

**IMPROVED WHITE LEAD GRINDING MACHINES.**

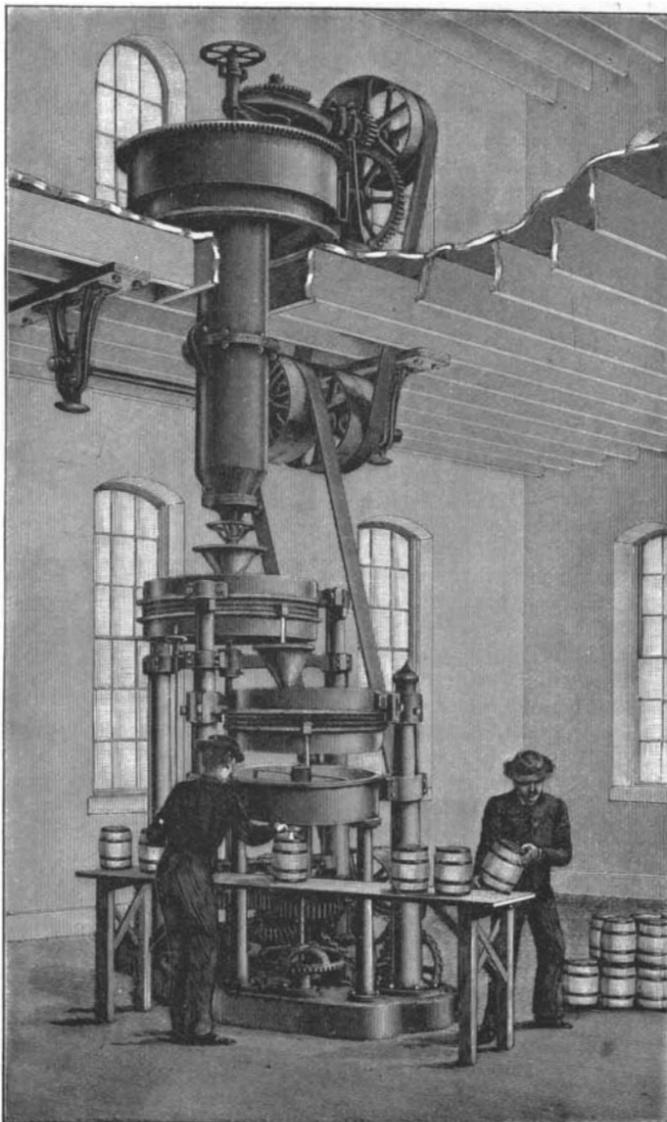
The accompanying illustrations represent machines embodying the latest improvements for facilitating the grinding of white lead. They were recently built for the John T. Lewis White Lead Company, of Philadelphia, by the Robert Poole & Son Company, of Baltimore, and form quite a departure from the usual machines for such purposes.

In the process of the manufacture of white lead, the lead, after coming from the corroding pots, where the pure or blue lead is treated with reducing acids, is ground in water to disintegrate all lumps of corroded lead before going to the settling tubs. The large machine illustrated herewith, which is known in the trade as a water mill, is designed to do this work. As the highest efficiency was one of the requisites, it was determined to depart from the usual light design and make a machine having heavy parts to be run at high speeds, and with all possible automatic details and labor-saving devices as well as the highest class of workmanship and best materials throughout.

The machine consists of a heavy bed plate of the box pattern, erected on solid concrete foundations, about 12 feet square. This plate carries four heavy square cast columns 5 feet long, on top of which rests a similar sized plate carrying the stones for grinding, which are 54 inches diameter of the best solid French buhr type. The under stone is the runner in every case. They are fitted in bronze baskets, and mounted on heavy spindles which drive by a universal joint device. There are four sets or pairs of these stones, making what is termed a double mill, although but one-half or two sets of stones only are in operation at a time; the other two sets are "spares." Under each set of upper stones there are placed two conveyors, driven by chain belt from the main shaft, to carry the material after the first grinding from the upper to the lower run of stones. Besides being positive this attachment economizes space, which would be necessary to obtain the same results by gravity. After passing its second grinding through the lower run of stones, the material is spouted away, and conveyed to the settling tubs.

