

No. 695,520.

Patented Mar. 18, 1902.

G. WILCOX.

MACHINE FOR APPLYING SOLDER TO SHEET METAL BLANKS.

(Application filed Oct. 17, 1901.)

(No Model.)

4 Sheets—Sheet I.

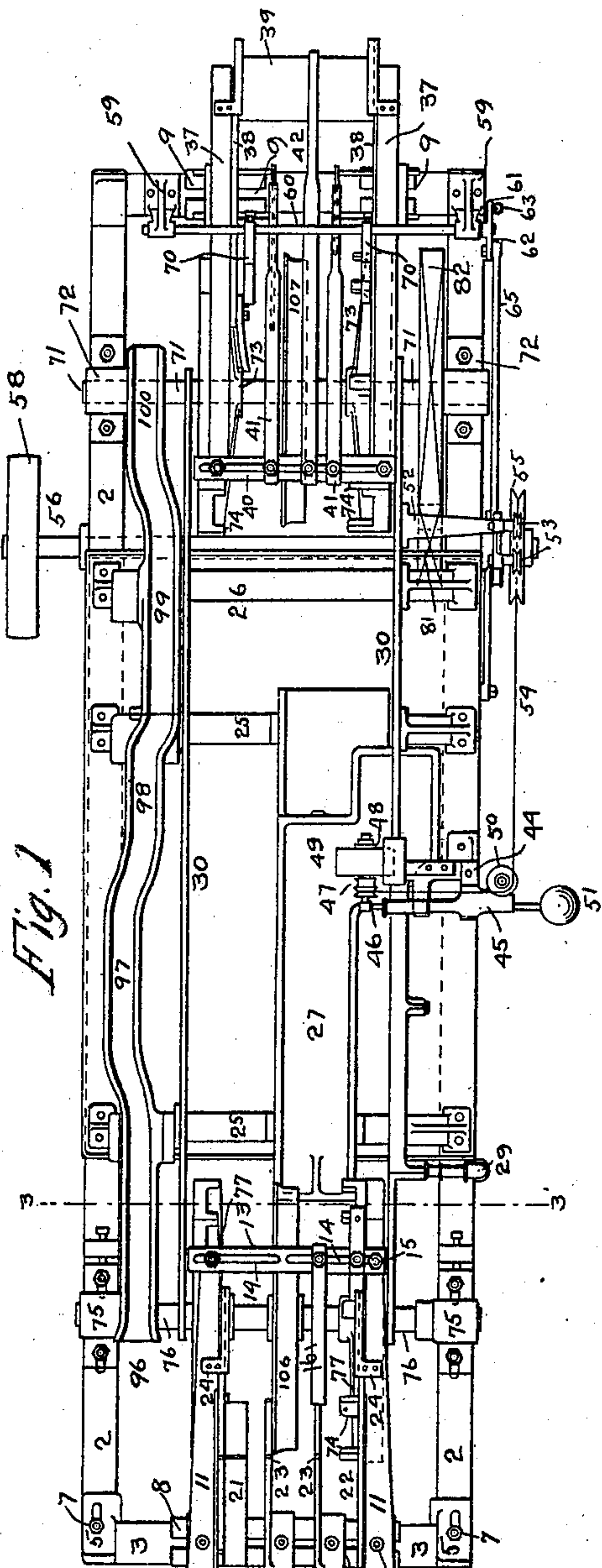


Fig. 1

Witnesses

Harry A. Brooks
B. H. Pierce

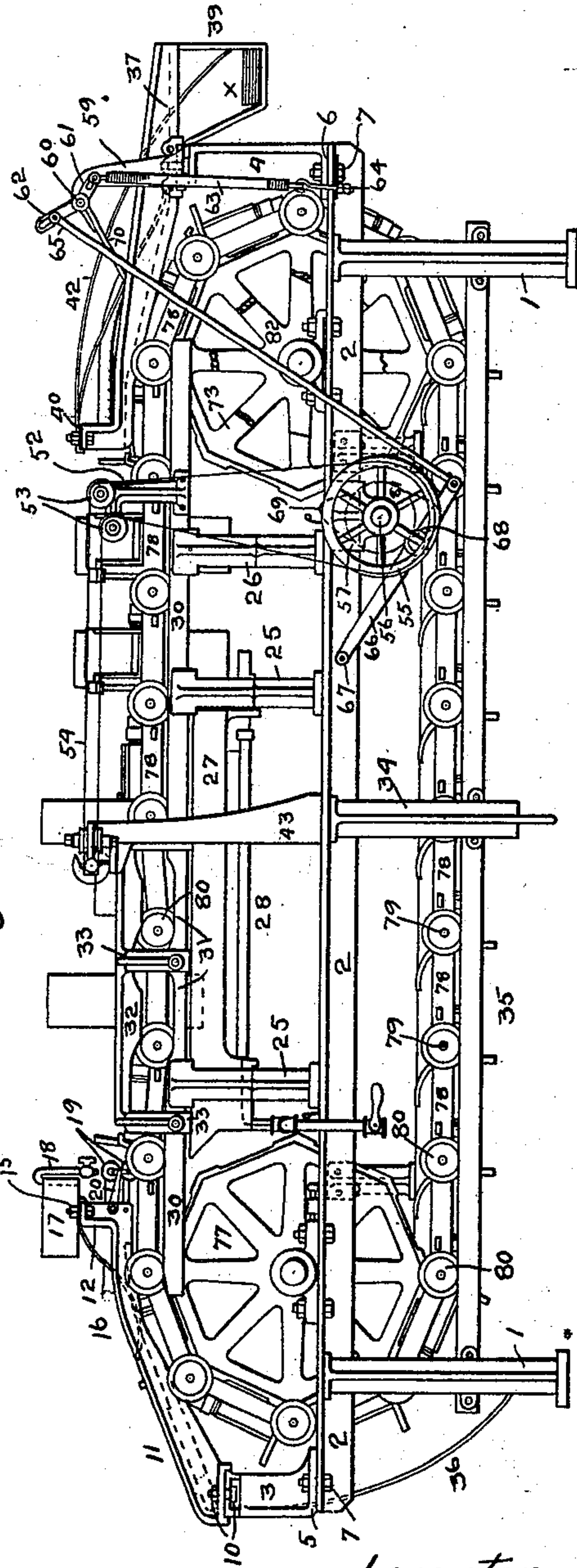


Fig. 2

