

995,589.

4 SHEETS—SHEET 1.



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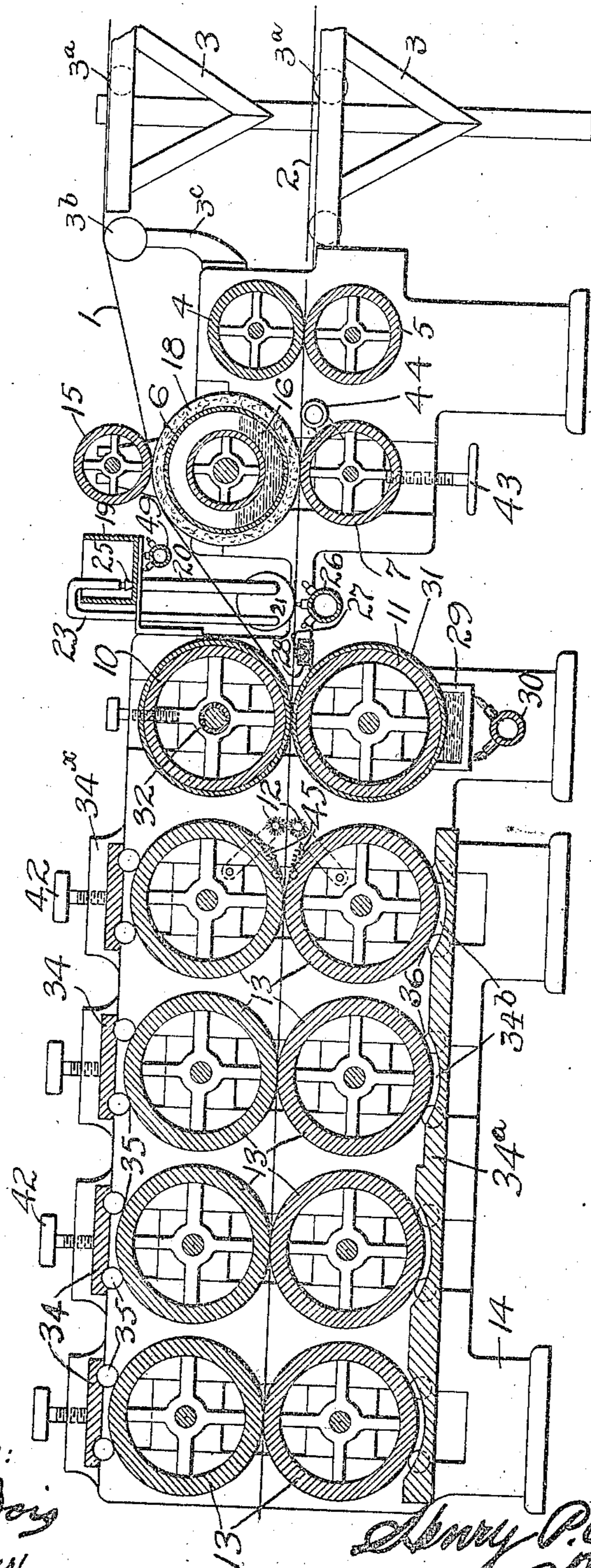
H. P. A. A. EICHMANN.
MACHINE FOR SOLDERING METAL PLATES.
APPLICATION FILED JAN. 15, 1910.

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Patented June 20, 1911.

4 SHEETS—SHEET 2.

Fig. 2.



