

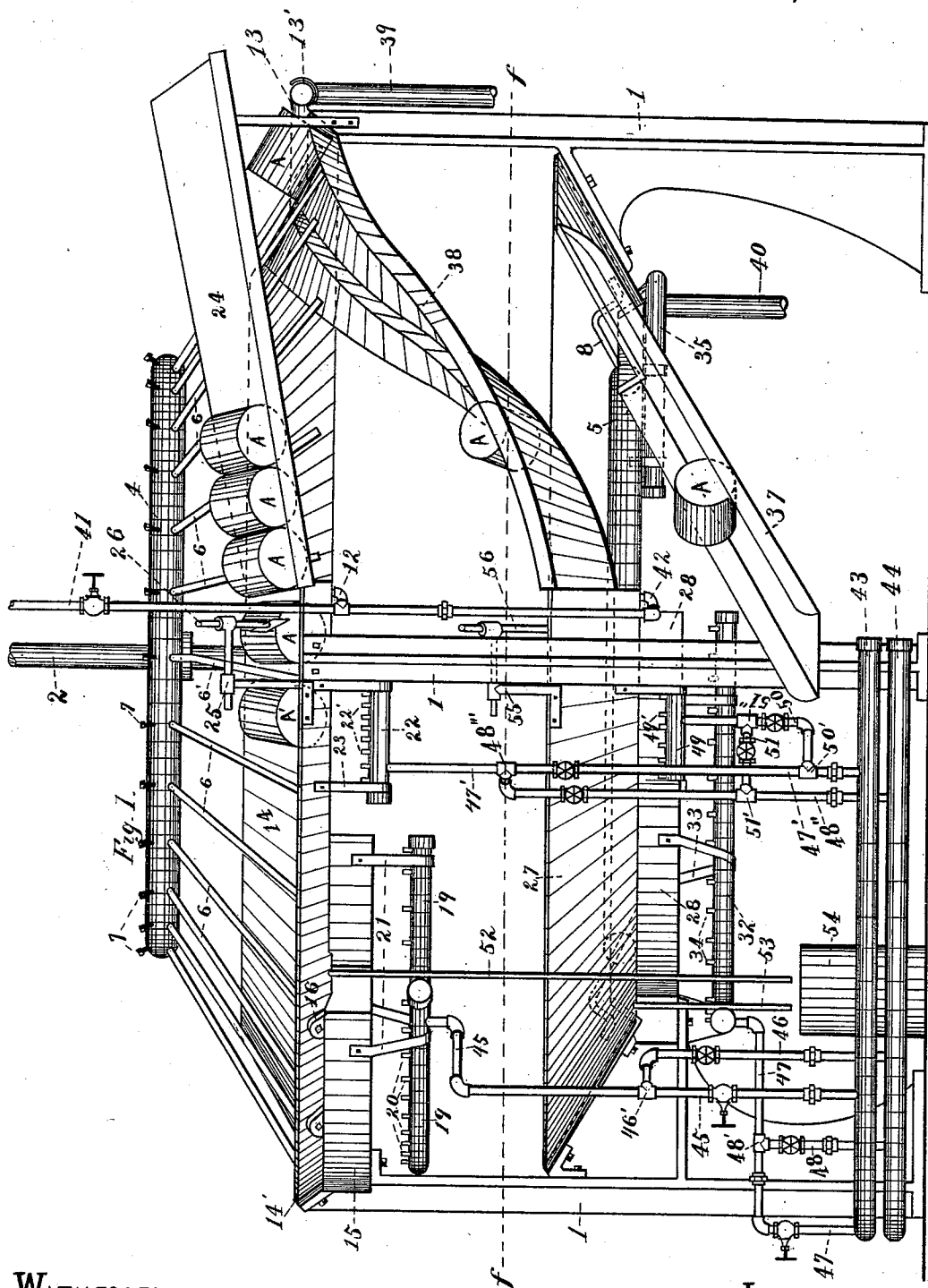
(No Model.)

5 Sheets—Sheet 1.

J. W. ROBERTS.  
CAN SOLDERING MACHINE.

No. 521,896.

Patented June 26, 1894.



