(No Model.) 2 Sheets—Sheet 1.

J. WILLIAMS & G. L. MORRIS.

APPARATUS FOR PICKLING IRON PLATES.

No. 512,784. Patented Jan. 16, 1894.

FIG. 1

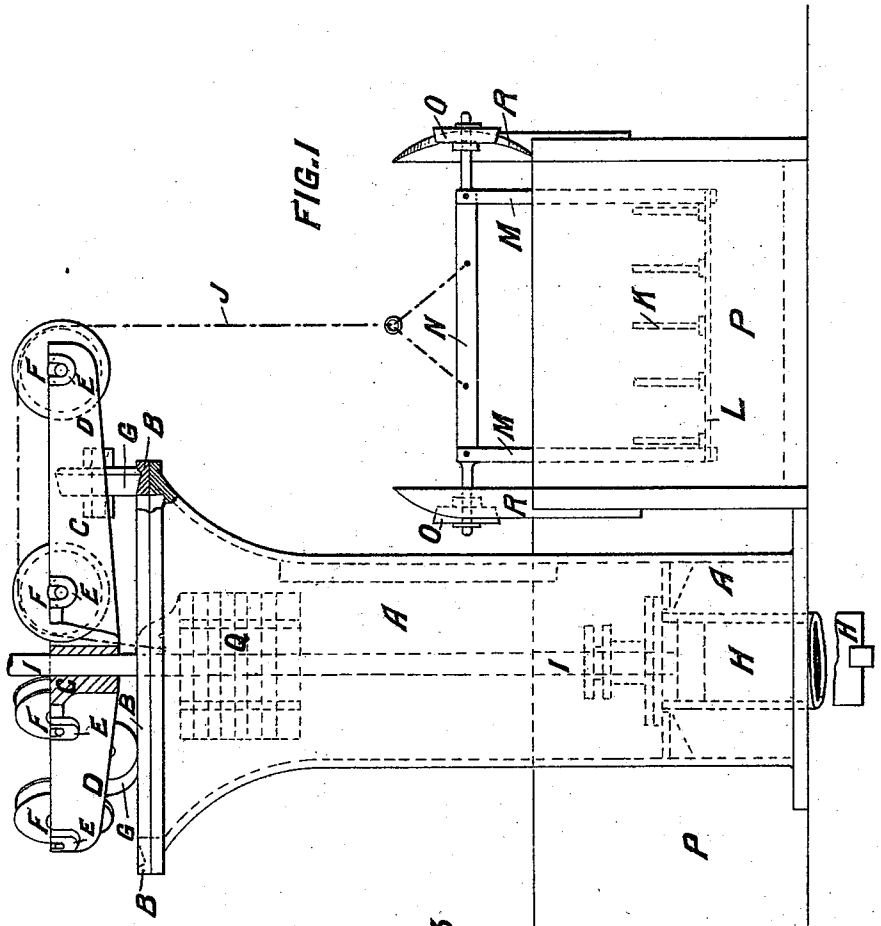
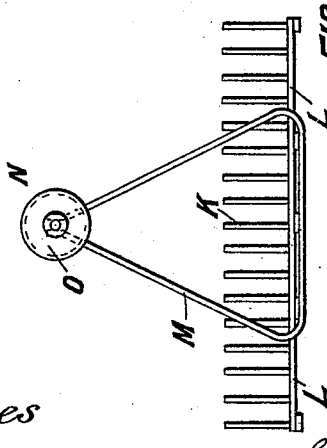


