2 Sheets--Sheet 1.

A. L. FREEMAN.

Improvement in Apparatus for Electro-Plating Iron with Copper, &c.

No. 129,124. Patented July 16, 1872.

Fig: 1

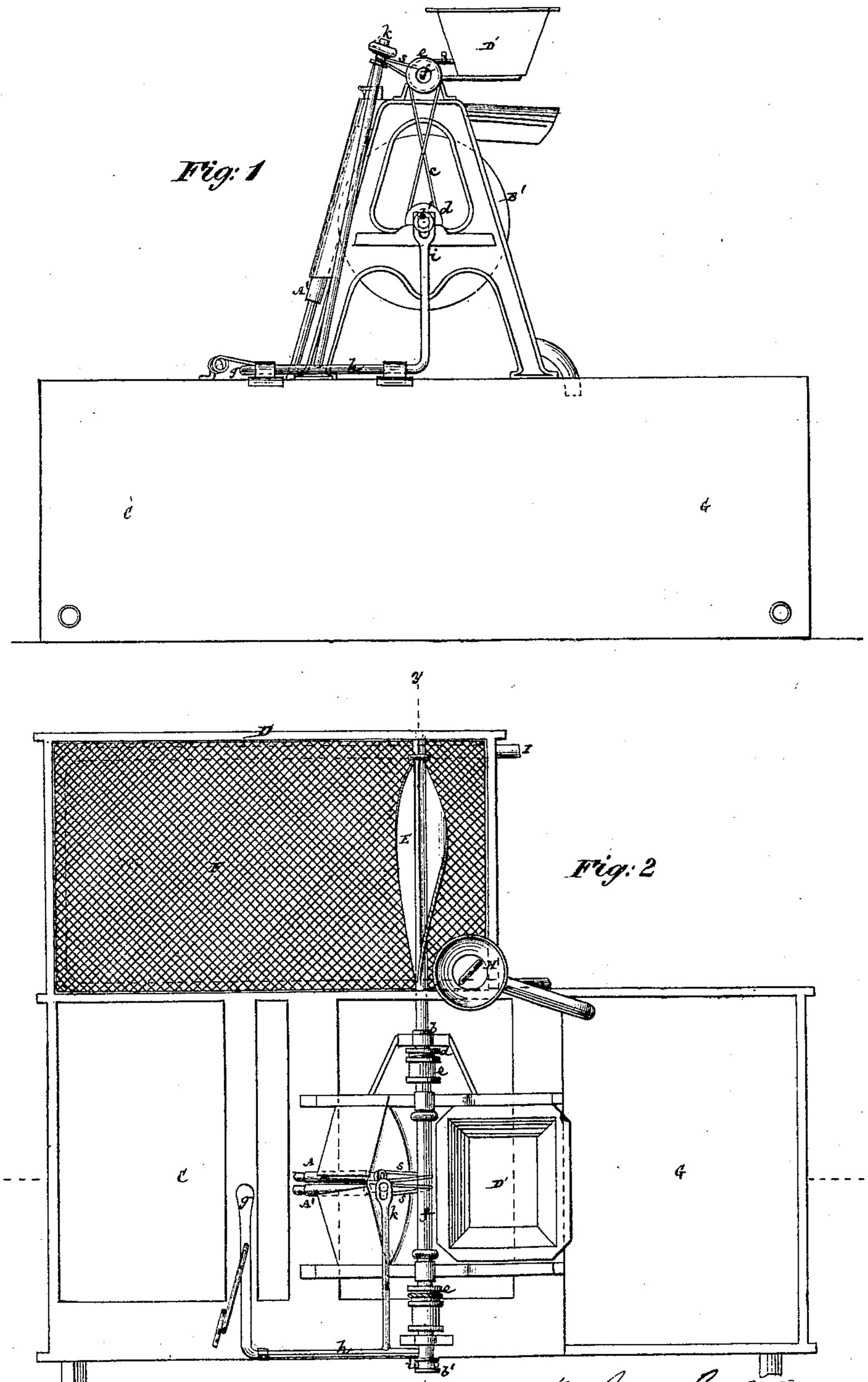

Fig: 2

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per Brown, Combat & Co
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2 Sheets--Sheet 2.