WITNESSES

W. M. Fawcett.  
James Banwell

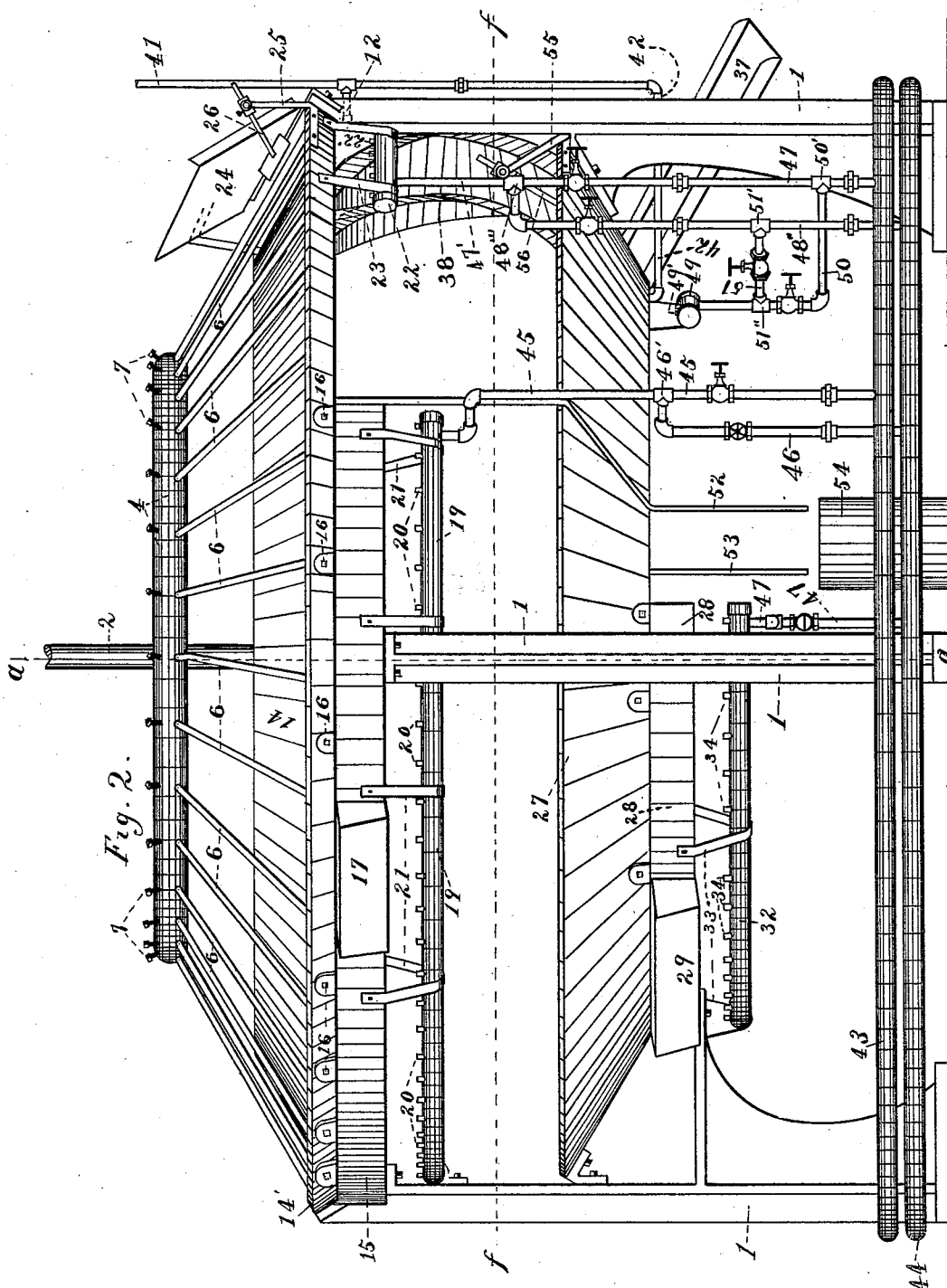
INVENTOR

John W. Roberts,  
By J. A. Osborne & Co.,  
attorneys.

J. W. ROBERTS.  
CAN SOLDERING MACHINE.

No. 521,896.

Patented June 26, 1894.