FIG. 3



Witnesses
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E. K. Sturtevant

Inventors:
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THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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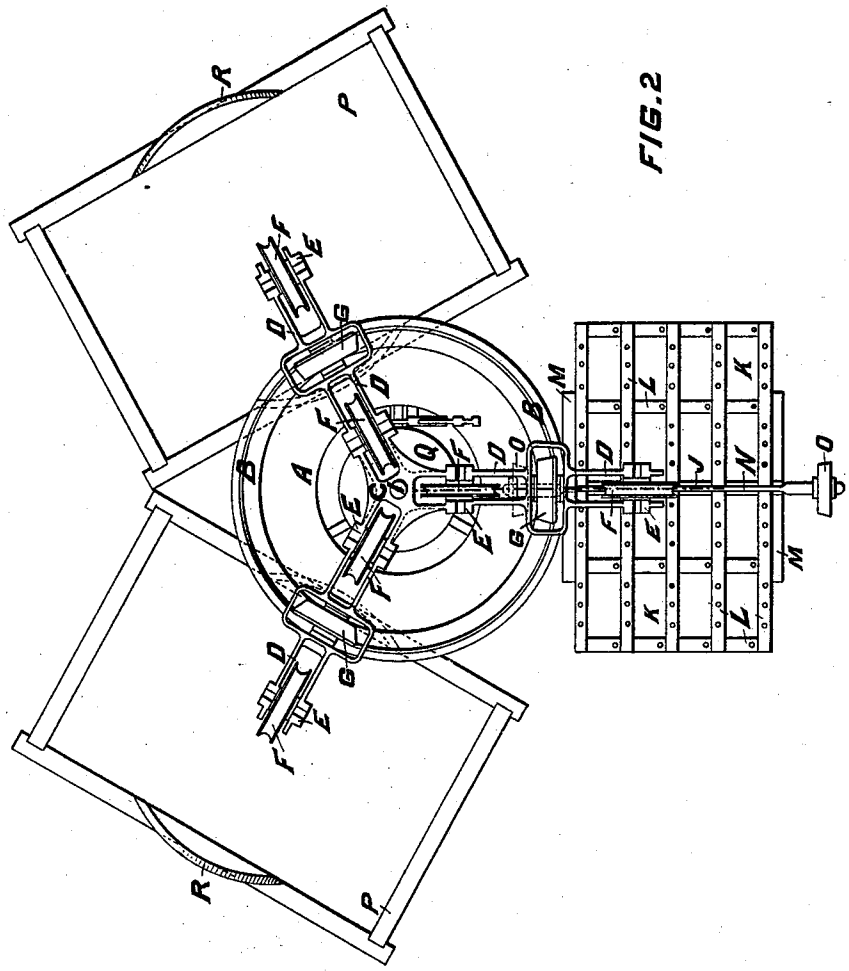

FIG. 2

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UNITED STATES PATENT OFFICE.

JOHN WILLIAMS AND GEORGE LOCKWOOD MORRIS, OF LANDORE, ENGLAND.

APPARATUS FOR PICKLING IRON PLATES.

SPECIFICATION forming part of Letters Patent No. 512,784, dated January 16, 1894.

Application filed April 29, 1893. Serial No. 472,410. (No model.) Patented in England March 26, 1881, No. 1,350.

To all whom it may concern:

Be it known that we, JOHN WILLIAMS and GEORGE LOCKWOOD MORRIS, subjects of the Queen of Great Britain and Ireland, residing at Landore, in the county of Glamorgan, Wales, England, have invented certain new and useful improvements in machinery or apparatus for pickling or preparing iron or other plates previous to their being coated with tin, terne, or other coating material, of which the following is a specification.

A patent for this invention has been obtained in Great Britain, No. 1,350, dated March 26, 1881.

The principal objects of this invention which relates to improvements in machinery or apparatus for pickling and swilling or preparing iron or other metal plates for being coated with tin, terne, or other coating material, are to simplify the construction of such apparatus, to render itself contained and independent of exterior actuation or appliances, and to obtain a sufficient agitation of the pickling and swilling liquids, with a relatively small movement of the parts, and an avoidance of much wear and tear of the machine, due to the improved construction and compact arrangement of the apparatus, and to the small movements of the moving parts.

An improved pickling machine constructed according to the principle of our invention is illustrated on the accompanying sheets of explanatory drawings in Figures 1 and 2, which respectively represent an elevation and a plan view thereof.

