

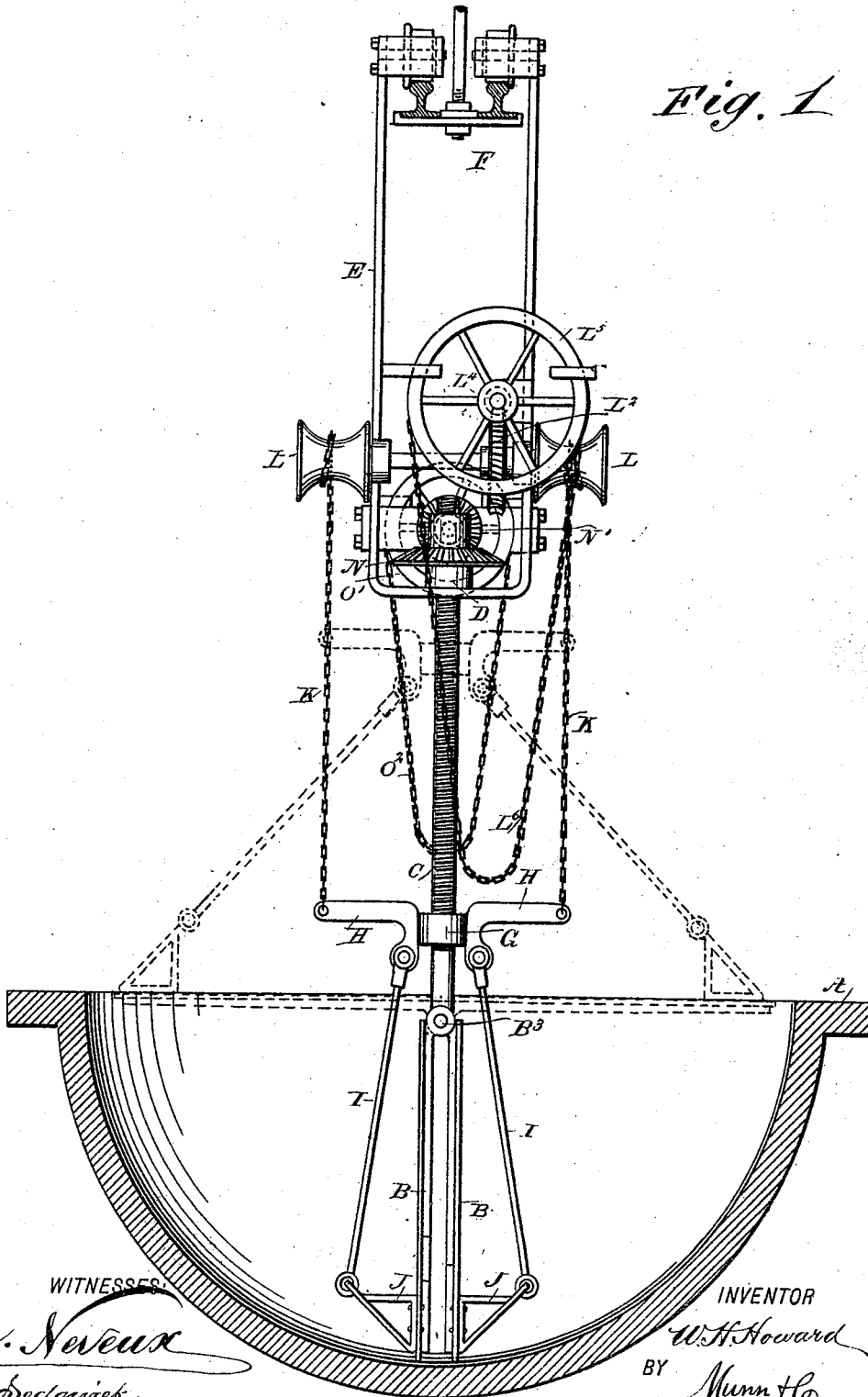
(No Model.)