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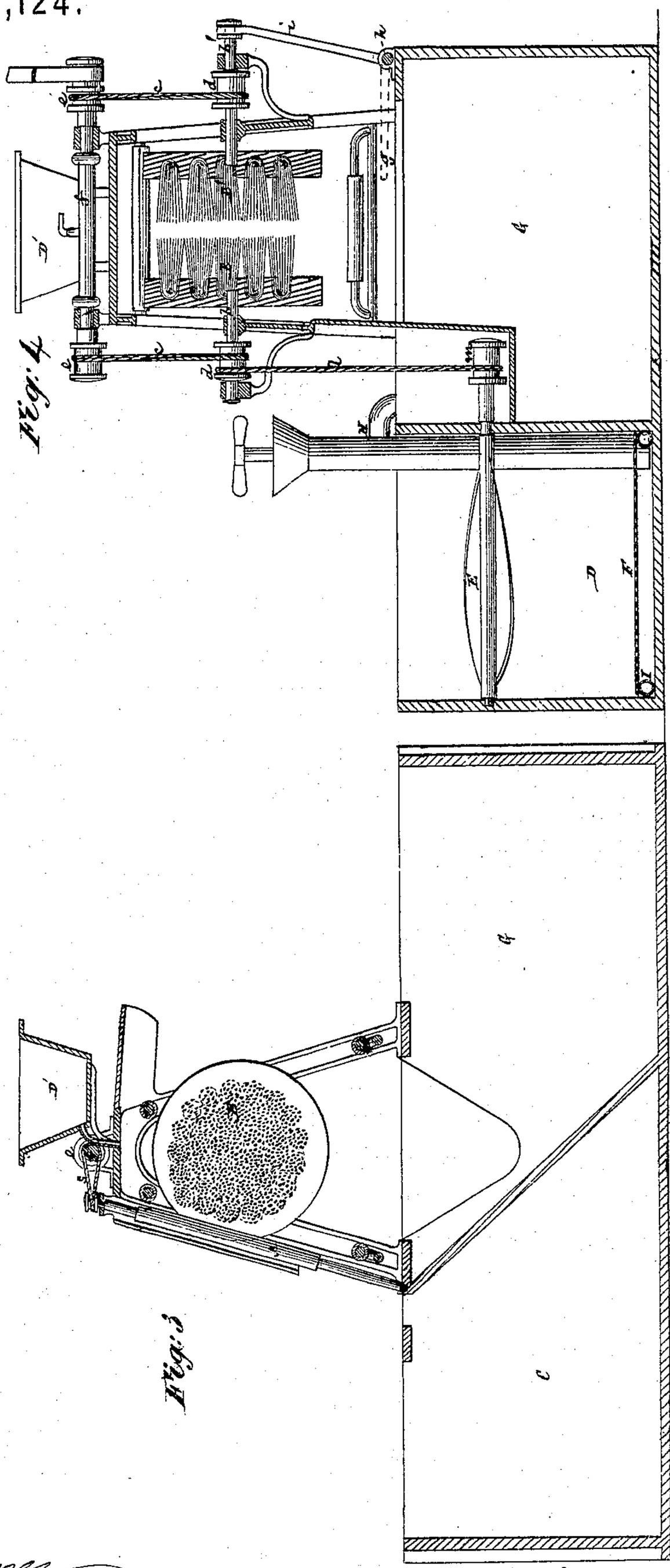

Fig. 2.

Fig. 3.

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129,124

UNITED STATES PATENT OFFICE.

ARTHUR L. FREEMAN, OF SOUTH BOSTON, MASSACHUSETTS.

IMPROVEMENT IN APPARATUS FOR ELECTROPLATING IRON WITH COPPER, &c.

Specification forming part of Letters Patent No. 129,124, dated July 16, 1872.

Specification describing certain Improvements in Apparatus for Plating Iron with Copper, the invention of ARTHUR L. FREEMAN, of South Boston, in the county of Suffolk and State of Massachusetts.

