

E. H. STRANGE & C. A. PIM.

PROCESS OF MANUFACTURING THIN SHEETS, FOIL, STRIPS, OR RIBBONS OF ZINC, LEAD,
OR OTHER METAL OR ALLOY.

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905,758.

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Fig. 1.

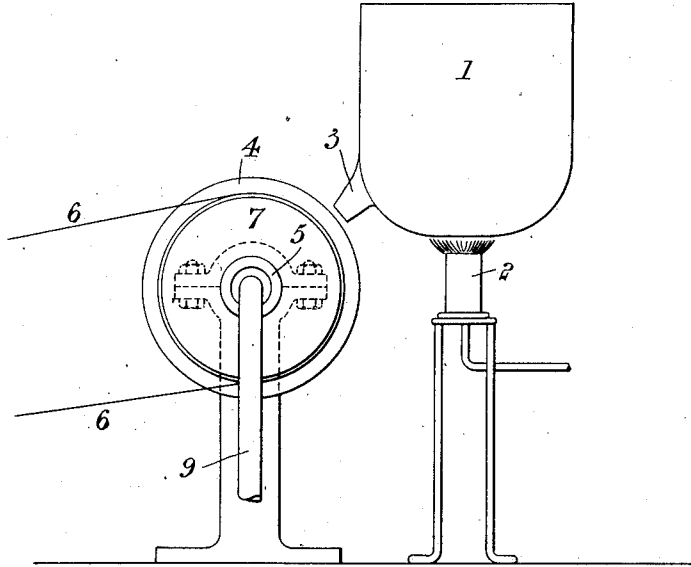
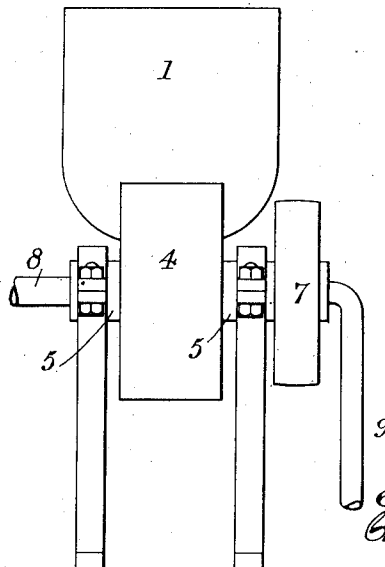


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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PROCESS OF MANUFACTURING THIN SHEETS, FOIL, STRIPS, OR RIBBONS OF ZINC, LEAD, OR OTHER METAL OR ALLOY.

No. 905,758.

Specification of Letters Patent.

Patented Dec. 1, 1908.

Application filed March 14, 1908. Serial No. 421,055.

To all whom it may concern:

Be it known that we, EDWARD HALFORD STRANGE, technical research chemist, and CHARLES ALBERT PIM, chemical engineer, subjects of the King of Great Britain and Ireland, both of 7 Staple Inn, in the county of London, England, have invented new and useful Improvements in Processes of Manufacturing Thin Sheets, Foil, Strips, or Ribbons of Zinc, Lead, or other Metal or Alloy, of which the following is a specification.

The object of our invention is to provide an improved process by means of which zinc, lead, or other metal, or alloy, of a character adapted for use in the form of thin sheets, or foil, or strips, or ribbons, and of a melting point sufficiently low to allow of being treated as hereinafter described, can be continuously and very expeditiously and economically formed into very thin and even sheets, or foil, or strips, or ribbons, of even width and thickness and as free from flaws, or other imperfections, as possible and in a condition eminently adapted for being acted upon chemically.

According to our invention, the metal, or alloy, to be made into thin sheets, or foil, or strips, or ribbons, is maintained in a molten condition in any suitable receptacle and passes, or is passed, out of the said receptacle through an outlet, or outlets, having a cross-sectional area proportional to the cross-section of the required thin sheets, or foil, or strips, or ribbons, the said receptacle and outlet, or outlets, being provided with any suitable means for retaining the metal, or alloy, in a sufficiently molten condition.

