

UNITED STATES PATENT OFFICE.

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METAL STOCK.

No Drawing.

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To all whom it may concern:

Be it known that I, ANDREW M. HUNT, a citizen of the United States, residing at Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Metal Stock, of which the following is a specification.

My invention relates to a metal stock and the production thereof, useful for various purposes but more particularly in connection with the deoxidation and purification of molten metals such as iron or steel and nickel.

One of the objects of the invention is the production of a metal stock comprising a plurality of metal ingredients united by subjecting a mixture of the comminuted metals to high pressure.

Another object of the invention is the utilization of this briquetted material for treating molten metals such as iron or steel and nickel.

As a specific illustration of the application of my invention, I may take 10—20 parts of powdered magnesium and mix the same with 90—80 parts respectively of powdered ferro-silicon or a mixture of powdered ferro-silicon and ferro-manganese. The magnesium mixture is then subjected to heavy pressure in a die for the purpose of forming a coherent briquet. Pressures as high as 40,000 pounds per square inch have been found sufficient to cause the ingredients to cohere. At this pressure the magnesium, on account of being the softer of the two metals and possessing sufficient plasticity, will flow around and be uniformly disseminated between the harder and less plastic iron particles causing the ingredients to cohere in a firm hard briquet. If the mixture is subjected to a temperature of about 300 degrees C. lower pressures may be employed in forming the briquet.

A specific application of the utility of the magnesium-iron briquet is in connection with the deoxidation of molten iron or steel. It is well known that magnesium is an efficient deoxidizer of molten iron, but limitations of its use heretofore have been dictated by the violence of the reaction which takes place on adding the magnesium, causing the molten metal to be projected out of the holding receptacle. The obvious expedient would be to add the magnesium in a diluted

form thus diminishing the violence of the reaction; but the usual method of attaining this end, such as alloying the magnesium with iron under favorable conditions cannot be availed of on account of the fact that these metals do not readily alloy. My briquet therefore has its special utility in this connection in that small quantities of magnesium may be added to the molten iron without any of the above mentioned disadvantages in carrying out this operation.

Another specific application of my invention is in connection with the deoxidation of molten nickel. In the electrolytic refining of nickel, if the nickel anode is full of blowholes, it crumbles to pieces as the process of refining is carried on. The addition of magnesium to the molten nickel before casting the anode, obviates this disadvantage by the elimination of blowholes. The magnesium is added in the form of a nickel-magnesium briquet. This briquet is made in the same manner as the iron-magnesium briquet, nickel being substituted for the iron alloy in the mixture.

While I have described the application of my invention in connection with magnesium and iron alloys and nickel, it is obvious that other mixtures of metals possessing the necessary physical characteristics might be substituted for the metals named.

From the above description it will be apparent that I have produced an article of the character described, which possesses the characteristics enumerated as desirable, and while I have disclosed the preferred form of and method of using my invention, it will be understood that I reserve the right to all changes properly falling within the spirit and scope of the appended claims.

I claim:

1. As a composition of matter, a mechanical mixture of metals in the form of a compressed coherent mass and comprising disseminated magnesium.
2. As a composition of matter, a uniform mechanical mixture of metals comprising magnesium and iron in the form of a compressed coherent mass.
3. As a composition of matter, a uniform mechanical mixture of metals comprising magnesium and ferro-silicon in the form of a compressed coherent mass.
4. As an article of manufacture, a compressed metal briquet comprising a uniform

mixture of hard ferrous and non-ferrous metals, the latter being relatively soft and plastic and acting as a binder for the former.

5 5. As an article of manufacture, a compressed metal briquet made up of a mixture of metals comprising magnesium and other relatively hard and non-plastic metals, the
10 magnesium acting as a binder for the other metals.

6. The method of briquetting magnesium with a relatively harder and less plastic metal, comprising subjecting a mixture of the said metals in powdered form to a high
15 degree of pressure whereby the magnesium

will flow around and weld together the relatively harder ingredients.

7. As a composition of matter, a uniform mechanical mixture of metals comprising magnesium, ferro-silicon and ferro-manga- 20
nese in the form of a compressed coherent mass.

8. As a composition of matter, a mechanical mixture of metals comprising magne- 25
sium in the form of a compressed coherent mass.

In testimony whereof I affix my signature.

ANDREW M. HUNT.