J. T. AU WERTER.

APPARATUS FOR PICKLING.

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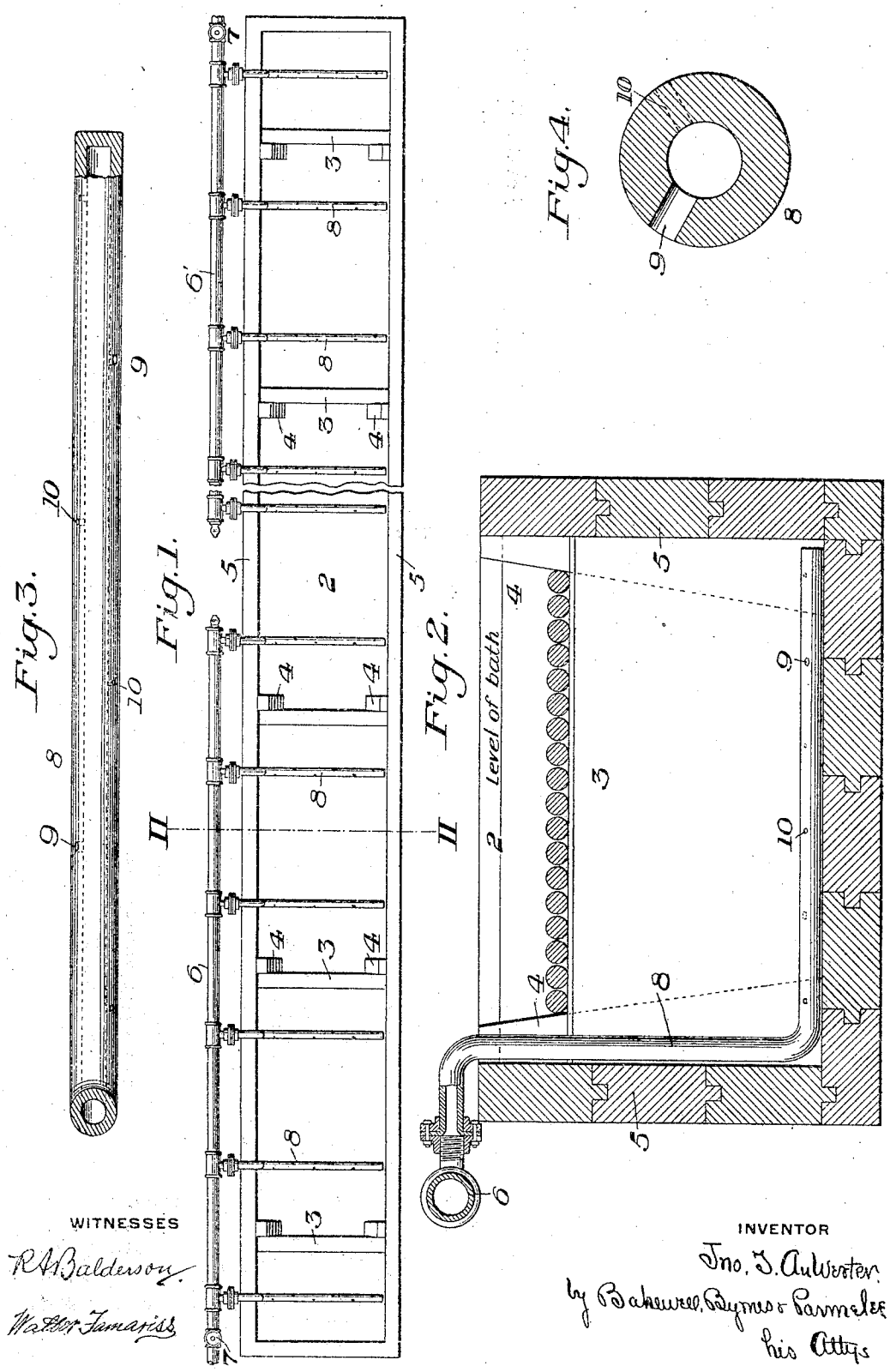
959,195. Patented May 24, 1910.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN T. AU WERTER, OF BRADDOCK, PENNSYLVANIA.

APPARATUS FOR PICKLING.

959,195. Specification of Letters Patent. Patented May 24, 1910.

Application filed October 12, 1909. Serial No. 522,332.

To all whom it may concern:

Be it known that I, JOHN T. AU WERTER, of Braddock, Allegheny county, Pennsylvania, have invented a new and useful Apparatus for Pickling, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of pickling apparatus constructed and arranged in accordance with my invention; Fig. 2 is a transverse section on a larger scale taken on the line II—II of Fig. 1; Fig. 3 is an enlarged detail of the steam pipes, forming part of my improved apparatus, and showing the arrangement of the openings or holes in these pipes. Fig. 4 is a transverse section of the pipes shown in Fig. 2 on a larger scale, showing the relative locations and sizes of the openings or holes in these pipes.

My invention relates to apparatus for pickling metal bars and similar articles, and the object of the invention is to provide apparatus for pickling having improved means for heating the pickling bath and for maintaining the bath at the desired temperature.

Another object of my invention is to provide improved means for quickly and uniformly heating the bath and the metal bars or other articles introduced into the bath to be pickled and for agitating the bath during the pickling operation.