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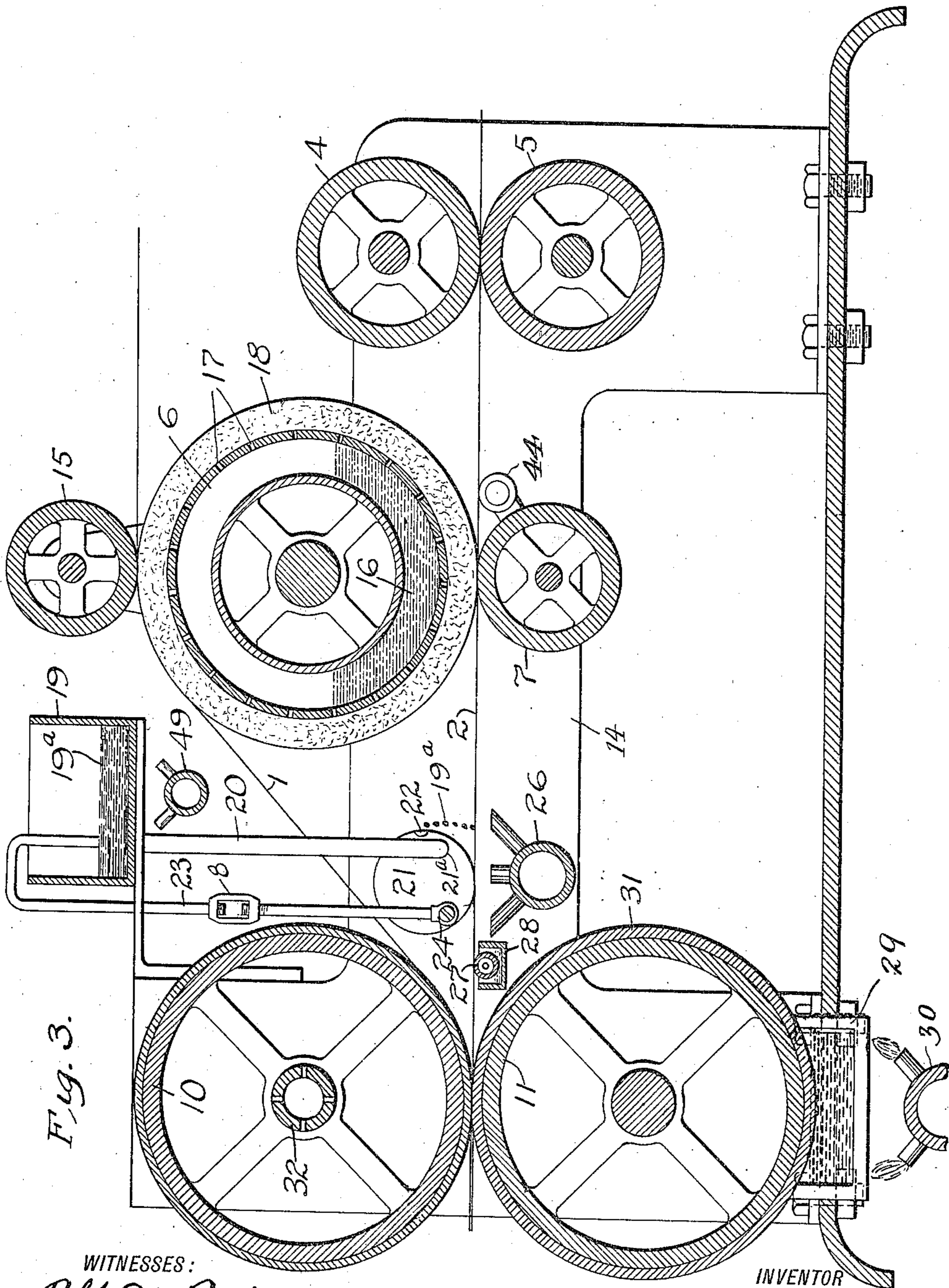


Fig. 3.

