

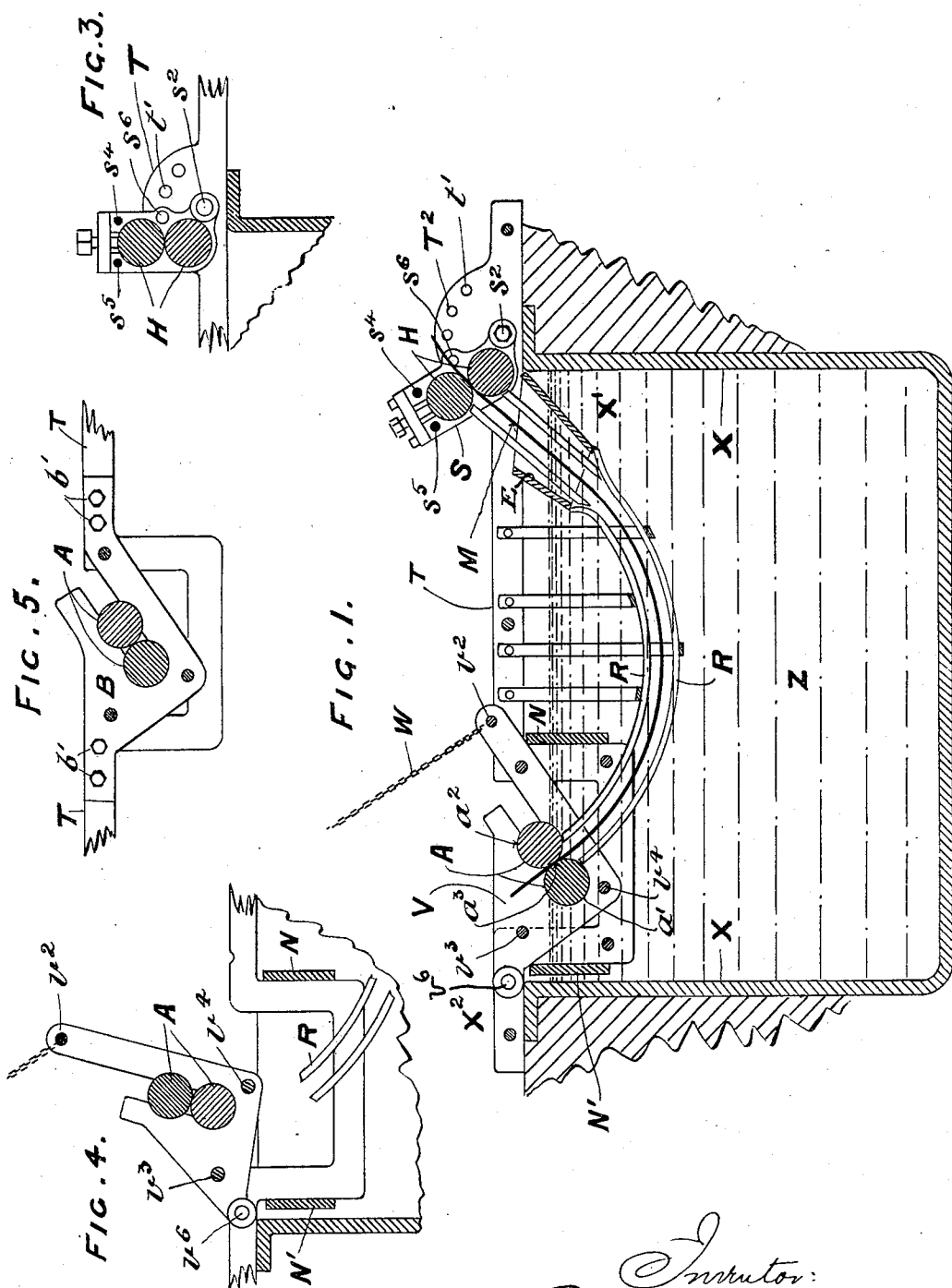
(No Model.)

2 Sheets—Sheet 1.

R. HEATHFIELD.
APPARATUS FOR COATING METAL SHEETS.

No. 478,282.

Patented July 5, 1892.



Witnesses:
J. A. Rutherford
James L. Norris Jr.

Inventor:
Richard Heathfield
By James L. Norris
Attorney

(No Model.)