2 Sheets—Sheet 1

W. H. HOWARD.
COMBINED SKIMMER AND SWEATER.

No. 502,122.

Patented July 25, 1893.



WITNESSES

C. Neveu

C. Sedgwick

INVENTOR

W. H. Howard

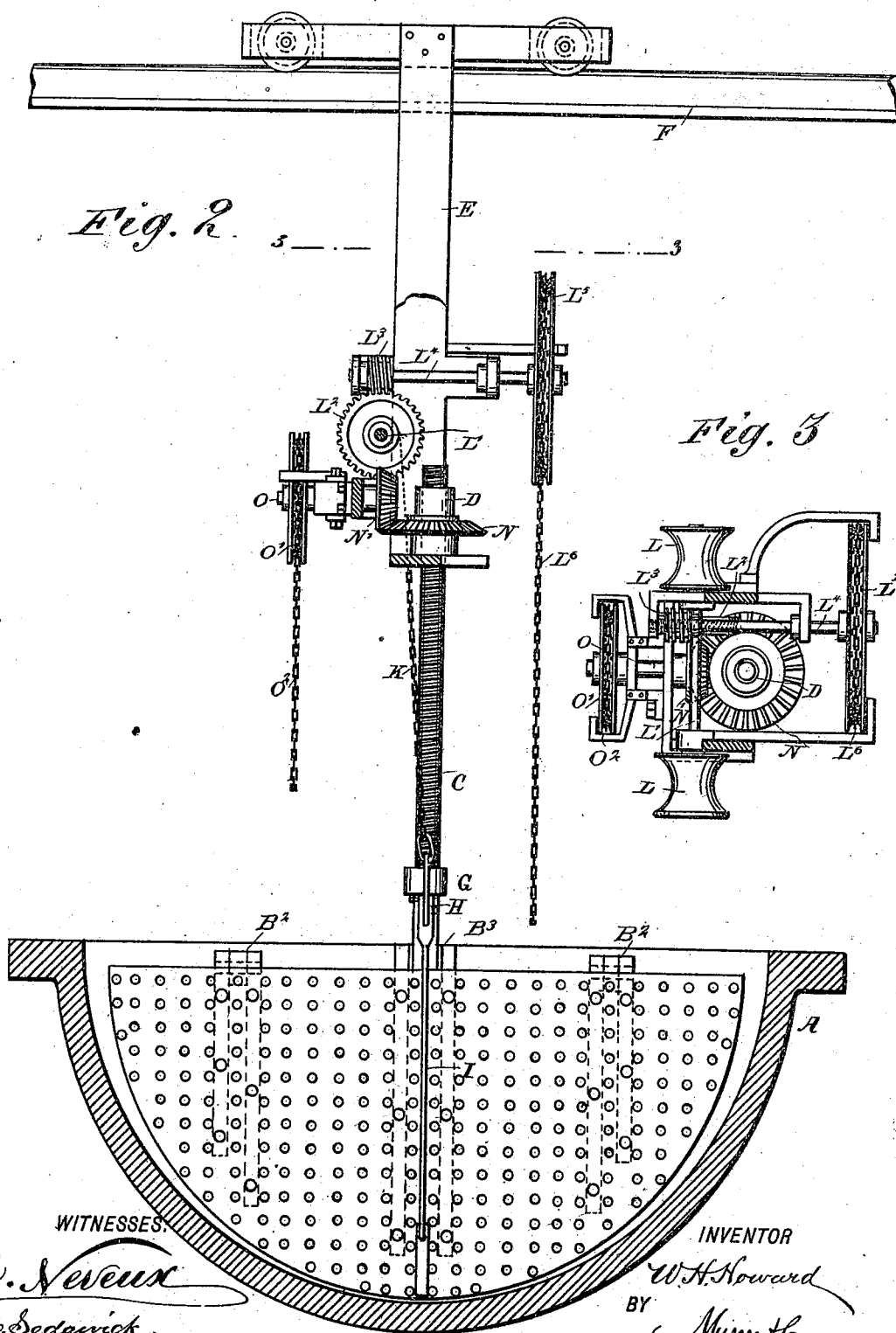
BY *Munn & Co*

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UNITED STATES PATENT OFFICE.

