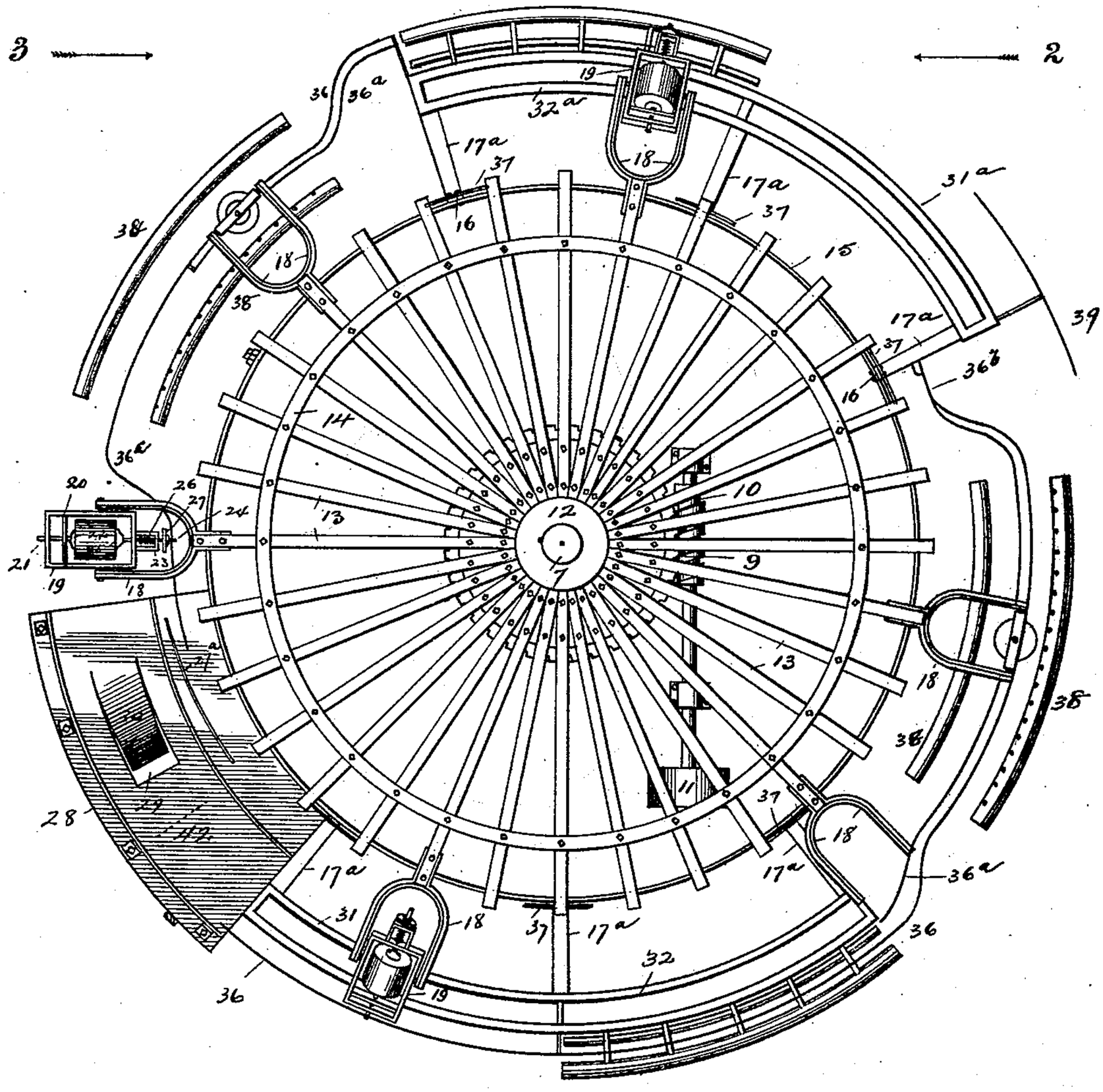
(No Model.) 3 Sheets—Sheet 1.

D. D. RANNEY.

CAN SOLDERING MACHINE.

No. 437,453. Patented Sept. 30, 1890.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

D. D. RANNEY.

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Fig. 2.