In the drawings, 2 represents a pickling vat, which is preferably constructed of wood and in which a bath of pickling fluid is maintained, the level of which extends closely to its top edge. Located at intervals in the length of the vat, which is generally long, compared to its width and height, are skids or supports 3, upon which the metal bars rest, while being pickled. At the sides of the vat adjacent to the skids 3 are side skids or bars 4, by which the bars are prevented from contacting with the sides 5 of the vat, and an opening is provided on opposite sides of the pile of metal bars in the bath for placing a chain or other lifting means around the bars in removing them from the bath. Located on one side of the vat are steam mains 6, 6′, having valves 7, by which the flow of steam through these mains is regulated and shut off. At intervals in the length of the mains or pipes 6, 6′ are branch pipes 8, which extend downwardly and then across its width at the bottom of the vat, these pipes being made of lead or other material not readily attacked by the acid used in the pickling bath. The pipes 8 are each provided with a series of holes 9 and 10, which are located in the walls of the pipe with their axes extending at an oblique angle to a horizontal center line through the pipe. The larger openings or holes 9 are alternately on opposite sides of the vertical axis of the pipe, and between each pair of the larger openings or holes are two smaller openings or holes 10, one on each side of the vertical axis of the pipe. The ends of the pipes 8 are preferably closed, as is shown in Fig. 3, so as to prevent the passage of steam therethrough.

In the operation of pickling by means of my improved apparatus, the pickling fluid is first placed within the vat, the bath preferably consisting of one part by volume of 66° sulfuric acid to two hundred parts of water. A batch or lot of bars are then placed within the vat by means of a crane or other suitable apparatus, the bath having first been heated by means of the steam pipes to about 210 degrees Fahrenheit. As the steam issues from the openings in the pipes 8, it rises through the bath and maintains the bath at substantially constant temperature. By reason of the arrangement of the openings or holes in the pipes, the bath is also agitated in all directions and the steam is brought into contact with the bath at all points in its length. In this way, the bath and the metal bars introduced into the bath are quickly and uniformly heated. This results in a more uniform pickling operation and results in the bars being cleaned more evenly and very much more quickly than heretofore, where the bars were ununiformly heated and the time required to raise the bars to the temperature of the bath was very much longer. After the bars have been immersed in the pickling bath for the required length of time, they are removed and a fresh lot of bars are placed in the vat when the above described operations are repeated.

The advantages of my invention will be apparent to those skilled in the art. The bars placed in the vat are much more quickly and uniformly heated than with the apparatus used heretofore. The steam being introduced into the bath at a large number of points, the entire bath is maintained at a

uniform temperature, while the amount of steam necessary to accomplish this result is greatly lessened. The lessened amount of steam cuts down the amount of coal necessary to make the steam and the expense of operating the apparatus is thereby reduced. By introducing steam at the large number of points shown, the cooling effect of new bars put into the bath is more quickly overcome and the bars are more rapidly and uniformly heated, thereby lessening the time required to perform the pickling operation and resulting in cleaner bars. The reduction in the time necessary to perform the pickling results in the production of bars having a uniformly clean smooth surface free from pitting and having an improved color and appearance. The lessened amount of equipment necessary to pickle the bars results in a reduction in the labor and expense while the cost of maintenance is correspondingly decreased.

Modifications in the construction and arrangement of the parts may be made without departing from my invention. The number of branch pipes may be varied, the size and number of the openings or holes in these pipes may be increased or decreased, and other changes may be made.

I claim:

1. Apparatus for pickling, comprising a pickling vat having a plurality of heating pipes extending transversely across substantially the entire width of the vat, the transversely extending pipes having a series of separated openings therein, and means for supplying steam to said pipes; substantially as described.

2. Apparatus for pickling, comprising a pickling vat having a plurality of heating pipes extending across the width of the vat below the surface of the bath, and means for supplying steam to said pipes; substantially as described.

3. Apparatus for pickling, comprising a pickling vat having a plurality of heating pipes extending across the width of the vat below the surface of the bath, said pipes having a plurality of openings therein; substantially as described.

4. Apparatus for pickling, comprising a pickling vat, a plurality of heating pipes extending across the width of the vat below the surface of the bath, said pipes having openings of varying sizes, and means for supplying steam to the bath through said openings; substantially as described.

5. Apparatus for pickling, comprising a pickling vat having a plurality of heating pipes extending transversely across the width of the vat below the surface of the bath, said pipes having a plurality of openings extending at an oblique angle to the horizontal, and means for introducing steam to said bath through the openings; substantially as described.

6. Apparatus for pickling, comprising a pickling vat having a plurality of heating pipes extending transversely across the width of the vat, means for supplying steam to said pipes, and means adapted to support and hold bars in the bath out of contact with said pipes; substantially as described.

7. Apparatus for pickling, comprising a pickling vat, a plurality of heating pipes extending transversely across the width of the vat, means for supplying steam to said pipes, and means arranged to hold bars in the bath out of contact with the sides of said vat; substantially as described.

8. Apparatus for pickling, comprising a pickling vat having a plurality of heating pipes extending transversely across the width of the vat, means for supplying steam to said pipes, and means for supporting and holding bars in the bath out of contact with the sides and bottom of the vat; substantially as described.

In testimony whereof, I have hereunto set my hand.

JOHN T. AU WERTER.

Witnesses:
J. E. LITTLE,
W. J. HOLLAND.