

No. 670,180.

Patented Mar. 19, 1901.

E. MANULA.
CAN SOLDERING MACHINE.

(Application filed Sept. 7, 1900.)

(No Model.)

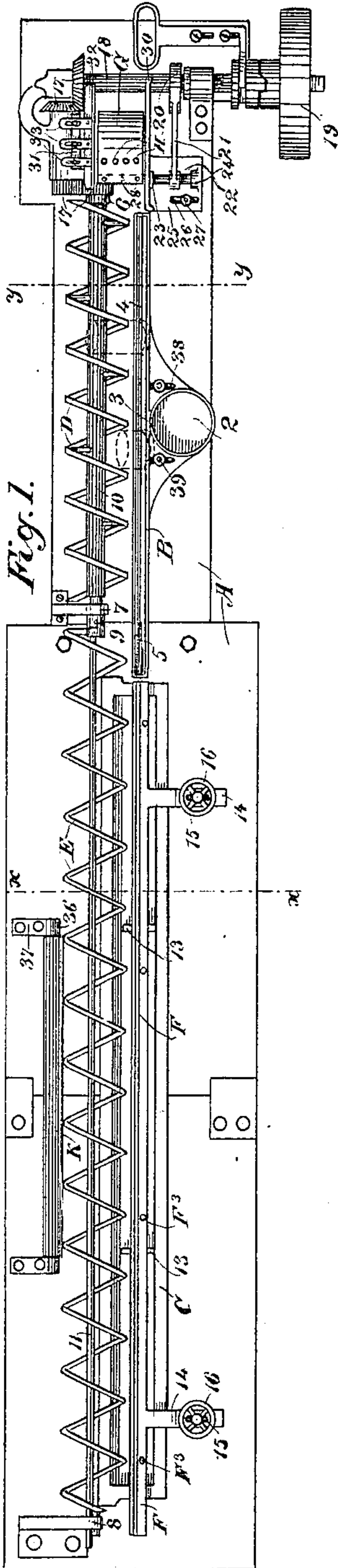


Fig. 1.

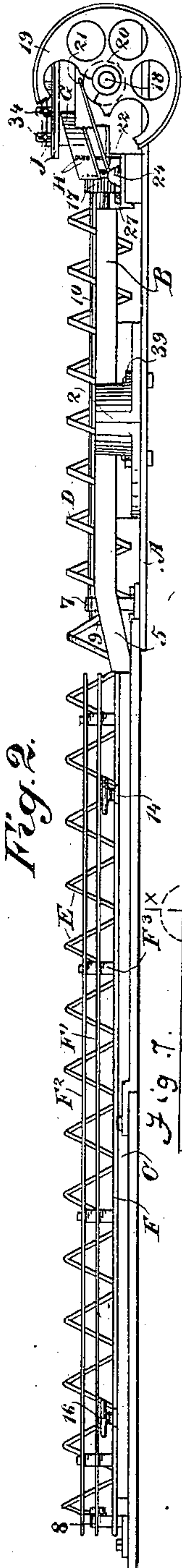


Fig. 2.

