UNITED STATES PATENT OFFICE.

JOHN H. ELWARD, OF POLO, ILLINOIS.

IMPROVED METHOD OF DESULPHURIZING COAL FOR WELDING IRON, &c.

Specification forming part of Letters Patent No. **52,699**, dated February 20, 1866.

To all whom it may concern:

Be it known that I, JOHN H. ELWARD, of Polo, in the county of Ogle and State of Illinois, have invented a new and useful Improvement in Desulphurizing Mineral Coals on Blacksmiths' Fires; and I do hereby declare that the following is a full and exact description thereof.

It is well known that all the mineral coals used for blacksmiths' fires contain more or less sulphur, and that many of them yield oil in greater or smaller quantities; and it is also well known that the presence of either sulphur or oils in excess mars the labors of the smith, more especially in welding. Now it is the object of my invention to deprive the coals to be used in blacksmiths' fires of their excess of sulphur and oleaginous matter, to enable welding to be effected with any crude coal and without previous coking; and my invention consists in bringing the coal to a red heat in the blacksmith's forge and applying thereto in douches a strong solution of niter or crude niter in a pulverized condition, or saturating the coal before heating with or in a solution of niter.

My process can be applied in either of the following modes with the most effective results:

First, I form in a suitable vessel a strong solution of niter. For those coals that hold large quantities of sulphur in combination with their carbon, I place in the water all the niter that the water in the vessel can be made to hold in solution, and with coals containing less sulphur I use a weaker solution. This vessel may be placed near the forge-fire, and from time to time I dip a portion of the solution and sprinkle or douche it over the ignited coal. Now, as the solution is expanded into steam by the heat and the niter it contains undergoes combustion it rapidly parts with its oxygen, which unites with the heated sulphur in the coal, for which its affinities are strong, and both pass off together from the fire, leaving it in such condition as is best adapted to the effecting of sound welding.

Second, instead of using a solution of niter, crude niter or even highly-nitrogenized earths may be finely pulverized and sprinkled over the fire from time to time with the same results, and even immersing the coal before heating in the nitrogenized solution will produce equivalent results.

It is obvious that my process may be advantageously used in desulphurizing other crude minerals without departing from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

The use of niter, either crude or in solution, for desulphurizing mineral coal in blacksmiths' fires, substantially in the manner described.

In testimony whereof I have hereunto subscribed my name.

JOHN H. ELWARD.

Witnesses:

EDM. F. BROWN,

HORACE HOLT.