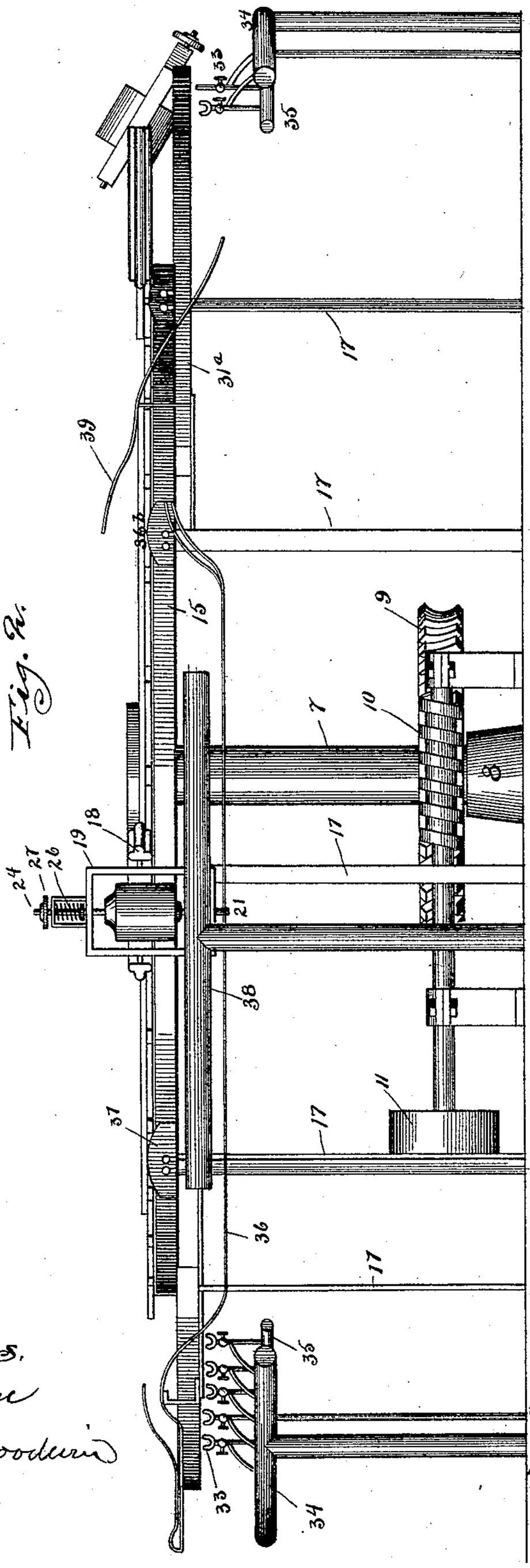


Fig. 6.

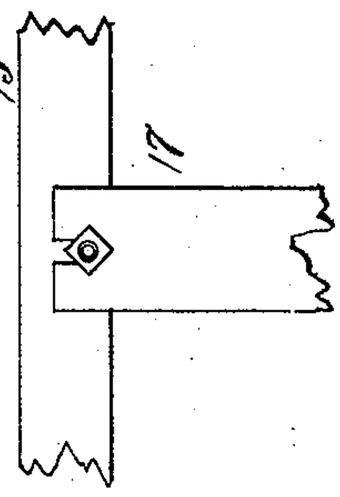


Fig. 4.

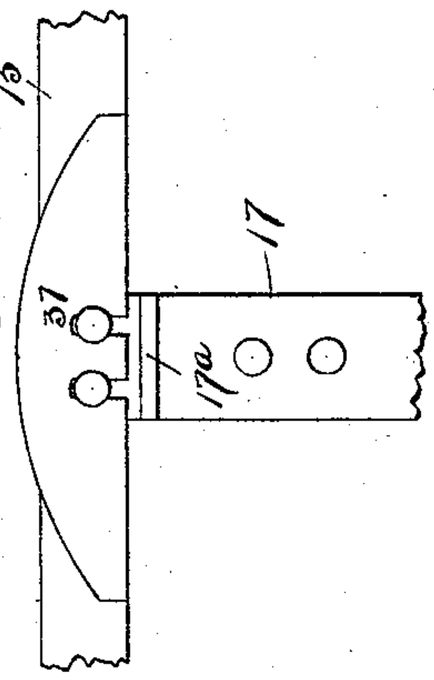
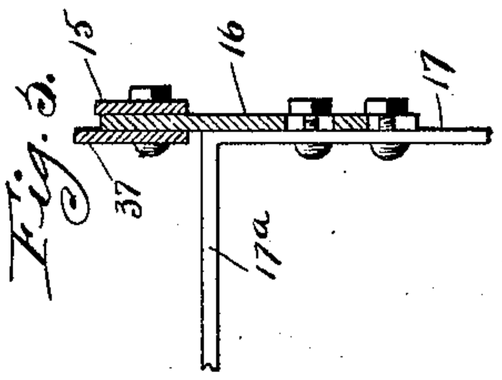


Fig. 5.



