

THE RAMMING AUTOMATIC ENGINE.

The Ramming Automatic Engine, which we illustrate herewith, presents in point of attraction a number of interesting features which we explain in detail.

The bed is a combination of the box and girder type, possessing great strength and rigidity, together with compactness, and is constructed to obviate the springing of the old style of box bed, and also the common defect called breathing in the girder type of engine.

This engine does not require a foundation of more than ordinary strength. The main journal, or pillow block, which is designed for strength and compactness, also the circular guides and bed are in one casting. Owing to its peculiar construction the metal is so distributed that there are no weak points from shrinkage cracks or shrinkage strains. The pillow block is fitted up with heavy phosphor bronze shell in bottom, gun metal quarter boxes partly filled with best engine babbitt metal, and extends over the periphery of the shaft journal, and has wrought iron wedges the full length and width of quarter boxes with convenient adjusting facilities. It also has a well-fitted pillow block cap, with a large chamber on top to permit close inspection of the main journal while the engine is running. The circular slides have wearing surface of large area, and are very strong and rigid.

The length of the pitman or connecting rod is always calculated on a basis of three times the length of the stroke of the engine, and is fitted up with stub ends, gibs and keys of such proportion as to admit the use of wrist pins of a diameter of more than one-fourth of the diameter of the cylinder. The crosshead has its wrist in centre of the bearings—a matter of no little importance in the construction of an engine. The cylinder has short steam passage and large exhaust port, and is bolted direct to end of engine bed.

A false head which acts as a packing chamber for piston rod on outside, and for a cylinder centering piece inside, is forced into a bored opening in end of engine bed. The cylinder is

finished on the bottom and rests on a planed extension piece which supports the full length of the cylinder. Automatic segmental cast iron piston packing of improved design is used in cylinder.

The steam chest which acts as a reservoir between boiler and cylinder contains two main valves and two cut off valves of a very simple balance device. They are driven by two eccentrics with wide wearing surface.

The governor is placed in centre of engine, and is especially designed to meet the requirements of this style of valve, and is very sensitive to the slightest change of speed. It can be adjusted to any required speed while the engine is running. This engine, owing to the peculiar construction of the valve, is guaranteed to give full opening for the admission of steam at a valve travel of three-eighths of an inch, and consequently full boiler pressure on the piston can be obtained.

The manufacturer claims that these engines can be run at any rate of speed desired, as there are no dash pots to increase the care of the engineer, as is found in the Corliss type of engine.

Special attention is called to the fact that there is not a single spring of any kind used in connection with the governor or valve. The valve arrangement is as simple as a plain slide valve engine.

All wrist pins are of steel as also are the piston and valve rods. Pitman and engine are of hammered iron.

The cylinder is neatly covered with a heavy sheet-brass jacket. Cylinder head and steam chest have polished and nickel plated cast iron covers, which not only add to the attractive appearance of the engine, but prevents condensation in cylinder and steam chest, and is easily kept clean and bright.

Mr. Ramming claims to have placed on the market an engine that is thoroughly first class in workmanship and design, and which for strength, simplicity, durability and economy of fuel consumption is unsurpassed.

These engines are built in sizes from 30 to 300 horse power.



BORAX: ITS OCCURRENCE AND PREPARATION.

BORAX AND ITS USES.

For nearly forty years I have been engaged more or less in promoting the introduction and useful application of borax. I have also visited many of the districts where it is found in its crude state, and have gained much information respecting its valuable properties and important uses—an almost inexhaustible subject, into which it would take too long to attempt to enter fully. I will therefore try, as briefly as possible, to

give an outline of its mode of occurrence in the natural state, describe how it is collected and manufactured, and explain as briefly as possible its uses:—

Borax is no new article of commerce, but was known to and used by the ancients from time immemorial. Nero used it. Pansa regretted that he was not sufficiently rich to buy borax to cover the arena after the death of the combatants, at the time of the combat between the gladiators Lydon and Tetrides. Doubtless its use on the arena was to deodorize the blood.