WILLIAM H. HOWARD, OF PUEBLO, COLORADO.

COMBINED SKIMMER AND SWEATER.

SPECIFICATION forming part of Letters Patent No. 502,122, dated July 25, 1893.

Application filed January 31, 1893. Serial No. 460,297. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HOWARD, of Pueblo, in the county of Pueblo and State of Colorado, have invented a new and Improved Combined Skimmer and Sweater, of which the following is a full, clear, and exact description.

The invention relates to apparatus used for desilverizing lead bullion in the zinc pot.

10 The object of the invention is to provide a new and improved combined skimmer and sweater designed for use in zinc pots containing the molten argentiferous lead and metallic zinc, the device being arranged for conveniently skimming the zinc and silver alloy rising to the surface, and also for sweating out the mechanically combined lead removed from the pot with the scum.

20 The invention consists of hinged perforated plates adapted to be passed into the zinc pot in a folded condition, and then opened therein and raised to carry off the zinc and silver alloy and to drain off the metallic lead.

25 The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

30 Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

35 Figure 1 is an end elevation of the improvement as applied to the zinc pot, the latter being shown in section. Fig. 2 is a sectional side elevation of the same, and Fig. 3 is a sectional plan view of the same on the line 3—3 of Fig. 2.

40 The improved device is used in connection with the ordinary zinc pot A, containing the molten argentiferous lead and the metallic zinc added to the same and thoroughly stirred therein, so as to form, when the pot cools, a zinc scum which carries the silver and rises to the surface to be skimmed off and removed from the pot.

45 The device is provided with two perforated plates B and B', preferably made semi-circular in shape to conform to the contour of the pot A, the said plates being connected with each other by hinges B² at their upper edges and are also pivotally-connected at B³ at the

center with the lower end of a screw rod C screwing in a suitable nut D held on a carriage E mounted to travel longitudinally on a suitable overhead track F to carry the device to and from the pot A.

On the screw rod C is mounted to slide loosely a sleeve G provided with arms H, the lower ends of which are pivotally-connected by links I with brackets J projecting from the free ends of the plates B and B', so that when the sleeve G is caused to slide upward on the rod C the plates B and B' swing upwardly through the molten mass in the pot A until the plates finally assume a horizontal position near the top of the pot A, as indicated in dotted lines in Fig. 1.

In order to raise the sleeve G, I connect the horizontal parts of the arms H with chains K, winding on drums L both secured on a horizontally-extending shaft L' mounted to turn in suitable bearings secured to the carriage E. On the shaft L' is secured a worm wheel L² in mesh with a worm L³ secured on a shaft L⁴ also mounted to turn in suitable bearings on the carriage E and carrying at one outer end a sprocket wheel L⁵ over which passes a chain L⁶ adapted to be actuated by the operator for conveniently turning the said wheel L⁵ to rotate the shaft L⁴ and the worm L³, which latter then rotates the worm wheel L³ and the shaft L' so that the drums L wind up the chains K to raise the sleeve G to open the plates B and B', as before described. When the wheel L⁵ is turned in the opposite direction, the drums L, L, are rotated to unwind the chains K, so as to lower the sleeve G on the screw rod C to close the plates B and B' before the latter are inserted into the pot A. The nut D previously mentioned carries a bevel gear wheel N in mesh with a bevel pinion N' secured on one end of a shaft O journaled in suitable bearings on the carriage E. On the outer end of this shaft O is secured a sprocket wheel O' over which passes a sprocket chain O² also adapted to be actuated by the operator in charge of the device for turning the said wheel O', the shaft O, pinion N' and gear wheel N to rotate the nut D, so as to raise and lower the screw rod C to move the apparatus in and out of the pot A.