Inventor

George Wilcox

By

James R. Rogers
Attorney

No. 695,520.

Patented Mar. 18, 1902.

G. WILCOX.

MACHINE FOR APPLYING SOLDER TO SHEET METAL BLANKS.

(Application filed Oct. 17, 1901.)

(No Model.)

4 Sheets—Sheet 2.

Fig. 4

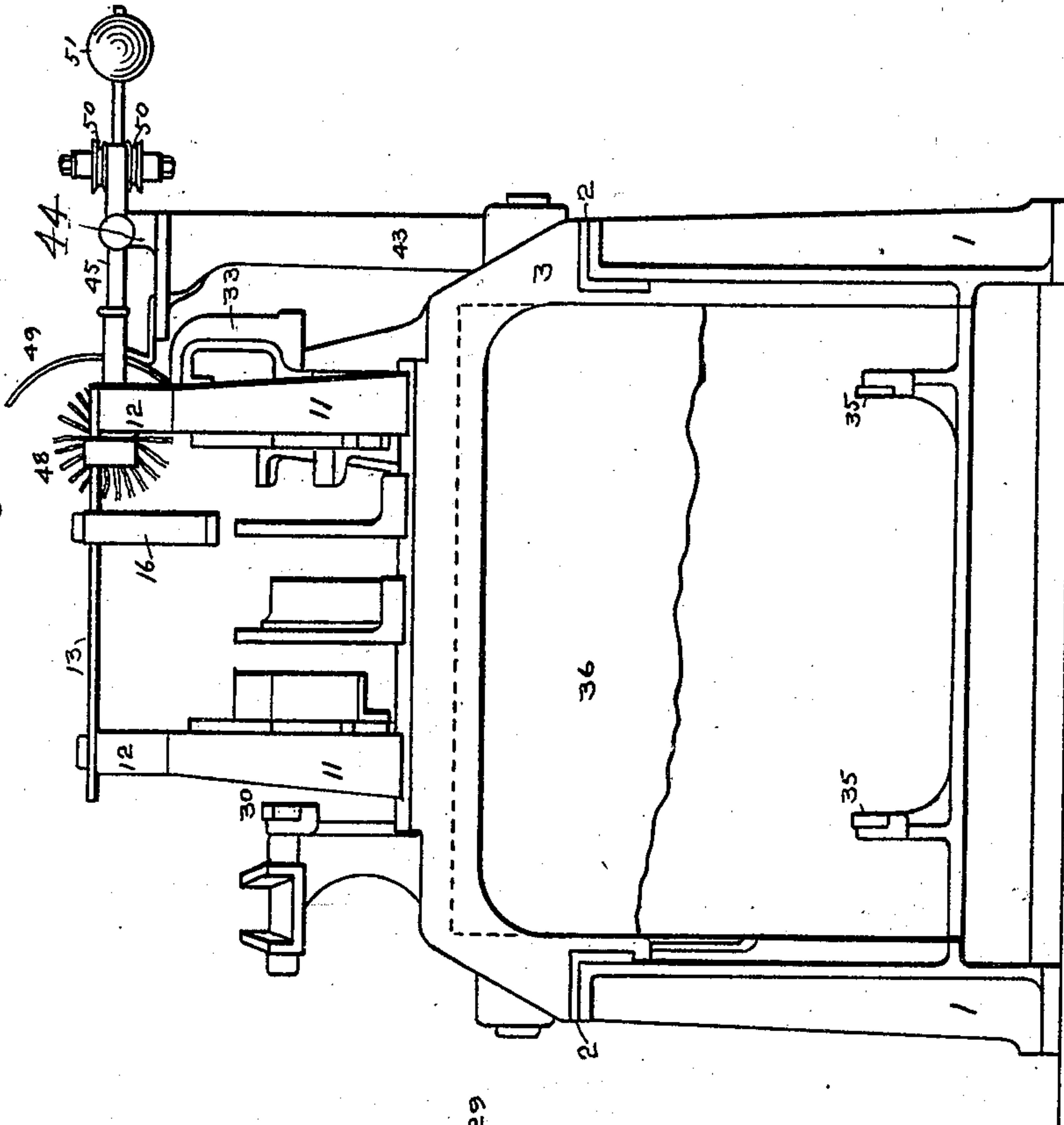
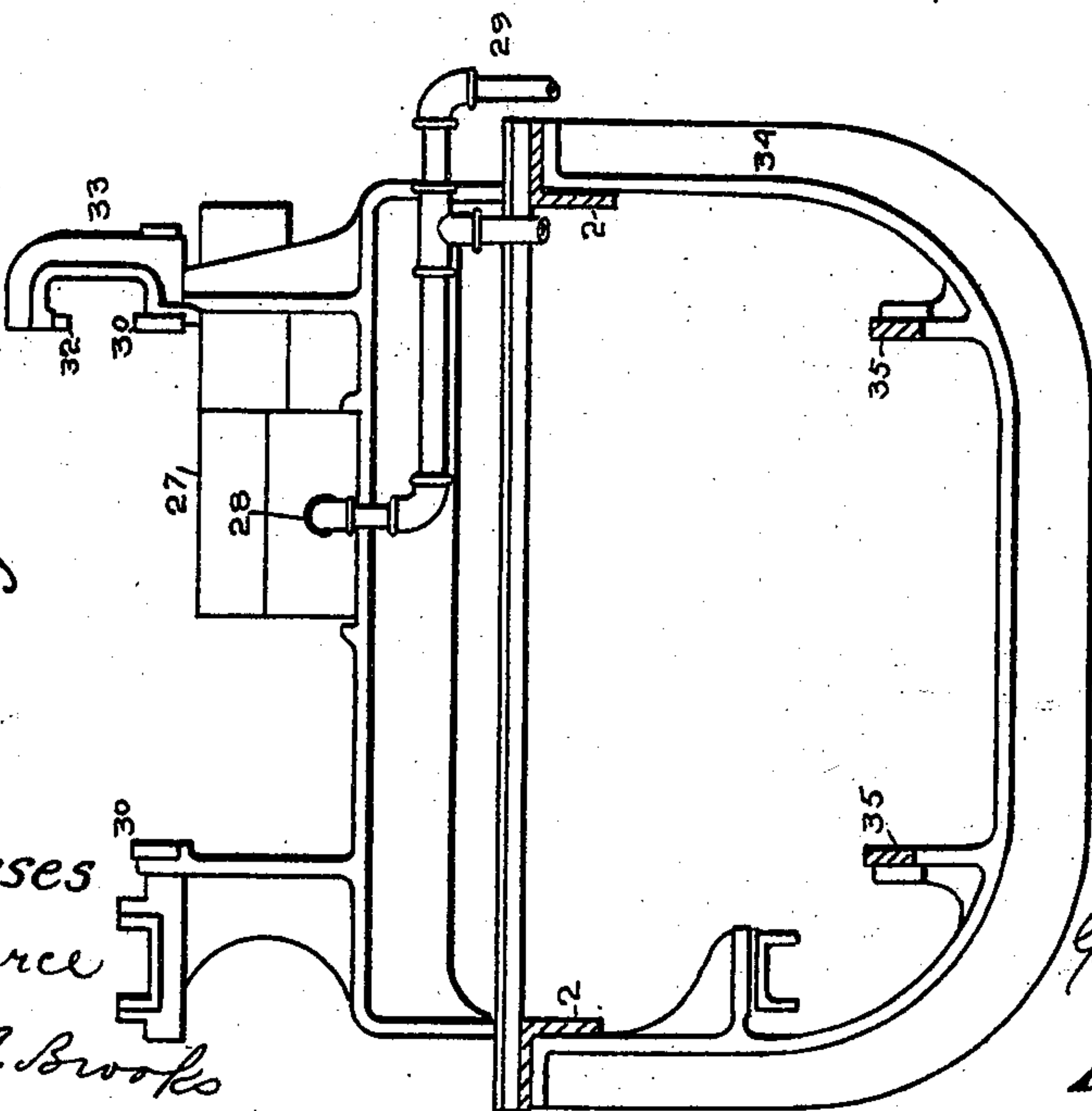