WITNESSES,

W. M. Sawcett.  
James Russell

INVENTOR,

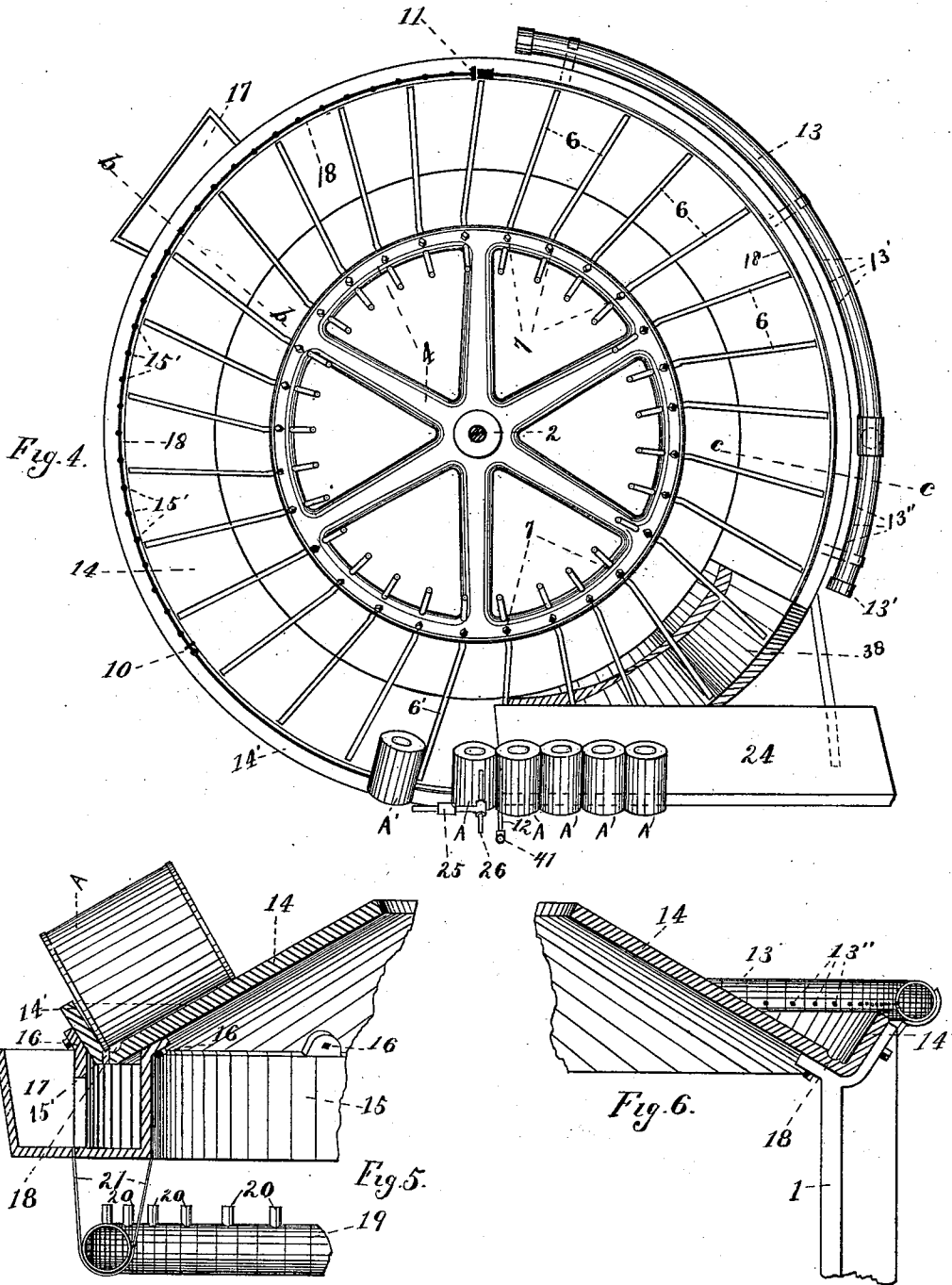
John W. Roberts.  
By J. A. Osborn & Co.,  
Attorneys



J. W. ROBERTS.  
CAN SOLDERING MACHINE.

No. 521,896.

Patented June 26, 1894.



WITNESSES,

*W. M. Fawcett.*  
*James Banwell*

INVENTOR,

*John W. Roberts.*  
*By J. A. Osborn & Co.,*  
*attorneys*

(No Model.)

5 Sheets—Sheet 5.

J. W. ROBERTS.  
CAN SOLDERING MACHINE.

No. 521,896.

Patented June 26, 1894.