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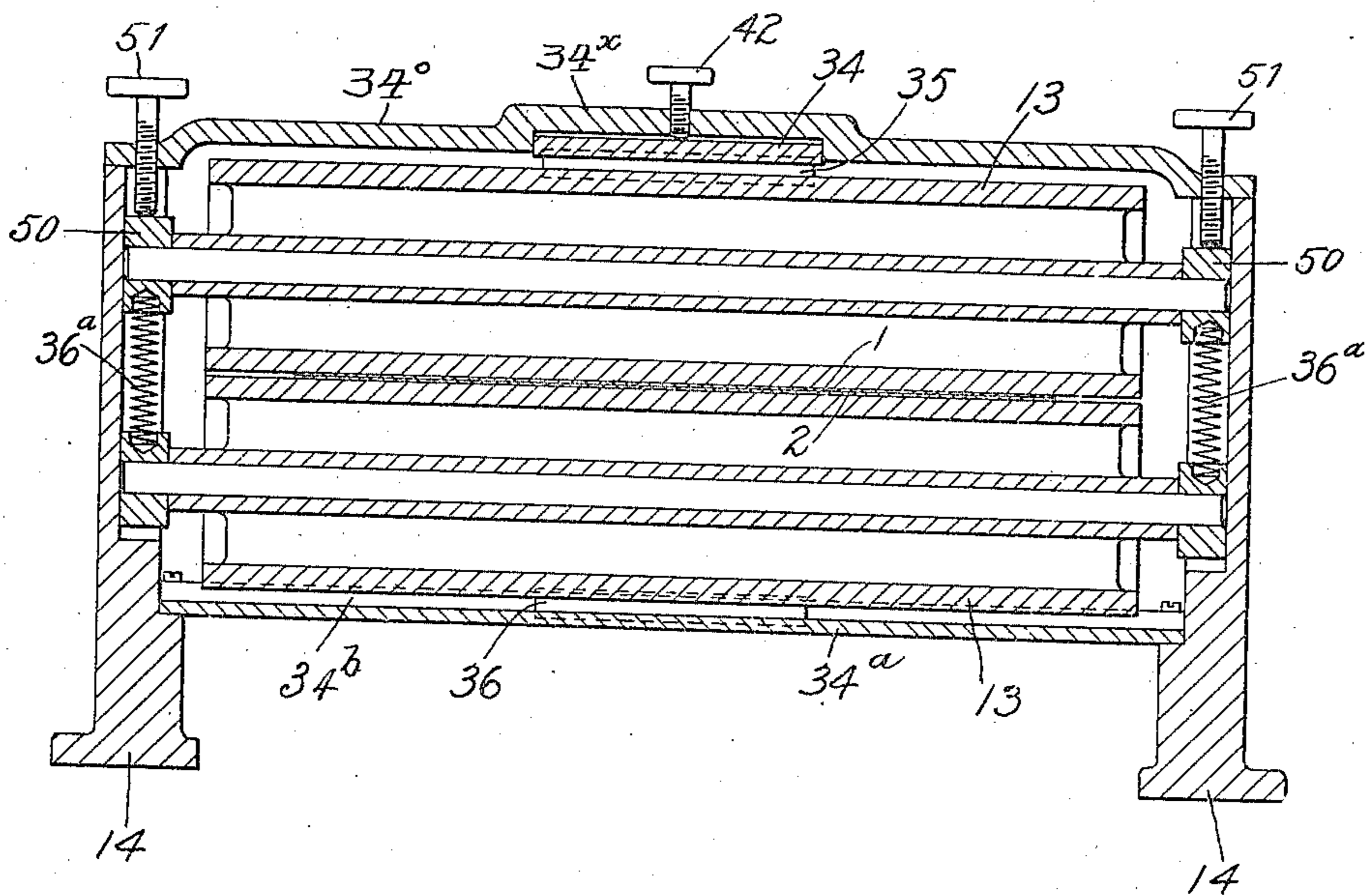
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4 SHEETS—SHEET 4.

Fig. 5



WITNESSES

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UNITED STATES PATENT OFFICE

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MACHINE FOR SOLDERING METAL PLATES.

995,589.

Specification of Letters Patent. Patented June 20, 1911.

Application filed January 15, 1910. Serial No. 538,295.

To all whom it may concern:

Be it known that I, HENRY P. A. A. EICHMANN, a citizen of the United States of America, residing at Corona, in the county of Queens and State of New York, have invented certain new and useful Improvements in Machines for Soldering Metal Plates, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an automatic machine for soldering sheet copper or bronze on sheet steel.

My object is to provide superior mechanism for producing such a product in the form of finished sheets especially adapted to be manufactured into fire-proof and rust-proof doors, window casings etc., which by reason of the copper exterior will possess all the external attractiveness of solid bronze, and by reason of the steel interior, will also possess the strength of that material.

To this end my invention consists in the peculiar features and combinations of parts more fully described hereinafter and pointed out in the claims.

In the accompanying drawings:—Figure 1, represents a side elevation of my complete machine, Fig. 2, a longitudinal section thereof wherein some of the parts are shown in elevation, Fig. 3, a vertical section on an enlarged scale of that part of the machine which supplies the acid, solder and tin to the metal sheets, Fig. 4, a detail view of the automatic solder supplying mechanism, and Fig. 5, a transverse section through one end of the machine.

