

### An Autographic Record of the Vibrations of a Tuning Fork.

The exact determination of the rate of vibration of a tuning fork by means of the siren has heretofore been attended with errors, resulting from imperfections of the recording gear and difficulty of maintaining and counting the beats of the two tones. These errors have been sought to be removed by obtaining autographic records of the rate of the siren and of the difference between this rate and that of the fork. The experimenter, while obtaining these results, being freed from the necessity of even counting the beats, no personal element enters into the observation, and the records, being permanent, can be studied at leisure. The apparatus with which these results are obtained is described in the *Amer. Jour. of Science*, the method employed being the following:

A strip of chemically prepared paper, which rests on a metal wheel, being drawn by clockwork under three platinum pens placed in electric circuits, three simultaneous electro-chemical records are obtained. One of these is a line of dots made at the rate of one a second, by a chronometer placed in the circuit of the same battery with one of the pens. The second is a row of dots made by a closing of the same circuit by a siren once in each revolution, while singing nearly in unison with the fork. The third is a row of dots made by the closing of the circuit of a second battery, once for each beat of the fork and siren.

It thus results that from the same strip of paper can be counted the number of revolutions made by the siren in any number of seconds (which gives the number of impulses produced by the siren) and the number of beats in the same time, which is the difference between the number of shocks imparted to the air by the siren and the number imparted by the fork. The record being made without throwing any work upon the fork, the rate of vibration of the unconstrained fork results.

### Roman Remains in London.

The extension of the Metropolitan Railway in London, requiring deep excavation in the very heart of the city, has given occasion for many interesting discoveries. A part of the new line, from the Mansion House Station to the Minories, on the north side of the Thames, and near the shore, is cut through soil which has been accumulating during much more than two thousand years of continuous occupation, and relics, not only of Roman but of British London, have been exhumed in abundance. Just south of the Bank of England the excavation crosses a handsome street known as Walbrook, on each side of which is a little eminence, that to the east have been reputed to be the site of the fortress of the British Prince Cassivelaunus, who fought against Julius Cæsar; while that on the west formed part of the Roman colony subsequently established. In digging under Walbrook, the bed of the ancient brook from which it takes its name was laid bare, and two small landing stages, for boats from the neighboring river, were exposed.