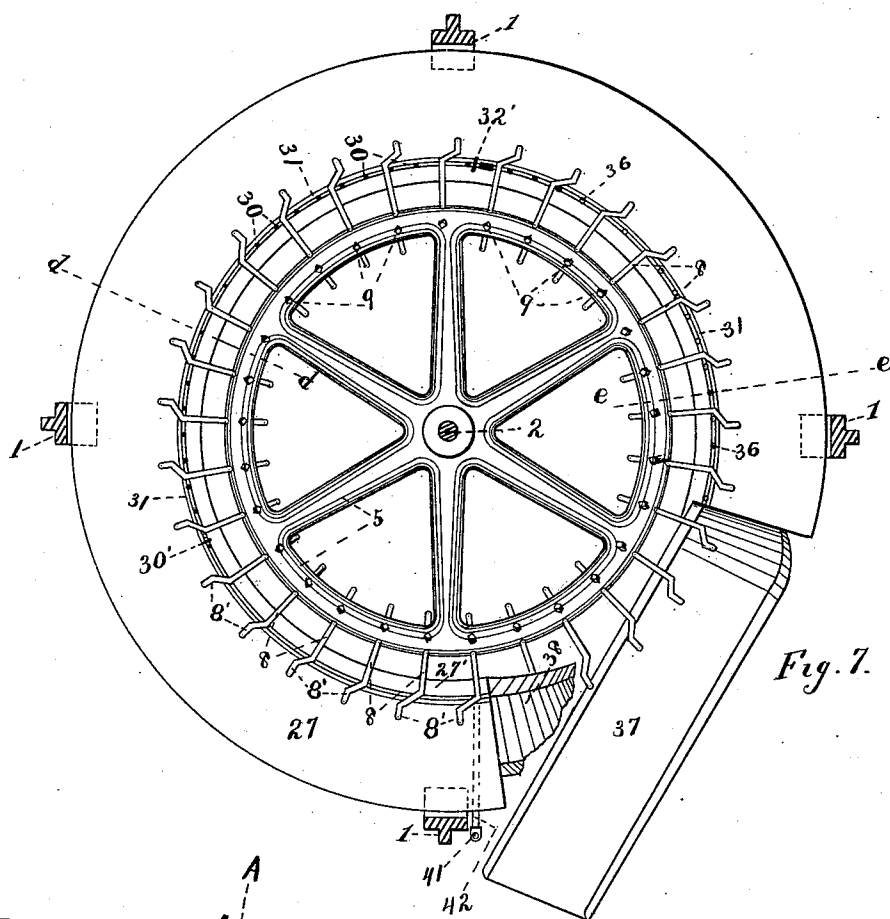


Fig. 7.

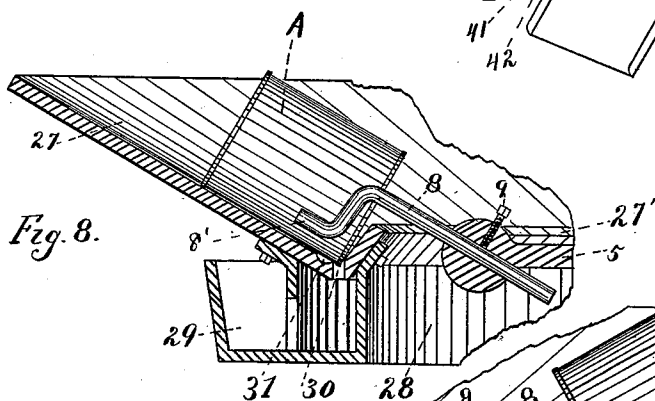


Fig. 8.

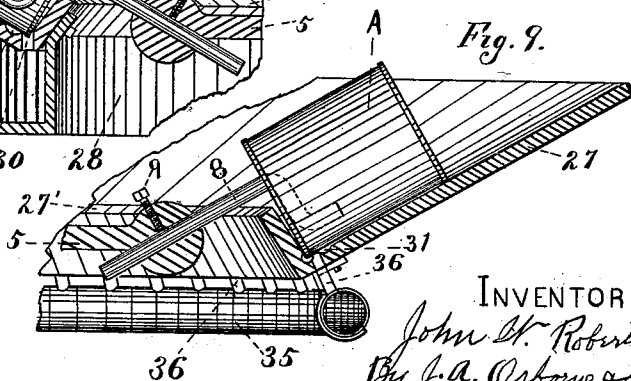


Fig. 9.

