H. REDDING.

INSULATED WIRE.

No. 189,262. Patented April 3, 1877.

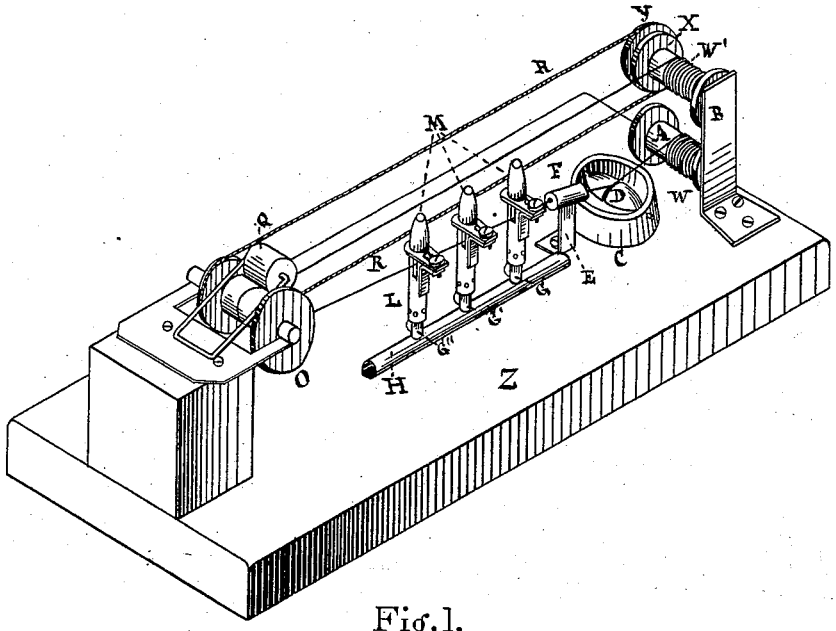

Fig. 1.

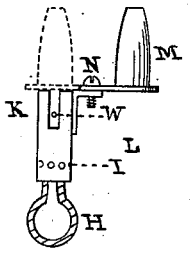

Fig. 2.

In presence of
Frank. E. Ferrahn.
George T. Tilden.

Harvey Redding

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HARVEY REDDING, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO JEROME REDDING, OF SAME PLACE.

IMPROVEMENT IN INSULATED WIRE.

Specification forming part of Letters Patent No. **189,262**, dated April 3, 1877; application filed January 27, 1877.

To all whom it may concern:

Be it known that I, HARVEY REDDING, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Insulated Wire, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My improvement consists in coating the fine copper wire throughout its whole length with an insulating substance that, when it becomes hard, still remains tough and pliable, capable of being bent in a short turn, and not liable to crack or scale off from the surface of the wire.

This insulating coating or covering is very thin, and occupies much less space than the common silk or cotton covered wire, thus greatly increasing the power or strength of a magnet.

I will first describe the apparatus for coating the wire, which is represented in the drawings, Figures 1 and 2.

The naked copper wire W is first wound upon a bobbin or spool, A, from whence it enters a small trough, C, containing the liquid insulating substance, and passes around the small roller D, which revolves within this trough. From this roller the wire enters the open end of the stuffing-box F, and issues from a small hole at the opposite end of the box. It then passes over a series of gas-burners or lamps, G G′ G″, &c.; thence around the driving-pulley O, being held in contact with the same by a spring or weight, Q; from this the wire passes to and is wound upon the reel, which is turned by the driving-cord R, running in a groove formed in the pulley Y, which is attached to one end of the reel X, the pulley O being driven by a crank or other suitable power.

The reels A and X are supported by a suitable standard, B, which may be placed at a distance of five to ten feet from the gas-burners or lamps G, in order that the insulating compound upon the wire W′ may become thoroughly dry and hard.

I prefer to use the Bunsen burners, constructed as represented in Fig. 2. These are attached to a horizontal gas-tube, H. Air is admitted at the apertures I within the case L, which has near the top a vertical slot, K, cut through both of its sides, giving space for the wire W to pass directly above or through the flame.

A projection from the side of the case L holds the chimney or cowl M, which may be turned off from the burner (revolving upon the screw N) when the wire is to be adjusted or put in place. In the projection that holds the cap M there is a slot, which allows the cap to be moved backward or forward, so as to direct the draft of air, and cause the middle of the flame to impinge directly upon the wire.

I prefer to use from five to ten burners, through the flame of which the wire passes in regular succession, thus causing the drying and hardening of the insulating substance as it moves forward, and is taken up by the reels in a finished condition.

Suitable stop-cocks are attached to the respective burners of the series, and also to the horizontal gas-supply pipe H.

The insulating substance that I prefer to use in the trough C is a solution of shellac in alcohol; and as this substance is very inflammable, and burns with a bright blaze when the coated wire enters the first flame, the wire is inclined upward two or three inches, and this prevents the flame from running back to the solution or varnish in the trough. It then passes through the small box F, which is stuffed with asbestus or other fibrous substance, which acts as a wiper, and causes the even distribution of the liquid insulating material, and also assists in preventing the flame from flashing to the trough C.

The copper wire, as it enters the burners, becomes heated to redness; but if a suitable velocity is imparted to the wire the coating is not burned off, but is hardened and becomes jet-black by the union of the carbon in the smoke of the burners with the insulating material; at the same time it assumes a peculiar toughness and strength, that is an especial requisite for the wire of electro-magnets.

What I claim is—

1. The gas-burner or the series of gas burners or lamps, through which the wire passes, and by which the insulating coat is hardened or cured, in combination with the reels A and X, the trough C, containing the liquid insulating substance, and the wiper or guard F.

2. As a new article of manufacture, the wire, in combination with its insulating coating or covering, prepared as herein described, or by an equivalent process.

HARVEY REDDING. [L. S.]

In presence of—
FRANK E. ZERRAHN,
GEORGE T. TILDEN.