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EXAMINER

DIV. 3.

UNITED STATES PATENT OFFICE.

HENRY ROBERTS AND FREDRICK CRICH, OF PITTSBURG, PENNSYLVANIA.

COMPOUND FOR WIPING WIRE.

SPECIFICATION forming part of Letters Patent No. 275,415, dated April 10, 1883.

Application filed May 4, 1882. (No specimens.)

To all whom it may concern:

Be it known that we, HENRY ROBERTS and FREDRICK CRICH, of Pittsburg, Allegheny county, in the State of Pennsylvania, have invented certain new and useful Improvements in Compounds for Wiping Wire, of which the following is a specification.

The object of the invention is to remove the surplus of melted metal from the wire in the act of galvanizing. What is properly termed "galvanizing" wire is effected by drawing the wire in continuous lengths through a long vessel filled with melted zinc. The wire, having been first treated with proper acids to induce the right condition of the surface, retains, on emerging from the metal bath, a coating of the zinc, which subsequently protects it from the weather, and adds much to its value; but it is found that, unless great care is taken in wiping the wire as it emerges, it will retain too thick a coating. The increased thickness is objectionable, not only by consuming too much zinc and irregularly increasing the size of the wire, but the wire does not retain the zinc so well, especially on sharp bends. There are difficulties in the wiping. Some are due to the practice of uniting the successive lengths of wire by roughly linking together, thereby forming a rigid enlargement, which makes it necessary to use a wiping material which is mobile as distinguished from rigidly-fixed elements of mechanism. Another difficulty is due to the high temperature of melted zinc, which rapidly burns and destroys ordinary unprotected cotton and various other materials which might otherwise be available for wiping. We have, with much experiment, found a composition, of which cotton-waste and an incombustible fibrous material known as "mineral wool" or "slag-wool" form important elements, which conforms to the requirements, and, when properly conditioned mechanically to insure the proper contact of the wiping material with the hot coated wire rising obliquely from the metal bath, wipes off the surplus, and returns it to the bath, leaving only the desired uniform thin coating of zinc on the wire.

The following is a description of what we consider the best means of carrying out our invention.

We take one pound of alum, three-quarters

of a pound of potash, one-half pound of sulphate of copper or sulphate of iron, and a quarter of a pound of rock-salt, or more if required, each reduced to a powder, and these ingredients, after being thoroughly mixed with water, are boiled to the consistency of cream. Then, in a separate vessel, we mix five quarts of unslaked lime and three quarts of unslaked or slaked hydraulic cement. We have used successfully the brands known as "Portland" cement and "Rosendale" cement. These ingredients are freshly powdered and mixed. With these we thoroughly work four quarts of lard-oil, and finally work this oily compound with the watery compound first described. We take ten pounds of cotton-waste, preferably hard-twisted fine yarns. With it we mix three pounds of what is known as "slag-wool" or "mineral wool"—a vitreous material produced by subjecting cinder from the blast-furnace to a current of high-pressure steam. These are intimately mixed, and constitute the fibrous body of our compound wiping material. These different compounds are now mingled mechanically together by any suitable means. We believe no particular care is necessary to make the union especially intimate; but we prefer that they be as thoroughly mingled as is practicable. The resulting mass should have the required consistency, and upon it we sprinkle and work in one pound of powdered sal-ammoniac.

Our compound is forced into the wiping-box and kept in contact with the wires which are to be wiped. We have used this compound in the wiping-box set forth in the patent to Henry Roberts, May 17, 1881, No. 241,721; but we employ this wiping material only in the lower front side of the box, where the wires enter, supplying it by forcing it in from the front side of the base of the wiping-box, which is made removable, and forcing it against the lowermost pair of rollers, which latter are allowed to remain at rest when this compound is used. The rollers at more distant points in the box are kept in motion, and perform their usual function on another and different species of material—dry or nearly dry mineral wool—without any of the other ingredients of the present compound.

There is a large amount of toughness and elasticity in the compound described. It is

common to draw twelve wires at once through a single bath of the melted zinc, and to wipe that number side by side in a single wiping-box. When a splice or joint rises from the metal and moves through this compound, it does not remove the compound to any considerable extent, but simply forces it away for the moment. The elasticity and applied pressure restores the wiping compound back to its proper contact with the wire after the splice has passed.

This wiping compound, by its contact, without much changing or kneading of its particles, rubs the wire with a gentle pressure and wipes off the principal surplus of melted zinc.

The parts of our compound immediately adjacent to each wire attain a temperature very nearly that of the wire. The inclosing of the wire in a wiping material of such temperature may be of advantage in properly distributing the soft-metal coating. The particles of composition distant from the wire perform important functions in addition to simply holding the working particles elastically to their place. They supply moisture and oil to the heated portion and maintain its elasticity and plasticity. Experiments on a large scale indicate that this wiping material will serve about two days, and should then be removed and a new batch supplied. As we have used it in connection with the wiping-rollers of the Roberts patent of May, 1881, the rollers in the more distant portion of the box were kept in rotation, and worked a quantity of the slag-wool in contact with the wire after it had passed our composition and been principally wiped thereby. We believe it of advantage to treat the wire in this manner—first by this composition and afterward by constantly-renewed surfaces of slag-wool or analogous wiping material. It is proposed to use mechanical rammers in addition

to the rollers to keep the slag-wool in a properly-compacted condition. Such will be made the subject of a separate application for patent.

We can substitute other oil—as whale-oil—for the lard-oil prescribed. Lard, tallow, or other fat may serve, heat being applied to bring it to a fluid state for proper incorporation with the other ingredients. Oil may be used instead of water in the first compound. The effect of the small quantity of fluid added to the powdered elements at that stage is mainly mechanical, to make the whole work as a fluid or semi-fluid mass. If oil is used instead of water, the partially fluid condition of the resulting compound is retained in the presence of the heated wires for a longer period. We prefer, all things considered, to mix the first elements with water, only using a liberal quantity of oil, as prescribed, in the second compound, and throwing out the material, with its mingled fibrous matter, and replacing it by new before it becomes unworkable.

We claim as our invention—

The wiping material described, composed of a fibrous body, partly of incombustible material, filled with a semi-fluid mass composed of alum, potash, blue vitriol, rock-salt, lime, hydraulic cement, oil, or other fatty substance, and sal-ammoniac, in about the proportions and combined substantially in the manner as herein set forth.

In testimony whereof we have hereunto set our hands, at Pittsburg, Pennsylvania, this 1st day of May, 1882, in the presence of two subscribing witnesses.

HENRY ROBERTS.
FREDRICK CRICH.

Witnesses:

H. E. HOLMES,
J. C. BRADY.