WITNESSES,

W. M. Fawcett.  
James Russell

INVENTOR,

John W. Roberts,  
By J. A. Osborne & Co.,  
Attorneys

# UNITED STATES PATENT OFFICE.

JOHN W. ROBERTS, OF CLEVELAND, OHIO, ASSIGNOR TO THE ROBERTS  
TINWARE COMPANY, OF SAME PLACE.

## CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,896, dated June 26, 1894.

Application filed December 1, 1893. Serial No. 492,425. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. ROBERTS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Can-Soldering Machines, of which the following, with the accompanying drawings, is a specification.

My invention relates to machines for soldering the ends upon circular cans made of tin or other sheet metal, and relates particularly to that class of machines employing a solder bath.

The object of my invention is to so improve the construction of such machines as to make them more simple, practical, and economical, and secure great durability.

My invention consists in the particular construction, arrangement and combination of parts shown in the drawings, described herein, and defined in the claims.

Reference is here made to the claims for a specific definition of my invention.

In the drawings, Figure 1 is a front elevation of my machine. Fig. 2 is an elevation from the left end of Fig. 1. Fig. 3 is a central vertical section through the line *a a* of Fig. 2. Fig. 4 is a plan of the upper section of my machine. Fig. 5 is an enlarged section of Fig. 4 on the line *b b*. Fig. 6 is an enlarged section of Fig. 4 on the line *c c*. Fig. 7 is a plan of the lower section of my machine. Fig. 8 is an enlarged section of Fig. 7 on the line *d d*. Fig. 9 is an enlarged section on the line *e e* of Fig. 7.

In Figs. 5, 8 and 9, cans A, A, are shown in position where none are shown in the figures of which these figures are sections, for the purpose of illustrating the manner of travel of cans in the machine.

My machine consists of two sections, the upper and the lower, which are substantially alike, which sections are illustrated by Figs. 4 and 7. The upper section, illustrated by Fig. 4, which is shown above the line *ff* of Figs. 1, 2 and 3, is designed to solder one end of a can while being rolled around said section as hereinafter described; and the lower section, illustrated by Fig. 7, and as shown below the sectional line *ff* of Figs. 1, 2 and 3, is designed to solder the opposite end of

the can, as hereinafter described, the can reversing its inclination on the lower section of the machine from that on the upper section of the machine by a change of the angle of inclination of the chute 38 from the upper section to the lower section and by the opposite inclination of the bath of the lower section to the inclination of the bath of the upper section.

1, 1, constitutes the main frame of the machine.

2 is a vertical shaft which rests in the journal block 3 and passes out through the top of the machine, and has a drive-pulley (not shown) fixed thereon. Two wheels, 4 and 5, are keyed upon the vertical shaft 2 and rotate therewith. The upper wheel, 4, carries a series of fingers, 6, around its rim, the fingers passing through holes in the rim and being secured therein by means of set-screws 7 in order that said fingers may be removable and a greater or fewer number employed, as desired, to accommodate the machine to solder cans of different sizes. The fingers, 6, of the upper wheel, 4, slant downwardly, as illustrated, to accommodate them to driving cans around the upper section of the machine. Fingers, 8, pass through holes in the rim of the lower wheel, 5, and are secured by set-screws, 9, in the same manner as the fingers 6 are secured in the upper wheel; but said fingers slant up and have a bent end, 8', to accommodate said fingers to rolling cans around the lower section of the machine.

The upper and the lower sections of the machine above and below the cross-sectional lines *ff* operate substantially alike, and the construction of said sections is substantially the same.

Referring to Fig. 4, two dams, 10 and 11, are seen. That part of the upper section included between the dams 10 and 11 forms the solder bath. That part of the upper section between the pipe marked 12 and the dam 10 constitutes the acid bath of the upper section. Between the dam 11 and the end 13' of the pipe 13 of the upper section, the cans having traveled through the acid bath and the solder bath, are subjected to a cold blast to solidify the solder.

By reference to Figs. 5 and 6 the construc-

tion of the upper solder bath is seen, and there is also illustrated by Fig. 6 the construction of the pipe 13 adapted to furnish a cold blast through the perforations 13'' to the soldered cans. The upper section constitutes a segmental frusto-conical plate, 14, having an upturned flange 14'. The plate 14 and its flange 14' are at an obtuse angle to each other, as illustrated, in order that the end joints of cans may roll closely down into the angle formed at the junction of the plate 14 and flange 14'.