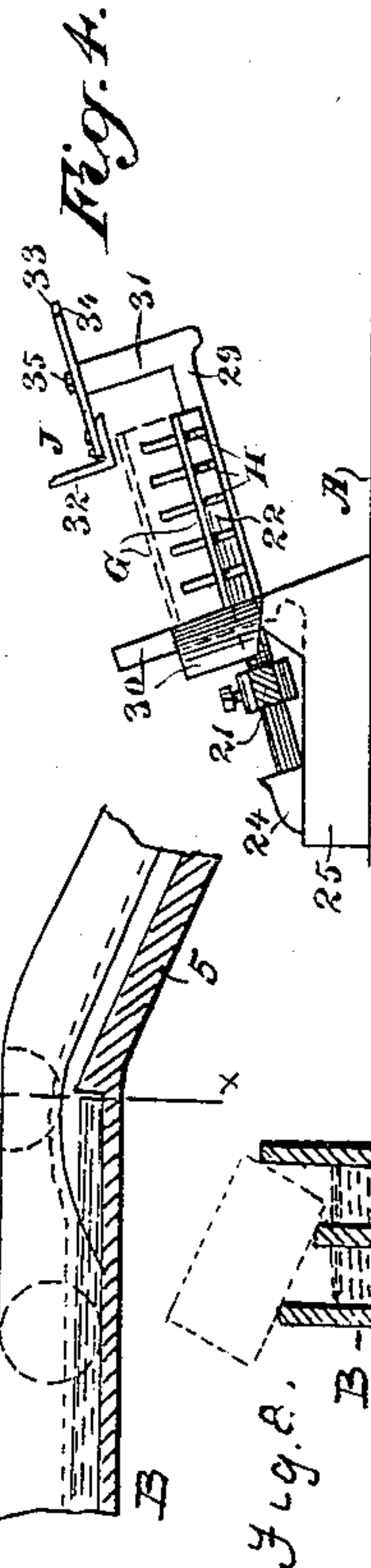


Fig. 3.