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(No Model.) 3 Sheets—Sheet 3.

D. D. RANNEY.

CAN SOLDERING MACHINE.

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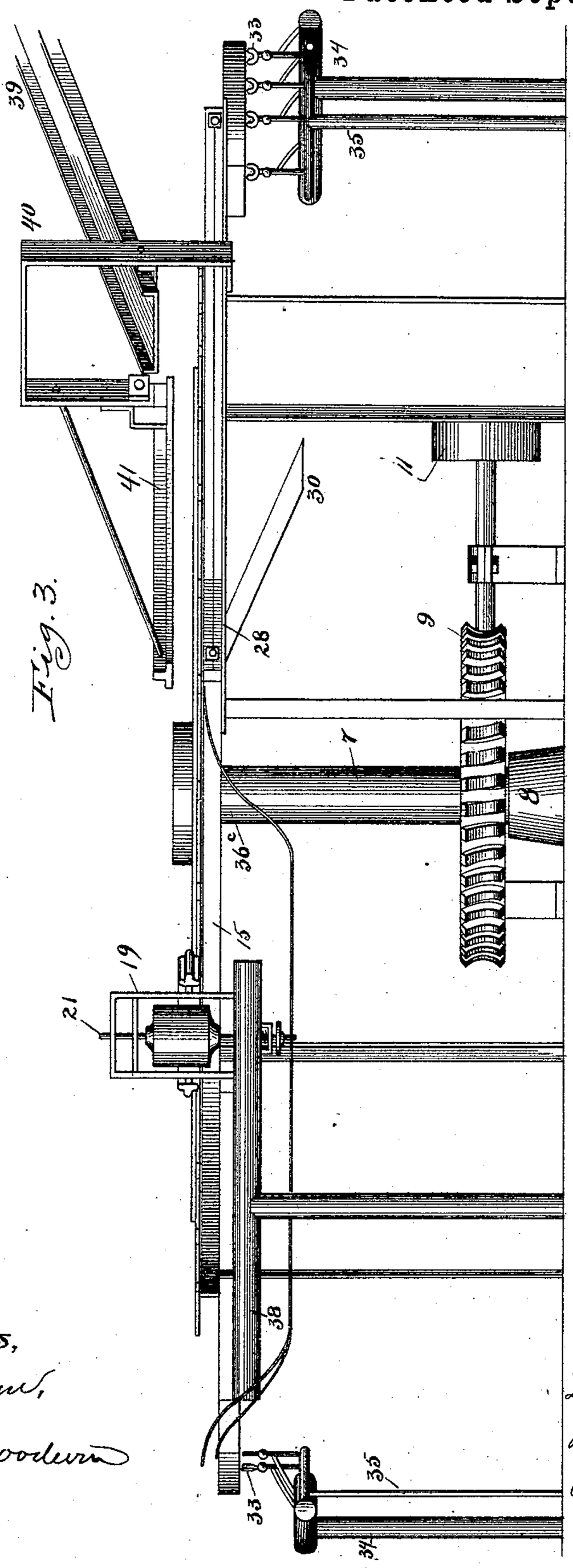

Fig. 3.

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UNITED STATES PATENT OFFICE.

DARWIN D. RANNEY, OF LEWISTOWN, ILLINOIS, ASSIGNOR TO HENRY W. PHELPS AND SARAH J. RANNEY, OF SAME PLACE.

CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 437,453, dated September 30, 1890.

Application filed October 14, 1889. Serial No. 326,954. (No model.)

To all whom it may concern:

Be it known that I, DARWIN D. RANNEY, a citizen of the United States, residing at Lewistown, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in Machines for Soldering the Ends of Sheet-Metal Cans, of which the following is a specification.

My invention relates to a machine for soldering the ends of sheet-metal cans; and it consists in the devices and combinations of devices to that end, as hereinafter described, but particularly pointed out in the claims.