Under that part of the upper section of the machine between the dams 10 and 11, which constitutes the solder bath, there is a solder box, 15, secured to the plate 14 and flange 14' by means of bolts, 16, as illustrated. At one part of said solder box 15 there is made a solder feed 17, as seen by Figs. 4 and 5.

At intervals between the dams 10 and 11, in the angle of the plate 14 and the flange 14', there are openings, 15', into the solder box 15, through which melted solder enters to the solder bath formed by the plate 14 and flange 14' from the solder box 15. Around said plate 14, just above the angle formed by the plate 14 and the flange 14', there is formed a groove, 18, for the purpose of receiving any lumps in the solder or foreign substances therein, and to catch drip from the can, and also to form a receptacle for solder to prevent its running unnecessarily up the sides of cans operated upon. There is suspended below the solder box 15, a heating pipe, 19, having tips, 20, tapped therein, from which tips 20 there burns a flame of commingled gas and air under the solder box 15 to melt the solder in the solder box. The heating pipe 19 is suspended from the solder box by means of straps, 21. A warmer pipe, 22, having burner tips 22', is suspended below the acid bath by means of straps, 23, for the purpose of keeping the acid and flux warm. Cans, A, are fed onto the upper section of the machine over a chute, 24, as illustrated. At the edge of the flange 14', at the entrance of cans upon the upper section of the machine, there is a bracket, 25, which carries a trap, 26, to prevent more than one can being carried on by any one finger of the wheel 4.

The lower section of the machine is substantially like the upper section, and will be readily understood. The lower acid and solder baths are formed by an inverted segmental frusto-conical plate, 27, and upwardly projecting flange 27'. By the inversion of the frusto-conical plate 27, the angle of inclination of cans upon the lower section is opposite their inclination upon the upper section, and the flange, 27', is to the inside instead of to the outside of the plate with which it forms an angle. The plate 27 and flange 27' form an obtuse angle.

30' and 32' are dams of the lower section which set off the solder bath from the acid bath and the cooling part of the lower section as the dams 10 and 11 of the upper section

set off the solder bath on that section. A solder box, 28, is secured below the lower solder bath, and the feed box, 29, is attached at one part of the solder box 28; a series of openings, 30, open from the solder bath into the solder box, and a groove, 31, is formed in the plate 27 like the groove 18 in the plate 14, and for the same purpose.

Below the solder box 28 there is suspended a heating pipe, 32, by means of straps, 33, and the box 28 is heated by the burning of commingled gas and air from the tips 34 which are tapped into the heating pipe 32. A cold blast is carried to the cans in the lower section, after they pass through the acid and the solder baths, by the pipe 35, which has a series of tubes, 36, opening from said pipe into the trough formed by the plate 27 and flange 27'. 37 is a chute down which cans are rolled from the machine after having had both ends soldered.

38 is a chute which carries cans from the upper section to the lower section of the machine, the cans rolling down said chute 38 by gravity. The chute 38 has its angle of lateral inclination reversed, as illustrated by Fig. 1, for the purpose of reversing the angle of cans rolling down it to be at the proper angle on entering upon the lower section of the machine. Cold air is carried to the cold blast pipe 13 through the pipe 39 from any suitable source, and cold air is carried to the cold blast pipe 35 through the pipe 40, from any suitable source.

41 is a pipe which connects with an acid supply and carries acid to the acid baths of the upper and lower sections, the acid reaching the upper acid bath through the pipe 12, and reaching the acid bath of the lower section through the connection 42.

43 is a gas supply pipe and 44 is an air supply pipe. Gas is carried to the upper heating pipe 19 through the pipe 45 from the pipe 43, and air is conducted to the pipe 45 from the pipe 44 through the pipe 46 to the junction of said pipes at 46'. Gas is carried to the burner pipe 32 through the pipe 47 that connects with the gas pipe 43, and air is carried to the burner 32 from the pipe 44 by the pipe 48 which connects with the pipe 47 at 48'. Gas is carried to the upper acid bath warmer 22 by the pipe 47' which connects with the gas pipe 43, and air is carried to the upper acid bath warmer 22 by the pipe 48'' which connects with the pipe 47' at 48''', and connects with the air pipe 44. Gas is carried to the lower acid bath warmer 49 by the pipe 50 which connects with the gas pipe 47' at 50', and air is carried to the lower acid burner 49 by the pipe 51 which connects with the air pipe 48'' at 51' and with the pipe 50 at 51''.