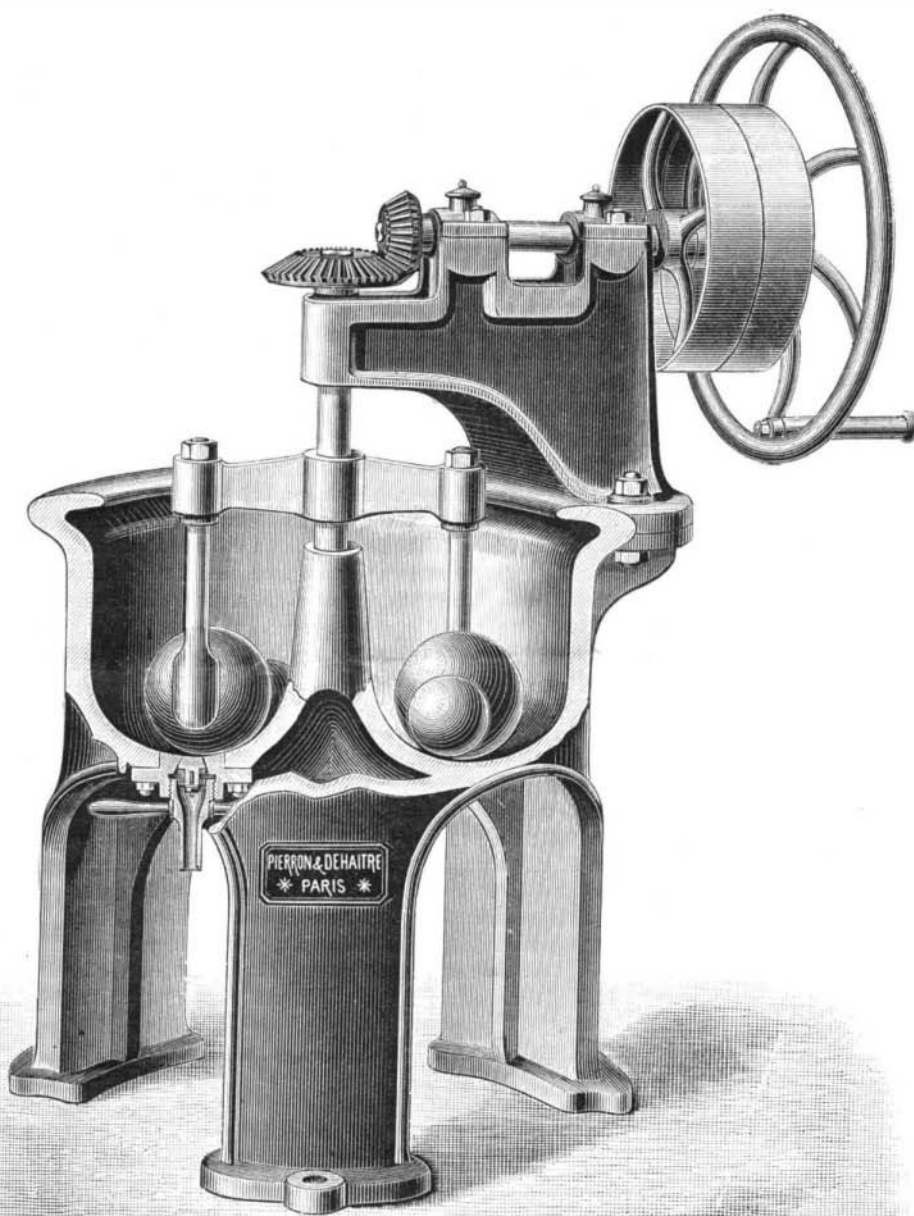
Both of them were built upon oak piles, and one had a quantity of oak tree roots thrown in among the piles, showing that the oak trees used were cut upon the spot, and the roots and useless twigs thrown in among the piles as the readiest way of clearing the ground. Over the piles, in each case, was a bed of concrete, and on this was a pavement of red Roman tiles. It is quite possible that the Roman pavement may have taken the place of a wooden platform, belonging to the original structure, which had fallen into decay, so that two thousand years may have passed since the piers were built. About them were found one or two skulls, of a British type, besides Roman pottery, leaden coffins of a Roman design, and a perfect bronze statue of heroic size. Not far off, at the bottom of a shallow well, was found, with its head downward, the skeleton of some unfortunate Briton, who had either been thrown or had fallen in, and had been left there, disregarded alike by his friends and by those who drank the water of the well.—*Building News*.

### MACHINE FOR GRINDING INDIGO AND ULTRAMARINE.

Indigo and ultramarine are, like all colors in general, very delicate materials, that require a lengthy grinding in order to render them perfectly homogeneous. Messrs. Pierron and Dehaitre's machine, which is represented herewith, is designed for performing this operation mechanically. It consists of a circular vessel resting upon three supports cast in a piece with it, and containing in its center a projection which serves as a bush for a vertical shaft that carries a bevel pinion at its upper part.

Upon this shaft there is fixed an iron crosspiece carrying a paddle at each extremity. These two paddles, on being set in motion by manual power or otherwise, revolve continuously around the shaft that carries the crosspiece, and push ahead, each of them, two spheres turned out of cast iron and of different diameters. These spheres, on rolling over the indigo or ultramarine slightly moistened with water, reduce all the granular portions to a very fine paste, and convert them into a very homogeneous material which is then in a state to be delivered to the industries.

The spheres have different diameters and weights, so that, under the action of centrifugal force, the smaller ones shall not have the same rolling circumference as the larger ones,



### MACHINE FOR GRINDING INDIGO.

and that the process of grinding shall thus be accelerated. For extracting the ground material from the apparatus when the operation is finished use is made of a cap in the form of a valve. It is only necessary to unscrew by a few turns the threaded rod which carries the conical cap to cause the latter to leave its seat and give sufficient passage for the flow of the ground material.