The mechanism and the preferred form of construction comprises a central rotatable shaft with means for rotating the same, said shaft bearing arms radiating therefrom, said arms being flexible and carrying at their outer ends a bifurcated frame-work, within which is pivoted a frame carrying clamp mechanism; a central supporting-ring on which the said flexible arms bear, and to which is applied at certain intervals cams which are adapted to raise the arms and the can-carrying frames in order to dip the cans into and raise them out of receptacles for a flux and a solder bath, which are provided at suitable intervals; cam-tracks which are adapted to engage the pivoted frame in order to present first one end of the can and then the other to the flux and solder; perforated air-pipes through which a blast of cold air is directed upon the seams after they are soldered; a track for engaging one of the can-clamps in order to release the can, and means for supplying the cans to and discharging them from the machine.

In the accompanying drawings, Figure 1 is a plan view of the machine, all of the can-carrying frames, except six, and also the appliance for delivering the cans to the machine being omitted. Fig. 2 is a side elevation of the machine looking in the direction of the arrow 2. Fig. 3 is a side elevation looking in the direction of the arrow 3, Fig. 1; and Figs. 4, 5, and 6 are details of the supporting structure, Figs. 4 and 5 showing also the cam-track in side elevation and cross-section, respectively.

7 represents a shaft, which is rotatably secured in an upright position in a step 8. Shaft 7 bears a worm-gear 9, with which enmeshes a worm-shaft 10, bearing a pulley 11, to which power is applied to operate the machine. Toward the upper end of shaft 7 is secured a flanged hub 12, and to the flange of said hub are secured the radiating arms 13.

14 is a strengthening-rim, to which each of the arms is secured, and whereby their lateral movement is prevented. It is designed, when the ends of said arms are thus strengthened, that the rim 14 shall be capable of a slight vertical movement, and near their outer ends they all ride upon a stationary ring-like support 15, which is carried by standards 16, adjustably secured on legs 17, the upper ends of which are bent outwardly and adapted to support at their outer ends parts presently to be described.

Each of the arms 13 bears at its outer end a yoke 18, between the outer ends of whose arms is pivoted a rectangular frame 19. Said frame has also toward one end thereof a cross-bar 20, and in said cross-bar and the adjoining end bar is rotatably secured a stem 21, bearing a disk 22, which is adapted to bear against one end of the can. On the opposite end of the frame is a U-shaped bracket 23, and in this bracket and the end bar of the frame is journaled a stem 24, carrying at its inner end a disk 25, which is adapted to bear against the other end of the can. Around the stem 24 is coiled a spiral spring 26, one end of which is seated against the outer end of the frame 23 and the other end of which bears against the collar of the stem 24. This spring holds the disk 25 normally in engagement with the end of the can. The frame 19 is adapted to turn freely in a vertical plane in the yoke 18; but its movements are controlled by the projecting ends of the stems 21 24, which engage circular tracks, hereinafter described, and the stem 24 bears a roller 27, which at one point in the circuit engages a cam-track, whereby said stem is moved outwardly, compressing the spring in order to release the can.

On the upwardly-turned ends 17ª of the legs 17 is carried a table 28, which has an opening 29 and a delivering-chute below said

opening, through which the cans are delivered. At one end of said table is supported a segmental receptacle 31 to contain resin or a suitable flux, and at the end of said receptacle is a segmental receptacle 32 to contain a solder bath, which will be kept heated by burners 33, which are preferably supplied with a vapor of gas and air from the pipes 34 35. In order to present the edge of the can to the flux and solder, I provide a circular cam-guide, which may be in the form of a rod 36, and beneath which the projecting end of stem 21 will pass as the can moves away from the table 28. The result of this will be to tilt the frame 19 on its pivot and to present the edge or corner of the can to the flux bath, and the frictional contact of the stem 21 with the rod 36 will insure the rotation of the can while passing through the liquid. At the meeting ends of the flux and solder receptacles cam 37 will be placed, being adjustably secured to the support 15, and when the arm carrying the can under operation reaches said cam it will be lifted vertically, thus insuring the rise of the can over the partition between the fluid-receptacles and the ends thereof without injury. The can will pass through the solder bath in the same way as through the flux bath, and when raised out of the solder the projecting end of the stem 21, still engaging the rod 36, which at this point is bent inwardly, causes the frame 19 to assume an upright position in the yoke, thus holding the can in a vertical position, in which position it passes between two perforated pipes 38, through which cold air is forced upon the newly-soldered seams. In order to prevent the frame from tipping while passing between the air-pipes, the supplemental guide 36^a is provided. After the can has passed the air-pipes it is necessary to still further tilt the frame, in order to reverse the position of the can to bring its unsoldered end in position to be operated upon, and this is readily effected by still further curving inwardly and upwardly the circular cam-guides 36 and 36^a, as shown in Figs. 1 and 2 at 36^b. When the can has reached the end of the track 36^b, the spring-bearing end of the frame 19, being heavier, will cause the outer end of the can to tip downwardly in proper position to enter the flux-receptacle 31^a and the solder-receptacle 32^a in succession.

