E. S. BERGLUND.

EXTRACTION OF ZINC.

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1,331,740. Patented Feb. 24, 1920.

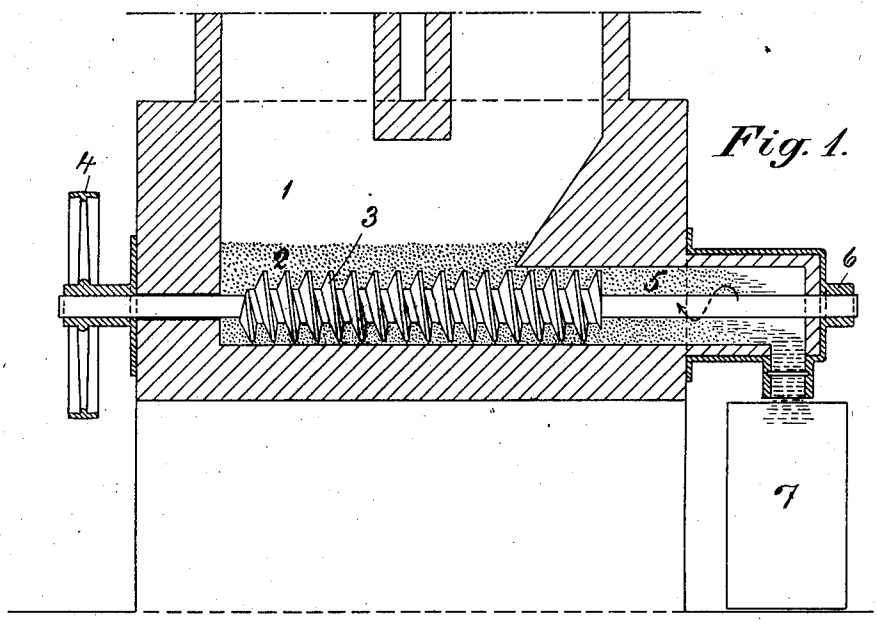
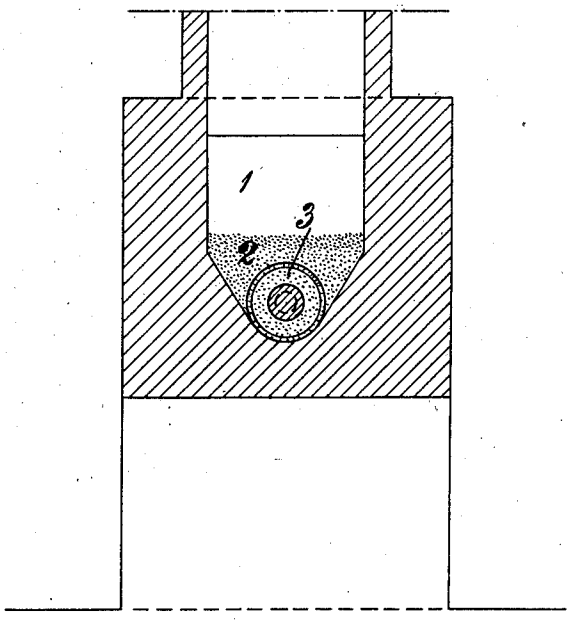


Fig. 1.

Fig. 2.



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EXTRACTION OF ZINC.

1,331,740. Specification of Letters Patent. Patented Feb. 24, 1920.

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To all whom it may concern:

Be it known that I, EDWARD SALOMON BERGLUND, residing at Trollhättan, Sweden, have invented certain new and useful Improvements Relating to the Extraction of Zinc, of which the following is a specification.

In the extraction of zinc a mixture of fluid zinc and zinc powder (poussière) is formed in the condenser, as is well known. The zinc powder consists of small particles of liquid zinc, which with difficulty conjoin to a fluid mass, mainly because they are covered with a thin film of zinc oxid or fine dust of ore, carbon or the like.

For obtaining the maximum amount of fluid zinc from this mixture and causing the zinc particles to conjoin, it has been proposed to subject the zinc powder to a mechanical treatment, having for object to liberate the zinc particles from the said film and bring the metallic particles together. Such mechanical treatment has been carried out within as well as outside the condenser, and has been performed by means of wisp like devices, rolls or the like.