The reference numeral 1 represents a sheet of copper or bronze, and 2 a sheet of steel.

3 is a feed table located before the receiving end of the machine. This table has two stories, the upper story being adapted to receive the sheets of copper 1, and the lower story the sheets of steel 2.

4 and 5 are feed rolls which take the sheet of steel 2 as it comes from the table and carry it forward beneath an acid-supplying roll 6 against which it is held by an upwardly pressing roll 7 having an adjusting screw 43. An intermediate idler 44 supports the steel sheet 2 on its way to the acid roll. The feed table 3 is provided with anti-friction rollers 3^a.

3^b represents a supporting idler carried on arms 3^c. This idler supports the upper

sheet 1 as it is passed from the top story of the feed-table to the top of the acid roll 6. Said feed rolls and the acid roll and their associated parts are journaled in a housing 14. The lower periphery of the acid-supplying roll 6 is in line with the meeting portions of the peripheries of the feed rolls 4 and 5, and so are the meeting peripheries of the subsequent soldering and finishing rolls.

A gravity roll 15 presses the copper sheet 1 down on the acid roll 6. This acid roll is hollow and contains a charge of acid which flows through perforations 17 into an absorbent felt jacket 18 around its periphery, all of which is more clearly seen in Fig. 3. In this way acid is applied by roll 6 to the bottom of the copper sheet and to the top of the steel sheet below. The sheets having thus been supplied with acid, upon their contiguous surfaces next pass under an oscillatory solder tank 21 eccentrically hinged at 21^a to the lower end of a vertical supply pipe 20 coming from a solder reservoir 19 above containing a supply of molten solder 19^a. While the steel sheet 2 is passing under the tank 21 it tilts and supports the latter against gravity sufficiently to discharge its contents through orifices 22 in the side of the tank onto the lower sheet.

23 is a solder shut-off rod having a valve 25 on its crooked upper end which seats in and closes the mouth of pipe 20. The rod 23 is eccentrically hinged at its lower end 24 to the end of the oscillatory tank 21. When the sheet steel 2 passes out from under the tank 21, and removes the support therefrom, the latter drops below the line of said sheet, carrying with it the rod 23 and closing the valve 25, whereby the supply of solder is stopped. A turn-buckle 8 in the rod 23 permits adjustment of the valve 25 on its seat. Burners 49 and 26 keep the solder in the reservoir 19 and tank 21 in molten condition. Acid is supplied to the under side of the steel sheet by an acid roll 27 operating in an acid trough 28. This is done prior to receiving a coating of tin.

29 is a tin tank adapted to contain molten tin and kept hot by a burner 30. Next in line is a pair of soldering rolls 10 and 11 jacketed with copper 31. The lower soldering roll 11 revolves in and takes up molten tin from the tank 29 and applies it to the bottom of the sheet of steel 2. The upper

roll of these two is heated by a perforated gas pipe 32.

Following the position of the soldering rolls is a series of finishing rolls 13 preceded by cleaning brushes 12 which brushes are held against the passing sheets by coil springs 45. The journals of the upper row of finishing and cooling rolls 13 are journaled in vertically movable boxes 50 which are partly sustained by lifting springs 36^a, and are adjusted vertically by screws 51.

In order to prevent the rolls from buckling in the middle, when forced upward by the introduction of the metal sheets between them, I provide pairs of intermediate horizontal pressure rollers 35 a pair of which bears directly on the periphery of the upper portion of each upper roll. A recessed bearing 34 seated in a recess formed in the underside of the central raised portion 34^x of the upper cross frame piece 34^o, and the adjusting screw 42 (not shown in Fig. 1) hold each pair of rollers 35 adjustably down on each upper roll 13. In the present case and for illustration, four pairs of finishing and cooling rolls and their associated parts are used. The lower cooling rolls 13 rest on rollers 36, and preferably extend into depressions 34^b in plate 34^a.