The improved apparatus is constructed with a central support A, consisting preferably of a hollow pillar, though it may consist of a series of solid pillars, or of any suitable central framework or equivalent therefor, made of cast iron, wrought iron, or any other suitable material. Upon the top of the support A is concentrically arranged a circular plane or traveling way B, and upon this rests a framing C, which consists of or is preferably provided with three, though it may be of or with more, radiating arms D, each of which in properly disposed bearings E carries two grooved pulleys F, and an intervening coned or other traveling wheel G, which rests upon the correspondingly conformed traveling way B, and supports the framing C clear thereof, and so that it can be freely rotated about the center of the supporting pillar A. Centrally of the pillar A an ordinary single-acting steam cylinder H is secured, the piston rod I of which is prolonged through and guided by the center of the framing C, and has suitably connected to its upper end a series of chains J, which pass thence one over the grooved pulleys F of each arm D, and are each connected at their outer depending ends to a light metallic cradle K (shown detached in Fig. 3) which is composed of cross strips L of yellow metal riveted to each other, and of other bent strips M which are riveted to an upper cross bar N, the ends of which carry two guiding pulleys O, the chains J being connected to the central or intervening part of the bar N. The cradles L are suspended thus, centrally over tanks P which are placed around the central supporting pillar A, and rest on the ground or floor and contain the pickling and swilling liquids respectively. The weight of the cradles is balanced by removable or cheese weights Q, which are supported by and around the piston rod D. On the opposite side of each of the tanks P two helically formed guides R are sometimes secured in such a position as to engage with the guiding pulleys O of the suspended cradles L, the object and effect of this arrangement being to cause the cradles and their contents to receive a twisting or lateral turning movement as they are raised and lowered in the tanks P, and thus to impart a desirable agitating movement to the pickling and swilling liquids, and which is efficacious in causing the more complete action thereof. The pitch of the helix may be made as desired, and according to the degree of agitation thought most beneficial. Thus as the steam, water, air, or other motive agent is admitted above the piston in the cylinder, the piston rod is caused to descend and the cradles and their contents are accordingly raised in or from their respective tanks, and have a lateral turning (or as combined, a helical motion) imparted to them by the guides R and pulleys O, or by other suitable and equivalently acting means, with the advantageous effect above mentioned, the tanks being made preferably square or oblong as the impulse thus given by the cradles and plates to the pickling and swilling liquids against

the sides will create a greater agitation of the liquids between the plates being treated. Upon the steam being exhausted from the cylinder, the cradles and plates descend by their excess of weight, and receive the same helical motion, and thus a small vertical movement of the cradle is rendered sufficient to cause a comparatively great and desirable agitation of the pickling and swilling liquids, and which has not been hitherto so simply effected, and thus much wear and tear of the movable parts is avoided; and by the above described means the apparatus is rendered self contained and independent of any external actuation, the method of working being as follows:

With a triangular frame C as illustrated in the accompanying drawings, two tanks P and three cradles L are used (the suspension of one only of the cradles being illustrated to avoid confusion in the drawings) two cradles being worked simultaneously, the one in the pickling tank and the other in the swilling tank, while the third is being loaded ready for pickling. When sufficient time has elapsed for the proper pickling and swilling of the plates, the three cradles are simultaneously lifted by the piston rod; and when they are clear of the tanks, the framing C is turned or partly rotated by the attendant, or by any suitable mechanical means, until the cradle containing the plates to be pickled is suspended over the pickling tank, the cradle containing the plates which have been pickled being now over the swilling tank, and the cradle containing the plates which have been pickled and swilled being over the table on on which it will be unloaded, and again loaded with fresh plates. The cradles are then simultaneously lowered into the tanks now respectively underneath them, the one which has been both pickled and swilled and which is now lowered on to the table being then unloaded and refilled with fresh plates. The above described operation is continuously repeated.

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. In combination, the central support or standard, the vertically movable rod, arranged within the same the radiating arms carrying truck wheels and adapted to a track at the top of the standard, the said arms being arranged to permit the vertical movement of the piston rod, through their central portion, the guide pulleys carried by the arms, the tank, the cradle adapted thereto, and the cord or chain passing over the pulleys and connecting the vertically movable rod with the cradle, substantially as described.

2. In combination, the standard, the radiating arms adapted to turn at the top thereof, the tank, the cradle having the rollers O, the chain for raising the cradle passing over pulleys on the radiating arms and the guides R on the tank arranged to contact with the rollers on the cradle to give the same a twisting movement, substantially as described.

In witness whereof we have hereto set our hands and affixed our seals this 7th day of April, 1893.

JOHN WILLIAMS. [L. S.]
GEORGE LOCKWOOD MORRIS. [L. S.]

Witnesses:
JOHN PRESCOTT,
JOHN RHYS WILLIAMS.