In close proximity to, but not in contact with, the said outlet, or outlets, we provide a cool and traveling surface, so that the molten metal, or alloy, is continuously received upon, and rapidly wiped up by, the said traveling cool surface, as it passes the outlet, or outlets, the said metal, or alloy, being solidified by contact with the said cooled surface and continuously carried away at a rapid rate from the outlet, or outlets, from the receptacle containing the molten metal, or alloy, so that it is drawn out thin between the outlet, or outlets, and the point of contact with the cooled surface. The said surface may be cooled by any suitable means which will not involve the application of moisture to the surface with which

the molten metal comes into contact, such as by internal circulation of water, or cold air, or impingement of cold air upon the surface. The said surface is preferably a disk, wheel, or roller, or two, or more, of them, which is, or are, set in close proximity to, but not in contact with, the outlet, or outlets, from the molten metal, or alloy, receptacle, so that the molten metal, or alloy, is received on the cooled side face, or cooled periphery, of the disk (or disks), or on the periphery of the wheel, or roller, (or wheels, or rollers), which is (or are) rapidly rotated, and the metal, or alloy, sets by contact with, and is given off continuously from, the cooled face, or periphery, as a very thin and even sheet, foil, strip, or ribbon, or two, or more, of them, in accordance with whether the machine is arranged to make one, or more than one, such thin sheet, foil, strip, or ribbon, at a time.

The accompanying drawing illustrates, in elevations at right angles to each other in Figs. 1 and 2, an apparatus suitable for the purposes of our invention.

1 represents the receptacle in which the metal, or alloy, is kept molten, for example by a Bunsen burner 2. The molten metal passes out by the outlet 3 which may be tubular, or slitted, or with an orifice of any other suitable shape in cross-section. In proximity to, but not in contact with, the said outlet, is mounted a hollow drum, or disk, 4, with a longitudinally straight and smooth periphery and mounted by hollow trunnions 5 in bearings in any suitable standards, or supports, and provided with any suitable means for rapidly rotating it, such, for example, as a band 6 passed over a pulley 7 secured to one of the hollow trunnions. Passing through these hollow trunnions we have shown pipes 8 and 9, for the admission and exit of a cooling medium. If necessary, the outlet passage may also be heated to insure the metal, or alloy, keeping molten till it comes upon the drum, or disk, or equivalent moving surface.

It has been proposed to make thin metallic sheets, or ribbons, by pouring a stream of molten metal onto a revolving copper drum partly immersed in water, or having jets of water injected against it, and to divide lead into fine threads, strips, or filaments, by melting the lead and permitting it to flow,

under the action of gravity, through small apertures into a liquid, and also it has been proposed to make metal wire rods, plates, bars, and the like, direct from molten metal by means of a cooling tube formed by a groove running round the face, or periphery, of a drum, or wheel, rotating on a horizontal axis and with a fixed semi-circular body inclosing and covering the groove, and we make no claim to such devices.

The products according to this invention can be used for any required purpose. For example the product when of zinc is eminently adapted for use in processes for the recovery of gold from solutions, and when of lead for the manufacture of white lead.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. The process of manufacturing thin strips of metallic material which consists in flowing the material in molten form upon a

cool surface and simultaneously moving said surface at a speed considerably greater than the rate of flow of said material whereby said material is drawn out and hardened in a continuous thin strip, substantially as described.

2. The process of manufacturing thin strips of metallic material which consists in flowing the material in molten form upon a dry cool surface and simultaneously moving said surface at a speed considerably greater than the rate of flow of said material whereby said material is drawn out and hardened in a continuous thin strip; substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

EDWARD HALFORD STRANGE.
CHARLES ALBERT PIM.

Witnesses:

GILBERT FLETCHER TYSON,
WILLIAM GERALD REYNOLDS.