

Seth Wilmarth.

Seth Wilmarth, one of the greatest of American machinists, died at his home in Malden, Mass., Nov. 5, aged 76, of heart disease. In navy yard circles, for the past quarter of a century, Mr. Wilmarth occupied a distinguished place, and made many and important mechanical improvements. His advice was sought by the most prominent machinists of the world. Over twenty patents were taken out by him, among them the hydraulic lift for revolving turrets, for which alone the United States Government paid him \$50,000. He invented a planer and the great lathe at the Charlestown Navy Yard, at the time of their construction the largest machines of their kind in the world. He was a farmer's son, and was born in Brattleborough, Vt., in 1810. Evincing a predilection for mechanical work, he was apprenticed at a machine shop in Pawtucket, R. I. He rose rapidly until he was recognized as a master of every branch of mechanical knowledge, and in 1855 he was appointed Master Mechanic and Superintendent of the Charlestown Navy Yard by Rear-Admiral Joseph Smith. Every building of importance in the yard was erected under his supervision, and he was the guiding mind in every mechanical improvement projected.

Dangers of Sewer Gas.

The amount of sickness caused by sewer gas, the world over, is little known. Defective plumbing is one form of murder. Death is almost sure to result unless the victim has a strong constitution to withstand the shock he receives from this source. It was defective plumbing, the *American Builder* claims, which caused the late severe illness of Secretary Manning. Workmen engaged in tearing the plumbing out of Secretary Manning's private office found in a little closet in the corner a pipe four inches in diameter, besides several smaller pipes, leading directly to the sewer without any trap or contrivance to prevent sewer gas from coming into the room. These pipes strike the sewer just at its head, where the greatest amount of gas is formed. In the winter, when the doors and windows were shut, the air was most oppressive, and sometimes in the coldest weather Mr. Manning was forced to open the windows. His physicians pronounce his disease blood poison from sewer gas, and say that it was brought on, beyond doubt, by his sitting in that little room.

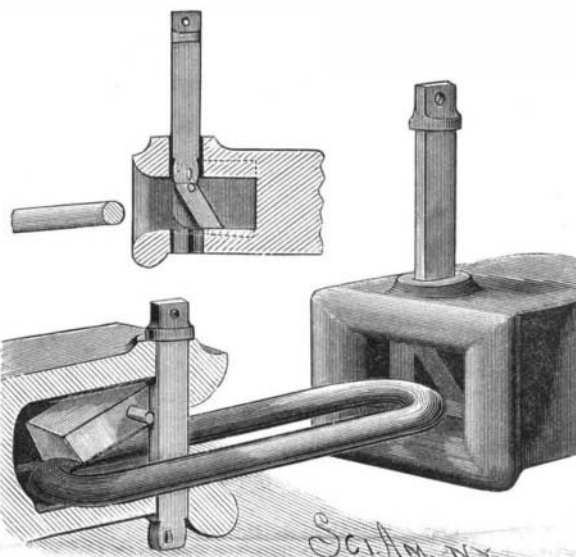
THE AFRICAN DIAMOND INDUSTRY.

At the diamond mines, South Africa, an immense amount of machinery is now employed in the work of elevating the earth containing the diamonds, crushing and separating the same. The earth is raised from the mine pits by means of tubs that run on wire cables, the loads being carried and dumped on inclined boxes, thence distributed into small cars, to be distributed upon the depositing floors.

Our illustration, which is from *Engineering*, shows one of the Compagnie Generale's depositing boxes, with blue ground in the box and trucks loaded ready to be drawn away to the depositing floor. An empty tipping tub is shown on the standing wires over the box ready to be lowered down again into the claims. The Kafir sitting on the box has to hook an anchored wire on to the hanging bar of the tub as it passes over him, by which means the tipping of the tub is effected, the tub itself being so balanced that it quickly rights itself again after tipping. The bottom of the depositing box is formed of iron grating, whereby the coarse lumps of blue ground are sifted from the finer ground, which passes into the lower receptacle of the depositing box and is trucked away separately, thus facilitating the process of pulverization.

IMPROVED CAR COUPLING.