This invention relates to apparatus for plating sheet-iron or articles made from sheet-iron with copper by the battery process. The invention consists in a combination, with the bath containing the alkaline copper solution in which the sheet or article to be plated is immersed, of a screw or agitator for stirring or keeping the solution in motion while the plating is being effected; also, of a sieve or strainer at the bottom of said bath for depriving the solution of sediment, and a pump for drawing off the sediment from under the strainer and discharging it within a pickle-bath. The invention also consists in a novel construction of rotary brushing devices, adjustable by the foot, for cleaning the sheets before introducing them to the bath in which the deposit is made; likewise, in an arrangement of feed-rollers in front of the brushes for passing the sheets to and between the brushes.

In the accompanying drawing, which forms part of this specification, Figure 1 represents a side view, and Fig. 2 a plan, of the whole apparatus. Fig. 3 is a longitudinal vertical section at the line *x x;* and Fig. 4, a transverse vertical section at the line *y y*.

Similar letters of reference indicate corresponding parts throughout the several figures of the drawing.

The sheets of iron or articles to be plated are first immersed in a pickle-bath, G, and then passed through or between feed-rollers A A′, which conduct the sheets or articles to and between a pair of vertically-arranged revolving brushes, B B′, made of any suitable material, and which serve to polish or prepare the sheet for the solution-bath. The sheets or articles thus prepared are then washed in a tank, C, of water, and afterward passed to the bath D, containing the solution for effecting the deposit by the aid of the battery. The brushes B B′ are fast to independent horizontal shafts *b b′* in axial line with each other, and derive their motion, by belts *c c* and pulleys *d d* and *e e*, from an upper main horizontal driving-shaft, *f*. The one brush-shaft *b′* is made capable of a longitudinal motion in its bearings for the purpose of adjusting the one brush B′ further from or nearer to the other brush to give the brushes any desired pressure on the sheets, and to adapt them to different thicknesses of sheets. This adjustment is effected by means of a lever or treadle, *g*, which may be operated by the foot, and which projects from a shaft, *h*, that carries a fork, *i*, connected with the brush-shaft *b′*. The shaft *h* also has attached to it a bent arm or lever, *k*, which is in slotted connection with the one feed-roller A′ at its top to allow of said roller, which is hung to rock from its base, adjusting itself and being adjusted by the treadle to the sheet, being fed by it and its fellow roller A. Said feed-rollers A A′ are driven by belts *s s* and pulleys, from or by the shaft *f*. A tank, D′, with drip-pipe, may be arranged over the brushes to supply water to the sheet while passing in between the brushes. E is the revolving screw or agitator within the bath D for keeping the solution in motion while deposit is being made, said agitator receiving rotary motion, by belt *l* and pulleys *m d*, from the shaft *b* of the rotary brush B or otherwise. F is the sieve or strainer at the bottom of the bath D for keeping the solution clear of sediment, and H the pump for drawing off said sediment and discharging it into the pickle-bath G. I is the steam-pipe, introduced within the bath D below the strainer F, for heating the solution to any desired degree in the bath D.

The solution which I prefer to use is prepared as follows: Take of sulphate of copper, three and one-half pounds; acetate of copper, seven and one-half pounds; and dissolve in about four gallons of boiling water. When cold add to this solution five pounds of carbonate of potassa and the same quantity of cyanide of potassium, and work with a strong battery.

The sheets or articles to be plated should first be heated by steam in a tank containing potash and lime-water, and then passed to the pickle-bath, through which steam should be turned on, as, by keeping the pickle warm, the pores of the iron are opened, which facilitates the reception or deposit of the copper and quickens the removal of scale and grease.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The screw or agitator E, in combination with the solution-bath D, substantially as and for the purpose herein set forth.

2. The solution-bath D fitted with a perforated false bottom, sieve, or strainer, F, whereby sediment is collected in the bottom of said bath below the strainer, substantially as described.

3. The combination of the pump H with the solution-bath D, the strainer F, and the pickle-bath, substantially as specified.

4. The combination of the agitator E, the solution-bath D, the strainer F, the steam-pipe I, and the pump H.

5. The rotary brushes B B′, adjustable in relation with each other, in combination with mechanism for effecting said adjustment by the foot of the operator, substantially as specified.

6. The combination of the feed-rollers A A′, adjustable in relation with each other, and the adjustable rotary brushes B B′, essentially as described.

ARTHUR L. FREEMAN.

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