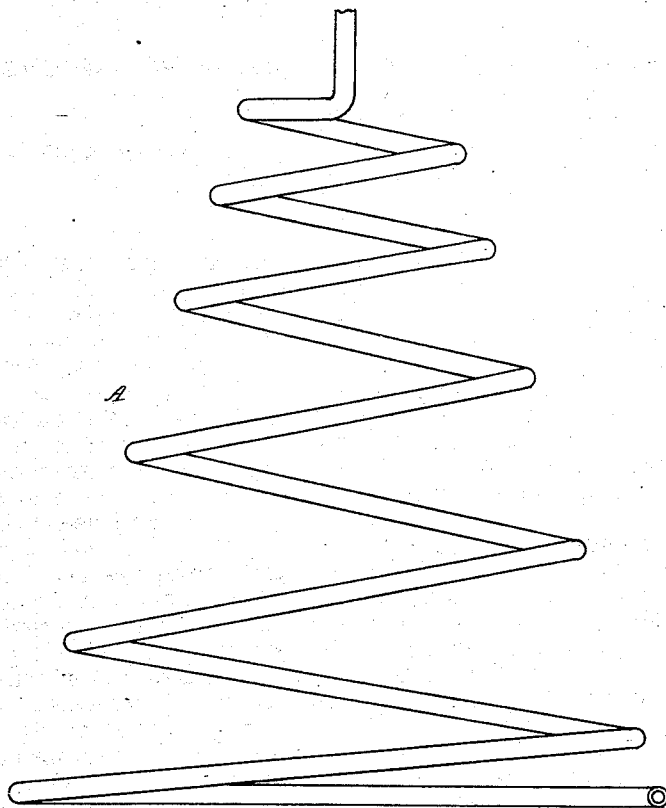


L. C. BOYINGTON.
Tin Coated Steel Bed-Springs.

No.154,742.

Patented Sept. 8, 1874.



WITNESSES

N. C. Gidley
F. F. Warner

INVENTOR

Lewi C. Boyington

UNITED STATES PATENT OFFICE.

LEVI C. BOYINGTON, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN TIN-COATED STEEL BED-SPRINGS.

Specification forming part of Letters Patent No. **154,742**, dated September 8, 1874; application filed January 31, 1874.

To all whom it may concern:

Be it known that I, LEVI C. BOYINGTON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements relating to Steel Spiral Springs, of which invention the following is a full, clear, and exact description, which will enable others to apply the same, reference being had to the accompanying drawing, representing a steel spiral spring embodying my invention.

The object of my invention is to prevent steel spiral springs from becoming rusty when exposed, and to accomplish this result by means of a cheap and ornamental coating, which may be readily applied to the surface of the springs without destroying their flexibility. To this end my invention consists of a steel spiral spring provided with a coating of tin, applied to its surface by means of any suitable process which will not injure the flexibility of the spring.

I deem it preferable to employ the following process for the purpose of enameling the spring: I form the spring, in any known manner, from soft steel wire, as hard steel wire would be too stiff and brittle for that purpose, and the spring is then dipped into muriatic acid diluted with zinc until the acid will take no more. It is then dipped into a combination of melted lead and tin, in proportions of one of lead to two of tin. As the spring, on being removed from the metallic bath, would be too soft for durable use as a spiral spring, it is immediately, on being removed from said metallic bath, immersed in oil or water to harden and temper it. When a brighter and smoother coating is desired, the spring, after receiving its first coating, and before being tempered in the manner described, is dipped into a second vessel containing melted tin and oil. The tempering can then be done, as described.

The spring, when taken from the molten lead and tin, or from the molten tin and oil, is as hot as would be required if it were to be heated in a fire for the purpose of being tempered, and is hardened equally as much as it would be if tempered in the latter manner, and much more evenly, for the reason that when heated in a bath of molten metal the heat is more evenly distributed.

I am aware that iron and steel wire have been tinned and hardened at the time of drawing the wire, but I am not aware that a tinned steel spiral spring has ever before been made or sold as an article of merchandise. Hard or tempered tinned steel wire could not be formed into a spiral spring having a perfect face, and salable as an article of merchandise, without first drawing its temper, and, when the temper is drawn from hard steel wire, so that it may be formed into a spiral spring, as also soft steel tinned wire, would not be useful and durable as a spiral spring without being tempered, as hereinbefore described, after being formed as a spiral spring.

In the drawing, A represents a steel spiral spring provided with a coating of tin in the manner described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A new article of manufacture, consisting of a steel spiral spring provided with a coating of tin, for the purpose specified.
2. In the manufacture of steel spiral springs, the process of first making the springs of steel wire sufficiently soft to be bent in the form required, and afterward providing them with a coating of tin and tempering them, in the manner described.

LEVI C. BOYINGTON.

Witnesses:

N. C. GRIDLEY,
F. F. WARNER.