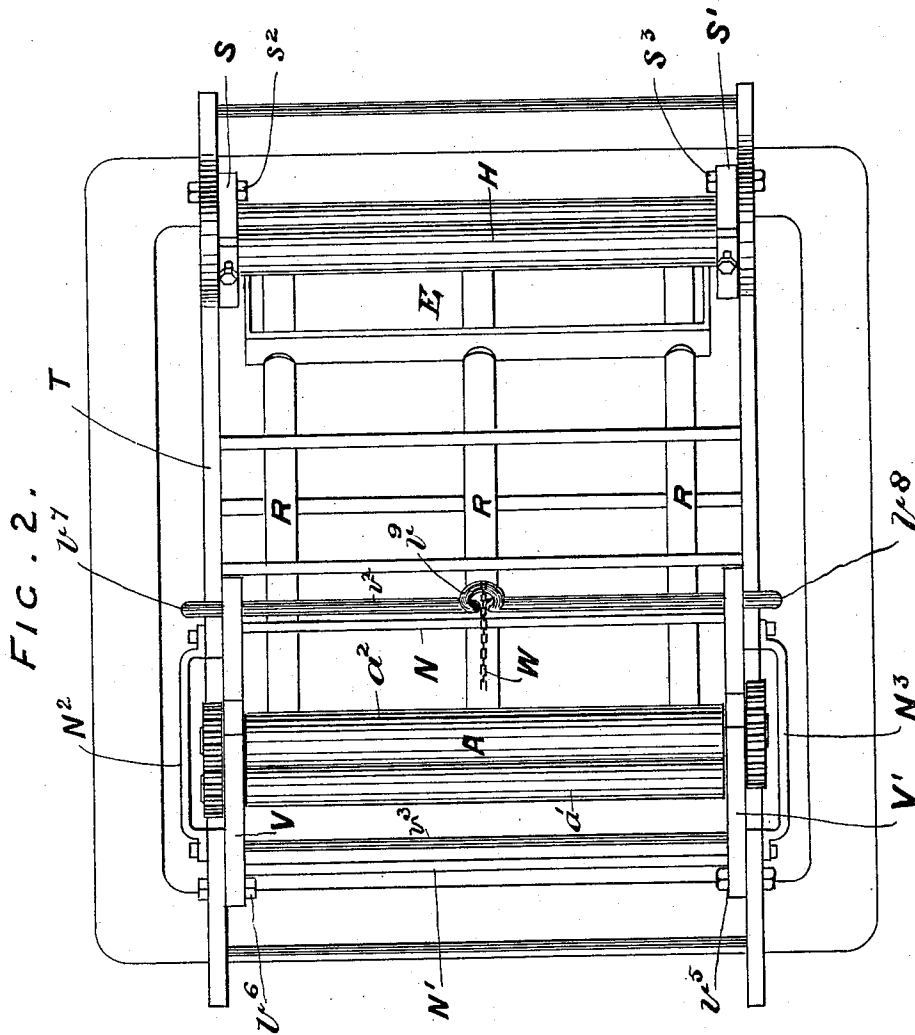
2 Sheets—Sheet 2.

R. HEATHFIELD.

APPARATUS FOR COATING METAL SHEETS.

No. 478,282.

Patented July 5, 1892.



Witnesses:

J. A. Rutherford

James L. Norris Jr.

Imperator:

Richard Heathfield

By James L. Norris
Attorney.

Storney.

UNITED STATES PATENT OFFICE.

RICHARD HEATHFIELD, OF DARLASTON, ENGLAND.

APPARATUS FOR COATING METAL SHEETS.

SPECIFICATION forming part of Letters Patent No. 478,282, dated July 5, 1892.

Application filed July 17, 1890. Serial No. 359,015. (No model.) Patented in England May 2, 1889, No. 7,311, and January 31, 1890, No. 1,682.

To all whom it may concern:

Be it known that I, RICHARD HEATHFIELD, manufacturer, a subject of the Queen of Great Britain, residing at Darlaston, in the county of Stafford, England, have invented certain new and useful Improvements in Apparatus or Machinery for Coating Metal Sheets with Metals or Alloys, (for which I have obtained patents in England, No. 7,311, dated May 2, 1889, and No. 1,682, dated January 31, 1890,) of which the following is a specification.

My invention has for its object improvements in apparatus or machinery for coating metal sheets with metals or alloys, by which means I am enabled to facilitate and improve the coating of the metal sheets and reduce the wear and tear upon the rolls.

In order that my invention may be clearly understood and more easily carried into practice, I have appended hereunto two sheets of drawings, upon which I have fully illustrated my improvements, so that they may be adapted to the various conditions met with in practice.

Figure 1 is a longitudinal section through the pot X with my improved apparatus attached thereto. Fig. 2 is a plan of same. Fig. 3 is a broken-off section through the inlet side of the pot, showing the feed-rolls H in an altered position. Fig. 4 is a broken-off section through the exit side of the pot, similar to Fig. 1, but showing the action of removing the exit-rolls A. Fig. 5 is a similar section to Fig. 4, but showing an alternative means for attaching the separate frame B to the supports T.