Fig. 3



Witnesses
B. W. Pierce
Harry A. Brooks

Inventor
George Wilcox

By

James R. Rogers
Attorney

No. 695,520.

Patented Mar. 18, 1902.

G. WILCOX.

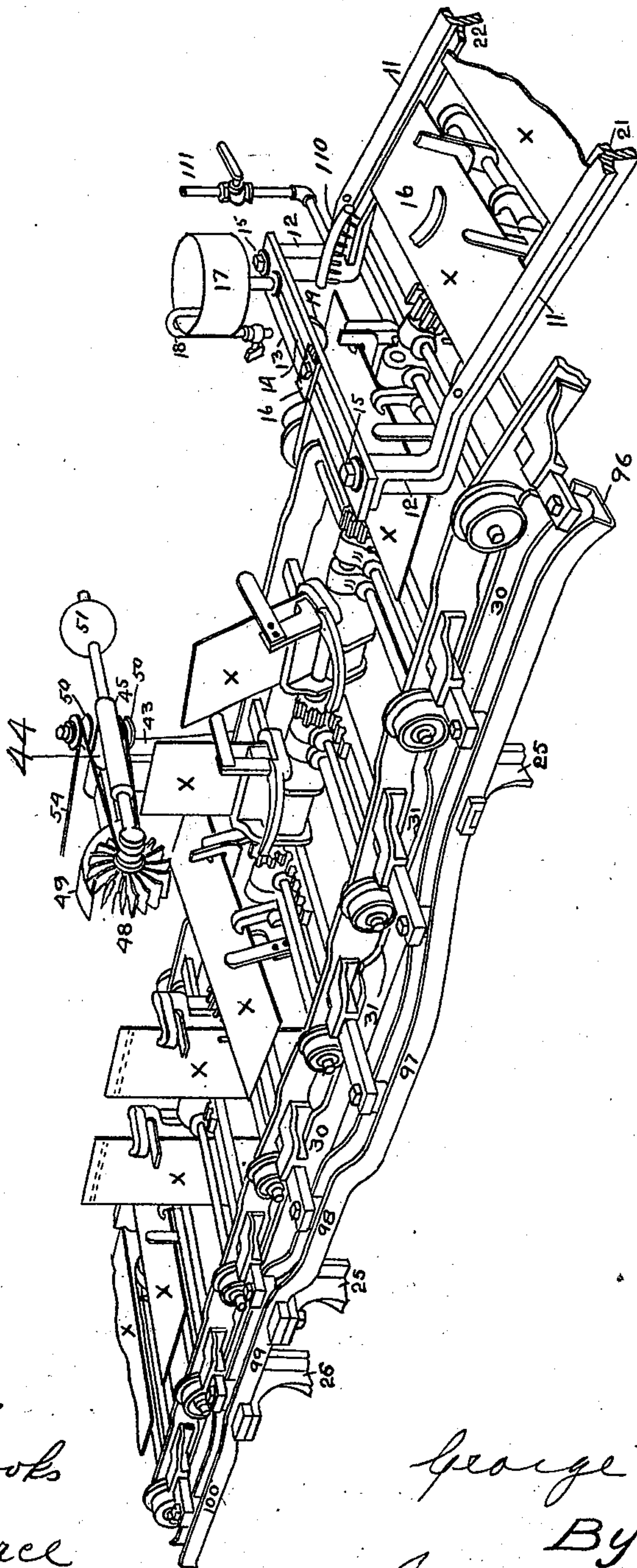
MACHINE FOR APPLYING SOLDER TO SHEET METAL BLANKS.