The main horizontal shaft of the machine connects directly with the engine, and the power is transmitted from this shaft to a central upright shaft by heavy machine cut bevel mortise gearing. From thence it is transmitted to the stone spindles by wood and iron spur gears, machine cut. Each stone pinion on the spindles is fitted with a very positive and powerful friction clutch, admitting of any pair of stones being thrown out at will. The toes of the spindles run in specially designed bronze steps, adjustable from above. All the driving mechanism is placed between the two bed plates in a compact yet well designed manner, and all parts are easily accessible, either for cleaning, adjusting or repairs. The operation is all controlled from the grinding floor, by suitable levers and connections. The floor space occupied is 12 feet by 12 feet, while the total height from lower floor to top of buhr casing is 14 feet 9½ inches. Total weight of machine on foundations, 112,000 pounds. The capacity of the machine is about 50 tons per day of 10 hours, requiring 75 horse power to drive.

After leaving the water mill, the product is allowed to settle by gravity in settling tubs, after which the water is evaporated by steam heat, and the lead is then ready to be mixed with oil. This is, in part, accomplished by a centrifugal mixer, shown at the top of one of the engravings. This machine consists of a cast iron base, with annular V slots, on which rests a cast iron pan 48 inches in diameter, 12 inches deep, with a circu-



**MIXER AND OIL MILL FOR WHITE LEAD GRINDING.**

lar hole in the bottom, which is opened and closed by a cast iron plug. Around the outer flange of the pan is fitted a segmental rack engaging with a bevel pinion in the head. The frame or head of the machine carries two shafts, one above the other, one for driving the pan and the other for driving the plows or stirrers which do the mixing and are fitted between the plug and the sides of the pan. The operation is very simple. The corroded lead and oil are put in the pan, and, as it revolves, they are carried under the stirrers, and, as these are also revolving, the two ingredients are mixed

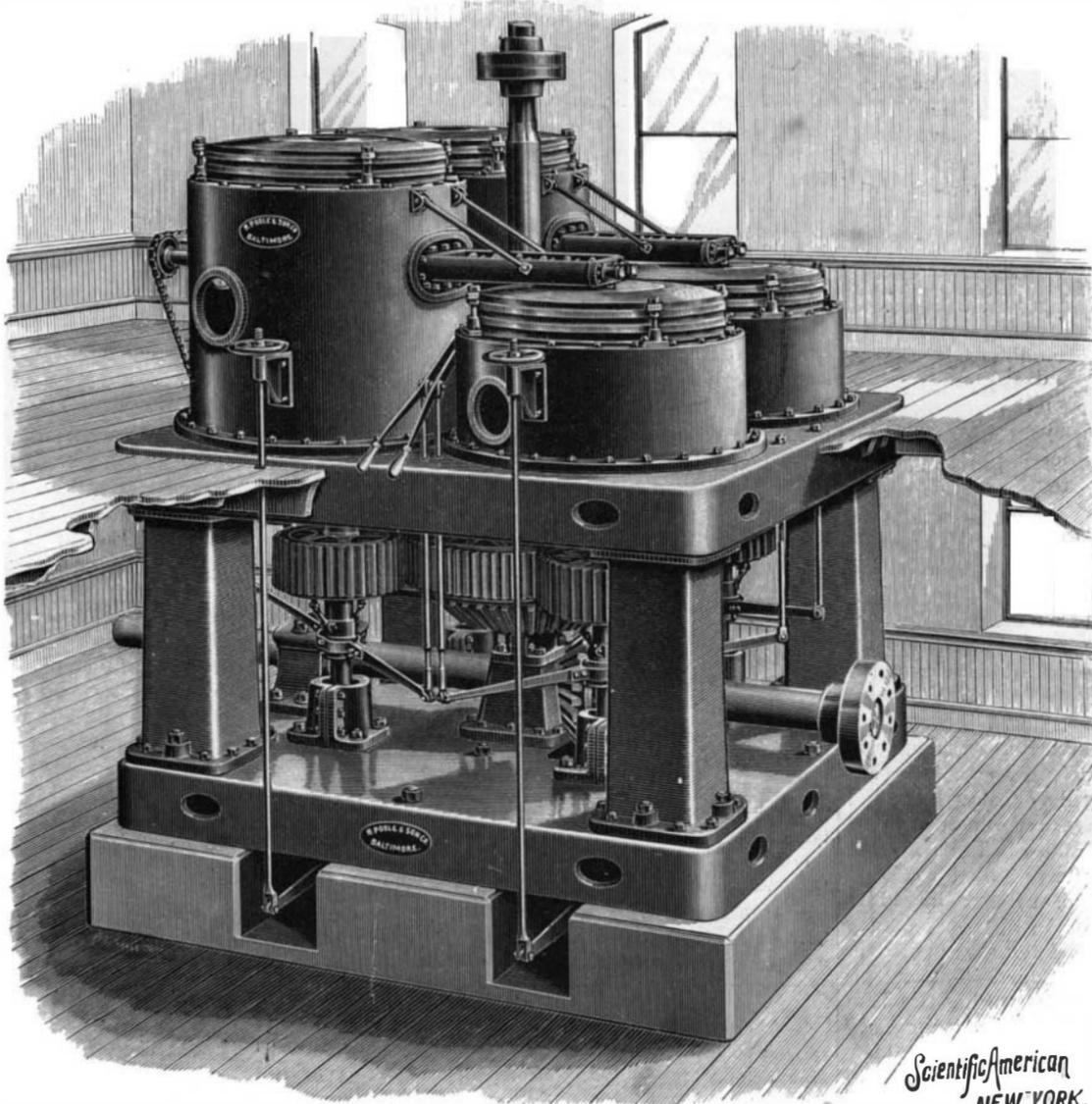
very thoroughly in a short time. The mixing may be continued as long as necessary, when the central plug can be raised and the mixed material allowed to fall into the receiver—a cylindrical cast iron receptacle placed immediately under the mixing pan. The capacity of the mixer is about one ton per hour, requiring 15 horse power in driving, and weighs nearly 5,000 pounds. From the receiver the material is fed mechanically into the oil mill to more thoroughly mix it, which is the last operation of the process. This mill is fitted with two run of best imported French buhr stones 36 inches in diameter under runner, one pair mounted to the side and above the other in cast iron cases resting on strong columnar frames, with lateral bracing, all fitted on substantial base plate. The stones are driven by suitable gearing from a horizontal shaft in the base, which in turn is driven from the main line shaft. The operation is similar in every way to the water mill, only these machines are not required to be as large and heavy. The material passes through the top stones and thence by gravity into the lower run of stones. From the lower stones it passes into the cooling pan to remove the heat engendered in the grinding, and is then packed in kegs for market as white lead. The machine requires about 20 horse power to drive and weighs about 10,000 pounds.

