

Water Power for Milling.

The *Post-Dispatch*, of St. Louis, published in a recent number the following account of an interview between one of its reporters and Mr. Allan T. Gale, a Minneapolis miller. Mr. Gale was apparently apprehensive regarding the prospects of Minneapolis as a center of flour milling, as he said: "We Minneapolis millers have for years been very anxious concerning the water supply. Year by year the amount of water coming over the Falls of St. Anthony has been diminishing, and this winter the trouble has been more serious than ever before at this season. The ice has always interfered with the operations of the mills, but this year the trouble has been the lack of water, and all mills without subsidiary steam power have either suspended operations or run at half power. Of the eighteen great mills, nine have substituted steam for water, while it is evidently a question of a very few years when all must do so. The decrease in the volume of water, caused by the diminution of the rainfall, generally ascribed to the cutting away of the timber, is not the only or indeed the most threatening danger that impends over the water power of Minneapolis, and bids fair to depose our city from its present position as the great flour-producing point of the world. The rock

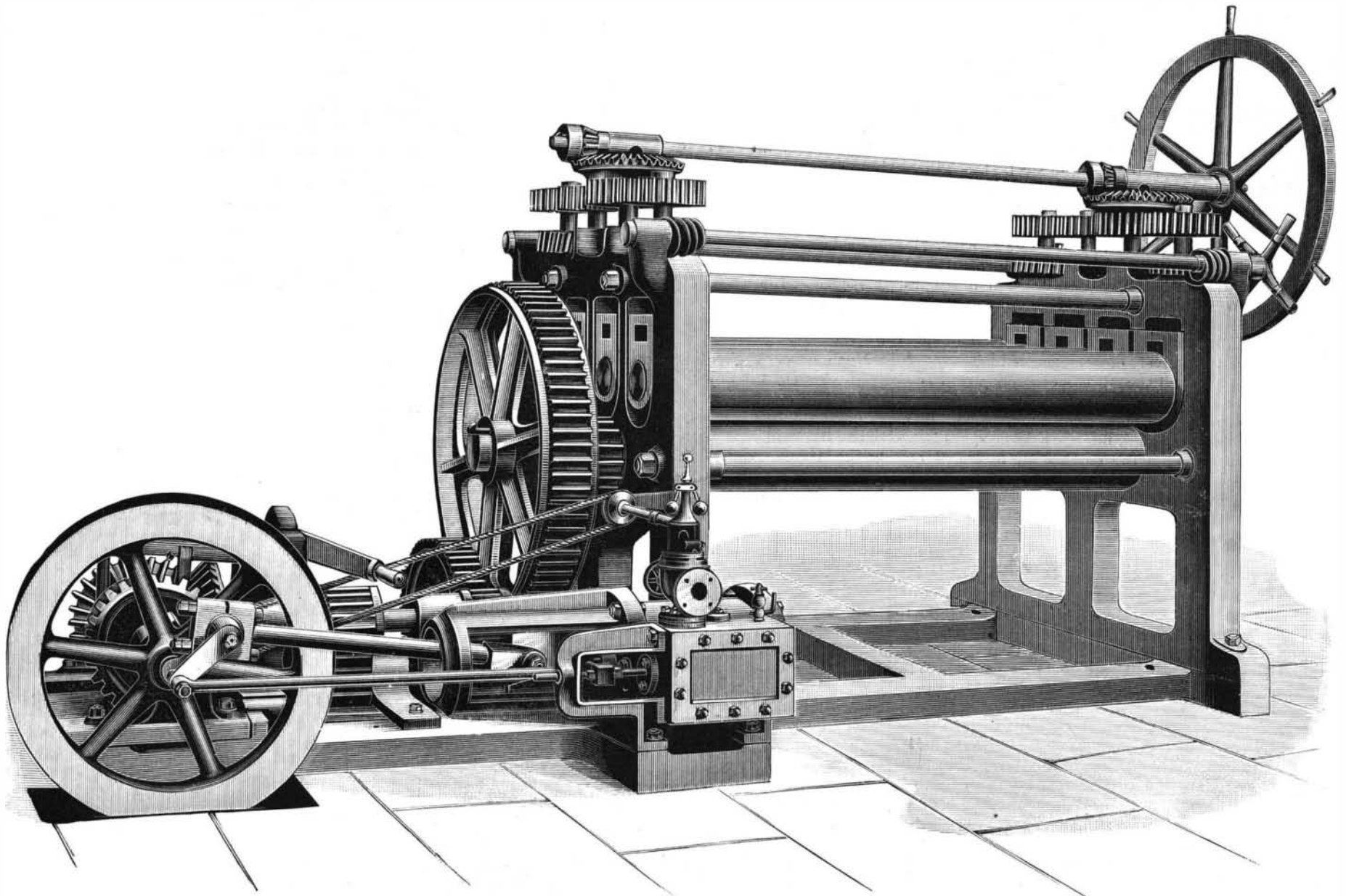
be surprised by the number of new mills that will be erected. The region along the Red River of the North is excellent for wheat, in spite of the low temperature of winter, and the river itself furnishes ample water power for all the mills in the world, being one series of swift rapids. Many of our most enterprising men have thoroughly prospected this field, and last winter many contracts for land suitable for mill sites were closed. Of course the millers, and the citizens of Minneapolis in general, are inclined to laugh at the danger which threatens that city, but they are fully alive to its seriousness and imminence, and many of those now most vociferous in their declarations of the future greatness of the city have quietly made preparations to move elsewhere."