52 is an acid drip-pipe from the upper acid bath to the receptacle 54, and the pipe 53 is an acid drip from the lower acid bath to the receptacle 54. The lower acid warmer 49 is provided with tubes 49' which are tapped into the warmer pipe 49 and burn under the acid

bath in all respects as do the burners 22' of the upper flux warmer under the upper acid bath.

At the entrance of cans upon the lower section, to the outer side of the plate 27, there is fixed a bracket 55, which carries a stop, 56, that is like the stop 26 of the upper section and is designed for the same purpose.

The operation of my machine will be readily understood. Solder is fed into the solder boxes as described and heated from the burner pipes 19 and 32, and acid is carried to the acid baths through the pipes 41, 12 and 42, and the acid baths of the upper and lower sections are kept warm by the warmers 22 and 49 as described; cans A A are fed upon the chute 24, as illustrated, and are carried around the sections by the fingers on the wheels as described. The manner in which a finger engages a can is seen by the finger 6' in engagement with the can A' on the upper section.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a vertical shaft having two wheels thereon with fingers secured upon the rims of said wheels, a segmental frusto conical plate with an upturned flange, a groove around said segmental frusto conical plate near its lower edge, said segmental frusto conical plate and upturned flange being divided off into sections to form an acid bath, a solder bath and a cooling section, a solder-box below that section of the segmental frusto conical plate and flange which forms the solder-bath, openings from the solder-bath into the solder-box, a heating-pipe below the solder-box, a warmer pipe below the acid bath a cooling pipe around the cooling section of the segmental frusto conical plate and flange, an inverted segmental frusto conical plate having an upturned flange below the first mentioned segmental frusto conical plate, a chute leading from the upper segmental frusto conical plate to the lower inverted segmental frusto conical plate, the inverted segmental frusto conical plate and its flange being divided off into sections by dams to form an acid bath, a solder-bath and a cooling section, a solder-box underneath the solder-bath of the inverted segmental frusto conical plate and flange, openings from said solder-bath into said solder-box, a heating pipe below said solder-box, a warmer pipe below the lower acid bath, a cold blast pipe along the cooling section of the inverted segmental frusto conical plate and a groove formed around said inverted segmental frusto conical plate near its junction with its upturned flange, substantially as illustrated and described.

2. The combination, in a can soldering machine, of two sections, the upper section being adapted to have cans rolled around it at one angle of inclination to solder one end of a can and the lower section being adapted to

have cans rolled around it at an angle of inclination opposite their inclination on the upper section to solder the opposite end of the can, a chute leading from the upper section to the lower section and adapted to change the angle of inclination of cans in their travel down said chute, a vertical shaft having thereon two wheels, carrying fingers around their rims, the fingers of the upper wheel being adapted to roll cans around the upper section of the machine and the fingers of the lower wheel being adapted to roll cans around the lower section of the machine, substantially as illustrated and described.

3. The combination, in a machine for soldering cans, of a solder-bath consisting of a segmental frusto conical plate with an upturned flange, a groove formed around said segmental frusto conical plate near its junction with said flange, a solder-box secured to the under side of said segmental frusto conical plate and flange, and openings from said solder-bath into said solder-box, substantially as illustrated and described.

4. The combination, in a can soldering machine, of a solder-bath consisting of an inverted segmental frusto conical plate having an upturned flange, a groove around said inverted segmental frusto conical plate near its junction with said flange, a solder-box secured to the under side of said inverted segmental frusto conical plate and flange, and openings from said solder-bath into said solder-box, substantially as illustrated and described.

5. The combination in a can soldering machine, of a solder-bath consisting of a segmental frusto conical plate having an upturned flange, a groove around said segmental frusto conical plate near its junction with said flange, a solder-box secured to the under side of said segmental frusto conical plate and flange, openings from said solder-bath into said solder-box, and a wheel having fingers around its rim, substantially as illustrated and described.

6. The combination, in a can soldering machine, of a solder-bath consisting of an inverted segmental frusto conical plate and upturned flange, a groove around said inverted segmental frusto conical plate near its junction with said upturned flange, a solder-box secured to the under side of said inverted segmental frusto conical plate and flange, openings from said solder-bath into said solder-box, and a wheel carrying fingers around its rim, substantially as illustrated and described.

In testimony whereof I affix my signature, in the presence of two witnesses, this 29th day of November, 1893.

JOHN W. ROBERTS.

Witnesses:

J. A. OSBORNE,  
W. M. FAWCETT.