(Application filed Oct. 17, 1901.)

(No Model.)

4 Sheets—Sheet 3.

Fig. 5



Witnesses
Harry A. Brooks
B. W. Pierce

Inventor
George Wilcox
By
James R. Rogers
Attorney.

No. 695,520.

Patented Mar. 18, 1902.

G. WILCOX.

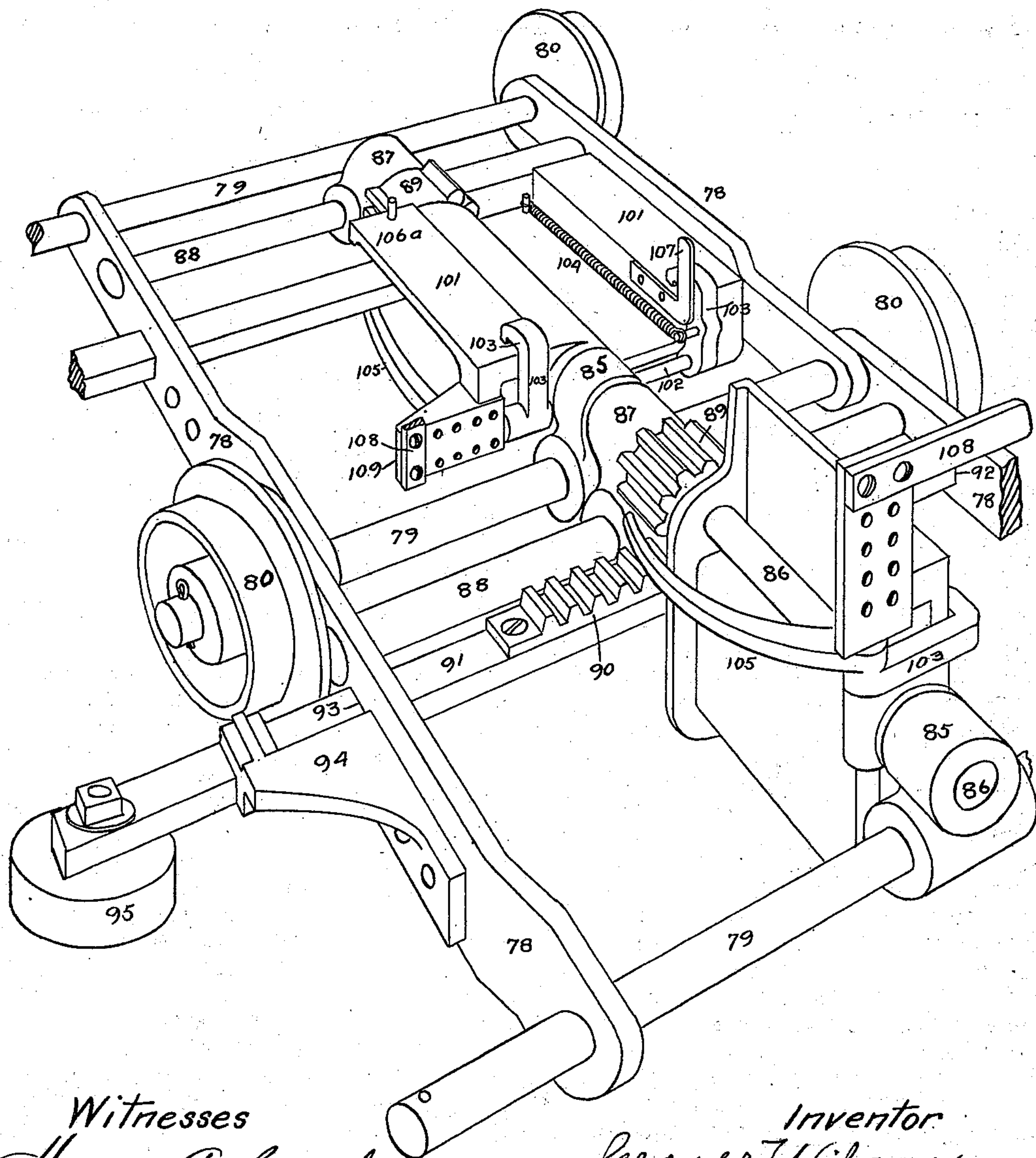
MACHINE FOR APPLYING SOLDER TO SHEET METAL BLANKS.

