hand lever laterally about four inches on a spiral feather, thus reversing the valves for running the engines in either direction. This arrangement answers well, and is found to be more durable than a link motion. A pair of spur wheels are placed on the left side of the crank shaft, and which gear into wheels on the countershaft below. One pair of these wheels are of equal, and the other of unequal, diameters, and either pair can be made drivers by means of a double toothed clutch. Provision is made for working the crane by hand if necessary through this shaft, which also carries a set of bevel wheels and double friction cones for driving the slewing and traveling motions. As this shaft has two speeds communicated to it from the engine shaft, it will impart two speeds to the slewing and traveling motions. The motion from this set of wheels is transmitted through a train of wheels to the spur wheel on the column, and which is twice the depth of the pinions gearing into it. The pinions are placed at different heights, so that the slewing pinion clears the pinion driving the traveling gear, and which is fixed. To travel the crane the body is fixed to the carriage, and the wheel, revolving on the crane post, drives the traveling motion. The friction cones are operated by an eccentric lever, and can be thrown in contact while the engine is running, the jib being put in motion gradually without slack. On the cones being reversed, they act as a brake, and arrest the motion of the jib. A pinion sliding on a feather in and out of gear, with a spur wheel on the barrel shaft, conveys the lifting motion from the coun-

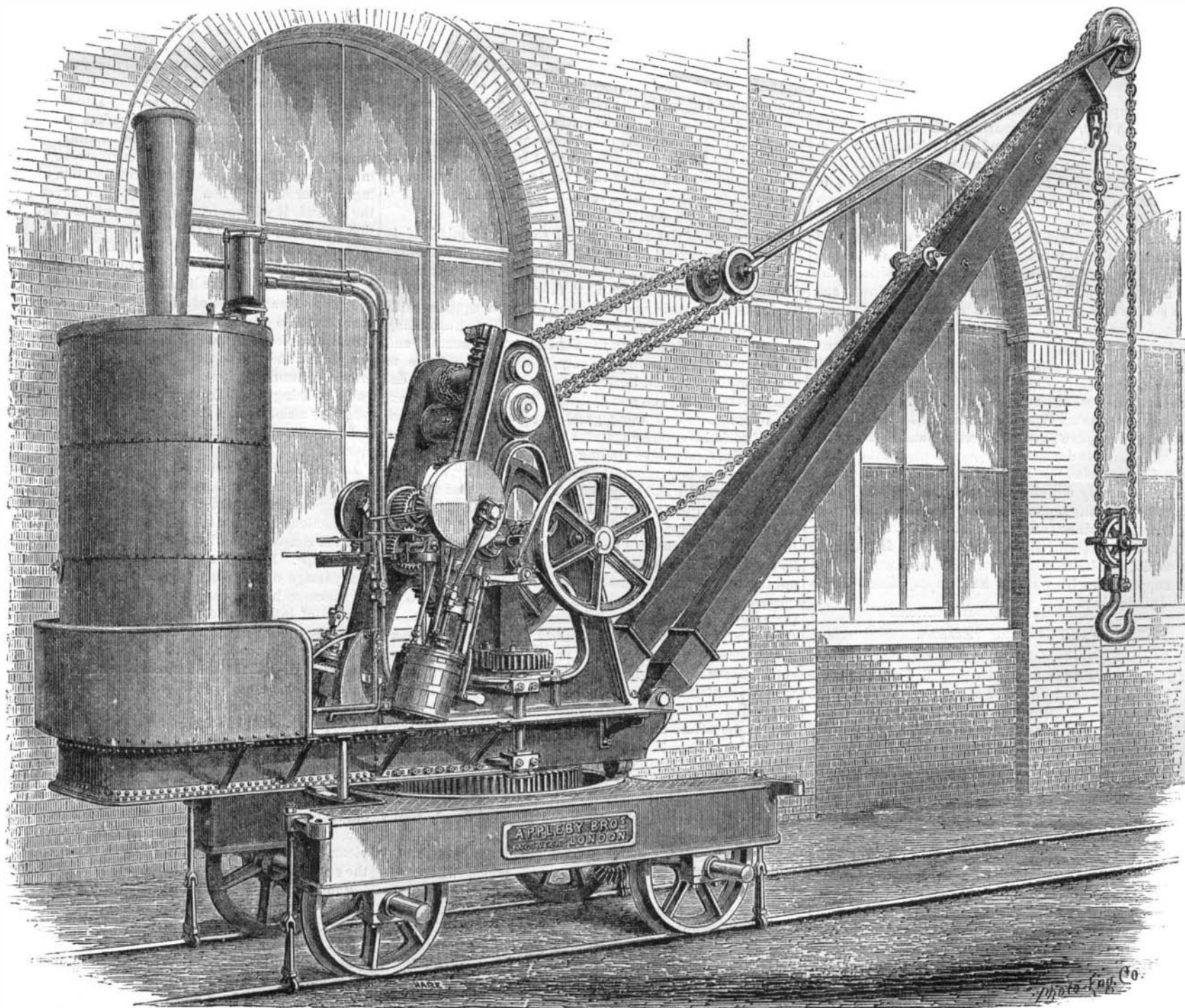
tershaft. This pinion is withdrawn for lowering, and the descent of the load is controlled by a strap brake worked from a foot lever, which is fitted with a pawl and ratchet, so that the load can be left suspended at any point of its descent.

As the slewing motion can be put into action through the cones while a load is being raised or lowered, a considerable saving of time is effected. It will be seen that the speeds of working are in direct relation to the loads; as many as 60 or 70 loads may be lifted and turned round in an hour with the quick speed, while heavier loads, which necessarily require more time to manipulate, are dealt with at a correspondingly lower speed.

The details of construction, says *Engineering*, to which journal we are indebted for the illustration, are well carried out in these cranes, which are well got up, without the superfluous finish too often given to machinery for exhibition. One of these machines did good service in unloading and transporting the heavy machinery sent to Vienna from England.

Clarifying Beer.

Of the thousand and one methods proposed for this purpose, one of the latest is that of Mr. Garton, and consists in the use of phosphate of lime. The process is as follows: A very concentrated solution of phosphate of soda is first put into the wort, and then gypsum or chloride of calcium and slaked lime are added. Instead of the soda salt, phosphoric acid or some soluble phosphate of lime may be employed. This clarifier can be used at any stage of the process, either before or after fermentation. The same process is also recommended for other fermented liquors.



STEAM CRANE AT THE VIENNA EXHIBITION.