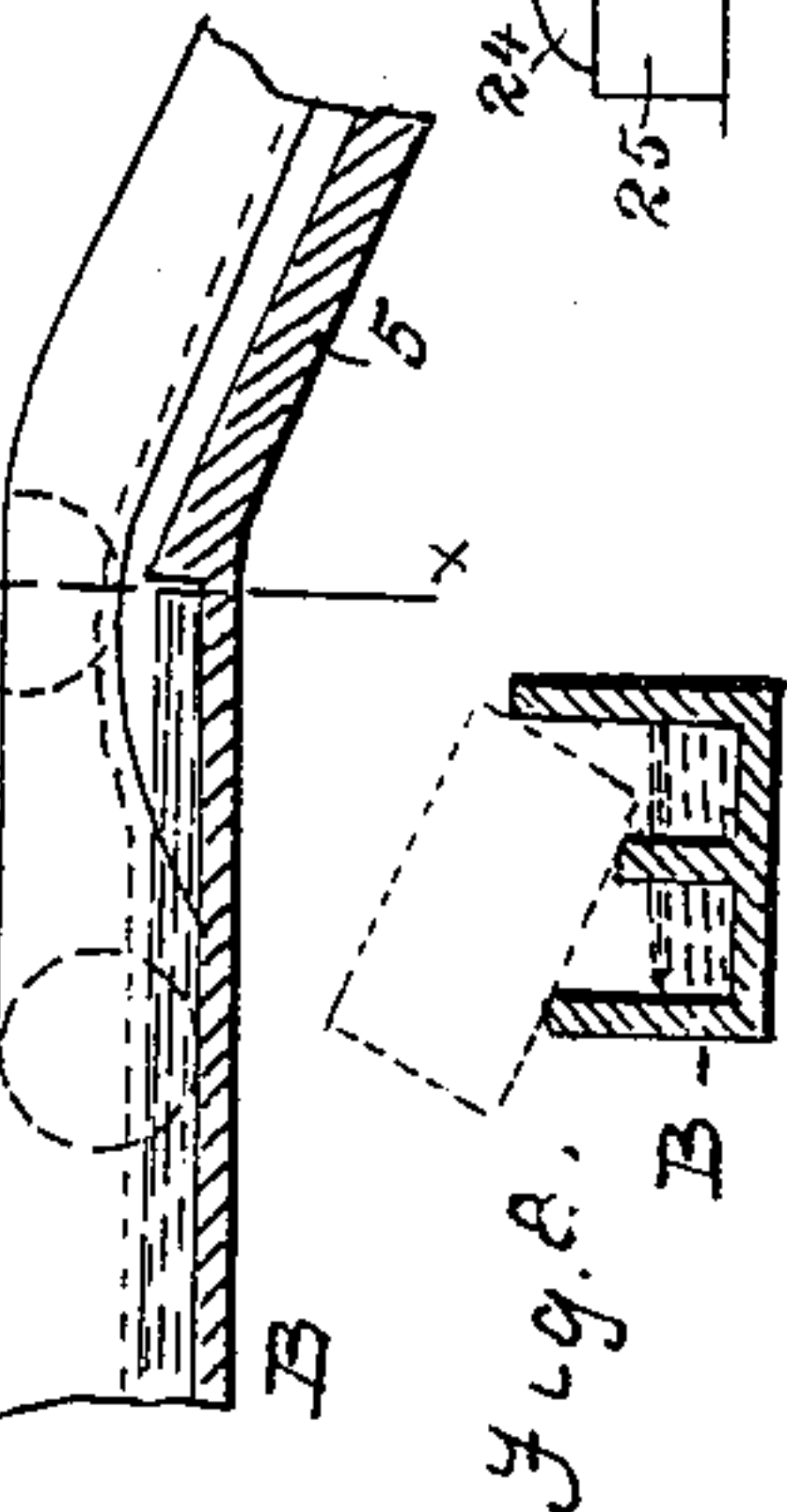


Fig. 4.