The operation is as follows: When the pot A is filled with argentiferous lead and on its

surface floats the zinc and silver alloy ready to skim off, then the two semi-circular plates B and B' are lowered into the pot A in a closed position, and then the operator manipulates the chain L⁶ so as to wind up the chains K on the drums L, to lift the sleeve G, as previously described, whereby the plates B and B', are opened to finally assume a horizontal position near the top of the pot A, and the zinc scum floats on the top of the plates B and B' on the surface of the lead. The device is then very slowly raised by the operator manipulating the chain O² so as to revolve the nut D to raise the screw rod C and the plates B and B' held thereon and extended in a horizontal position, as previously described. During this operation of slowly raising the perforated plates B and B', any scum near the edges of the pot is moved by a suitable tool upon the top of the plates. As soon as the latter are raised until the upper surface on which the zinc scum rests is out of the lead, then the apparatus is allowed to remain still for a few minutes to permit the mechanically combined lead in the zinc scum to drain out and back into the pot A over the edges and through the perforations of the plates B and B'. When this so-called sweating has gone far enough, the plates B and B' are rapidly raised by further raising the screw rod C, as previously described, until the plates are entirely free of the pot and then the carriage E with the apparatus supported thereon is pulled along outside of the pot and the skimmings on the plates B and B' are dumped on the floor by again closing the plates B and B' in the manner previously described.

It will be seen that this apparatus acts both as a large skimmer capable of removing the whole of the scum in one operation, and also utilizes the heat of the molten lead in the pot A to perform the process of sweating to remove the surplus lead.

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

1. The method of skimming molten lead which consists in passing a perforated skimmer beneath the scum and raising the skimmer slowly until its upper surface on which the scum rests is out of the lead, then holding the skimmer stationary on the surface of the lead (where it will be kept hot) until the mechanically combined lead in the scum is freed therefrom and drains through the skimmer, substantially as shown and described.

2. A lead skimming apparatus comprising

a carriage, a skimmer suspended below the carriage and adapted to be raised and lowered bodily toward and from the carriage; said skimmer being pivoted at one edge to its suspending medium to permit it to be swung down to enter the pot with its lower or free edge and adjusting mechanism for swinging the skimmer on its axis, substantially as set forth.

3. A combined skimmer and sweater, comprising perforated plates hinged together, a screw rod adapted to be raised and lowered and pivotally-connected with the said plates, and means, substantially as described, for opening and closing the said plates, as set forth.

4. A combined skimmer and sweater, comprising perforated plates hinged together, a screw rod adapted to be raised and lowered and pivotally-connected with the said plates, means, substantially as described, for opening and closing the said plates, and a carriage for supporting the said plates, screw rod and means for actuating the same, substantially as shown and described.

5. A combined skimmer and sweater, comprising a screw rod adapted to be raised and lowered, perforated plates hinged on the said screw rod, a sleeve fitted to slide on the said screw rod, and links pivotally-connecting the said sleeve with the free ends of the said plates, substantially as shown and described.

6. A combined skimmer and sweater, comprising a screw rod adapted to be raised and lowered, perforated plates hinged on the said screw rod, a sleeve fitted to slide on the said screw rod, links pivotally-connecting the said sleeve with the free end of the said plates, and means, substantially as described, for raising and lowering the said sleeve to open and close the plates, as set forth.

7. A combined skimmer and sweater, comprising a screw rod adapted to be raised and lowered, perforated plates hinged on the said screw rod, a sleeve fitted to slide on the said screw rod, links pivotally-connecting the said sleeve with the free end of the said plates, means, substantially as described, for raising and lowering the said sleeve to open and close the plates, and means, substantially as described, for raising and lowering the said screw rod, as set forth.

WILLIAM H. HOWARD.

Witnesses:

E. P. MATHEWSON,
W. J. HAMILTON.