(Application filed Oct. 17, 1901.)

(No Model.)

4 Sheets—Sheet 4.

Fig. 6



Witnesses
Harry A. Brooks
B. W. Pierce

Inventor
George Wilcox
By
James R. Rogers
Attorney

UNITED STATES PATENT OFFICE.

GEORGE WILCOX, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO AMERICAN CAN COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR APPLYING SOLDER TO SHEET-METAL BLANKS.

SPECIFICATION forming part of Letters Patent No. 695,520, dated March 18, 1902.

Application filed October 17, 1901. Serial No. 79,042. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WILCOX, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Machine for Applying Solder to Sheet-Metal Blanks, of which the following is a specification.

This invention relates to apparatus to be used in the construction of vessels or receptacles, and particularly to machines for dipping the body plate or blank from which such vessel or receptacles are to be constructed into the adhesive material, so as to form thereon a rib or strip of solder, which when the blank is formed into a body is melted to complete the seam; and one of the objects of this invention is to provide a conveyer to receive the body plate or blank, convey the same a predetermined distance, then grip the blank and immerse one end thereof in a bath of adhesive material, and finally discharge or release the blank after the same has been provided with a rib or bead of adhesive material.

Another object of the invention is to provide a bead or rib of adhesive material only upon one side of the body plate or blank.

It is also an object of this invention to apply acid or similar material upon the blank during the transportation of the latter through the machine.

Still another object of the invention is to heat or warm that end of the blank to which the acid and adhesive material are applied before the blank receives such application.

Furthermore, an object of this invention is to provide a machine constructed to form a bead or rib of adhesive material upon a body plate or blank at a distance from the extremity thereof, so that such bead may be caused to run into and seal the seam of the vessel-body.

With these and other objects in view the invention consists, essentially, in the construction, combination, and arrangement of parts, substantially as more fully described in the following specification and illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is a top plan view of an apparatus embodying this invention with the conveyer mechanism removed therefrom. Fig. 2 is a side elevational view of the complete machine. Fig. 3 is a transverse sectional view taken on line 3 3 of Fig. 1. Fig. 4 is an end elevational view of the machine. Fig. 5 is a perspective view of the upper portion of the machine, illustrating the position of the body plates or blanks during the passage of the same through the machine and the method of wiping the same; and Fig. 6 is an enlarged detail view of a portion of the conveyer mechanism, illustrating the construction of the cradles.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, the reference character 1 designates standards or supports, which may be secured upon the floor or other surface whereon the machine is supported, and to the upper end of each of said standards are preferably secured parallel angle-bars or side pieces 2, to which are desirably secured arch-pieces 3 and 4, preferably provided with attaching-flanges 5 and 6, respectively, constructed to receive bolts 7 to retain the arch-pieces in position in an adjustable manner upon the ends of the side pieces 2, Figs. 1 and 2 of the drawings, and the arch end piece 4 is preferably larger than the arch-piece 3, substantially as shown in Fig. 2 of the drawings, and each of the arch-pieces 3 and 4 is preferably provided with a slotted upper edge 8 and 9, respectively, Fig. 1, the former being designed to receive bolts 10, which adjustably secure inclined arms 11, having upturned ends 12, connected by a cross-piece 13, having a longitudinal slot 14 to receive bolts or other devices 15, which adjustably secure said cross-piece upon said ends 12, and a finger or guide 16 may be adjustably mounted on said slotted cross-piece, constructed to guide the body plate or blank X in the passage of the latter through the machine.

Mounted upon the cross-piece 13 is a receptacle or reservoir 17 for the acid or other material used, and the reservoir may be provided with a discharge-tube 18, constructed to convey the contents of the reservoir upon fric-

tion disks or rollers 19, carried by an arm 20, attached to the end 12 of the inclined arms 11, Fig. 2, said rollers being adapted to contact with the edge of the blank X and apply the acid thereto during the passage of the blank beneath the roller, as will be readily understood.

One of the arms 11 is preferably provided with a laterally-extending notched flange 21, and the other arm 11 is desirably provided with a narrow flange 22, which flanges, together with the supports or adjustable brackets 23, are designed to receive and support the blanks X when the same are introduced into the machine, and the inclined arms 11 may be provided with spring-guides 24 to prevent the excessive upward movement of the blanks X when the same are taken up by the conveyer mechanism, as hereinafter explained.

Suitably mounted upon the side pieces 2 are intermediate arch-pieces 25 and 26, the former being constructed to support a tank or receptacle 27 to retain the adhesive material employed, which may be heated by a burner 28, having connection 29 with the source of supply of any suitable heating agent, and upon the arch-pieces 25 are mounted parallel rails 30, Figs. 1 and 2, preferably cut away, as shown at 31, Figs. 2 and 5, and above the cut-away portion of the rails 30 is preferably mounted an upper guide-rail 32, supported by brackets 33, secured to the rail 30, Fig. 2, by means of which construction the wheels of the conveyer mechanism are depressed at a predetermined place or places in their travel.

Secured upon and depending from the side pieces 2 is a yoke or frame 34, to which and to the standards or supports 1 are preferably secured parallel lower rails 35, Figs. 2 and 3, and the feeding end of the apparatus is preferably provided with a curved or segmental apron 36, Figs. 2 and 4 of the drawings.