Thus constructed the operation of the mechanism may be briefly described as follows: The two sheets 1 and 2 of metal are fed simultaneously from the feed table into the machine. The lower sheet of steel is first gripped by rolls 4 and 5 which force it forward between the rolls 6 and 7. The roll 6 supplies the necessary amount of acid to the top of the said steel sheet. The upper sheet of copper 1 is gripped between the roll 15 and the top of acid roll 6 and the mechanism is timed to move it forward in unison with the lower sheet 2 and to supply acid to its under side at the same time. Thus the two contiguous sides of the sheets are supplied with acid preliminary to pressing them together. The steel sheet is carried forward under the hinged solder tank 21 which delivers a predetermined supply of solder to the top of the sheet, and spreads it out as the sheet moves under the tank. Continuing the steel sheet passes over an acid roller 27 which supplies the under side of the sheet with acid preliminary to receiving the tin which comes up from tank 29. Thus the steel is protected from rust on one side by copper, and on the other side by tin. The two sheets next pass between rolls 10 and 11 the pressure of which should be great enough to unite them, and at the same time apply the tin, after which the work, that is to say the united and tinned sheets, passes on through the rolls 13 which complete the cooling and finishing operation. As soon as the steel sheet passes out from under the solder tank 21, the latter drops down, and

pulling down rod 23 and valve 25, shuts off the flow of solder from the reservoir 19 above.

Any suitable arrangement of driving gearing between the various driven rolls may be employed, that shown comprising chains 37 and 38, sprocket wheels 39, 40 and 41, and gear wheels 50, 50 and 51^o 51^o, these parts being represented in Fig. 1.

Although I have shown specific means for carrying out my ideas yet it is evident that other devices which would naturally suggest themselves to a skilled mechanic, might be substituted and still come within the spirit and scope of my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A machine for uniting sheet metal plates and the like, consisting of the combination with suitable feeding mechanism, of means located between the paths of these ingoing sheets, for supplying molten metal to the sheets, soldering rolls for pressing the prepared sheets together, and cooling rolls which take the pressed sheets from the soldering rolls.

2. In a machine of the character described, and in combination with suitable uniting rolls, feed-rolls and cooling rolls, an acid-supply roll located between the path of the ingoing sheets, and arranged and adapted to supply acid to the contiguous sides of said sheets preliminary to applying the uniting medium.

3. In a machine for uniting metal sheets and the like, a revoluble acid-applying roll, means for directing one sheet into engagement with the roll on one side of its axis, means for directing another sheet into engagement with the roll on the opposite side of its axis, and means for bringing the sheets together after they have had the acid applied to their contiguous surfaces.

4. In a machine for uniting metal sheets and the like, a hollow acid-supplying roll provided with discharge orifices in its periphery, and with an absorbent jacket, in combination with pressure rollers oppositely engaging its periphery, and means for directing two sheets respectively between the said opposite pressure rollers and the acid-supplying roll whereby the two ingoing metal sheets are simultaneously held against the acid supplying roll and supplied with acid upon their contiguous faces.

5. In a machine for uniting metal sheets and the like, the combination with suitable feeding, soldering and cooling rolls, of an oscillatory solder tank suspended in the path of an ingoing metal sheet which tilts said tank, and discharges the solder on said sheet.

6. In a machine for soldering metal sheets, an oscillatory solder tank operated by an ingoing sheet, and means connected with the

tank for automatically shutting off the solder supply upon the withdrawal of said sheet.

5 7. In a machine for soldering metal sheets and the like, the combination with suitable feeding and cooling rolls, of an acid-supplying roll positioned to revolve between a pair of ingoing sheets, a soldering tank also disposed between said sheets, heating devices
10 for the soldering tank, an additional acid supplying device, a pair of soldering rolls, and a tin supply tank in which one of the soldering rolls revolves.

15 8. In a machine for soldering metal sheets and the like, the combination with suitable feeding and cooling rolls, of a soldering tank, a tin supply tank, means for supplying acid to the upper face of an ingoing sheet, means for supplying acid to the lower face
20 of said sheet, a pair of soldering rolls, and means for heating said rolls and tank.

9. The combination of means for feeding

forward a metal sheet, means for applying another metal sheet to a face of the first named sheet and for soldering the two to- 25
gether, and means for applying a coating of tin to the face of the first named sheet which is opposite that to which the second sheet is united.

10. In a machine for soldering or uniting 30
metal sheets, an acid-supplying roller interposed between the two sheets to be united, in combination with means for holding the sheets to the roller, whereby the contiguous sides of the sheets are simultaneously sup- 35
plied with acid preparatory to receiving solder.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY P. A. A. EICHMANN.

Witnesses:

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