its surface from the surrounding atmosphere. This would just sufficiently dim the excessive luster to render a good photographic representation possible. —*Photographic News.*

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute on Thursday evening Oct. 6, 1864, the President, D. S. Tillman, Esq., in the chair.

NEW SMELTING FURNACE.

Prof. Fleury gave a description of a furnace invented some time since in Russia, and now patented all over the civilized world. It is quadilateral in form, flaring towards the top. Its principal peculiarity is the arrangement of the tuyeres, which enter on the long sides of the hearth, those on one side being opposite the middle of the spaces between those on the other side. The speaker read a long paper giving many statistics to show that these furnaces were cheaper to construct, and produced more iron in a given time and with less fuel than the circular bosh furnaces at present in use. He also stated that these furnaces are better adapted than any others to the smelting of copper and lead ores. They are called the Rachette furnace.

MAKING GLOVES.

The regular subject of the evening, glove making, was then taken up, when the President read a paper containing in the main the same facts that appeared in our last week's issue.

Dr. Richards:—Glove making was first established on any considerable scale in this country at Johnstown, in this State. When the country was new this was the frontier part of Sir William Johnson, and the Indians brought their deer skins to it for sale. The manufacture of gloves was started to utilize the skins. The gloves were cut out and distributed among the farmers of the vicinity to be sewed by the women. The business was afterwards established at Gloversville, where it was carried on in the same way. Thus for two or three generations the women of that region have been trained to glove sewing, and they have acquired a skill and proficiency that defies competition. Attempts have been made to start glove manufactories in other places, but they have failed from want of skill among the women in the vicinity of those places in this special art.

At first all of the skins were bought of the Indians, but now they are purchased in this city. Some imported cow skins are used, as well as the deer skins of this country.

Dr. Rich:—Some years ago I had a special interest in making inquiries in France into the details of the glove manufacture, and I found that the making of fine kid gloves pays very low wages even for the cheap labor of that country. I do not believe that the manufacture can be introduced into this country unless machinery can be employed.

Prof. Fleury:—I wonder that asbestos gloves are not used by firemen in this country. In Austria I have seen a man with a complete suit of asbestos walk right through a flame. His eyes were protected by plates of mica, and he carried a moist sponge over his mouth. He was also provided with bags of asbestos for carrying off valuable articles from burning buildings. I suppose a full suit might be obtained at the present time for seventy dollars.

Mr. Nieman:—Kid skins, to be suitable for gloves must be taken from the young animals before they are weaned. After they begin to live on grass the skin undergoes a change, which impairs its value for this purpose. A glove maker, or an experienced dealer, will detect the skin from a grass-fed animal as soon as he sees it.

Mr. Ely:—I have seen it stated on apparently good authority that the very finest gloves are made from the skins of kids that are obtained by killing the dam and taking the kid from her womb. I have also seen a statement of the sum which is annually paid to the French Government for the privilege of entering the sewers of Paris for the purpose of killing rats; the object being to obtain their skins to be used in glove making.

Dr. Rich:—I do not think a rat's skin is large enough to yield pieces of suitable size for gloves that are of uniform thickness and quality.

Mr. Nieman:—We sent some rat skins to Paris, but they would not sell. Even if the skins were large enough, they are spoiled by the rats biting one another so much. If you take up a dressed rat skin you will find it full of either holes or scars.

The skins of tame animals are generally better than those of wild animals, and the skins are tough in proportion to the agility of the animals.

Dr. Rowell:—The very toughest skin that saddle makers can find is a hog's skin. I do not know that the hog excels in agility.

Dr. Richards:—I was at one time interested in the manufacture of leather, and we found that calves of the most improved breeds furnished better hides than ordinary cattle.

The new mode of travel by the pneumatic tube was selected as the subject for the next meeting, and the Association adjourned.

WARREN'S DEEP-WELL OIL PUMP.

Ordinary oil wells range from 400 to 1,000 feet in depth, and when in working order the pumps therein are subjected to an immense strain from the hydrostatic pressure due to the long column of oil that has to be lifted at each stroke. This pressure is very great, and not only causes the packing to wear leaky in a short time, but it also endangers the safety of the pump barrel itself, which not unfrequently bursts from the severe strain of resisting the movement of the column. The great hydrostatic pressure referred to causes the pump piston to become so leaky in a short time that no vacuum can be maintained, and the apparatus is wholly deranged in consequence. Many rich wells have been declared dry from the failure of the pumps to act. Where such important interests are concerned, proprietors of, or others interested in oil wells, should not fail to adopt this pump, as it is devised on sound mechanical principles, and will work well if properly made. The details are as follows:—

Fig. 1.