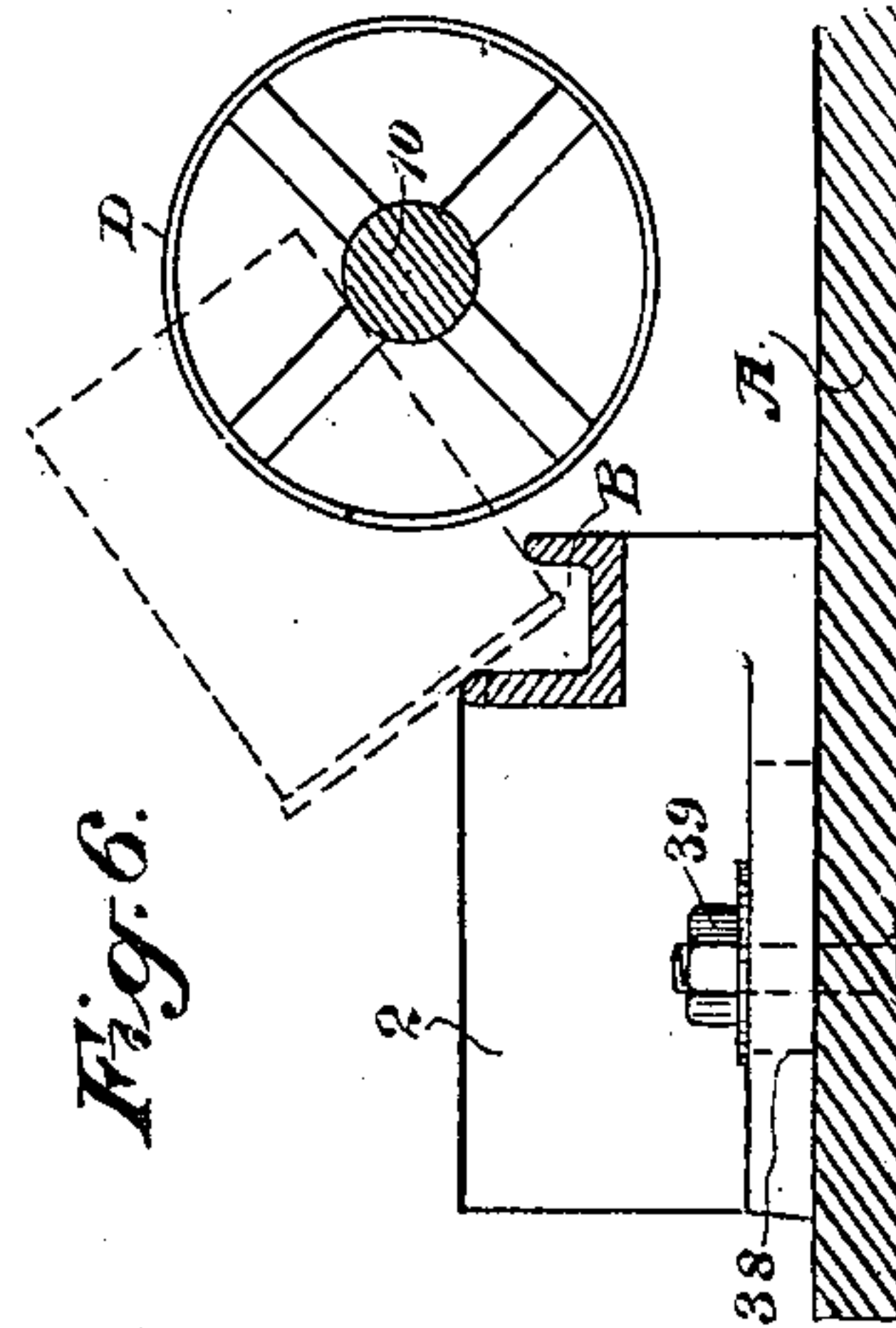


Fig. 5.