Mounted in the slotway 9 of the arched end piece 4 are parallel arms or guides 37, preferably provided with flanges 38 and desirably supporting a receiver 39 for the dipped blanks X, Figs. 1 and 2, and said arms 37 are preferably adjustably bolted to a slotted cross-piece 40, carrying adjustable depressing-fingers 41 and a curved guide 42, constructed to direct the blanks into the receiver 39 after the same have been released by the conveyer mechanism.

A standard 43 may be mounted upon one of the side pieces 2 and is desirably constructed with a bearing 44, in which is movably mounted an arm 45, carrying a shaft 46, provided with a sheave 47 and with a wiper 48, and the standard 43 may support a shield 49 for the wiper, Figs. 1, 4, and 5 of the drawings, and twin sheaves or pulleys 50 are preferably carried by the arm 45, which also may be provided with a counterbalance 51 to regulate the position of the wiper and the pressure exerted thereby upon the end of the blank X when the same passes therebelow.

Formed on or connected with one of the upper rails 30 is a standard 52, carrying guide sheaves or pulleys 53, constructed to receive a driving belt or band 54, passing over a driven wheel 55 upon a shaft 56, journaled in hangers 57, formed on or connected with the side pieces 2, said shaft carrying a driving-wheel 58, Fig. 1, that may be actuated in any desired manner, and said belt or band 54 passes over the sheaves or pulleys 50 on the arm 45 and around the sheave or pulley 47 on the shaft of the wiper to impart motion to the latter, preferably a very rapid motion.

Standards 59 are mounted upon the arched end piece 4 and carry a rocking shaft 60, provided with cranks 61 and 62, preferably having slotted ends, and a spring 63 is adjustably mounted in the slotted end of the crank 61 and may be adjustably connected with one of the side pieces 2, as shown at 64, Fig. 2 of the drawings, and adjustably mounted in the slotted end of the crank 62 is a link or rod 65, movably connected with one end of a lever 66, attached at 67 to one of the side pieces 2, and preferably carries a roller 68, engaging a double cam 69 on the shaft 56, whereby the rock-shaft 60 is actuated and the fingers 70 thereon are caused to contact with the blanks X and force the same into the receptacle 39.

A shaft 71 is mounted in bearings 72 upon the side pieces 2, near the discharge end of the machine, and said shaft preferably carries octagonal wheels 73, preferably carrying laterally-extending lugs 74, Fig. 1, and mounted in adjustable bearings 75 near the feeding end of the machine is a shaft 76, carrying similar wheels 77, it being understood that there are preferably two octagonal wheels on each of the shafts 71 and 76, which are constructed to receive links 78, which are preferably pivotally connected by wheeled shafts 79, the flanged wheels 80 whereof are constructed to travel upon the rails 30 and 35, substantially as shown in Fig. 2 of the drawings. By means of this construction an endless conveyer is provided embodying two sets of links 78, movably connected by a shaft 79, carrying the wheels 80, and this endless conveyer is actuated by the rotation of the wheels 73 and 77, the lugs of the latter preventing the displacement of the conveyer when passing thereover. The wheels 73 and 77 are preferably driven by a pinion 81 upon the shaft 56, which meshes with a gear-wheel 82 upon the shaft 71, Fig. 1.

Referring particularly to Figs. 5 and 6, the construction of the conveyer mechanism will be described. As before stated, the links 78 are movably connected by means of the shafts 79, carrying the flanged wheels 80, and upon said shafts are secured bearings 85, each of which is adapted to receive one end of a transverse shaft 86, the other end whereof is preferably mounted in a similar bearing 87 upon a cross-bar 88 near the opposite end of the link, and a transverse shaft 86 preferably carries a pinion 89, meshing with a rack-bar 90

upon a reciprocating bar 91, mounted in bearings 92 in the links on one side of the conveyer and passing through a similar bearing in the links upon the other side of the conveyer and through a bracket 94, Figs. 5 and 6, and upon the end of the bar 91 is mounted a roller or other device 95, constructed to travel in a camway 96, preferably constructed with portions 97, 98, 99, and 100, which act upon the rollers to extend the bars 91 first laterally or away from the wiper side of the conveyer, thereby rotating the pinion 89 toward the wiper side of the apparatus and tilting the cradles into a vertical position, as indicated by the first two cradles in Fig. 5 and the first cradle in Fig. 6. After the roller 95 shall have passed into the portion 98 of the cam the bar 91 has been partially returned to the initial position thereof on entering the camway, and the blank X is passed beneath the wiper 48 in a slightly-inclined position, as shown in Fig. 5, in which position the rapidly-revolving wiper removes the adhesive material from that side of the blank, and upon the passage of the roller 95 into the portion 99 of the camway the bar 91 will be forced farther toward the wiper side of the conveyer and the pinion 89 will be rotated in an opposite direction or away from said side, thereby bringing the blanks X, Fig. 5, into a vertical position, with the dipped end up, in order that the adhesive material upon the under side of the blank may gravitate away from the edge of the blank and form a bead or rib at a distance therefrom, substantially as indicated in dotted lines in Fig. 5. Upon the further travel of the roller 95 into the straight portion 100 of the camway the bar 91 will be again drawn slightly away from the wiper side of the conveyer, thereby returning the cradles to a horizontal position, as shown by the last two blanks X in Fig. 5 of the drawings. The cradles are preferably provided with receiving portions or tables 101 and with a shaft 102, whereon are mounted jaws or grippers 103, normally forced upon the tables 101 by the action of a spring 104, secured thereto and to the body of the cradle, and upon the shaft 102 is mounted a releasing-arm 105, constructed to engage with the periphery of flanged wheels 106 and 107, respectively, mounted upon the shafts 76 and 71, and to release the grippers 103 from the cradles, which are also provided with a stop pin or lug 106^a to prevent the blanks X from being forced off of the cradle by the action of the grippers 103. A finger or support 107 may be secured to the cradle and a standard or support 108 may be adjustably mounted at the other side of the cradle, substantially as shown at 109 in Fig. 6 of the drawings.