This coupling may be used on any form of car, but is especially applicable for use on freight cars. It may be used in connection with the ordinary pin and link coupling. The drawhead is formed with the usual opening, and in the upper portion are two recesses, within which are pivotally mounted tumblers, whose forward faces are recessed. The tumblers are connected

**REQUA'S IMPROVED CAR COUPLING.**

by a cross rod so located that, when in the position shown in the upper sectional view, the rod will be beneath the coupling-pin hole, the pin being provided at its lower end with a cotter which prevents it from being entirely withdrawn. The tumblers serve to hold the extended end of the coupling link elevated when arranged as shown in the left of the lower figure, the lower wall of the main opening being inclined so that the link will be raised to a position to couple automatically with the adjacent car. In the drawhead into which the link enters, the pin is supported by the cross rod uniting the tumblers, which are swung down. The entering link strikes and throws the tumblers back, so as to permit the pin to drop into the link.

This invention has been patented by Mr. Mark M. Requa; particulars can be obtained from Mr. B. A. Mann, of Lanesborough, Minn.

Electrical Resistance of Carbon.

The principle of the carbon telephonic transmitters

the better contact of the carbon and the metal caused by thus squeezing them together. This view has been opposed by Mendenhall (*American Journal of Science and Arts*), and his later experiments make good his position. He finds, using soft carbon or compressed lampblack, that the resistance of this material varies greatly with pressure, and that the greater part of this change is due to a real change in the resistance of the carbon itself, and only a small portion of the variation is due to the surface contact. He found that a comparatively great pressure would sometimes result in a permanent reduction of the resistance of the carbon; and that this resistance is so uncertain and fluctuating, that it is extremely doubtful whether this phenomenon could be applied so as to give a measure of the pressure exerted.

Chinese Straw Shoes.

We understand that Dr. Macgowan has sent to the Agricultural Bureau, through Consul-General Kennedy, of Shanghai, a collection of shoes made of rice straw, and worn by laboring people in the south of China. Dr. Macgowan sends them, suggesting the introduction of rice-straw shoe making into the rice-producing regions of the South. They are made by women and others who are too feeble for more active employment, which circumstance, and the abundance of the material, render them very cheap—from one to twelve cents per pair!