No attention seems to have been spared to make all of these machines of the very highest type of efficiency. With properly designed parts and best workmanship and materials, they form in their completeness one of the most thoroughly equipped plants in this line of manufacture to-day.

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**A Motor Car Club in London.**

The London correspondent of the New York Tribune, in a recent letter, states that the first meeting of the Motor Car Club, which will soon occur, will excite less interest than a lord mayor's show, but it may lead to more important results. It will be a trial trip of horseless vehicles from the Hotel Métropole to Brighton, through Brixton and Reigate. Fifty-four vehicles have been entered for the contest. These will include two Daimler cars, which finished first and second in the race from Paris to Marseilles and back; several German vehicles, two Duryea cars from America, and a large number of English electric carriages and petroleum traps. It will be a remarkable show, and will attract throngs of spectators from the Embankment and Westminster Bridge all the way to the coast. Coventry has become the headquarters for the new industry of supplying what are, by an atrocious barbarism, called "autocars," which answer the requirements of the new act of Parliament, but there have been interesting experiments also in Colchester and other towns. One invention employs neither an electric battery nor a heating tube. It has no external flywheel and the oil lamp is not kept constantly burning. With electric omnibuses in common use the aspect of London streets will be changed, but the cabmen are not yet convinced that their occupation is threatened.



**POWERFUL WATER MILL FOR GRINDING WHITE LEAD.**

*Scientific American*  
NEW YORK.

THE Scientific American Reference Book, published by Munn & Company, of New York, costs but twenty-five cents, but is worth, says the Spatula, of Boston, ten times that amount. It tells all about the patent and trade mark laws, and gives minute directions for securing the various kinds of protection for anything that's new and a fit subject for a patent, trade mark or copyright. The principal mechanical movements are illustrated by 150 diagrams, the steam engine is dissected and analyzed, the metric system is explained and hundreds of useful facts are gathered together and carefully indexed.