A burner 110 is preferably mounted adjacent to one end of the inclined arms 11 and is provided with suitable connections 111 with the source of supply of a heating agent in order that the end of the blank X may be heated before the same is dipped into the ad-

hesive material employed to facilitate the action of the material thereon.

The operation of this invention will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following explanation thereof.

Referring particularly to Figs. 1 and 5, the blank X is laid upon the flanges 21 and 22 of the inclined arms 11 and upon the supports 23, where it is retained by the notches or shoulders thereon until it is engaged by the fingers 107 and 108 upon the cradle, the grippers 103 being held away from the cradle by the action of the wheel 106 upon the releasing-arm 105 as the cradles pass over said wheel. Then upon further movement of the conveyer the end of the blank X is passed beneath and subjected to the action of the flame from the burner 110, which heats said end, whereupon the heated blank X is passed between the rollers 19, which apply acid thereto that drips on said wheels or rollers from the reservoir 17 through the pipe or tube 18. Then the rollers 95 pass into the portion 97 of the camway, thereby pulling the reciprocating bars 91 away from the wiper side of the apparatus and rotating the pinion 89 in an opposite direction, thereby tilting the cradle toward the wiper side of the conveyer until the blank on the cradle in question is brought into a vertical position, Figs. 2 and 5, and about this time the wheels supporting the cradle in question descend upon the cut-away portion 31 of the upper rails 30 and permit the descent of the cradles supported thereby, thus dipping the depending ends of the blank X into the adhesive material within the tank or receptacle 27, substantially as shown in dotted lines in Fig. 2 of the drawings. When the roller 95 shall have traveled into the portion 98 of the camway, the reciprocating bar 91 will have been forced toward the wiper side of the conveyer, thereby returning the cradle to a substantially horizontal position, during the passage beneath the wiper 48, which removes from the upper side thereof the adhesive material, whereupon the blank X is turned into a vertical position by the further travel of the roller 95 into the portion 99 of the camway, in which position the adhesive material on the upwardly-extending end of the blank X gravitates away from the edge thereof and forms a bead or rib of material at a distance from said edge, substantially as illustrated at the right of Fig. 5 of the drawings. The further travel of the conveyer brings the roller 95 into the straight portion 100 of the camway, thereby returning the cradle, together with the blank thereon, into its initial horizontal position, when the releasing-arm 105 engages the periphery of the flanged wheel 107, thereby releasing the grippers 103 and allowing the dipped blank X to be forced by the fingers 70 on the rocking arm 60 into the receiver 39.

It is not desired to confine this invention

to the specific construction, combination, and arrangement of parts herein shown and described, and the right is reserved to make all such changes in and modifications of the same as come within the spirit and scope of the invention.

I claim—

1. An apparatus of the character described provided with conveying mechanism constructed to receive a body plate or blank in the flat and dip the same in adhesive material and invert the blank to cause the material to recede from the edge of the blank.

2. An apparatus of the character described provided with wheels and conveyer mechanism passing thereover constructed to dip a blank into adhesive material and invert the same to cause the material to recede from the edge of the blank.

3. In combination, with octagonal wheels, a conveyer made up of links pivoted together and arranged to pass over said wheels, means for applying solder to the blank, and means carried by the conveyer for holding the blank and for inverting it before the solder sets to allow the solder to creep down and form a rib-like deposit removed from the edge, substantially as described.

4. In combination, means for applying adhesive material to both sides of a sheet-metal piece, means for wiping the adhesive material from one side of the said piece and means for inverting the piece to allow the adhesive material to recede from the edge before setting to form a rib-like deposit, substantially as described.

5. In combination, a bath, a conveyer for the sheet-metal pieces, means carried thereby for holding and dipping the sheet-metal piece into the bath and removing it therefrom, means for wiping one side of the sheet-metal piece, and means for inverting the sheet-metal piece to allow the solder to creep down before setting to form a rib-like deposit, substantially as described.

6. In combination, a conveyer, cradles carried thereby to rock in a direction transversely of the conveyer, a bath for the solder, a camway and means operated by the camway and connected with the cradles to dip the sheet-metal pieces into the bath, remove them therefrom and to invert and hold them in inverted position to allow the solder to recede from the edge of the sheet-metal pieces, substantially as described.

7. An apparatus of the character described provided with a camway, devices in engagement therewith carrying rack-bars, cradles carrying pinions meshing therewith, whereby the cradles are rocked by the passage of said devices through said way and means for conveying said cradles, the said rack-bars being reciprocated by the camway, substantially as described.

8. An endless conveyer provided with links wheeled shafts movably connecting said links

bearings on said shafts, spindles in said bearings and cradles upon said spindles.

9. An endless conveyer provided with links, wheeled shafts movably connecting said links and having bearings, transverse shafts mounted in said bearings and cradles carried by the latter shaft constructed to rock thereon.

10. An endless conveyer provided with links, wheeled shafts movably connecting said links and having bearings, transverse shafts mounted in said bearings, cross-bars having bearings to support one end of said transverse shafts, cradles upon the latter shafts and means for rocking the cradles.

11. An endless conveyer provided with pivoted links, shafts mounted between the links and parallel thereto, cradles on said shafts, rack-bars mounted in said links meshing with pinions on said shaft and means for actuating the rack-bars to rock the cradles.

