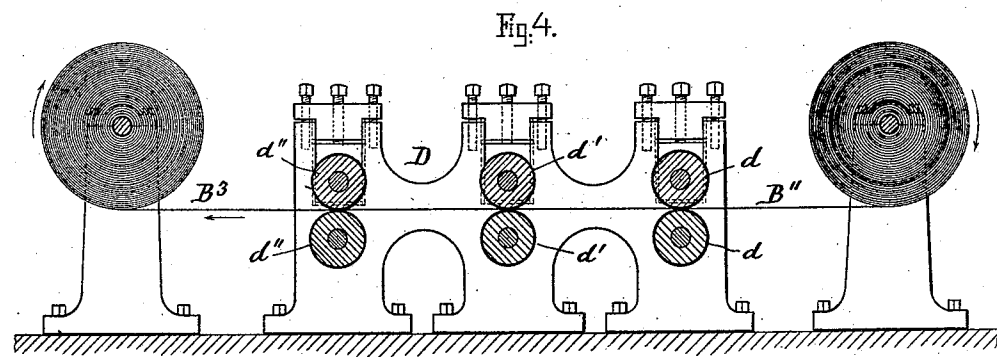
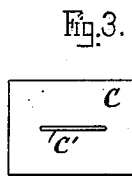
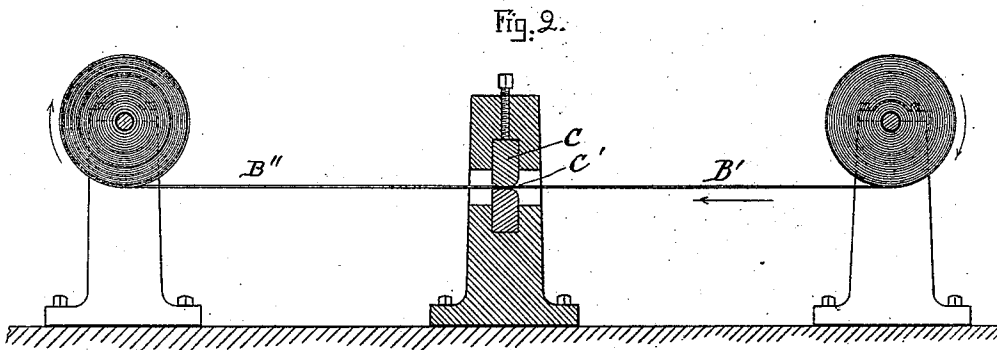
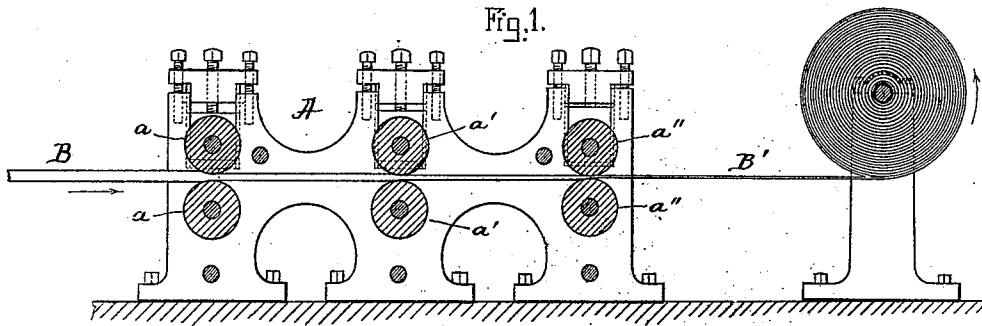


(No Model.)

O. J. WINLUND & A. L. LARSON.
METHOD OF MAKING SHEET OR BAND METAL.

No. 471,298.

Patented Mar. 22, 1892.



Witnesses.

Lauritz N. Möller.
Alice A. Perkins.

Inventors.

Olof J. Winlund, and
August L. Larson.
by Allan Andren their atty.

UNITED STATES PATENT OFFICE.

OLOF J. WINLUND AND AUGUST L. LARSON, OF WORCESTER, MASSACHUSETTS.

METHOD OF MAKING SHEET OR BAND METAL.

SPECIFICATION forming part of Letters Patent No. 471,298, dated March 22, 1892.

Application filed September 29, 1891. Serial No. 407,131. (No model.)

To all whom it may concern:

Be it known that we, OLOF J. WINLUND, a citizen of Sweden, and a resident of Worcester, in the county of Worcester and State of Massachusetts, and AUGUST L. LARSON, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have jointly invented new and useful Improvements in Methods of Making Sheet or Band Metal, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in methods of making sheet or band metal; and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a sectional view of a rolling-machine, in which the heated blank is hot-rolled and wound upon a reel preparatory to the subsequent drawing process. Fig. 2 represents a sectional view of the perforated die through which the reduced sheet or ribbon is drawn while in a cold state. Fig. 3 represents a detail front elevation of the said perforated die; and Fig. 4 represents a sectional view of the rolling-mill in which the plate or ribbon is finally rolled to the desired thickness, as will hereinafter be more fully shown and described.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In carrying out our improved method we proceed as follows: In Fig. 1, A represents a rolling-mill having a series of rollers $a a, a' a', a'' a''$, arranged in pairs, as is common in devices of this kind. Between such rollers is introduced a heated metal blank B, which is rolled while in a hot state and reduced to a thin sheet B', which is wound upon a reel, as shown in Fig. 1. The sheet or ribbon B' is then drawn cold between a die C, having a slot or perforation C', Figs. 2 and 3, causing the fibers of the metal to be compressed vertically as well as horizontally and causing a ribbon or plate B'' to be produced having

parallel edges and of even thickness throughout its length, which is wound upon a reel, as shown in Fig. 2. The compressed and uniformly-drawn plate or ribbon B'' is then reheated and rolled cold between one or more successive pairs of rollers $d d, d' d', d'' d''$ in a rolling-mill D, as shown in Fig. 4, causing a thin sheet or band B³ to be produced having straight and parallel edges and of uniform thickness throughout its length. If so desired, the sheet or band B³ thus produced may be reheated and rolled one or more times until a sheet or band of the desired thickness is obtained.

By this method a sheet or band of thin metal can be produced of a uniform width and having its edges true and parallel, thus saving a great deal of waste which usually occurs in trimming the uneven edges of the sheet or band.

By this our improved method we are enabled to produce thin sheet metal, watchsprings, paragon or flat steel wire, and other similar articles in a very rapid and practical manner without any waste occurring in such production.

Having thus fully described the nature of our invention, we wish to secure by Letters Patent and claim—

The herein-described method of making thin metal sheets or bands, consisting in first hot-rolling and reducing a heated blank between rollers, then drawing the cooled sheet or ribbon through a reduced die, heating the drawn sheet or ribbon, and finally rolling it between rollers, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 1st day of July, A. D. 1891.

OLOF J. WINLUND,
AUGUST L. LARSON.

Witnesses:

ALBAN ANDRÉN,
JOSEPH F. HAWKINS.