UNITED STATES PATENT OFFICE.

GEORGE K. SMITH, OF WATERLOO, IOWA, ASSIGNOR OF ONE-HALF HIS RIGHT TO GEORGE W. MILLER, OF SAME PLACE.

IMPROVEMENT IN COMPOSITION METALS FOR CASTING PLOWS.

Specification forming part of Letters Patent No. **143,539**, dated October 7, 1873; application filed April 8, 1873.

To all whom it may concern:

Be it known that I, GEORGE K. SMITH, of Waterloo, in the county of Black Hawk and State of Iowa, have invented a certain new and useful Improvement in a Composition and Process of Making a Metal for Casting Plows and for other purposes; and the following is a full, clear, and exact description of the same.

This invention relates to that class of compounds to be used as a substitute for steel plows, or other agricultural implements, that require to wear bright and smooth in order to work easily; and it consists of the ingredients, in their several proportions, prepared and cast in the manner or process hereinafter more fully described.

To prepare the metal for making plows, &c., to the one hundred pounds I take thirty pounds of scrap-steel, (old files,) thirty pounds of wrought-iron in scrap, of about the same size of the steel, and four pounds of black oxide of manganese, which is put in a sheet-iron tube, and bound up in a bundle with the steel and iron scrap. A bed or mold for casting a pig is made, into which the fagot or bundle is placed. Then I take thirty-six pounds of ordinary cast-iron and melt it in the cupola and pour it in the mold around the bundle of scrap and manganese, making a pig of one hundred pounds' weight, with the definite proportion of each metal. These pigs of iron and steel are then broken and melted in the cupola, the same as if they were all cast-iron, and may be cast into plows, or other implements, in the same manner.

In this way, wrought iron and steel can be melted in a cupola; whereas if such metal were thrown in loose the cast-iron would melt first, and the wrought-iron and steel would oxidize and burn up. The object of the manganese is to give the iron a body, and use up the excess of carbon, and harden the iron. By this process of mixing, the cast-iron contains carbon enough to flux the steel and iron, and all melt and commingle together, and when cast make a very fine-grained iron casting, exceedingly hard and durable, and capable of receiving a very high polish. It is also capable of being annealed, so as to be drilled and worked under the hammer the same as ordinary malleable iron, so that the plow-points can be sharpened in that way the same as though they were made of steel, and hardened by the same process.

It is a well-known fact that the soil in the different sections of the country has a very different effect upon the implements and tools used for digging and cultivating—for instance, in New England and the State of New York, a cast-iron plow will scour and wear bright and smooth; but take the same plow into the western prairie States—Illinois and Iowa, for instance—and it is a failure, as there is not grit enough in the soil to wear and keep it bright; consequently steel plows only can be used successfully, which are very expensive, as they have to be wrought into shape.

The plows made and cast from the composition as above described have proved a success in every way, and can be furnished at cost but little above the ordinary cast-iron plows.

Having thus fully described my invention, and the process of preparing and compounding the same, what I claim, and desire to secure by Letters Patent, is—

A composition of scrap-steel, scrap wrought-iron, cast-iron, and black oxide of manganese, in the proportions enumerated, and prepared, mixed, and cast in the manner herein described, for the purposes specified.

In testimony whereof I hereunto subscribe my name.

GEORGE K. SMITH.

Witnesses:

J. C. ELWELL,

J. L. HUSTED.