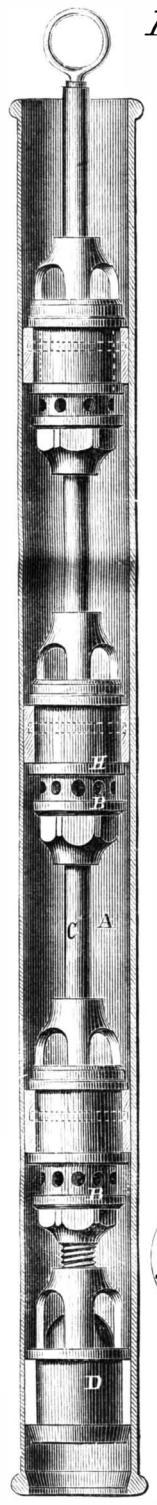

Fig. 2.

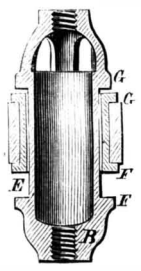

Fig. 3.

The engraving represents a long pump barrel, A, which has the pistons, B, in it. These pistons are all connected by one rod, C, and move simultaneously. At the bottom of the pump is a foot valve, D, of the ordinary kind, which opens upward, allowing oil to enter but not to return.

The pistons have a loose sleeve, E, where the packing is in ordinary pumps, (see Fig. 2) which moves up with the piston when the two flanges, F F, come together. It also moves down when the other flanges, G, come in contact. The sleeve therefore slides easily on the body of the piston. These three sliding partitions, so they may be called, virtually divide the pump barrel into as many compartments, for although the pistons move simultaneously the loose sleeves are of different lengths, so that each one moves a little in advance of the other. In this way each piston lifts only the column directly above it. So soon as the top piston moves up the flange, F, on it, strikes the loose sleeve and raises it; the oil which entered through the holes, H, is shut off from the column below, and the piston goes away from it. The second piston then meets the other loose sleeve and shuts off the oil from the openings, H, and raises its load, and so the operation goes on down the barrel. The times of lifting the load on each individual piston is regulated by the distance the loose sleeves travel on the pistons which shut off communication between one compartment and the other, earlier or later, as occasion requires. Although the aggregate load on the pump rod and bottom piston is the same as in any ordinary pump the *pressure* on the latter is far less, being only that due to the column resting upon it, as any intelligent person can see at a glance.

These pumps give great satisfaction, and can be obtained of Messrs. Hart, Ball & Hart, Buffalo, N. Y.

The invention was patented on May 10, 1864, by John Warren, of Buffalo, N. Y., from whom all further information can be obtained.

CHANGING IRON TO STEEL BY CARBONIC OXIDE

Le Genie Industriel publishes the following note recently presented to the Academy of Sciences, Paris, by M. Fred Marguerite:—

"The idea of carburation by a gas is due to Clonet, who thought that iron has such an affinity for carbon that at a very high temperature it would remove it even from oxygen. He relied for this opinion on the fact that having heated iron divided into small pieces with a mixture of carbonate of lime and clay, he obtained steel. He concluded that the carbonic acid of the carbonate of lime was decomposed, yielding its carbon to the iron.

"But Mushet, repeating the experiment of Clonet, operated with lime deprived of carbonic acid, or simply with sand, and obtained steel; thus demonstrating that the carbon was not furnished by the carbonic acid of the mixture, but by the gas from the furnace which penetrated through the walls of the crucible.

"Collet-Descotils and Marckensie proved that, in the same circumstances, the iron might be perfectly melted without its properties being sensibly altered.

"M. Boussingault, following rigorously the indications of Clonet, obtained a product which analysis demonstrated not to be steel, but the silicide of iron.

"Later, M. Leplay gave his ingenius theory of the treatment of minerals in high-furnaces, which he summed up thus:—

"Carbonic oxide reduces all the compounds, and carburets all the metals which can be reduced and carburetted by cementation.

"But in the researches followed in common by MM. Laurent and Leplay, the action of carbonic oxide was found absolutely null, and their experiments had for conclusion that carburetted hydrogen is the cause of the cementation and the carbonic oxide of the deoxydation.'