In carrying my invention into effect I place the exit-rolls A in a diagonal or horizontal position at the exit side X² of the pot X and arranged so that the nip a^3 of the rolls is close to the surface of the coating metal Z, the position shown in Fig. 1 being that best suited to my purpose, although I may raise or lower the nip of the rolls with regard to the surface of the coating metal to a certain extent—i. e., so long as the lower roll a^1 is not completely submerged or the upper roll a^2 is not out of the metal sufficiently for the bottom of the said roll a^2 to be clear of the surface of the molten coating metal Z—by which means I am enabled to pass the sheets M

through the finishing-rolls A without either side of the sheet M coming in contact with the superfluous flux upon the coating metal, and thus I obtain the coated sheets with a much better appearance and finish than those having contact with the superfluous flux on the surface of the metal. The exit-rolls A may be boxed in from the greater part of the superfluous flux by the boxing N, N', N², and N³

In combination with the diagonal rolls and for the rapid and easy feeding of the sheets into the said rolls A, I provide the feed-rolls H on the inlet side X' of the pot, through which the sheets are fed, being guided to the exit-rolls A by means of the guides R. These rolls H, I may mount in a separate frame formed by the ends S and S', which are pivoted or hinged at s^2 and s^3 to the supports T and are connected together by the tie-rods s^4 and s^5 , thus allowing the inclination of the said feed-rolls H to be altered to almost any inclination desired, in which position they are secured by a bolt which fits into the eye s^6 on the frame S, as also into one of a series of corresponding holes t' in the quadrant T², which forms part of or is fixed to the support T, the frame S and S' being thus firmly retained in the position required. This arrangement for inclining the rolls may be applied to all kinds of pots in which rolls are used and may be used in conjunction with exit-rolls or not, as may be desired.

E is a flux-box located in the pot X, below the feed-rolls H.

The exit-rolls A may be mounted in a separate frame V, formed by the ends V and V', connected together by the tie-rods v^2 , v^3 , and v^4 , this frame V being pivoted or hinged to the main supports T by the bolts v^5 and v^6 . The tie-rod v^2 is extended at v^7 and v^8 , so as to find a bearing on the supports T, and is provided with the eye v^9 , to which the chain W is attached, by means of which the rolls A may be readily raised and suspended out of the metal, as shown at Fig. 4, without interfering with the guides R or any other part, and in case of the rolls requiring to be stopped or repaired the frame V may be turned clean over on its pivot until the rolls drop out on the outside of the pot.

I do not confine myself to the exact means

shown for turning up and elevating the rolls, as I may vary the same considerably—as, for instance, I may bolt the separate frame to the supports, as shown by B in Fig. 5, which is
 5 secured to the supports T by the bolts b' , and the said ends V or B may be outside the supports T, while such arrangement for elevating and removing the rolls may be used in the case of rolls whether diagonal or horizontal or when worked by themselves or in conjunction with feed-rolls, and, indeed, is generally applicable for this purpose. With the feed-rolls H considerably inclined I may reduce the inclination of the exit-rolls A very
 10 considerably, or until they are quite horizontal.

What I claim, then, is—

1. In an apparatus for coating metal sheets, the combination, with the pot X, adapted to
 20 contain molten coating metal, and the feed-rolls H, of the exit-rolls A, adjustably supported within the pot below the upper edge thereof, whereby the nip of said rolls may be brought close to the surface of the molten
 25 metal, but with the lower roll not completely submerged and the upper roll not wholly out of the metal, substantially as described.

2. In an apparatus for coating metal sheets, the combination of the pot X, adapted to contain molten coating metal, the feed-rolls H, a separate pivoted frame in which said feed-rolls are mounted, the exit-rolls A, located below the edge of the pot, and a separate pivoted frame in which said exit-rolls are supported, whereby the nip of the exit-rolls may be brought close to the surface of the coating metal, but with the lower exit-roll not completely submerged and the upper exit-roll not

wholly out of the metal, substantially as described. 40

3. In an apparatus for coating metal sheets, the combination, with the pot X, adapted to contain molten metal, of the adjustable frame S, arranged on the outside of the pot and provided with the pivot s^2 and eye s^6 , the feed-rolls H, supported in said frame, the quadrant T^2 , having eyes t' , and a pin for locking the roll-supporting frame at any required inclination, substantially as described. 45

4. In an apparatus for coating metal sheets, the combination, with the pot X, adapted to contain molten coating metal, of the feed-rolls H, a separated pivoted and adjustable frame in which said rolls are mounted on the outside of the pot, means for locking said
 50 frame in its adjusted position, the exit-rolls A, and an adjustable frame in which said rolls are mounted below the edge of the pot, substantially as described. 55

5. In an apparatus for coating metal sheets, the combination of the pot X, adapted to contain molten metal, the feed-rolls H, a pivoted and adjustable frame in which said feed-rolls are supported on the outside of the pot, the exit-rolls A, and a removable and adjustable
 60 frame in which said exit-rolls are supported below the edge of the pot, substantially as described. 65

In testimony that I claim the foregoing as my own I affix my name in the presence of
 two witnesses. 70

RICHARD HEATHFIELD.

Witnesses:

GEORGE PRICE,
 ALBERT NEWHEY.