IMPROVED PLATE STRAIGHTENING MACHINE.

We illustrate below a plate straightening machine, by Francis Berry & Sons, of the Calderdale Iron Works, Yorkshire. For our engraving we are indebted to *Engineering*. This machine, which is capable of dealing with plates up to nine-sixteenths inch thick by six feet wide, has seven rollers, four of which are adjustable, and can be raised or lowered either all together or the two outer ones can be adjusted inde-

Uses of Mica.

The peculiar physical characteristics of mica, its resistance to heat, transparency, capacity of flexure, and high electric resistance, adapt it, says *Engineering*, to applications for which there does not appear to be any perfect substitute. Its use in windows, in the peep holes on the furnaces used in metallurgical processes, as well as the ordinary use in stoves for domestic purposes, are examples of its adaptability to specific purposes which it does not seem to share with any other material. Recently there has been introduced in America a type of watch in which the plate covers about three-fourths of the works, and the remaining portion over the balance wheel and attendant mechanism is protected from exposure when the watch is open by a thin covering of mica. The inclosure of the mechanism of the watch is rendered still more perfect by a ring which is placed around the works before they are inserted into the case. Its fitness for use in physical apparatus is represented by its application for the vanes on the Coulomb meter recently invented by Professor George Forbes, F.R.S. For electrical purposes mica has proved useful, acting as an insulator between the segments of commutators of dynamos and safety fuses in lighting circuits, also as



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over which the river runs about the falls is of a very soft and porous nature, and in spite of all that can be done is fast wearing away. The falls have been cased in boards, regular inspectors are continually on watch, and every precaution has been taken to check at once any tendency of the rock to break down. But in spite of all this, the danger of the river tunneling through the soft rock is always present, and it would surprise no one to find some morning that the Minneapolis water power had entirely disappeared. Some eight years ago the water began to penetrate the rock on the east side, and it was by a mere chance that the falls were saved. The likelihood of their disappearance increases every year, as the stratum of hard rock which incases the very soft underlying limestone is in places almost washed through, and the limestone itself will melt before the rush of the rapids almost as easily as clay. Minneapolis was made by the falls, and should they fail, her prominence will disappear.

"The millers, recognizing the impending danger," Mr. Gale went on to say, "are looking about for new locations. Two places present themselves to the consideration of the flour men—the Red River of the North country and St. Louis. Before the rise of Minneapolis, St. Louis was the greatest flour point in the United States, and to-day this city ranks second. Many of our most far-sighted flour men have been quietly surveying the ground here, and before long the city will

pendently of the remainder. Power is supplied by cast steel pinions keyed on the ends of the three remaining rollers, and the driving gear generally, which includes an engine having a cylinder ten inches in diameter, regulated by a high speed governor, is confined to one end of the machine, while the hand wheel for adjusting the rollers is placed at the other. In this way the workman in charge runs no risk of being caught in the gearing. As will be seen from the illustration, the machine is mounted on a strong cast iron bed plate, extending its whole length, so that, in spite of its weight being $12\frac{1}{4}$ tons, but little foundations are required, and the machine is completely self-contained.

The New Artesian Well at Paris.

The artesian well of Place Hebert, at Paris, has just been finished, after twenty-two years' work on it. It was necessary to bore to a depth of 2,360 feet to reach water, and such depth was attained only with the greatest difficulty. The work had to be stopped several times, either on account of the hardness of the strata traversed or of the crushing of the metallic tubing, caused by the pressure of the earth. The new well is the third of the public wells of Paris, the others being those of Grenelle and Passy. Its diameter is $5\frac{1}{4}$ feet, and the weight of the tubing about 880,000 pounds. The temperature of the water that it furnishes is $84\frac{1}{2}^{\circ}$. The cost of this important undertaking was \$300,000.

the base part of switches handling heavy currents, to obviate the danger of ignition by the arc formed when the switch is changed. For this latter purpose it shares the field with sheets of slate. Both of these uses were first suggested a number of years ago by an insurance expert in America, in the course of regulations governing the safe installation of electric light plants. As a lubricator mica answers a very peculiar purpose for classes of heavy bearings, where the powdered mica serves a useful office in keeping the surfaces separate, thereby permitting the free ingress of oil. It is used in roof covering mixtures in a powdered condition in combination with coal tar, ground steatite, and other materials, its foliated structure tending to bond the material together. Not affected by ordinary chemicals which are corrosive to many other substances, it has been applied in the valves to sensitive automatic sprinklers, where a sheet of mica placed over a leather disk has proved to be non-corrosive, and without possibility of adhering to the seat, while the leather packing rendered the whole sufficiently elastic to provide a tight joint.

PROF. LECLERC, writing in *Cosmos*, maintains that odors are due, not to the emanations, as such, of so-called odoriferous bodies, but to the vibratory movement among such emanations, due to processes of oxidation. Sent, on this theory, is analogous to sound.