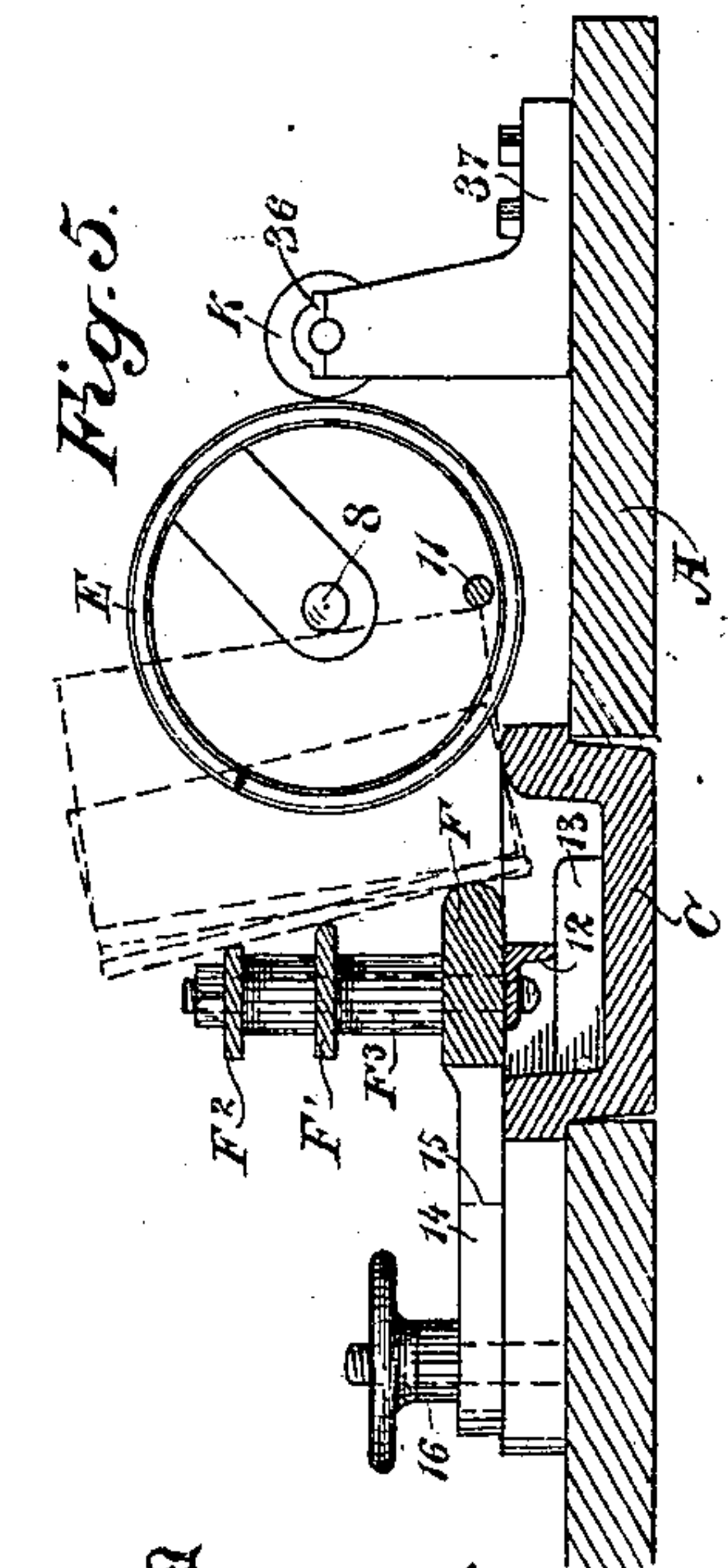


Fig. 6.

Witnesses,
J. H. Morse
J. F. Aschbeck

Inventor,
Erik Manula
By Duway Strong & Co.
Attys

UNITED STATES PATENT OFFICE.

ERIK MANULA, OF ASTORIA, OREGON.

CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,180, dated March 19, 1901.

Application filed September 7, 1900. Serial No. 29,267. (No model.)

To all whom it may concern:

Be it known that I, ERIK MANULA, a citizen of the United States, residing at Astoria, county of Clatsop, State of Oregon, have invented an Improvement in Can-Soldering Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in can-soldering machines.

It consists of an adjustable feed device, acid-trough, and solder-trough in line and in different planes and adjustable with regard to each other, two spirals of different length axially in line and parallel to the two troughs, the one governing the advance of the cans through the acid-bath having a revoluble shaft or can-support, and the one governing the advance through the solder-bath having an eccentric and fixed can-support.

It also comprises details of construction that will be more fully explained in the following specification and drawings.

Figure 1 is a plan view of the machine. Fig. 2 is an elevation of the same. Fig. 3 shows the entrance into the hollow spiral. Fig. 4 is an end view of the feeding device. Fig. 5 is a lateral section on line $x x$ of Fig. 1. Fig. 6 is a similar section on line $y y$ of Fig. 1. Fig. 7 is an enlarged sectional detail of a portion of the trough B, showing the inclined plate 5. Fig. 8 is a cross-section of the same on the line $x x$.

A represents the frame or bed of the machine.

B is the acid-trough. It has a reservoir 2, from which the liquid flows over the lip 3 into the groove 4, in which the tins dip. The bed-plate of this trough is transversely slotted, as at 38, and is secured to the bed A by set-screws 39. C is the solder-trough. These troughs are essentially horizontal and of sufficient length so that all parts of the article to be soldered can be made to dip successively into the baths while moving from one end of the bed to the other. The trough B is elevated about two inches above the solder-trough C, and the inner upper edges of these troughs are connected by an inclined plate 5.

D is a spiral centrally journaled at 6 and 7. E is a second and longer spiral having the

same axial line as D and the common journal 7 and journaled at the opposite end at 8. The shaft of the spiral D attaches at 9 to the shaft of the spiral E, so that the same power drives and turns both in unison. The turns of these spirals are sufficient to admit the cans which are to be soldered. The spirals are capable of replacement by others of different size where varying diameters of cans are to be operated upon. The spiral D, which is arranged in relation and parallel to the acid-trough, has a shaft 10, revoluble with the spiral. The edge of the trough B is just enough below the plane of the upper edge of the shaft 10, so that a can resting upon both will dip at the proper angle into the acid. The spiral E, which is arranged in relation to the solid trough, is hollow and incloses a fixed shaft 11, lying below the center of the spiral and for the greater part of its length parallel to the axis of the spiral. Near where the two spirals are joined the shaft 11 turns upwardly and parallel to the incline 5 and is fastened in the journal-support of 7 and at the opposite end is attached to the journal-support of 8. This shaft is slightly above the inner edge of the solder-trough, so as to incline the cans properly thereto. The spiral D is shorter than the spiral E, as the trough B is shorter than trough C, for the reason that one revolution of a can in the acid is sufficient and, in fact, preferable, while in the solder it is desirable that the can be made to revolve a number of times and take up sufficient solder to make a perfect seal.