To prevent the frame from dropping too suddenly, whereby the can might be injured, the rod 39 is provided, which is adapted to receive the projecting end of the stem 24.

The appliances for heating the solder and cooling the seams, before described, will be duplicated on the opposite side of the machine, and at the end of the solder-receptacle the cam-guides 36 36^a are resumed and are so disposed as to receive the projecting end of stem 24 and to carry the same inwardly and downwardly, so as to cause the frame 19 to again assume a vertical position as it passes between the air-pipes, at the end of which it is bent sharply inward, as shown at 36^c, whereby to complete the revolution of the frame in its bearing, thus restoring it to its initial position. It remains now to discharge the can from the frame and replace it with another. To perform this work the roller 27 is made to engage with a short section of track 27^a, which is so disposed as to gradually withdraw the stem 24 until the disk 25 is released from the end of the can, whereupon the latter will drop through the opening 29 and roll down the incline 30.

In order to feed the cans to the machine, I have provided the inclined trough 39, supported on the standards 40, and from these standards projects a bar 41, under which the roller 27 passes, and which bar insures the engagement of the roller with the cam-track 27^a and the consequent release of the can. The cans will be delivered over the line 42, in which position the clamping-disks grasp them as the roller 27 passes off the end of the cam-track 27^a.

The above description is intended to set forth the preferred form of construction, and is one which I have found efficient and serviceable in practical use; but it is evident that many of the structural features above described may be changed without departing from the spirit of my invention.

I claim—

1. In a machine for soldering the ends of sheet-metal cans, the combination, with a central rotatable shaft, of arms rotatable with and radiating therefrom, said arms bearing at their outer ends horizontally-pivoted can-supporting frames, solder-receptacles arranged concentrically to the central shaft and beneath the path of the pivoted frames, and cam-tracks whereby said frames are revolved in vertical or substantially vertical planes to present the ends of the can successively to the solder, substantially as described.

2. In a machine for soldering the ends of sheet-metal cans, the combination, with a central rotatable shaft, of arms rotatable with and radiating therefrom, said arms bearing at their outer ends horizontally-pivoted can-supporting frames, solder-receptacles arranged concentrically to the central shaft and beneath the path of the pivoted frames, cam-tracks whereby said frames are revolved in vertical or substantially vertical planes to present the end of the can successively to the solder, and rotatable clamping devices for the can journaled in said frames, substantially as described.

3. In a machine for soldering the ends of sheet-metal cans, the combination, with a central rotatable shaft, of radiating arms having yokes at the outer ends thereof, can-supporting frames journaled in said yokes and adapted to be revolved in a vertical or substantially vertical plane, cam-tracks engaging said frames whereby to rotate them completely around on their axes, segmental solder-wells, and means for delivering a blast of cold air to the seams, substantially as described.

4. In a machine for soldering the ends of sheet-metal cans, the combination, with a central rotatable shaft, of radiating arms bearing yokes, can-supporting frames journaled in said yokes, can-clamping disks journaled in said frame, the stems of said disks projecting beyond the frame, and cam-tracks adapted to engage the projecting ends of said stems, whereby to revolve completely around the frame on its axis, substantially as described.

5. In a machine for soldering the ends of sheet-metal cans, the combination, with a central rotatable shaft, radiating arms, vertically-revoluble frames journaled thereto, and can-clamping disks journaled in said frame, of cam-tracks adapted to engage said frame and rotated completely around on its axis, one of said disks having an inwardly-forcing spring connected with its stem, and a cam-track adapted to engage said stem and compress the spring at one point of the revolution of the machine whereby to release the can, substantially as described.

6. In a machine for soldering the ends of sheet-metal cans, the combination of a central rotatable shaft having radiating arms formed of a resilient material and bearing at the outer ends thereof a vertically-rotatable frame, segmental solder-wells, and cams arranged in the path of the moving arms whereby to raise the outer ends thereof to permit the can to pass into and out of the solder-wells, substantially as described.

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Witnesses:
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W. M. BEGGS.