This machine revolves at the rate of 50 or 60 revolutions per minute. It is capable of grinding 15 kilogrammes of indigo in 10 hours, and costs 580 francs.—*Annales Industrielles*.

### The Road to Riches.

One of the richest men in Chicago was asked for a private interview by a *Wall Street News* reporter, who explained: "You are very rich. You have had wonderful luck. Tell me what to speculate in, that I may make money."

"Never speculate at all," was the serious answer.

"But you have made money in railroad stocks, wheat, silver mines, canal stocks, etc."

"Not a dollar, young man! In fact, that's the way I have lost thousands."

"Why, then, how have you made your wealth?"

"By inventing a spring bed, and patenting a bootjack. Let all speculation alone, and turn your attention to the solid wants of the people."

### Cedar Shingles.

White cedar shingles are the curiosity of the northwestern lumber trade. They are such for the reason that they are much better than white pine, and yet the majority of consumers do not know it. Men are continually buying pine roof covering, when they could purchase just as handily a better article for less money than pine costs. A special curiosity in connection with cedar shingles is this, that, while a large proportion of the settlers throughout the Northwest originally came from New York, New England, and Canada, and cut their teeth and gloried in their first pair of boots under a white cedar shingle roof, they seem to have forgotten all about this material since they became citizens of the Northwestern States.

The wholesale lumber dealers give as a reason why cedar shingles are not carried in stock more extensively that there is little demand for them. Nearly everybody wants pine. The wholesale dealers, like other merchants, handle the kind of goods there is the more sale for. But a progressive trader will endeavor to educate his customers. This the pine merchants have not attempted to do to any great extent as yet.

The lasting quality of good cedar shingles should insure their dominance over pine, leaving out any other consideration.

It is positively asserted by good authority, that cedar shingles are less liable to warp than pine, stay where they are put better, draw nails less, and consequently make a tighter roof than pine. In places where pine and cedar shingles have been used on contiguous roofs, it has been observed that the pine roofs look old and dilapidated while yet the cedar shingled roofs look as well as when first put on. All who are in any way acquainted with the quality of cedar know that it has great endurance against the effects of moisture and alternate moisture and dryness. Cedar is the favorite wood for posts and pavement on this account. Cedar shingles on roofs have been known to last forty years. There is a shingle in this office to-day that was taken from a roof in the State of Maine, where it had lain forty years. Half of the weather end is worn away, but enough is still there to shed rain. The writer of this was nurtured in his childhood under a cedar roof that tradition said had lasted fifty years; and when it was demolished to make way for a new one, the shingles were still sound, though moss covered and worn. There is no question but that cedar shingles are much more durable than pine.

The quality of lightness in cedar shingles is greatly in their favor as material for shipment. The lumber trade of this city, especially, has a long reach.

In reference to shingles, far away Kansas, Nebraska, Dakota, and Texas are the more important distributing fields. The lighter shingles can be made the more profitable is their shipment. They are very dry pine shingles that are made to weigh but 245. Cedar shingles can be made to weigh but 200 and less pounds per thousand. This results in a great difference on a car load.

Up to the present time cedar shingles have sold considerably cheaper in this market than pine. The current prices by the cargo range from \$1.50 to \$2.00, which includes standard and extra. The range on the same classes of pine shingles is \$1.75 to \$2.20.

In view of the excellence, the durability, and the cheapness of cedar shingles there can be no reason why they should not sell in larger quantity than pine shingles, unless it is that they are not so extensively manufactured. The only possible objection to cedar shingles is that they cannot usually be made as wide as pine shingles. But that is not a serious objection, since cedar shingles do not shrink, warp, nor split as badly as pine, and cedar lays a roof that stays in place better than pine.—*Northwestern Lumberman*.

LAST year the German Lifeboat Society saved 277 lives, the rescued persons belonging to 47 German vessels, and to 5 English, 4 Dutch, 4 Swedish, 3 Danish, and 2 Russian ships. The society supports 87 lifeboat stations.