F is an adjustable solder-bar or guide-bar. Its ends rest upon the end edges of the solder-trough. On its lower side and extending the inner length of the solder-trough is a downward extension or angle-plate 12. Ribs or supports 13 are cast in the trough at intervals and support the plate 12, and prevent the bar F from sagging. To the bar F are attached arms 14, having slots 15, through which pass locking devices 16, and which latter attach arms 14 to the bed, by which the bar F may be advanced or withdrawn over the edge of the trough.

F' F² are parallel bars held upon the posts F³ and all forming the guide part, called for convenience F.

The spirals are driven by gearing, as at 17.

18 is a shaft connecting therewith, having the power-pulley 19 and carrying the eccentric or cam 20. Resting upon this cam and held thereto simply by gravity is the lever 21. The other end of this lever is fixedly attached to a shaft 22, journaled at 23 and 24, which latter are part of the base-plate 25. The plate 25 has a slot 26 and is held in position upon the bed A by the bolt 27. Upon the shaft 22 is the feed-plate G, fastened as at 28. Rearward of 28 is a line of perforations up through which extend the impeding-pins H. The base-plate 25 referred to is of cast metal, having an angular extension 29 parallel to the shaft 22. Upon 29 and at right angles thereto, are flanges 30 and 31. The incline of 29 is such as to conform with the incline between the shaft 10 and the inner edge of B, previously mentioned, or, in other words, at the angle at which the cans are desired to dip into the acid, &c. The flange 30 is a guide-wall, against which the cans rest as they are slid into the spirals. The pins H are fastened in the plate 29. Upon the upper edge of 31 is a parallel guide J. This is made of angle-iron 32, upon which are riveted the parts 33, having the longitudinal slots 34. Guide J is then removably attachable to 31 by screws 35. The adjustment of guide J in relation to the guide-wall 30 is determined by the length of can, and the face of angle-iron 32 is of about the same length as that of flange 30, and the purpose of these two guides, as seen, is to steady the can while the plate G is raised and to preserve it in proper alinement in entering the spiral.

The length of the hollow spiral E and the weight of the cans carried while in operation cause a vibration that to overcome I have shown a roller K. This roller is journaled at its ends at 36 upon supports 37, and rests lightly against the outer periphery of the coil.

Having described the details of the machine, its operation would be as follows, supposing we are to work with tall cans: The solder-bar F is drawn out to the outer edge of the solder-trough, the acid-trough is moved away from the spiral, the bolt 27 is loosened, and the plate 25, carrying the feeder, moved outwardly. The lever 21, resting tangentially to the shorter radius of the cam 20, shows the plate G, with the pins H projecting above said plate. A can is placed upon the plate and behind the pins, with the end to be soldered against the wall 30 and the guide J near but not touching the other end of the can. The shaft 18 is revolved, the lever 21 is lifted, and the plate G tilted till the height of the pins above this plate is so reduced as to allow the cans to roll forward between the guides 30 and J into the acid-spiral. One end of the can will there rest upon the inner edge of the acid-trough and the other on the shaft 10. The cans lying upon the supports are advanced from one end to the other by turning the spirals, and the cans are rolled or turned upon these supports so as to have the

full circumference of their edges submerged in the acid. Passing from the acid-trough and the shaft 10 and to the spiral E, the can follows, by the parallel incline of the before-mentioned upturned part of the stationary rod 11 and the part 5, into the solder-bath. The solder-bar F, the acid-trough, and the guide 30 of the feed device having, as said, been adjusted in relation to each other and so that their connecting edges are flush and offer no projecting points to impede the can act as a support to the outer end of the can throughout its journey. The cans are delivered at the other end of the solder-trough by any suitable means. To operate with short cans, these guide parts are simply pushed in closer to the spirals, and the cans instead of resting partly on the shaft 10 and the shaft 11 rest entirely on the inner edge and against the outer wall of the acid-trough and on the edge of the solder-trough and against the solder-bar F and are carried forward by the revolving spirals, as before. The guide J is in the latter case brought closer to the guide 30 and the cans are held straight, as before. As the revolution of the shaft 18 is the same as the revolution of the spirals, the plate G is consequently lifted and lowered in unison therewith, and as a can is released at every revolution each successive space between the spiral convolutions is accordingly filled. The action of the machine is thus made continuous and the timing is absolute and varies only as the speed of the coils.

