No. 672,137. Patented Apr. 16, 1901.

R. C. STIEFEL & J. H. NICHOLSON.

PICKLING APPARATUS FOR METAL TUBES.

(Application filed June 12, 1900.)

(No Model.)

Fig. 1.

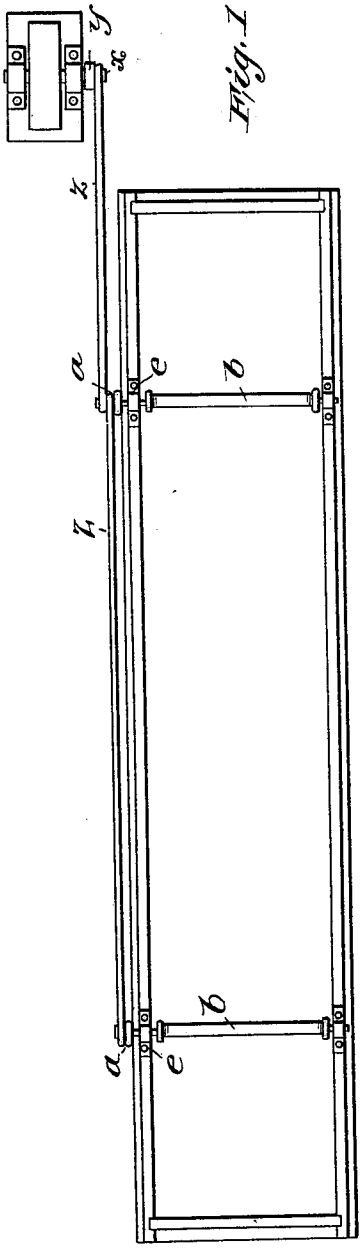


Fig. 2.

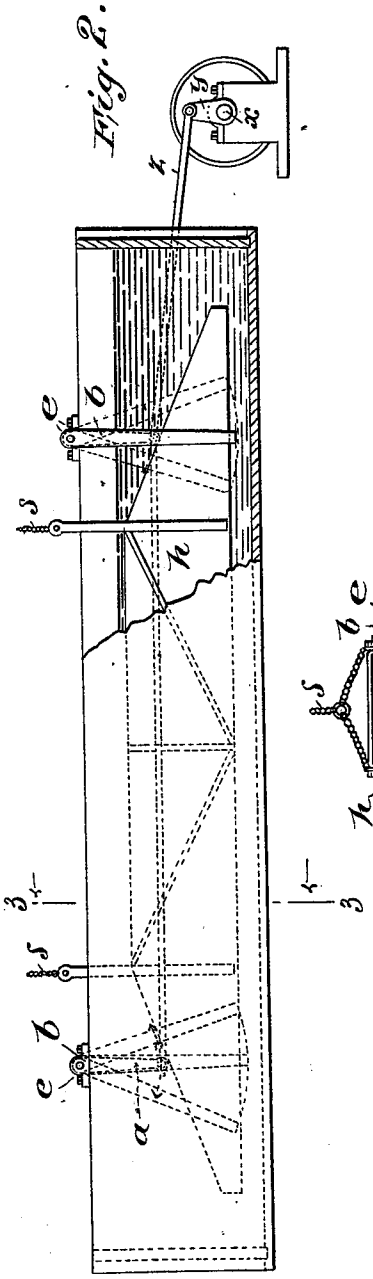
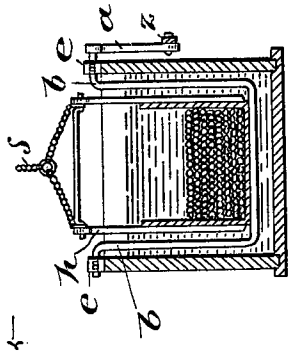


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

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PICKLING APPARATUS FOR METAL TUBES.

SPECIFICATION forming part of Letters Patent No. 672,137, dated April 16, 1901.

Application filed June 12, 1900. Serial No. 20,059. (No model.)

To all whom it may concern

Be it known that we, RALPH CHARLES STIEFEL, of Ellwood City, and JOHN H. NICHOLSON, of Pittsburg, State of Pennsylvania, have invented certain new and useful Improvements in Pickling Apparatus for Metal Tubes, of which the following is a description, referring to the accompanying drawings, which form part of this specification.

In the pickling of metal tubes it is very desirable, as is readily seen, to have some means by which the inside surfaces of the tubes will readily and thoroughly come into contact with the pickling solution. To accomplish this, it is necessary either to impart to the solution a circulation parallel with the tubes in order that the liquid may move longitudinally through and along the inner surfaces of the tubes or to impart a longitudinal movement to the tubes.

The object of our invention is to produce a simple, effective, and economical mechanism which shall impart longitudinal motion to the tubes and yet allow the ready insertion and withdrawal of the tubes while the acid liquid is in motion.

In the drawings, Figure 1 shows a plan view of the pickling-tank and of the mechanism for agitating the cage or cradle. Fig. 2 shows an elevation of the tank, and Fig. 3 is a cross-section taken on plane 3 3 in Fig. 2.

In the drawings like letters of reference indicate like parts.

The source of power represented in the drawings forms no part of the claims of this invention and is represented simply by a shaft x, a crank y, and a connecting-rod z. Two or more U-shaped supports b are mounted to rock or oscillate in the bearings e and are provided with short actuating-arms a, connected to the rods z. The pickling crate or cradle h, which carries the tubes, is lowered into and lifted out of the U-shaped frames b by chains s and suitable hoisting mechanism.

Having briefly described the mechanism of this one form of our device, we will now show one method in which it is used.

The crate or carrier h after being filled with the tubes is lowered into the tank until it rests on the oscillating or reciprocating frames b, as seen in Figs. 2 and 3. This can be done without stopping the movement of the frames, as the cradle or crate or carrier h, as shown in Fig. 3, may rest entirely free at its sides from contact with the frames b. The extremities of the arms a as they rotate about fixed centers describe short arcs, as shown by the dotted lines in Fig. 2. The crate h will therefore move backward and forward with the bottom members of the frames on which it rests, causing the tubes and the solution to move longitudinally in reverse direction and also causing a slight up-and-down movement. When the pickling has been accomplished, the crate is hoisted out of the tank and removed by means of the chains s without requiring the stopping of the oscillating mechanism.

It will be readily seen that the longitudinal motion imparted to the tubes and reversely to the solution will bring the acid pickling solution into intimate contact with the interiors of the tubes.

We have now described the nature of our invention as embodied in the best form of construction now known to us, and without attempting to enumerate the many variations and changes of form of which our invention is capable we claim and desire to secure as the essential and distinguishing novel features of our invention the following:

In combination, a tube-pickling apparatus, a removable crate or carrier for containing the tubes, a pickling-tank adapted to receive the crate or carrier; a plurality of U-shaped frames arranged in line at substantially the ends of the crate pivoted to fixed bearings at their upper portions and adapted to receive and loosely support the crate or carrier, and connections for simultaneously oscillating the frames to give longitudinal curvilinear reciprocation or oscillation to the crate or carrier and the tubes, substantially as set forth.

Signed this 16th day of May, 1900.

RALPH CHARLES STIEFEL.
JOHN H. NICHOLSON.

Witnesses:
HENRY S. MERTON,
HAROLD BINNEY.