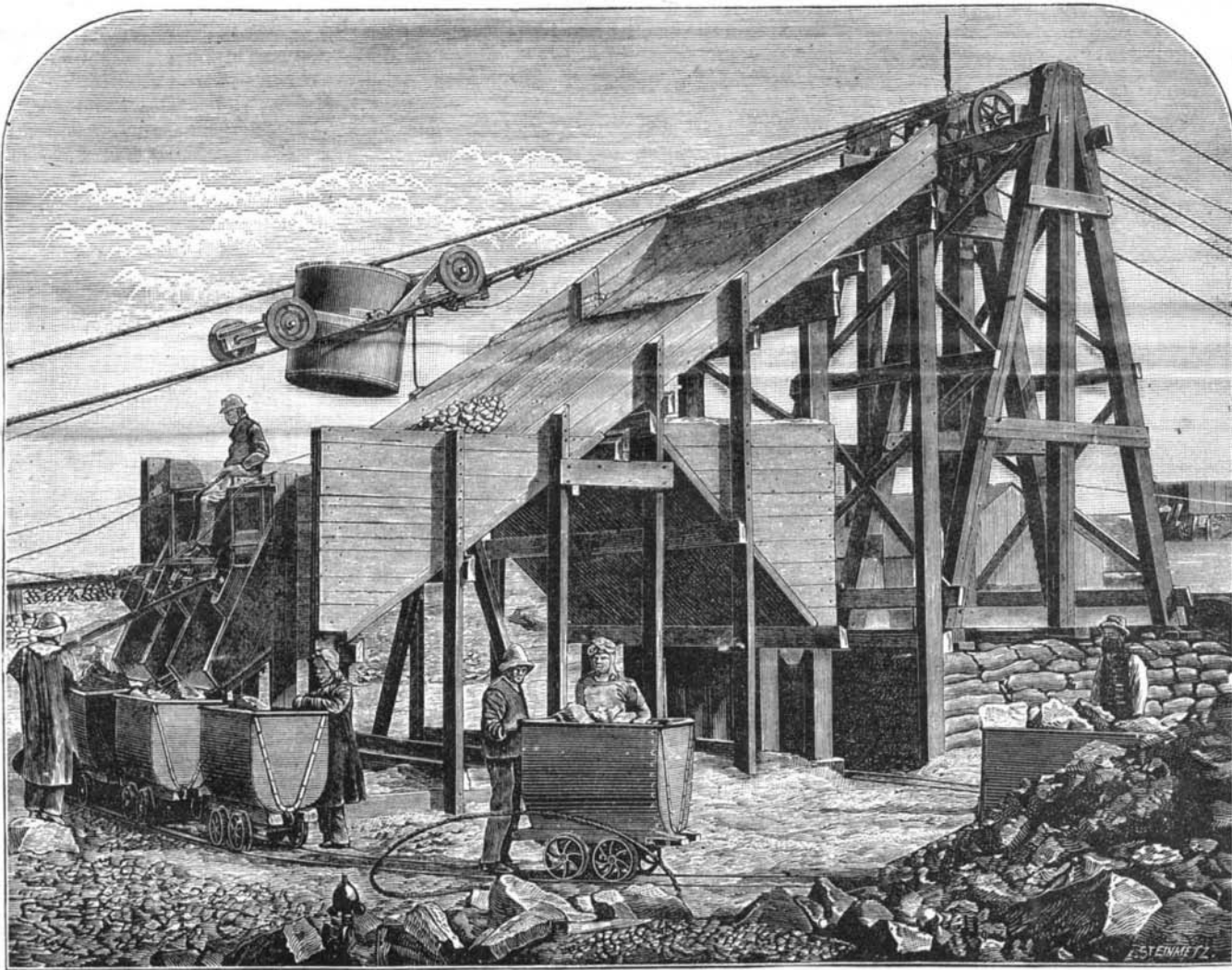
Dr. Macgowan suggests also the introduction into nurseries for children's wear of these straw shoes, that more freedom be allowed to the feet of our children.

The highest priced shoes—12 cents—are made of mat grass (*Arundo mites*), which Dr. Macgowan says should be acclimated in the South, and that mat making would prove a profitable industry.

The Electrical Railway in Minneapolis.

The *Electrical Review* contains an interesting account of the successful operation of the electrical railway in Minneapolis, in which it says: "The trains consist of three or four passenger cars, each weighing 11 tons empty. The number of passengers carried is often as high as 600 at one time, so that the weight of the train is as follows: Four cars, each 11 tons, 44 tons; 600 passengers, at 130 pounds, 39 tons; motor car, 8 tons; total, 91 tons. The steam dummy now brings the train to as far as the steam is allowed, and then the electric motor relieves it and takes the train down town with its passengers. The distance over which the electric motor travels is at present somewhat near a mile, the speed

being about seven miles an hour, this being the regulation speed within the city limits. Considering the constant stopping and starting at each block, the grades in the road, and the heavy trains, the electric motor must be given the credit of doing at least as good work as could be expected or obtained from any steam engine. During the seventeen or eighteen hours of service, not a single minute of stoppage is made except to let off and take on passengers. This electric road has been in operation for several weeks without a hitch or a breakage. The motor, which is about 40 horsepower, works as perfectly under a heavy as under a light load. From the permanency and the character of the work done by this electric railway, it will be

**THE AFRICAN DIAMOND INDUSTRY.—A DEPOSITING STAND.**

is briefly this: A button of carbon is placed between two metal conductors, one of which, being in contact with the vibrating membrane, is made, when the telephone is used, to bear with varying pressure on the button of carbon, thus changing the resistance of the circuit, and so varying the current flowing therein. Previously, the diminution of resistance corresponding to the increased pressure has been held to be due to

seen that electric railways on elevated as well as on ordinary roads must become facts in the immediate future. They are indeed now with us, and there is no more trouble to build 200 or 300 horse-power generators than to build machines of fifty horse-power. The public is losing its skepticism, and what was proclaimed as an impossibility yesterday has become a fact to-day."