Oval and irregular shaped cans are operated as in the foregoing cases.

In Fig. 5 the dotted lines represent short cans, while in Fig. 6 the dotted lines indicate a tall can.

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

1. In a soldering-machine, the combination of an automatic feed device, an acid-trough and a longer solder-trough in horizontal alinement, but in different planes of elevation, spirals essentially parallel to these troughs, by which the cans are successively propelled through the acid and solder baths, means including an adjustably-secured base-plate having an angular extension and opposing guide-flanges for supporting and guiding the cans and means for operating the coils.
2. In a soldering-machine, the combination of an acid-trough, and a solder-trough horizontally in line, but in different planes, a spiral having a concentric and revoluble support, a second and longer spiral, said second spiral inclosing an eccentric and fixed support, both spirals turning on the same axial line and arranged in relation respectively to the acid and solder troughs, guides upon the troughs, and means for operating the feed device and the coils in unison.

3. In a soldering-machine, the combination of a spiral-driving device arranged parallel to a movable acid-trough, and a fixed solder-

trough, which latter are in horizontal alignment, but in different planes, supports within the spirals parallel to the inner edges of the troughs, a solder-bar resting upon the ends 5 of the solder-trough and adjustable transversely to the solder-trough, and means including a tilting feed-plate and impeding-pins adapted to project through the same for feeding cans successively into the revolving 10 spirals.

4. In a spirally-driven soldering-machine, a feeder consisting of a slotted base-plate, having an upward plate extension, a guide wall or flange upon the lower part of and perpendicular to this incline, an adjustable guide 15 parallel to this wall and attachable upon the upper part of this extension-plate, a shaft journaled upon the base-plate and extending above and parallel to the extension-plate, 20 carrying a feed-plate which has a transverse row of perforations, up through which project impeding-pins attached in the extension-plate, a lever attached to the shaft and between the journals on the base-plate, the end 25 of the lever resting upon an eccentric on the shaft, which latter transmits power to the spirals, and the lever so operating that by each revolution of the spirals, the feed-plate is tilted so that the impeding-pins are depressed below the upper surface of the feed- 30 plate, and cans placed upon the plate are admitted regularly into successive spaces in the spirals.

5. The combination in a soldering-machine

of a movable acid-trough having a storage- 35 reservoir integral with a shallow longitudinal dipping trough or groove, a fixed longer solder-trough horizontally in line with but on a lower plane than the acid-trough, said solder-trough having short transverse ribs 40 within it, an inclined connection of the inner edges of these troughs, a solder-bar adjustable transversely of the solder-trough, open, spirals centrally journaled and parallel to the troughs, said spirals inclosing supports essentially parallel with the inner edge of the 45 acid-trough, with the connecting-incline, and with the inner edge of the solder-trough, and of a feeder movable outwardly and inwardly in relation to the position of the acid-trough 50 and the solder-bar, and mechanism for commonly operating the feeder and the coils.

6. The combination in a soldering-machine, having horizontally-disposed acid and solder troughs, of a short spiral having a revolving 55 shaft, a second and longer and hollow spiral operating with the first-named spiral, and a roller suitably supported, lying contiguous to the outer periphery of this second spiral and preventing vibration of the latter as the 60 spirals are revolved, and means for driving the spirals.

In witness whereof I have hereunto set my hand.

ERIK MANULA.

Witnesses:

E. G. ROGERS,
J. R. BENNETT.