12. An endless conveyer provided with pivoted links, shafts mounted between the links and parallel thereto, cradles on said shafts, rack-bars mounted in said links meshing with pinions on said shafts and carrying rollers and a camway in which the rollers travel to rock the cradles.

13. An endless conveyer provided with wheeled shafts, links mounted thereon, cross-bars between the links, bearings on said shafts and bars, transverse shafts mounted in said bearings and carrying pinions, cradles on the transverse shafts and means for operating said pinions to rock the cradles.

14. An endless conveyer provided with wheeled shafts, links mounted thereon, cross-bars between the links, bearings on said shafts and bars, transverse shafts mounted in said bearings and carrying pinions, cradles on the transverse shafts and a rack-bar mounted in said links and meshing with said pinions and carrying a roller and means engaging the roller to reciprocate the rack-bar.

15. A transversely-rocking cradle provided with retaining-fingers, grippers mounted upon the cradle, an arm for releasing the grippers, a spring to force the grippers upon the cradle and means for conveying the cradles and operating said arm, said cradle and grippers being arranged to hold a sheet-metal piece in flat form, substantially as described.

16. A transversely-rocking cradle provided with retaining-fingers, grippers mounted upon the cradle, an arm for releasing the grippers, a spring to force the grippers upon the cradle, wheels to depress said arms as the cradles pass thereover to release the grippers and means for conveying the cradle, said cradle and grippers being arranged to hold a sheet-metal piece in flat form, substantially as described.

17. The combination with means for applying molten solder to the edge of a piece of sheet metal in flat form, of means for holding said sheet-metal piece in flat form with its molten-solder-coated edge uppermost before

and while the solder sets to allow the solder to creep down and form a rib-like deposit removed from the extreme edge of the sheet-metal piece and seam-section, substantially as specified.

18. The combination with a solder-bath, of means for dipping the edge of a piece of sheet metal therein while in flat form, and means for turning the said sheet-metal piece in flat form with its dipped edge uppermost before the solder thereon sets and holding it in such position to allow the solder to flow down and form a rib-like deposit removed from the extreme edge of the piece and seam-section, substantially as described.

19. Means for forming a rib-like deposit on a sheet-metal piece of flat form consisting of means for applying molten solder to the edge portion of said piece, means for holding said piece with its molten-solder-coated edge uppermost in a substantially horizontal line before the solder sets to allow the solder to creep down and form a rib-like deposit removed from the edge and seam-section and parallel to said edge, substantially as described.

20. Means for forming a rib-like deposit on a sheet-metal piece including a solder-bath and a holder for the piece to hold it in flat form and means whereby the edge of the sheet-metal piece in flat form is dipped into the bath with its edge in substantially a horizontal line and for turning the said piece in flat form with its molten-solder-coated edge uppermost before and while the solder thereon sets while maintaining the horizontal position of the edge to allow the solder to creep down and form a rib-like deposit removed from the extreme edge and seam-section and parallel to said edge, substantially as described.

21. In combination, means for applying solder to a sheet-metal piece in flat form including a bath and holding means, said holding means receiving the sheet-metal piece in flat form and in a substantially horizontal position and having movement to turn the flat sheet-metal piece so that its edge will dip into the bath and for then inverting the flat sheet-metal piece so that its dipped edge will be uppermost to allow the solder to recede from the dipped edge before setting, substantially as described.

22. In combination, means for applying solder to a sheet-metal piece in flat form including a bath and holding means, said holding means receiving the sheet-metal piece in flat form and in a substantially horizontal position and having movement to turn the flat sheet-metal piece so that its edge will dip into the bath and for then inverting the flat sheet-metal piece so that its dipped edge will be uppermost to allow the solder to recede from the dipped edge before setting, and means for

wiping one side of the blank before it is inverted, substantially as described.

23. Means for applying solder to sheet-metal pieces in flat form comprising a bath for the molten solder, a holder to receive and hold the sheet-metal piece in flat form, said holder having movement to dip one edge of the sheet-metal piece into the bath, to then turn the same into a substantially horizontal position, wiping means for removing the solder from the upper side of the sheet-metal piece, said holder having a further movement to turn the sheet-metal piece with its solder-coated edge uppermost before setting, substantially as described.

24. In combination with a bath, means for holding a sheet-metal piece in flat form and carrying the same edgewise along the bath with one edge dipping therein and means for turning the blank with the dipped edge uppermost before the solder sets to allow the solder to creep down and form a rib-like deposit removed from the edge, substantially as described.

25. In combination with a conveyer, a cradle carried thereby and supported to rock in a direction transversely of the direction of movement of the conveyer, said cradle being arranged to hold a sheet-metal piece in flat form, means for supplying solder to the sheet-metal piece and means for turning the blank with the dipped edge uppermost before the solder sets to allow the solder to creep down and form a rib-like deposit removed from the edge, substantially as described.

26. In combination, a conveyer, a cradle arranged to rock in a direction transversely to the direction of movement of the conveyer and a bath, said cradle serving to dip the sheet-metal piece therein and to invert the same before the solder sets to allow the solder to creep down and form a rib-like deposit removed from the edge, substantially as described.

27. In combination in a machine for forming solder ribs upon sheet-metal blanks in flat form, a traveling carrier, means thereon for receiving the sheet-metal pieces in flat form and in a substantially horizontal position, means for turning the said flat sheet-metal pieces up on edge, a solder-bath for applying solder to the lower edges of said sheet-metal pieces and means for turning the flat sheet-metal pieces with their solder-coated edges uppermost before the solder sets, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE WILCOX.

Witnesses:

J. W. KEMP,

L. B. ALDERETE.