In practical employment of said devices certain difficulties have arisen. If the treatment is carried out within the condenser, difficulties arise in the satisfactory mechanically working of the devices owing to the heat, and the deposit of zinc in the bearings and tightening means. If the treatment is carried out outside the condenser, it is difficult to protect the powder from oxidation.

A method for treating zinc powder within the condenser avoiding the inconvenience referred to, has therefore long been desired.

The present invention refers to such a method and consists in subjecting the zinc particles within the condenser to a rubbing and pressure by the aid of a rotating screw, situated in the zinc powder or mixture of fluid zinc and powder, forcing the zinc powder through an opening, which may constitute the outlet opening of the condenser.

The following advantages are hereby gained:—The device can be mounted without difficulty in the condenser, so as to work mechanically well, the required tightening of the screw and its shaft being performed by the powder itself. Special tightening means, which are easily destroyed by the heat in the condenser or by the zinc will therefore be unnecessary. The zinc powder is subjected to a pressure, the amount of which may be varied by varying the pitch and length of the screw and the size of the opening. It will thus be possible to subject the zinc powder a sufficiently long time to the necessary rubbing and to a sufficiently great pressure for cleaning the particles in the most efficient way from the film which covers them, and to compress the particles to a fluid mass.

If the said opening forms the outlet opening of the condenser, which is preferable, a further advantage is gained in that the usual raking out by hand of the zinc powder, which is a troublesome and dangerous operation, is avoided.

The accompanying drawing illustrates diagrammatically a device for carrying out the invention. Figure 1 is a vertical section of the lower part of a condenser, and Fig. 2 is a transverse section of the same.

1 indicates the condenser, on the bottom of which a mixture 2 of fluid zinc and zinc powder collects. A screw 3, which is journaled with one end outside the condenser and is provided with a driving wheel 4, passes with the other end through a chamber 5 to the opposite condenser wall where it is journaled at 6 in any suitable manner. 7 indicates a receiver or chamber for the extracted fluid zinc, fitted to the opening of the chamber 5. The screw 3 is embedded in the mixture 2 of fluid zinc and zinc powder, which thus itself forms the tightening at the places where the screw goes through the condenser walls. By varying the size of the chamber 5 and its opening in relation to the diameter of the screw 3 and the length of the screw in relation to the length of the chamber 5 and the pitch of the screw the mixture may be caused to pass out of the chamber 5 under a desired pressure and with a desired speed for obtaining the maximum amount of fluid zinc owing to the rubbing of the particles against one another under pressure during their passage over the screw surfaces and through the chamber 5 and its opening.

By varying the length of the chamber 5, the screw 3 and the thickness of the condenser wall, the distance through which the zinc is forced or pushed forward without being conveyed by the screw may be varied and thereby the desired pressure may be obtained.

Having now particularly described my invention and ascertained in which manner the same is to be performed, what I claim is:

1. A method of treating a mixture of particles of fluid zinc and powder, consisting in collecting the material in a condenser; subjecting the particles to mutual friction against each other, feeding the material through the condenser; subjecting the material to pressure and discharging it.

2. A method of treating a mixture of particles of fluid zinc and powder, consisting in collecting the material in a condenser; subjecting the particles to mutual friction against each other by forcing it to follow a helical path, feeding the material through the condenser; subjecting the material to pressure and discharging it.

3. An apparatus for treating a mixture of particles of fluid zinc and powder, comprising a chamber for collecting the mixture, a revolving conveyer screw in the lower part of such chamber and embedded in said mixture, a compression chamber, receiving the mixture from the first named chamber, and an outlet to said compression chamber through which the treated product is forced.

4. In a condenser for condensing zinc, a rotating screw, journaled at the lower part of the condenser, an opening in the condenser wall, through which said screw passes and a receiver, fitted to said opening, for receiving the fluid zinc formed during the passage of the zinc powder through said opening.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD SALOMON BERGLUND.

Witnesses:

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